PRETERM LABOUR

INTRODUCTION
- Although preterm is defined as delivery <37 completed weeks' gestation, most morbidity and mortality occur with delivery <34 completed weeks' gestation
- Prevention and diagnosis of preterm delivery is important as a means of reducing adverse outcomes in the child
- for babies delivered >34 weeks' gestation, outcome is extremely good and labour is often allowed to proceed
- for some women, tocolysis is inappropriate, e.g. labour too advanced, concerns about fetal infection or evidence of placental abruption
- Not all women presenting with symptoms of preterm labour will deliver preterm

Risk factors for preterm birth
- Previous preterm delivery
- Genital tract infection/inflammation
- Cervical weakness
- Uterine abnormalities
- Substance abuse
- Multiple pregnancy
- Polyhydramnios
- Bleeding/thrombosis
- Early stress
- Low body mass index (BMI)
- Short conception cycle <1 yr
- Age <17 yr or >35 yr

Diagnosis
- Diagnosis is difficult and is often wrong (50% of cases)
- For a reliable diagnosis of preterm labour, there should be painful uterine contractions >1 every 10 min, plus one or more of the following cervical signs:
  - objective evidence of cervical change over 2 hr minimum
  - ruptured membranes
  - positive fetal fibronectin test from vagina

ASSESSMENT
- Obstetric on-call registrar assesses all women with suspected preterm labour or preterm ruptured membranes
- Maternal temperature, pulse and blood pressure
- Check gestation carefully
- Abdominal palpation to determine presentation. If in doubt, ask obstetric registrar to confirm using labour ward portable ultrasound
- Palpate contractions to assess strength and frequency. Note any tenderness
- Perform electronic fetal monitoring (EFM) – continue this while contracting regularly
- Perform sterile speculum examination without lubricant except sterile water
  - if appropriate (see below), perform vaginal fetal fibronectin test first
  - HVS, endocervical swab in Stuarts medium and endocervical swab for chlamydia
  - MSU, FBC and CRP

Digital examination
- Digital examination, performed by obstetric registrar or consultant, is only indicated when regular contractions have been palpated or after an abnormal speculum examination

Digital examination can introduce infection and release prostaglandins and must be avoided when preterm rupture of membranes has occurred without contractions

Fetal fibronectin testing
- Valid only between 23–35 weeks’ gestation
- Test not indicated if:
Preterm labour 2013–15
- evidence of membrane rupture
- moderate or gross bleeding
- placenta praevia or abruption suspected
- To reduce risk of false positive result, do not use lubricant (other than sterile water) for speculum examination
- Take swab from posterior fornix before any other vaginal or cervical swab or digital examination
- If sexual intercourse occurred in previous 24 hr, test may be difficult to interpret

**MANAGEMENT OF <23 WEEKS’ GESTATION**
- Unless there is uncertainty about gestational age, care for woman as a late miscarriage

**MANAGEMENT OF ≥23 WEEKS’ GESTATION**
- See Flowchart and formulate a clear management plan including:
  - steroids
  - tocolysis
  - antibiotics
  - mode of delivery
  - type of fetal monitoring

### Use of steroids, tocolysis and antibiotics

<table>
<thead>
<tr>
<th>Membranes</th>
<th>Cervix</th>
<th>Vaginal fibronectin</th>
<th>Initiate steroids</th>
<th>Initiate tocolysis</th>
<th>Initiate antibiotics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intact</td>
<td>&lt;4 cm</td>
<td>Positive</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Ruptured</td>
<td>&lt;4 cm</td>
<td>NOT required</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Intact or ruptured</td>
<td>&gt;4 cm</td>
<td>NOT required</td>
<td>If delivery not imminent, yes</td>
<td>No</td>
<td>If ruptured membranes, yes</td>
</tr>
</tbody>
</table>

**Steroids**
- Consultant obstetrician decides on use of steroids if:
  - signs of infection
  - diabetic mother
  - steroids already given earlier in pregnancy
  - 23+0–23+6 weeks’ gestation
- Otherwise, prescribe betamethasone when there is a significant risk of premature delivery between 24–35 weeks’ gestation
- if appropriate, administer two 12 mg doses IM 12 or 24 hr apart (depending on clinical situation) to promote fetal lung maturity

