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Related Trust Policies (to be read in conjunction with)	(Refer to the main body of the text) 04071 Standard Infection Prevention 04072 Hand Hygiene 06036 Maternity Record Keeping including Documentation in Handheld Records 08049 Guideline for the Management of Term Pre-labour Rupture of Membranes 04292 Guideline for the Management of Preterm Pre-labour Rupture of Membranes 04265 Guideline for Fetal Heart Rate Monitoring in Pregnancy and Labour 09160 Guideline for the prevention of neonatal group B streptococcal infection

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1.0	Dr Teare, Dr Babu		April 2001
2.0	Dr Teare, Dr Babu		April 2003
3.0	Dr Teare, N.Smethhurst and J.Bishop		June 2005
4.0	Susan French		January 2010
5.0	Dr Jaha		June 2012
5.1	Dr Field	Clarification to 7.0, 8.0	November 2012
5.2	Sarah Moon	Clarification to 6.9	March 2013
6.0	Madhu Joshi, Consultant for Obstetrics and Gynaecology		October 2015
6.1	Louise Teare	Clarification to point 7.2	4 January 2016
6.2	Anita Dutta	Clarification to point 7.2	20 June 2017
6.3	Anita Dutta	Clarification to points 5.2; 5.3; 6.1, 7.3, 7.3.1 and 8.1	2nd March 2018
6.4	Megha Mistry	Clarification to Appendix B	26th April 2018
7.0	Anita Dutta	Full Review	3rd October 2018

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1.0 Purpose

1.1 The purpose of this guideline is to provide evidence based guidance for obstetricians, paediatricians, midwives and neonatal nursing staff on the prevention of early-onset neonatal group B streptococcal (GBS) disease.

2.0 Equality and Diversity

2.1 Mid Essex Hospital Services NHS Trust is committed to the provision of a service that is fair, accessible and meets the needs of all individuals.

3.0 Incidence of EOGBS Infection

3.1 Group B streptococcus, is a normal body commensal, carried asymptomatically by up to 30 per cent of the population. Approximately a third of men and women carry GBS in their intestine and a quarter of women carry it in their vagina. GBS carried in this way does not cause any symptoms.

3.2 Neonatal bacterial sepsis is associated with significant morbidity and mortality. Group B Streptococcus (GBS) is the leading cause of perinatal infection. The incidence of infection in England and Wales is 5-7 in 1000 live births.

3.3 The incidence of early-onset GBS disease in the absence of systematic screening or widespread intrapartum antibiotic prophylaxis is 0.5/1,000 births, which is similar to that seen in the USA after universal screening and intrapartum antibiotic prophylaxis (IAP).

3.4 Vertical transmission of GBS during labour or delivery may result in invasive infection i.e. septicaemia, pneumonia and/or meningitis in the newborn during the first week of life. This is known as EOGBS (less than 7 days of age). Approximately 100 of the 700 babies who develop GBS each year will die (early-onset and late onset GBS disease). Up to a third of survivors of GBS meningitis will be left with mental or physical handicaps.

3.5 Rates of vertical transmission (resulting in colonisation) vary from 40 to 70%, however rates of neonatal infection are low but are significantly increased by major risk factors.

4.0 Antenatal Screening in the UK for GBS (bacteriological or risk based)

4.1 Routine screening is not practised in the UK. It would only detect 50 % of carriers and of those that would be detected 50% would go on to be culture negative at birth.

5.0 Antenatal Prophylaxis

5.1 Antenatal treatment with penicillin is not recommended when vaginal swabs show GBS, as this does not reduce the likelihood of GBS colonisation at time of delivery. However patients who present with GBS in the urine during pregnancy should be treated with antibiotics at the time of diagnosis.

5.2 For women with GBS detected in their previous pregnancy, the obstetrician should discuss the option of intrapartum antibiotic prophylaxis (IAP), or bacteriological testing in late pregnancy and then offer of IAP if still positive.

5.3 If performed, bacteriological testing should ideally be carried out at 35 – 37 weeks of gestation or 3 –5 weeks prior to the anticipated delivery date, e.g. 32 – 34 weeks of gestation for women with twins.

