CLINICAL PRACTICE GUIDELINE

Preterm prelabour rupture of membranes (PPROM)

This document should be read in conjunction with the Disclaimer

Contents

Suspected PPROM: MFAU quick reference guide (QRG) ...............2
  Assessment .................................................................................................................... 2
  Flow Chart for the Management of Suspected PPROM ........................................ 3
PPROM medical and midwifery management ................................................. 4
  Background .................................................................................................................. 4
  Key points ................................................................................................................. 4
  Diagnosis .................................................................................................................... 5
    Medical history ........................................................................................................ 5
    Physical examination .............................................................................................. 5
    Al – Sense Panty Liner™ ....................................................................................... 5
    Ultrasound examination ......................................................................................... 6
  Management .............................................................................................................. 6
    Observations ........................................................................................................... 6
    Pathology tests ...................................................................................................... 7
    Maternal education ............................................................................................... 7
    Referrals ................................................................................................................. 7
    Fetal surveillance .................................................................................................. 8
    Antibiotics ............................................................................................................ 8
    Corticosteroids ...................................................................................................... 9
    Amniocentesis ........................................................................................................ 9
    Amnioinfusion ....................................................................................................... 9
    Progesterone ......................................................................................................... 9
    Prophylactic Tocolysis .......................................................................................... 9
    Cervical Cerclage ................................................................................................... 10
    Magnesium Sulphate .......................................................................................... 10
  Outpatient management ......................................................................................... 10
    Future Pregnancy .................................................................................................. 11
Care on the ward: QRG .................................................................................. 12
PPROM confirmed: Outpatient management: MFAU QRG .................. 14
  Assessment ............................................................................................................... 14
  Weekly Assessments ............................................................................................. 14
  Outpatient management of confirmed PPROM: Flow chart .................. 15
References .......................................................................................................... 16
Suspected PPROM: MFAU quick reference guide (QRG)

Assessment

**Note: Do not perform a digital examination as it increases risk of infection**

1. Document time and history of the reported vaginal loss. Note type, colour, amount, and any abnormal smelling discharge.
2. Perform and record maternal temperature, pulse and blood pressure, respirations & oxygen saturation.
3. Auscultate the fetal heart rate and confirm presence of fetal movements.
4. Perform an abdominal palpation noting:
   - Symphysis fundal height
   - Lie (if appropriate depending on gestation)
   - Presentation (if appropriate depending on gestation)
   - Uterine tenderness, irritability / activity
5. If >24 weeks gestation, commence a CTG if there is any tenderness or uterine activity. If the woman is having uterine tightenings > 1:10 minutes see Clinical Guideline Preterm Labour, and notify the Obstetric Medical team.
6. Provide the woman with an Al-Sense liner to wear and encourage mobilisation for the next 5-10 minutes within the department.
   - Perform a set of maternal and fetal observations.
   - Assess the panty liner for any colour change.
   - If there is a colour change on the panty liner to blue of green there is probable ROM.
   - If the pad remains yellow or turns yellow the fluid leak is probably not ROM.
   - If negative the woman may be discharged home. An ultrasound scan, CTG or speculum does not need to be performed.
   - Advise the woman to continue to wear the panty liner for 12 hours. If the liner turns blue at any stage during the 12 hours she should contact MFAU / her MGP/CMP midwife.
7. If SROM is confirmed perform:
   - Low vaginal swab (LVS) for culture
   - Rectal swab (assessing for group B streptococcus)
   - Endo cervical swab (ECS) – may be collected for Chlamydia trachomatis or Neisseria gonorrhoea if needed. Perform a High vaginal Swab (HVS) if there is a purulent discharge.
   - Collect further pathology, including Full blood picture & CRP, and any booking antenatal bloods and pathology tests as required.
8. Arrange ultrasound assessment of amniotic fluid volume if there is a history suggestive of PPROM in the absence of clinical signs.

