Guy's and St Thomas' NHS
NHS Foundation Trust

Clinical Guidance

Guideline for the Management of Prelabour Rupture of Membranes 18+0 – 42wks

Summary
Diagnosis and management of pre-labour rupture of membranes at all gestations from 18+0 to 42+ weeks of pregnancy.

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15th December	Page 1 updated references Page 5 Update advice regarding expectant management. Dosage of betamethasone changes to 9.9mg 24 hours apart. Preterm pre labour management broken down into gestation specific advice. Additional table of advice for management at different gestations	

	Additional table of survival rates for premature babies.	

Introduction:

Prelabour rupture of membranes (PROM) is a common presentation to the Maternity Assessment Unit (MAU) and Hospital Birth Centre and can occur at any gestation. PROM complicates 8% of term pregnancies (Scorza, 2016). Rupture of membranes prior to 37 weeks is referred to as preterm prelabour rupture of membranes (pPROM). pPROM complicates 2-3% of pregnancies (RCOG Greentop 44, 2010), but is associated with 40% of preterm deliveries, resulting in significant perinatal mortality and morbidity depending on the gestational week at the time of delivery (RCOG Greentop 44).

Maternal complications:

- Chorioamnionitis
- Endometritis
- Sepsis
- Death

Fetal complications: (Duff, 2016)

- Prematurity with associated complications, e.g., respiratory distress syndrome, pulmonary dysplasia, hypoxic ischaemic encephalopathy (HIE), necrotising enterocolitis (NEC), neurodevelopment impairment, etc.
- Sepsis
- Placental abruption, if associated polyhydramnios
- Cord prolapse
- Perinatal Death

Diagnosis of PROM

Diagnosis is suspected on the basis of history and confirmed by a speculum examination.

History:

- Time and date of ROM, and duration
- Nature of onset: sudden gush or slow trickle
- Amount of fluid lost
- Colour of loss (clear/meconium/blood stained)
- Any offensive smell

Examination:

- General examination with vital signs (plotted on a MEOWS chart).
- Abdominal palpation for fetal lie and presentation.
- Confirm fetal wellbeing (Sonicaid or CTG, depending on gestation age).
- Look for any signs of sepsis – Maternal pyrexia >37.4° C, tachycardia, Increased respiratory rate uterine tenderness and offensive vaginal discharge.
- Sterile speculum examination to look for pooling of amniotic fluid is the gold standard for confirmation or exclusion of ROM. It also allows for assessment of the colour of the amniotic fluid and opportunity to rule out cord prolapse.
- Do not carry out a speculum examination if it is certain that the membranes are ruptured (NICE 2014).
- Digital vaginal examination (VE) should be avoided where ROM is suspected until the woman is in labour (or is having regular painful contractions), as it increases the risk of uterine infection.

- Where there is a persuasive history of ROM but no amniotic fluid seen even on coughing, then a speculum examination can be repeated after 1 hour of the patient lying supine, which allows liquor to pool in the posterior vaginal fornix.
- Ultrasound measurement of the amniotic fluid volume can neither confirm nor exclude ROM; it can simply assess the current amniotic fluid volume. However, in some cases oligohydramnios on US can be helpful to establish the diagnosis in the background of a good history, and a negative speculum examination.

Differential diagnoses:

1. Urinary leak: take a detailed history about urinary stress or urge incontinence, if no amniotic fluid seen in the vagina on speculum examination. Also, do a dipstick examination of urine, and arrange an MSU, if indicated.
2. Transudate from bulging membranes: fluid is often observed in the vagina with intact membranes bulging through a dilated cervix on speculum examination.
3. Vaginal discharge: either physiological discharge or vaginitis. Characteristic vaginal discharge seen on speculum examination rather than a clear pool of amniotic fluid.

Management after PROM is confirmed:

Management at different gestation is summarised in Table 1.

Pre-labour ROM at term (at or after 37+0 weeks)

Expectant management may be offered to women to await spontaneous labour for up to 24 hours, as 60% will go into spontaneous labour (NICE 2008). Advise women with PROM at term that the risk of serious neonatal infection is 1 % compared to 0.5 % for women with intact membranes (NICE NG25, 2015).

- There is no evidence performing a vaginal swab at this gestation improves outcomes and this should not be done routinely.

- Stimulation of labour is appropriate approximately after 24 hrs (NICE 2014) as the risk of infection increases subsequently. If however a vaginal examination has been performed, stimulation should be carried out at about 6 hrs.