6.0 Intrapartum Antibiotic Prophylaxis (IAP)

6.1 **IAP should be recommended** for the following patients:

- Patients who present incidentally during current pregnancy with GBS
- Patients with a previous baby with neonatal GBS disease
- Patients with GBS urinary tract infection during current pregnancy (antibiotic treatment should also have been given at time of diagnosis)
- IAP is recommended for women in confirmed preterm labour irrespective of GBS status

6.2 IAP for other groups requires informed discussions by the clinician and the patient. The argument for prophylaxis becomes stronger in the presence of two or more known risk factors.
(Refer to Appendix A)

6.3 **IAP is not recommended** for the following patients:

- Women undergoing planned elective caesarean section in the absence of labour or rupture of membranes regardless of GBS colonisation status (however, patients who present in labour or have ruptured membranes should be made aware that IAP is recommended and that administration of IAP should be given where possible at least 4 hours prior to the caesarean section delivery)

6.4 If ruptured membranes occur and the patient's status is positive to GBS the obstetric registrar/consultant on call should be informed in order to prescribe the IAP and discuss and document an individual plan of care in the patient's handheld maternity records. The patient should be informed verbally that IAP is recommended at the onset of induction/labour.
(Refer to the 'Guideline for the management of term pre-labour rupture of membranes'. Register number 08049; and 'Guideline for the management of preterm pre-labour rupture of membranes'. Register number 04292)

6.5 For patients who consent to administration of IAP, an obstetrician should prescribe the appropriate IAP following confirmation of patient's allergy status.

6.6 The obstetric registrar/consultant on call and midwife should also confirm the patient's allergy status by referring the medical records and by obtaining a verbal history with the patient prior to administration. Administration should be in accordance with the Trust policy for the administration of medicines.

6.7 If chorioamnionitis is suspected, broad-spectrum antibiotic therapy including an agent

active against GBS should replace GBS-specific antibiotic prophylaxis.

6.8 Inform the paediatric senior house officer/registrar on call of any patient with a positive GBS status and/or presence of any additional risk factors when attending the delivery.

6.9 Intrapartum observations should include 4 hourly temperature, pulse, respirations and blood pressure. Intermittent auscultation of the fetal heart rate should only be carried out once normality is confirmed by initial assessment with continual fetal monitoring. However in the presence of additional risk factors (refer to appendix A) continuous electronic fetal monitoring is advised.
(Refer to the 'Guideline for fetal heart rate monitoring in pregnancy and labour'. Register number 04265)

6.10 There is insufficient data to support or discourage the use of fetal scalp electrodes or performing fetal scalp/blood pH in patients known to be colonized with GBS.

7.0 Treatment of GBS during the Intrapartum Period

(Refer to Appendix B)

7.1 Intravenous administration is the only route recommended for intrapartum GBS prophylaxis because of the higher intramniotic concentrations achieved with this route.

7.2 Intravenous (IV) benzylpenicillin 3g (loading dose) as soon as possible after the onset of labour or spontaneous ruture of membranes, followed by IV benzylpenicillin 1.5 g, 4 hourly thereafter until delivered.

7.3 Provided a woman has not had severe allergy to penicillin, a cephalosporin should be used. If there is any evidence of severe allergy to penicillin, vancomycin should be used. The obstetrician should establish in discussion with the woman the degree of severity of allergic status and prescribe the antibiotic accordingly as follows:

- Cephalosporin can be administered intravenously (e.g. cefuroxime, 1.5 g loading dose followed by 750 mg every 8 hours). If the allergy to beta-lactams is severe then intravenous vancomycin (1 g every 12 hours) is recommended

7.3.1 If allergy is of an anaphylactic nature, use IV vancomycin by continuous infusion (see microguide) keeping levels 10 to 25 kgs/ L

7.4 Broad spectrum antibiotics such as ampicillin should be avoided as much as possible, as concerns have been raised regarding increased rates of neonatal gram negative sepsis. To optimise the efficiency of antibiotic prophylaxis, the first dose should be given at least two hours prior to delivery. However if **chorioamnionitis** is suspected, broad-spectrum antibiotic therapy including agent active against GBS should replace GBS-specific antibiotic prophylaxis.

8.0 Tests to Detect GBS Colonisation

8.1 When testing for GBS carrier status, a swab should be taken from the lower vagina and the anorectum. A single swab (vagina then anorectum) or two different swabs can be used.

8.2 Enriched culture medium tests are recommended. The clinician should indicate that the swab is being taken for GBS.

8.3 To obtain a private ECM test contact the 'Doctors' Laboratory' for information leaflets and/or GBS screening packs telephone 020 7307 7405; e-mail:

GroupBStrep@tdlpathology.com

Or Omnilabs Pathology Services Telephone: 020 7908 7000; e-mail customerservices@omnilabs.co.uk .

