Preterm Birth Risk Pathway (Guideline)

Summary statement: How does the document support patient care?	By providing information to ensure optimal outcomes for mother/birthing parent and baby in cases of risk of preterm labour, delivery, and late miscarriage and to act as a resource for staff caring for pregnant women and people whose needs fall within the scope of this guideline.
Staff/stakeholders involved in development	Consultant Obstetrician, midwives
Division	Women and Children's
Department	Maternity
Responsible Person	Chief of Service
Author	Consultant Obstetrician, midwives
For use by	Obstetricians, Midwives, and Paediatricians
Purpose:	To provide guidance for staff with regard to risk of preterm labour and birth and late miscarriage
This document supports	NICE CG55 2007, NICE CG132 2011, NICE NG25 2019 , NG207: Inducing Labour, RCOG GTG no.73
Key related documents	This document replaces: Preterm Labour and Delivery (Including Preterm Pre-labour Rupture of Membranes), Fetal Fibronectin. Management of women at risk of preterm birth. UH Sussex (SRH&WH) maternity guidelines: Multiple pregnancy and birth, Diabetes in pregnancy, Neonatal Resuscitation, Maternal Transfer and On-Site Handover of Care, Management of Women and Neonates with Risk Factors for Neonatal Sepsis (including Group B Streptococcus) Obstetrics antimicrobial formulary
Approved by	Joint Obstetric Guideline Group - 19th October 2022 Medicines Governance Committee – 12th March 2024
Approval date	19th October 2022 Date uploaded: 13th March 2024
Ratified by Board of Directors/ Committee of the Board of Directors	Not Applicable- Divisional Ratification only required
Ratification Date	Not Applicable- Divisional Ratification only required
Expiry Date	March 2025
Review date:	September 2024
If you require this document in another format such as Braille, large print, audio or another language please contact the Trusts Communications Team	
Reference Number:	CG20013

Version	Date	Author	Status	Comment
1.0	January 2021	A. Vecsei, Consultant O&G with special interest in high-risk obstetrics N. Beckley, Project Midwife SBLCB J. Collard, Clinical Effectiveness Support Midwife	Archived	New Trust Maternity guideline combining: CG13001 Preterm labour and Delivery. CG20013 Management of women at risk of preterm birth. CG1115 Fetal fibronectin. Reviewed to ensure NICE NG25 Preterm labour and birth and Saving Babies Lives Care Bundle V2 compliance.
2.0	February 2022	A. Vecsei, Consultant O&G with special interest in high-risk obstetrics C. Robotin, Obstetric Registrar N. Beckley, Project Midwife SBLCB J. Collard, Clinical Effectiveness Support Midwife	Archived	Reviewed to ensure compliance with: • RCOG GTG no.73: Care of Women Presenting with Suspected Preterm Prelabour Rupture of Membranes from 24+0 Weeks of Gestation (rcog.org.uk) • NG207: Inducing Labour • RCOG (2022) GTG no.74 Antenatal Corticosteroids to reduce neonatal morbidity and mortality – appendix 10 added. Reformatted to new Trust Standard and gender neutral pronouns added.
2.1	Oct 2022	A. Vecsei, Consultant O&G with special interest in high-risk obstetrics R. Mason, Fetal Medicine Consultant CE Team	LIVE	Updated in line with NICE NG25 Preterm Labour and Birth (June 2022) Section 7.2 amended to align with SBLCB

The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt contact a senior colleague or expert.

Contents

Preterm Birth Risk Pathway

1.0 Background

Around 8% (approximately 60,000) babies are born prematurely each year in England and Wales. Preterm birth (PTB) is defined as delivery at less than 37+0 weeks gestation. It is the most important single determinant of adverse infant outcomes with regards to survival and quality of life. Babies born preterm have high rates of early, late, and post-neonatal mortality and morbidity.

Morbidity is inversely correlated to gestational age. The most significant adverse outcomes are associated with very preterm birth, defined as occurring less than 32+0 weeks gestation. These births account for 1.4% of all deliveries in the United Kingdom, affecting 13,500 individuals every year. In 2013 in England and Wales 0.1% of live births occurred at less than 24 weeks. The infant mortality rate for these babies was 877.2 deaths per 1000 live births. Majority of these deaths (93%) occurred during the early neonatal period. BAPM has published a Framework for Practice, which has been developed by a multidisciplinary working group in the light of evidence of improving outcomes for babies born before 27 completed weeks of gestation.

The financial implications associated with preterm birth are significant. PTB is estimated to cost health services in England and Wales £3.4 billion per year. A recent economic analysis has concluded that delaying preterm birth by a single week across all gestational categories would reduce the total public sector cost of preterm birth (excluding any intervention costs) from £2.946 billion to £1.952 billion (an annual saving of £994 million).

2.0 Aims

- Improve the diagnosis and management of pregnant women and people at risk of preterm birth between 22 - 36+6 weeks of pregnancy.
- Give foundation and support for the preterm birth prevention clinics in University Hospitals Sussex (SRH&WH).
- Provide strategies to identify pregnant women and people at risk of spontaneous preterm birth (sPTB).
- Screening/preventive options for pregnant women and people at risk of sPTB.
- Management of suspected preterm labour, preterm pre-labour rupture of membranes (P-PROM), and imminent preterm birth (PTB).

3.0 Scope

This guideline applies to all medical, obstetric, and midwifery staff caring for pregnant women and people presenting with risk factors for preterm delivery and / or with signs and symptoms of preterm labour or delivery.

4.0 Responsibilities

It is the responsibility of all midwifery and medical staff to:

- Access, read, understand, and apply this guidance.
- Attend any mandatory training pertaining to this guidance.

It is the responsibility of the division to:

- Ensure the guideline is reviewed as required in line with UH Sussex (SRH&WH) and national recommendations.
- Ensure the guideline is accessible to all relevant staff.

5.0 Definition

Preterm labour is defined by the World Health Organisation (WHO) as the onset of regular uterine contractions between viability and 37/40 weeks gestation associated with cervical effacement and dilatation. Current guidelines describe a 'threshold of viability' between 22 and 26 weeks.

Preterm birth is defined as birth between 22–23 weeks to 36+6 weeks gestation.

Preterm Pre-labour Rupture of Membranes (P-PROM) is defined as rupture of membranes without labour less than 37+0 weeks gestation.

Incidence of preterm labour:

- **6.6%** - approximately **40,000** per annum in the UK
- **Mildly preterm** (32+0 – 36+6 weeks) = 5.5%
- **Moderately preterm** (28+0 – 31+6 weeks) = 0.7%
- **Extremely preterm** (24+0 – 27+6 weeks) = 0.4%

5.1 Abbreviations used within this guideline

APH - Antepartum Haemorrhage	**BV -** Bacterial Vaginosis
CRP - C-reactive protein	**CTG -** Cardiotocography
DAU - Day Assessment Unit	**DFM -** Decreased Fetal Movements
FBC - Full Blood Count	**fFN -** Fetal Fibronectin
FGR - Fetal Growth Restriction	**GBS -** Group B Streptococcus
IGFBP-1 - Insulin-like Growth Factor-binding Protein 1 (IGFBP-1)	**IUGR -** Intrauterine Growth Restriction
LLETZ - Large Loop Excision of the Transformation Zone	**LVS -** Low Vaginal Swab
MEOWS - Modified Early Obstetric Warning Score	**MSU -** Midstream Urine Sample
PAMG-1 - Placental Alpha Microglobulin-1	**PET -** Preeclampsia Toxaemia
P-PROM - Preterm Pre-labour Rupture of Membranes	**PTB -** Preterm birth
SCBU - Special Care Baby Unit	**sPTB -** Spontaneous Preterm Birth
TV USS - Trans Vaginal Ultrasound Scan	**UH Sussex -** University Hospitals Sussex

UTI - Urinary Tract Infection	**U&E's -** Urea & Electrolytes
WHO - World Health Organisation	

6.0 Risk factors for preterm birth

The following conditions are associated with PTB and therefore history and examination should be performed to identify or rule out any of these conditions:

6.1 Previous preterm birth

Previous preterm birth is the most significant risk factor. This association is modified by three risk factors:

- The number of prior preterm births.
- The gestational age at which the previous birth(s) occurred.
- The order in which the prior preterm birth(s) occurred.

For example: the risk with one previous preterm birth is 15–20%, after two preterm births is 35–40%, and with one preterm and a subsequent term birth is 10–15%.

6.2 Abnormal vaginal flora

The imbalance of microbial subpopulations seen in Bacterial Vaginosis (BV - predominance of anaerobes and deficiency of lactobacilli) is associated with an increased risk of preterm birth. Pathogenic organisms such as Neisseria Gonorrhoeae and Chlamydia trachomatis may also trigger an inappropriate inflammatory response leading to labour. Early screening and treatment (before 20 weeks) is imperative. Group B Streptococcal colonisation is normally seen in up to 25% of inner-city populations and is not an indication for antepartum treatment unless accompanied by symptomatic discharge or bacteriuria.

6.3 Urinary tract infection (UTI)

UTI including asymptomatic bacteriuria, cystitis, and pyelonephritis. Treatment as per Microguide.

6.4 Systemic bacteraemia

Both acute (e.g. pyelonephritis, appendicitis, pneumonia and dental abscesses) and chronic (cystic fibrosis) bacteraemia are associated with preterm birth. This is presumed to be either due to direct blood-borne spread of infection to the uterine cavity or indirectly due to chemical triggers such as accompanying endotoxins or cytokines.

6.5 Cervical incompetence

Cervical incompetence (due to length or strength) may arise following large loop excision of the transformation zone (LLETZ), cone biopsy, multiple dilatations of the cervix, hysteroscopic procedures where the cervix has been dilated up to or beyond Hegar 10, or in conjunction with Mullerian variants (alterations in uterine size/shape such as unicornuate or bicornuate uterus).

6.6 Uterine capacity

Conditions that increase uterine distension or interfere with uterine capacity such as polyhydramnios, multiple pregnancy or seen as a consequence of Mullerian variants.