**Flow Chart for the Management of Suspected PPROM**

**Woman presents to MFAU with suspected PPROM**

- Midwife / RMO takes a history and provides the woman with an AI Sense panty liner

**Is PPROM confirmed?**

- No
  - Discharge Home with the panty liner after discussion with the Obstetric Registrar or above.
  - Routine antenatal follow up with the usual health provider.
  - Instruct the woman to contact MFAU/MGP/CMP if there are any further signs of PPROM or if the panty liner changes colour in the next 12 hours

- Yes
  - See the section covering medical and midwifery management

**Arrange review by the Obstetric registrar or above**

**Unknown**
PPROM medical and midwifery management

Background
PPROM is defined as spontaneous rupture of the membranes before the onset of labour prior to 37 weeks gestation.\(^1\)\(^-\)\(^3\) It complicates 2 - 4% of all singleton and 7 - 20% of twin pregnancies\(^2\)\(^,\)\(^4\) and is associated with over 60% of preterm births.\(^5\)

The aetiology is multifactorial and risk factors for PPROM include intra-amniotic infection, placental abruption and invasive uterine procedures (e.g. amniocentesis, cordocentesis, chorionic villus sampling, cervical cerclage).\(^4\)

Typically women with PPROM present with a large gush or steady trickle of clear vaginal fluid. The clinical signs of PPROM may become less accurate after 1 hour has elapsed.\(^4\)

The interval between PPROM and the onset of labour is influenced by many factors including gestational age. Women with PPROM have a 50% chance of going into labour within 24 to 48 hours and 70 to 90% chance within 7 days. If PPROM occurs between 24 and 28 weeks gestation the latency period before birth is generally longer than if occurring closer to term.\(^4\)

PPROM is associated with an increase in perinatal mortality and an increase in neonatal morbidity. Perinatal complications include respiratory distress syndrome, infections, intraventricular haemorrhage, pulmonary hypoplasia, skeletal deformities, cord prolapse, and malpresentation.

Key points
1. **Digital vaginal examination** should be avoided unless the woman is in active labour or birth is imminent.\(^3\)
2. Between 23 and 23\(^{+6}\) weeks gestation the decision for corticosteroids administration is made following consultation between the Obstetric/Paediatric Medical Team and the parents.
3. A single course of antenatal corticosteroids should be considered for administration to women with PPROM without signs of infection between 23 and 36+6 weeks gestation.
4. If gestation is less than 34 weeks and in the absence of infection or complications and in circumstances when a course of corticosteroids has not been completed, tocolysis may be considered for threatened premature labour. The extension of steroid use to 36\(^{+6}\) weeks does not mean that tocolytic therapy is recommended past 34 weeks.
5. Broad spectrum antibiotic administration is recommended following PPROM to prevent infection and prolong the pregnancy in the short term, leading to a reduction in neonatal and maternal morbidity.\(^6\)\(^,\)\(^7\)
6. It is the Obstetric Consultant’s decision, as to when to deliver a preterm baby. If
expectant management continues >34 weeks, women should be advised of the increased risk for chorioamnionitis and the decreased risk of respiratory problems in the neonate.6

7. All CMP clients who report or suspect premature pre-labour rupture of membranes at < 37 weeks gestation must be referred immediately to their supporting hospital for an obstetric review.

8. Outpatient management of women with PPROM must be approved by a consultant obstetrician.

**Diagnosis**

Diagnosis of PPROM is usually made on the basis of maternal history, physical examination, and ultrasound examination.

**Medical history**

On admission note and document:

- Time of PPROM.
- Type and colour of fluid loss.
- Amount of fluid loss.
- Signs of infection including ‘offensive smelling’ vaginal discharge, uterine tenderness, maternal fever, and fetal tachycardia.

Assess for a differential diagnosis:

- Leakage of urine (incontinence)².
- Physiological vaginal discharge².
- Bacterial infection e.g. bacterial vaginosis².
- Cervical mucous (show) which may be a sign of impending labour².

**Physical examination**

**Abdominal palpation**

- Depending on the gestation abdominal palpation may be appropriate to assess fetal size and presentation.
- Note any abdominal tenderness which may indicate infection.

**AI – Sense Panty Liner™**

The AI-Sense Panty Liner™ may be used as a screening tool for PPROM > 20 weeks gestation.