- NICE (2008) recommends prostaglandin for stimulation of labour. The trial by Hannah et al (1996) showed no difference in neonatal infection rates or caesarean section rates with syntocinon vs prostaglandin for stimulation, however induction with syntocinon was associated with less risk of maternal pyrexia. In view of this, oxytocin may be used as the primary method of induction where the Bishops' score is >4 after discussion with the woman and in accordance with her wishes. If however, Bishop's score is <4, prostaglandin may be used first followed by syntocinon infusion after six hours. [Please refer to guideline on Induction, Stimulation and Augmentation of Labour for dosage regime and administration]. Prostin gel should be the preferred prostaglandin rather than the long-acting variety (Propess), as another 24 hours to wait for the response may increase the risk of infection.

- The Midwife or Doctor attending to the patient should book the date for stimulation of labour and document the plan in the notes.

- Women may be allowed home if all circumstances are suitable including; clear amniotic fluid, cephalic presentation ≤3/5th palpable per abdomen (non-cephalic presentation should be admitted), normal fetal movements, normal observations including a normal CTG (cardiotocograph), no VE has been performed, no evidence of intrauterine infection, adequate home support, reliable communication and transportation, etc.

- Women with Group B Streptococcus (GBS) positive vaginal swab or MSU (midstream urine) during the current pregnancy, and women who have had a previous baby with early onset GBS [EOGBS] infection should be offered immediate rather than delayed stimulation, and given antibiotic prophylaxis against GBS once in labour [see GBS prophylaxis guideline].

- If labour has not started 24 hours after PROM women should be advised to give birth in hospital (either Home from Home or Hospital Birth Centre) rather than at home, if originally planned so. These mothers should stay in hospital for at least 12 hours after the birth (NICE 2014) for neonatal observations.

- If expectant management beyond 24 hours is chosen by the woman, do not offer lower vaginal swabs or CRP. Advise her to record temperature every 4 hours during waking hours and to report immediately a rise in temperature of ≥0.5°C, any change in the colour or smell of her vaginal loss. Inform women that bathing and showering is not associated with an increase in infection, but that having sexual intercourse may be. Assess fetal movement and heart rate at initial contact and then every 24 hrs after ROM while the woman is not in labour, and advise the women to report immediately any decrease in fetal movements (NICE 2014). Review on MAU every 24 hours to assess fetal and maternal well being.

Contraindications to expectant management of PROM:

- Signs of chorioamnionitis (MEOWS score >1, temperature >37.4, pulse rate >90, RR >20)
- Digital vaginal examination following PROM
- Thick meconium
- Blood stained amniotic fluid or vaginal bleeding
- Group B streptococcus (as above).
- HIV infection unless undetectable viral load
- Recent vaginal infection (e.g. gonorrhoea, trichomonas, herpes, chlamydia)
- Intrauterine death
- Please discuss with ST 5 or above if any complications in the pregnancy

Preterm Pre-labour ROM (pPROM) 23^{+0} - 36^{+6} weeks

Four possible groups of patients:

Individualised care plan should be in place:

A) <u>pPROM at 23+0 – 27+6 weeks</u>:

- After confirmation of pPROM, admit the woman and check for signs of infection with 6 hourly temperature and maternal pulse; daily FHR check, twice weekly full blood count (FBC) and C reactive protein (CRP).

- There is no consensus on how to monitor the fetus at this gestation. CTG is usually (outside PROM) not recommended <28wks (RCOG Green top 57, 2011), unless there is specific indication. CTG may help identify sepsis (fetal tachycardia and loss of baseline variability) but there is no consensus on the utility of antenatal CTG prior to 28 weeks gestation

- Offer antenatal Corticosteroids after discussion with the patient (Dexamethasone sodium phosphate Inj. two doses of 9.9mg IM 24 hours apart as per Premature Labour Guideline).

- Tocolysis in women with pPROM is not recommended because this treatment does not significantly improve perinatal outcome (RCOG Green top 44, 2010). However, in certain cases, if contractions are present, discuss with consultant/Senior Registrar whether to give tocolysis to complete the course of antenatal corticosteroids.

Tocolysis is contraindicated in the presence of infection or bleeding.

- Inform NICU and check availability of neonatal cot, and if in-utero transfer (IUT) is required. Liaise with neonatal team (Neonatal Registrar bleep 0241, or Extension 88847) to counsel parents regarding neonatal survival and neonatal management issues (see Table 2).

- Offer oral erythromycin 250mg 4 times a day for a maximum of 10 days or until the woman is in established labour (whichever is sooner).