6.7 Placentation

Antepartum haemorrhage and/or persisting extrachorionic haemorrhage due to abnormal placentation with chronic and repeated bleeding.

7.0 Identification and care of pregnant women and people at risk of preterm birth

Prevention of preterm labour involves the screening of **all** pregnant women and people to identify and initiate intervention tailored to specific risk factors.

7.1 Risk factors to be identified at booking visit

Smoking: doubles the risk of preterm birth. All pregnant women and people should be asked their smoking status at booking and throughout their pregnancy. Please see maternity Smoking Cessation guidance for further information.

Pregnant women and people who have experienced a previous preterm birth who stop smoking early in 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. Therefore, the importance of promoting smoking cessation from booking is one of the most important prevention strategies to implement.

Maternal age: young women and people (under 18 years) have an increased risk of preterm birth. Appropriate referral to the Teenage Pregnancy team should be offered to provide adequate support and advice throughout the pregnancy – this referral is organised by the ANC or community midwife when someone under 20 years of age completes an online self-referral to the hospital at the beginning of their pregnancy.

Domestic violence: Women and people experiencing domestic violence and/or other social pressures should be directly counselled and referred for specific support through local pathways. Please see Trust guidance on domestic abuse.

Vaginal infection: pathogens such as *Neisseria Gonorrhoeae* and *Chlamydia Trachomatis* are associated with PTB, and screening should be offered to at-risk pregnant women and people. The booking midwife in particular should inform each pregnant woman or person under the age of 25 years about the high prevalence of Chlamydial infection in their age group and offer screening. 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 as to its screening and treatment in at-risk women/people. 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.

7.2 Risk factors requiring referral to the Preterm Prevention Clinic

A further set of questions should be used to ascertain risk factors associated with preterm birth at this appointment to appropriately identify at-risk women and people who may benefit from preventive strategies and/or further assessment and more intensive monitoring within the hospital setting. They can be then offered risk-tailored care as outlined below:

Risk factor	Referral pathway
High Risk	
• Previous preterm birth or mid-trimester loss (16 to 34 weeks gestation). • Previous preterm pre-labour rupture of membranes. • Previous use of cervical cerclage. • Known uterine variant (i.e., unicornuate, bicornuate uterus or uterine septum). • Intrauterine adhesions (Ashermann's syndrome). • History of trachelectomy (for cervical cancer).	• Referral to Preterm Prevention Clinic by 12 weeks from Booking appointment (or as soon as possible if late booking). • All pregnant women/people to be offered transvaginal scan for cervical length every 2-4 weeks between 16-24 weeks. • Additional use of quantitative fetal fibronectin in asymptomatic women may be considered where centres have this expertise • Clinician to determine individual plan for when to be seen in Preterm Prevention Clinic.
Intermediate	
• Previous birth by caesarean section at full dilatation. • History of significant cervical excisional event i.e., LLETZ where >15mm depth removed, or >1 LLETZ procedure carried out or cone biopsy (knife or laser, typically carried out under general anaesthetic).*	• Referral to Preterm Prevention Clinic by 12 weeks from Booking appointment (or as soon as possible if late booking). • A single transvaginal scan for cervical length between 18-22 weeks (can be part of the anomaly scan). • Reassess at 24 weeks for consideration of transfer of care to low risk pathway.

* This can be found in the histopathology report, documenting the size of the tissue excised (by convention the third measurement is always the depth if otherwise not stated). If uncertain contact the gynaecology department where the procedure was done and ask for histology result. In the meanwhile, treat as it was more than 15mm.

Referrals to this clinic are organised by the ANC midwives when risk factors are identified on the booking risk assessment. If an obstetrician feels it is appropriate, they too can make a referral via the ANC midwives.

8.0 Prevention of preterm birth in high risk women and people

Transvaginal sonography may be used to assess cervical length and the anatomy of the internal os between 16 – 24 weeks. In low-risk women/people cervical length is a normally-distributed variable with a mean of 35–40mm from 14–30 weeks. The lower 10th percentile is 25mm. Cervical length is a good predictor of PTB for high risk women and people with sensitivity of 60–80% and PPV of 70% when cervical length is 25mm or less between 16 – 18 weeks. After 30 weeks of gestation the cervix progressively shortens physiologically in preparation for labour and thus it is not usual to rely on cervical length measurement at this gestation and beyond for the prediction of spontaneous preterm birth in ***asymptomatic*** women and people.

The initial consultation and base-line assessment should include:

- MSU.
- LVS.
- Chlamydia risk assessment and if necessary screening.
- Lifestyle advice.
- Identify risk factors for FGR/PET/Suboptimal placentation and start aspirin 150mg once per day orally if necessary. This should be discussed by a senior obstetrician and a letter sent to the GP to prescribe. An individualised plan for gestation to stop taking aspirin should be made and clearly communicated to the woman or person and documented.

After assessment in the Preterm Birth Prevention Clinic, based on history and/or additional screening, women and people may be offered treatment to prevent second trimester miscarriage and preterm birth.

Several interventions have been assessed for women and people at high risk of preterm birth: cervical cerclage, progesterone and pessaries. Cervical cerclage is an established procedure, progesterone* is recommended in certain situations by NICE such as preterm pre-labour rupture of membranes (P-PROM) in a previous pregnancy or a history of cervical trauma (NICE NG25 Preterm labour and birth). There are randomised trials suggesting benefit in the use of Arabin pessaries in at-risk women/people.

Based on current evidence at present we cannot determine precisely in which women/people, and in what circumstances, each intervention will be most effective. Therefore care must always be individualised, take into account the woman/person's wishes, and follow a discussion with a clinician able to discuss the potential risks and benefits of each intervention and make a shared decision on which treatment is most suitable.

The following options will usually be discussed at the Preterm Birth Prevention Clinic:

8.1 Pregnant women and people with a history of spontaneous preterm birth (up to 34+0 weeks) or late miscarriage (16+0 onwards)

- Prophylactic vaginal progesterone* or prophylactic cervical cerclage can be offered to these women if on transvaginal ultrasound carried out between 16+0 and 24+0 weeks of pregnancy they have a cervical length of 25mm or less.

8.2 Pregnant women and people with a previous failed transvaginal suture

- The circumstances of the failed suture and other clinical factors will be considered prior to placement and a Shirodkar (high vaginal) or transabdominal cerclage may be considered.
- Transabdominal placement during pregnancy needs to be undertaken prior to 14 weeks.

8.3 Pregnant women and people with no history of spontaneous preterm birth or mid-trimester loss in whom a transvaginal cervical length scan has been carried out between 16+0 – 26+0 weeks of pregnancy and the cervix is 25mm or less (or below the 5th centile)

- Care for these women and people should be individualised - counselling should include options of continued surveillance and consideration of prophylactic vaginal progesterone*.

Pregnant women and people with an intervention (cerclage, pessary or progesterone*) will usually remain under the care of the Preterm Birth Prevention Clinic until birth. If cerclage is used ensure that a plan is in place for removal of the suture.

Women and people undergoing transvaginal cervical length screening usually continue this until 22 – 24 weeks; if no intervention is recommended, women/people may be transferred to routine pathways of care. Midwifery-led care is appropriate if no other additional risk factors are identified.

* Dose of progesterone:

- 400mg Cyclogest pessaries PV before bedtime until 32-36 weeks.
- 250mg 17-Alpha-Hydroxyprogestrone Caproate IM weekly between 16 – 36 weeks gestation (currently not available in UH Sussex SRH&WH).

8.4 Quantitative fetal fibronectin

The addition of second screening tool, quantitative fetal fibronectin (fFN) can be considered. In asymptomatic women/people, this additional tool may be used from 18+0 weeks to ascertain risk of second trimester miscarriage or preterm birth in conjunction with cervical length measurement and support discussions of potential interventions with pregnant women and people. It can also be used in high risk women and people in late second/early third trimester to determine timing and preparation for preterm birth, for example, administration of steroids and magnesium sulfate. The use of quantitative fetal fibronectin should be at the discretion of the lead clinicians.

Note: fFN test can be done from 18+0 weeks onwards - NICE guidance suggests the use of cervical length measurement with TV USS if available and if the skill mix is appropriate. The fFN in this case is the second best option if cervical length scanning is not available.

Please use below tables to interpret the quantitative fFN results if the QUiPP app are not being used.

TABLE 2
Prediction of spontaneous preterm birth within 14 days

	Fetal fibronectin threshold			
Predictive variable	**10 ng/mL**	**50 ng/mL**	**200 ng/mL**	**500 ng/mL**
Sensitivity, %	82.4	76.5	58.8	35.3
Specificity, %	59.3	81.1	93.9	97.5
Negative predictive value, %	98.2	98.3	97.4	96.1
Positive predictive value, %	10.9	19.7	37.0	46.2
Likelihood ratio				
Plus	2.02	4.04	9.69	14.12
Minus	0.30	0.29	0.44	0.66
Receiver operator characteristic curve area	0.71	0.79	0.76	0.66
Relative risk (relative to fetal fibronectin 0-9 ng/mL)	0.9	4.3	16.1[a]	26[a]

[a] χ^2 test, $P < .01$.

Abbott. Quantification of fFN in prediction of sPTB. Am J Obstet Gynecol 2013.

TABLE 3
Prediction of spontaneous preterm birth at <34 weeks' gestation

	Fetal fibronectin threshold			
Predictive variable	**10 ng/mL**	**50 ng/mL**	**200 ng/mL**	**500 ng/mL**
Sensitivity, %	90.0	70.0	55.0	45.0
Specificity, %	64.0	85.7	96.7	98.6
Negative predictive value, %	98.5	96.8	95.8	95.0
Positive predictive value, %	19.4	31.8	61.1	75.0
Likelihood ratio				
Plus	2.52	4.90	16.5	31.5
Minus	0.16	0.35	0.47	0.56
Receiver operator characteristic curve area	0.77	0.78	0.76	0.72
Relative risk (relative to fetal fibronectin 0-9 ng/mL)	5.6[a]	7.9[b]	22.8[b]	51.3[b]

χ^2 test.

