



Maternal Group B Streptococcus in pregnancy: screening and management

This statement has been developed and reviewed by the Women's Health Committee and approved by the RANZCOG Board and Council.

A list of Women's Health Committee Members can be found in [Appendix A](#).

Disclosure statements have been received from all members of this committee.

Disclaimer This information is intended to provide general advice to practitioners. This information should not be relied on as a substitute for proper assessment with respect to the particular circumstances of each case and the needs of any patient. This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The document has been prepared having regard to general circumstances.

First endorsed by RANZCOG: July 2003
Current: July 2019
Review due: July 2022

Objectives: To provide health professionals and care facilities providing maternity care with information and recommendation regarding the screening and management of maternal Group B Streptococcus in pregnancy.

Target audience: Health professionals providing maternity care, and patients.

Values: The evidence was reviewed by the Women's Health Committee (RANZCOG), and applied to local factors relating to Australia and New Zealand.

Validation: This statement was compared with ACOG, SOGC and RCOG guidance on this topic.

Background: This statement was first developed by Women's Health Committee in July 2003 and most recently reviewed in July 2019.

Funding: The development and review of this statement was funded by RANZCOG.

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1. Plain language summary

Group B streptococci (GBS) are bacteria that occur naturally in the vagina, urethra and bowel in some women. Carrying GBS on the body is normal and rarely harmful to healthy, non-pregnant women. However, the bacteria can pass to a baby in the birth canal during labour and there is a small chance a baby who contacts GBS during labour will develop an infection and become seriously ill. Giving antibiotics to the mother during labour reduces the risk of a baby developing a GBS infection soon after birth.

Whether a woman should have antibiotic treatment in labour can be determined in one of two ways: either by identifying risk factors during pregnancy and labour; or, by taking a swab at about 36 weeks in pregnancy. The swab test will usually determine whether a woman carries GBS. Using either of these approaches it is possible to identify women whose babies are at increased risk and offer treatment with antibiotics during labour to reduce this risk to the baby.

2. Summary of recommendations and good practice points

Recommendation 1	Grade
All maternity services should have an established plan for prevention of EOGBS.	Consensus – based recommendation
Recommendation 2	Grade
Universal culture-based screening, using combined low vaginal plus or minus anorectal swab at 35-37 weeks gestation, or 3-5 weeks prior to anticipated delivery in high risk pregnancy such as poorly controlled diabetes, multiple pregnancy, or a clinical-risk factor-based approach are both acceptable strategies for reducing EOGBS.	Consensus – based recommendation
Good Practice Point	Grade
If a woman's GBS carriage status is unknown at the time of labour onset, then treatment according to clinical risk factors is appropriate.	Good Practice Point
Recommendation 3	Grade
Low vaginal and anorectal swabs for GBS screening should be incubated in enriched media to achieve acceptable sensitivities.	Consensus – based recommendation
Good Practice Point	Grade
Pathology request forms should specify that the sample has been collected for GBS screening rather than routine culture in order to facilitate specialised culture conditions for GBS. For a patient known to be allergic to penicillin, this should be indicated on the pathology form and antibiotic sensitivities requested.	Good Practice Point
Recommendation 4	Grade
Intrapartum antibiotic prophylaxis with IV penicillin-G or ampicillin should be offered to all women at increased risk of EOGBS.	Consensus – based recommendation
Good Practice Point	Grade
Women who are known to be allergic to penicillin should have antibiotic sensitivities performed at the time of GBS culture. Acceptable alternatives to penicillin include cefazolin, clindamycin and vancomycin, depending on the nature of previous adverse reaction to penicillin and the antibiotic resistance.	Good Practice Point

3. Introduction

Group B streptococcus (GBS) is the leading cause of early onset neonatal sepsis in developed countries.^{1,2} Maternal colonisation rates of GBS during pregnancy vary between 10 and 30%. Approximately 40–50% of babies born to colonised mothers will become colonised with GBS. Without prophylactic interventions such as intrapartum antibiotics, the incidence of early onset GBS (EOGBS) in Australia, the United States and Western Europe has been estimated at between 0.4 and 4 per 1000 live births.^{3,4} This is important because the contemporary case fatality rate for EOGBS is approximately 14%.⁵ Although approximately 70% of cases of EOGBS are in term babies, mortality rates of approximately 20% have been documented in preterm infants, which is ten-fold higher than the term infants.⁶ EOGBS in the neonate most commonly presents with respiratory symptoms and pneumonia; late onset GBS infection is more likely to present with meningitis and septicaemia. The risk of EOGBS can be reduced by 80% with the use of intrapartum antibiotics.⁷ The incidence of late onset GBS infection (occurring in babies aged between one week and three months) appears to be unchanged by the use of intrapartum antibiotics.

