Guideline for the prevention and management of preterm labour

Author/Owner	**Inpatient Matron, Practice Education Midwife, Consultant obstetrician**	
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1.0 Introduction

Preterm labour is defined as delivery at less than 37+0 gestation, and is a common complication of pregnancy, comprising around 8% of births in England and Wales (NICE 2015, NHS England 2019). It is the most important single determinant of adverse infant outcome with regards to survival and quality of life. (Saigal Doyle 2008, NHS England 2019). It is mainly babies born before 32 weeks who are at an increased risk of mortality and morbidity (NICE 2015)

2.0 Objective

This guideline provides guidance on how to care for women identified to be at risk of a preterm labour or who have suspected or confirmed preterm labour.

3.0 Scope

This Guideline applies to all medical and midwifery staff working in maternity services.

4.0 Prevention

4.1 Preventative screening

All women should be screened at booking for risk factors for Preterm birth (see section 4.2)

As per Saving Babies lives V3 (SBLV3), the following are all preventative measures that can be taken to reduce the risk of preterm birth:

- **Smoking cessation**: Smoking doubles the risk of preterm delivery (Andres & Day 2000). Therefore, all women should be asked about smoking, offered cessation advice and/or a referral to cessation services should be provided. Women who have experienced a previous preterm birth who stop smoking early in the pregnancy, modify their risk back to that of a non- smoker. If smoking cessation is delayed until the third trimester, this modifiable benefit is lost. The importance of promoting smoking cessation is therefore one of the most important prevention strategies to implement. Refer to Element 1 of SBLV3.

- **Maternal age**: Young women (<18 years) have an increased risk of preterm birth (UK Preterm Clinical Network 2018). These women should be under the care of the Young Families midwife.
- **Domestic violence**: Women experiencing domestic violence and/or other social pressure have an increased risk of preterm birth. They should be directly counselled and referred for specific support through local pathways.
- **Urinary tract infection (UTI)**: This is associated with preterm birth, and so as indicated in the NICE guidance (NICE 2018), midstream urine sample (MSU) should be taken and sent for culture and sensitivity in all pregnant women at booking. Culture positive samples, even in symptom-free women (asymptomatic bacteriuria), should be promptly treated. Following any positive culture and treatment, a repeat MSU to confirm clearance is recommended. Those who have a recurrent episode require review in antenatal clinic, and a telephone appointment should be made with their named consultant. If under Midwife Led Care (MLC), their care should be transferred to any Consultant.
- **Vaginal infection**: Pathogens such as *Neisseria Gonorrhoeae* and *Chlamydia Trachomatis* are associated with preterm birth, and screening should be offered to at-risk women. In particular, healthcare professionals should inform pregnant women under the age of 25 years about the high prevalence of chlamydial infection in their age group. They should be signposted to their local National Chlamydia Screening Programme.

The role of organisms found in bacterial vaginosis (BV) remains controversial; the presence of BV is linked with preterm birth, but the varying methods used to ascertain its presence, and the timing and means of treatment in several studies have meant that no consensus currently exists regarding screening and treatment in at-risk women. The presence of Group B Streptococci in a vaginal swab is not an indication to treat until in labour, unless also isolated from a midstream urine specimen. (NHS England 2019)

4.2 Risk Assessment

The preterm birth risk assessment sits within the Electronic Patient Record (EPR) and aligns with SBLV3. It should be started with the community midwife at the booking appointment and be completed at the first hospital antenatal clinic appointment

All women at risk of preterm birth will be offered referral for shared care within the Preterm Birth Clinic, led by Dr Khanem and Dr Fawzy.

Risk should be categorised as follows:

HIGH RISK	
Risk Factor	Surveillance
• Previous preterm birth or mid-trimester loss (16 – 34 weeks gestation) • Previous preterm rupture of membranes < 34/40 • Previous use of cervical cerclage • Known uterine variant e.g.	• First Consultant appointment for management plan by 12 weeks in the preterm birth clinic. • Further risk assessment based on history +/- examination as appropriate in secondary care with identification of women needing referral to tertiary services

• unicornuate, bicornuate uterus or uterine septum • History of trachelectomy (for cervical cancer)	• Trans vaginal cervix scanning as a secondary screening test to more accurately quantify risk every 2-4 weeks between 16 and 24/26 weeks. • Additional use of quantitative fetal fibronectin in asymptomatic women can be considered. If this is required refer to preterm birth clinic.
INTERMEDIATE RISK	
Risk Factor	Surveillance
• Previous delivery by caesarean section at full dilatation • History of significant cervical excisional event: o LLETZ where > 10 mm depth removed o or > 1 LLETZ procedure carried out o or cone biopsy (knife or laser) typically carried out under general anaesthetic	• First Consultant appointment for management plan by 12 weeks • Further risk assessment based on history +/- examination as appropriate in secondary care with discussion of option of additional screening tests including: • A single transvaginal cervical length scan between 18-22 weeks as a minimum • Additional use of quantitative fetal fibronectin in asymptomatic women can be considered. If this is required refer to preterm birth clinic.

4.3 Prophylactic Interventions

After assessment in the Antenatal clinic, on the basis of obstetric/gynaecological history and/or additional screening, women should be offered treatment to prevent second trimester miscarriage and preterm birth.
Several interventions have been assessed for women at high risk of preterm birth: cervical cerclage, progesterone and pessaries. At present the evidence base cannot determine precisely in which women, and in what circumstances, each intervention will be most effective. Care must, therefore, always be individualised, considering the woman's wishes, and following a discussion with a clinician able to discuss the potential risks and benefits of each intervention. The following evidence and guidance should be discussed (NHS England 2019):

4.3.1 Women with a history of spontaneous preterm birth or late miscarriage (16-34 weeks)

- Offer a history-indicated planned, elective cerclage for women with singleton pregnancies and three or more previous preterm births.
- History-indicated cerclage should be placed by the end of the first trimester (at 12 completed weeks) where possible. However, often it may be prudent to wait until

after the dating scan and aneuploidy screening has been performed, so that significant fetal malformations can be excluded (14-15 weeks)
- For women having ultrasound surveillance, discuss intervention when cervical length is = or <25mm. This can be either **cervical cerclage** or **prophylactic progesterone** (vaginal or intramuscular) (NHS England 2019)
- Discuss the benefits and risks of prophylactic progesterone and cervical cerclage with the woman and take her preferences into account.
- Insertion of a history or ultrasound indicated cerclage in women with multiple pregnancy is not recommended.