[a] $P < .05$; [b] $P < .001$.

Abbott. Quantification of fFN in prediction of sPTB. Am J Obstet Gynecol 2013.

A **negative** result has a negative predictive value of **98.3%** for birth within 14 days and **96.8% for birth before 34 weeks**.

8.4.1 Considerations before performing the test

- The test may not be accurate if the patient has had sexual intercourse, digital vaginal examination or a speculum vaginal examination using lubrication other than plain water within the last 24 hours. In these circumstances consider taking the swab and discussing with the consultant if analysis of the swab might be useful.
- Any patient with moderate or gross vaginal bleeding should not be tested. Any patient with history or clinical signs of watery discharge should be tested for ruptured membranes and amniotic fluid leakage should be excluded prior to a fFN test.
- Any patient with history or clinical signs of watery discharge should be tested for ruptured membranes and amniotic fluid leakage. If there are clinical or biochemical signs of ruptured membranes, then do not do fFN test, but follow section 15.0 Preterm pre-labour rupture of membranes.
- Any patient presenting with a “show” or light bleeding can have the test performed. The risk is that more tests will be falsely positive but a negative test is still valid.

8.4.2 The equipment

- All the specific equipment required for performing a fetal fibronectin test is kept in the delivery suite.
- The fFN testing machine and the printer must always be kept plugged in and switched on. Daily quality control must be performed on the machine and recorded in the results diary.
- When a new supply of cassettes arrives the machine is recalibrated and retested.

8.4.3 Taking the swab

- The test is performed by use of swab to collect samples of cervico-vaginal secretions during a speculum examination. The correct polyester swab, kept next to the testing machine, must be used. No other swab can be used to take the test.
- Care must be taken not to contaminate cervico-vaginal fluid with topical agents such as lubricants, soap, disinfectants or creams. Water will be used as a lubricant for a speculum examination.
- Rotate the correct sterile swab across the posterior fornix of vagina for 10 seconds.
- Remove the swab and immerse the tip in the buffer solution.
- Mix the swab in the buffer solution for 10-15 seconds.
- Leave the swab in the tube; break the swab by snapping at the score, in line with the top of the tube.
- Align the shaft with the hole inside the tube cap and push down tightly over the shaft, sealing the tube for transfer to the analyser (Warning – the shaft must be aligned to stop leakage).
- Take the tube and the patient’s hospital number to the treatment room.

8.4.4 Performing the analysis

- Insert the rapid fFN cassette into the analyser and follow the on screen instructions to run the test.
- Enter your user ID (any combination of numbers and letters). Please write your user ID in the back of the diary next to the machine so that there is a record of who is who.
- When asked to enter the patient ID use the Patient's hospital number.
- Pipette 200µL (0.2ml) sample into the well of the rapid fFN cassette using a 1 ml syringe.
- Keep the tube, labelled, in the box next to the machine in case you have to repeat the test.
- Wait for the analyser to run the test.
- A print out of the results will be available in 23 minutes.
- Press enter to get a second print out.
- One result label should be placed in the patient's notes.
- The second result label is put into the diary next to the machine. Sign the page next to your result.

8.4.5 Interpreting the results

Note: a negative fFn is not helpful if there is cervical dilatation present. The patient should then be treated as being in preterm labour. Clinical judgement must always be a part of the assessment – in the presence of a negative test where there is still a high index of suspicion; the case should be discussed with the consultant on call.

- A negative result has a negative predictive value of 98.3% for birth within 14 days and 96.8% for delivery before 34 weeks.
- If the result is negative the consultant or middle grade will decide the management of the case. This may include discharge home unless other obstetric indications require admission.
- All pregnant women and people with a negative test will be given education on the signs and symptoms of preterm labour and reassured that they can come back at any time.
- Once a positive test has been confirmed on a pregnant woman or person who has signs and symptoms of preterm labour the management will be in accordance with section 9.0 Diagnosis of preterm labour and section 16.0 Preterm labour management.
- Special Care Baby Unit will be notified of admission. If there are no cots available it may be necessary to arrange intra-uterine transfer.
- Positive test patient should have steroids administered see section 12.0 Corticosteroid prophylaxis.
- The use of tocolysis should be considered in line with section 13.0 Tocolysis.
- If the woman or person has not birthed within 7 days, a plan of care will be decided by the obstetric consultant/obstetric team.

8.4.6 The QUiPP App

The use of the QUiPP app (for iOS or Android) or the browser based version at https://quipp.org/ can be also considered in connection with the fFN test to interpret results and therefore to predict the risk of preterm labour, plan care, and avoid unnecessary intervention in asymptomatic, but at-risk women/people. A risk of greater than 5% of giving birth within 7 days may be used as a threshold for further care for symptomatic women/people.

9.0 Diagnosis of preterm labour

Explain to pregnant women and people reporting symptoms of preterm labour who have intact membranes (and their family members or carers as appropriate):

- The clinical assessment and diagnostic tests that are available.
- The clinical assessment and how diagnostic tests are carried out.
- What the benefits, risks and possible consequences of the clinical assessment and diagnostic tests are, including the consequences of false positive and false negative test results taking into account gestational age.

The diagnosis of preterm labour should be made based on the following examinations:

Regular contractions:

- Regular contractions >= 6 / 60 minutes, palpable or visible on CTG.
- Offer a clinical assessment to women/people reporting symptoms of preterm labour who have intact membranes (Appendix 2).This should include:
  - Clinical history taking.
  - Observations described for the initial assessment of a woman or person in labour in the CG1196 Care in labour guideline.
  - A speculum examination by the Obstetric Registrar or Consultant (followed by a digital vaginal examination if the extent of cervical dilatation cannot be assessed).
- If the clinical assessment suggests that the pregnant woman or person is in suspected preterm labour and she is 29+6 weeks pregnant or less – advise treatment for preterm labour. (Appendix 2)
- If the clinical assessment suggests that the pregnant woman or person is in suspected preterm labour and they are 30+0 weeks pregnant or more, consider transvaginal ultrasound measurement of cervical length or if it is not acceptable or not available, then fetal Fibronectin testing (fFN) as a diagnostic test to determine likelihood of birth within 48 hours. Act on the results as follows:
  - If cervical length is more than 15 mm or the fFN test is negative (50ng/ml or less), explain to the pregnant woman or person that it is unlikely that they are in preterm labour and:
    - Think about alternative diagnoses.

  - Discuss with them the benefits and risks of going home compared with continued monitoring and treatment in hospital.
  - Advise them that if they do decide to go home, they should return if symptoms suggestive of preterm labour persist or recur.

- If cervical length is 15 mm or less or the fFN test is positive (more than 50ng/ml), view the pregnant woman or person as being in diagnosed preterm labour and offer treatment.

- If a pregnant woman or person in suspected preterm labour who is 30+0 weeks pregnant or more does not have transvaginal ultrasound measurement of cervical length or fetal Fibronectin testing to exclude preterm labour, offer treatment consistent with them being in diagnosed preterm labour.

Considerations:

- Do not use transvaginal ultrasound measurement of cervical length and fetal Fibronectin testing in combination to diagnose preterm labour.
- Ultrasound scans should be performed by healthcare professionals with training, and experience of, transvaginal ultrasound measurement of cervical length.

Cervical changes:

- Cervical effacement, shortening or opening os on speculum +/- internal examination.
- If internal examination is considered then it should be carried out by experienced examiner (SpR or Consultant) to avoid uncertainty and therefore repeat examination.

Fetal Fibronectin Test:

- See section 8.4 Quantitative fetal fibronectin
- A negative result has a negative predictive value of 98.3% for birth within 7 – 14 days and 96.8% for delivery before 34 weeks.
- If fetal Fibronectin test is negative, consider cervical length scan. This should involve consultation with obstetric Consultant.

10.0 Emergency cervical cerclage

Do not offer emergency cervical cerclage to pregnant women and people with:

- Signs of infection.
- Active vaginal bleeding.
- Uterine contractions.

If emergency cervical cerclage is used ensure there is a documented plan in place for removal.

Consider emergency cervical cerclage for pregnant women and people between 16+0 and 27+6 weeks of pregnancy with a dilated cervix and exposed, unruptured fetal membranes:

- Take into account gestational age (being aware that the benefits are likely to be greater for earlier gestations) and the extent of cervical dilatation.
- Discuss with a consultant obstetrician and consultant paediatrician.

Explain to pregnant women and people for whom emergency cervical cerclage is being considered (and their family members or carers as appropriate):

- Risks of the procedure.
- That it aims to delay the birth, and so increase the likelihood of the baby surviving and of reducing serious neonatal morbidity.

11.0 Counselling the family

- The following points should be covered when counselling a pregnant woman or person and their family:
  - The neonatal care of preterm babies, including location of care.
  - The immediate problems that can arise when a baby is born preterm.
  - The possible long-term consequences of prematurity for the baby (how premature babies grow and develop).
  - Ongoing opportunities to talk about and state their wishes about resuscitation of the baby.
  - An opportunity to see the neonatal unit.
  - An opportunity to speak to a neonatologist or paediatrician.
- When counselling pregnant women and people and families regarding morbidity and mortality an experienced Paediatrician should be involved beyond 23 weeks gestation and appropriate information should be given.
- In situations where there is uncertainty about the gestation between 22-23/40; and the parents are requesting neonatal resuscitation, the Consultant Obstetrician should discuss the case with the on-call Paediatric Consultant and formulate a plan of care (see UH Sussex SRH&WH leaflet "Having an Extremely Premature Baby'').
- The following table (from EPICure 2; 2006-2011) describes the overall outcome from different stages in the pregnancy and birth process from the start of labour or delivery through birth to admission for neonatal care. In different hospitals survival may vary from the figures shown but the chances of a normal outcome are likely to be very similar.