  Use of erythromycin has been shown to be associated with prolongation of pregnancy, reductions in neonatal treatment with surfactant, decreases in oxygen dependence at 28 days of age and older, fewer major cerebral abnormalities on ultrasonography before discharge, and fewer positive blood cultures. Research evidence does not support Erythromycin treatment before 24wks [Kenyon et al, 2001, ORACLE Trial]

  For women who cannot tolerate erythromycin or in whom erythromycin is contraindicated, consider oral penicillin for a maximum of 10 days or until the woman is in established labour (whichever is sooner). [NICE NG25, 2015]

  Do not offer women with pPROM co-amoxiclav as prophylaxis for intrauterine infection (although there is no direct evidence of harm when used in the presence of established infection).

- Ultrasound scan (USS) may be useful to confirm the fetal lie and presentation, and establish estimated fetal weight (EFW) to aid counselling about mode of delivery and neonatal outcome (the latter by the neonatologist), particularly at gestation below 28 weeks. However, residual amniotic fluid does not provide sensitive prediction of intrauterine infection.

- Do not use transvaginal ultrasound measurement for cervical length or fetal fibronectin testing in women with pPROM (NICE, 2016)

- Outpatient management via Maternity Assessment Unit (MAU) may be considered after 5 days of in-patient observation. This should be discussed with the consultant obstetrician. Women should be advised to attend MAU twice weekly to check for signs of chorioamnionitis, and CTG, FBC and CRP.

- Women managed as outpatients should be advised on signs & symptoms of chorioamnionitis to check their temperature 4-6 hourly and when to seek advice.

- Clear follow-up and delivery care plan should be documented in the notes.

B) <u>pPROM at 28+0 – 31+6 weeks</u>:

- Admit after initial assessment and confirmation of diagnosis on Maternity Assessment Unit (MAU).

- Check for signs of infection with 6 hourly temperature and maternal pulse; daily CTG, twice weekly full blood count (FBC) and C reactive protein (CRP).

- USS to check for fetal growth, umbilical artery Doppler, amniotic fluid index (AFI) and estimated fetal weight (EFW).

- Offer antenatal Corticosteroids

- Offer oral erythromycin (or alternative antibiotics, as in Group A).

- Consider in-patient management for 2-5 days; then out-patient management via MAU and/or ANC, as in Group A.

C) pPROM 32+0 – 33+6 weeks:

- Initial assessment on MAU.

- Consider admission for 2 days, if any symptoms of preterm labour, but if asymptomatic, consider expectant out-patient management.

- Offer Erythromycin, and antenatal corticosteroid as in Groups A & B.

- Consider USS

D) pPROM 34+0 – 36+6 weeks

- Initial assessment on MAU

- Manage as outpatient

- Do not offer antenatal corticosteroid as >34 weeks the benefits of steroids is less clear (RCOG, Green top 44, 2010). (However, this can be discussed with the consultant obstetrician and the neonatal unit on individual case basis.)

DELIVERY

- Expectant management is recommended prior to 34 weeks, unless there are other obstetric indications (e.g. infection or fetal compromise), in which case delivery should be expedited, regardless of gestation, and the woman should be managed as per the 'Pyrexia in Labour' guideline.

- Offer delivery from 37 weeks gestation, usually induction with prostaglandin (prostin) followed by syntocinon infusion if Bishop's score is <4, or by syntocinon infusion if Bishop's score is >4 [see Induction of labour guideline].

- *Delivery between 34+0 and 36+6wks*: There is insufficient evidence to guide clinical practice on the benefits and harms of immediate versus delayed delivery. Delayed delivery (expectant management) may be associated with an increased risk of chorioamnionitis, intrapartum haemorrhage, intrapartum fever, postpartum treatment with antibiotics, and prolonged hospital stay, whereas immediate delivery may be

associated with increased risk of respiratory distress syndrome, mechanical ventilation and longer stay in a neonatal intensive or special care unit.

On balance, in the absence of overt signs of infection or fetal compromise, a policy of expectant management with appropriate surveillance of maternal and fetal wellbeing should be followed in these women [Morris et al, 2016, PPROMPT trial]. Cost-wise, expectant management is no more or less costly than immediate birth [Lain SJ, et al. BJOG. 2016]

- During labour, the woman should be offered continuous CTG (if >26 weeks gestation). Explain to the woman that usefulness and evidence-base for benefit of CTG in labour in the preterm fetuses is limited but consistent with that in babies born at term (NICE NG25, 2015). Below 25+6 weeks gestation intrapartum monitoring should be discussed with the couple and the senior obstetrician on call.