4.3.2 Women with a previous failed transvaginal suture

- The circumstances of the failed suture and other clinical factors should be considered prior to placement of another suture in the index pregnancy; and appropriately experienced clinicians should be involved in the decision making and surgery. High vaginal or transabdominal cerclage may be considered. Transabdominal cerclage during pregnancy should be undertaken prior to 14 weeks.
- For a high vaginal or an abdominal cerclage, patients should be referred to Professor Nigel Simpson, Obstetrician with expertise in Shirodkar suture and transabdominal cerclage at the preterm prevention clinic in Leeds

4.3.3 Women with no history of spontaneous preterm birth or mid-trimester loss in whom a transvaginal cervix scan has been carried out between 16+0 and 24+0 weeks of pregnancy and the cervix is less than 25mm

- Care for these women should be individualised. Counselling should include the options of continued surveillance, or interventions to prevent preterm labour. There is uncertainty to how to care for these women if a short cervix is identified on ultrasound scan and there is **no** history of previous preterm labour. An ultrasound indicated cervical cerclage may be considered. Other intervention is the vaginal progesterone (RCOG,2022).

- When using vaginal progesterone, start treatment between 16+0 and 24+0 weeks of pregnancy and continue until 34 weeks. (NICE 2019)
- Women with cerclage should remain under the care of the preterm prevention clinic until delivery
- Women undergoing transvaginal cervix scanning screening should continue this until 24 weeks, when this screening pathway is complete and if no intervention is recommended, women may be transferred to routine pathways of care. Midwifery-led care is appropriate if no other additional risk factors are identified. (NHS England 2019)
- Please note: Women with singleton pregnancy and no other risk for preterm labour, insertion of cervical cerclage is **not recommended** in women who have an incidentally identified short cervix.

4.4 Rescue cervical cerclage

This may be considered for any woman between **16+0- and 27+6 weeks** gestation with a dilated cervix and exposed, intact fetal membranes. This will be the consultant's decision as risk of accidental rupture of membranes is very high.
Do not offer rescue cervical cerclage to woman with:
- Signs of chorioamnionitis.
- Active vaginal bleeding
- Uterine contractions

Please see more details under 4.6.2

4.4.1 Suture Removal

- If prophylactic cervical cerclage is used, ensure that a plan is in place at the time of insertion for removal of the suture. The suture should be removed at 37 weeks, or following premature rupture of membranes (PROM) or if the woman goes into labour (NICE 2019)
- After PPROM, delayed suture removal until labour ensues or birth is indicated, is associated with an increased risk of maternal/fetal sepsis and is not recommended.
- In women with PPROM between 24 and 34 weeks of gestation and without evidence of infection or preterm labour, delayed removal of the cerclage for 48 hours can be considered to facilitate in utero transfer.
- Given the risk of maternal/fetal sepsis and the minimal benefit of 48 hours of latency in pregnancy with PPROM before 23 weeks and after 34 weeks gestation, delayed suture removal is unlikely to be advantageous in this situation.

4.5 Supplementary education

When a woman is referred to the preterm birth clinic:

- Discuss, demonstrate and supply equipment for harvesting breast milk
- Offer a tour of the birthing centre
- Offer a tour of the neonatal unit, and discussion with the neonatal team
- Offer practical support on caring for a preterm baby
- Ensure she is aware of the signs of labour
- Ensure she has contact numbers
- Discuss birth preparation classes

4.6 Management of Preterm Labour

4.6.1 22 + 0 to 36+6 gestation

Women should attend the Maternity Assessment Unit for review if they think they are in preterm labour.
In addition to routine observations as per the Triage proforma, the following should be discussed and offered to the woman:

- Vaginal examination/speculum to assess cervical dilatation, position of cervix, consistency, effacement, position of baby and station
- Vaginal loss assessment
- High Vaginal Swab (HVS)
- MSU even if the dip stick is negative, FBC and CRP
- Fibronectin test
- A copy of the Yorkshire & Humber PeriPREM passport: Only if the gestation is = or <34 weeks
- https://portal.bdgh-tr.trent.nhs.uk/SiteDirectory/TrustApprovedDocuments/TAD/Yorkshire%20and%20Humber%20Periprem%20passport

4.6.2 Management of bulging membranes before 24 weeks

Second trimester miscarriage and very early preterm birth results in significant risks of morbidity and mortality to babies. Cervical weakness is one important cause of mid-trimester birth. An established treatment for cervical insufficiency is vaginal cervical cerclage.
In a situation where the cervix has opened and the fetal membranes are exposed, an emergency cervical cerclage (ECC) may be considered. This procedure aims to halt further cervical dilatation and prolong pregnancy, preventing miscarriage or preterm birth, and thus potentially improving neonatal outcome. However, ECC has not been fully evaluated for clinical and cost effectiveness, and carries risks to both the mother and baby. These risks include cervical trauma, severe infection/sepsis and iatrogenic rupture of membranes during the procedure leading to fetal loss.
There remains uncertainty about both the immediate benefit and long-term development of babies born following ECC. Specifically, *in utero* infection may worsen neurodevelopmental outcome.
If a woman at 16-24 weeks gestation presents with bulging membranes, ECC may be considered.
Contraindications to a cerclage would be where pain, contractions, heavy bleeding, ruptured membranes, or chorioamnionitis were present; or where fetal parts were no longer in the uterus.
On identification of a woman with bulging membranes at 16-24 weeks:

- 16 – 19+6 admit to gynaecology inpatient services
- 20 + weeks admit to Delivery Suite
- Check bloods – FBC and CRP
- HVS
- MSU, even with negative dipstick
- TED stockings
- Inform on call consultant
- If presenting overnight, fast from 3am, can drink water until 7am if a suture is to be considered
- If labour appears to be progressing, then there should be consideration of steroids and magnesium sulphate for gestations above 22 weeks

There is no evidence of benefit for a head-down tilt, total bed rest or urinary catheter insertion and so these should be avoided. (West Yorkshire and Harrogate Local Maternity System 2021)

4.7 Fetal Fibronectin Test Including QUIPP app

The following Standard Operating Procedure explains when and how to use Fetal Fibronectin

https://portal.bdgh-tr.trent.nhs.uk/SiteDirectory/TrustApprovedDocuments/TAD/Fetal%20fibronectin%20V4

Clinical decision-making adjustments
1. While stocks of quantitative FFN are low or absent, the use of this test on asymptomatic women should be avoided:
a. Within preterm birth clinics the swabs should be taken prior to assessment of cervical length but only analysed if there is concurrent cervical length shortening or this will significantly affect management (eg if considering insertion of cervical suture, etc).