Gestational Age at Birth Population	22 weeks	23 weeks	24 weeks	25 weeks	26 weeks
Alive at the onset of labour	272	416	495	550	594
Live birth	152	339	443	521	580
Live birth with intended care *	41	284	427	514	576
Admission for neonatal care deaths in neonatal care deaths after discharge home	19 16 0	217 151 3	382 204 1	498 152 5	571 123 1

Survivors to 3 years of age survivors with severe disability survivors with moderate disability survivors without disability	3 1 1 1	63 17 14 32	177 37 33 107	341 57 48 236	447 45 54 348
Survival from onset of labour	1%	15%	36%	62%	75%
of live births with intended care * of admissions for neonatal care	7% 16%	22% 29%	42% 46%	66% 69%	78% 78%
Survival without disability from onset of labour of live births with intended care * of admissions for neonatal care	0.4% 2% 5%	8% 11% 14%	22% 25% 28%	43% 46% 47%	59% 60% 61%

Key: * excluding those where a decision was recorded not to intervene after birth.

12.0 Corticosteroid prophylaxis

- An informed discussion should take place with the pregnant woman or person (and their family members or carers as appropriate) about the potential risks and benefits of a course of antenatal corticosteroids. Although antenatal corticosteroids may reduce admission to the Special Care Baby Unit (SCBU) or Neonatal Unit (NNU) for respiratory morbidity, it is uncertain if there is any reduction in RDS, transient tachypnoea of the newborn (TTN) or SCBU/NNU admission overall, and antenatal corticosteroids may result in harm to the neonate which includes hypoglycaemia and potential developmental delay (see Appendix 6). RCOG (2022)

- One course of antenatal Corticosteroids should be offered to all pregnant women or people in suspected or established preterm labour, are having a planned preterm birth or have P-PROM up to 34+6 weeks gestation:
  - 22+0 – 23+6 weeks – discuss with the pregnant woman or person in the context of their individual circumstances.
  - 24+0 – 33+6 weeks – offer corticosteroids.
  - 34+0 – 35+6 weeks – consider corticosteroids.
  - Up to 38+6 weeks if there is an increased risk of requiring delivery by caesarean birth in early labour (e.g. FGR, poor placental development, polyhydramnios, etc.) – consider corticosteroids.

- Antenatal Corticosteroids should be offered to pregnant women and people for whom an elective caesarean birth is planned under 39 weeks gestation.
- Consider a single repeat course of maternal or birthing parent corticosteroids for pregnant women and people less than 24+0 weeks of pregnancy, but take into account:
  - Have they already had a course of corticosteroids more than 7 days ago **and**
  - Are they at very high risk of giving birth in the next 48 hours.
- Do not give more than 2 courses of maternal or birthing parent corticosteroids for preterm birth.

Regime for corticosteroid prophylaxis:

- **In-patients/outpatients (except diabetic patients – see below):**
  Two doses of Dexamethasone sodium phosphate 12mg IM 24 hours apart.

- **If preterm delivery is expected within 24 hours then give:**
  Two doses of Dexamethasone sodium phosphate 12mg 12 hours apart.

Diabetic women/people (outpatients on insulin treatment or on diet) (refer to Diabetes in Pregnancy guideline)

- Should be admitted to labour ward or the antenatal ward and have 2 hourly blood glucose monitoring.
- For intravenous sliding scale protocol refer to Diabetes in Pregnancy guideline.
- The pregnant woman or person should remain in hospital for monitoring until 24 hours after the last corticosteroid dose.
- In certain well controlled diabetic patients, corticosteroid administration may be organised as outpatient. This decision is to be made by pregnancy diabetes team only.

Corticosteroid prophylaxis for diabetic in-patients (refer to Diabetes in Pregnancy guideline)

- Four doses of Dexamethasone sodium phosphate 6mg IM 12 hours apart

OR if Dexamethasone is not available:

- Four doses of Betamethasone sodium phosphate 6 mg IM 12 hours apart.

13.0 Tocolysis

Treatment of preterm labour aims to reduce the high perinatal morbidity and mortality rates associated with early delivery. Tocolytic drugs aim to suppress uterine contractions and prolong the duration of pregnancy. There is no clear evidence that tocolytic drugs improve outcome and therefore it is reasonable not to use them. However tocolysis should be considered if the few days gained would be put to good use such as completing a course of corticosteroids. Therefore as soon as the diagnosis of preterm labour has been made and the mother/birthing parent has not had corticosteroid prophylaxis since 26 weeks gestation the tocolysis should be commenced unless contraindicated.

Take the following factors into account when making a decision about whether to start tocolysis:

- Whether the pregnant woman or person is in suspected or diagnosed preterm labour.
- Other clinical features (for example, bleeding or infection) which may suggest that stopping labour is contraindicated.
- Gestational age at presentation.
- Likely benefit of maternal corticosteroids.
- Availability of neonatal care or need for transfer to another unit.
- The preference of the pregnant woman or person.

For pregnant women and people who have intact membranes and are in suspected preterm labour:

- Consider tocolysis between 24+0 and 25+6 weeks.
- Offer tocolysis between 26+0 and 33+6 weeks.

The first choice of tocolysis is Nifedipine. The advised dose for Nifedipine is:

- Nifedipine capsules swallowed **orally** (use capsules for loading and maintenance doses).
- **Loading dose:** 20mg orally, followed by 10mgs every 15 minutes until good tocolysis achieved to a maximum of 4 additional doses (maximum total loading dose of 60mgs).
- **Maintenance dose:** 10-20mgs (capsules) three to four times daily, adjusted according to uterine activity, for up to 48 hours after the first dose of corticosteroid. Maximum maintenance dose 60mgs daily.

Note: Pharmaceutical advice was sought regarding the optimum preparation of Nifedipine to be used for the maintenance dose. The advice was that a quick acting dose enables adjustment according to the contractions (RCOG 2011 recommendation); there is no difference otherwise between using quick acting vs. modified release for short term use.

Contraindications to tocolysis:

- Gestational age more than 33+6 weeks.
- Ruptured membranes.
- Cervix more than 4cm dilated.
- Signs/symptoms of chorioamnionitis.
- Abnormal CTG.
- IUGR.
- Placental abruption.
- Significant antepartum haemorrhage.
- Severe hypertension, pre-eclampsia or eclampsia.
- Intrauterine fetal death.
- Serious maternal cardiac or thyroid disease or other serious medical condition.
- Fetal anomaly not compatible with survival.

Contraindications to Nifedipine:

- Cardiac conducting defects.
- Hypotension.
- Left ventricular failure.
- Hepatic and renal failure are relative contraindications.

Cautions:

- Pregnant women and people taking medicines that may interact with Nifedipine.
- Avoid grapefruit segments and juice during Nifedipine treatment.

- Tocolysis, in particular Nifedipine, may compromise cardiac function. In these cases oxytocin receptor agonist is the preferred tocolytic (currently not in use in UH Sussex SRH&WH).
- Do not offer betamimetics for tocolysis.

Note: Nifedipine is not licensed to use as a tocolytic drug in the UK. The patient should be informed regarding this and advised that according to the RCOG recommendation it is safe to use in pregnancy and effective in prolonging the pregnancy and therefore reducing fetal morbidity.

Nifedipine side effects:

Minor side effects (1- 10% of cases) include hot flushes, nausea and vomiting, headaches and fever. As well as a maternal/birthing parent and fetal tachycardia, the diastolic blood pressure often falls.

Stop tocolytic therapy if:

- Maternal or birthing parent tachycardia (greater than 140 bpm).
- Complicated CTG or fetal tachycardia > 180 bpm.
- Maternal or cirthing parent palpitations or chest pain.
- Labour progresses despite therapy.
- Maternal or birthing parent pyrexia.
- Vaginal bleeding.
- Hypokalaemia (low potassium, Nifedipine may worsen the hypokalaemia)
  24 hours after last dose of corticosteroids.

Observations whilst receiving tocolysis:

- Maternal or birthing parent pulse – at least every 30 minutes.
- Blood pressure – initially every 30 minutes.
- Recording of temperature 4 hourly.
- Fluid balance chart.
- Continuous CTG (26+0 weeks gestation or over) or intermittent auscultation (less than 26+0 weeks gestation).
- Warn patient of expected side effects of tocolysis.
- Nurse in left-lateral position.

Speculum +/- Vaginal examination must be performed prior to transfer from Labour Ward.

14.0 Magnesium Sulfate

Introduction:

Babies born preterm are at increased risk of cerebral palsy with 25% of all cases occurring in children born before at less than 34 weeks gestation. Recent evidence suggests that the administration of Magnesium Sulfate to mothers or birthing parents in preterm labour reduces the incidence of cerebral palsy in their children. Before 30 weeks gestation it is

estimated that 46 women/people would need treatment to prevent one case of cerebral palsy. Unlike steroids this protective effect occurs within a short time of the administration of Magnesium Sulfate so magnesium can be administered later in the process when it is clearer that the mother or birthing parent is in progressing labour.

Who and when to treat (Appendix 3)

When preterm birth is planned or expected within 24 hours, Magnesium Sulfate for neuroprotection should be:

- 23+0 – 23+6 weeks - Discussed with the pregnant woman or person (and their family members or carers as appropriate) in the context of their individual circumstances.
- 24+0 – 29+6 weeks – Offered.
- 30+0 – 33+6 weeks – Considered.

Ideally Magnesium Sulfate should be administered at least four hours before birth but it is still likely to confer benefit if given later than this.

Urgent birth should not be delayed to administer Magnesium Sulfate.

Cautions:

- Magnesium Sulfate may interact with Nifedipine causing hypotension. If so, both the Nifedipine and the Magnesium infusion should be discontinued and both an obstetric and anaesthetic review undertaken.
- It may also cause muscle weakness in individuals with neuromuscular disorders.
- Because of the small risk of respiratory suppression Magnesium Sulfate should not be used during transfer between hospitals unless resuscitation and ventilatory support are immediately available.
- Use with caution with Hepatic impairment e.g. hepatic coma (not known to be harmful for short term IV administration in eclampsia).
- Excessive doses in third trimester can cause respiratory depression.