- Provide the woman with a liner to wear and encourage mobilisation for the next 5-10 minutes within the department.
- Perform a set of maternal and fetal observations.
- Assess the panty liner for any colour change.
- If there is a colour change on the panty liner to blue of green there is probable ROM
If the pad remains yellow or turns yellow the fluid leak is probably not ROM.

If negative the woman may be discharged home. An ultrasound scan, CTG or speculum does not need to be performed.

Advise the woman to continue to wear the panty liner for 12 hours. If the liner turns blue at any stage during the 12 hours she should contact MFAU / her MGP/CMP midwife.

**If the panty liner is positive for ROM**

- Avoid digital examination unless birth is imminent.
- Perform a sterile speculum examination.
- Obtain a low vaginal swab (LVS) for microscopy and sensitivity.
- Collect LVS and ano-rectal swab for Group B Streptococcus screening.
- Offer screening for Chlamydia if unbooked and no results are available.

**Ultrasound examination**

Arrange ultrasound examination for gestational age, fetal well-being, growth and estimation of amniotic fluid index (AFI). This provides a useful adjunct for diagnosis of oligohydramnios but is not diagnostic.\(^3\) \(^8\)

**Management**

Management is influenced by gestation age of the fetus, presence of infection, advanced labour and evidence of fetal compromise.

**Observations**

1. **On admission** – perform baseline assessment for temperature, pulse, and blood pressure (BP), respirations, O\(_2\) saturation, uterine activity or tenderness, vaginal discharge & urinalysis.
2. Ongoing observations include:
   - **4 hourly:** Temperature, pulse, fetal activity, uterine activity and/or tenderness, and vaginal discharge – assess colour and amount. Note if discharge is ‘offensive smelling’ which may indicate infection.
   - **Twice daily:** Fetal heart rate
   - **Daily:**
     - BP
     - Assess bowel activity

**Note:** Unless otherwise instructed by the medical team night-time observations shall be performed at 2200 and 0600.

**Notify the medical team of any deviation from the normal observations.** The frequency of observations shall be adjusted according to the maternal and fetal clinical condition.
Pathology tests
On admission with PPROM collect:
- Full blood picture (FBP)
- C-reactive protein (CRP) if clinically indicated – while studies have shown a CRP is a poor predictor of chorioamnionitis, studies cannot conclude that it is ineffective in detection of chorioamnionitis or neonatal sepsis.9, 10
- Mid-stream urine (MSU)
- Low vaginal swab (LVS) and rectal swab for culture, including specific Group B Streptococcus testing
- Endocervical swab (ECS) if screening required for Chlamydia11.

Ongoing follow-up pathology tests may be ordered by the medical team if clinically indicated:
1. FBP and/or CRP if there is suspicion of infection
2. LVS as required.

If a woman is unbooked to KEMH ensure a copy of all tests and results done in her pregnancy are available for review. Order booking antenatal bloods and pathology tests as required. See Clinical Guideline, O&M: Antenatal Care: Antenatal Visits–Initial visit.

Maternal education
1. Instruct the woman about personal hygiene including changing her sanitary pad 4 hourly or as required. Tampons should not be used.
2. Alert the woman to look out for changes in colour and odour of the PV loss.
3. Encourage frequent leg exercises and instruct the woman to wear graduated compression stockings until full ongoing mobility is assured. Elastic compression stockings assist in the prevention of deep vein thrombosis.12
4. Arrange a Paediatric consultation for gestations under 32 weeks or in pregnancies with other complications. Discuss management of preterm birth e.g. feeding methods, Neonatal Intensive Care (NICU) admissions, risk factors and outcomes.
5. Inform the woman about the Health Information Resource Services (HIRS).
6. Advise women that sexual intercourse should be avoided with PPROM.

Referrals
As required offer referral to specialist services:
- Neonatologist- if <32 weeks gestation or other complications such as IUGR
- Aboriginal Liaison Office
- Social worker
- Psychological Medicine
Fetal surveillance
There is no clear evidence on the optimum frequency to perform fetal surveillance tests for women with PPROM. The frequency of tests is adjusted according to the maternal and fetal clinical situation.

