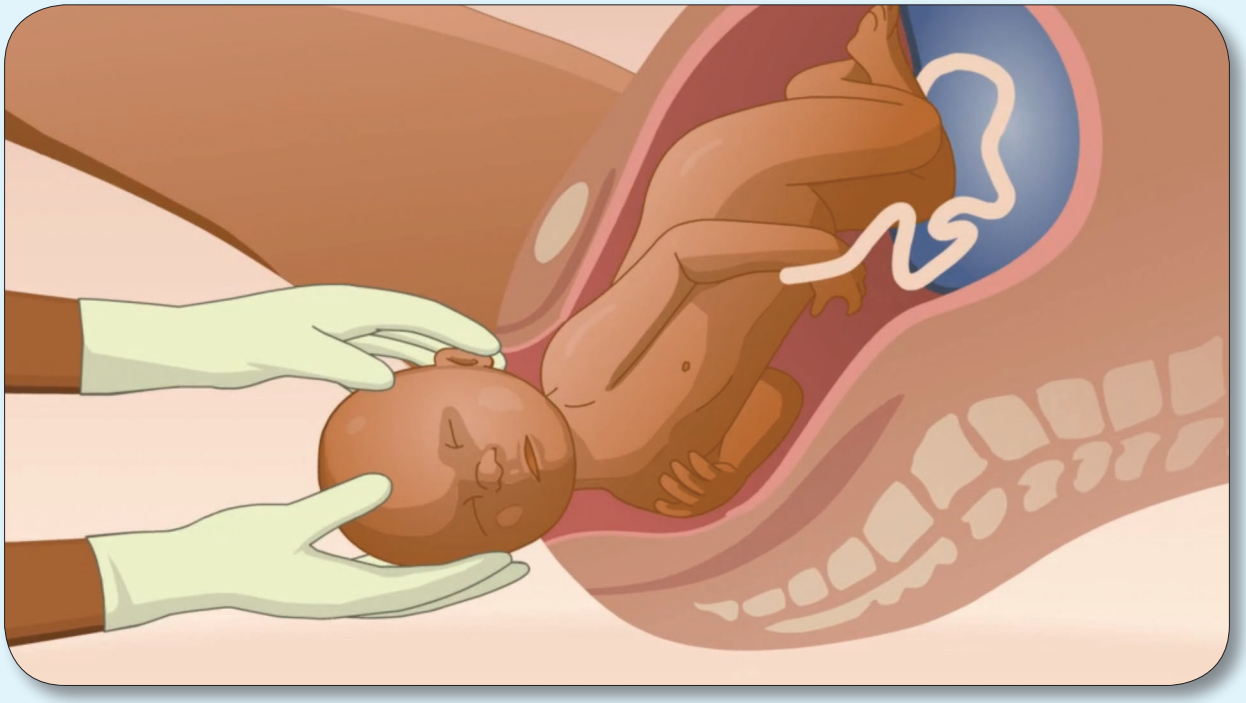
Companions to Management Series

PRETERM LABOUR

The Welfare of Women

Preterm Labour

Preterm delivery occurs before 37 completed weeks of pregnancy. It is a global problem (with prevalence ranging between 5% and 18%) and a major contributor to neonatal morbidity and mortality. It's impact on the newborn can be reduced by ensuring labour takes place in the most appropriate healthcare setting and that a number of key interventions are undertaken around this time.



https://www.glowm.com/resource_type/resource/health_care_workers/title/supplement---a-demonstration-of-normal-vaginal-childbirth/resource_doc/1775

Clinical Relevance

Preterm babies are more prone to serious illness and death in the hours, days, and weeks following delivery. Those who survive are at greater risk of lifelong complications.

Risk comes from the increased difficulties that they encounter with breathing, feeding, and body temperature regulation, along with susceptibility to infection and neurological injury. Prematurity is the leading cause of neonatal death globally and the second most common factor underlying mortality in children under the age of 5 years. Gestation at the time of delivery has a profound effect on these risks – with babies born 'severely' premature [before 28 weeks gestation] typically facing more challenges and requiring a greater neonatal support.

The survival chances of babies born preterm vary depending on the location of their birth, their gestational age at birth and the presence of any co-existing morbidity such as fetal growth restriction or infection. Access to the best available neonatal skills and equipment is essential, so ensuring that delivery occurs in the most appropriate place is a vital part of management. Sometimes a patient will need to be transferred to another healthcare facility

to access more advanced neonatal care facilities. Where indicated, this should be done quickly and safely. The benefits of such a move should be considered against the risks of potential delivery during transfer – which inevitably represents the worst possible outcome. If labour is too far advanced, or the risks of transfer too great, then preparations for delivery should be made in the patient's current location. Post-natal transfer can be considered, although this too presents its own challenges.

