Management of Preterm Pre-Labour Rupture of membranes and Preterm Labour

Classification:	Guideline		
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To be read in conjunction with the following documents:
Preterm Birth Prevention Clinic SOP

Are there any eCARE implications? No

CQC Fundamental standards:
Regulation 9 – person centered care
Regulation 10 – dignity and respect
Regulation 11 – Need for consent
Regulation 12 – Safe care and treatment
Regulation 15 – Premises and equipment
Regulation 17 – Good governance

Disclaimer

Since every patient's history is different, and even the most exhaustive sources of information cannot cover every possible eventuality, you should be aware that all information is provided in this document on the basis that the healthcare professionals responsible for patient care will retain full and sole responsibility for decisions relating to patient care; the document is intended to supplement, not substitute for, the expertise and judgment of physicians, pharmacists or other healthcare professionals and should not be taken as an indication of suitability of a particular treatment for a particular individual.

The ultimate responsibility for the use of the guideline, dosage of drugs and correct following of instructions as well as the interpretation of the published material **lies solely with you** as the medical practitioner.

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Guideline Statement

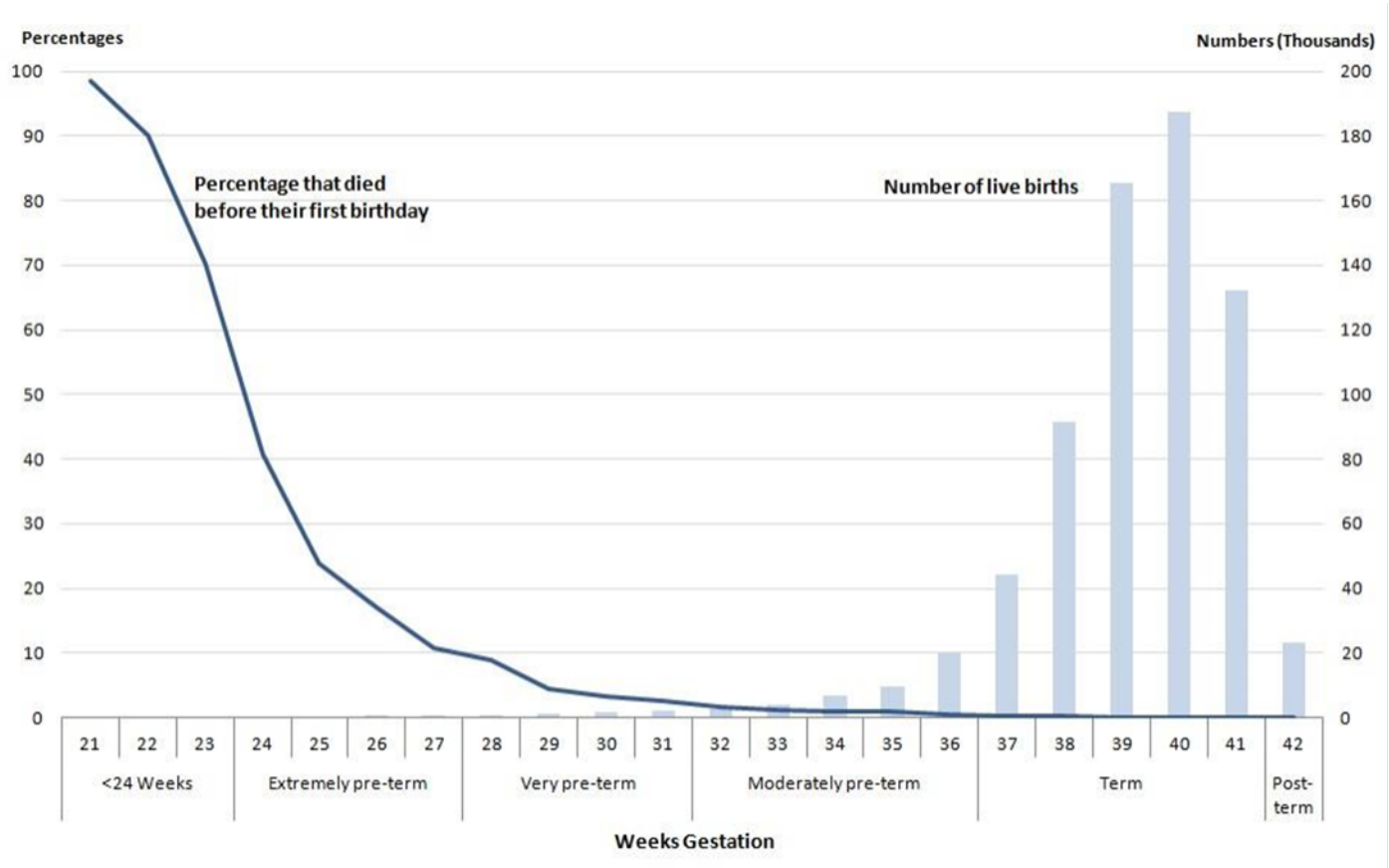
To assist midwives and medical staff in the management of pre-term pre-labour rupture of membranes, and threatened pre-term labour.

Executive Summary

Preterm pre-labour rupture of membranes (PPROM) is defined as rupture of the membranes in the absence of uterine activity at less than 37 weeks gestation. This guideline applies to a situation where rupture of membranes occurs in a singleton pregnancy that is otherwise uncomplicated.

Preterm birth (PTB), defined as delivery at less than 37+0 week's gestation, is a common complication of pregnancy, comprising around 8% of births in England and Wales. It is the most important single determinant of adverse infant outcome with regards to survival and quality of life. Babies born preterm have high rates of early, late, and post-neonatal mortality and morbidity. PTB is estimated to cost health services in England and Wales £3.4bn per year. (Saving Babies Lives Version 3)

Percentage of infant deaths and number of live births by week gestation 2013
(Office for National Statistics, (2013). Pregnancy and ethnic factors influencing births and infant mortality. London: Office for National Statistics)



Prevention of preterm birth is now a national priority, and all maternity services should ensure that measures are in place to realise this ambition.

The Department of Health has set an ambition to reduce the national rate of pre-term births from 8% to 6% in order to achieve the national Maternity Safety Ambition (to halve the rates of stillbirths, neonatal and brain injuries that occur during or soon after birth by 2030 .

The British Association of Perinatal Medicine (BAPM) 2019 Framework 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 and evolving national and international changes in the approach to

their care.

The BAPM reports that whilst overall outcomes are improving, the prognosis remains guarded for extremely premature babies: 7 out of 10 babies who are born alive at 22 weeks will die whereas the outcome for babies born alive at 26 weeks is much better: 8 in 10 babies will survive with active stabilisation at birth.

The BAPM framework 2019 states that management of labour, birth and the immediate neonatal period should reflect the wishes and values of the mother and her partner, informed and supported by consultation and in partnership with obstetric and neonatal professionals.

Saving Babies Lives Care Bundle Version 3 has element 5 aims to reduce preterm birth from 8% to 6 % by focussing on prediction and prevention of preterm birth and ensuring better preparation when preterm birth is unavoidable. Prediction and prevention of preterm birth is addressed by the **Preterm Birth prevention clinic SOP**.

This guideline will focus on diagnosis and management and preparation when preterm delivery is likely (in women that require admission to hospital, administration of antenatal steroids, magnesium sulphate and tocolysis).

Pre-term labour and birth is thought to be a syndrome of multiple mechanisms, including infection, uteroplacental ischaemia or haemorrhage, uterine over distention and other immunological processes. **However, the majority of premature births occur without any obvious cause or known risk factors**.

Correctly diagnosing pre-term labour is difficult. Fewer than 50% of women presenting with suspected pre-term labour will deliver during the current episode. Administration of antenatal steroids to the mother reduces the rate of respiratory distress syndrome, intraventricular haemorrhage and death in the neonate. Repeated courses of antenatal steroids, however, may be associated with harm to the neonate and should be avoided.
Obstetric care therefore aims to correctly diagnose those women likely to deliver preterm, and who require admission to hospital and antenatal steroids.

We must time steroids appropriately - Steroids are beneficial to babies if delivery occurs between 1-7 days after administration (less respiratory distress syndrome and intraventricular haemorrhage). Even just one course, after 7 days, does harm (lower birth weight, head circumference and weight).

Foetal fibronectin is a glycoprotein and biochemical marker which can be detected in a woman's cervicovaginal secretions throughout pregnancy. In normal pregnancy fFN is present in the vagina up to the fusion of the chorionic membrane with the maternal decidua at approximately 20 – 22 weeks of gestation. After this time the level of fFN then falls to below 50ng/ml. After 22 weeks of gestation, a level above 30ng/ml is thought to result from inflammatory or mechanical insult to either the placenta or the foetal membranes indicating separation of the chorion and the deciduas, and imminent delivery.

Concentrations ≥50ng/ml during 23 – 35 weeks of gestation have been shown to indicate a greater risk of preterm delivery. Meta-analysis suggests that foetal fibronectin has a sensitivity of 77% and a specificity of 87% in predicting delivery within 7 days in symptomatic women.
When the fFN measurement is combined with a cervical length measurement and a woman's risk factors in **the QUiPP app** (https://quipp.org/) a woman's risk of preterm birth can be calculated which can be helpful when discussing interventions with women. QUIPP app can be used even in the absence of cervical length measurement in symptomatic women.

For women with suspected preterm labour under 30 weeks' gestation, NICE recommends a 'treat all' strategy, without reference to either fFN or CL tests. Using **the QUiPP App**, it has been found that 89% of hospital admissions may be safely avoided if a ***threshold of 5% risk of delivery within the 7 days*** is used to guide clinical practice, allowing outpatient management in the vast majority of cases.

Abbreviations

ADAU- Antenatal Day Assessment Unit
BAPM- British Association of Perinatal Midicine
cCTG- Computerised Cardiotocograph
CTG - Cardiotocograph
fFN- Fetal fibronectin **HVS**-
High vaginal swab
IV- Intravenous
IUT- In utero transfer **LVS**-
Low vaginal swab
LW- Labour Ward
MEOWS- Maternal early
observation warning
system
MgSO4- Magnesium sulphate
NICE- National Institute of Clinical Excellence
NNU- Neonatal Unit
OAHSN-Oxford Academic Health Science Network
PReCePT- Preventing Cerebral Palsy in Preterm labour
PTB- Preterm Birth
PPROM – Preterm Prelabour Rupture of Membranes
SOP- Standard Operating Procedure
SROM- Spontaneous Rupture of Membranes
TRIAGE- 24 hour emergency review in antenatal day assessment

1.0 Roles and Responsibilities:

It is the responsibility of all staff working with maternity service users to be aware of, and adhere to this guideline. It is the responsibility of the Maternity Guideline Group to ensure that this document is reviewed and updated.

Obstetricians: Assessment of all women presenting with preterm labour, requesting relevant Investigations and prescription of medication including steroids, Atosiban or Nifedipine and Magnesium Sulphate if eligible. The use of clinical tests including fFN, Amnisure, and the QUiPP app.

Midwives: Initial assessment, sending investigations, monitoring of foetal wellbeing and administering medication including Magnesium Sulphate as per protocol. The use of cCTG where clinically indicated.

It is the responsibility of both midwives and obstetrician to liaise with neonatal team and make arrangements such as in utero transfer if needed.

2.0 Implementation and dissemination of document

This document will be placed on the Trust's central database (Guidelines and Patient Information System) which can be accessed via the Trust's Intranet.

2.1 Implementation

Training

Healthcare professionals performing the Fibronectin test and analysis should be trained in its use. Appropriate training will be performed at induction of junior doctors and midwives, and at regular intervals on the Labour Ward for midwifery and consultant staff. Only those individuals who have received adequate training will be able to perform the Fibronectin test and analysis.

Audit of use

The machine log book will be examined on a weekly basis for 3 months and then monthly thereafter to ensure tests are being performed on the appropriate women, being logged correctly and the test results are clearly documented.

An audit of outcomes of women tested by Fibronectin test will be performed 3 and 6 months after implementation and then yearly thereafter. The results of the audit will be communicated to all those involved in antenatal patient care.

An audit of the machine is regularly performed by the point of care coordinator

3.0 Processes and procedures

3.1 Risks

Preterm prelabour rupture of membranes (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. The median latency after PPROM is 7 days and tends to shorten as the gestational age at PPROM advances. (RCOG, 2019, p.e153)

Preterm birth (PTB), defined as delivery at less than 37+0 week's gestation, is a common complication of pregnancy, comprising around 8% of births in England and Wales. It is the most important single determinant of adverse infant outcome with regards to survival and quality of life. Babies born preterm have high rates of early, late, and post-neonatal mortality and morbidity. PTB is estimated to cost health services in England and Wales £3.4bn per year. (Saving Babies Lives Version 3)

3.2 Assessment, diagnosis and management of Preterm prelabour rupture of Membranes (PPROM)

3.2.1 Assessment of PPROM

Establish diagnosis from history and inspection of sanitary pad.

Fetal heart auscultation if <28 weeks, CTG if >=28. Consider CTG from 26 weeks if confirmed SROM if clinically indicated.

SHO/Registrar should be asked to attend to confirm the diagnosis by sterile speculum examination, demonstrating pooling of fluid in posterior vaginal fornix.

If on speculum examination no amniotic fluid is observed, perform ***AmniSure*** test to confirm PPROM to guide further management.(see Appendix 1)

Obtain a low vaginal swab for GBS

Do not perform a digital examination when PPROM unless there is a high index of suspicion that the cervix is dilating i.e. progressive preterm labour.

If the results of the AmniSure test are negative and no amniotic fluid is observed, do not offer antenatal prophylactic antibiotics. Explain to the woman that it is unlikely that she has P-PROM, but that she should return if she has any further symptoms suggestive of P-PROM or preterm labour (NICE NG25, 2015, Section 1.3.3)

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 women with P-PROM. The above tests must not be used in isolation to confirm or exclude intrauterine infection in women with P-PROM. If the results of the clinical assessment or any of the tests are not consistent with each other, continue to observe the woman and consider repeating the tests.(NICE NG 25, 2015, Section 1.5)

If there is a clinical suspicion of infection e.g. maternal temperature or uterine tenderness, send vaginal swab, midstream specimen of urine (MSU) and full blood count (FBC) urgently and start empiricial antibiotics .If no improvement occurs after 24 hrs , call on call Microbiologist for further advice.

If the diagnosis is confirmed and there is no evidence of chorioamnionitis or any other obstetric indication for delivery the woman should be managed expectantly and transferred to the antenatal ward.

Women treated as inpatients should be observed for signs of clinical chorioamnionitis at least 4-8 hourly. Criteria for diagnosis of clinical chorioamnionitis include maternal pyrexia, tachycardia, leucocytosis, uterine tenderness, offensive vaginal discharge and fetal tachycardia.

Neonatal Unit (NNU) should be informed of the admission, and if they would be unable to cope with the baby if delivery occurs then the case should be discussed with the Consultant to decide if in-utero transfer is advisable.

3.3 Management of PPROM

Oxford Academic Health Science Network MATERNITY

Oxford AHSN Regional Maternity Guideline

Algorithm for Management of Preterm Prelabour Spontaneous Rupture of Membranes (Updated July 2023)

Suspected preterm prelabour SROM at ≥ 22+3 [1] to <34+0

- Acute fetal compromise[2] *or* Maternal compromise/ *or* Placental abruption → Stabilise[8] → Deliver , or Consider IUT[11] if situation stabilised
- No abruption / immediate fetal compromise
  - Chorioamnionitis [3] → IV antibiotics[5] Sepsis care bundle Steroids Mg[6] if <32+0 EFW[7] if poss. VE → Gestation is <27+0 (singleton) **OR** <28+0 (multiple) **OR** EFW <800g[9] (incl if <24+0 or EFW <500g **IF** parents want active management)[10] → Request IUT[11] if del unlikely <1hr → No tocolysis[12]
  - Contracting + / - minor bleed → Steroids Mg[6] if <32+0 EFW[7] if poss. IV antibiotics VE → Gestation is <27+0 (singleton) **OR** <28+0 (multiple) **OR** EFW <800g[9] (incl if <24+0 or EFW <500g **IF** parents want active management)[10] → Request IUT[11] if del unlikely <1hr → Consider tocolysis for IUT[10] only
  - Not contracting +/- minor PVB, but likely SROM/POC[4] +ve → Steroids No Mg EFW[7] if poss. Erythromycin po → Gestation is <27+0 (singleton) **OR** <28+0 (multiple) **OR** EFW <800g[9] (incl if <24+0 or EFW <500g **IF** parents want active management)[10] → Request IUT[11] → No tocolysis
  - Likely not SROM / POC -ve → Consider no steroids No Mg Non-urgent USS No antibiotics → Consider discharge

Footnotes:

1. Note active resuscitation for neonates <22+3 will not usually be performed. Dates according to CRL excl in IVF pregnancies.
2. CTG to be used only >/=26+0 weeks
3. Chorioamnionitis is very common at presentation of severely preterm SROM and may be subtle. Early IVABs (<1hr of diagnosis), see local sepsis guideline. Confirmed chorioamnionitis requires delivery, but this can usually be after transfer, if IUT criteria are met.
4. POC: point of care test for SROM (e.g., Actim PROM).
5. IV antibiotics. Follow unit antibiotic guideline; avoid co-amoxiclav
6. Mg: Magnesium bolus 4g (16mmol) Magnesium Sulphate as 20mls of 20% magnesium sulphate IV over 5 – 10 minutes. If <32+0 weeks. Note PReCePT suggests 30 but clinical benefit up to 32 weeks.
7. EFW: estimated fetal weight +/-15% if possible
8. Stabilisation of acutely unwell mother beyond scope of this. Early IVABs (<1hr of diagnosis) essential, see local sepsis guideline.
9. Criteria for delivery in Level 3 Neonatal Unit. If criteria not met follow local guideline
10. If time, offer discussion with paediatrician. Document any discussion regarding IUT with parents. Consider providing Thames Valley Neonatal Network patient information leaflets if available. Patient Information leaflets Extreme Prematurity
11. For IUT: try OUH first. Between 08:00-21:30 call Delivery Suite (01865 221987/8) and specifically request to speak to the consultant obstetrician on Delivery Suite. DO NOT call NICU or Delivery Suite manager first. Between 21:30 -08:00, call OUH switchboard (01865 741166) and request to speak to the obstetric consultant on call. If IUT is agreed

Management of Preterm Prelabour SROM V3 Updated July 2023 Author: Mr Lawrence Impey, Oxford AHSN Maternity Clinical Lead

between 21:30-08:00 , then call Delivery Suite (01865 221987/8) to complete required handover forms. If no OUH availability, access PeriDASH South East Perinatal Maternity Bed and Neonatal Cot Locator - Power Apps. and SONeT (Southampton Oxford Neonatal Transport)

12. Tocolysis. Follow unit tocolysis guideline. Do not use nifedipine if magnesium given or to be given.

Perform C - reactive protein (CRP) & Full blood count (FBC) twice weekly.

Following the diagnosis of preterm prelabour rupture of the membranes (PPROM) ,Erythromycin 250mg 4 times a day should be given for 10 days or until the woman is in established labour (whichever is sooner). (RCOG Grade A recommendation 2019) Do not offer women with P-PROM co-amoxiclav as prophylaxis for intrauterine infection.[2015]" (NICE NG25, 2015, Sections1.4.3)

A Cochrane review found that "Routine prescription of antibiotics for women with preterm rupture of the membranes is associated with prolongation of pregnancy and improvements in a number of short-term neonatal morbidities, but no significant reduction in perinatal mortality. Despite lack of evidence of longer-term benefit in childhood, the advantages on short-term morbidities are such that we would recommend antibiotics are routinely prescribed." (Kenyon, Boulvain & Neilson, 2013, p.2)

For women with P-PROM who cannot tolerate erythromycin or in whom erythromycin is contraindicated, consider an oral penicillin for a maximum of 10 days or until the woman is in established labour (whichever is sooner). (NICE NG25, 2015 (updated 2019), Section 1.4.2)

"For those with evidence of GBS colonisation in the current pregnancy or in previous pregnancies, the perinatal risks associated with preterm delivery at less than 34 +0 weeks of gestation are likely to outweigh the risk of perinatal infection. For those at more than 34 +0 weeks of gestation it may be beneficial to expedite delivery if a woman is a known GBS carrier." (RCOG guideline No.36, 2017, p.e283)

Women 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 on an individual basis with careful consideration of patient preference and ongoing clinical assessment. (RCOG Grade A recommendation 2019) (RCOG, 2019, p.e153)

3.4 Gestational age < 20+0 weeks

"The probability of neonatal death and morbidity associated with PROM decreases with longer latency and advancing gestational age (25). In a review of preterm PROM between14 weeks and 24 weeks of gestation, perinatal deaths were more or less equally divided between stillbirths and neonatal deaths. Survival rates were much improved with expectant management following membrane rupture after 22 weeks of gestation compared with membrane rupture before 22 weeks of gestation (57.7% versus 14.4%, respectively) (26).

Most studies of second-trimester and previable PROM are retrospective and include only expectantly managed cases. Thus, they likely overestimate survival rates because of selection bias. Survival data may vary by institution." (ACOG, 2018, p.e2)

The rate of pulmonary hypoplasia after PROM before 24 weeks of gestation vary widely among reports, but is likely in the range of 10–20%." (ACOG, 2018, p.e2)

Discuss further management and administration of steroids with on call consultant at receiving level 3 unit if gestational age is between 22+0 to 22+3 weeks.

3.5 Gestational age 22+0 to < 27 weeks (singleton) OR <28+0 (multiple) OR EFW <800g

Inform neonatal team and Consultant Obstetrician.
Request In-utero transfer (IUT) ASAP if delivery unlikely <1 hr.
If >= 22+3 weeks, Offer two doses of betamethasone 12 mg intramuscularly (IM) 24 hours apart.
If between 22+3 to < 23 weeks & risk of imminent delivery, **give MAGSO4, and discuss with oncall obstetric team at OUH.**
Tocolysis in patients with PPROM is not recommended (RCOG, 2019, p.e158) Consider tocolysis for IUT only. (Impey on behalf of Oxford AHSN, 2020 – see section 3.3
Follow unit tocolysis guideline. ***Do not use Nifedipine if Magnesium given or to be given.***

Following the diagnosis of preterm prelabour rupture of the membranes, (PPROM) an antibiotic (preferably erythromycin) should be given for 10 days or until the woman is in established labour (whichever is sooner). (RCOG Grade A recommendation 2019) (RCOG, 2019, p.e153). NICE guideline NG25 recommends 250mg of erythromycin given 4 times a day. (NICE, 2015, section 1.4.1).
If unsuitable for IUT due to active labour or imminent delivery, give Intrapartum antibiotic prophylaxis (Benzyl penicillin or Clindamycin)) (NICE CG149, 2012, Section 1.3).
Decision regarding mode of delivery at this extreme of gestational age should be made by obstetric consultant on-call after discussing with patient. Caesarean section in the fetal interests is rarely indicated < 25/40 gestation.
Caesarean section in preterm birth can be a difficult procedure and therefore must be performed by an experienced operator.

3.6 Gestational age ≥ 27 to < 37 weeks

- Admit to Hospital for the first 2 days and inform Neonatologists.
  - Confirm dates with early ultrasound scan
- Administer two doses of betamethasone 12 mg intramuscularly (IM) 24 hours apart. Steroids can be considered up to 35^{+6} weeks(RCOG, 2019, p.e153)
- There is insufficient evidence to support the use of tocolysis in women with PPROM, as there is an increase in maternal chorioamnionitis without significant benefits to the neonate. (Mackeen, et al., 2014, p.2)
- If in established preterm labour , Offer Magnesium sulphate if <32+0 .Consider Magnesium sulphate between 32- 33+6 weeks.
  - Leave cervical cerclage (if present) in situ unless decision taken to deliver
  - Inform Maternal Medicine Consultant/ ANC sister if patient has T4 cell disorder.
- Arrange ultrasound scan for fetal presentation, growth, EFW, Doppler, residual AFV with / without biophysical profile.
- Exclude clinical chorioamnionitis (CCA) - defined as any 2 or more of: maternal / fetal tachycardia, pyrexia 38^0 C, leucocytosis > 15,000, CRP raised by ³ 30% above baseline, tender/irritable uterus, purulent or offensive vaginal discharge
- Chase up microbiological samples
- If known to be GBS positive and PPROM is to be managed conservatively – please discuss with the Consultant Obstetrician and a plan to be documented.
- Following the diagnosis of preterm prelabour rupture of the membranes, (PPROM) an antibiotic (preferably erythromycin) should be given for 10 days or until the woman is in established labour (whichever is sooner). (RCOG Grade A recommendation 2019) (RCOG, 2019, p.e153). NICE guideline NG25 recommends 250mg of erythromycin given 4 times a day. (NICE, 2015, section 1.4.1).

- For women with P-PROM who cannot tolerate erythromycin or in whom erythromycin is contraindicated, consider an oral penicillin for a maximum of 10 days or until the woman is in established labour (whichever is sooner).
- CTG daily, Maternal pulse, temperature 4 hourly, FBC, CRP twice weekly
- Women 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 on an individual basis with careful consideration of ***patient preference and ongoing clinical assessment.*** (RCOG, 2019, p.e153)
- Offer Intrapartum antibiotic prophylaxis (Benzyl penicillin or Clindamycin)) (NICE CG149, 2012, Section 1.3).
- For cephalic presentations, IOL should be started with PGE2 unless cervix is 3 cms dilated.
- D/W consultant if previous Caesarean section
- See birth plan & inform Maternal Medicine Consultant /ANC sister if patient is T4 cell positive.

3.7 Outpatient management of PPROM <37 weeks

The decision to offer outpatient care to women with PPROM should be made on an individual basis, taking into account markers of delivery latency. (RCOG, 2019, p.e159-60).
Women can be considered for outpatient monitoring of PPROM only after agreement with Consultant Obstetrician .
A management plan should be documented with frequency of outpatient appointments and what tests should be carried out.

- Assess home / social / domestic situation, available adult accompany to hospital · Fetus in cephalic presentation and no evidence of fetal compromise
- Should live within a reasonable distance of the hospital + access to telephone
- Can and willing to attend ADAU twice a week, monitor own temperature, heart rate and vaginal loss.
- Outpatient management should involve twice weekly review in ADAU to assess for any signs of symptoms of chorioamnionitis. This should include C reactive protein (CRP), white cell count (WCC), a full set of maternal observations and a CTG (if ≥28/40, or auscultation of the FH if <28/40)
- Weekly high vaginal swab need not be performed.
- Individualised plans for repeat tests and ultrasound scans should be made in agreement with the Consultant Obstetrician.
- Women being managed as outpatients should be counselled regarding other signs and symptoms of chorioamnionitis to look out for including:
- Abdominal pain PV bleeding
- Reduced fetal movements
- Feeling non-specifically unwell
- Feeling as though they have a temperature, or feeling feverish
- Change in colour or smell of liquor
- Avoid sexual intercourse (protected or not)
- Following the diagnosis of preterm prelabour rupture of the membranes, (PPROM) an antibiotic (preferably erythromycin) should be given for 10 days or until the woman is in established labour (whichever is sooner). (RCOG Grade A recommendation 2019) (RCOG, 2019, p.e153). NICE guideline NG25 recommends 250mg of erythromycin given 4 times a day. (NICE, 2015, section 1.4.1)
- Women 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 on an

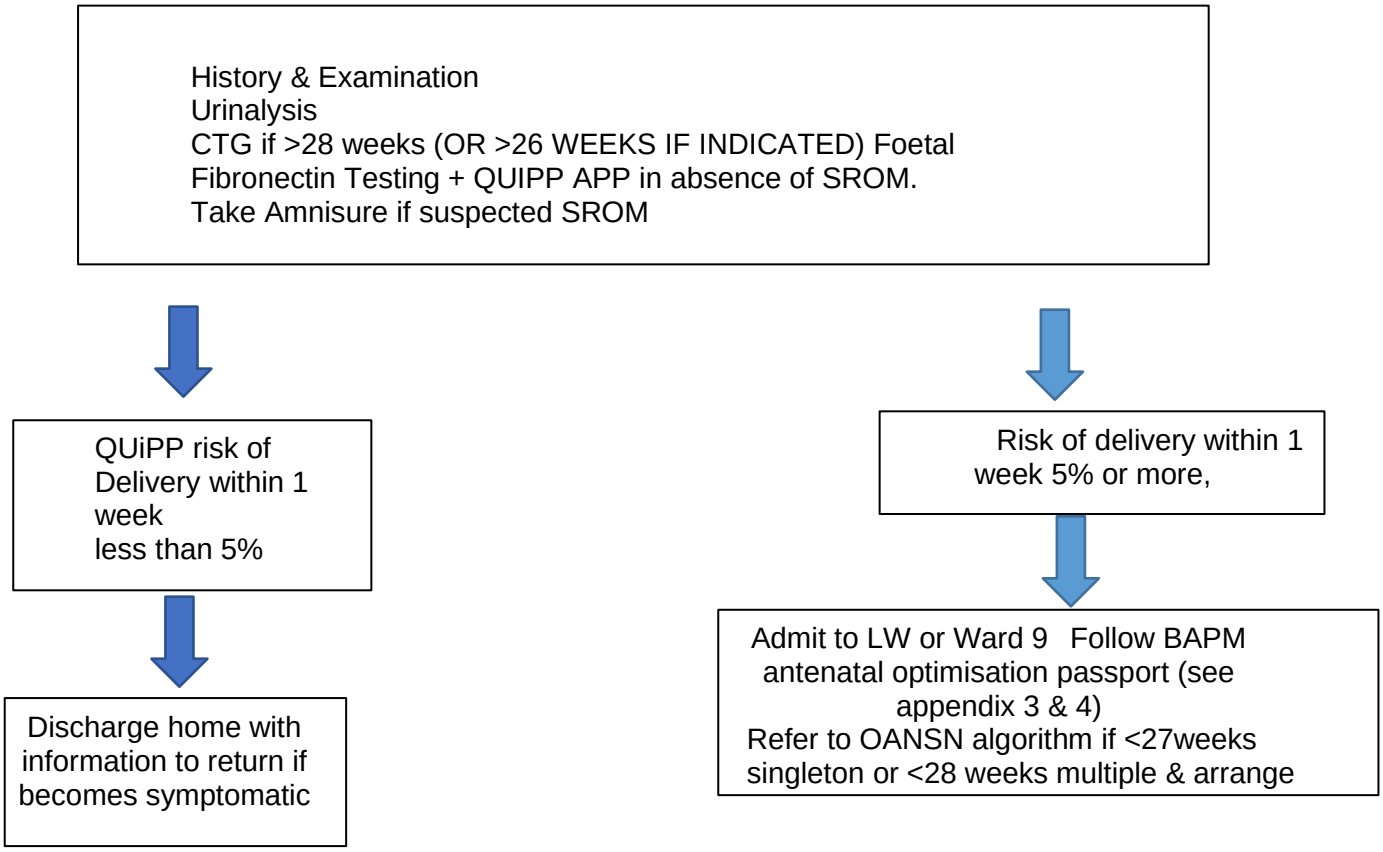
individual basis with careful consideration of ***patient preference and ongoing clinical assessment.*** (RCOG, 2019, p.e153)

The on call Paediatrician must be alerted to the delivery of any infant where there has been a history of PPROM.

4.0 Assessment, diagnosis and management of preterm labour

4.1 Initial assessment

Flow Chart for the Management of Threatened and Confirmed Preterm Labour



Consider initial assessment on TRIAGE if mild abdominal pain (as per RAG rating assessment) . In the presence of moderate to severe abdominal pain, women should be transferred to labour ward for initial assessment .

If following initial assessment, diagnosis of preterm labour is confirmed, arrange transfer to labour ward.

Following initial assessment and an established diagnosis of preterm labour, **the preterm optimisation passport** should be initiated (see appendix 3).

A full history should be taken, including details on:

- previous obstetric history
- previous medical history
- history of present pregnancy to date including gestational age from agreed EDD
- the start and timing of contractions
- any vaginal loss of blood or fluid
- urinary and bowel symptoms
- symptoms of systemic illness
- history of recent sexual intercourse

Obstetric examination should include:

- abdominal palpation to determine the lie and presentation of the fetus
- symphysial-fundal height
- abdominal ultrasound examination *by a trained operator* to assess fetal viability, presentation, estimate fetal weight, measure the liquor volume and placental site
- any evidence of uterine, suprapubic or renal angle tenderness • any palpable uterine contractions
- maternal pulse, BP, temperature and respiratory rate

Speculum examination should then be performed:

- Pass a sterile speculum
- look for a pool of liquor, significant vaginal blood and/or cervical dilatation
- if appropriate a fibronectin swab should then be taken (see below) .This should be taken **prior** to taking other vaginal swabs.
- Take swabs from the vaginal fornix (HVS), low vagina (LVS) and endocervical canal (Chlamydia) for infection screen .
- If unable to visualise the cervix or advanced dilatation is suspected, a gentle sterile digital examination can be performed to assess cervical effacement and dilation OR Transvaginal ultrasound for cervical length if skilled operator available
- Digital examination should be avoided if premature rupture of membranes is suspected
- Digital examination should be avoided if cervix is clearly visible

Investigations:

- CTG if gestation >= 28 weeks or at earlier gestation (from 26 weeks) if clinically indicated.
Urine dipstick and MSU
- Blood for FBC, CRP, G&S .
- Follow sepsis pathway if any clinical triggers of infection.

4.1.1 Fetal Fibronectin (fFN) Analysis

The Fetal Fibronectin Test is an *in vitro* diagnostic test that uses single-use, disposable cassettes called Rapid fFN 10Q Cassettes. Analysis to measure the fFN concentration in a swab taken of the cervicovaginal secretions is done using the automated *PeriLynx System.* The machine gives a result within 10 minutes of the swab being tested. The test will give a quantitative result.

Women transferred to Milton Keynes Hospital via *in utero* transfer should have an fFN swab performed if they fulfil the criteria for testing and provided, they have not had an fFN swab performed at their referral hospital. NOTE: If the woman has had a digital vaginal examination in the last 24 hours at the referring hospital, the fFN test may show a false positive result and be invalid. Testing for fFN should be delayed until 24 hours after the digital vaginal examination.

Criteria for testing:

- Women with signs and symptoms of pre-term labour between 22 & 34 weeks of gestation
- **WITH Intact membranes** AND
- Minimal Cervical dilatation (<=3cm)

Specimens should be collected prior to:

- Digital cervical exam
- Collection of culture specimens
- Vaginal probe ultrasound exams

Contraindications:

The test is not valid in the presence of:

- Ruptured membranes
- Placenta praevia
- Placental abruption
- Moderate or gross vaginal bleeding*
- Within 24 hours of sexual intercourse*
- Within 24 hours of manipulation of the cervix e.g. digital examination of the vagina or vaginal probe ultrasound exams
- Cervical cerclage (especially within 4 weeks of cerclage placement)

**If the test is <10ng/ml under either of these two testing conditions it can be interpreted as a valid result*

Avoid contaminating the cervicovaginal secretions with lubricants, soap, disinfectants, creams or jelly.

Use water to lubricate the speculum

Taking a fFN swab

The sample should be collected **before** digital examination is carried out. You will need:

- Sterile speculum
- Fibronectin swab
- Buffer solution
- PeriLynx System with Rapid fFN 10Q Cassette

Only use water to lubricate the sterile speculum (no cream or lubrication jelly)

Positive fFN result (concentration >=50ng/ml)

If fFN testing is positive (concentration more than 50 ng/ml), use the QUIPP app to calculate the % risk for preterm birth. **If the QUIPP APP risk is above 5% risk of delivery within 1 week, admit and follow the ANTENATAL OPTIMISATION PASSPORT APPENDIX 3. If fFN positive but QUiPP <5% risk of delivery within 1 week** consider differential diagnosis and home.

Explain that there is an increased risk of preterm birth within 7 days. For Guidance on use of the QUIPP APP, see appendix 5

- offer antenatal corticosteroids according to protocol below
- offer tocolysis according to protocol below
- Inform NNU and neonatal sister in charge for all gestations 22 weeks or more. The neonatal registrar or consultant should counsel the woman and partner appropriately.
- If there is no NNU cot available, then in-utero-transfer should be considered. This should be discussed with the consultant on call.

Clinical decision making adjustments in presence of shortage /non availability of Fetal Fibronectin test:

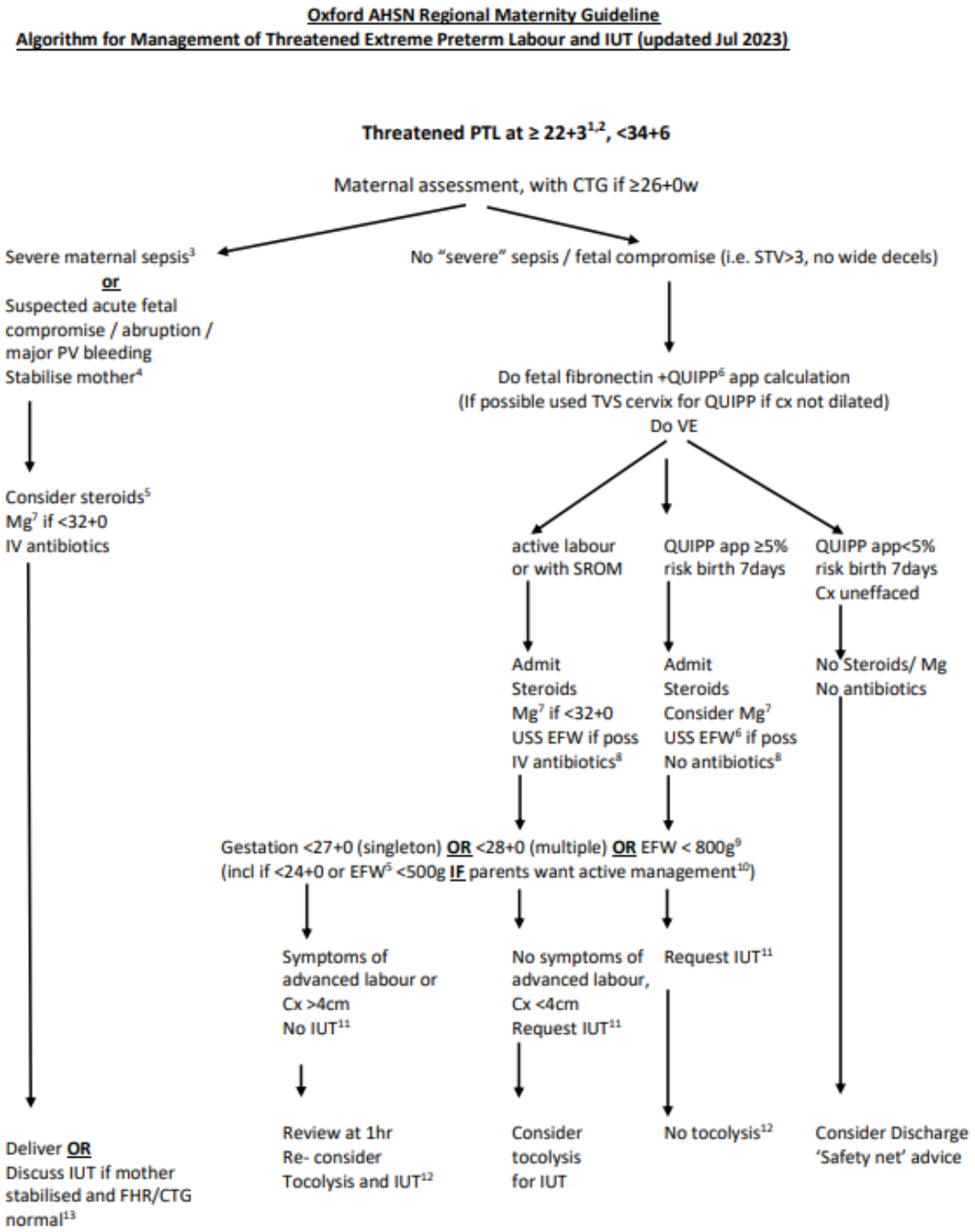
When stocks of quantitative FFN are low or absent, the use of this test on asymptomatic women should be avoided.

Women presenting in threatened preterm birth can be assessed with an alternative test called **Partosure**.

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.

If the test is positive, the woman should be recommended to deliver in an appropriate unit and receive optimisation medication.

5.2 Management of pregnant women presenting with Threatened Extreme Preterm Labour- Please refer to Oxford AHSN algorithm below



Oxford AHSN Regional Maternity Guideline

Algorithm for Management of Threatened Extreme Preterm Labour and IUT (updated Jul 2023)

Footnotes:

1. Dates according to CRL excl in IVF pregnancies. Note this gestation has been modified following new BAPM Guidelines. Active resuscitation for neonates <23+0 will be offered if there are good prognostic (eg >/+22+3, had steroids, delivery in Level 3). If there is uncertainty about the circumstances or the dates, call obstetric consultant at OUH.
2. Women potentially suitable for emergency cerclage (i.e. >14 weeks, no sepsis and with painless cervical opening) should be discussed with Level 3 FMU consultant.
3. Sepsis meeting criteria for local severe sepsis bundle
4. Stabilisation of acutely unwell mother beyond scope of this document
5. Steroids with caution in severe sepsis. Ensure antibiotics first
6. Using Point of care test (fibronectin) +/- TVS cervix to improve accuracy. Available as app on mobile device.
7. Mg: Magnesium bolus 4g (16mmol) Magnesium Sulphate as 20mls of 20% magnesium sulphate IV over 5 – 10 minutes if <32+0 weeks. Note PReCePT suggests 30 but clinical benefit up to 32 weeks
8. IV antibiotics indicated, but not if QUIPP app high risk but cervix not dilated. Follow unit antibiotic guideline; avoid co-amoxiclav.
9. Criteria for birth in a Level 3 unit and NICU. If criteria not met, manage as per local preterm labour guideline
10. If time, offer discussion with paediatrician. Document any discussion regarding IUT with parents. Consider providing Thames Valley neonatal network patient information leaflets if available Patient Information leaflets Extreme Prematurity
11. For IUT: try OUH first. 08.00-21.30 call Delivery Suite (01865 221987/8), and specifically request to speak to the consultant obstetrician on Delivery Suite. DO NOT call NICU or Delivery Suite manager first. Between 21:30 – 08:00 call OUH switchboard (01865 741166) and request to speak to the obstetric consultant on call. If IUT is agreed between 21:30 – 08:00, then call delivery Suite to complete required handover forms. If no OUH availability, use PeriDASH South East Perinatal Maternity Bed and Neonatal Cot Locator - Power Apps and SONeT (Southampton Oxford Neonatal Transport)
12. Tocolysis. Follow unit tocolysis guideline. Do not use nifedipine if magnesium has been given or is to be given
13. Consider discussion with Level 3 obstetrician on call

6.0 Antenatal Corticosteroids

Offer steroids to all women with preterm labour between 22+3 weeks to 34+6 weeks & follow region-wide **Oxford AHSN Maternity Network Guideline: use of antenatal corticosteroids: singletons and multiple births guideline**.

Neonatal stabilisation may be considered for babies born from 22+0 weeks of gestation following assessment of risk and multiprofessional discussion with parents. It is not appropriate to attempt to resuscitate babies born before 22+0 weeks of gestation. Therefore, fo**r pregnancies at 22 weeks and above, neonatal teams at MKUH should be informed**.

The effect of treatment is optimal if the baby is delivered more than 24 hours after administration of corticosteroids and less than 7 days after the start of treatment.

Oxford Academic Health Science Network MATERNITY

Oxford Patient Safety Collaborative

Oxford AHSN Maternity Network Guideline: use of antenatal corticosteroids: singletons and multiple births

Authors: Mr Lawrence Impey and Oxford AHSN Maternity Network V1 FINAL Ratified 24/11/2022

Dose: 12mg betamethasone or dexamethasone, repeated 24 hours later. Only repeat earlier (at 12 hours) if birth likely <24 hours of first dose.

1. 22+3[1]-34+6 weeks: indications for recommending [2]:

Threatened PTL:	If QUiPP [3] app suggests >5% risk of birth < 7days.	
	If clinically in active labour (cx effaced and regular, painful contractions)	
Preterm SROM:	If confirmed by speculum	
	If good history and POC test + (not if poor history [4] of SROM and POC test +)	
FGR/PET<34w:	If <32w:	at diagnosis of AREDF [5] (deliver by 32w)
		or abnormal antenatal CTG (decelerations or STV<4[6])
	If 32+0-34+6:	if umbA >95th c and EFW <3rd c [7]
		if birth planned <34+6 weeks
Other:	Maternal sepsis: ensure adequate resuscitation and IV antibiotics given first[8]. Birth must not be delayed to allow steroids 'to work'	
	Consider if other serious maternal illness, admitted for severe pre-eclampsia (beware pulmonary oedema)	
	Bulging membranes; significant PVB, severe abdominal pain etc	
	<1 week before any planned CS <34+6 weeks	
>7 days since steroids:	A single 'repeat course' should be considered if > 7 days since first course, if birth <30+0 is planned or *highly likely* to be <7 days [9]. The risks/ benefits should be discussed with the parents.	

2. >34+6 <37+0: recommend steroids if:[10]

Fetal lung issue:	Specifically, fetal lung abnormality/cardiac problem likely to cause lung issues. Give for all indications as above (i.e. if birth anticipated at <37+0 in <7 days)
Pre-labour CS, <37+0:	<1 week before any planned CS <37+0 weeks
Other indications:	(i.e. all above: section 1 and birth anticipated at <37+0 in <7 days.) Recommend RCOG based decision tool[8] for all above indications and *only give if* parents request. This includes women with diabetes or GDM.
>7 days since steroids	repeat not advised

Oxford Academic Health Science Network MATERNITY

Oxford Patient Safety Collaborative

Oxford AHSN Maternity Network Guideline: use of antenatal corticosteroids: singletons and multiple births

Authors: Mr Lawrence Impey and Oxford AHSN Maternity Network V1 FINAL Ratified 24/11/2022

3. >36+6<39+0 weeks: recommend steroids If [10]:

Fetal lung issue:	Specifically, fetal lung abnormality/cardiac problem likely to cause lung issues. Give for all indications (i.e. if birth anticipated at <39+0 in <7 days)
Other indications:	Not advised. This includes women with diabetes or GDM.
>7 days since steroids	repeat not advised

Notes:

1. Wait for 22+3
2. From 22+3 weeks-26+6 weeks (or twins 27+6 weeks or any EFW <800g) IUT to Level 3 NNU advised if criteria for steroids met. Also consider MgSO4 if birth likely <12 hours.
3. QUiPP app ('symptomatic' part) has better sensitivity and specificity: meaning better timing. Needs quantitative fetal fibronectin +/- TVS cervix. https://apps.apple.com/gb/app/quipp/id964256400. Cervical scan results improve prediction but is not mandatory.
4. False positive rates of POC tests can be high.
5. AREDF usually lasts for several days before there is decompensation particularly in more preterm fetuses. Note steroids may be followed by temporary return of EDF
6. Delivery likely within 48 hours if present and AEDF not always present before decompensation. STV <3 a criterion for delivery <24 hours under most circumstances
7. At this gestation AREDF is indication for birth: these criteria suggest high risk of birth <7 days
8. WHO recommendation against giving steroids where 'chorioamnionitis'. Based on data from non-high income countries. Given frequency of chorioamnionitis, usually subclinical, with preterm birth this appears to contradict data from populations more relevant to the UK.
9. This is controversial but given increased mortality risk without steroids, benefits probably > risks, particularly at extreme preterm gestations. https://journals.plos.org/plosmedicine/article/file?id=10.1371/journal.pmed.1002771&type=printable. 30 weeks was chosen as corresponding to average gestation in most trials' participants.
10. At this gestation steroids reduces RDS but this should be set against the risk of hypoglycaemia and probable long term issues in the child. https://obgyn.onlinelibrary.wiley.com/doi/epdf/10.1111/1471-0528.17027.

Corticosteroids:

Contraindications:

- Active tuberculosis

Caution:

- Systemic maternal sepsis. In the presence of definite evidence of chorioamnionitis, the administration of betamethasone should first be discussed with the on-call consultant and its relative merits and potential adverse effects discussed.
- In Gestational diabetes or type1/2 diabetes steroids can exacerbate hyperglycaemia and the course of steroids may need to be given in conjunction with extra doses of insulin (see MKH guidelines on gestational diabetes).

The most extensively studied regimens of corticosteroid treatment for the prevention of RDS are two doses of betamethasone 12 mg given intramuscularly (IM) 24 hours apart or four doses of dexamethasone 6 mg given intramuscularly 12 hours apart.

However, as long as 24 mg of either drug is given within a 24–48-hour period, any dosing regimen can be used.

At Milton Keynes university hospital, steroids regime should be prescribed as follows:

Betamethasone 12 mg IM as 2 doses 12 to 24 hours apart

(Refer to the following trust guideline for further information: Antenatal corticosteroids to reduce neonatal morbidity and mortality)

6.1 Tocolytics

Tocolysis aims to:

- delay delivery
- allow steroid administration
- allow time for transfer to another unit when NNU has no available cots

Contraindications

- Gestation is over 34 weeks
- Placental abruption
- Antepartum haemorrhage associated with placenta previa
- Evidence or strong suspicion of chorioamnionitis[7]
- Abnormal CTG
- After delivery of first preterm twin
- Atosiban is not licensed for use in women under 18 years of age
- Any situation where delaying delivery would be harmful to the mother

Tocolysis can be considered in preterm premature rupture of the membranes to buy time for maternal corticosteroids to have maximum benefit or to allow *in utero* transfer to another hospital. However, care should be taken when there is evidence or suspicion of chorioamnionitis.

If the decision is made to use a tocolytic drug, Nifedipine and Atosiban appear to have

comparable effectiveness in delaying delivery, with fewer maternal adverse effects and less risk of rare serious adverse events than alternatives such as Ritodrine or Indomethacin. Ritodrine and Atosiban are licensed in the UK for the treatment of threatened preterm labour. Although the use of Nifedipine for preterm labour is an unlicensed indication, it has the advantages of oral administration and a low purchase price. The available evidence should be discussed with the woman and her partner and their preferences taken into account in determining her care.

Although Nifedipine is not licensed in the UK (and thus the responsibility lies with the prescribing doctor), there is considerable experience with its use in this clinical situation and is also recommended by the Royal College of Obstetricians and gynaecologists (2011). Nifedipine also has the advantage as it can be given orally. **Nifedipine should therefore be used first line** unless there are any contraindications.

Evidence shows that Nifedipine and Atosiban have comparable effectiveness at delaying birth for up to 7 days (RCOG green top guideline 1b). It is as effective as ß agonists such as Ritodrine, but it has fewer side effects. **Atosiban is therefore the second line** choice for tocolytic when Nifedipine is contraindicated.

Nifedipine:

Contraindication:

- Allergy to Nifedipine
- Cardiac disease
- Severe hypotension
- Concurrent use of IV salbutamol, transdermal nitrates (GTN), or antihypertensive agents.

Use with caution:

- Diabetes
- Multiple pregnancy due to risk of pulmonary oedema
- Impaired liver function, dose reduction may be required in severe impairment.
- Concurrent use of IV magnesium sulfate due to risk of hypotension

Dose:

The suggested dose of Nifedipine is an initial oral dose of 20 mg followed by 10–20 mg three to four times daily, adjusted according to uterine activity for up to 48 hours. A total dose above 60 mg appears to be associated with a three- to four-fold increase in adverse events such as headache and hypotension.

Side effects:

- Hypotension – if significant hypotension occurs treatment should be discontinued.
- Tachycardia, palpitations
- Flushing, headaches, dizziness and nausea
- Hyperglycaemia (Rarely)

Atosiban:

Contraindications:

- Eclampsia and severe pre-eclampsia
- Intra-uterine infection
- Intra-uterine foetal death

- Antepartum haemorrhage (requiring immediate delivery)
- Placenta praevia
- Abruptio placenta
- Intrauterine growth restriction with abnormal foetal heart rate
- Premature rupture of membranes after 30 weeks gestation.

Dose and Administration:

Step	Regimen	Infusion rate	Atosiban dose
1	Initial bolus	Over 1 minute	6.75 mg
2	3-hour high dose Intravenous infusion	24ml / hr	18mg / hr
3	low dose Intravenous Infusions for up to 45 hours	8ml / hr	6mg / hr

Step 1

IV bolus of 6.75mg over 1 minute:

- The vial comes ready prepared as a 0.9ml IV injection containing 6.75mg.
- Draw up the 0.9ml (6.75mg) and dilute with 10ml of sodium chloride 0.9%.
- Inject via IV bolus over 1 minute.

Step 2

3-hour continuous high dose IV infusion:

- Remove and discard 10ml from a 100ml bag of sodium chloride 0.9%
- Add the contents of two 5ml Atosiban 7.5mg/ml vials in to the bag.
- The resulting solution will contain 75mg of Atosiban (0.75mg/ml)
- Give by IV infusion at a rate of **24ml/hour** (i.e.18mg/hour) for **3 hours**

Step 3

Continuous low dose infusion:

- Once the high dose infusion has completed (after 3 hours)
- Reduce the infusion rate to **8ml/hour** (i.e. 6mg/hour) for up to **45 hours**

Maximum duration of treatment with Atosiban must not exceed 48hours.

Use a Baxter infusion pump for setting the infusion rates

Observations:

- BP and pulse hourly
- Continuous CTG, monitor contractions
- Temperature and respiration rate 4 hourly • No need for routine BM's

All observations should be contemporaneously recorded on ECARE MEOWS chart and escalate as per trust guidelines.

Side effects:

- Nausea, vomiting
- Tachycardia
- Hypotension
- Headache
- Dizziness
- Hot flushes
- Hyperglycaemia
- NB: The most common side effect is nausea; therefore, antiemetics may be required.

There is insufficient evidence for any firm conclusions about whether or not maintenance tocolytic therapy following threatened preterm labour is worthwhile. Thus, maintenance therapy is not recommended

6.2 Magnesium Sulfate for neuroprotection

PReCePT (The preventing cerebral palsy in preterm labour) & NICE guideline on *Preterm labour & Birth* suggest offering MagSO4 for neuroprotection of the baby before 30 weeks but clinical benefit is seen up to 32 weeks *(New Meta-Analysis: Crowther et al, Assessing the neuroprotective benefits for babies of antenatal magnesium sulphate: An individual participant data meta-analysis, 2017, PLoS Medicine)*

Oxford AHSN guideline therefore advises to offer Magnesium sulphate for neuroprotection to women from 22+3 weeks to *under 32 weeks* at high risk of imminent preterm delivery within 12 hours. (see oxford AHSN flowchart).

NICE Guidance on *Preterm labour & Birth* advises to *consider* intravenous magnesium sulfate for neuroprotection of the baby for women between 30^{+0} and 33^{+6} weeks of pregnancy who are in established preterm labour or having a planned preterm birth within 24 hours.

6.2.1 Evidence

The Cochrane review by Doyle et al concluded that antenatal magnesium sulphate therapy given to women at risk of preterm birth substantially reduced the risk of cerebral palsy in their children with a relative risk (RR) of 0.68 (95%CI 0.54–0.87). There was also a significant reduction in the rate of substantial gross motor dysfunction (RR 0.61; 95% CI 0.44–0.85)

The RCOG Specialist Advisory Committee Opinion paper (29) concluded that Magnesium Sulfate given to mothers shortly before delivery reduces the risk of cerebral palsy and protects gross motor function in those infants born preterm.

National recommendations are that both a bolus and an infusion are used.
Magnesium infusions require intensive monitoring and therefore increase workload. Adverse events have also been reported.
The most recent meta-analysis by Crowther et al (2017) concludes that a bolus plus infusion regime is ***not superior*** to a bolus only regime and that some benefit is gained up to at least 32 weeks. It is therefore suggested a ***bolus only regime*** is used and that Mg is used up to 32+0 weeks.

6.2.2 Eligibility

At Milton Keynes University hospital, Mg SO4 should be offered to mothers from 22+3 weeks to under 32 weeks (consider upto 33+6 weeks) who are at high risk of delivery within 12 hours i.e.

1. Planned CS at time of preparation of anaesthetic.
2. Confirmed preterm labour, especially if Cervix > 4cm dilated

For those women suitable for IUT, please discuss with Obstetric on call team at OUH /tertiary centre whether to give MAGSO4 prior to transfer.

6.2.3 Preparation & administration

Bolus: Take one 20 ml syringe and fill with the contents of two 10ml ampoules of 20% Magnesium Sulphate. This contains 4g (16mmol) of Magnesium Sulphate.
Give the 4g (16mmol) Magnesium Sulphate by slow IV bolus, over 5-10 minutes.

6.2.4 Timing and Repeat doses of neuroprotective dosage

Magnesium Sulphate can be given just prior to birth and is effective within minutes.
If birth is imminent >12 hrs after a bolus has been given, ***the loading dose can be repeated.***
The 4g bolus is sufficient because of lack of evidence for better outcomes with infusions, in conjunction with manpower /risk issues with prolonged infusions.

6.2.5 The Antidote for Magnesium Sulfate Is Calcium Gluconate

The dose is 1g calcium gluconate IV. This pack contains a 10ml ampoule of 10% calcium gluconate, which should be administered IV over 10 minutes. Calcium gluconate should only be given under Consultant/Registrar supervision.

7.0 "Rescue" cervical cerclage

The decision for emergency or 'rescue' cerclage insertion is based on the clinical presentation. Emergency cervical cerclage implies cervical dilatation and therefore bulging membranes into the vagina, seen on speculum examination.

Nice Guidance 2019 advises not to offer 'rescue' cervical cerclage to women with:

- signs of infection **or**
- active vaginal bleeding **or**
- uterine contractions

Nice guidance 2019 advises to Consider 'rescue' cervical cerclage for women between 16^{+0} and 27^{+6} weeks of pregnancy with a dilated cervix and exposed, unruptured foetal 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 women for whom 'rescue' cervical cerclage is being considered (and their family members or carers as appropriate):

- about the 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

If "rescue" cervical cerclage is used, ensure that a plan is in place for removal of the suture which will usually be offered at 37 weeks

8.0 Intrapartum antibiotics

NICE guideline on prevention & treatment of neonatal infection [NG195 published 20 April 2021] suggests the following antibiotics regime for preterm labour:

Allergies	**Women without chorioamnionitis**	**Women with chorioamnionitis**
No penicillin allergy	Use Benzylpenicillin.	Use Benzylpenicillin plus gentamicin plus metronidazole.
Penicillin allergy that is not severe	Use Cephalosporin with activity against group B streptococcus (for example cefotaxime). Use with caution.	Use Cephalosporin with activity against group B streptococcus (for example cefotaxime) plus metronidazole. Use with caution.
Severe penicillin allergy	Consider: Vancomycin **or** An alternative antibiotic that would be expected to be active against group B streptococcus based on either sensitivity testing performed on the woman's isolate or on local antibiotic susceptibility surveillance data.	Consider: Vancomycin plus gentamicin plus metronidazole **or** An alternative antibiotic to vancomycin that would be expected to be active against group B streptococcus based on either sensitivity testing performed on the woman's isolate or on local antibiotic susceptibility surveillance data plus gentamicin plus metronidazole.

9.0 Fetal monitoring

Discuss with women 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).

Involve a senior obstetrician in discussions about whether and how to monitor the fetal heart rate for women who are between 23^{+0} and 25^{+6} weeks pregnant.

Explain the different fetal monitoring options to the woman (and her family members or carers as appropriate), being aware that:

- 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 (see monitoring during labour in the NICE guideline on intrapartum care)
- 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 foetal hypoxia or acidosis is present.

Explain to the woman (and her 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 the baby compared with intermittent auscultation.

Offer women in established preterm labour but with no other risk factors (see monitoring during labour in the NICE guideline on intrapartum care) a choice of foetal heart rate monitoring using either:

- cardiotocography using external ultrasound **or**
- intermittent auscultation.

9.1 Fetal scalp electrode

Do not use a fetal scalp electrode for fetal heart rate monitoring if the woman 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 and are unacceptable to her.

Discuss with the woman (and her family members or carers as appropriate) 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.

10. 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 P-PROM (and their family members or carers as appropriate).

Explain to women in suspected, diagnosed or established preterm labour and women with P-PROM 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.
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 very limited.
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.

Timing of cord clamping for preterm babies (born vaginally or by caesarean section)

Perform delayed cord clamping for 1 minute if the baby is stable. Optimal Cord Management reduces death in preterm babies by nearly a third.

Position the baby at or below the level of the placenta before clamping the cord.

Contraindications:
The need for maternal resuscitation in the face of massive, acute haemorrhage would be a rare, justifiable reason to proceed with early clamping of the cord.

A ruptured vasa praevia, snapped cord or other trauma to the cord vessels which will result in haemorrhage from the baby are also reasons for early cord clamping.

BAPM recommends that units should only reserve umbilical cord milking for those rare situations such as maternal collapse requiring resuscitation where cord clamping is required to be expedited for maternal safety. In these cases, the reason must be documented. Do not perform cord milking if baby is <28 weeks

Please contact MKUH library service for the latest guidance to help steer this documents contact Extn: 85065

11.0 References:

BAPM Optimal Cord Management Toolkit available at: Optimal Cord Management Toolkit | British Association of Perinatal Medicine (bapm.org)

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Additional references

These documents are presented for you to consider and add to the list of references for this guideline as appropriate.

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BAPM Antenatal Optimisation for Preterm Infants less than 34 weeks A Quality Improvement Toolkit (2020) available at: AO_Toolkit_FULLTOOLKIT_11-2-21.docx.pdf (hubble-live-assets.s3.amazonaws.com)

Bond, D.M., et al. (2017) Planned early birth versus expectant management for women with preterm prelabour rupture of membranes prior to 37 weeks' gestation for improving pregnancy outcome. *Cochrane Database of Systematic Reviews* 2017, Issue 3. Art. No.: CD004735. DOI: 10.1002/14651858.CD004735.pub4. Available from: https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD004735.pub4/full [Accessed 10 October 2019]

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Sharp, G.C., Stock, S.J. and Norman, J.E. (2014) Fetal assessment methods for improving neonatal and maternal outcomes in preterm prelabour rupture of membranes. *Cochrane Database of Systematic Reviews* 2014, Issue 10. Art. No.: CD010209. DOI: 10.1002/14651858.CD010209.pub2. Available from: https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD010209.pub2/full [Accessed 10 October 2019]

Shepherd, E., et al. (2017) Antenatal and intrapartum interventions for preventing cerebral palsy: an overview of Cochrane systematic reviews. *Cochrane Database of Systematic Reviews* 2017, Issue 8. Art. No.: CD012077. DOI: 10.1002/14651858.CD012077.pub2. Available from: https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD012077.pub2/full [Accessed 10 October 2019]

Tchirikov, M., et al. (2018) Mid-trimester preterm premature rupture of membranes (PPROM): etiology, diagnosis, classification, international recommendations of treatment options and outcome. *Journal of Perinatal Medicine* [Online] **46** (5), pp.465-88. Available from: https://www.degruyter.com/downloadpdf/j/jpme.2018.46.issue-5/jpm-2017-0027/jpm-2017-0027.pdf [Accessed 11 October 2019]

12.0 Governance

12.1 Document review history

Version number	Review date	Reviewed by	Changes made
8.0	Oct 2023	Maternity guideline group	Amalgamation of PPROM and preterm birth, and corticosteroids guidelines
8.1	Jan 2024	Alex Fry	Amended Audit criteria to reflect audits that are completed for MIS compliance.

5.2 Consultation History

Include staff in consultation who will be required to ensure the Guideline is embedded. This table should be completed in full even if no comments are received

Stakeholders Name/Board	Area of Expertise	Date Sent	Date Received	Comments	Endorsed Yes/No
Maternity Guideline group		Oct 2023	Oct 2023	Amalgamation of PPROM and preterm birth, and corticosteroids guidelines	Yes
Women's Health Guideline Review Group	Maternity	03/01/2024	-	Version 8.1 approved as chairman's action	Yes

12.3 Audit and monitoring

How will compliance of this Guideline be evidenced?.

Audit/Monitoring Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee/Board
Audit to be completed against SBLV3 audit criteria, element 5, section 5.2-5.24	SBLV3 audit tool element 5	Governance team	Quarterly	Maternity governance report
Adverse Maternal / neonatal outcome associated with preterm birth	RADAR	Governance team	Per incident	MatNeo, PMRT, referral to MNSI, safety MDT, 72 hour report, where appropriate

12.4 Equality Impact Assessment

As part of its development, this Guideline and its impact on equality has been reviewed. The purpose of the assessment is to minimise and if possible remove any disproportionate impact on the grounds of race, gender, disability, age, sexual orientation, religion or belief, pregnancy and maternity, gender reassignment or marriage and civil partnership. No detriment was identified. Equality Impact assessments will show any future actions required to overcome any identified barriers or discriminatory practice.

Equality Impact Assessment			
Division		**Department**	
Person completingthe EqIA		**Contact No.**	
Others involved:		**Date of assessment:**	
Existing policy/service		**New policy/service**	

Will patients, carers, the public or staff be affected by the policy/service?	
If staff, how many/which groups will be effected?	

Protected characteristic	**Any impact?**	**Comments**
Age	NO	
Disability	NO	
Gender reassignment	NO	
Marriage and civil partnership	NO	
Pregnancy andmaternity	NO	
Race	NO	
Religion or belief	NO	
Sex	NO	
Sexual orientation	NO	

What consultation method(s) have you carried out?	
How are the changes/amendments to the policies/services communicated?	
Review date of EqIA	

Appendix 1: AmniSure test

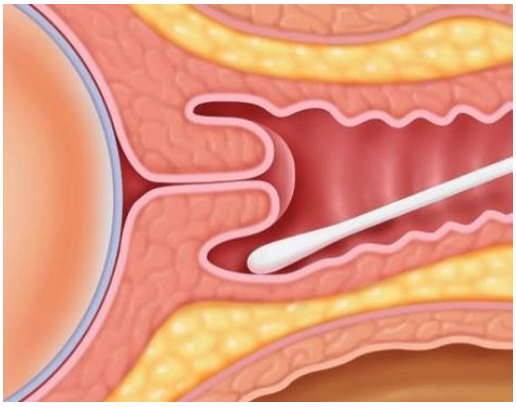
It is a rapid qualitative immunochromatographic test for invitro detection of amniotic fluid in vaginal discharge in pregnant women. Kit is stored at a dry place at 4 to 25C.
CAUTION:
Amnisure ROM test should not be performed within 6 hours after removal of any disinfectant solutions or medicines from vagina.
Do not Perform a digital examination prior to sample as this can lead to inaccurate test results.
Placenta previa can also lead to inaccurate test results

AMNISURE TEST PROCEDURE:

1: Shake solvent vial , keep in vertical position and open solvent vial.
2:Use swab provided. Hold swab by the middle of shaft and while patient is lying on her back carefully insert the swab into the vagina until fingers contact the skin (no more than 5-7 cm deep). Withdraw the swab from vagina after 1 minute.
3:Place the swab in the solution provided and rinse the swab by rotating for 1 minute. Remove and dispose the swab.
4: Test the sample within 30 minutes after collection.
5: Insert white end of Amnisure ROM strip into the solution vial for 5 minutes.
Interpretation:
Two lines: There is a rupture
One line: No rupture
No lines: invalid test : Run another test.

Limitations:
In rare cases when a sample is taken after 12 hours or later after rupture of membranes. Periodic retesting in such cases can be considered.
In cases of trace amount of blood test functions properly, but in presence of significant amount of blood, the test malfunctions and is not recommended.
Results should be used in conjunction with other clinical information. The test claims 98.9% sensitivity and 100% specificity.

Appendix 2: fFN testing



STEP 1

During speculum examination, lightly rotate the supplied swab across the posterior fornix of the vagina for 10 seconds to absorb cervicovaginal secretions

STEP 2
Remove swab and immerse tip in buffer. Gently mix the swab in the buffer solution and remove if the test is to be performed immediately

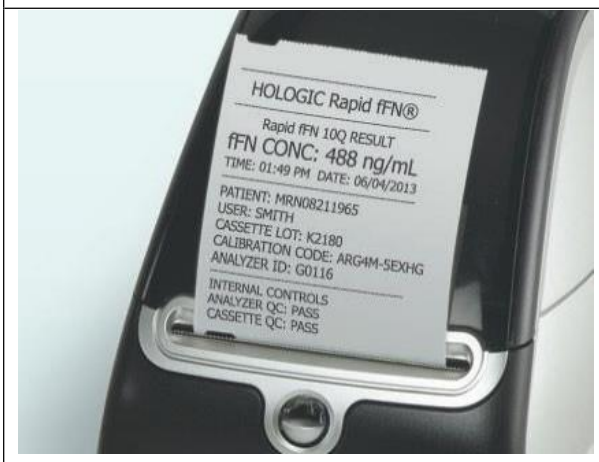
Note: *Refer to transportation and storage notes overleaf if test is to be performed at a later time.*

STEP 3
Enter User ID, Press 'NEXT'

Enter Rapid fFN 10Q Cassette lot number and press 'NEXT'

Enter Patient ID and press 'NEXT'

Insert the Rapid fFN 10Q Cassette and press 'NEXT'

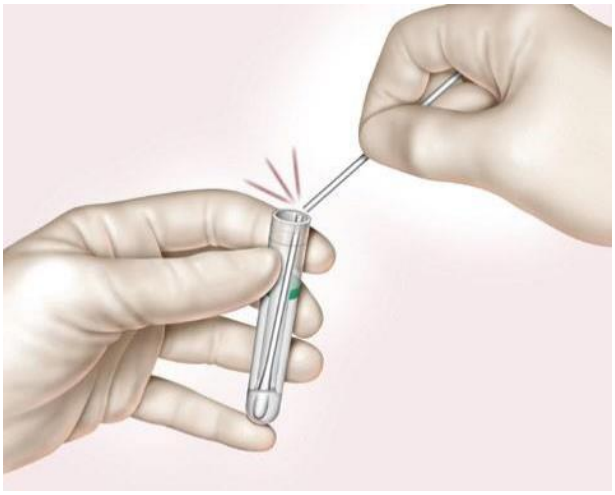
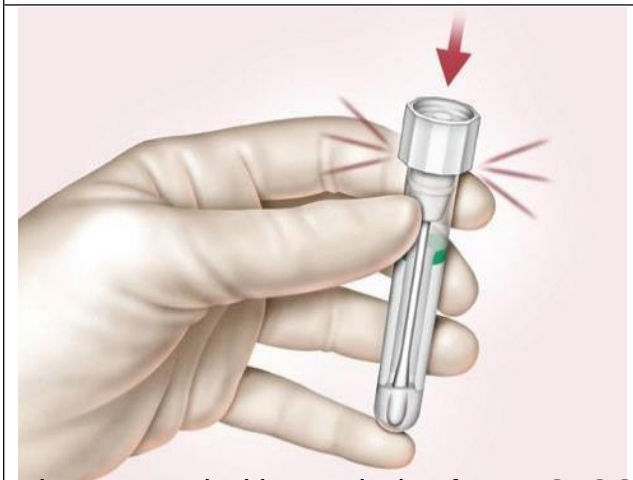
	STEP 4 Pipette **0.2mL (200µl)** from the sample collected in the buffer solution into the well of a Rapid fFN 10Q Cassette and press 'START TEST'
	STEP 5 Internal Quality Control results can be found on the print out The fFN concentration will be displayed and printed in 10 minutes A permanent record is now available for patient notes ***Note:*** *Press Print to obtain a second copy of the printout.*

Pictures used with permission from HOLOGIC

Transportation of Collected Sample (In instances where a patient sample is not processed immediately)

- Transport samples at 2-25°C, or frozen
- Samples are stable for up to 8 hours at room temperature
- Samples not tested within 8 hours of collection must be stored refrigerated at 2-8°C and tested within 3 days of collection, or frozen and tested within 3 months to avoid degradation of the

analyte.

 Break the shaft (at the score) even 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 ***Warning:*** *The shaft must be aligned to avoid leakage* Send fFN sample to a Rapid fFN PeriLynx Analyser near you	
 Pictures used with permission from HOLOGIC	

Appendix 3 Perinatal Optimisation Pathway Passport

Perinatal Optimisation Pathway Passport

British Association of Perinatal Medicine

This passport must be completed for all women at risk of birth before 34 weeks' gestation and should accompany the baby on admission to neonatal care.

Time of birth: _ _ : _ _ Gestation: /40
Type of birth: Birth weight: g
Time of admission to NNU: _ _ : _ _
Apgars: @1 @5 @10
Booking Hospital:

Name:
DOB:
Hosp No:
NHS No:
Or patient sticker here

1. Place of Birth:

Aim: babies <27/40, EFW <800g or multiple pregnancy <28/40 should be born in maternity centre with a NICU

Born in a maternity centre with the appropriate designation of neonatal unit?

Y ☐ N ☐ N/A ☐

If not, why was intrauterine transfer not achieved?

2. Antenatal Steroids:

Aim: women giving birth before 34 weeks should receive a full course of steroids no longer than 7 days prior to birth

Full course of antenatal steroids (2 doses 12-24hrs apart)?

Y ☐ N ☐ N/A ☐

Last dose: Date: / / Time: :

If a full course of optimally timed steroids was not achieved, why?

3. Antenatal Magnesium

Aim: women giving birth before 30 weeks should receive a loading dose and ideally a 4-hour infusion in the 24 hours prior to birth

Loading dose given? Y ☐ N ☐ N/A ☐

Was a 4-hour infusion given within 24 hours prior to birth?

Y ☐ N ☐

If optimally-timed Magnesium was not achieved, why?

4. Antibiotic Prophylaxis

Aim: women in established preterm labour should receive intrapartum antibiotic prophylaxis to prevent early onset GBS infection

Required? Y ☐ N ☐

Given > 4hrs before birth? Y ☐ N ☐

If no antibiotic prophylaxis given or antibiotic given within 4h, why?

5a. Early Breast Milk (antenatal info)

Aim: women at risk of preterm birth should receive information about the importance of breast milk

Antenatal counselling and advice for mother re benefits of MBM and early & frequent expressing?

Y ☐ N ☐ N/A ☐

Supplemental information given eg. Written / digital

Y ☐ N ☐ N/A ☐

If not given, why?

6. Optimal Cord Management (OCM)

Aim: the umbilical cord should be clamped at or after one minute following birth

Was the umbilical cord clamped at or after one minute?

Y ☐ N ☐ N/A ☐

Time of OCM: __ minutes __ seconds

If no OCM, why?

7. Thermal Care

Aim: babies should have an admission temperature taken within one hour and this should be between 36.5-37.5C

Admission Temp between 36.5°C to 37.5°C ?

Y ☐ N ☐ N/A ☐

Admission Temp: °C

If normothermia was not achieved, why?

5b. Early Breast Milk

Aim: all mothers should be supported to express within 2 hours of birth

All babies should receive their own mother's milk within 24 hours of birth and ideally within 6 hours

Mother helped to express within 2h of birth?

Y ☐ N ☐ N/A ☐

Date: / / **Time:** :

Colostrum first available: **Date:** / / **Time:** :

Colostrum given to baby: **Date:** / / **Time:** :

If not achieved within first 24h, why?

www.bapm.org/pop www.weahsn.net/periprem

This passport has been modified with kind permission from PERIPrem.

Appendix 4: BAPM antenatal optimization for infants less than 34 weeks

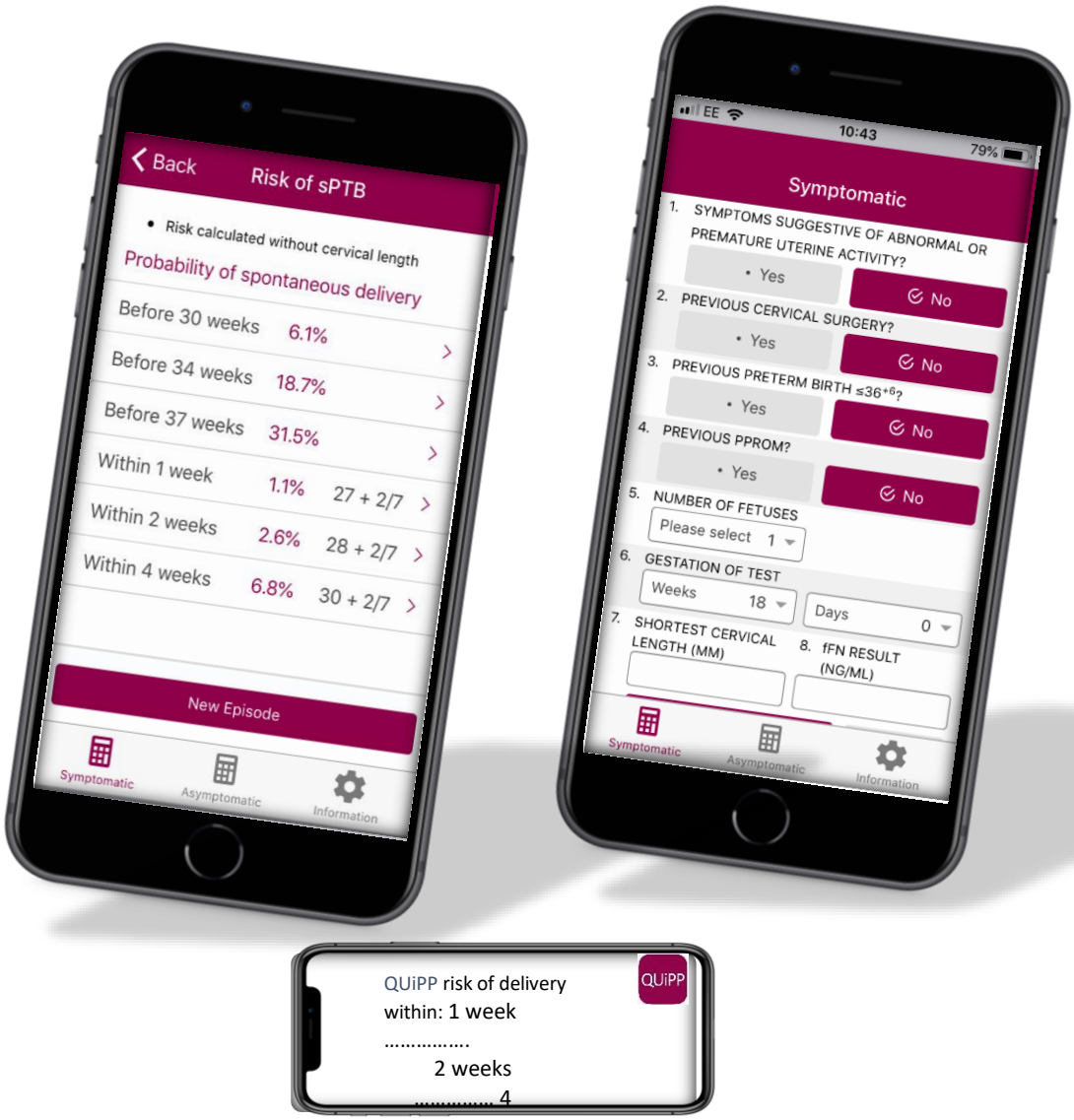
A link to the BAPM antenatal optimization for infants less than 34 weeks can be found:

AO_Toolkit_FULLTOOLKIT_11-2-21.docx.pdf (hubble-live-assets.s3.amazonaws.com)

Appendix 5: The QUIPP® App

The QUIPP app

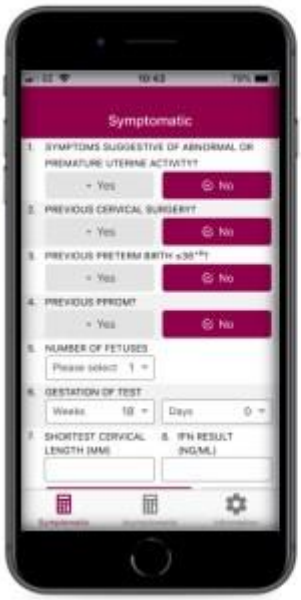
- Free to download on Apple and Android– search 'QUiPP' • Website version available at: www.quipp.org
- Gives individualised scores for risk of having a spontaneous preterm delivery
- Uses medical history, her quantitative Fetal Fibronectin result and/or cervical length
- 3 separate algorithms [a) fFN only, b) cx length only, c) fFN and cx length combined]
- We use the actual concentration of fFN in the app (no cut off)
- Decision-support tool



weeks

……

The App interface looks like this for symptomatic women:



How to use QUIPP APP

1. This should be yes because she is pregnant and at your unit with symptoms
2. Cervical surgery includes large loop excision of transformation zone, laser treatments or cone biopsy
3. This refers to a spontaneous preterm birth at 36+6 or less
4. This refers to a spontaneous premature rupture of membranes in a previous pregnancy
5. The app can be used in twins or singletons
6. The current gestation of the woman
7. Her cervical length via transvaginal scan (within the last 24 hours only). If you do not have a result for this please leave this section blank
8. The woman's quantitative Fetal Fibronectin result

Press calculate!

This woman has a risk of less than 0.1% of delivering within the next week.

If this was more than 5% you may consider admitting her, giving her steroids and/or transferring to another unit.

You can use the longer term predictions to decide when to see her again.

If you click on any of the result scores you get a donut illustration of the woman's risk score. You can use this to explain the results to the woman, and to aid shared decision-making.

If you require more information, look at the other resources in the toolkit such as the FAQ section.

You can also look at the information section on the App, or contact us at quippapp@gmail.com