2. Women presenting in threatened preterm birth can be assessed with an alternative test (Actim® Partus):

a. If this test is negative, the woman can be assumed to be at low risk of preterm birth and as such would not require in-utero transfer or optimisation medications.
b. If the test is positive, the woman should be recommended to deliver in an appropriate unit and receive optimisation medications. (NHS England)

4.8 Administration of Corticosteroids

Two doses of steroid when administered 7 days prior to delivery have significant benefit in reducing the incidence of: perinatal death; intraventricular haemorrhage; necrotising enterocolitis; respiratory distress syndrome with a need for mechanical ventilation; and sepsis within the first 48 hours of life. (Roberts et al 2017)
The optimum time between administration of corticosteroids and delivery is more than 24 hours and less than 7 days. However, there appears to be some benefit even if less than 24 hours elapse before delivery. Every effort should be made to administer steroids if premature delivery is anticipated, even if delivery seems imminent and there is time to administer only one dose.

Current research supports short term benefits for babies within the first few weeks of life with repeat dose(s) of prenatal corticosteroid for women still at risk at of preterm birth seven days or more after the initial course (Walters et al 2015)

When offering or considering maternal corticosteroids, discuss with the woman and her family members or carers where appropriate, the benefits and risks (NICE 2019)

4.8.1 Recommendations based on available evidence

Dexamethasone 12mg IM - two doses 24 hours apart (can be 12 hours apart if indicated by clinical picture) should be offered to:

- All women between 22+0 and 23+6 at the individual instigation of a Consultant Obstetrician taking all the clinical aspects into account along with input from the neonatal team. Use clinical judgement in deciding whether to initiate steroids in cases below 24 completed weeks where it is anticipated that the fetus will be viable at birth.
- All women between 24 and 34+6 weeks gestation inclusive (up to 35+6 weeks if small for gestational age)
- All women to be delivered electively at less than 36 completed weeks gestation but more than 24 completed weeks gestation, where it is anticipated that the fetus will be viable at birth.
- Those who are in proven or suspected pre-term labour
- Those where pre-term delivery may be anticipated, e.g. pre-term rupture of membranes, antepartum haemorrhage

This includes multiple pregnancies

Consider actively suppressing labour with tocolysis for 24 - 48 hours to allow corticosteroid therapy to have maximum effect.

Consider steroids up to 36 weeks.

Women between 22+0 and 23+6 should have full counselling about the outcome of the pregnancy with the neonatal consultant.

Antenatal corticosteroids are most effective in reducing the risk of respiratory distress syndrome in pregnancies that birth between 24 hours and 7 days of administration of the 2nd dose of antenatal corticosteroids.

4.8.2 Contraindications

- Current active tuberculosis
- Porphyria
- Senior opinion should be sought when contemplating delaying delivery for steroid prophylaxis in overt chorioamnionitis, as delaying delivery is not recommended due to increased risk of cystic periventricular leukomalacia, cerebral palsy and maternal infection

4.8.3 Precautions

Women with an impaired glucose tolerance or diabetes require extra care. The guidance within MSG 159 Management of Diabetes in Pregnancy Guideline, should be followed: https://portal.bdgh-tr.trent.nhs.uk/SiteDirectory/TrustApprovedDocuments/TAD/Diabetes%20In%20Pregnancy%20v6

4.8.4 Repeat Courses

Do not give more than 3 courses of maternal corticosteroids for preterm birth, routinely.

Consider a single repeat course of maternal corticosteroids for women less than 34+0 weeks of pregnancy who: -

Have already had a course of corticosteroids when this was more than 7 days ago, and

- are at very high risk of giving birth in the next 48 hours. Where the woman is less than 30+0 weeks pregnant or if there is suspected growth restriction, take into account the possible impact on fetal growth of a repeat course of maternal corticosteroids

The use of 'prophylactic' steroids, in women at risk of preterm birth but where this is not imminent or they are not symptomatic, is not evidence based and should be discouraged. (UK Preterm Clinical Network 2018)

4.9 Individualised Care

When it has been agreed that potentially life-sustaining care for the baby is appropriate, active obstetric management is important to ensure the baby is born in the best possible condition. An individualised package of obstetric interventions should be offered in all cases where a commitment to active neonatal care is in place. Obstetric management should be regularly reviewed, particularly if events suggest a changing prognosis for the baby. The package of obstetric care to be offered to parents may (but will not necessarily) include any or all of the following: antenatal steroids, tocolysis, antenatal transfer to a tertiary obstetric center co-located with a NICU, magnesium sulphate for neuroprotection, delayed cord clamping, intrapartum fetal heart monitoring, caesarean section (if potential benefits are considered to outweigh risks)

Antenatal steroids, tocolytic use, magnesium sulphate and delayed cord clamping have been shown to be of benefit in improving outcome in preterm infants. Parents should be made aware that there is a paucity of data in relation to the magnitude of benefit and risks of these interventions, particularly before 24 weeks of gestation

Parents should be signposted to 'BLISS' for support whilst their baby is cared for in the neonatal environment.

https://www.bliss.org.uk/health-professionals/information-and-resources/resources-for-parents

For parents who do not have a smart phone this information can be downloaded and given to them.

5.0 Magnesium Sulphate for neuroprotection

Evidence supports the beneficial effects of magnesium sulphate in reducing the risk of cerebral palsy in infants delivered at preterm gestations.

Magnesium Sulphate must be administered on the Birthing Centre with 1:1 midwifery care.

