MATERNITY UNIT: The prevention of neonatal Group B streptococcal infection (GBS)

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SCOPE: All midwives, nurses and obstetricians working in the Maternity and Neonatal Unit.

PURPOSE: To direct the management of pregnancy and labour for women with high risk for GBS in order to reduce the incidence of GBS infection of the neonate. Although the prognosis for term neonates with congenital GBS infections has improved considerably over the last decade, morbidity and mortality is still substantial in affected premature infants. If the recommended dose of antibiotics is given, the risk of developing neonatal GBS infection falls from 1:300 to 1:6000.

DEFINITIONS: GBS is a common bacterium which is almost always harmless in adults. In rare cases however, a woman who has GBS can infect her baby during a vaginal birth. It is estimated that GBS is a normal part of the rectovaginal flora in 10-40% of pregnant women and is the leading cause of early-onset neonatal sepsis, pneumonia and meningitis. Since intrapartum antibiotics interrupt vertical GBS transmission, this is now largely a preventable public health problem. The use of intrapartum prophylaxis with antibiotics, given to women at risk of transmission of GBS to their newborns, prevents early onset sepsis and is cost-effective.

Early onset GBS infection (EOGBS)
This occurs from birth to 6 days of age, but is usually apparent within 12 hours.

Intrapartum Antibiotic Prophylaxis (IAP)

Late onset GBS infection
From day 7 up to 89 days of age.

GUIDELINE
The New Zealand GBS Consensus Working Party recommends a **risk-based prevention policy**, as this exposes the least number of women and their babies to antibiotics, while preventing virtually all deaths from GBS sepsis. Continuing education of health professionals and pregnant women, auditing protocol compliance, tracking adverse events amongst pregnant women, and national surveillance of neonatal sepsis and mortality rates and antibiotics are necessary for the strategy's success. An alternative is a culture-based prevention strategy, which is not the preferred screening option in New Zealand but may be an option requested by a woman having made an informed decision.

Table One

Indications and non-indications for intrapartum antibiotic prophylaxis to prevent early-onset GBS disease.

Intrapartum GBS prophylaxis indicated (initiate antibiotics in established labour)	Intrapartum GBS prophylaxis NOT indicated
♦ Previous infant affected by GBS	♦ LSCS birth performed before onset of labour in a woman with intact membranes, regardless of GBS history or gestational age
♦GBS bacteriuria during any trimester of the current pregnancy	♦ Colonization with GBS during a previous pregnancy (unless an indication for GBS prophylaxis is present for current pregnancy)
♦ Positive GBS rectovaginal screening culture <5 weeks before term labour during current pregnancy	♦ GBS bacteriuria during previous pregnancy (unless an indication for GBS prophylaxis is present for current pregnancy)
♦ Preterm labour (<37 weeks gestation) until GBS status known	♦Negative rectovaginal GBS screening culture in late gestation (<5wks before labour) during the current pregnancy, with term labour, regardless of intrapartum risk factors
♦ prolonged rupture of membranes (>18hrs)	An incidental GBS on vaginal swab early in pregnancy should be repeated at 35-37 weeks.
♦ Intrapartum fever(>38 ºC) –should receive intrapartum antibiotic treatment (not prophylaxis) Follow Intrapartum Fever Guideline	

If an incidental GBS on a vaginal swab in early pregnancy is not repeated, intrapartum antibiotic prophylaxis is recommended

When there are two or more risk factors identified the risk of having an infected infant with GBS is greater.

Antenatally

Carrier status should be clearly recorded in the woman's records. A woman with risk factors should be counselled regarding neonatal sepsis, intrapartum prophylaxis and the importance of early contact with her LMC if spontaneous rupture of membranes or suspected labour. The woman should be involved in any decision to give antibiotics, using the table below to counsel women regarding estimated effects of risk screening.

Estimates of the risk of EOGBS disease in the presence of individual antenatal risk factors, with and without IAP.