**Tocolysis**
- Use as indicated in Table only to allow time for steroids to act or for transfer to another unit
- Use only if cervix ≤4 cm dilated, and either membranes ruptured or vaginal fibronectin positive
- it is usually futile to start tocolysis beyond >4 cm dilatation with a fully effaced cervix
- tocolytics are contraindicated in antepartum haemorrhage or suspicion of intrauterine sepsis or where baby would be safer delivered
- Site IV line with crystalloid solution running in all women receiving tocolytics in case of sudden change in blood pressure
- Record pulse and blood pressure before each dose of tocolytics (e.g. atosiban, nifedipine – see regimens below)
- Atosiban and nifedipine are equally effective in delaying delivery. Atosiban has a more favourable side effect profile but is considerably more expensive

**Cot availability**
- Call neonatal unit to check availability of neonatal cot
- If no cot available, consultant obstetrician will decide whether to transfer mother to a unit with neonatal cot
- check availability of cot at local regional unit
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- contact labour ward of receiving unit to confirm they can accept the woman. See 
  Maternal transfer guideline

Preterm rupture of membranes in the absence of contractions
- Manage as outlined with the following differences:
  - do not carry out digital examination
  - assess risk of cord prolapse – see Umbilical cord prolapse guideline
  - unless signs of infection or any other indication that fetus would be safer delivered, admit 
    woman to antenatal ward
  - commence oral erythromycin 250 mg 6-hrly for 10 days to reduce risk of preterm labour 
    and delivery. Consultant obstetrician decides whether to extend the use of erythromycin 
    beyond 10 days
  - if woman pyrexial, erythromycin will not provide cover for Gram negative and anaerobic 
    infections. Commence antibiotics to cover Gram positive, Gram negative and anaerobic 
    organisms, e.g. cefuroxime and metronidazole – follow local policy

23–26 WEEKS’ GESTATION
- Outcome for babies delivered <26 weeks’ gestation is generally not good. Discuss how 
  labour should be managed with consultant obstetrician and mother
- Manage as outlined with the following differences:
  - it may not be appropriate to monitor fetal heart in first stage of labour, particularly if no 
    action would be taken in the event of abnormalities. Consider fetal monitoring in second 
    stage as this may influence management and may be of importance to neonatologist in 
    considering resuscitation
  - it may be appropriate to deliver baby vaginally, regardless of presentation. Consultant 
    obstetrician must make decision to undertake a caesarean section at this gestation and 
    should normally attend
  - ask neonatal registrar equivalent to speak to mother and describe plan of care for baby 
    neonatal registrar equivalent attends delivery

<30 WEEKS’ GESTATION
Magnesium sulphate (if used locally)
- Magnesium sulphate protects premature babies’ brains from cerebral palsy
- Consider for all babies likely to deliver in the next 24 hrs before 30 weeks’ gestation 
  regardless of mode of delivery. It can be given to women with multiple pregnancy and 
  irrespective of whether steroids have been given
- Ideally, commence infusion 4 hr before delivery but there may still be benefit if given 
  <4 hr before delivery
- Do not delay delivery in time-critical situations e.g. fetal distress. Administration may also 
  be impractical when delivery is imminent. The decision to administer magnesium sulphate 
  must be made by a consultant obstetrician
- Inform woman about possible side effects. The most common of which are:
  - facial flushing
  - nausea and vomiting
  - sweating
  - tachycardia and hypotension have also been observed
  - The effect may be more pronounced when given with calcium channel blockers e.g. 
    nifedipine

Loading dose
- Administer a loading dose of 4 g (8 mL) IV
  mix 4 g (8 mL) magnesium sulphate 50% with 12 mL sodium chloride 0.9% (total of 20 
  mL)
  set syringe driver at 60 mL/hr and administer over 20 min

Maintenance dose
- Administer maintenance dose of 1 g/hr IV via syringe pump until delivery or for 24 hr, 
  whichever is sooner
  mix 5 g (10 mL) magnesium sulphate 50% with 40 mL sodium chloride 0.9% (total of 50 
  mL)
  set syringe driver to 10 mL/hr and administer at 1 g/hr
Hourly observations
- Respiratory rate
- Level of consciousness

Monitoring
- Monitor deep tendon
- Check reflexes more often when there is oliguria, woman is also taking nifedipine and dose of magnesium sulphate has needed adjustment
- Oxygen saturation continuously with a pulse oximeter
- Stop the infusion immediately and call obstetric registrar if:
  - tendon reflexes absent
  - respiration <12/min
  - SpO₂ <96%
  - abnormal conscious level
  - urine output <1.5 mL/kg over 4 hr