The Obstetric team are responsible for the assessment of the patient and the decision to commence and continue magnesium sulphate administration

Evidence suggests the following considerations for administration of magnesium sulphate for neuroprotection -

- Between 22+0 and 23+6 weeks gestation who are in established labour or having a planned preterm labour within 24 hrs discuss the use of magnesium sulphate taking into consideration her individual circumstances (NICE, 2019)

- Offer magnesium sulphate for women who are between 24+0 and 29+6 weeks gestation and are in established preterm labour or having a planned preterm birth within 24hrs (NICE, 2015)

- Consider magnesium sulphate for women who are between 30+0 and 33+6 weeks gestation and are in established preterm labour or having a planned preterm birth within 24hrs (NICE, 2015)

A 4g intravenous (IV) bolus of magnesium sulphate should be administered over 15 minutes followed by a maintenance infusion of 1g per hour until the birth or for 24hrs (whichever is sooner)

See Appendix 3 for Preparation and Administration guidance

5.1.1 Monitoring for Magnesium Sulphate Toxicity

Maternal –

- An assessment of pulse, blood pressure, respiratory rate and deep tendon reflexes should be performed prior to commencement of the IV medication.
- Women receiving IV magnesium sulphate must be monitored for signs of toxicity at least every 4 hours by recording pulse, blood pressure, respiratory rate and deep tendon reflexes.
- Urine output must be monitored hourly – if a woman has or develops oliguria or other evidence of renal failure then monitoring for magnesium toxicity should be increased, obstetric review must be undertaken and consideration should be given to reduce or

- stop the dose of magnesium sulphate (NICE, 2022)
- SP02 monitoring must be continuous

Fetal –

- Continuous fetal heart monitoring with cardiotocography should be employed when maternal magnesium sulphate is being administered.

5.1.2 Management of Magnesium Toxicity

Magnesium toxicity is unlikely with the regimes recommended in current guidance and serum magnesium concentrations do not need to be routinely measured.

Women with the following signs of magnesium toxicity or renal compromise including oliguria or rising creatinine levels will require obstetric review and monitoring of their serum magnesium levels.

- Flushing
- Feeling warm
- Slurred speech
- Blurred vision
- Nausea and vomiting

Instant referral

The antidote is 10mls Calcium Gluconate given slowly intravenously

Serum Magnesium Levels and required action

Plasma Mg (mmol/L)	Comment	Action
≤4.0	Therapeutic range	Continue at current rate
4.1 – 5.0	May have lost reflexes	Halve infusion rate
5.1 – 12	Potential for respiratory and CNS depression	Stop infusion
>12.1	Cardiac arrest	

The infusion must be stopped if –

- Respiratory rate is less than 12 breaths per minute
- Patellar reflexes are absent
- Hypotension occurs
- Urine output is less than 20mls/hr

5.1.3 Tocolysis

The use of tocolysis is not recommended to improve neonatal outcomes for women at risk of imminent preterm birth, although the evidence is of low quality.

Tocolysis may be used when short term delay is desirable, for example, in-utero transfer, and to ensure adequate antenatal exposure to corticosteroids/magnesium sulphate (i.e. for no longer than 48 hours).

There is no evidence that maintenance tocolysis is beneficial. (UK Preterm Clinical Network 2018)

When compared with no tocolytic treatment, oxytocin antagonists and calcium channel blockers appear effective in delaying birth for more than 48 hours. In the absence of any contraindications Nifedipine is the preferred agent for tocolysis. (NICE 2019)
This may provide a window for in-utero transfer to an appropriate birth setting, however, there is no direct evidence to support this. (UK Preterm Clinical Network 2018)
Contraindications for the use of tocolytic drugs:

- Placental abruption, significant haemorrhage, e.g. not just from cervical dilation
- Chorioamnionitis, Sepsis
- Fetal distress
- Maternal condition
- Lethal fetal abnormalities
- Intrauterine death

5.1.4 Nifedipine

Nifedipine is the drug of choice for tocolysis. In circumstances where it is contraindicated or there is a need for in-utero transfer, Atosiban can be considered as an alternative. Never give two tocolytics concurrently.
Nifedipine is contraindicated if the woman has cardiac disease and should be used with caution if she has diabetes or multiple pregnancy, due to the risk of pulmonary oedema.
When using nifedipine, it is important to:

- Confirm threatened or actual preterm labour
- **ONLY prescribe moderate release or long acting Nifedipine**
- Give oral dose 20mg Nifedipine

5.1.5 If uterine contractions persist

- Give second oral dose Nifedipine 20mg, 30 minutes after 1st dose
- The maximum dose in the 1st hour is 40mg
- Do not give any further Nifedipine until 3 hours after the 2nd dose
- If contractions continue administer oral Nifedipine 10-20mg every 3-6 hours for up to 48 hours, unless contractions cease or the woman establishes in labour
- Tocolysis with Nifedipine for 48 hours allows completion of a full course of corticosteroids, provided there is no contraindication to prolonging pregnancy
- Do not prescribe nifedipine for tocolysis as PRN on the medication chart
- The maximum dose of Nifedipine is 160mg in 24 hours

5.1.6 Maternal Observations

Do not give Nifedipine if systolic BP is <95mmHg or diastolic <65mmHg
Record BP and pulse every 15 minutes for the first hour. Thereafter check BP and temperature every hour for two hours. Once stable continue with 4 hourly MEOWS

observations on the HDU Chart.

5.1.7 Atosiban

Atosiban should be considered if between 22 and 33+6 weeks gestation and

- Mother cannot tolerate Nifedipine
- There is a need for intra uterine transfer

Contraindications

- Abnormal fetal heart rate pattern
- Placental abruption or praevia
- Severe pre-eclampsia/eclampsia as delivery is indicated
- Suspected chorioamnionitis

Caution

- Vaginal bleeding or uterine pain, discuss with on call consultant

5.2 In-utero Transfer

Optimise place of birth – women at imminent risk of preterm birth should be offered transfer to a unit with appropriate and available neonatal cot facilities when safe to do so and as agreed by the Operational Delivery Network (ODN). (NHS England 2019)

Appropriate in-utero transfer is associated with reduced neonatal morbidity and mortality (UK Preterm Clinical Network 2018).
It is crucial to transfer out women between 22 and 26+6 – less than 27 weeks to a level 3 tertiary centre.
A full assessment should be done within one hour for all threatened pre-term labourers, and the case should be discussed with the on-call consultant regarding in-utero transfer where the gestation is below 27 weeks as per Yorkshire and the Humber In-Utero Transfer Guideline (2021)
https://portal.bdgh-tr.trent.nhs.uk/SiteDirectory/TrustApprovedDocuments/TADDocs/In%20utero%20transfer%20Yorkshire%20and%20the%20Humber.pdf