- When in labour, antibiotic prophylaxis should be started (as per the GBS prophylaxis guideline) for all women <37 weeks gestation or with ROM for >18 hours ≥ 37wks regardless of whether the woman is GBS positive. [18 hours used as a cut-off as a postnatal risk factor for EOGBS]

  There is no evidence that immediate induction of women with GBS carriage in the current pregnancy or previously affected baby who present with pPROM is beneficial.

- There is no evidence that women with pPROM and with known GBS carriage or a previously affected baby should be treated with antibiotics prior to labour or induction. When the woman does eventually labour antibiotic prophylaxis should be instituted as per the GBS guideline.

- For established chorioamnionitis, take appropriate measures for PPH, as there is an increased risk.

- If Caesarean section is necessary, a vertical uterine incision may be required for extreme prematurity with a transverse fetal lie and severe oligo/anhydramnios. Hence a senior obstetrician must be present at delivery for gestation of less than 26wks, and the patient must be counselled appropriately.

Magnesium sulfate for neuroprotection (NICE NG25, 2015)

Offer intravenous magnesium sulfate for neuroprotection of the baby to women with pPROM between 23^{+0} and 29^{+6} weeks who are in established preterm labour or having a planned preterm birth within next 24hours.

Consider magnesium sulfate for neuroprotection of the baby for women between 30^{+0} and 33^{+6} weeks.

Dosage and administration: Give a 4g intravenous bolus of magnesium sulfate over 15 minutes, followed by an intravenous infusion of 1g per hour until the birth or for 24hours (whichever is sooner). Stop at delivery ($MgSO_4$ is being given for fetal not maternal indications).

Monitor for clinical signs of magnesium toxicity at least every 4hours by recording pulse, blood pressure, respiratory rate and deep tendon (for example, patellar) reflexes, oliguria or other signs of renal failure.

AFTER DELIVERY:

- Send the placenta for histology, and placental swab from the fetal surface for culture and sensitivity.
- Inform the link obstetric consultant if an extremely premature baby admitted to NICU
- Debrief the mother/couple
- Consider a formal debriefing appointment with the link obstetric consultant after 6-8wks.

PROM at < 23^{+0} weeks

Midtrimester pPROM complicates up 0.1 to 0.7% of pregnancies (McElrath, 2016). Pregnancy complications include infection (chorioamnionitis, endometritis), placental abruption, cord prolapse.

The risk of pulmonary hypoplasia following pPROM at 20+0-23+6 weeks is 22% increasing to 51% following pPROM below 20+0 weeks. (Carrol et al, 1996). Only 5% of fetuses reach viability following pPROM below 20 weeks.

Fetal complications include prematurity, pulmonary hypoplasia, sepsis, Potter's syndrome, musculoskeletal deformations and fetal death.

Maternal complications include sepsis, ICU admission, multiorgan failure (and dialysis) and maternal death.

- The parents should be counselled by the obstetric consultant.
- The neonatal team do not routinely counsel women at this gestation nor would they attend delivery.
- Steroids or prophylactic antibiotics with Erythromycin and GBS antibiotic prophylaxis in labour are NOT recommended.
- Termination of pregnancy as an option should be considered and may have to be discussed sensitively with the parents by the consultant.

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Table 1
Summary of Management of pPROM at various gestations

Management	GESTATION			
	<23wks	**23^{+0}-34^{+6}wks**	**35^{+0}-36^{+6} wks**	**≥ 37wks**
Steroids	No	Yes	No	No
Erythromycin	No	Yes (see text for <24wks)	Consider (unless decided otherwise by Consultant)	No
Tocolysis	No	Consider	No	No
Vaginal swab	Yes	Yes	Yes	Only if signs of infection
USS for presentation and EFW	No	Yes	No (unless any clinical indication)	No
Neonatal consultation	No	Yes	No (unless any clinical concern)	No
GBS prophylaxis in labour	No	Yes	Yes	Yes, if >18hrs post ROM
Delivery options	Conservative/ Termination	Expectant management until at least 34 wks. Consultant decision >34wks (see Text)	Offer delivery, but see Text	Stimulation of labour >18Hrs

Table 2

Evelina Neonatal Unit Survival Rates (Sept 2012 Sept 2016)
(note this does not equate to survival of babies alive on admission to labour ward)

Gestation	Total Babies (inborn and outborn)	Total Deaths	Survival Percentage
23	52	15	71.2
24	119	17	85.7
25	102	20	80.4
26	101	11	89.1
27	99	4	96
28	90	7	92.2
29	103	3	97.1
30	86	4	95.3
31	119	4	96.6
32	149	9	94
33-36	768	14	98.2
37-42	1966	29	98.5