Adverse effects include:

- Nausea / vomiting.
- Thirst.
- Hypotension.
- Flushing.
- Respiratory depression.
- Loss of tendon reflexes.
- Muscle weakness.

14.1 Loading dose:

The dosage and administration rate is the same as for mothers or birthing parents with pre-eclampsia, with less frequent observations of blood pressure. For mothers or birthing parents

with pre-eclampsia the observations should be consistent with the UH Sussex SRH&WH guideline: CG1112 Management of severe pre-eclampsia & eclampsia.

- Magnesium Sulfate should be given intravenously with a 4 gram loading dose (slowly over 15 minutes).
- For the 4g Magnesium Sulfate loading dose use a 4g in 20ml prefilled syringe and run at 80ml per hour.

If the pre-filled syringe is unavailable, prepare the loading dose as follows:

- Draw up 4 X 10mls (1 gram (g) in 10mls) Magnesium Sulfate, giving 4 grams in 40mls.
- Administer at 160mls per hour via a syringe pump or by hand by an experienced clinician (over 15 minutes).

Maternal or birthing parent observations pre and post loading dose:

- Before loading dose check pulse, blood pressure, and respiratory rate and patella reflexes.
- Repeat at 10mins and at end of loading dose (15 minutes).

14.2 Maintenance dose:

- Following the loading dose use a Magnesium Sulfate maintenance infusion. Use a 5g in 50ml pre-filled syringe and run at 10ml (1g) per hour.

If the pre-filled syringe is unavailable, prepare the maintenance infusion as follows:

- Draw up 5 X 10mls (1 g in 10mls) Magnesium Sulfate, giving 5 grams in 50mls.
- Administer at 10mls per hour via syringe pump (rate 1g per hour).

Continue the infusion until birth or for 24 hours, whichever comes first.

Maternal or birthing parent observations and management whilst on maintenance dose:

- As a minimum record pulse, blood pressure, respiratory rate, PaO2 and deep tendon (for example, patellar) reflexes every 4 hours, unless more frequent observations are indicated by the clinical situation for instance premature labour or severe pre-eclampsia requiring urgent delivery.
- Maintain MEOWS and fluid balance.
- During administration pregnant women and people should be regularly assessed. Resuscitation and ventilatory support should be immediately available.
- Where hypotension or respiratory depression occur, prompt medical review is recommended and the infusion may need to be stopped.
- Repeat electrolytes and creatinine every 12 hours if any concern about maternal/birthing parent renal function.

The infusion should be stopped if:

- Respiratory rate decreases more than 4 breaths per minute below baseline, or is less than 12 breaths per minute. (If respiratory rate less than 12 but SpO2 remains normal and reflexes present this is unlikely to be caused by magnesium toxicity and more likely to be related to opioid analgesia).
- Diastolic blood pressure decreases more than 15 mm Hg below baseline level.
- Urine output is less than 100 ml over 4 hours.

Fetal monitoring and considerations:

- Alert Neonatal Team.
- Continuous CTG should be carried out, if appropriate, and the mother or birthing parent is in premature labour see section 16.3 for further guidance on the use of CTGs.
- Interpretation of the CTG should take into account the reduced variability that is often seen with magnesium infusions.
- If preparing for elective caesarean section, CTG should be carried out if there are clinical indications which would increase the risk of CTG abnormalities, such as severe pre-eclampsia or growth restriction.

Repeat doses:

In the event that birth has not occurred after giving Magnesium Sulfate for neuroprotection of the infant, and preterm birth (less than 30 weeks' gestation) again appears imminent (planned or definitely expected within 24 hours), a repeat loading dose of Magnesium Sulfate may be considered if more than six hours after completing the previous infusion. There is no guidance on how many repeat doses can be given before 30 weeks and if repeated infusions are considered this should be decided by the supervising team at the time.

Magnesium levels:

There is no need to measure magnesium levels routinely. If magnesium toxicity is suspected then it is reasonable to check reflexes. Therapeutic magnesium levels are thought to be in the range of 1.25 - 2.5 mmol/L. The abolition of knee jerk reflex occurs at 3.3 - 5mmol/L, respiratory arrest at 5 - 7.5 mmol/L and cardiac arrest at 15mmol/L.

Indications for measuring magnesium levels include:

- Reduced renal function (urine output less than 25mls/hour, creatinine above 90).
- Signs of toxicity (loss of reflexes).
- Unexplained clinical symptoms or signs e.g. reduced level of consciousness.

If a pregnant woman or person has or develops oliguria or other evidence of renal failure monitor more frequently for magnesium toxicity and reduce or stop the dose of magnesium sulfate.

Toxicity:

Magnesium toxicity is unlikely with the regimens recommended in these guidelines and serum magnesium concentrations do not need to be routinely measured (RCOG 2006). In women/people with renal compromise, serum magnesium monitoring is recommended.

Magnesium antidote:

If loss of deep tendon reflexes and/or respiratory depression is observed, call obstetric and anaesthetic registrar and:

- Administer 1g of Calcium Gluconate intravenously (10 ml of Calcium Gluconate 10% solution) over 5-10 minutes.
- Rate should not exceed 2ml/min of undiluted solution.
- Check magnesium levels and stop magnesium infusion.

15.0 Preterm Prelabour Rupture of Membranes (P-PROM)

Identifying infection in women/people with P-PROM:

Use a combination of clinical assessment and tests (C-reactive protein, white blood cell count and measurement of fetal heart rate using cardiotocography) to diagnose intrauterine infection in pregnant women or people with P-PROM. See Appendix 1**.**

Do not use any one of the following in isolation to confirm or exclude intrauterine infection in women/people with P-PROM:

- A single test of C-reactive protein.
- White blood cell count.
- Measurement of fetal heart rate using cardiotocography.

If the results of the clinical assessment or any of the tests are not consistent with each other, continue to observe the pregnant woman or person and consider repeating the tests.

If, on speculum examination, no amniotic fluid is observed, clinicians should consider performing an insulin-like growth factor-binding protein 1 (IGFBP-1) (Actim PROM Test) or placental alpha microglobulin-1 (PAMG-1) test of vaginal fluid to guide further management.

If the results of the insulin-like growth factor-binding protein-1 or placental alpha-microglobulin 1 test are negative and no amniotic fluid is observed, antenatal prophylactic antibiotics should not be offered. It should be explained to the pregnant woman or person that it is unlikely they have P-PROM, but that they should return for reassessment if there are any further symptoms suggestive of P-PROM or preterm labour.

Actim PROM for P-PROM should not be used if labour becomes established in a pregnant woman or person reporting symptoms suggestive of P-PROM.

P-PROM less than 37+0 weeks:

- Offer admission for 24-48 hours.
- Take FBC, CRP, HVS (to rule out GBS).
- 4 hourly maternal or birthing parent observations.
- CTG twice daily.
- Ultrasound scan to check growth and amniotic fluid level as inpatient.
- Administer oral Erythromycin 250mg 4 times a day for a maximum of 10 days or until established labour (whichever is sooner). If the patient is allergic to Erythromycin then use oral Penicillin and discuss dosing or other alternatives with on-call consultant microbiologist.
- Give IV Benzylpenicillin* in labour (3g loading dose, then 1.5g 4 hourly until birth). * If the patient had non-IgE mediated allergy to penicillin (e.g. rash), then use I.V. cefuroxime 1.5g STAT followed by 750mg every eight hours. In case of history of severe allergic reaction (IgE mediated / anaphylaxis) to pencilling then use vancomycin 1g STAT followed by 1g every twelve hours.
- Ensure named Consultant aware of clinical situation.

Outpatient monitoring:

- CTG 1-2 times / week in DAU (frequency depends on clinical situation).
- Weekly full blood count (FBC) and C-reactive protein (CRP).
- Weekly LVS (low vaginal swab).
- 4-8 hourly temperature (self-monitoring).
- Monitor for abdominal pain, flu like symptoms and offensive vaginal discharge.
- Scan for fetal or maternal or birthing parental reasons only (e.g. IUGR, oligohydramnios on initial scan, DFM).

Pregnant women or people should be advised to contact DAU / Maternity Triage / Labour Ward if they feel unwell, shivering, pyrexic, the draining liquor is no longer clear, or they experience contractions.

If any signs of chorioamnionitis:

- Admission to maternity ward.
- Give broad spectrum antibiotics.
- Discuss with Consultant as soon as possible re: **urgent** birth.

Pregnant women or people with Penicillin allergy:

Women or people who are allergic to Penicillin should be given Cefuroxime 1.5g loading dose followed by 750mg every 8 hours providing the allergy is not severe (e.g. vomiting).

If the allergy to Penicillin is severe (e.g. anaphylaxis, angioedema, respiratory distress or urticaria) then IV Vancomycin 1g every 12 hours should be given instead until delivery.

Induction of labour:

Pregnant women or people whose pregnancy is complicated by PPROM after 24+0 weeks' gestation and who have no contraindications to continuing the pregnancy, should be offered expectant management until 37+0 weeks; timing of birth should be discussed with each woman or person on an individual basis with careful consideration of patient preference and ongoing clinical assessment.

If a pregnant woman or person has preterm prelabour rupture of membranes (PPROM) after 34+0 weeks, but before 37+0 weeks, discuss the options of expectant management until 37+0 weeks or induction of labour with them. When making a shared decision, take into consideration the following factors:

- Risks to the pregnant woman or person (for example, sepsis, possible need for caesarean birth).
- Risks to the baby (for example, sepsis, problems relating to preterm birth).
- Local availability of neonatal intensive care facilities.
- The woman or person's individual circumstances and their preferences.

If a woman or person has preterm prelabour rupture of membranes (PPROM) after 34+0 weeks (but before 37+0 weeks), and has had a positive group B streptococcus (GBS) test at any time in their current pregnancy, offer immediate induction of labour or caesarean birth.