8.4 The cost of the ECM test is approximately £18.00

8.5 If a patient chooses to have the ECM test, the patient's clinician should ensure a clear plan of care is made in the event of a positive ECM result

8.6 All midstream specimens of urine (MSU) / vaginal swabs (HVS) request forms must be labelled to indicate they are from a pregnant patient, including gestation and reason for investigation. This will alert laboratory staff of the need to telephone any positive result to the antenatal clinic in office hours or out of hours to labour ward.

8.7 The result will be recorded in a GBS folder in antenatal clinic and then documented in the patient's handheld maternity records by the antenatal clinic midwife or community midwife. Documentation should include the date of GBS culture and whether MSU or HVS. If GBS is present in MSU the midwife (if the specimen was obtained by the midwife) will inform the patient's GP or obstetrician so that the appropriate antibiotic treatment can be given at time of GBS culture.

8.8 There is no clinical benefit in treating a patient antenatally with positive vaginal GBS culture. The midwife will document all actions in the patient's handheld maternity records. GBS alert stickers should be placed on the communication, labour and neonatal pages of the maternity records (not on the outside folder of the patient's records).

8.9 Receipt of positive GBS result out of hours; this will be the responsibility of the midwife in charge of the day assessment unit or if closed the labour ward co-ordinator. The midwife will retrieve the patient's maternity records in order to review the patient's history.

8.10 If the GBS status has not previously been documented in the maternity records the midwife should follow the procedure for documenting a positive GBS result; points 8.6 and 8.7.

8.11 Review of the patient's history should include identification of any other risk factors informing the duty obstetric registrar so that an appropriate plan of care is made. This may involve advising the patient to attend Broomfield Hospital for obstetric review and assessment. If the patient has no other risk factors, the patient's community midwife should be informed. If out of area the midwife should ensure that the antenatal clinic midwife is informed on the next working day.
(Refer to appendix A)

8.12 There is insufficient data to support or discourage membrane stripping (stretch and sweep) in patients known to be GBS colonised.

9.0 GBS and Maternal Sepsis

9.1 Although rare all clinicians should be alert to this serious condition. Risk factors include: prolonged rupture of membranes; chorioamnionitis; emergency caesarean section; retained products of conception. The organism may cause urinary tract infection, amnionitis, endometritis, sepsis or rarely meningitis.

9.2 GBS is the most commonly identified organism responsible for maternal deaths from genital tract sepsis. The latest figure is 18 per 100,000 maternities, and this rate is one of the highest in the past15 years.

9.3 Any symptoms noted during the patient's hospital stay should be clearly documented in the patient's handheld records and discharge letter, in order that appropriate follow-up visits may be arranged and the significance of developing symptoms identified.

10.0 Management of the Newborn Infant

(Refer to the 'Guideline for the prevention of neonatal group B streptococcal infection. Register number 09160)

11.0 Receipt of Positive GBS Status Following Delivery

11.1 If in-patient document findings in maternity and neonatal records. Inform the mother and paediatrician. If no other risk factors and the baby is over 24 hours of age and well it is unlikely that the baby will develop GBS disease and no special observations are required. As the risk of a baby developing early onset group B streptococcus (EOGBS) after this time is no greater than a baby born with no risk factors.
(Refer to the 'Guideline for the prevention of neonatal group B streptococcal infection. Register number 09160)

11.2 If discharged home inform the patient's community midwife, if the baby is over 12 hours of age and is well follow above. If the baby is less than 12 hours of age, the community midwife should arrange a visit in order to assess the wellbeing of the baby. If she has any concerns she should discuss her findings with the paediatrician.
(Refer to the 'Guideline for the prevention of neonatal group B streptococcal infection. Register number 09160)

11.3 Parents should be informed of the signs and symptoms of sepsis and how to get advice.

12.0 Antibiotic Resistance

12.1 Penicillin G is a narrow spectrum antibiotic and as well as being highly effective against GBS also minimizes the risk of antibiotic resistance developing.

13.0 Effectiveness of IAP

13.1 This is 80% effective in preventing early-onset GBS disease; however even with IAP some infants will die particularly if the disease is well established prior to birth.
(Refer to the 'Guideline for the prevention of neonatal group B streptococcal infection. Register number 09160)

14.0 Anaphylaxis

14.1 The risk of a mother developing anaphylaxis as a result of an allergic reaction to penicillin is approximately 1/10,000 and 1/100,000 of the mother developing fatal anaphylaxis. The fetal effects of anaphylaxis have not been well reported.

15.0 Staff and Training

15.1 All midwifery and obstetric staff must attend yearly mandatory training which includes antenatal screening update.

15.2 All midwifery and obstetric staff are to ensure that their knowledge and skills are up-to-date in order to complete their portfolio for appraisal.