In utero transfer to a tertiary centre optimises outcomes for the baby, is better than ex utero transfer and is now a prioritized NHS England recommendation as well being recommended in the Scottish Maternity and Neonatal services Review.
https://portal.bdgh-tr.trent.nhs.uk/SiteDirectory/TrustApprovedDocuments/TAD/In-utero%20transfer

5.3 Preterm pre-labour rupture of membranes (PPROM)

PPROM complicates up to 3% of pregnancies and is associated with 30-40% of preterm births. PPROM can result in significant neonatal morbidity and mortality, primarily from prematurity, sepsis, cord prolapse and pulmonary hypoplasia. In addition, there are risks associated with chorioamnionitis and placental abruption (RCOG 2019)

Immediate assessment will be offered, on the Maternity Assessment Unit, to assess if PPROM has occurred.

Upon arrival, please follow the Guideline for Admission to the Maternity Assessment Unit

Admission to the maternity assessment unit.pdf (trent.nhs.uk)In addition to this a full history should be taken including the time of the suspected rupture of membranes and the colour of the liquor.

Digital examination should be avoided unless there is a strong suspicion that the woman is in labour.

Clinical care will include: -

- A sterile speculum examination should be offered, following a verbal assessment of the maternal history.

  If pooling of amniotic fluid is observed, do not perform any diagnostic test

  If pooling of amniotic fluid is not observed, the clinician should consider using an Actim PROM

- Obtain a high vaginal swab (HVS) for microbiological testing

- Consider an ultrasound scan if there is any doubt regarding diagnosis of SROM and estimation of liquor volume is required, there are concerns regarding fetal growth and wellbeing and/or the presentation of the fetus is unclear

- Women who have PPROM between 24+0 and 33+6 are to be offered corticosteroids, steroids can also be considered up to 35+6 gestation (RCOG 2019)

Following the diagnosis of PPROM, an antibiotic (preferably Erythromycin 250mg) should be given for 10 days or until the women is in established labour (whichever is sooner) (RCOG 2019)

Penicillin may be used in women who cannot tolerate erythromycin. Co-amoxiclav should be avoided as it is associated with an increased risk of neonatal necrotising enterocolitis.

- Obtain blood samples for full blood count (FBC) which will include white blood cell count and C-reactive protein (CRP)

Request an obstetric review and arrange admission to the Antenatal Postnatal Ward with an individualised management plan which will include involvement of the Neonatal Team. The woman should be reviewed by the Neonatal team during her admission.

The woman may be discharged from hospital after 48-72 hours if there are no concerns regarding fetal or maternal wellbeing.

A plan of care including expectant management and delivery planning will be discussed and agreed prior to discharge.

An initial Antenatal Clinic appointment following discharge may be necessary to enable the woman's Obstetric team to formulate a plan for expectant management and delivery if this has not been agreed during the hospital stay.

5.3.1 Expectant Management following discharge

Advise the woman to record her temperature every 4 hours whilst awake and contact the Maternity Assessment Unit if she has:

- A temperature >37.5 °C
- General malaise or any other signs of infection
- Concerns regarding fetal movements
- Changes to the colour of the liquor
- Contractions, abdominal pain or suspected labour
-

The woman will be advised to avoid sexual intercourse

Signpost the woman to the RCOG 'When your waters break prematurely' leaflet

5.3.2 Follow Up Care on the Antenatal Day Unit

The woman will be required to attend Antenatal Day Unit twice weekly for assessment of maternal and fetal wellbeing

An antenatal assessment will be performed including

- Enquiries into general well being
- Observations including temperature, pulse, blood pressure and respirations
- Urinalysis
- Abdominal palpation
- Enquiries into the amount and colour of liquor or any other vaginal discharge and uterine activity

Bloods will be obtained for FBC and CRP, twice weekly.

An assessment of fetal wellbeing will be performed including

- Enquiries regarding fetal movement pattern
- Auscultation of the fetal heart rate using Pinnards or hand held doppler, external CTG if >28 weeks and there are concerns regarding fetal wellbeing

The woman will be reviewed by the Obstetrician if there are concerns regarding maternal or fetal wellbeing.

5.3.3 Delivery Planning

Delivery planning should be in accordance with individual circumstances taking into consideration the risks of neonatal infection as a result of chorioamnionitis and the risks associated with premature birth.

For women with PPROM after 24+0 weeks gestation, expectant management should be offered until 37+0 weeks gestation if there are no contraindications to continuing the

pregnancy. Timing of the birth should be discussed with each family on an individual basis taking into consideration individual family preferences and ongoing clinical assessment.

The decision of how and when to deliver will involve an MDT discussion including senior Obstetricians, Neonatologists, Anaesthetists, Midwives and the family.

The management plan will be amended if there are any clinical concerns regarding maternal or fetal wellbeing.

5.4 Labour and Birth

5.4.1 Administration of IV Antibiotics

IV Antibiotics should be offered to all women in preterm labour, when established in labour, to prevent a possible transmission of Group B Streptococcal (GBS), according to updated guidance by the Royal College of Obstetricians and Gynaecologists. (RCOG 2017, King, Flenady & Murray 2011)

- No penicillin allergy-Use benzylpenicillin - 3gm stat and then 1.5 gm every 4 hourly until delivery
- Penicillin allergy not severe use Cephalosporin with activity against Group B Streptococcus (eg Cefotaxime)
- Penicillin allergy severe – use Vancomycin OR an alternative antibiotic expected to be active against Group B Streptococcus based on either sensitivity testing performed on the woman's isolate or on local susceptibility surveillance data.