16.0 Preterm labour management

(Appendix 2)

16.1 Main considerations:

- All suspected preterm labourers (under 37+0 weeks) should be admitted directly to Labour Ward.
- Prophylactic antibiotics should be given to established preterm labour irrespective of GBS status. See CG11100 Management of pregnant women/people and neonates with risk factors for early on-set neonatal sepsis.
- Inform Obstetric Registrar, Paediatric Registrar and Special Care Baby Unit (SCBU) of gestation and ascertain management plan and the availability of SCBU cots.
- Consultant Obstetrician needs to be informed less than 34+0 weeks gestation and all preterm breech deliveries.
- Paediatric Registrar needs to be available at the birth especially those of earlier gestations.
- Consultant Paediatrician must be routinely called for deliveries less than 29+0 weeks gestation.
- If there is strong suspicion of preterm labour (under 35+0 weeks) the pregnant woman or person should be reviewed and examined by the Obstetric Registrar or Consultant.
- All premature breech labours must be discussed with the Obstetric Registrar and Consultant on-call.
- Elective method and timing less than 35+0 weeks should always be discussed with Consultant Obstetrician together with anaesthetic and paediatric colleagues.

- Delivery by caesarean birth of baby less than 34+0 weeks should be performed or supervised by Consultant Obstetrician.

16.2 Management:

- High vaginal and cervical swabs required in each case and urine for microscopy and culture.
- Take bloods for FBC, CRP, U&E's, Kleihauer if blood group is Rh-negative.
- Temperature on admission and 4 hourly thereafter.
- If the cervix is more than 4cm dilated, allow to deliver, unless time required for transfer or steroids, then consider tocolysis.
- Any evidence of infection / chorioamnionitis should be treated with antibiotics (Cefuroxime 1.5g IV TDS or Clindamycin 900mg IV TDS).
- Avoid Co-Amoxiclav (Augmentin).
- Avoid Pethidine.

16.3 Fetal monitoring

Cardiotocography and intermittent auscultation:

Discuss with pregnant women or people in suspected, diagnosed or established preterm labour (and their family members or carers as appropriate):

- The purpose of fetal monitoring and what it involves.
- The clinical decisions it informs at different gestational ages.
- If appropriate, the option not to monitor the fetal heart rate (for example, at the threshold of viability).
- Explain the different fetal monitoring options to the woman or person including:
  - There is limited evidence about the usefulness of specific features to suggest hypoxia or acidosis in preterm babies.
  - The available evidence is broadly consistent with that for babies born at term a normal cardiotocography trace is reassuring and indicates that the baby is coping well with labour, but an abnormal trace does not necessarily indicate that fetal hypoxia or acidosis is present.
- Offer women or people in established preterm labour but with no other risk factors a choice of fetal heart rate monitoring using either cardiotocography using external ultrasound or intermittent auscultation.
- Explain to the woman or person (and their family members or carers as appropriate) that there is an absence of evidence that using cardiotocography improves the outcomes of preterm labour for the woman or person, or the baby, compared with intermittent auscultation.

Involve senior obstetrician in discussion about whether and how to monitor between 23+0 and 25+6 weeks pregnant.

Fetal scalp electrode:

Do not use a fetal scalp electrode for fetal heart rate monitoring if the pregnant woman or person is less than 34+0 weeks pregnant unless all of the following apply:

- It is not possible to monitor the fetal heart rate using either external cardiotocography or intermittent auscultation.
- It has been discussed with a senior obstetrician.
- The benefits are likely to outweigh the potential risks.
- The alternatives (immediate birth, intermittent ultrasound and no monitoring) have been discussed with the woman or person and are unacceptable to them.

Discuss the possible use of a fetal scalp electrode between 34+0 and 36+6 weeks of pregnancy if it is not possible to monitor the fetal heart rate using either external cardiotocography or intermittent auscultation.

Fetal blood sampling:

- Do not carry out fetal blood sampling if the pregnant woman or person is less than 34+0 weeks pregnant.
- Discuss with the pregnant woman or person the possible use of fetal blood sampling between 34+0 and 36+6 weeks of pregnancy if the benefits are likely to outweigh the potential risks.
- When offering fetal blood sampling, discuss this with the pregnant woman or person, and advise them that if a blood sample cannot be obtained a caesarean birth is likely.

17.0 Management of preterm birth

General considerations:

- Inform Obstetric and Paediatric teams.
- Paediatrician present (under 35+0 weeks).
- Avoid ARM, unless strongly indicated.
- Avoid narcotic drugs (discuss with Paediatrician).
- Episiotomy is indicated if there is delay due to the head pushing against a tight perineum.
- Avoid vacuum extractions.
- Ensure resuscitaire is checked and on pre-warm.
- Plastic bag for baby should be used if less than 30+0 weeks.
- Adequate room temperature (26^{o}C).
- Resuscitaire with O_2/air blender set to 21% O_2.
- Neonatal resuscitation/stabilisation trolley present and equipment checked including PEEP circuit, transwarmer and O2 saturation monitor).

18.0 Mode of birth

18.1 Counselling for vaginal birth versus caesarean birth

- Explain to pregnant women or people in suspected, diagnosed or established preterm labour and women with P-PROM about the benefits and risks of caesarean birth that are specific to gestational age. In particular, highlight the difficulties associated with performing a caesarean birth for a preterm birth, especially the increased likelihood of a vertical uterine (classical) incision and the implications of this for future pregnancies.
- The type of caesarean section is important, as at less than 26+0 weeks gestation the lower uterine segment is not formed. The classical vertical incisions carry greater risks for the mother and have implications for future pregnancies. When the lower segment is not completely formed a lower segment incision with a possible “J” extension on the side of the surgeon is a good alternative.
- Discuss the general benefits and risks of caesarean section and vaginal birth with pregnant women or people in suspected, diagnosed or established preterm labour and women or people with P-PROM (and their family members or carers as appropriate).
- Explain to pregnant women or people 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 very limited.

18.2 Breech presentation

- The mode of delivery should be individualised based on the stage of labour, type of breech presentation, fetal wellbeing and availability of an operator skilled in vaginal breech delivery.
- Pregnant women and people should be informed that caesarean section for breech presentation in spontaneous preterm labour at the threshold of viability (22–25+6 weeks of gestation) is not routinely recommended.
- Consider caesarean section for pregnant women and people presenting in suspected, diagnosed or established preterm labour between 26+0 and 36+6 weeks of pregnancy with breech presentation.
- The mode of delivery of the preterm breech presentation should be discussed on an individual basis with a pregnant woman or person and their partner. Where there is head entrapment during a preterm breech delivery, lateral incisions of the cervix should be considered.

22–25+6 weeks:

- Pregnant women and people should be informed that caesarean section for breech presentation in spontaneous preterm labour is not routinely recommended at this gestation.
- External Cephalic Version (ECV) or internal version can be used occasionally in these situations. This decision should be made by a Consultant Obstetrician.

26+0 and 36+6 weeks:

- Pregnant women and people should be informed that planned caesarean section is recommended for preterm breech presentation where the birth is planned due to maternal and/or fetal compromise.
- The mode of birth should be individualised based on the stage of labour, type of breech presentation, fetal wellbeing and availability of an operator skilled in vaginal breech birth.
- The mode of birth of the preterm breech presentation should be discussed on an individual basis with a pregnant woman or person and their partner.

18.3 Timing of cord clamping

- Wait at least 60 seconds before clamping the cord of preterm babies unless there are specific maternal (or birthing parent) or fetal conditions that need earlier clamping.
- Babies at risk of resuscitation (those that cannot wait 60 seconds after birth) should have their cord clamped and cut and transferred to the resuscitaire for further immediate assessment. The Resuscitation Council UK do not currently recommend milking of the cord in those infants that require resuscitation.
- Vigorous term and preterm infants, who are not depressed at birth, should have optimal (delayed) cord clamping:
    - Wait at least 60 seconds, but no longer than 3 minutes, before clamping the cord of preterm babies if the mother or birthing parent and baby are stable. Skin to skin is invaluable and has evidenced benefits for preterm babies and should be facilitated if baby and mother or birthing parent is stable.
    - Position the baby at or below the level of the placenta before clamping the cord.

It is imperative and critical that the infant is dried and kept warm at all times.

Refer to other relevant guidance for further support for the newborn after birth:

Newborn Feeding Guideline
Skin-Skin (Parent to baby) Contact Guideline

19.0 In utero transfer

- If preterm labour is suspected, the mother or birthing parent should be seen by the on-call Obstetric Registrar or Consultant urgently as in utero transfer to another obstetric unit may be necessary.
- The on-call Paediatric Registrar / Consultant and Neonatal Unit (NNU) or SCBU must be contacted regarding NNU or SCBU cot availability.
- Speculum +/- vaginal examination must be performed prior to transfer.
- A midwife experienced in managing preterm labour should ideally accompany the mother during transfer.

- In utero transfer should be arranged as required following liaison with NNU or SCBU and Paediatric Team for anticipated preterm labour when:

    - **St Richards Hospital and Worthing Hospital (Level 1 SCBU)**: Gestational age less than 31/40 discuss with on-call paediatric team to consider if staffing for SCBU and Children's ward adequate over the next 3 days. As a general rule under 31/40 – as long as it is safe – arrange in utero transfer to an obstetric unit with Level 2/3 neonatal unit.
    - SCBU is closed.

20.0 Audit and monitoring compliance

Recommended auditable standards:

- The incidence of pregnant women and people with a singleton pregnancy giving birth (liveborn and stillborn) as a % of all singleton births:
  - In the late second trimester (from 16+0 – 23+6 weeks).
  - preterm delivery from 24+0 – 36+6 weeks in three groups:
    - 24+0 – 29+6 weeks.
    - 30+0 – 33+6 weeks.
    - 34+0 – 36+6 weeks.