Neonatal morbidity and mortality following preterm birth can be reduced through interventions provided to the mother before or during pregnancy, and to the preterm infant after birth. These can be directed at all women for primary prevention of preterm labour (e.g. smoking cessation programmes) or used to minimise the risk in pregnant women with known risk factors (e.g. cervical cerclage in a patient with a short cervix). However, the most beneficial interventions are those taken when preterm birth is deemed inevitable. These are provided to the mother shortly before or during the birth process with the aim of overcoming immediate and future health challenges of the preterm infant.

While infection is often implicated, causes of preterm birth are unknown in over 50% of cases and the mechanism for progress into spontaneous preterm labour remains poorly understood. However, certain risk factors are associated with delivery before 37 weeks:

Factors associated with preterm labour
• Previous history of preterm delivery or ruptured membranes (PPROM)
• Previous history of mid-trimester loss
• Congenital uterine anomalies – e.g. bicornuate uterus
• Multiple pregnancy
• History of antepartum haemorrhage (APH) in this pregnancy
• Short cervical length – e.g. following previous cervical surgery, such as cone biopsy
• Smoking

Potential Differential Diagnoses

Any condition that leads to abdominal pain in pregnancy can represent a possible differential diagnosis for preterm labour. This includes placental abruption, urinary tract infection (UTI), constipation, pelvic girdle pain, an ovarian cyst +/– torsion, and appendicitis.

In placental abruption, especially without vaginal bleeding, the main presenting symptom is abdominal pain and this can mimic preterm labour. This condition may itself lead to preterm labour.

If there is a history of pain on passing urine, urinary frequency, or previous urinary tract infections (UTIs), the lower abdominal pain may instead be a further UTI. Left untreated, this may also precipitate preterm labour.

Any intra-abdominal infections can present similarly to preterm labour. Appendicitis is an important diagnosis to consider as a ruptured appendix or widespread intra-abdominal sepsis has a significant mortality rate and can also trigger labour.

Management Algorithm

1. Take a comprehensive clinical history from the patient

Particular attention should be paid to any history suggestive of bleeding, unusual vaginal discharge, maternal pyrexia, or reduced fetal movements; along with the other risk factors detailed in the table above. Intermittent abdominal pain associated with uterine contractions raises the possibility of preterm labour.

Only a small percentage of preterm labour cases are identified by history alone. Maintain a low index of suspicion and undertake clinical examination (plus further investigations as appropriate) even if other diagnoses seem more likely. Given the risks associated with delivering a preterm baby outside a healthcare facility, it is vital that cases are not missed and patients discharged inappropriately to less supported environments.

2. Complete a clinical examination, plus any additional investigations to add to the assessment

Regular, palpable uterine contractions, cervical dilatation >3 cm, ruptured fetal membranes, or a positive point-of-care test (e.g. fetal fibronectin) increase the likelihood of preterm labour.

A high vaginal swab (HVS), midstream urine sample (MSU), and full blood count (FBC) – including white blood cell count – are helpful to investigate possible infective precipitants of labour.

A sterile speculum examination is preferable to a digital vaginal examination as it is considered to reduce the risk of introducing infection (especially when the amniotic membranes have ruptured) or stimulating the cervix.

Regular monitoring of the patient's vital signs (including blood pressure, pulse, respiratory rate, and temperature), along with fluid input and output, is important. These should be documented and acted upon if becoming abnormal.

3. Assess fetal wellbeing and presentation

Monitor the fetal heartbeat – preferably by continuous electronic monitoring (i.e. CTG) in pregnancies >28 weeks of gestation; The beneficial role of CTG prior to 28 weeks is uncertain because of the poor development of fetal autonomic nervous system. Alternatively intermittent auscultation of the fetal heart rate may be performed.

If available, ultrasound can help provide information on the presentation and wellbeing of the fetus. Otherwise, abdominal palpation and measurement of the symphysial-fundal height may give an estimate of fetal growth, along with assessment of movements.

4. Ensure the optimal location of delivery and personnel present

The single most important factor to the wellbeing of the preterm neonate is to ensure that they are delivered in the optimal location, with appropriately trained staff to support them immediately from birth. In some situations, this may necessitate referral to a higher-level health facility.