4. Discussion and recommendations

4.1 Prevention of EOGBS

The use of intrapartum antibiotic prophylaxis (IAP) for women with risk factors can prevent EOGBS⁸⁻¹⁰ and is cost effective in some health care settings.^{11,12} Although data from high quality randomised control trials is limited¹³, the decline in incidence of EOGBS seen at a population level appears to be associated with the use of IAP and universal screening adopted in some countries like US. Universal screening and IAP cannot prevent all maternal or neonatal disease, which further supports the case for vaccination against serotypes Ia, III & V in the antenatal period. Phase II Trials using trivalent vaccination are ongoing and the manufacturers are in the process of developing these vaccines.^{14,15}

Clinical risk factors for EOGBS include:

- Spontaneous onset of labour at <37 weeks gestation.
- Rupture of membrane \geq 18 hours.
- Maternal fever \geq 38°C.
- A previous infant with EOGBS or late onset GBS
- GBS bacteriuria during the current pregnancy.
- Known carriage of GBS in current pregnancy.
- Clinical diagnosis of chorioamnionitis
- Other twin with current EOGBS.

Earlier guidelines for the prevention of EOGBS endorsed both clinical risk-based or culture-based screening approaches to identifying those at risk of EOGBS.^{9,16} In 2002 a large population-based study was published that supported the universal culture-based screening approach, both for identifying women at risk and for rates of IAP.¹⁷ For these reasons, the Centers for Disease Control and Prevention (CDC)¹⁴ and other professional bodies in the United States (American Congress of Obstetricians and Gynecologists¹⁸, the American Academy of Pediatrics¹⁹) recommend a universal culture-based screening approach to determining which women should be offered IAP. However, the Royal College of Obstetricians and Gynaecologists (RCOG) currently does not recommend universal culture-based screening due to conclusions about cost-effectiveness in the United Kingdom setting.¹⁵

In Australia, a large prospective single centre study demonstrated that a policy of universal culture-

based screening and IAP was associated with an 84% decline in the incidence of early onset GBS disease.²⁰ That study reported a decline in the incidence of blood culture-proven EOGBS (1.4/1000 vs 0.2/1000 live births) with a number needed to treat (NNT) of 224). The majority of confirmed EOGBS cases were attributed to non-compliance with the screening protocol. Similar benefits to screening and IAP have been shown in the North America.⁶

A recent Australian systematic review that included data from nine studies concluded that the odds of EOGBS in infants of any gestation (that is, both term and preterm) was significantly lower with routine culture-based screening compared with risk factor-based screening (OR 0.45, 95% CI 0.37 - 0.53).²¹ The odds ratio for term infants alone was similar (OR 0.45, 95% CI 0.36 - 0.57). Preterm infants were four times more likely to develop EOGBS than term infants, regardless of the screening approach.

Women who have previously had an infant with EOGBS or late onset GBS¹⁵ (not simply colonisation) should have IAP in subsequent pregnancies, irrespective of the current colonisation status. Antenatal screening is not recommended in these women due to its high false negative rates^{15,17} Although there is little direct evidence to guide practice, consideration of the aforementioned evidence has led to recommendations that women with unknown GBS status at the time of delivery should be managed according to the presence of intrapartum risk factors.

Vaginal cleansing with chlorhexidine during labour does not reduce the risk of EOGBS disease.^{25,34}

Recommendation 1	Grade
All maternity services should have an established plan for prevention of EOGBS.	Consensus – based recommendation
Recommendation 2	Grade
Universal culture-based screening, using combined low vaginal plus or minus anorectal swab at 35-37 weeks gestation or 3-5 weeks earlier if delivery is anticipated for high risk women, or a clinical risk factor-based approach are both acceptable strategies for reducing EOGBS.	Consensus – based recommendation
Good Practice Point	Grade
If a woman’s GBS carriage status is unknown at the time of labour onset, then treatment according to clinical risk factors is appropriate.	Good Practice Point
Recommendation 3	Grade
Low vaginal and anorectal swabs either a single swab (vagina then anorectum) or two different swabs or GBS screening should be incubated in enriched media to achieve acceptable sensitivities. If processing is delayed, specimens should be refrigerated. ²⁴	Consensus – based recommendation
Good Practice Point	Grade
Pathology request forms should specify that the sample has been collected for GBS screening rather than routine culture in order to facilitate specialised culture conditions for GBS. For a patient known to be allergic to penicillin, this should be indicated on the pathology form and antibiotic sensitivities requested.	Good Practice Point