These estimates are based on an incidence of EOGBS disease in the UK of 0.5/1000, which

is likely to be the minimum incidence.

Risk factor	Risk of EOGBS disease if IAP not given	Risk of EOGBS disease if full IAP given	Risk of death from EOGBS disease if IAP not	Risk of death from EOGBS disease if full IAP
Intrapartum fever	1:189	1:943	1:1783	1:8915
Prolonged rupture of membranes (>18 hours) at term	1:556	1:2777	1:9754	1:48 772
Prematurity (<37+0 weeks of	1:435	1:2173	1:2377	1:11 885
Prematurity (<35+0 weeks of	1:357	1:1786	1:1566	1:7829
Positive GBS swab in a previous pregnancy	1:1105	1:5525	1:10 424	1:52 122
Positive GBS swab in current pregnancy	1:434	1:2170	1:4094	1:20 471

EOGBS = early-onset group B streptococcus; IAP = intrapartum antibiotic prophylaxis.

The assumptions on which the figures in the table above are based are as follows:

- Live birth rate in the UK in 2008: 793 388
  - 1.9% intrapartum fever >38°C
  - 9.4% PROM at term
  - 7.9% <37 weeks of gestation
  - 4.0% <35 weeks of gestation
- Prevalence of maternal risk factors in infants with EOGBS disease:
  - 19.9% intrapartum fever >38°C
  - 34% PROM at term
  - 37% <37 weeks of gestation
  - 22% <35 weeks of gestation
- Incidence of EOGBS in the UK: 0.5/1000
- Mortality of EOGBS in the UK is:
  - 10.6% overall
  - 18.3% <37 weeks of gestation
  - 22.8% <35 weeks of gestation
  - 5.7% >37 weeks of gestation
- 80% effectiveness of IAP in preventing EOGBS

It should be noted that GBS bacteriuria is a risk factor for neonatal disease but the magnitude of risk cannot be quantified.

Intrapartum Management
Intrapartum antibiotics should be commenced at the onset of labour.

First line regime (no history of penicillin allergy or sensitivity)
- **Penicillin G** 1.2gm intravenously (IV) as the initial dose, and then 0.6g intravenously every 4 hours until birth; or
- **Amoxycillin** 2g IV initially, then 1g every 8 hours until birth.

Second line regime (history of penicillin sensitivity i.e. rash, nausea, etc)
- **Cephazolin** 2g intravenously initially then 1g intravenously every 8 hours until birth.

Third line regime (history of significant penicillin allergy i.e. anaphylaxis, bronchospasm)
- **Vancomycin** 1gm every 12 hours until birth. This should be only with obstetrical consultation. Be aware that Vancomycin should be infused slowly over 60 minutes.

As part of antenatal assessment, a history of penicillin allergy should be sought, including details of immediate (within 24 hours) hypersensitivity reactions (eg anaphylaxis, angioedema, laryngospasm, bronchospasm, or urticaria). The small group of women with a definite history of immediate hypersensitivity may be screened for GBS. If negative, no further studies or treatment are indicated. If positive, it is recommended to test their GBS for sensitivity to erythromycin and clindamycin and treat appropriately. Because many GBS are resistant to erythromycin and clindamycin, in the absence of sensitivities, for a woman with severe penicillin allergy who requires treatment for GBS, vancomycin is the preferred drug.

Screening
It is recognised that some LMC's may, on the basis of overseas data, opt for culture based screening of GBS. However, it is also recognised that to avoid an additional 5 cases of GBS a year, the universal screening-based approach would expose annually 9,000 (50%) more women to intrapartum antibiotics and the attendant small risk of anaphylaxis