<table>
<thead>
<tr>
<th>Fetal Surveillance</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fetal Heart Rate (FHR)</strong></td>
<td>Perform an initial period of electronic FHR monitoring &amp; uterine activity monitoring (at ≥ 23 weeks) on admission to identify abnormal FHR &amp; evaluate for contractions. Thereafter, FHR twice daily (morning / evening).</td>
</tr>
<tr>
<td><strong>Fetal Activity</strong></td>
<td>4 hourly</td>
</tr>
<tr>
<td><strong>Cardiotocograph Monitoring (CTG)</strong></td>
<td>Weekly if the gestation is more than 30 weeks. Between 23 -25 weeks gestation CTG monitoring should be discussed with the senior registrar or consultant before commencing.</td>
</tr>
<tr>
<td><strong>Ultrasound</strong></td>
<td>If the fetus is more than 23 weeks gestation:</td>
</tr>
<tr>
<td></td>
<td>• Weekly AFI, BPP, umbilical artery (UA) doppler studies</td>
</tr>
<tr>
<td></td>
<td>• 2 weekly fetal biometry.</td>
</tr>
</tbody>
</table>

**NOTE:** Report any abnormalities to the Medical Obstetric Team.

**Antibiotics**
Certain antibiotic administration to women with PPROM provides short-term benefits by prolonging pregnancy and reducing risk for infection. It has been shown to reduce some markers of maternal and neonatal morbidity and although it does not equate to a statistically significant reduction in perinatal mortality, research indicates it makes it possible to reduce risk or mortality. The demonstrated delay in onset of labour may
allow sufficient time for effective prophylactic corticosteroids. **Avoid** the use of Amoxicillin/Clavulanate as it is associated with neonatal necrotising enterocolitis.\(^3\), \(^8\), \(^{13}\)

**Antibiotic dosage**

Chorioamnionitis is an indication for delivery.\(^3\)

- Oral **Erythromycin** 250mg four times a day for 10 days.\(^3\), \(^{14}\)
- If the woman has a positive screening result for Group B Streptococcus (GBS) see [Clinical Guideline Group B Streptococcal Disease](#) for management.

**Corticosteroids**

Evidence supports the use of a course of antenatal corticosteroids to accelerate fetal lung maturation in women at risk of preterm birth.\(^3\), \(^{15}\) This reduces the risk of neonatal death, respiratory distress syndrome, cerebroventricular haemorrhage, necrotising enterocolitis, infectious morbidity and the need for respiratory support and neonatal intensive care admission.\(^{16}\), \(^{17}\)

**Corticosteroid dosage and administration**

- Consider administering corticosteroids between 23 weeks and 36+6 weeks gestation.\(^{18}\)
- Between 23 and 23+6 weeks gestation the decision for corticosteroids administration is made following consultation between the obstetric/paediatric medical team and the parents.

See KEMH [Antenatal Corticosteroids to Reduce Neonatal Morbidity and Mortality](#).

**Amniocentesis**

Routine amniocentesis should not be performed for women with PPROM.\(^6\) In selected cases it may be an option for detecting subclinical infection.

**Amnioinfusion**

There is currently insufficient evidence to support amnioinfusion for PPROM.\(^1\)

**Progesterone**

Progesterone should not be commenced in women with PPROM and should be discontinued in women using it prior to PPROM.

**Prophylactic Tocolysis**

Tocolysis may be used to allow a course of corticosteroids to be completed and if a woman is requiring transfer to a tertiary hospital, but should not routinely be continued after arrival.\(^2\) Use of tocolysis with PPROM does not significantly improve perinatal outcome.\(^6\) Furthermore, the risk of chorioamnionitis is increased when tocolytic therapy is used and further research is required to guide its general use.\(^3\), \(^{19}\)

See also KEMH Clinical Guidelines: O&M: Complications of Pregnancy: [Preterm Labour](#); & LBS QRG Nifedipine Tocolytic Therapy
Cervical Cerclage
For women with PPROM, the optimal timing for cerclage removal is unclear.\textsuperscript{3, 20} A 10 year RCT involving 56 participants showed no statistically significant differences in prolonged latency, infection or neonatal outcomes with cerclage removal or retention, although the possibility of increased infection with cerclage retention was expressed.\textsuperscript{21} Decisions regarding removal of cervical cerclage after PPROM should be made in consultation with a Consultant Obstetrician.