NICE guideline [NG195] Neonatal infection: antibiotics for prevention and treatment

(Any further allergies/sensitivities should be discussed with the Microbiology lead, the choice can be as per the local antibiotic susceptibility surveillance data or individual patient)

5.4.2 Fetal Monitoring/Fetal Scalp Electrode (FSE) and Fetal Blood Sampling (FBS)

Cardiotocography (CTG) and Intermittent Auscultation

The following guideline offers further advice in relation to fetal monitoring for a preterm infant: https://portal.bdgh-tr.trent.nhs.uk/SiteDirectory/TrustApprovedDocuments/TAD/Guideline%20for%20fetal%20auscultation%20V20

Antenatal electronic fetal monitoring (EFM) should not be performed prior to 26 weeks gestation as reliability is less certain due to the immaturity of the central nervous system, and intermittent auscultation should be used.
Continuous CTG should be undertaken during the intrapartum period.
If appropriate, consider the option not to monitor the fetal heart rate, for example, at the threshold of viability.

5.4.3 Mode of Birth

Discuss the general benefits and risks of caesarean section and vaginal birth with women in suspected, diagnosed or established preterm labour and women with prolonged preterm rupture of membranes (PPROM) (NICE 2019)

Explain to women in suspected, diagnosed or established preterm labour and women with PPROM about the benefits and risks of caesarean section that are specific to gestational age. In particular, highlight the difficulties associated with performing a caesarean section for a preterm birth, especially the increased likelihood of a vertical uterine incision and the implications of this for future pregnancies. (NICE 2019)

Explain to women in suspected, diagnosed or established preterm labour that there are no known benefits or harms for the baby from caesarean section, but the evidence is limited. (NICE 2019)

Consider caesarean section for women presenting in suspected, diagnosed or established preterm labour between 26+0 and 36+6 weeks of pregnancy with breech presentation. (NICE 2019)

5.5 Cord clamping

Delayed cord clamping for at least 60 seconds should be routine practice unless contraindicated, and particular attention should be paid to the maintenance of normothermia, with the use of a plastic bag and/or other methods of delivering thermal care, and skin protection.

Wait at least 30 seconds, but no longer than 3 minutes, before clamping the cord of preterm babies if the mother and baby are stable.

Position the baby at or below the level of the placenta before clamping the cord. (NICE 2019)

If a preterm baby needs to be moved away from the mother for resuscitation, or there is significant maternal bleeding:

- Consider milking the cord,
- Clamp the cord as soon as possible

5.6 Preterm labour below 26 weeks gestation

British Association of Perinatal Medicine (BAPM) Guidance should be followed. https://www.bapm.org/resources/80-perinatal-management-of-extreme-preterm-birth-before-27-weeks-of-gestation-2019

Our aim is to continue to ensure that the right baby receives the right care in the right place at the right time. In utero transfer to a tertiary centre optimises outcomes for the baby, is better than ex utero transfer and is now a prioritised NHS England recommendation.

If birth of a preterm infant below 26 weeks appears imminent, the most experienced staff in all disciplines (obstetrics, midwifery and paediatrics) should meet the parents and agree a provisional management plan. An accurate assessment of gestational age is essential. (Wilkinson et al 2009). They should give information to parents, and make recommendations on:

- Short-term and long-term fetal and neonatal outcomes
- Below 26 weeks gestation, a senior obstetrician should be involved in decisions around intra-partum fetal heart rate monitoring as there is a lack of evidence to inform practice. Monitoring of the fetal heart is unlikely to be indicated below 24 weeks). Monitoring of the fetal heart is unlikely to be indicated below 24 weeks. https://www.nice.org.uk/guidance/ng25/chapter/update-information
- 10-15% of all babies surviving below 26 weeks' gestation will have moderate to severe mental or physical handicaps

- Outcome for babies born alive between 22 and 26 weeks' gestation
  - 22 weeks: 3 in 10 babies survive
    1 in 3 babies has severe disability (24%-43%)
  - 23 weeks: 4 in 10 babies survive,
    1 in 4 babies has severe disability (16%-33%)
  - 24 weeks: 6 in 10 babies survive
    1 in 7 babies has severe disability (11%-24%)
  - 25 weeks: 7 in 10 babies survive
    1 in 7 babies have severe disability (6-21%)
  - 26 weeks: 8 in 10 babies survive
    1 in 10 babies has severe disability (6-14%)
- The survival rate may be lower if there is evidence of sepsis or intrauterine growth restriction (IUGR)
- Following MDT discussion between Paediatric Consultant/Middle Grade Doctor and Obstetric Teams, the survival rate should be discussed with the parents
- Management plans discussed with parents should include flexibility for initiating, withholding or withdrawing treatment and may require modification immediately at and after birth, depending on the status of the neonate.
- The Paediatric Consultant/Middle Grade Doctor using information about size, gestational age, intrapartum events and condition at birth will make the decision regarding resuscitation at birth. The factors that will guide the decision for or against resuscitation must be discussed before delivery where possible.
- Wherever possible, a decision to withhold or withdraw newborn treatment immediately after birth should be made jointly, after full discussion by the Paediatrician, the parents or guardians, and appropriate members of the health care team. Management decisions should be documented clearly.

5.7 Postnatal Care

Follow up pathways are essential for all women who have undergone a preterm birth.

- All women who have delivered prior to 34 weeks should be offered a postnatal consultation with their own consultant,
- Placental histology should be routine for all deliveries prior to 34 weeks' gestation.
- A follow up appointment facilitates debriefing and provides information regarding the delivery, it should also lead to a plan of care prior to and during any future pregnancy.
- Women with a history of extreme preterm birth (<28 weeks) despite the placement of a transvaginal cervical cerclage should be counselled about the option of placing an abdominal cervical cerclage either before the next pregnancy (laparoscopic or open) or during the next pregnancy (open), to reduce the risk of preterm birth.

6.0 Roles and responsibilities

6.1 Midwives

To provide the best evidence-based care for women in accordance with appropriate guidance from diagnosis to delivery.

6.2 Obstetricians

To provide care for women in accordance with appropriate guidance from NICE/RCOG/Saving Babies Lives

6.3 Paediatricians

To work as part of the MDT to provide information, support and clinical knowledge/experience.

7.0 Associated documents and references

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National Institute for Health and Care Excellence (2018). Urinary tract infection (lower): antimicrobial prescribing (NICE Guideline 109). Available from: https://www.nice.org.uk/guidance/ng25 [Information accessed 11 December 2018].