4.2 Culture-based screening for maternal GBS colonisation

Culture-based screening for GBS is performed using a combined low vaginal and anorectal swab. Because maternal colonisation is being screened for, and not active infection, the culture needs to be performed on selective enriched media in order improve the sensitivity. False negative rates of up to 50% can occur without the use of enriched culture media. Rectovaginal culture at 36 weeks has a sensitivity of 91% and specificity of 88.9% for intrapartum maternal vaginal colonization.²²

GBS carriage is thought to fluctuate over time, and culture results have been shown to be less predictive of carrier status if more than five weeks has elapsed between sample collection and delivery.¹³ For this reason screening for GBS colonisation at term is predicted by screening at 35-37 weeks gestation or 3 to 5 weeks before the anticipated delivery in high risk women who need to be delivered pre term for other indications.^{12,15} The GBS screening swab can be collected by the clinician or the patient. The negative predictive value of GBS culture performed within five weeks of delivery is 95-98%.²³ GBS bacteriuria is commonly associated with heavy genital tract colonisation. Women with this finding during pregnancy should receive appropriate treatment for bacteriuria, and IAP at the time of labour.^{15,26}

A recent Danish study which used rapid GBS- PCR with a turnaround time of 120 minutes, for women in labour who had at least one risk factor revealed 92% sensitivity. This would significantly reduce the number of women who would have otherwise received antibiotics because of one or more risk factors.²⁵ However, the current technology is still not sufficiently advanced to provide GBS – PCR results rapidly enough to safely institute antibiotics 4 hours prior to delivery. There are also concerns with regards to cost implications as well as accessibility to the laboratory for PCR analysis during after-hours.¹⁵

4.3. IAP regime for GBS colonised women

Chemoprophylaxis for those who are found to be GBS carriers before the onset of labour or rupture of membranes has been shown to be ineffective. Antepartum antibiotic prophylaxis of colonized women results in a 67% recurrence of GBS colonization later in pregnancy. Intrapartum therapy has been found to be effective in preventing neonatal EOGBS disease.

Intravenous penicillin and ampicillin are equally effective against GBS, but penicillin may be preferable for IAP because of its narrower spectrum of activity. Optimal IAP is defined as penicillin administered at least four hours prior to delivery.²⁷ Appropriate doses for intrapartum penicillin should be in line with institutional/jurisdictional protocols.

Penicillin administered to a woman with no known history of β -lactam allergy carries a risk of anaphylaxis of between 4/10,000 to 4/100,000.⁹ Mortality from anaphylaxis is rare in a hospital setting. Any morbidity associated with anaphylaxis is greatly offset by reduction in incidence of neonatal and maternal sepsis.

Women with known penicillin allergy should have sensitivity testing for clindamycin and erythromycin specifically requested at the time of GBS culture. Approximately 20% of GBS strains will be resistant to clindamycin, and 30% to erythromycin. For those women allergic to penicillin, alternative antimicrobial strategies¹⁰ should be used in accordance with local institutional/jurisdictional guidelines. Women who have not experienced anaphylaxis, angioedema, urticarial, or respiratory distress after a penicillin or cephalosporin can receive IV cefazolin for IAP.¹² For woman at risk of anaphylaxis with penicillin, and where the GBS is resistant to erythromycin or clindamycin, vancomycin is the recommended alternative with a dosage regime of 20 mg/kg intravenous every 8 hours (to a maximum individual dose of 2 grams).²⁴

Recommendation 4	Grade
Intrapartum antibiotic prophylaxis with IV penicillin-G or ampicillin should be offered to all women at increased risk of EOGBS.	Consensus – based recommendation
Good Practice Point	Grade
Women who are known to be allergic to penicillin should have antibiotic sensitivities performed at the time of GBS culture. Acceptable alternatives to penicillin include cefazolin, clindamycin and vancomycin, depending on the nature of previous adverse reaction to penicillin and the antibiotic resistance.	Good Practice Point

5. Specific clinical scenarios

5.1 Elective CS

For elective Caesarean section prior to the onset of labour, no additional prophylaxis is recommended, irrespective of GBS carriage.¹⁷ However, if a woman screened positive for GBS commences labour or has spontaneous rupture of the membranes before her planned CS, she should receive IAP while awaiting delivery.