Cerclage management
- < 23 weeks gestation – remove cerclage due to increased risk of maternal chorioamnionitis and neonatal mortality from sepsis (however, antibiotics administration will decrease risks)\textsuperscript{22}.
- Delayed suture removal until labour occurs or when birth is indicated, is associated with an increased risk of maternal/fetal sepsis, therefore is not recommended.\textsuperscript{23}
- Between 23 and 34 weeks gestation, if there are no contraindications such as preterm labour, non-reassuring fetal status, or infection, delayed removal of cerclage may be appropriate to allow for completion of antenatal steroids.\textsuperscript{22, 23}

Send the cervical suture for culture, once removed.

Magnesium Sulphate
If early preterm birth (<30 weeks) is planned or expected within 24 hours, a magnesium sulphate infusion can be offered (if no contra-indications) to women for potential fetal neuro protection.\textsuperscript{3}

See KEMH Clinical Guideline Antenatal Magnesium Sulphate Prior to Preterm Birth for Neuro Protection of the Fetus Post Birth & QRG MgSO4 for Neuro Protection of the Fetus.

Outpatient management
The safety, cost and women’s views about home management with PPROM has not been established through large studies.\textsuperscript{3, 24}

A woman should only be considered for outpatient management if strict criteria are met and following Obstetric Consultant review.

The decision is based on:
- Gestation and presentation.
- Close accessibility to the hospital
- Absence of signs of threatened premature labour.
- No evidence of infection.
- Absence of maternal or fetal risk factors.
- Absence of fetal compromise.
If a woman is deemed suitable for outpatient management she should be counselled to:

- Attend weekly outpatient visits to MFAU to monitor the clinical situation. See KEMH Clinical Guideline, O&M: Complications of Pregnancy: Preterm Prelabour Rupture of Membranes MFAU – Quick Reference Guide and / or
- Attend an antenatal clinic appointment for Obstetric Team Consultant review.
- Monitor her temperature. Instruction and demonstration of temperature taking procedure should be performed and documented prior to discharge. The woman is advised to contact KEMH if she notices any signs of infection or has a temperature of above 37 degrees Celsius.
- Wear sanitary pads not tampons, and return to hospital if she has abnormal smelling vaginal discharge, or abnormal appearance of the vaginal discharge.
- Avoid vaginal intercourse.
- Have showers rather than baths, and avoid swimming.
- Monitor fetal movements and notify the hospital (Maternal Fetal Assessment Unit- MFAU) if fetal movements are decreased.
- Notify and return to the hospital if any signs of threatened preterm labour, vaginal bleeding, or abdominal pain / tenderness.

Future Pregnancy

The KEMH Preterm Birth Prevention Clinic may be considered in future pregnancies for women with PPROM who continue on to have a preterm birth. The clinic aims to reduce the rate of preterm birth, and referral details can be found in The Whole Nine Months: Lasts a Lifetime booklet or website.
Care on the ward: QRG

Avoid digital examination unless birth is believed to be imminent

**Maternal Assessment**

- On admission
  - Full set of observations
    - Vaginal loss, uterine activity / tenderness
  - 4 hourly
    - Temperature, pulse, vaginal loss, uterine activity / tenderness
    - If abnormal perform a full set of observations*
  - Daily
    - Blood Pressure, Bowel activity
    - If abnormal perform a full set of observations*
  - Overnight
    - Observe and perform observations only as required between 22:00 and 06:00

**Fetal Assessment**

- 4 hourly
  - Fetal Movement
    - Report any decrease in movements or change in usual pattern of movements
  - BD
    - Fetal heart rate
      - Report any abnormalities promptly

**CTG**

- Gestation > 30 weeks
  - Once weekly
  - Immediately if contracting

* Full set of observations includes Blood Pressure, Pulse, Temperature, Respiration, O2 Saturation and conscious state.
Procedures to be considered