NICE (2019). Preterm Labour and Birth. NICE Guideline NG25. London. https://www.nice.org.uk/guidance/ng25/resources/preterm-labour-and-birth-pdf-1837333576645

NICE guideline [NG195] (2021) Neonatal infection: antibiotics for prevention and treatment

NHS England (2019) Saving Babies Lives v3. A care bundle for reducing perinatal mortality.

RCOG (2017). Group B Streptococcal Disease, Early Onset. Green Top Guideline 36. London: RCOG.

RCOG (2022) Antenatal corticosteroids to reduce neonatal morbidity and mortality, Green-top Guideline No 74 Antenatal corticosteroids to reduce neonatal morbidity and mortality (wiley.com)

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UK Preterm Clinical Network (2018). Reducing preterm birth: Guidelines for Commissioners and Providers. UK: Preterm Clinical Network.

Walters A, McKinlay C, Middleton P, Harding JE, Crowther CA (2015) Repeat doses of prenatal corticosteroids for women at risk of preterm birth for improving health outcomes (Review), www.cochranelibrary.com

West Yorkshire and Harrogate Local Maternity System, Guideline for the Management of women at risk of preterm birth or in preterm labour between 22 weeks and 36 and 6 weeks gestation, 2021.

8.0 Training and resources

Training will be delivered as outlined in the Maternity Training Needs Analysis. This is updated on an annual basis.

9.0 Monitoring and audit

Any adverse incidents relating to the guideline for the management of preterm labour will be monitored via the incident reporting system. Any problems will be actioned via the case review and root cause analysis action plans. The action plans are monitored by the risk midwife to ensure that improvements in care are made. The trends and any root cause analysis are discussed at the monthly risk meetings to ensure that appropriate action has been taken to maintain safety.
The guideline for the management of preterm labour will be audited in line with the annual audit programme, as agreed by the CBU. The audit action plan will be reviewed at the monthly risk management meetings on a quarterly basis and monitored by the risk midwife to ensure that improvements in care are made.

10.0 Equality and Diversity

The Trust is committed to an environment that promotes equality and embraces diversity in its performance as an employer and service provider. It will adhere to legal and performance requirements and will mainstream equality, diversity and inclusion principles through its policies, procedures and processes. This guideline should be implemented with due regard to this commitment.

To ensure that the implementation of this guideline does not have an adverse impact in response to the requirements of the Equality Act 2010 this policy has been screened for relevance during the policy development process and a full equality impact assessment is conducted where necessary prior to consultation. The Trust will take remedial action when necessary to address any unexpected or unwarranted disparities and monitor practice to ensure that this policy is fairly implemented.

This guideline can be made available in alternative formats on request including large print, Braille, moon, audio, and different languages. To arrange this please refer to the Trust translation and interpretation policy in the first instance.

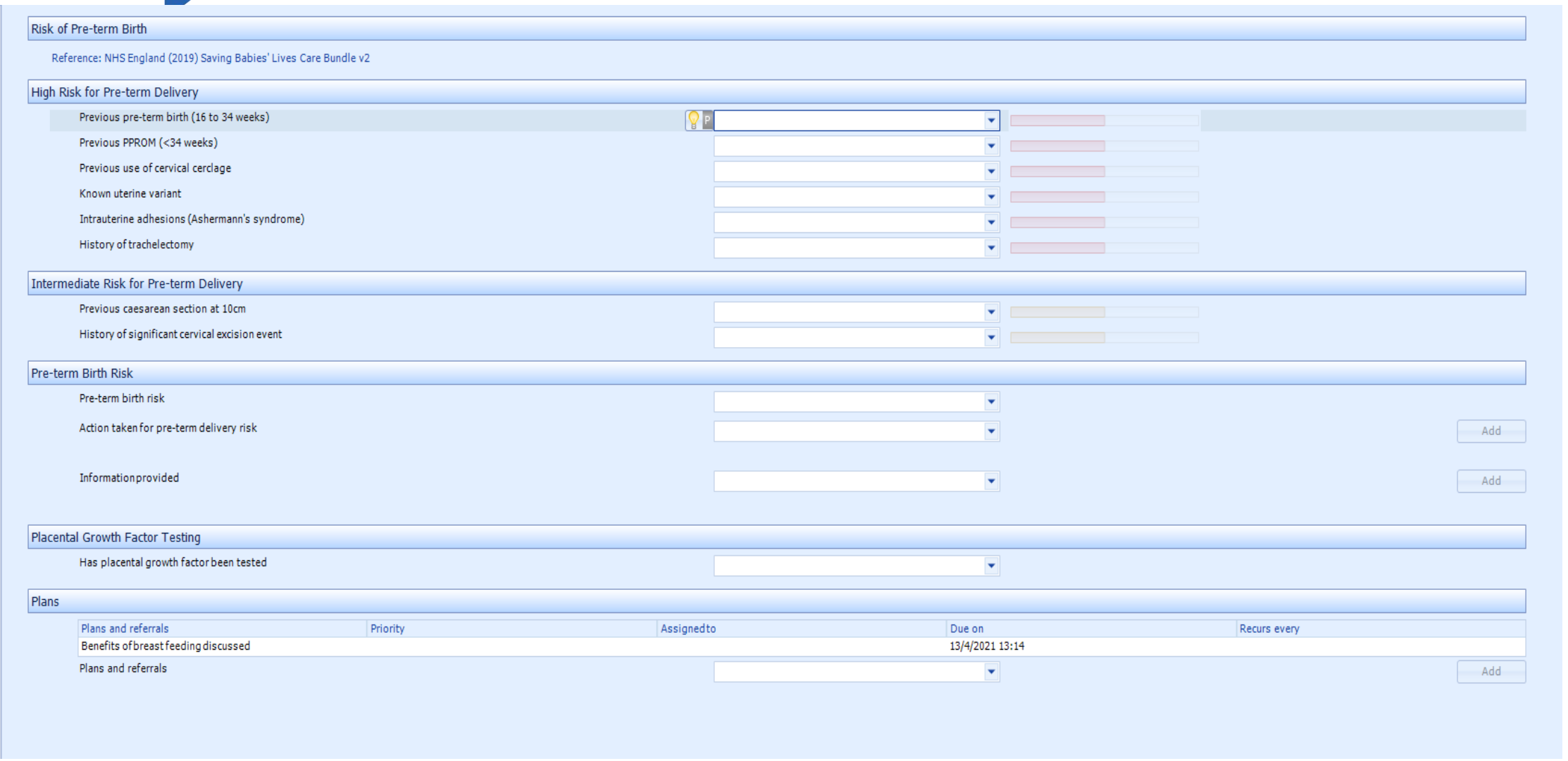
The Trust will endeavor to make reasonable adjustments to accommodate any employee/patient with particular equality, diversity and inclusion requirements in implementing this guideline. This may include accessibility of meeting/appointment venues, providing translation, arranging an interpreter to attend appointments/meetings, extending policy timeframes to enable translation to be undertaken, or assistance with formulating any written statements.