5.2 Women with preterm labour, GBS status unknown

Women who present with threatened preterm labour should have a rectovaginal swab taken for GBS culture. IAP for GBS should be commenced if labour establishes and continued until delivery. If labour does not establish, GBS prophylaxis should be ceased. If the culture is subsequently found to be positive IAP should be recommenced at the time of labour onset.

5.3 Term pre-labour rupture of the membranes (PROM)

Women with PROM and who have screened positive for GBS should be offered induction of labour and IAP without delay.

5.4 Preterm pre-labour rupture of membranes (PPROM)

For women with suspected or confirmed PPROM a rectovaginal swab should be taken for GBS culture. In this setting there is insufficient evidence to provide conclusive recommendations and in North America the CDC and ACOG^{12,18} recommend that IAP should be given for 48 hours, or until a negative GBS result is returned, whereas in the UK setting the RCOG does not support this.¹⁵ If the GBS result is subsequently found to be positive, then IAP should be offered with the onset of labour. Antibiotics for latency (that is, to lengthen gestation) should be given independent consideration to GBS prophylaxis.

If a woman has confirmed PPROM at 34 weeks or more and is known to be GBS positive, immediate delivery or IOL should be offered. If she is less than 34 weeks, she should be managed as any woman with PPROM until she reaches 34 weeks, because the risk of prematurity outweighs the risks of neonatal GBS infection.^{15,30}

5.5 Obstetric procedures

Provided women are treated with IAP there is insufficient evidence to recommend either avoidance of, or alterations of technique, in routine obstetric procedures such as membrane sweeping, amniotomy, and fetal scalp blood sampling on the basis of GBS status.

5.6 Clinical chorioamnionitis

If a GBS-positive woman develops clinical signs of chorioamnionitis in labour, then a broader spectrum of antibiotic cover will be required to provide a better coverage than penicillin for non-GBS causes of chorioamnionitis.

5.7 Water birth and water immersion

Water Birth or water immersion are not contraindicated in women who are known to have GBS carrier, as long as they agree to receive IAP.^{15,31,32}

5.8 High risk women declining IAP

Women with known GBS colonisation who decline IAP should be advised the risk of baby developing EOGBS is significantly higher than if they received IAP. These babies should be very closely monitored for 12 hours after birth in accordance with local guidelines.^{15,33}

5.9 Women with previous carriage of GBS

Recent meta-analysis revealed about 50% of pregnant women who were previous carriers are at the risk of recurrence in the subsequent pregnancy. Mothers should be informed of the risk of recurrence and discuss the options of IAP or bacteriological testing in late pregnancy and only offer of IAP if they are GBS positive.^{15,35,36}

6. Conclusion

Maternal colonisation with GBS is common, and there is established evidence that programs of screening for GBS and treatment with IAP reduce the risk of EOGBS. However, considerations of cost-effectiveness have led to different approaches to prevention of EOGBS in different parts of the world. All maternity services should have an established plan for prevention of EOGBS, whether by a universal culture or a clinical risk factor-based approach. Provision should be made for management of potential or known maternal GBS carrier status in a wide variety of clinical settings, including labour or PROM occurring before a planned caesarean section, with PROM in women planning vaginal birth, and in PPRM irrespective of planned mode of delivery. Audit and review of outcomes within a maternity service is encouraged.

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8. Links to other College statements

Routine Antenatal Assessment in the Absence of Pregnancy Complications (C-Obs 03b)

[https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Routine-Antenatal-Assessment-\(C-Obs-3\(b\)\)-Review-July-2016.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Routine-Antenatal-Assessment-(C-Obs-3(b))-Review-July-2016.pdf?ext=.pdf)

Consent and provision of information to patients in Australia regarding proposed treatment (C-Gen 02a)

[https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical%20-%20General/Consent-and-provision-of-information-to-patients-in-Australia-\(C-Gen-2a\)-Review-July-2016.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical%20-%20General/Consent-and-provision-of-information-to-patients-in-Australia-(C-Gen-2a)-Review-July-2016.pdf?ext=.pdf)

Consent and provision of information to patients in New Zealand regarding proposed treatment (C-Gen 2b)

[https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical%20-%20General/Consent-and-provision-of-information-NZ-\(C-Gen-2b\)-Review-March-2016.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical%20-%20General/Consent-and-provision-of-information-NZ-(C-Gen-2b)-Review-March-2016.pdf?ext=.pdf)

Evidence-based Medicine, Obstetrics and Gynaecology (C-Gen 15)