This itself can present risks, so any decision to transfer a patient in threatened or confirmed preterm labour needs to be made carefully. See CTM on Patient Referral and Transport for further information.

Even when remaining in the same location for delivery, the Neonatal team must be provided with as much advanced warning as possible, in order that they can prepare appropriately. Good communication between the two teams is important throughout.

5. Antenatal corticosteroids to help reduce neonatal respiratory complications

Antenatal corticosteroid (ACS) therapy is recommended for women at risk of preterm birth **from 24 + 0 weeks to 33 + 6 weeks gestation** when the following conditions are met:

- The gestational age has been calculated as precisely as possible
- Preterm birth is considered imminent – i.e. within 7 days
- There is no clinical evidence of maternal infection

Dexamethasone or betamethasone (total 24 mg IM in two divided doses, given 12 or 24 hours apart) are recommended as the ACS therapy of choice as these readily cross the placenta and help promote fetal lung maturation – reducing the risk of respiratory distress post-birth.

Repeated ACS doses (at different times in the same pregnancy) are not recommended, so should not be given again if already administered at an earlier gestation.

6. Magnesium sulphate to help reduce neonatal neurological complications

The use of magnesium sulphate is recommended for women at risk of imminent preterm birth – i.e. within 24 hours – **before 32 weeks gestation** for prevention of cerebral palsy in the infant.

Different dosing regimes have been suggested, but the simplest is **4 grams Magnesium Sulphate IV over 20-30 mins**. If IV access is not possible, then it is reasonable to administer intramuscularly (in the same way that a loading dose would be given for a patient with pre-eclampsia).

It is preferable to administer the magnesium between 1 and 6 hours before delivery. If delivery is imminent within minutes then it may be advisable to utilise the time physically preparing for the birth (rather than risking staff becoming distracted with administration of the magnesium). If 6 hours have passed from giving the magnesium and the baby is still not born, then a further 4-gram dose can be considered if delivery still seems imminent at that stage.

7. Antibiotics for preterm labour

Antibiotic administration is recommended for women with preterm prelabour rupture of membranes (PPROM) – typically **Erythromycin 250 mg oral QDS for 10 days**.

Intrapartum antibiotic prophylaxis is recommended for women in preterm labour to prevent early-onset neonatal infection – typically using **Benzylpenicillin 3 grams IV loading dose, then 1.5 grams IV maintenance dose every 4 hours until delivery**.

8. Mode of delivery and deferred cord clamping

Vaginal delivery is favoured at less than 26 weeks, because caesarean section can be surgically challenging at that gestation and is potentially also a stressful mode of delivery for a baby so premature.

Beyond 26 weeks, decisions regarding mode of delivery should consider the same obstetric factors that would guide management at term.

Regardless of the type of delivery, deferred cord clamping (waiting for between 1 and 3 minutes after delivery before separating the baby and placenta) is particularly beneficial for preterm babies and should be undertaken in all cases, unless immediate resuscitation is required. See CTM on ***Cord Care*** for further information.

9. Thermal care for the preterm newborn

Preterm babies can experience greater difficulty maintaining their body temperature – they have reduced fat stores, a relatively larger surface area for their mass, and an immature temperature control system. Hypothermia is associated with an increased risk of neonatal mortality, even over short periods of time, and the risk of death increases significantly for every 1°C below 36.5°C. It is therefore essential that the newborn's temperature is closely monitored and steps taken to proactively maintain this.

There are two main strategies for dealing with this in the first few minutes of life:

- Place the newborn directly into a clean plastic bag, with just the face exposed to the outside air; do not dry initially; place a hat; and immediately position close to a heat source – the bag provides insulation against heat loss.
- Dry the newborn; place a hat; and position skin-to-skin against the mother – in order that the baby regulates its body temperature against that of its parent. Keep well covered to maintain body heat.

'Kangaroo' mother care is recommended for the routine care of newborns weighing <2000 g at birth and should be initiated in health-care facilities as soon as the neonate is clinically stable. This involves infants being carried, usually by the mother, with skin-to-skin contact. The parent should always be warned to monitor closely the breathing of their child, in case this becomes compromised at any time.

Associated GLOWM Resources

- Pre term labor chapter *The Continuous Textbook of Women's Medicine* Obstetrics Module Volume 10
  https://www.glowm.com/article/heading/vol-10--common-obstetric-conditions--preterm-labor/id/414173

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