- Low vaginal swab – repeat as required
- GBS screening may need to be repeated depending on gestation
- Antibiotics see below for details
- Corticosteroids – consider a single course between 24 and 36+6 weeks gestation
- Maternal laboratory investigations – FBP and CRP if there is suspicion of infection

Education

- PPROM
- Plan of care, tests and procedures
- Caesarean section
- Preterm birth
- Special care Nursery
- Breastfeeding
- Personal hygiene

Activity

- Consider bedrest with toilet and shower privileges for the first 48 hours
- Subsequent activity to be determined by the medical officer

Documentation

- MR 285 Observation sheet
- MR 810 Medication chart
- MR 250 Progress notes
- MR 410 Neonatal History sheet
- Baby notes prepared
- STORK perinatal database record updated

Referrals to be considered

- Neonatologist
- Aboriginal Liaison Officer
- Anaesthetic department
- Dietician
- Parent Educator
- Physiotherapist
- Psychological
PPROM confirmed: Outpatient management: MFAU QRG

Assessment
Women with confirmed PPROM are assessed once a week on an outpatient basis. The Multiple Visit Record Sheet MR 226 is to be used each visit to record the assessment and any test results or treatment given.

Weekly Assessments
1. Arrange weekly assessments on the woman’s Obstetric Team day with Team Consultant.
2. Check and record maternal temperature, pulse and blood pressure, respirations & oxygen saturation. Ensure the woman has been taking her temperature at home daily, and that recordings have been <37°C.
3. Check vaginal loss recording the amount and nature of the loss.
4. Perform abdominal palpation noting:
   - Symphysis fundal height
   - Lie (if appropriate depending on gestation)
   - Presentation (if appropriate depending on gestation)
   - Uterine tenderness, irritability / activity
5. Perform a urinalysis and send an MSU for MC&S where there is proteinuria of >1+
6. Take a LVS, without using a speculum, for MC&S.
7. If the fetus is > 23 weeks gestational age arrange assessment of fetal wellbeing:
   - Ultrasound assessment for amniotic fluid index (AFI) and umbilical artery (UA) Doppler velocities at each visit
   - Fetal biometry every 2 weeks
   - CTG at each visit if / when > 30 weeks gestational age
8. Consider the woman for a single course of betamethasone if the gestational age is between 23 and 36+6 weeks. At gestations between 23-23+6 days, the decision to give steroids should take into account the parent’s wishes for the management of the neonate.
9. Ensure the woman has received or has been commenced on a ten-day course of erythromycin 250mg QID. Obtain and review any results from the previous visit if these have not already been documented.
10. Provide the woman with information of management for PPROM after discharge. See PPROM: Medical and Midwifery Management in this document for detailed advice and care.
Outpatient management of confirmed PPROM: Flow chart

Women presents to MFAU for **weekly** review and Assessment on her Obstetric Team day.

Midwife / Resident performs the assessment as outlined in the QRG.

Midwife / Resident reviews all maternal and fetal Assessments and test results.

Are all the assessments and results normal? (see yellow box)

**Yes**
- Inform the Obstetric Team of results and arrange review in the ANC or in MFAU as appropriate.

**No**
- Inform Obstetric Registrar or above and arrange review.

**Follow-up Management**
- Continue weekly assessment in The Maternal Fetal Assessment Unit and/or ANC with Team Consultant review.

**Abnormal / Reportable Results**
- Maternal temperature $\geq 37^\circ C$
- Maternal pulse $\geq 100$ bpm
- Positive LVS or MSU
- Vaginal loss which is offensive and / not clear
- WCC $> 17$ or $10^9/l$ or a WWC that is rising
- CRP $> 10$mg/l
- AFI (MVP $< 2$cms)
- Fetal biometry $< 10^{th}$ centile
- UA doppler $> 95^{th}$ centile
- Non-reactive CTGx2
- Fetal tachycardia
References


19. Mackeen A, Seibel-Seamon J, Muhammad J, Baxter J, Berghella V. Tocolytics for preterm premature...


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**Standards Applicable:** NSQHS Standards: 1 Clinical Care is Guided by Current Best Practice

4- Medication Safety; 6- Clinical Handover 9 Clinical Deterioration,

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