16.0 Infection Prevention

16.1 All staff should follow Trust guidelines on infection prevention by ensuring that they effectively 'decontaminate their hands' before and after each procedure.

16.2 All staff should ensure that they follow Trust guidelines on infection prevention. All invasive devices must be inserted and cared for using High Impact Intervention guidelines to reduce the risk of infection and deliver safe care. This care should be recorded in the Saving Lives High Impact Intervention Monitoring Tool Paperwork (Medical Devices).

17.0 Audit and Monitoring

17.1 Audit of compliance with this guideline will be considered on an annual audit basis in accordance with the Clinical Audit Strategy and Policy (register number 08076), the Corporate Clinical Audit and Quality Improvement Project Plan and the Maternity annual audit work plan; to encompass national and local audit and clinical governance identifying key harm themes. The Women's and Children's Clinical Audit Group will identify a lead for the audit.

17.2 As a minimum the following specific requirements will be monitored:

- Management of a newborn where there is known group B haemolytic streptococcus present in either mother or newborn
- Documentation of all of the above

17.3 A review of a suitable sample of health records of patients to include the minimum requirements as highlighted in point 17.2 will be audited. A minimum compliance 75% is required for each requirement. Where concerns are identified more frequent audit will be undertaken.

17.4 The findings of the audit will be reported to and approved by the Multi-disciplinary Risk Management Group (MRMG) and an action plan with named leads and timescales will be developed to address any identified deficiencies. Performance against the action plan will be monitored by this group at subsequent meetings.

17.5 The audit report will be reported to the monthly Directorate Governance Meeting (DGM) and significant concerns relating to compliance will be entered on the local Risk Assurance Framework.

17.6 Key findings and learning points from the audit will be submitted to the Clinical Governance Group within the integrated learning report.

17.7 Key findings and learning points will be disseminated to relevant staff.

18.0 Guideline Management

18.1 As an integral part of the knowledge, skills framework, staff are appraised annually to ensure competency in computer skills and the ability to access the current approved guidelines via the Trust's intranet site.

18.2 Quarterly memos are sent to line managers to disseminate to their staff the most currently approved guidelines available via the intranet and clinical guideline folders, located in each designated clinical area.

18.3 Guideline monitors have been nominated to each clinical area to ensure a system whereby obsolete guidelines are archived and newly approved guidelines are now

downloaded from the intranet and filed appropriately in the guideline folders. 'Spot checks' are performed on all clinical guidelines quarterly.

18.4 Quarterly Clinical Practices group meetings are held to discuss 'guidelines'. During this meeting the practice development midwife can highlight any areas for further training; possibly involving 'workshops' or to be included in future 'skills and drills' mandatory training sessions.

19.0 Communication

19.1 A quarterly 'maternity newsletter' is issued and available to all staff including an update on the latest 'guidelines' information such as a list of newly approved guidelines for staff to acknowledge and familiarize themselves with and practice accordingly.

19.2 Approved guidelines are published monthly in the Trust's Focus Magazine that is sent via email to all staff.

19.3 Approved guidelines will be disseminated to appropriate staff quarterly via email.

19.4 Regular memos are posted on the guideline notice boards in each clinical area to notify staff of the latest revised guidelines and how to access guidelines via the intranet or clinical guideline folders.

20.0 References

National Institute for Clinical Excellence (2008) Antenatal Care: routine care for the healthy pregnant woman NICE clinical guideline March 2008

Confidential Enquiry into Maternity and Child Health (2007) Saving mothers lives. CEMACH.

Royal College of Obstetrics & Gynaecologists (2012) Prevention of Early Onset Neonatal Group B Streptococcal Disease; guideline No. 36 July 2012

Omnilabs Pathology services Group B Streptococcus Screening Information
E-mail: customerservices@omnilabs.co.uk
www.omnilabs.co.uk

Appendix A

Risk Factors associated with EOGBS versus IAP

Risk Factor	EOGBS cases/10,000 untreated women with risk factor	EOGBS deaths/10,000 untreated women with risk factor	NNT with IAP to prevent one case of EOGBS	NNT with IAP to prevent one death from EOGBS	EOGBS cases prevented/ year in UK	EOGBS deaths prevented/ year in UK
Intrapartum Fever (>38-°C)	60	6.3	208	1984	52	5.5
Prematurity (<35 weeks)	35	8	357	1562	61	14.0
Prematurity (< 37 weeks)	25	4.6	500	2717	101	18.5
Prolonged rupture of membranes (≥18 hours) at term	21	1.2	595	10416	91	5.2

EOGBS = early onset group B streptococcus; IAP = intrapartum antibiotic prophylaxis; NNT = numbers needed to treat

RCOG 2003

Appendix B

Intrapartum Antibiotic Prophylaxis for the Prevention of Early Onset Group B Streptococcus Infection

Guidelines for the use of Vancomycin in Adults by continuous infusion

Background

The efficacy of vancomycin depends on the time for which the serum concentration exceeds the minimum inhibitory concentration for the micro-organism rather than the attainment of high peak concentrations. There is evidence that giving vancomycin as a continuous infusion over 24 hours is as effective as the traditional method of intermittent infusions whilst being much simpler to organise in terms of monitoring serum levels.