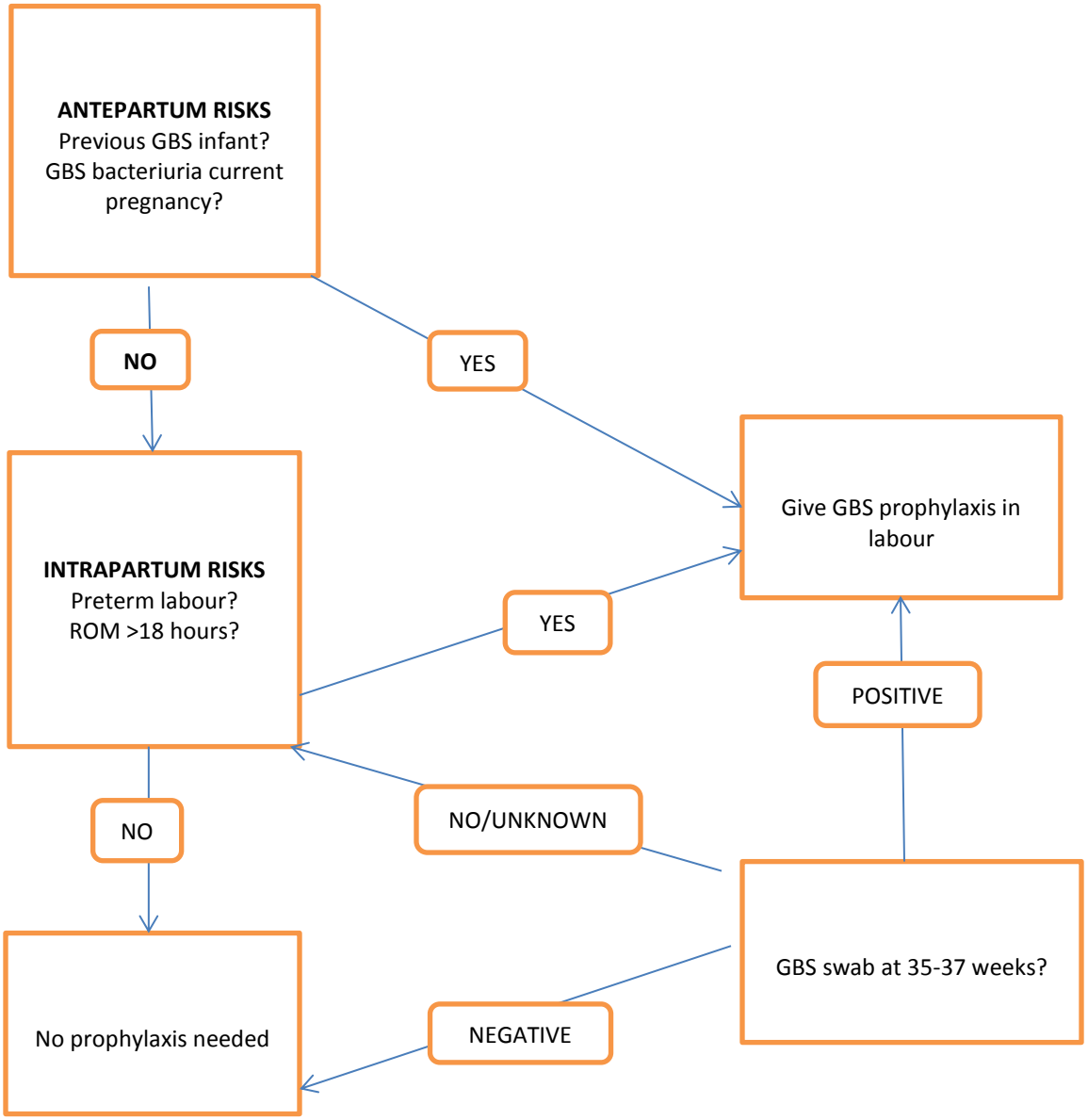
If screening is chosen, a rectovaginal swab (combined low vaginal and anorectal swab) should be taken between 35-37 weeks and sent to the lab for GBS culture. All women who are positive for GBS should be treated in established labour.