[https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical%20-%20General/Evidence-based-medicine,-Obstetrics-and-Gynaecology-\(C-Gen-15\)-Review-March-2016.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical%20-%20General/Evidence-based-medicine,-Obstetrics-and-Gynaecology-(C-Gen-15)-Review-March-2016.pdf?ext=.pdf)

9. Patient information

A range of RANZCOG Patient Information Pamphlets can be ordered via:

<https://www.ranzcog.edu.au/Womens-Health/Patient-Information-Guides/Patient-Information-Pamphlets>

Appendices

Appendix A Women's Health Committee Membership

Name	Position on Committee
Professor Yee Leung	Chair and Board Member
Dr Gillian Gibson	Deputy Chair, Gynaecology
Dr Scott White	Deputy Chair, Obstetrics and Subspecialties Representative
Associate Professor Ian Pettigrew	Member and EAC Representative
Dr Kristy Milward	Member and Councillor
Dr Will Milford	Member and Councillor
Dr Frank O'Keefe	Member and Councillor
Professor Sue Walker	Member
Dr Roy Watson	Member and Councillor
Dr Susan Fleming	Member and Councillor
Dr Sue Belgrave	Member and Councillor
Dr Marilyn Clarke	ATSI Representative
Associate Professor Kirsten Black	Member
Dr Thangeswaran Rudra	Member
Dr Nisha Khot	Member and SIMG Representative
Dr Judith Gardiner	Diplomate Representative
Dr Angela Brown	Midwifery Representative
Ms Ann Jorgensen	Community Representative
Dr Rebecca Mackenzie-Proctor	Trainee Representative
Prof Caroline De Costa	Co-opted member (ANZJOG member)

Appendix B Overview of the development and review process for this statement

i. Steps in developing and updating this statement

This statement was originally developed in July 2003 and was most recently reviewed in July 2019. The Women's Health Committee carried out the following steps in reviewing this statement:

- Declarations of interest were sought from all members prior to reviewing this statement.
- Structured clinical questions were developed and agreed upon.
- An updated literature search to answer the clinical questions was undertaken.
- At the March 2016 face-to-face committee meeting, the existing consensus-based recommendations were reviewed and updated (where appropriate) based on the available body of evidence and clinical expertise. Recommendations were graded as set out below in Appendix B part iii)

ii. Declaration of interest process and management

Declaring interests is essential in order to prevent any potential conflict between the private interests of members, and their duties as part of the Women's Health Committee.

A declaration of interest form specific to guidelines and statements was developed by RANZCOG and approved by the RANZCOG Board in September 2012. The Women’s Health Committee members were required to declare their relevant interests in writing on this form prior to participating in the review of this statement.

Members were required to update their information as soon as they become aware of any changes to their interests and there was also a standing agenda item at each meeting where declarations of interest were called for and recorded as part of the meeting minutes.

There were no significant real or perceived conflicts of interest that required management during the process of updating this statement.

iii. Grading of recommendations

Each recommendation in this College statement is given an overall grade as per the table below, based on the National Health and Medical Research Council (NHMRC) Levels of Evidence and Grades of Recommendations for Developers of Guidelines. Where no robust evidence was available but there was sufficient consensus within the Women’s Health Committee, consensus-based recommendations were developed or existing ones updated and are identifiable as such. Consensus-based recommendations were agreed to by the entire committee. Good Practice Notes are highlighted throughout and provide practical guidance to facilitate implementation. These were also developed through consensus of the entire committee.

Recommendation category		Description
Evidence-based	A	Body of evidence can be trusted to guide practice
	B	Body of evidence can be trusted to guide practice in most situations
	C	Body of evidence provides some support for recommendation(s) but care should be taken in its application
	D	The body of evidence is weak and the recommendation must be applied with caution
Consensus-based		Recommendation based on clinical opinion and expertise as insufficient evidence available
Good Practice Note		Practical advice and information based on clinical opinion and expertise

Appendix C Full Disclaimer

This information is intended to provide general advice to practitioners, and should not be relied on as a substitute for proper assessment with respect to the particular circumstances of each case and the needs of any patient.

This information has been prepared having regard to general circumstances. It is the responsibility of each practitioner to have regard to the particular circumstances of each case. Clinical management should be responsive to the needs of the individual patient and the particular circumstances of each case.

This information has been prepared having regard to the information available at the time of its preparation, and each practitioner should have regard to relevant information, research or material which may have been published or become available subsequently.

Whilst the College endeavours to ensure that information is accurate and current at the time of preparation, it takes no responsibility for matters arising from changed circumstances or information or material that may have become subsequently available.