Antidote
- 1 g (10 mL 10% solution) calcium gluconate IV over 3 min
- A repeat dose can be given later in the pregnancy if woman did not deliver as expected

COMMUNICATION
- Discuss all aspects of care with woman and her partner
- Discuss and clearly document any change in plan
- Liaise with neonatal team
- Ensure parents spoken to by a well-informed member of neonatal staff

Labour and delivery
- Decide mode of delivery on an individual basis. In general, if presentation not cephalic and once labour confirmed, delivery will be by caesarean section
- Electronic fetal monitoring
  - after 26 weeks’ gestation – throughout labour to assess fetal wellbeing
  - <26 weeks’ gestation – on the direction of obstetric consultant. See 23–26 weeks’ gestation above
- Ensure delivery room/theatre warm. Shut windows, turn off fans and turn on resuscitaire heater well before delivery – premature babies are vulnerable to hypothermia
- Prematurity is an intrapartum risk factor for early onset Group B Streptococcus (GBS). Follow local policy for the use of antibiotic prophylaxis in labour
- Episiotomy is indicated to prevent delay in second stage of labour. There is no evidence that routine episiotomy prevents intracranial haemorrhage
- If <34 weeks’ gestation and it is necessary to accelerate delivery, Ventouse is contraindicated
- At vaginal births, if possible, delay cord clamping for at least 30–45 seconds with baby held below mother to promote placento-fetal transfusion
- Neonatal registrar equivalent and SHO attend delivery of <32 weeks’ gestation
- Remember to put a woolly hat on baby
- <29 weeks’ gestation, put baby in a polythene bag on the resuscitaire to reduce risk of hypothermia
- Obtain paired cord blood samples for blood gas analysis and inform neonatal unit of results – see Umbilical cord sampling guideline

ATOSIBAN REGIMEN

Initial treatment
- Bolus dose 6.75 mg over 1 min
- Comes ready prepared as a 0.9 mL IV injection containing 6.75 mg, and can be diluted with sodium chloride 0.9% to make infusion over 1 min easier
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Subsequent treatment up to 48 hr – via infusion pump
- Remove and discard 10 mL from a 100 mL bag of sodium chloride 0.9%. Add 2 x 5 mL vials of atosiban (37.5 mg total) to make a solution of 0.75 mg/mL
- Infuse 18 mg/hr for 3 hr (24 mL/hr for 3 hr)
- Then infuse 6 mg/hr for a maximum of 45 hr (8 mL/hr for maximum of 45 hr). Discontinue if contractions cease
- Total maximum duration of therapy 48 hr, total maximum dose given 330 mg

Observations and cautions
- Monitor blood loss after delivery
- Use with caution in presence of
  - intrauterine growth retardation
  - known hepatic impairment
  - known renal impairment

NIFEDIPINE REGIMEN

Contraindications
- Aortic stenosis
- Heart failure
- Porphyria
- Severe hypotension

Initial treatment
- 20 mg nifedipine capsule (do not crush) or slow-release tablet dispersed in water

Observations
- BP every 15 min for first 2 hr after first dose and once 15 min after subsequent doses
- Nifedipine should not cause a drop in blood pressure in normotensive women
- Continuous electronic fetal monitoring for first 2 hr

Subsequent treatment up to 72 hr
- 10–20 mg nifedipine retard (slow release tablet) 8-hrly adjusted according to uterine activity
Regular contractions
24–34 weeks' gestation
**Strong and at least** one every 10 min

- **Ruptured membranes**
  - Broad spectrum antibiotics as per local practice
  - Unless previously administered, betamethasone if appropriate
  - Tocolysis for up to 48 hr if:
    - Needs steroids AND
    - Cervix ≤4 cm or needs IUT

- **Intact membranes**
  - **Cervix >4 cm**
    - Await delivery
    - Unless previously administered, betamethasone if appropriate
    - No tocolysis
    - No IUT

  - **Cervix ≤4 cm**
    - Vaginal fetal fibronectin **positive**
      - (20–40% chance of delivery within 7–14 days)
      - Tocolysis for up to 48 hr if:
        - Needs steroids AND
        - Cervix ≤4 cm or needs IUT
    - Vaginal fetal fibronectin **negative**
      - (95% chance of no delivery within 7–14 days)
      - 24 hr observation
      - No tocolysis
      - No IUT
      - Consider discharge home