CHORIOAMNIONITIS
Neither Penicillin G nor amoxicillin alone are adequate treatment for chorioamnionitis (suspected when there is intrapartum fever associated with at least 2 of the following: fetal tachycardia, uterine tenderness, offensive vaginal discharge, or maternal leucocytosis). As E. coli, anaerobes, and GBS can all cause chorioamnionitis, this requires immediate aggressive management with broad-spectrum antibiotics such as amoxicillin/clavulanate and gentamycin as per Intrapartum Fever guideline.

THREATENED PRETERM DELIVERY/PRETERM RUPTURE OF MEMBRANES

- Women with signs or symptoms of labour or with rupture of membranes at < 37 weeks gestation should be screened for GBS colonization at hospital admission unless a rectovaginal GBS screen was performed within the preceding 5 weeks.
- Women admitted with signs and symptoms of preterm labour who have unknown GBS colonization status at admission or a positive GBS screen within the preceding 5 weeks should receive GBS prophylaxis at hospital admission. Antibiotics given for GBS prophylaxis to a woman with preterm labour should be discontinued immediately if at any point it is determined that she is not in true labour or if the GBS culture at admission is negative.

IDENTIFICATION OF WOMEN REQUIRING GBS PROPHYLAXIS



- Women with fever in labour should be assessed for chorioamnionitis and treated as per INTRAPARTUM FEVER GUIDELINE.
- Caesarean section prior to labour with intact membranes does not require GBS prophylaxis.
- Women receiving GBS prophylaxis in labour who have a caesarean section still need surgical prophylaxis (cefazolin).

PROLONGED PRELABOUR RUPTURE OF MEMBRANES

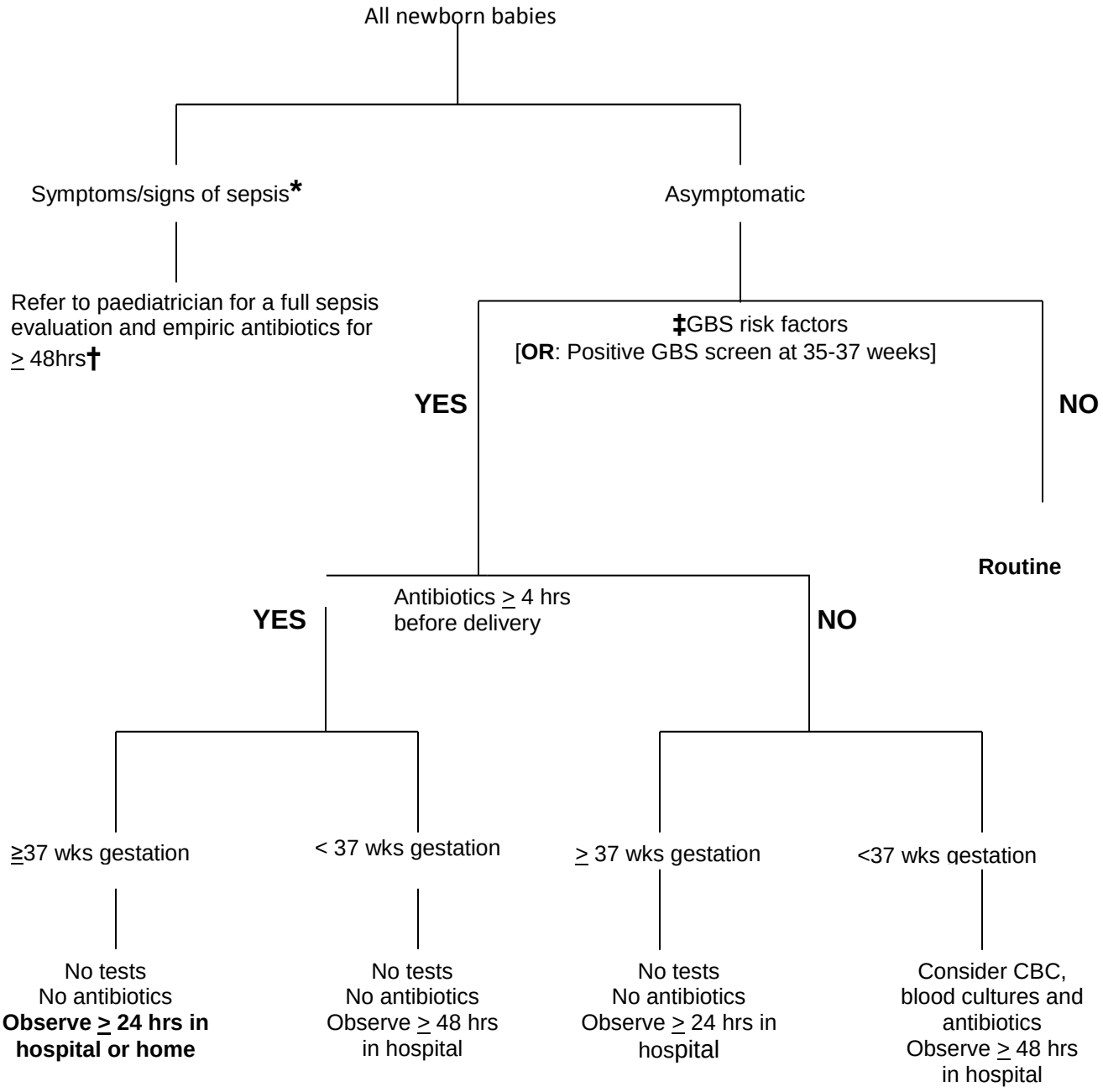
In the special circumstance of prolonged (>18 hours) pre-labour rupture of membranes at term, the New Zealand Guidelines recommend consultation with the obstetrician by 24 hours and prophylaxis for B Strep in established labour. **However, when a woman is known to have high risk factors for early onset GBS neonatal infection and the plan already includes antibiotics in labour, it may be appropriate to consult the obstetrician to consider induction as soon as possible to prevent transfer of GBS to the baby. In this circumstance, consider starting intrapartum antibiotic prophylaxis at the commencement of induction.**