10.1 Recording and Monitoring of Equality & Diversity

The Trust understands the business case for equality, diversity and inclusion and will make sure that this is translated into practice. Accordingly, all guidelines will be monitored to ensure their effectiveness.

Monitoring information will be collated, analysed and published on an annual basis as part of Equality Delivery System. The monitoring will cover the nine protected characteristics and will meet statutory employment duties under the Equality Act 2010. Where adverse impact is identified through the monitoring process the Trust will investigate and take corrective action to mitigate and prevent any negative impact.

Appendix 1 Electronic Patient Record (EPR) risk assessment



Appendix 2- Atosiban Regime

Step	Regimen	Preparation	Infusion Rate	Atosiban Dose	Duration
1	0.9 ml iv bolus	Use 1 vial of Atosiban for Injection **This should be administered by Medical Staff**	Over 1 minute	6.75 mg	1 min
2	3 hours iv loading infusion	For the intravenous infusion withdraw 10mls of 0.9% saline from a 100ml infusion bag and discard. (leaves 90 ml) Replace it by 10ml of Atosiban 7.5mg/ml concentrate for solution i.e. **TWO** 5ml vials of Atosiban **concentrate** for solution for infusion.Infuse a total of 72 mls **(leaves 28 ml)**	24 ml / hr	18 mg / hr	3 hrs
3	Subsequent iv infusion	Use remaining 28mls from step 2 but infuse at 8 mls per hour	8ml/hr	6mg/hr	3.5 hours
4		Make up another 100mls solution containing 75mg Atosiban (as in step 2) and infuse at 8mls per hour – should last 12.5 hours	8ml/hr	6mg/hr	12.5 hours

- The above regime should use a total of 1 vial of Atosiban for injection and 4 vials of Atosiban concentrate for solution and last for 19 hours.
- In **exceptional circumstances**, it may be appropriate to continue Atosiban for another 6 hours (i.e. total of 25 hours therapy). If this is indicated then make up a further solution as follows: withdraw 5mls of 0.9% saline from a 50ml infusion bag and discard. Replace it by 5ml of Atosiban 7.5mg/ml concentrate for solution i.e. one 5mls vial of Atosiban concentrate for infusion.
- Infuse at 8mls per hour – should last 6 hours.

Appendix 3

Preparation and Administration of Magnesium Sulphate for Neuroprotection

Loading dose –

20mls (4g) magnesium sulphate 50% IV over 5-15 minutes

To draw up

- Use 20mls of the 50% magnesium sulphate (10 of the 2ml ampules)
- Remove 20mls from a 50ml bag of normal saline and discard
- Add 20mls of magnesium sulphate to the bag of normal saline with 30mls remaining and mix well
- Draw up 20mls of the solution and give as a loading dose over 5 to 15 minutes

Maintenance Dose –

Magnesium Sulphate 50% (200mg/ml) IV over 24hrs

Draw up the remaining 30mls of the solution and give via a 50ml syringe using the syringe driver at a rate of 5mls/hr

To make further maintenance doses

- Use 20mls of the 50% magnesium sulphate (10 of the 2ml ampules)
- Remove 20mls from a 50ml bag of normal saline and discard
- Add 20mls of magnesium sulphate to the bag of normal saline with 30mls remaining and mix well
- Draw up the entire 50mls of solution and give via a syringe driver at a rate of 5mls/hr

Appendix 4
Glossary of terms

- GBS: Group B Streptococcus
- CTG: Cardiotocography
- NNU: Neonatal Unit
- PPROM: Preterm Premature Rupture of Membranes
- CRP: C-Reactive Protein
- FBC: Full Blood Count
- FBS: Fetal Blood Sampling
- FSE: Fetal Scalp Electrode
- IM: Intramuscular
- SBLV3 Saving Babies Lives V3
- UTI Urinary tract infection
- MSU Mid-stream urine
- MLC Midwife Led Care
- BV Bacterial Vaginosis
- EPR Electronic Patient Record
- PROM Premature rupture of membranes
- EFM Electronic Fetal Monitoring
- IUGR Intrauterine Growth Restriction

Appendix 5

Maintain a record of the document history, reviews and key changes made (including versions and dates)

Version	Date	Comments	Author

Review Process Prior to Ratification:

Name of Group/Department/Committee	Date
Reviewed by Maternity Guideline Group	
Reviewed at Women's Business and Governance meeting	
Approved by CBU 3 Overarching Governance Meeting	

Trust Approved Documents (policies, clinical guidelines and procedures)

Approval Form

Please complete the following information and attach to your document when submitting a policy, clinical guideline or procedure for approval.

Document type (policy, clinical guideline or procedure)	Guideline
Document title	prevention and management of preterm labour
Document author (Job title and team)	Emma Hey – Maternity Matron (inpatients)
New or reviewed document	Reviewed
List staff groups/departments consulted with during document development	
Approval recommended by (meeting and dates):	Reviewed by Maternity Guideline Group Reviewed at Women's Business and Governance meeting 19/01/2024 Approved by CBU 3 Overarching Governance Meeting Feb 2024
Date of next review (maximum 3 years)	19.01.2027
Key words for search criteria on intranet (max 10 words)	Preterm, premature
Key messages for staff (consider changes from previous versions and any impact on patient safety)	
I confirm that this is the FINAL version of this document	**Name: Emma Hey** **Designation: 20/10/2023**

FOR COMPLETION BY THE CLINICAL GOVERNANCE TEAM

Approved by (group/committee): **CBU3 Governance**
Date approved: 19/01/2024
Date Clinical Governance Administrator informed of approval:
Date uploaded to Trust Approved Documents page: