Humber and North Yorkshire
Health and Care Partnership

Humber and North Yorkshire
Local Maternity and Neonatal System

Guideline for the prevention and prediction of preterm birth and optimising perinatal care of the preterm infant

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Approved by	Version 1 written by Dr Elizabeth Bonney and Mr Nigel Simpson and approved by HCV LMS Preterm Birth Working Group 2021. Version 2 updated by Anna Fox and approved by HNY LMNS Clinical Leads and LMNS PQSG.
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1: Introduction

Preterm birth (PTB), defined as delivery at less than 37^{+0} weeks gestation, is a common complication of pregnancy affecting 8% of births in England and Wales.[1] 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. PTB is estimated to cost health services in England and Wales £3.4bn per year.

The National Maternity Safety Ambition has set a target to reduce the rate of preterm birth to 6% and focus on three intervention areas to improve outcomes which are prediction and prevention of preterm birth and better preparation when preterm birth is unavoidable.

1.1 Purpose of the Guideline

- To aid the prediction and prevention of preterm births and promote the provision of optimal perinatal care when preterm birth cannot be prevented.
- To provide strategies to identify women at risk of spontaneous preterm birth (sPTB), screening/preventive options for these women, and management of suspected preterm labour, preterm prelabour rupture of membranes (PPROM) and imminent preterm birth.
- To improve the diagnosis and management of women in preterm labour between 22 + 0 weeks and 36 + 6 weeks of pregnancy.
- To improve the outcomes for babies born preterm.

1.2 Scope and Exclusions

This guideline applies to all pregnant women booked for maternity care within the Humber and North Yorkshire (HNY) Local Maternity and Neonatal System (LMNS). It also includes women presenting with suspected preterm labour who are un-booked or booked elsewhere who contact a maternity unit within the region or are transferred into the region from a hospital outside the HNY LMNS.

1.3 Definitions

- A **Senior Obstetrician** refers to a Registrar ST6/7 or Consultant in Obstetrics and Gynaecology (O&G).
- An **Obstetrician** refers to a Speciality Registrar (ST3 and above) or Trust Grade O&G Doctor.

A **Doctor** refers to a qualified Doctor working within Obstetrics and Gynaecology – including Foundation Year Doctors and GP VTS Trainee

Instructions and/or information in orange boxes may vary slightly between Trusts within the HNY LMNS.

1.4 Roles and Responsibilities

It is the responsibility of all HNY LMNS healthcare professionals providing care to pregnant women to be aware of the content of this guideline and ensure it is adopted though local governance procedures as required.

It is the responsibility of the LMNS to update guidance in line with national recommendations.

In line with the Saving Babies Lives Care Bundle Version 3 Trusts are responsible for the development of a Preterm Birth Lead Team. This should include:

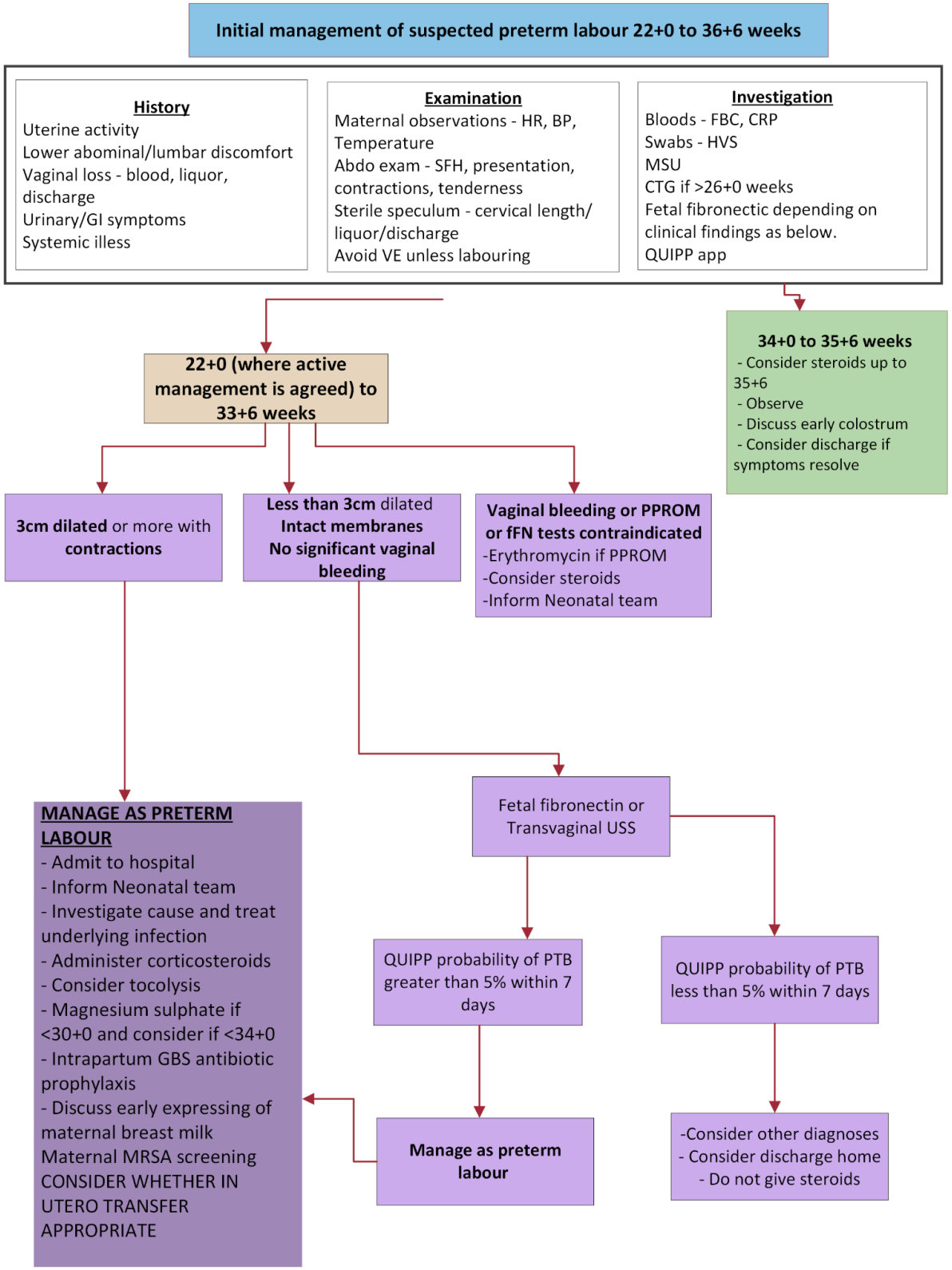
- An Obstetric Consultant lead for preterm birth, delivering care through a specific Preterm Birth Prevention clinic, or within an existing fetal medicine service
- A Neonatal Consultant lead for preterm perinatal optimisation
- An identified local preterm birth/perinatal optimisation Midwife Lead
- An identified Neonatal Nursing lead for preterm perinatal optimisation

Each Preterm Birth Lead Team should have clear audit and QI pathways for preterm birth prevention, prediction, and perinatal optimisation, and should engage in shared learning and QI with local preterm birth clinical networks, the LMNS and neonatal ODN.

1.5 Trust Sign-up

TRUST	SIGNATURE OF LOCAL GOVERNANCE LEAD	DATE
HUTH		
NLaG		
YSTHFT		

2: Summary Flow Chart



3: Guideline

3.1 Risk factors for preterm birth

All pregnant women should be assessed at booking for factors which increase the chances of preterm birth. This assessment should include modification of population-based factors acknowledging that the majority of preterm births occur in pregnant women not appropriate for care in a Preterm Birth Prevention clinic.

Following assessment, the ongoing care of pregnant women should be stratified to low, intermediate and high-risk pathways based on their individual risk factors. See section 3.3 for more details.

A prescription of aspirin from the first trimester onwards can reduce the chance of pregnancy-related complications in some women.[2] All women should be assessed at booking to determine if a prescription of aspirin is appropriate using the criteria in Appendix A.

Women identified to be at increased risk for preterm birth should be given information about the signs and symptoms of preterm labour and be encouraged to attend their local maternity unit promptly if any of these signs occur. Women should be made aware that their first choice for intended place of birth may not be the most appropriate setting for their baby to be born, and they may require transfer to a more appropriate unit.

The Yorkshire and Humber Neonatal ODN have produced parent information leaflets and a video explaining in utero transfer (link below) which may be given.

https://www.networks.nhs.uk/groups/yorkshire-humber-neonatal-odn/documents/folders/39/

https://www.youtube.com/watch?v=CVbIdDypf3c&t=27s

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

3.1.1 Previous preterm birth

Previous preterm birth is the most significant risk factor.[3] This association is modified by three risk factors:

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

For example, the chance of preterm birth following 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%.[3]

3.1.2 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 chance of preterm birth;[4] pathogenic organisms such as *Neisseria gonorrhoeae* and *Chlamydia trachomatis* may also trigger an inflammatory response leading to labour. Early screening and treatment (before 20 weeks) can be considered.[5] Group B streptococcal (GBS) 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] Women with known GBS, or who have previously had an infant affected by GBS, will be offered intrapartum antibiotics.

3.1.3 Urinary tract infection (UTI)

UTI including asymptomatic bacteriuria, cystitis, and pyelonephritis is associated with PTB.[7]

3.1.4 Systemic bacteraemia

Both acute (e.g. pyelonephritis, appendicitis, pneumonia and dental abscesses) and chronic 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.[8, 9]

3.1.5 Cervical compromise

Cervical compromise (to length or strength) may arise following large loop excision of the transformation zone –LLETZ (particularly >15mm depth of excision in x1 previous LLETZ or more than one LLETZ procedure), knife cone biopsy, multiple dilatations of the cervix, including 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 uteri).[10-12] Late first stage and second stage caesarean sections may also inadvertently damage the internal os increasing the chance of sPTB or midtrimester loss in subsequent pregnancies.[13]

3.1.6 Uterine capacity

Conditions that increase uterine distension or interfere with uterine capacity such as polyhydramnios, multiple pregnancy, or seen because of Mullerian variants are risk factors for PTB.[12]

Multiple pregnancy should be managed in accordance with NICE guidance.

3.1.7 Placentation

Antepartum haemorrhage and/or persisting extra-chorionic haemorrhage due to abnormal placentation, with chronic and repeated bleeding, is also a recognised risk factor for PTB.[14]

3.2 Identification and care of women at risk of preterm birth

Prevention of preterm birth involves the screening of all women to identify and initiate intervention tailored to specific risk factors.

The following risk factors should be identified at the booking visit.

3.2.1 Smoking

This doubles the chance of preterm birth. All women should be asked about smoking, and cessation advice and/or referral should be provided. Women who have experienced a previous preterm birth who stopped smoking early in the pregnancy (<15 weeks gestation) modify their risk back to that of a non-smoker. If smoking cessation is delayed until the third trimester this modifiable benefit is lost. The importance of promoting smoking cessation is therefore one of the most important prevention strategies to implement. Appropriate intervention, in line with NICE guidance, should be implemented to ensure the pregnancy is smoke free before 15 weeks.

3.2.2 Maternal age

Young women (<18 years) have an increased chance of preterm birth. Appropriate referral to the Teenage Pregnancy team should be offered to provide adequate support and advice throughout the pregnancy.

3.2.3 Domestic violence

Women experiencing domestic violence and/or other social pressures should be directly counselled and referred for specific support through our local pathways.

3.2.4 Urinary tract infection (UTI)

A midstream urine sample (MSU) should be taken and sent for culture and sensitivity in all pregnant women at booking. Culture-positive samples should be repeated and if the same bacterial species is present this should be treated even in symptom-free women (asymptomatic bacteriuria). Following any positive culture and treatment, a repeat MSU to confirm clearance should be performed. Those who have a recurrent episode require review in secondary care.

3.2.5 Vaginal infection

Pathogens such as *Neisseria gonorrhoeae* and *Chlamydia trachomatis* are associated with PTB, and screening should be offered to at-risk women. In particular, the booking midwife should inform each pregnant woman 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. The presence of GBS in a vaginal swab in an asymptomatic woman is not an indication to treat until in labour unless also isolated from a midstream urine specimen.

3.2.6 Pregnancy post assisted reproductive techniques

The risk of sPTB is significantly higher in singleton pregnancies following IVF/ICSI assisted reproduction compared with spontaneously conceived singleton pregnancies.[15]

3.2.7 Socioeconomic deprivation

Adverse pregnancy outcomes including PTB are higher in women from areas of higher socioeconomic deprivation.[16]

Some factors which increase the chance of preterm birth may arise during pregnancy, such as intra-abdominal surgery, therefore risk assessment needs to be a dynamic process throughout pregnancy based on the individual's circumstances and continued review of care.

3.3 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. This will appropriately identify at-risk women who may benefit from preventive strategies and/or further assessment and more intensive monitoring within the hospital setting. They can then be offered care according to their risk stratification as outlined below:

Risk factor	Referral pathway
High risk	
Previous use of cervical cerclage	Referral to be seen at the Preterm Prevention clinic **by 12 weeks.** Further risk assessment based on history/ examination with identification of women needing referral to tertiary services. Offer transvaginal cervix scanning every 2-4 weeks between 16 and 24 weeks.
History of trachelectomy (for cervical cancer)	
Previous preterm birth or mid-trimester loss between 16 and 34 weeks' gestation OR Previous PPROM <34 weeks' gestation	

	+/- Additional use of quantitative fetal fibronectin in asymptomatic women.
Known or suspected uterine variant (i.e. unicornuate, bicornuate uterus or uterine septum)	
Intrauterine adhesions (Ashermann's syndrome)	
Intermediate Risk	
History of significant cervical excisional event: • any LLETZ where greater than 15mm depth removed* • more than one LLETZ procedure • any knife cone biopsy	Referral to be seen at the Preterm Prevention clinic **by 12 weeks.** Further risk assessment based on history/examination with discussion of option of additional risk assessment tests.
Previous delivery by caesarean section at full dilatation (or documented extensions to lower segment incision at operation)	Single transvaginal cervix scan between 18-22 weeks of pregnancy. Reassess at 24 weeks for consideration of transfer back to a low-risk pathway.

**this can be found from the histopathology report documenting the size of the specimen excised (by convention the third measurement recorded); if uncertain refer to a general antenatal clinic for speculum and onward referral if cervix appears flush with the vaginal vault.*

See Appendix B for risk assessment form for requesting the Preterm Birth Prevention Clinic.

See Appendix C for management pathways within the Preterm Birth Prevention Clinic.

3.4 Prevention of preterm birth in high risk women

Midwifery Continuity of Carer (CoC) models, with a focus on individualised risk assessment and care pathways, may prevent preterm birth and save babies' lives. Ideally the care for women identified as high risk for preterm birth should follow the CoC model. Capacity to deliver this model of care will vary, and local implementation plans should ensure prioritisation of women from the most deprived groups.

https://www.england.nhs.uk/wp-content/uploads/2021/10/B0961_Delivering-midwifery-continuity-of-carer-at-full-scale.pdf

Transvaginal sonography is used to assess cervical length and the appearance of the internal os between 16 and 26 weeks. In low-risk women, cervical length is a

normally distributed variable with a mean of 35-40mm from 14 to 30 weeks. The lower 10th percentile is 25mm.[17] Cervical length is a good predictor of PTB for high risk women, with sensitivity of 60-80% and PPV of 70% when cervical length is less than 25mm between 16-18 weeks.[18,19] 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.

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

Several interventions have been assessed for women at high risk of PTB: cervical cerclage, progesterone and Arabin pessaries. Cervical cerclage is an established procedure, progesterone is recommended in certain situations by NICE, and there are randomised trials suggesting benefit in the use of Arabin pessaries in at-risk women.

At present the evidence base cannot determine precisely in which women, and in what circumstances, each intervention will be most effective. Care must, therefore, always be individualised taking into account the women's wishes and following a discussion with a clinician able to discuss the potential risks and benefits of each intervention.

Risk factors which emerge during a pregnancy may necessitate discussion around the intended place of birth particularly if the intended place of birth is not on the site of an appropriate level neonatal unit. Consider whether transfer of care to a unit with a higher level of neonatal care is appropriate.

The following options will usually be discussed at the preterm prevention clinic:

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

- Assess each woman with a history of preterm birth to determine whether this was associated with placental disease and discuss prescribing aspirin with her.
- Transvaginal ultrasound surveillance of the cervix within the second trimester or a history-indicated (planned, prophylactic, elective) cervical cerclage.
- History-indicated cerclage will usually be placed by the end of the first trimester where possible, typically after the dating scan and aneuploidy screening has been performed.
- For women having ultrasound surveillance, intervention to be discussed when the closed length of cervix is <25mm: a choice of either cervical cerclage, Arabin pessary or prophylactic vaginal progesterone*. Make a shared decision on which treatment is most suitable.

3.4.2 Women with no history of spontaneous preterm birth <34 weeks or mid-trimester loss in whom a transvaginal cervix scan has been carried out

between 16+0 and 26+0 weeks of pregnancy and the cervix is less than 25mm:

- Care for these women should be individualised; counselling should include options of continued surveillance or intervention which should include cervical cerclage, pessary and progesterone* as appropriate.
- Women with an intervention (cerclage, pessary or progesterone*) will usually remain under the care of the Preterm Birth Prevention clinic until delivery.
- Women undergoing transvaginal cervix scan screening usually continue this until 22-26 weeks; if no intervention is recommended, women may be transferred to routine pathways of care. Midwifery-led care is appropriate if no other additional risk factors are identified.

3.4.3 Women in whom a transvaginal cervix scan carried out between 16+0 and 26+0 weeks of pregnancy showing a cervical length of less than 25mm who have risk factors for PTB:

Consider prophylactic cervical cerclage for women with the above findings AND the following risk factors:

- PPROM in a previous pregnancy **or**
- A history of cervical trauma

3.4.4 Women with a previous failed transvaginal suture:

- Referral to Leeds Teaching Hospital Preterm Prevention Team should be considered. leedsth-tr.preterm@nhs.net
- 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 should be undertaken prior to 14 weeks.

3.4.5 * Dose for progesterone:

250mg 17 alpha hydroxyprogestrone caproate IM weekly from 16-36 weeks
or
400mg progesterone pessaries PV nocte from 16-36 weeks

3.5 Management of suspected preterm labour and/or preterm, prelabour rupture of the membranes (PPROM)

Women should be assessed if they have suspected PPROM or symptoms of preterm labour with intact membranes. Preterm labour can be relatively asymptomatic and a high index of suspicion is needed for women presenting with antepartum haemorrhage, vaginal discharge or urinary symptoms.

The management of women in suspected preterm labour should always be discussed with a senior Obstetrician.

If PPROM is diagnosed and/or PTB is anticipated the Neonatal Team should be involved as soon as possible to allow time to meet as a perinatal team and discuss care options including perinatal optimisation measures with the family. For cases presenting to maternity units with an on site LNU/SCU support is available through the tertiary neonatologist, in addition to the local neonatal teams, to support decision making around borderline viability. In utero transfer should be considered for these cases as early as possible.

Families should be made aware of perinatal optimisation interventions – these can be documented on the PERIPrem Baby Passport as they are discussed and provided. (See Appendix D)

3.5.1 History

A full history should be taken with specific reference to:

- uterine activity
- lower abdominal or lumbar discomfort suggestive of cervical shortening
- vaginal loss – blood, liquor and/or discharge
- urinary/renal symptoms, gastrointestinal symptoms
- other symptoms of systemic illness

3.5.2 Examination

General examination: A full medical examination including pulse, temperature, blood pressure, documented on a MOEWS chart.

Abdominal examination should record fundal height, fetal lie, presentation and engagement of the presenting part. If there is uncertainty regarding presentation an ultrasound scan should be performed. The presence of uterine activity/irritability should be noted.

A ***sterile speculum examination*** should be performed to assess the state of the cervix, recording cervical length and dilatation and the presence/absence of vaginal loss or rupture of membranes. A high vaginal swab should be obtained regardless of whether the membranes have ruptured. Digital examination should be avoided unless there is a strong suspicion that the woman is in labour.

The diagnosis of ruptured membranes relies on:-

- evidence from the woman's pad and/or
- visible loss of liquor between the labia on vulval inspection and/or

- the visualisation of liquor pooling in the posterior fornix or within the speculum

The diagnosis of PPROM can be uncertain therefore the woman should be advised to return if concerns of further PV loss despite an initially inconclusive speculum examination.

NICE recommends the use of an insulin-like growth factor binding protein-1 test or placental alpha-microglobulin-1 test of vaginal fluid if pooling of amniotic fluid is not observed on speculum examination. The woman's clinical condition, medical and pregnancy history and gestational age should be taken into account when interpreting the results of this test.

3.5.3 Investigations

TEST	**REASONING**
Blood Tests: *FBC and CRP*	Blood should be taken for a **full blood count** (FBC) and a **C reactive protein** (CRP). In cases of PPROM these are repeated daily (whilst an inpatient) then weekly (through the antenatal day unit).
High vaginal swab (HVS)	This should be taken and sent at the time of the first speculum examination. If amniotic fluid is present on speculum examination this should be swabbed for culture and sensitivity.
Quantitative fetal fibronectin (fFN) (where available)	fFN for prediction of preterm birth helps because only 3-5% of women with symptoms will deliver within 7 days.[20-22] Correct assessment avoids unnecessary use of tocolytics and steroids, and aids decision making for *in utero* transfer. NICE guidance (NG25) suggests treating all women who clinically appear to be in preterm labour less than 29+6 weeks. However, newer studies[22] demonstrate it is reasonable to use fibronectin swabs and rely on the results of the tests in conjunction with the QUIPP app rather than initiating unnecessary treatment.
QUIPP app	This may help quantify the likelihood of diagnosis, plan care with parents, and avoid unnecessary intervention. A risk of greater than 5% of giving birth within 7 days may be used as a threshold for further care as per the EQUiPP and QUIDS studies.[23] The app can be downloaded on to smartphones or found at https://quipp.org

MSU	This should be sent, even with a negative urine dipstick. If positive this should be repeated after antibiotic treatment for 'confirmation of cure'.
Cardiotocography (CTG)	CTG should be performed to assess fetal wellbeing if the gestation is beyond 26+0 weeks. This should ideally be a computerised CTG, however, if uterine activity is present this should be a non-computerised CTG. For gestations less than 26 weeks, intermittent auscultation is preferred.
Transabdominal (TA) ultrasound (USS)	TA USS should be performed to confirm fetal presentation. A formal ultrasound scan should be arranged following diagnosis of PPROM to assess fetal growth and wellbeing.
Transvaginal (TV) ultrasound (USS)	>30 weeks gestation where available TV USS examination for funnelling or shortening of cervix may be considered to determine the likelihood of birth within 48 hours. A closed cervical length of less than 15mm is suggestive of preterm labour.

3.6 Management of women following confirmed Preterm Prelabour Rupture of Membranes (PPROM)[24]

The median latency after PPROM is 7 days and tends to shorten as the gestational age at PPROM advances. Many of these women will deliver within 48 hours.

Treat as follows:

- Admit to the antenatal ward. Monitor vital signs, including pulse, blood pressure, respiratory rate and temperature 6 hourly and record on MOEWS chart.
- Consider clinical setting and whether in utero transfer to maternity site with a higher level neonatal unit is appropriate. *See Section 3.1 for links to parent information about transfer between maternity units*.
- Prophylactic antibiotics for intrauterine infection: Erythromycin: 250mg QDS for ten days. For women who cannot tolerate Erythromycin consider oral Amoxicillin 250mg QDS for a maximum of 10 days.[25] If treated as preterm labour antibiotics for GBS prophylaxis should be offered as outlined in section 3.9.4.
- Antenatal corticosteroids: Offer Dexamethasone or Betamethasone 12mg IM every 24 hours for 48 hours, alternatively Dexamethasone or Betamethasone 6mg IM every 12 hours for 48 hours.
- Transabdominal USS to confirm fetal presentation. USS to assess fetal growth and wellbeing including assessment of liquor volume and umbilical artery Dopplers.

- If active labour or delivery in the next 24 hours is anticipated, offer antenatal magnesium sulphate if <30/40 and consider if <34/40.
- Discuss the importance of early maternal breast milk for preterm infants.
- Offer families the opportunity to visit the Neonatal Unit with support from either a member of the midwifery or neonatal team.
- Consider the emotional wellbeing of the woman and her family and offer additional support if needed.

Monitoring for infection should involve a combination of clinical assessment, laboratory results (CRP and WCC) and assessment of the fetal heart rate.

Outpatient care may be considered on an individual basis following a period of inpatient observation. A senior obstetrician should be involved in this decision, taking into account markers of delivery latency.

If a *malpresentation* is present which is likely to be associated with cord presentation and subsequent prolapse in early labour (for example in transverse lie), careful discussion with the woman is required; continued inpatient care may be preferred given the need for swift intervention if cord prolapse occurs. Decision making may also be influenced by other factors such as gestational age, and consultant involvement in these situations is to be preferred.

During outpatient care, women may take their temperature at home once or twice a day. They should be advised of the symptoms associated with infection such as palpitations, temperature rise, or change in the nature of vaginal discharge. Women should be reviewed in the Antenatal Day Unit for weekly FBC/CRP and, from 26 weeks, a computerised CTG.

After 34 weeks gestation the risks and benefits of expedited delivery or expectant management should consider the following:-

- Signs of infections
- Fetal compromise eg growth restriction
- Known carriage of Group B Streptococcus
- Malpresentation eg transverse or breech
- Poor maternal engagement in follow up

If none of the above are present a policy of expectant management with appropriate surveillance of maternal and fetal wellbeing may be recommended. It would be reasonable to consider delivery at 37 weeks.[26] However, if clinical picture changes there should be a low threshold to expedite delivery.

3.7 Management of bulging membranes before 24 weeks

Cervical weakness is an important cause of mid-trimester birth. An established treatment for cervical insufficiency is vaginal cervical cerclage.

In a situation where the cervix has opened and the fetal membranes are exposed, an emergency cervical cerclage (ECC) may be considered. This procedure aims to halt further cervical dilatation and prolong pregnancy, preventing miscarriage or extreme PTB, and thus potentially improving neonatal outcome. However, ECC has

not been fully evaluated for clinical and cost effectiveness and carries risks to both the mother and baby. These risks include cervical trauma, severe infection/sepsis and iatrogenic rupture of membranes during the procedure leading to fetal loss.

There remains uncertainty about both the immediate benefit and long-term development of babies born following ECC. Specifically, *in utero* infection may result in worsening neurodevelopmental outcomes.

If a woman at 16+0 to 24+0 weeks gestation presents with bulging membranes ECC may be considered.

Contraindications to ECC:

- Uterine contractions
- Active vaginal bleeding
- Ruptured membranes
- Signs of infection/chorioamnionitis
- Fetal parts are no longer in the uterus.

On identification of a woman with bulging membranes at 16+0 to 24+0 weeks:-

- Admit
- Bloods – FBC and CRP
- HVS
- MSU (even if recently normal results or negative dipstick)
- TED stockings
- Inform on call consultant / or Preterm Clinic Consultant
- Senior input early and consideration of an ECC and careful counselling
- Inform Neonatal team if gestation 21+6 weeks or above
- If labour appears to be progressing there should be consideration of corticosteroids, magnesium sulphate and intrapartum antibiotics for gestations above 21+6 weeks if active survival-focused care is appropriate.

If an ECC is to be considered ensure the team and patient are aware of the time to fast from and time of last clear fluids.

If an ECC is used, ensure a plan is made and documented for removal of the suture.

There is no evidence of benefit for a head-down tilt, total bed rest or urinary catheter insertion and so these should be avoided.

If appropriate to do so, offer families the opportunity to visit the Neonatal Unit with support from a member of the midwifery or neonatal team.

3.8 Antenatal Counselling/Providing information to parents about preterm birth

Women presenting with PPROM or preterm labour or those having a planned preterm birth should be provided with information and support that includes:

- Information about the likelihood of their baby surviving and other outcomes including disability. (See Appendix E for BAPM infographic)
- Explanation of the neonatal care of preterm babies including location of care.
- Discussion of the immediate problems that can arise when a baby is born preterm.
- The importance of mother's own milk for preterm infants and recommendation for expressing within the first 2 hours after birth. Written information about hand expressing, colostrum syringes and knitted squares may also be provided.

The BAPM Framework for Practice 'Perinatal management of extreme preterm birth before 27 weeks of gestation' is recommended for guidance specific to this gestation age group.[27] Accurate information about the current pregnancy, including assessment of both fetal and maternal health should be used to refine gestation-based risk of absolute survival and survival without severe impairment. A range of factors are associated with increased or decreased risk: fetal factors, clinical conditions, therapeutic strategies and clinical settings. See Appendix E.

Conversations with the family should include the most senior members of the Paediatric/Neonatal team, be clearly documented and regularly reviewed.

At 22+0 to 23+6 weeks gestation – Use the BAPM framework to establish whether 'extremely high risk' or 'high risk'. Discussions should involve the most senior member of the Neonatal team. Support is available for LNU/SCU teams from the tertiary Neonatologist via Embrace. Parents should have the opportunity to talk about and state their wishes about resuscitation of their baby. The perinatal plan should be clearly documented and reviewed if the pregnancy continues.

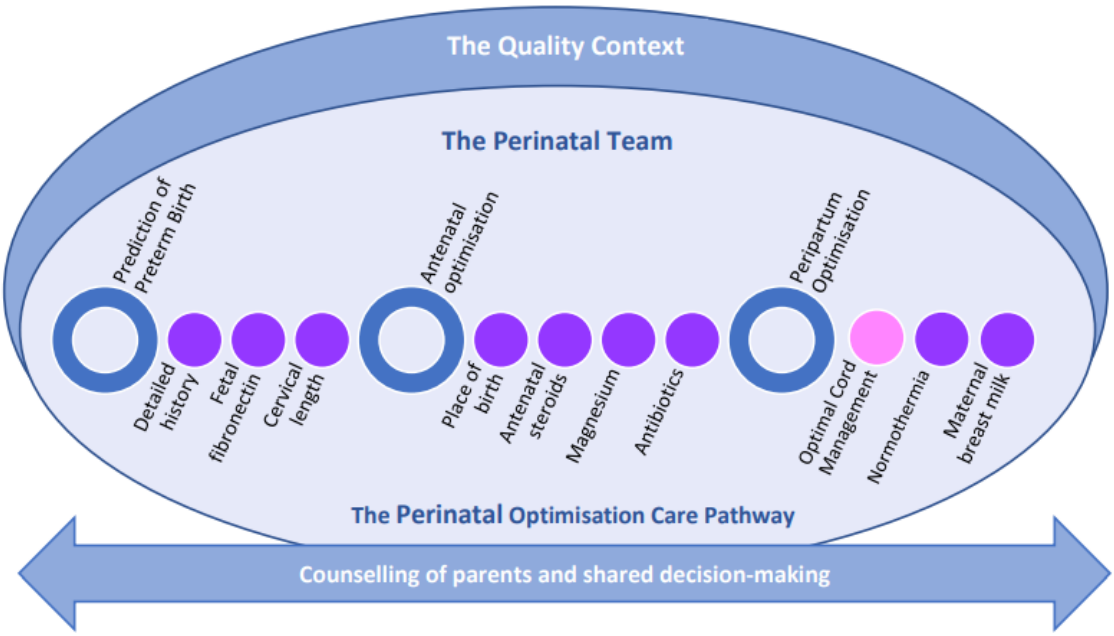
Refer to the BAPM Framework for Practice 'Perinatal management of extreme preterm birth before 27 weeks of gestation' for further guidance around Obstetric and Neonatal interventions for comfort-focused care and active survival-focused care.

3.9 Care following diagnosis of preterm labour

Treatment is aimed at:

- addressing the precipitating cause
- improving fetal outcome with the use of antenatal corticosteroids, antenatal magnesium sulphate and intrapartum antibiotics
- aiming for delivery in a unit with an appropriate level of neonatal care for the baby's gestation
- delaying delivery, if appropriate, to enable a full course of corticosteroids or permit in utero transfer

The neonatal team should be made aware when the diagnosis of preterm labour is made and the perinatal team should discuss perinatal optimisation including the need for transfer to a more appropriate unit, mode of delivery, a plan for optimal cord management and whether antenatal expression of maternal colostrum is possible.



Perinatal optimisation interventions can be documented on the PERIPrem Baby Passport (see Appendix D) - this accompanies the baby to the Neonatal Unit after delivery.

3.9.1 Place of birth

For infants born prematurely the risk of dying and the risk of intraventricular haemorrhage is reduced when they are delivered in a clinical setting appropriate for their gestation.[27]
Women who have symptoms suggestive of preterm labour or who are having a planned preterm birth:
a) less than 27 weeks gestational age (in a singleton pregnancy)
b) less than 28 weeks gestational age (in a multiple pregnancy)
c) any gestation with an estimated fetal weight of less than 800g
should be managed in a maternity service on the same site as a neonatal intensive care unit (NICU).
For women with complications arising during pregnancy following which a high level of neonatal care is anticipated, for example oligo/anhydramnios from an early gestation, consider delivery at a NICU site irrespective of gestation.
See Section 3.1 for links to parent information about in utero and ex utero transfer.
When women present with symptoms of preterm labour and transfer is appropriate the reasons for transfer should be discussed with the family. Parent information leaflets can be found on the Yorkshire and Humber Neonatal ODN website.
Transfer is not usually advisable if cervical dilatation is more than 3cm with uterine contractions and *ex utero* transfer may have to be considered in conjunction with the neonatal team. The use of the QUIPP app may be valuable in aiding the decision to

transfer, as a probability less than 5% of delivering within 7 days would suggest that delivery is not imminent and therefore would avoid unnecessary transfer.

3.9.2 Corticosteroids

Targeted antenatal corticosteroids reduce the risk of perinatal and neonatal death, respiratory distress syndrome and intraventricular haemorrhage (IVH).[28] The period of maximal effectiveness is 24 hours to 7 days after administration of a full course. The accurate prediction of preterm birth is, therefore, of utmost importance. A steroid-to-birth interval of greater than 7 days should be avoided wherever possible.

Corticosteroids should be offered to women between 22+0 and 33+6 weeks of gestation, in whom active management of the baby is anticipated, when preterm birth is anticipated either due to established preterm labour, PPROM or planned preterm birth.

The decision to administer corticosteroids at gestations between 22+0 and 23+6 weeks of gestation should be made by a senior obstetrician taking all clinical aspects into consideration and after consultation with the wider perinatal MDT including the Neonatal team (including tertiary care discussion if appropriate) and parents.

Steroids can be considered from 34+0 to 35+6.

Birth should not be delayed for antenatal corticosteroids if the indication for birth is impacting the health of the woman or her baby.

Dosing of corticosteroids:

Dexamethasone 12mg given by intramuscular injection, two doses, 24 hours apart.[29]
OR
Dexamethasone 6mg given by intramuscular injection, 4 doses, 12 hours apart.

If dexamethasone is unavailable, then betamethasone is a suitable alternative (same dosage/administration).

If given to women with pre-existing or poorly controlled gestational diabetes, a variable rate insulin infusion should be discussed with a consultant, and the woman monitored closely after steroid administration.[30] Unnecessary steroids should be avoided, especially in diabetic women.

Repeat courses of maternal corticosteroids should be avoided where possible. However, a single repeat course of antenatal corticosteroids should be considered for women at risk of preterm birth who have received a single course of steroids at least 7 days prior.

Particular consideration should be given to babies under 32 weeks gestation.

(Yorkshire and Humber Maternity Clinical Network position statement: Aug 2023)

When considering whether a repeat course of antenatal steroids is appropriate take into account:

- the interval since the end of last course
- gestational age
- the likelihood of birth within 48 hours.[31]

Repeat doses of steroids should be discussed with a consultant.

3.9.3 Magnesium Sulphate

Antenatal magnesium sulphate is used to reduce the risk of cerebral palsy in preterm infants and the effects are greatest at earlier gestations.[32]

Magnesium is to be offered to women between 22+0 (where active management is agreed) and 29+6 weeks of pregnancy - and considered for women between 30+0 and 33+6 weeks of pregnancy - who are in established labour or are having a planned preterm birth, e.g. for fetal growth restriction, within 24 hours.

It is likely that benefit is conferred even after the loading dose has been given so administration to mothers should be considered even if delivery appears imminent.

3.9.3.1 Magnesium Sulphate Regime

Commence IV Magnesium sulphate as close to 4 hours before birth as possible.

Loading dose – intravenous (IV)

4g Magnesium sulphate - 20mLs of 20% Magnesium Sulphate IV over 20 minutes

Maintenance therapy – intravenous (IV)

1g per hour Magnesium Sulphate - 20% Magnesium Sulphate IV run at 5mls/hr via syringe pump to be continued until delivery or for 24 hours (whichever is sooner)

Important Monitoring when giving IV Magnesium Sulphate

- One to one midwifery care should be given to women receiving Magnesium sulphate.
- Urine output should be >100ml in the previous 4 hrs. 97% of magnesium is excreted in the urine; presence of oliguria can lead to toxic levels. Consider an indwelling urinary catheter and fluid balance chart, alternatively measure and record each void accurately.
- Hourly respiratory rate – should be >12 breaths/min, BP and pulse.
- Four Hourly maternal deep tendon reflexes checks should be performed i.e. biceps

Side Effects/Concerns

- If a woman has or develops oliguria or other signs of renal failure monitor more frequently for magnesium toxicity or think about reducing/stopping the infusion.
- Discontinue the magnesium sulphate if there is:-
  - Motor Paralysis Absent tendon reflexes
  - Respiratory Depression Cardiac Arrhythmia

If side effects occur, get a senior Obstetric or Anaesthetic Medical review and consider 10ml 10% calcium gluconate IV

3.9.4 Antibiotics

Preterm or low birthweight babies are particularly vulnerable to GBS sepsis. Women in ***confirmed*** preterm labour under 37 weeks gestation should be given intrapartum antibiotic prophylaxis as below. This is irrespective of whether amniotic membranes have ruptured. However, if a woman is showing clinical evidence of sepsis, antibiotic treatment should be modified appropriately and directed towards treating the source of her infection.

Antepartum antibiotics for GBS should be Benzylpenicillin unless contraindicated or unsuitable based on swab sensitivity results.
Refer to local antibiotic policy for dosing and alternatives in Penicillin allergy.

3.9.5 Tocolysis

In randomised trials there was no decrease in perinatal mortality or morbidity associated with tocolytic use and it should be remembered that ***prolongation of the pregnancy is not always beneficial for the baby***.[33] Its use is mainly to allow time for ***steroids to be effective or to enable an in utero transfer***.

Indications for tocolysis

Uterine contractions of at least 30 seconds duration and QUIPP probability of birth >5% within 7 days

OR

Cervical dilatation of 1-3cm and effacement of at least 50% and QUIPP probability of birth >5% within 7 days

Relative contraindications to tocolysis

- less than 24+0 or more than 34+0 weeks gestation
- antepartum haemorrhage
- chorioamnionitis
- known hypersensitivity to the active substance or any of the excipients (the carrier vehicle for the active drug)
- any other conditions in the mother or fetus in which continuation of the pregnancy would be hazardous

3.9.5.1 Nifedipine

Nifedipine should be used as the first-line tocolytic. The decision to start nifedipine should be taken by a senior Obstetrician with the aim of delaying delivery long enough to administer antenatal corticosteroids and/or enable in utero transfer. There is good evidence that the calcium channel blocker nifedipine is effective in treating preterm labour, does not cause a significant fall in blood pressure in normotensive women, and has no significant fetal/neonatal side effects but may in fact have some positive benefits in terms of reduced neonatal complications (when compared with β-sympathomimetics).

Nifedipine is contraindicated in women with cardiac disease.

Nifedipine should be used with caution in women with diabetes or multiple pregnancy due to the risk of pulmonary oedema.

3.9.5.2 Nifedipine regime

Loading dose
Immediate release nifedipine orally, 10mg every 15 minutes until contractions stop (maximum dose 40mg)
Maintenance therapy
Modified release (MR) orally, 20mg 6 hourly for a maximum of 48 hours

Monitoring

- Blood pressure and pulse every 15mins for the first 2 hours.
- Continuous EFM if >26 weeks gestation for the first 2 hours which can be discontinued if contractions settle.

If Nifedipine is contraindicated then Atosiban should be used as a first-line tocolytic

3.9.5.3 Atosiban Regime (for 24+0 to 34+0 weeks gestation)

The decision to start Atosiban should be taken by a senior obstetrician with the aim of delaying delivery long enough to administer steroids.

STEP 1 Initial bolus dose (6.75milligrams) over one minute.	Draw up 0.9mL from 5mL ampoule of atosiban 7.5mg/mL concentrate for intravenous infusion and give over one minute

STEP 2 Immediately followed by a continuous high dose infusion (300micrograms/min) of Atosiban over three hours	Withdraw 18.1mL from a 100mL bag of 0.9% sodium chloride Add to the remaining sodium chloride (81.9mL), a total of 9.1mL of atosiban 7.5mg/mL (the 4.1mL from the first 5mL ampoule. and a second 5mL ampoule of the same concentrate) The resulting solution (0.75mg/mL) should be infused at 24mL/hour (300micrograms/min) over three hours This solution will last nearly four hours
STEP 3 Followed by a lower dose of atosiban infusing at 100micrograms/min for up to 45 hours or a total treatment length of 48 hours	Withdraw 10mL from a 100mL bag of 0.9% sodium chloride Add two 5mL ampoules of atosiban 7.5mg/mL concentrate for solution for infusion. The resulting solution (0.75mg/mL) should be infused at 8mL/hour (100micrograms/min)

Step	Regime	Injection/infusion rate	Atosiban dose	Length
1	0.9mL IV bolus	Over 1 minute	6.75mg	1 minute
2	3 hours IV loading infusion	24mL/hour	18mg/hour (300mcg/min)	3 hours
3	Subsequent IV infusions	8mL/hour	6mg/hour (100mcg/min)	Up to 45 hours

If the uterus remains quiescent, discontinue infusion.

Response to Atosiban should be judged by uterine activity and not by repeated vaginal examinations.

Monitoring

- Maternal pulse and BP every 15 minutes for first hour then hourly
- Continuous electronic fetal monitoring (greater than 26 weeks) until contractions stop after which intermittent auscultation should be carried out

every 4 hours and a CTG twice daily until the atosiban infusion is completed. Continuous electronic fetal monitoring (greater than 26 weeks) should be restarted if contractions recommence.

If labour progresses, discontinue atosiban

3.9.6 Mode of delivery

Preterm babies less than 26 weeks gestation are usually delivered vaginally. Caesarean section carries significant maternal morbidity with risk of classical caesarean section and implications for future pregnancies.

In preterm labour after 26 weeks, a decision on mode of delivery will be governed by obstetric factors as per term delivery. There is no clear evidence to suggest benefit from caesarean section for all preterm breech presentation; the risk of head entrapment (up to 10%) is a feature of all breech births under 37 weeks, regardless of route.[34]

The available evidence does not support the use of 'prophylactic' outlet forceps or elective episiotomy for vaginal delivery. Ventouse delivery and fetal scalp electrodes must be avoided below 34 weeks gestation and used with caution thereafter.

The use of epidural anaesthesia is not contraindicated and can be offered for pain relief in labour. Postulated benefits include avoiding expulsive efforts before full dilatation or a precipitate delivery, a relaxed pelvic floor and perineum and the ability to proceed quickly to abdominal delivery. Other types of analgesia are also safe and informed decision making should be supported with the provision of information on the benefits and risks of each type of analgesia in relation to clinical indicators such as progress of labour.

The RCOG mandates that a consultant obstetrician MUST ATTEND in cases of caesarean birth <28/40 and premature twin birth <30 weeks gestation.

In cases of caesarean birth of <32 weeks and vaginal twin birth the consultant must attend unless the most senior doctor present has documented evidence as being signed off as competent. In these situations, the senior doctor and the consultant should decide in advance if the consultant should be informed prior to the senior doctor undertaking the procedure.

3.9.7 Thermoregulation

Hypothermia increases the risk of mortality in preterm infants. Careful management is necessary to avoid this and maintain normothermia (36.5-37.5°C). Ensure the room is warm enough, windows are closed and fans are switched off.

Babies delivered <32 weeks gestation should be placed directly into a plastic bag at birth and the head should be covered. The NeoHelp™ Poncho includes a head covering, alternatively a hat can be used. Use of a radiant heater at all gestations and warming mattress (e.g. Transwarmer™) at gestations <32 weeks.

The temperature of the baby should be monitored, ideally continuously (sevo mode with auto-regulation preferable), to detect a falling temperature and appropriate action must be taken to maintain normothermia before, during and after transfer to the Neonatal Unit.

Thermoregulation should be considered during delivery room parental touch/cuddle, skin to skin or kangaroo care.

3.9.8 Optimal cord management

Delaying cord clamping by at least 60 seconds after delivery reduces mortality in preterm infants, with the greatest benefit to babies born <28 weeks gestation.

The only contraindications to delayed cord clamping is trauma to the cord resulting in fetal blood loss or the need for immediate maternal resuscitation.

Perinatal team discussion prior to delivery should include a plan for how to achieve optimal cord management, particularly in centres where 'cord intact resuscitation' is not feasible.

3.9.9 Early maternal breast milk

Babies born <37 weeks gestational age should receive their own mother's milk, ideally within 6 hours, and always within 24 hours of birth (except in rare situations where there are contraindications to maternal breast milk).

This requires a consistent and multidisciplinary team approach and planning should begin antenatally. Mothers should be given adequate and appropriate information and be supported to start expressing no later than 2 hours after delivery. This time frame has implications for the benefits conferred to baby and improves long term milk volumes and rates of breastfeeding at discharge.[35]

Link for PERIPrem Parent information leaflet on Early Breast Milk (available in several languages via PERIPrem resources):

https://www.healthinnowest.net/wp-content/uploads/2023/06/03028-Breast-Milk-Leaflet-No-Crops-HIGH-RES.pdf

3.9.10 Volume-targeted ventilation

For babies born below 34 weeks' gestation who need invasive ventilation, use volume-targeted ventilation (VTV) in combination with synchronised ventilation as the primary mode of respiratory support. This reduces the chance of death or bronchopulmonary dysplasia by 27% and intraventricular haemorrhage (grades 3–4) by 47% compared with pressure-limited ventilation modes.

3.9.11 Caffeine

For babies born below 30 weeks' gestation, caffeine reduces the chance of death or disability. Caffeine should be started within 24 hours of birth.

4: Training

Training should be undertaken and competency assessed in relation to the following:

- Symphysis-fundal height measurement
- Performing CTG
- Antenatal/Non-labour CTG interpretation.

5: Patient Involvement

The LMNS Maternity Voice Partnership group will review and advise on the content of this guideline. The guideline will be available for public access on the LMNS website.

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8: Monitoring Compliance and Effectiveness (Quality and Safety)

Compliance with the guideline will be monitored through incident reporting and audit according to the table below.

Where monitoring identifies recommendations, an action plan will be developed and reported to the appropriate group. The identified group will monitor the implementation of the action plan.

Process indicators

- Percentage of singleton live births less than 34+0 weeks receiving a full course of antenatal corticosteroids, within seven days of birth.
- Percentage of singleton live births less than 34+0 weeks occurring more than seven days after completion of their first course of antenatal corticosteroids.
- Percentage of singleton live births less than 30+0 weeks receiving magnesium sulphate within 24 hours prior to birth.
- Percentage of singleton live births less than 34+0 weeks receiving IV intrapartum antibiotics for GBS prophylaxis.
- Percentage of women who give birth in an appropriate care setting for gestation (in accordance with local ODN guidance).
- Percentage of babies born less that 34 weeks gestation who have their umbilical cord clamped at or after one minute after birth.
- Percentage of babies born less than 34 weeks gestation with a first recorded temperature between 36.5 and 37.5°C measured within one hour of birth.
- Percentage of babies born less than 34 weeks gestation who receive their own mother's milk within 24 hours of birth.

Outcome indicators

- the incidence of women with a singleton pregnancy giving birth (liveborn and stillborn) as a % of all singleton births:
    - in the late second trimester (from 16+0 to 23+6 weeks)
    - preterm (from 24+0 to 36+6 weeks)

Audit results should be presented in line with each Trust's current governance procedures.

9: Document Control

Version Control

Version number	Revision date	Changes made by	Summary of changes	Approved by

1	September 2021	PTB sub group	1st version produced	LMS Clinical Leads
2	January-February 2024	Anna Fox	Updated to reflect Saving Babies Lives Care Bundle V3 and 2022 RCOG and NICE guidance.	LMNS Clinical Leads

9.1 Review process

The guideline will be reviewed initially after 1 year then as a minimum every 3 years. When relevant national guidance is published, the guideline will be reviewed and updated accordingly.

9.2 Consultation process

Consultation will include all HNY LMNS provider organisations and representatives from midwifery, obstetric and ultrasonography professions.

9.3 Approval process

Approval will be in line with the LMNS Guidelines Group approval process.

9.4 Publication and dissemination

Following approval, the guideline will be launched to all HNY Trusts by email.

Trusts will be responsible for removing and electronically archiving previous versions.

At Trust level, all relevant staff groups will be informed of the new publication.

10: Appendices

10.1 Appendix A: Clinical risk assessment for preeclampsia as indications for aspirin in pregnancy.

Risk level	Risk factors	Recommendation
High	• Hypertensive disease during a previous pregnancy • Chronic kidney disease • Autoimmune disease such as systemic lupus erythematosus or antiphospholipid syndrome • Type 1 or type 2 diabetes • Chronic hypertension • Placental histology confirming placental dysfunction in a previous pregnancy	Recommend low dosage aspirin if the woman has ≥1 of these high-risk factors
Moderate	• First pregnancy • Are 40 years or older at booking. • Pregnancy interval of more than 10 years • Body mass index (BMI) of 35kg/m² or more at first visit • Family history of preeclampsia in a first degree relative • Multiple pregnancy	Consider aspirin if the woman has two or more moderate risk factors

10.2 Appendix B: Booking Form for Preterm Birth Prevention Clinic

Patient ID **Name** **DOB**

Date completed **Name of Referrer** .

Risk factors	Tick as appropriate
Smoking (CO, Referral, cessation advice, GAP scans per protocol)	
Maternal age<18(referral)	
Domestic violence (EHASH referral)	
Suspected UTI (Send MSU)	

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. This will appropriately identify at-risk women who may benefit from preventive strategies and/or further assessment and more intensive monitoring within the hospital setting. They can then be offered high-risk care:

Please send this form via email to (HNY LMNS units use local email) **for HUTH-**

hyp-tr.pretermclinichull@nhs.net

Risk factor	Referral pathway	Tick
Previous use of cervical suture **(urgent referral)**	Referral to be seen at the Preterm Prevention clinic **by 12 weeks**	
History of trachelectomy-removal of cervix for cervical cancer **(urgent referral)**	Referral to be seen at the Preterm Prevention clinic **by 12 weeks**	
Previous preterm birth, midtrimester loss, and/or PPROM between 16 and 34 weeks' gestation (**urgent referral**)	Referral to be seen at the Preterm Prevention clinic **by 12 weeks**	
Known or suspected uterine variant (i.e. unicornuate, bicornuate uterus or uterine septum)	Referral to be seen at the Preterm Prevention clinic **by 12 weeks**	
Intrauterine adhesions (Ashermann's syndrome)	Referral to be seen at the Preterm Prevention clinic **by 12 weeks**	
History of significant cervical excisional event: • **ANY PREVIOUS LLETZ** where greater than 15mm depth removed* • **>1 LLETZ procedure** • any knife cone biopsy	Referral to be seen at the Preterm Prevention clinic **by 12 weeks**	
Previous delivery by caesarean section at full dilatation (or documented extensions to lower segment incision at operation)	Referral to be seen at the Preterm Prevention clinic **by 12 weeks**	

**** This can be found from the histopathology report***

Please note if any of the above criteria are not met, this patient is not eligible for an appointment in a PPC clinic. (Exclusion criteria for preterm prevention clinic (Iatrogenic preterm delivery e.g. Induction of labour/ emergency

section due to IUGR, preeclampsia /Current multiple pregnancy /Previous loss of a twin),When patients don't meet criteria for PPC clinic triage for consultant/midwifery led as appropriate)

Please send MSU & LVS at time of this referral.

10.3: Appendix C: Flowchart for surveillance in the Preterm Birth Prevention clinic

<table>
<tr><th></th><th colspan="6">High Risk</th><th colspan="2">Intermediate risk</th></tr>
<tr><th>History</th><th>History of trachelectomy (for cervical cancer)</th><th>Previous failed cervical cerclage</th><th>Previous use of cervical cerclage</th><th>Previous preterm birth, midtrimester loss, and/or PPROM between 16 and 34 weeks gestation</th><th>Known uterine variant (i.e. unicornuate, bicornuate uterus or uterine septum).</th><th>Intrauterine adhesions (Ashermann's syndrome)</th><th>Previous delivery by caesarean section at full dilatation</th><th>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).</th></tr>
<tr><td>12week</td><td colspan="2">Review history; booking MSU, LVS, Referral to tertiary services (Leeds Teaching Hospital Preterm Prevention Team should be considered leedsth-tr.preterm@nhs.net)</td><td>Review history; booking MSU; Low vaginal swab (LVS) If high risk/request high cerclage. Consider referral to Leeds</td><td colspan="3">Review history; booking MSU; Low vaginal swab (LVS)

Offer history-indicated (planned, prophylactic, elective) cervical cerclage or TV US surveillance of the cervix in the 2nd trimester.</td><td colspan="2">Review history and booking MSU, LVS +/- repeat tests.</td></tr>
<tr><td>14 weeks</td><td colspan="2" rowspan="8">Follow advice from tertiary unit if returns to care for local surveillance as previous use of cervical cerclage</td><td colspan="5">Review history and booking MSU, LVS; Trans vaginal Scan</td><td colspan="2"></td></tr>
<tr><td>16weeks</td><td colspan="5">Trans vaginal Scan,MSU,LVS - 2 weekly from 16 weeks</td><td colspan="2"></td></tr>
<tr><td>18weeks</td><td colspan="5">Trans vaginal Scan,MSU,LVS
Quantitative fetal fibronectin may be used from 18 weeks</td><td colspan="2">Urinalysis +/-MSU; LVS;
TV US scan cervix – further scans to be arranged on the basis of results</td></tr>
<tr><td>20weeks</td><td colspan="5">Urinalysis +/-MSU; LVS; Trans vaginal Scan</td><td colspan="2">Urinalysis +/-MSU; LVS; Trans vaginal Scan for cervical length in PPC /@ 20 weeks USS with sonographers</td></tr>
<tr><td>22weeks</td><td colspan="5">Trans vaginal Scan,MSU,LVS</td><td colspan="2"></td></tr>
<tr><td>24weeks</td><td colspan="5">Trans vaginal Scan,MSU,LVS</td><td colspan="2">Back to midwife lead care if no other risk factors identified</td></tr>
<tr><td>28-30 weeks</td><td colspan="5">Trans vaginal Scan; Back to midwife lead care if no other risk factors identified</td><td colspan="2" rowspan="2"></td></tr>
<tr><td>34 weeks</td><td colspan="5"></td></tr>
</table>

***Speculum assessment should be carried out at first consultation in PTBC and if cervical cerclage is being considered**

10.4: Appendix D: Humber and North Yorkshire Perinatal Optimisation Baby Passport (English)

This resource has been adapted from the PERIPrem baby passport. The original version including other languages and trans-friendly versions are available on the PERIPrem resources website.

Name: DOB: Hosp No: NHS No: **Or patient sticker here**	Name: DOB: Hosp No: NHS No: **Or baby's patient sticker here**

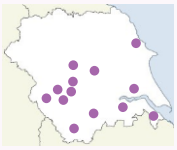
Preterm Baby Passport

Humber and North Yorkshire Health and Care Partnership

Humber and North Yorkshire

Place of Birth

(babies born early or small sometimes need to be born in a more specialist unit.



I am at the optimal hospital in case my baby(ies) needs to be born early.

I am aware that I might have to be moved to another hospital and if this isn't possible then my baby(ies) might need to be moved to another hospital after they're born.

Time and Date discussed with neonatal team

Date ..... Time.....

Antenatal Steroids

(for all babies born before 34 weeks)

I have been given a full course of steroids to help prepare my baby(ies) for being born early.

The need for a single repeat course has been considered if my baby(ies) was not born within 7 days of the full course of steroids.

Name of drug used.....

No 1 Date ..... Time.....

No 2 Date ..... Time.....

Repeat course considered?
(Please circle)
Yes / No / N/A
If given, Date.....Time.....

Antenatal Magnesium Sulphate

(for all babies born before 30 weeks and considered for babies born before 34 weeks)

I have been given Magnesium Sulphate to protect my baby(ies) brain.

Loading dose:

Date ..... Time.....

4 hour infusion in the 24 hours prior to birth given? Yes / No

Antibiotics

(for all babies born before 37 weeks where mum was in labour)

I have been given antibiotics to reduce the chance of my baby(ies) developing an infection called Group B Strep.

Name of antibiotics.....

Last antibiotic dose

Date ..... Time.....

Early Breast Milk

(for all babies born before 37 weeks)

I have been given information about the benefits of early breast milk and have been shown how to express to make this milk for my baby(ies) before or within an hour of birth.

Benefits of breast milk discussed?

Date ..... Time.....

Help given to express within 2 hours of birth: Yes / No

Expressed breast milk obtained

Date ..... Time.....

Expressed breast milk given to baby

Date ..... Time.....

Optimal Cord Management

(for all babies)

After my baby(ies) is born, the team will wait at least a minute before clamping the cord, to allow my baby to be born safely and get extra blood from the placenta.

Duration of delayed cord clamping

.....Minutes .....Seconds

Thermal Care

(for all babies)

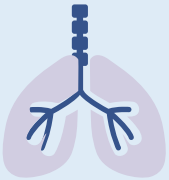
After my baby(ies) is born, the team will try to keep their temperature normal and will help us to hold baby skin-to-skin as soon as it is safe.

Admission temperature .....

Time taken .....

Respiratory Management

(for babies born before 34 weeks who may need it)



If my baby(ies) needs help with a breathing tube, the neonatal team will protect their lungs by using a special ventilator setting.

Was VTV/VG ventilation used as initial mode of ventilation if ventilated in first 72 hours?

Yes / No / N/A

Caffeine

(for all babies born before 30 weeks and some babies born less than 34 weeks or who weigh less than 1500g)

My baby(ies) has been given caffeine to protect their brain and help their breathing.

Date ..... Time.....

Hydrocortisone

(for babies born before 28 weeks)

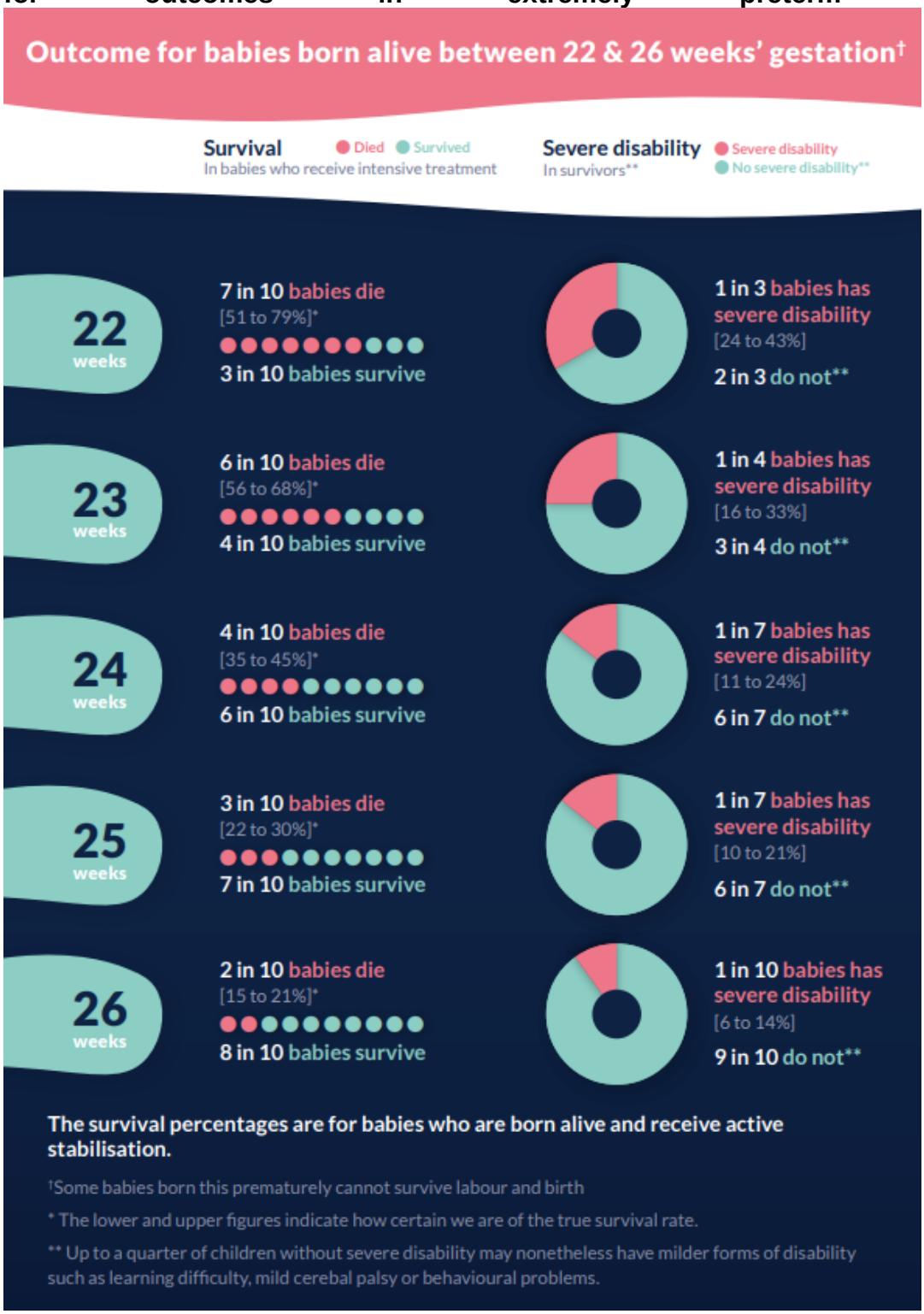
My baby(ies) has been given hydrocortisone to help their lungs.

Date given.....

Time given.....

This resource has been adapted from PERIPrem/BAPM (as appropriate). PERIPrem/BAPM cannot verify the translated version. PERIPrem was co-produced by Health Innovation West of England and Health Innovation South West, and the South West Neonatal Operational Delivery Network. Find out more at www.healthinnowest.net/periprem.

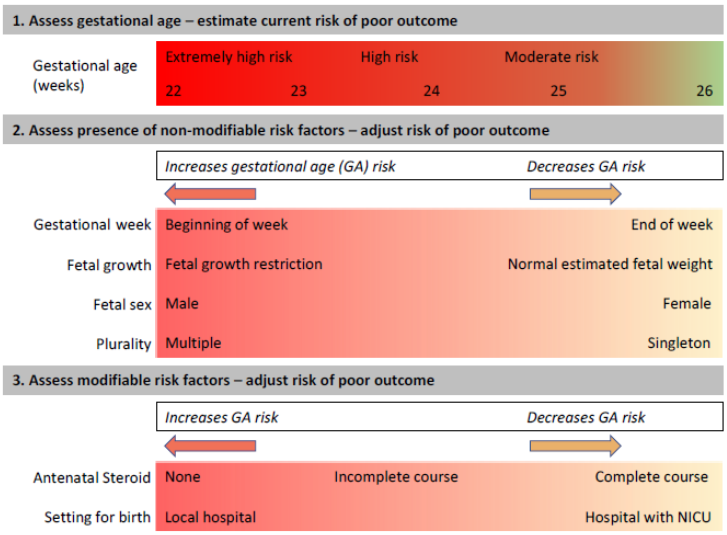
10.5: Appendix E: British Association of Perinatal Medicine (BAPM) infographic for outcomes in extremely preterm babies



10.6: Appendix F: Perinatal Management of the Extreme Preterm Baby.

Perinatal Management of the Extreme Preterm Baby <27 weeks gestation

Antenatal planning involving senior clinical staff from obstetrics, midwifery and neonatology should be used to designate the baby into different risk categories. The baby's assesed risk category should be shared clearly but sympathetically with the parents.



Risk categories

Extremely high risk: babies with a > 90% chance of dying /surviving with severe impairment. E.g:

- babies at 22+0 - 22+6 weeks' with unfavourable risk factors
- some babies at 23+0 - 23+6 weeks' with unfavourable risk factors, including severe fetal growth restriction
- (rarely) babies ≥ 24+0 weeks' with **significant** unfavourable risk factors, including severe fetal growth restriction

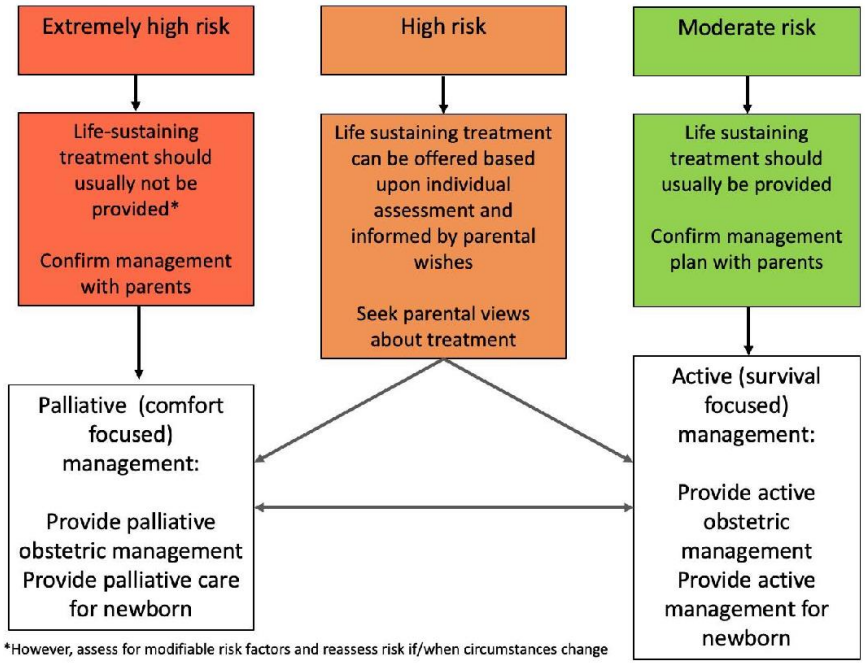
High risk: babies with a 50-90% chance of dying /surviving with severe impairment. E.g.

- babies at 22+0 - 23+6 weeks' with favourable risk factors
- some babies ≥ 24+0 weeks' with unfavourable risk factors and/or co-morbidities

Moderate risk: babies with a < 50% chance of dying/surviving with severe impairment. E.g:

- most babies ≥ 24+0 weeks'
- some babies at 23+0 – 23+6 weeks' with favourable risk factors

On the basis of the assessed risk babies and following consultation with the parents the babies initial care will then follow either the active or palliative care pathways. Parents must be counselled that the antenatal plan will be reviewed after birth and may need to be changed on the basis of the clinical condition of the baby. Where a decision for active management is agreed, obstetric care should be as for 23 and 24 weeks with antenatal steroids and magnesium. Requests for inutero transfer into Hull from a nearby L1 or 2 unit should be prioritised with the default position being to accept.



Neonatal Active Management

- Most senior person (ideally consultant) to manage or directly supervise stabilisation.
- Ensure DCC and good thermal care
- Face mask ventilation to proceed rapidly to intubation and curosurf if this is insufficient.
- If resuscitation is required and deemed to be appropriate follow the NLS algorithms
- If baby in unexpectedly poor condition always act in the best interests of the baby.
- Poor outcomes after bradycardia that fails to respond to a few minutes of effective CPR

Neonatal Palliative Management

- Not necessary for neonatal team to be present but may attend at parental request
- Ensure parents are aware that baby may show signs of life
- Keep baby with family
- Do not offer respiratory support

Areas of uncertainty

- GA uncertain
- Deliver baby into plastic bag. Unless baby clearly <22/40 or <350g start face mask ventilation and assess response.
- No antenatal counselling
- Start on stabilisation/resuscitation pathway and reassess if baby very immature or fails to respond to stabilisation (bradycardia despite IPPV)
- Unexpectedly good condition at birth
- Discuss if gestation/risk factors are accurate
- Change to active care without delay if it is deemed to be in the baby's best interests.