Informed Consent

Women with increased risk factors should be strongly recommended to have intrapartum antibiotics, gaining informed consent for their use, as per TDH policy, and taking into account the Code of Health & Disability Service's Consumer's Rights. They should be informed that Penicillin administered to a woman with no history of beta-lactam allergy involves a risk of anaphylaxis of 4 in 10,000-100,000.

SEE FREQUENTLY ASKED QUESTIONS IN APPENDIX 1 FOR FURTHER INFORMATION ON SPECIFIC CIRCUMSTANCES.

Flow Chart 2 (Management of newborn babies)



*Signs of sepsis include respiratory distress (tachypnoea, grunting, subcostal recession); apnoea; an oxygen requirement; pallor with poor peripheral perfusion; fever >38° C or an unusual temperature; and acidosis.

†At least a complete blood count (CBC), blood cultures and, when feasible, a lumbar puncture. A penicillin and an amino glycoside are the antibiotics of choice.

‡Group B streptococcus risk factors (see flow chart 1).

Elective C/S
Babies born by elective caesarean section where the membranes were intact prior to delivery do not need to have observations following birth.

Observations to be carried out
The consensus of paediatricians is that observation of newborn babies at risk of GBS infection should include:

1/ for babies >37 weeks where the woman has received IV antibiotics >4 hours prior to the birth:

- **Respiration rate, temperature and heart rate within 1 hour of birth**
- **If all within normal limits, 4 hourly observations for 24 hours**
- **If any abnormal findings, repeat observations after 1 hour**
- **If still abnormal – REFER to paediatrician**

2/ for all other at risk categories:

- **Hourly respiration rate, temperature and heart rate for the first 4 hours following birth**
- **Subsequently 4 hourly up to 24/48 hours after birth (see flow chart 2).**
- **IF THERE ARE ANY SIGNS OF SEPSIS PROMPT REFERAL TO A PAEDIATRICIAN IS VITAL**

Note normal parameters for a newborn baby, as agreed with paediatricians at TDH are:
- Core temperature 36.5 – 37.5 degrees centigrade
- Normal heart rate 100 – 180bpm
- Normal respiration rate 30 – 60 breaths per minute

These recordings should be made on a 'calm' baby

Breastfeeding
Breastfeeding does not increase the risk of GBS in the newborn. Women should be given the usual breast feeding advice.