- Pregnant women and people in pre-term labour have a documented evidence of involvement with Paediatrician prior to delivery.
- Pregnant women and people in pre-term labour have a documented evidence of involvement of the Consultant Obstetrician.

Pregnant women and people at risk of preterm birth should have documented evidence that one course of antenatal Corticosteroids has been considered up to 34+6 weeks gestation:

- Pregnant women and people in suspected or established preterm labour, or having a planned preterm birth or have P-PROM should have one course of antenatal corticosteroids offered up to 34+6 weeks gestation:
  - 22+0 – 23+6 weeks – discuss with the pregnant woman or person in the context of their individual circumstances.
  - 24+0 – 33+6 weeks – offer corticosteroids.
  - 34+0 – 35+6 weeks – consider corticosteroids.
- Up to 38+6 weeks if there is an increased risk of requiring delivery by caesarean birth in early labour (e.g. FGR, poor placental development, polyhydramnios, etc.) – consider corticosteroids. When preterm birth is planned or expected within 24 hours, Magnesium Sulfate for neuroprotection should be documented as having been:
  - Discussed with the pregnant woman or person in the context of their individual circumstances if between 23+0 – 23+6 weeks
  - Offered if between 24+0 – 29+6 weeks.
  - Documented as considered at 30+0 – 33+6 weeks.
- Pregnant women and people with PROM and less than 37+0 weeks should be prescribed oral Erythromycin 250mg 4 times a day for 10 days or until established labour (whichever is sooner).
- Pregnant women and people who are being offered antenatal corticosteroids have a documented discussion of risks and benefits using appendix 6.

21.0 References

ACOG Committee Opinion No. 419 October (2008) Use of progesterone to reduce preterm birth. Obstet Gynecol 2008; 112:963-965.

Arias, F. et al. Maternal placental vasculopathy and infection: two distinct subgroups among patients with preterm labour and preterm ruptured membranes. Am J Obstet Gynecol. (1993) 168(2): 585-91.

Australian Research Centre for Health of Women and Babies. Antenatal Magnesium Sulfate Prior to Preterm Birth for Neuroprotection of the Fetus, Infant and Child – National Clinical Practice Guidelines. Adelaide: ARCH, (2011).

Beck, S., et al., The worldwide incidence of preterm birth: a systematic review of maternal mortality and morbidity. Bull World Health Organ (2010) 88(1): 31-8.

Berghella, V. et al. Cervical ultrasonography compared with manual examination as a predictor of preterm delivery. Am J Obstet Gynecol. (1997) 177(4): 723-30.

Berghella V, Obido AO, To MS, et al. Cerclage for a short cervix on ultrasound: metaanalysis of trials using individual patient-level data. Obstet Gynaecolo (2005); 106: 181-189.

British Association of Perinatal Medicine Executive Committee. Memorandum – Fetuses and newborn infants at the threshold of viability a framework for practice. (2000).

Dodd JM, Flenady V, Cincotta R, Crowther OA. Prenatal administration of progesterone for preventing preterm birth. Cochrane Database System rev (2006); 3: CD004947.

Easmon CS. The carrier state: group B streptococcus. *JAntimicrob Chemother. (*1986) 18 Suppl A: 59–65.

EPICure 2 Study 2006-2011.

A Framework for Practice. Perinatal Management of Extreme Preterm Birth before 27 weeks of gestation. October 2019.

Hooker J. Nifedipine for Acute Tocolysis. RWS Guideline. December 2005.

Hua, M. et al. Congenital uterine anomalies and adverse pregnancy outcomes. Am J Obstet Gynecol. 2011. 205(6): 558 e1-5.

Kyrgiou M, Kolipopulus G, Martin-Hirsch P et al. Obstetric outcomes after conservative treatment for intraepithelial or early invasive cervical lesions: systematic review and metaanalysis. Lancet 2006; 367:489-498.

Lamont, R.F. et al. Treatment of abnormal vaginal flora in early pregnancy with clindamycin for the prevention of spontaneous preterm birth: a systematic review and meta-analysis. Am J Obstet Gynecol. 2011. 205(3): 177-90.

Lams, J.D. et al. The length of the cervix and in the risk of spontaneous premature delivery. National Institute of Child health and Human Development Maternal-Fetal Medicine Unit Network. N Eng J Med. 1996. 334(9): 567-72.

McManemy J, Cooke E, Amon E, Leet T. Recurrence risk for preterm delivery. Am J Obstet Gynecol. 2007. 196(6): 576.e1-6.

Meis, P.J. et al. The preterm prediction study: significance of vaginal infections. National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Am J Obstet Gynecl. 1995. 173(4): 1231-5.

National Institute of Clinical Excellence. NG25: Preterm labour and birth. November 2015. Updated 2019

National Institute of Clinical Excellence. CG132 Caesarean Section , November 2011

National Institute of Clinical Excellence. GC55 Intrapartum Care. 2007.

National Institute of Clinical Excellence. NG207: Inducing Labour. November 2021.

National Institute of Clinical Excellence. NG25 Preterm Labour and Birth June 2022

NHS England. Saving Babies' Lives Version three: A care bundle for reducing perinatal mortality March 2023.

Offenbacher, S. et al. Progressive periodontal disease and risk of very preterm delivery. Obstet Gynecol. 2006. 107(1): 29-36.

Owen, J. et al. Mid-trimester endovaginal sonography in women at high risk for spontaneous preterm birth. JAMA. 2001. 286(11): 1340-8.

Poon, L.C. et al. Large loop excision of transfornation zone and cervical length in the prediction of spontaneous preterm delivery. BJOG. 2012. 119(6): 692-8.

RCOG (2022) GTG no.74 Antenatal Corticosteroids to reduce neonatal morbidity and mortality

RCOG. Green-top Guideline 73: Care of Women Presenting with Suspected Preterm Pre-labour Rupture of Membranes from 24+0 Weeks of Gestation 2019

RCOG. Green-top Guideline No. 20b: Management of Breech Presentation 2017

RCOG (2007) Safer Childbirth Working Party. Safer Childbirth – Minimum Standards for the Organisation and Delivery of Care in Labour.

RCOG (2011) Magnesium sulfate to prevent cerebral palsy following preterm birth. Scientific Advisory Committee Opinion Paper 29, 2011.

Shah, P.S. et al. Induced termination of pregnancy and low birthweight and preterm birth: a systematic review and meta-analyses. BJOG. 2009. 116(11): 1425-42.

SHIP Preterm Birth Network. Regional Risk assessment and Management Tool. 2019.

Smaill, F. and Vazquez, J.C. Antibiotics for asymptomatic bacteriuria in pregnancy. Cochrane Database Syst Rev. 2007 (2): pCD000490.

UK Preterm Clinical Network (2019) Reducing Preterm Birth: Guidelines for Commissioners and Providers.

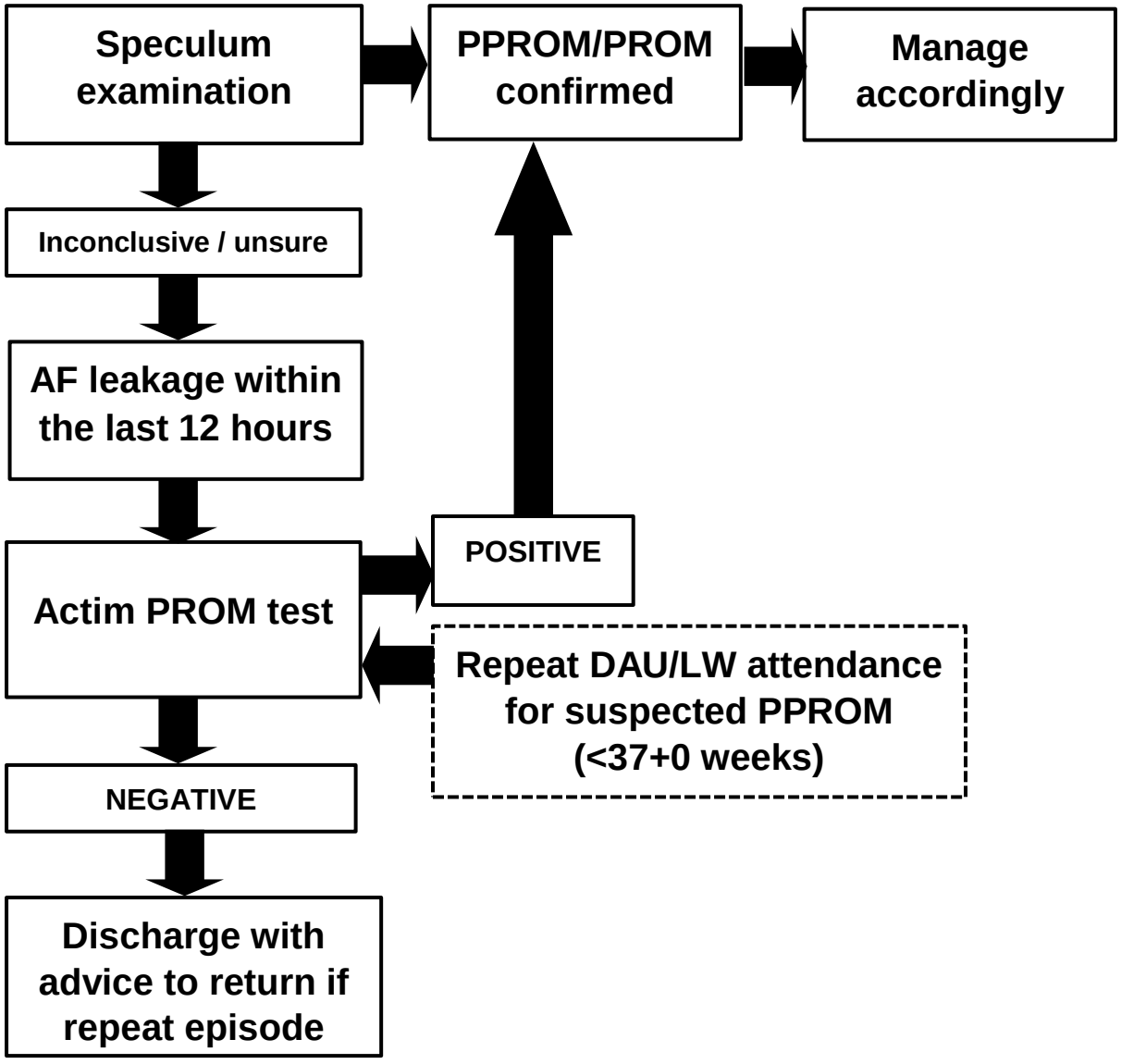
Wood NS, Marlow N, Costeloe K et al. Neurologic and developmental disability after extremely preterm birth. EPICure study group. N Engl J Med 2000; 343:378-384.

World Health Organization (2003) Managing complications in pregnancy and childbirth – abdominal pain in later pregnancy.

Wren, B.G. Subclinical renal infection and prematurity. Med J Aust. 1969. 2(12): 596-600.

Appendix 1: Actim PROM test indication flowchart

- □ Suspected PPROM (<37+0 weeks)
- □ Suspected PROM + GBS positivity
- □ Suspected PROM + history of GBS-affected baby

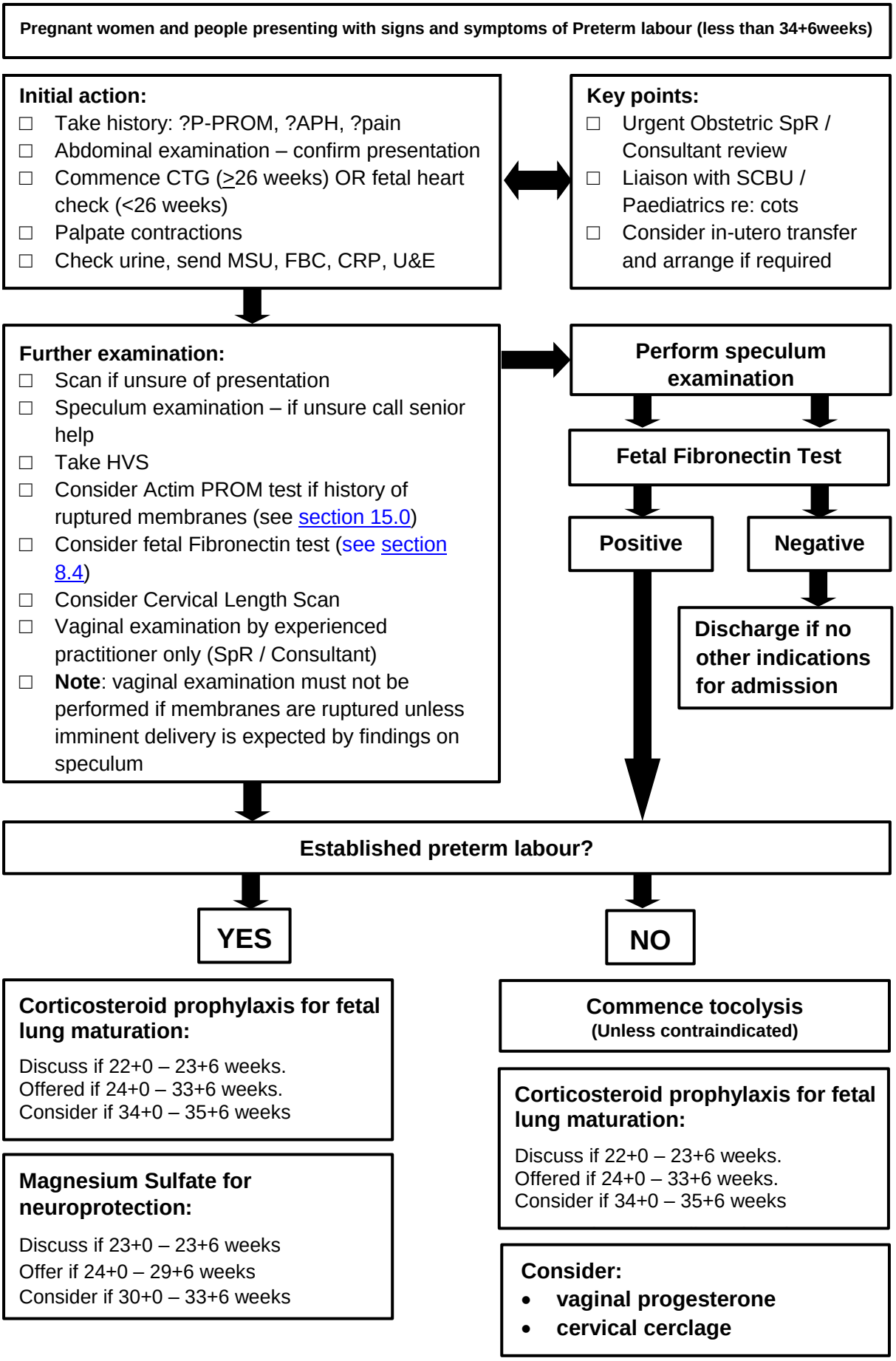


Please note that the following are NOT contraindications for the Actim PROM test:

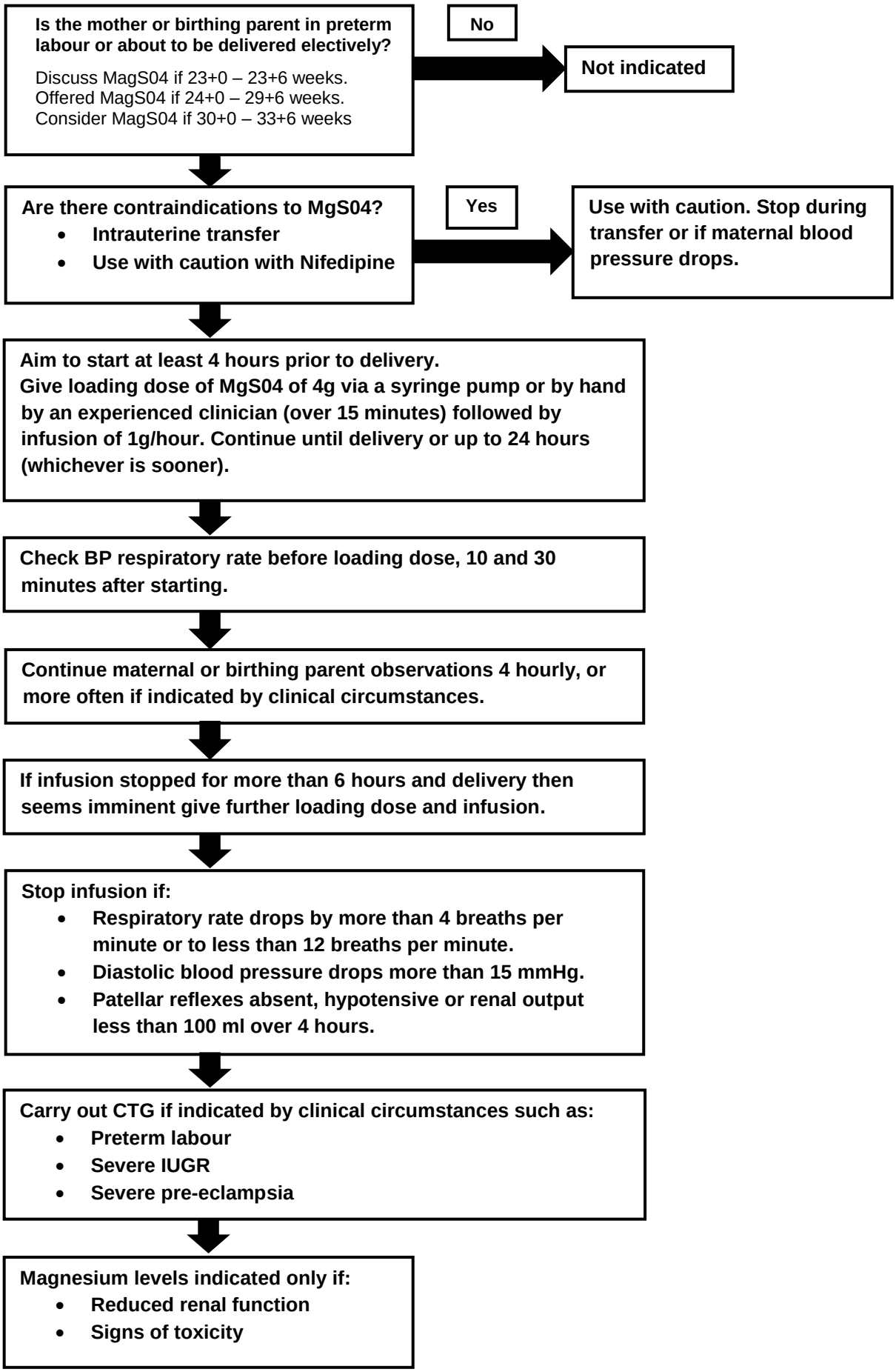
- **Sexual intercourse**
- **Small amount of blood in the vagina**

Actim PROM for should not be used if labour becomes established in a woman or person reporting symptoms suggestive of P-PROM.

Appendix 2: Preterm labour presentation signs and symptoms flow chart



Appendix 3: Magnesium Sulfate in preterm labour flow chart



Appendix 4: Sussex Preterm in-utero Transfer Process

Preterm In Utero Transfer Pathway Sus

kss-neonatal-network -infants-at-the-thresh

Appendix 5: Further information

- **QUiPP (click hyperlinks)**
  To access on a desktop
  Google Play App Store
  Apple App Store

- Perinatal Management of Extreme Preterm Birth Before 27 weeks of Gestation (2019) A BAPM Framework for Practice

2020-10 SECAmb
Suspected Preterm La

Appendix 6: Antenatal Corticosteroids to reduce neonatal morbidity and mortality