Vancomycin has a potentially toxic side effect profile, which includes nephrotoxicity and ototoxicity. Avoid using in patients with previous hearing loss and discontinue if tinnitus occurs. Regular blood monitoring is required.

Prescribing

(1) Loading dose

All patients should receive a weight-related loading dose, prescribed on the *Once Only & Premedication Drugs* section on front of drug chart:

Peripheral administration	
< 65kg	**1g IV** over **100 minutes** in 250mL sodium chloride 0.9%
> 65 kg	**1.5g** IV over **150 minutes** in 500mL sodium chloride 0.9%

(2) Maintenance dose - continuous 24 hour infusion

The continuous intravenous infusion should follow immediately after the loading dose and should be based on an estimate of the patient's renal function.

	Estimated creatinine clearance* (ml/min)	Starting daily **vancomycin dose**
Normal renal function	> 50	2 g
Mild impairment	20-50	1.5 g
Moderate impairment	10-20	1 g

Severe impairment	< 10	500 mg
Filtration /Diafiltration	-	1000 mg

** Creatinine clearance can be estimated using the Cockroft-Gault equation:*

$$CrCl = \frac{A\ (140\text{-age})\ wt\ (kg)}{Serum\ Cr}$$ *(Where A= 1.23 in males & 1.04 in females)*

To prevent the prescription of vancomycin being missed on ward rounds, prescribe in the *Antimicrobial* section of the drug chart:
'Vancomycin continuous IV infusion as per protocol'

Prescribe the 24 hour infusion on the *Infusions and IV therapy* section on the back of the drug chart. For central line administration, prescribe as separate infusions of 500mg in 50mL sodium chloride 0.9% (for rate of infusion for central line administration of vancomycin see microguide).

Administration instructions

Determine whether vancomycin is to be administered centrally or peripherally. An infusion pump must be used to administer vancomycin infusions.

(1) Loading dose

Peripheral line: Vancomycin **1 g in 250ml** sodium chloride 0.9% over **100 minutes**

Peripheral line: Vancomycin **1.5 g in 500ml** sodium chloride 0.9% over **150 minutes**

(2) Maintenance dose - continuous 24 hour infusion

For **peripheral line** administration:

Reconstitute each vancomycin 500mg with 10ml water for injection. REMEMBER for each reconstituted vial (10ml) to remove the same volume from the infusion bag.

Vancomycin total daily dose	Volume of infusion bag to administer via peripheral line	Volume to be removed from infusion bag before adding vancomycin	Concentration of vancomycin in infusion bag	Infusion rate using an infusion pump
3g	1000ml	60ml	3000mg in 1000ml (3mg/ml)	
2.5g	500ml	50ml	2500mg in 500ml (5mg/ml)	
2g	500ml	40ml	2000mg in 500ml (4mg/ml)	
1.5g	500ml	30ml	1500mg in 500ml (3mg/ml)	
1g	250ml	20ml	1000mg in 250ml (4mg/ml)	
500mg	250ml	10ml	500mg in 250ml (2mg/ml)	
250mg	250ml	5ml	250mg in 250ml (1mg/ml)	

NB Discard any remaining solution after 24 hours. Record the infusion stop time when the bag is stopped or changed

Monitoring and Dose Adjustments

- Request a serum level every day at 08.00 hours. If treatment with vancomycin started within 4 hours of the usual 08.00 hours level, wait for the next morning's level to adjust the dose. LEVELS MUST BE TAKEN AT THE SAME TIME EVERY DAY so do not wait for the phlebotomist to take the blood sample.

- As soon as the serum level is known record level on chart and adjust the dose according to the table. Prescribe a new 24 hour infusion.

Vancomycin level	Dosage change required
< 10 mg/L	Increase the dose by 500mg
10 – 25 mg/L	**No change**
> 25 mg/L	Decrease the dose by 500mg*
> 30 mg/L	Stop infusion for 6hrs and restart at a reduced dose (as agreed on ward round)