ASSOCIATED DOCUMENTS
TDH Organisational Policy: Informed Consent September
TDH Women's information leaflet – Group B Streptococcus – Information for Women
Maternity guideline - Pre-labour rupture of the membranes
Maternity guideline - Pre-term rupture of the membranes
Maternity guideline – Intrapartum fever
The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (2009) C-Obs 19: Instructions for the collection of a genital swab for the detection of group B streptococcus (GBS). Downloaded on 11 May 2010 from:
http://www.ranzcog.edu.au/publications/statements/GBS%20SWAB%20SHEET3.pdf

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APPENDIX 1

Frequently asked questions

Q. What do I do if the woman is found to have GBS on a urine culture at some point during the pregnancy?

Treat with oral antibiotics as per sensitivities, even if asymptomatic, in order to prevent pyelonephritis, sepsis and preterm labour
Add GBS bacteriuria as a risk in MCIS
Advise the woman that she should receive GBS prophylaxis in labour to reduce risk of early-onset neonatal GBS sepsis, and document this advice

Q. If a woman has had GBS on a urine culture earlier in pregnancy, or a previous baby with GBS disease, would I offer her routine screening at 35 - 37 weeks?

No, these women already have an antepartum risk factor and should receive GBS prophylaxis in labour

Q. If a woman has had GBS on a urine culture earlier in the pregnancy, or a previous baby with GBS disease, do I need to give her GBS prophylaxis in labour even if she does not have ruptured membranes > 18 hours?

Yes, these women already have an antepartum risk factor and should receive GBS prophylaxis in labour

Q. What do I do if the woman is found to have GBS on a vaginal swab < 35 weeks?

Vaginal carriage of GBS is normal and does not require antibiotic treatment. Vaginal carriage of GBS earlier in pregnancy does not imply GBS carriage at the time of birth, thus she does not necessarily require GBS prophylaxis in labour Recommend repeating GBS swab at 35 - 37 weeks and follow the algorithm based on the 35 - 37 week result. If no repeat swab is done, recommend GBS prophylaxis in labour.

Q. If I choose to perform routine screening for GBS outside NZ guidelines, when and how do I do this?

Routine screening is performed at 35 - 37 weeks
It should be a low vaginal-anorectal swab. The swab can be clinician or patient collected. The RANZCOG guideline has a good diagram
The requisition should specifically state "for GBS screening." If the woman has a penicillin allergy, request sensitivity testing if positive.

Q. If a woman undergoes routine screening at 35 - 37 weeks and is negative, and then goes on to have ruptured membranes > 18 hours, should I give her GBS prophylaxis?

No, she already has had routine screening which is negative

Q. If this was a low vaginal swab only and was done at 35- 37 weeks for another reason, and there was no GBS reported, is this the same as a negative screen?

No, because GBS screening should also include anorectum and specifically have "GBS screening" stated on the requisition; this woman should undergo risk-based screening

Q. What if the woman has a caesarean not in labour with intact membranes?

No, she does not need GBS prophylaxis

Q. What if the woman is having GBS prophylaxis in labour and then needs an emergency caesarean, does she still need Cefazolin?

Yes, she still needs surgical site infection prophylaxis in addition to GBS prophylaxis.

Q. What if the woman develops a fever in labour?

A woman with temperatures>= 38 should be reviewed by the OB on call in order to assess for chorioamnionitis, to consider giving broad spectrum antibiotics and paracetamol, and to discuss optimal timing of delivery.

GBS prophylaxis is not adequate management of fever in labour and will not reduce the risk of postpartum endometritis nor neonatal sepsis.