The importance of basic and comprehensive Emergency Obstetric and Neonatal Care in resource limited settings

The availability of emergency obstetric and neonatal care (EmONC) indicates how well any health system can respond to the obstetric and newborn complications that are the main causes of maternal and newborn deaths. The Averting Maternal Death and Disability Program (AMDD) and the United Nations have defined 9 essential EmONC services that directly treat these complications. These are termed signal functions.

The functional status of an EmONC facility depends on the 24 hour availability of these life-saving signal functions and whether they have been performed recently. To qualify as a basic EmONC (or BEmONC) facility, health centers and hospitals must have performed the following seven signal functions within the past three months:

1. administered IM or IV antibiotics;
2. administered IM or IV anticonvulsants;
3. administered IM or IV uterotonic drugs;
4. performed manual removal of placenta;
5. performed removal of retained products (manual vacuum aspiration);
6. performed assisted vaginal delivery (with vacuum extractor or forceps); and
7. performed neonatal resuscitation with bag and mask.

To qualify as a comprehensive EmONC (or CEmONC) facility, health centers and hospitals must have performed all seven basic services listed above plus the following two additional signal functions within the past three months:

8. blood transfusion
9. caesarean section.

In order for these EmONC systems to work adequately, it is essential that there is an effective coordination of the supplies of essential emergency drugs, medical and surgical supplies and equipment to every facility providing this care. Essential drugs must include oxytocin, magnesium sulphate, misoprostol, antibiotics and anti-hypertensive drugs. Essential supplies include sutures and urinary catheters. Essential equipment includes Manual Vacuum Aspirators, vacuum delivery kits and self-inflating bag and mask ventilators for newborn resuscitation.

Complications of labour

Prolonged and obstructed labour, uterine rupture and shoulder dystocia

Prolonged/obstructed labour

It helps to reduce prolongation of labour if mothers in labour are allowed to sit upright, or in a lateral or semi-upright position, **never flat on their backs**. Mothers should be encouraged to stand, and be mobile in the first stage of labour for as long as comfortably possible. The benefits include the assistance of gravity in descent of the baby, the avoidance of pressure on the inferior vena cava (IVC) with all the effects compression has on the circulatory dynamics and possibly a reduction in the pain of contractions.

Recognition of prolonged or obstructed labour and early referral

Remember: 3 Ps: Power (too little), Passenger (too big) and Passage (too small).

Prevention of prolonged labour

- Good antenatal care so that the presentation of the fetus is known before the onset of labour (ideally confirmed by ultrasound examination): **If presentation is abnormal, the mother must be transferred to hospital as soon as she enters labour.**
- Use of the modified WHO partograph
- Good nutritional state in the mother
- Absence of anaemia in the mother
- Adequate fluids and glucose during labour

Dangers of slow progress in labour

For mother:

- infection
- uterine rupture
- fistulae
- DEATH

For baby:

- infection
- lack of oxygen to the brain and traumatic injury
- stillbirth
- neonatal death
- permanent brain damage

Main causes of slow progress in labour:

1. Poor quality uterine contractions
2. Mal-presentations and mal-positions
3. Disproportion between the size of the baby and of the pelvis**

** *Exclude 1 and 2 before diagnosing this*

All need urgent transfer to hospital

Figure 1 Cervical dilatation over time

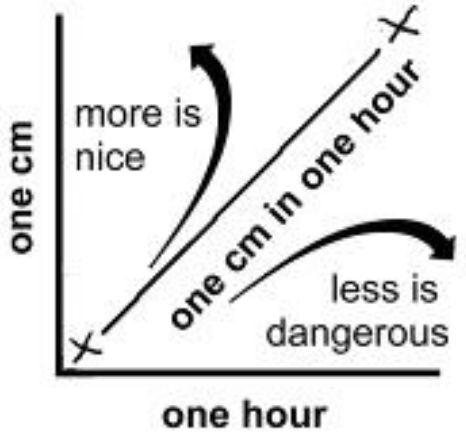
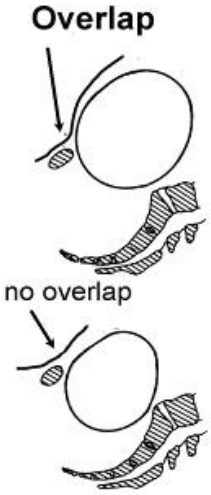


Figure 2 Obstruction of the fetal head's descent



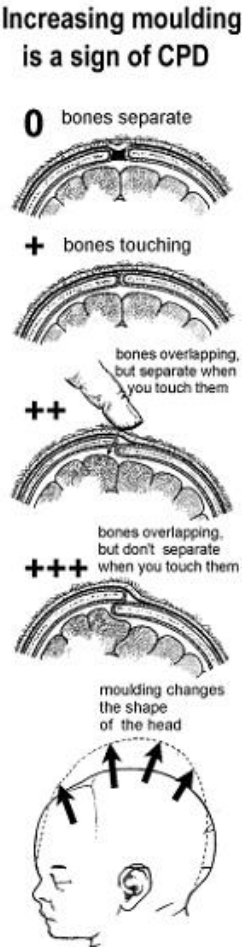
Bandl's ring

The presence of a Bandl's ring may be one sign seen in obstructed labour. It is often a late sign. The Bandl's ring describes a depression between the thickened upper segment and the thinned lower segment. A distended bladder sometimes forms a third swelling.

Moulding of fetal head

Moulding refers to the over-riding of the fetal skull bones which may occur during labour. Moulding should be assessed at the sagittal suture (not the lambdoid). During descent of the fetal head, the fetal skull bones move closer together. Moulding is described in 3 stages, the first (+) occurs when the bones touch, the second (2+) where the bones overlap but are reducible and the third (3+) is irreversible overlapping of the bones. Moulding, especially 3+ may suggest cephalopelvic disproportion and should be looked at in conjunction with other clinical signs of obstructed labour.

Figure.3 Development of increasing moulding of skull bones of fetus in labour



Note: The moulding score. Bones still separate, score 0. Bones touching, score +. Bones overlapping, but when you press with a finger they separate, score ++. Bones overlapping, but when you press them with a finger they don't separate, score +++.

The partogram in obstructed labour

The mother was admitted in active labour at 10 AM:

- fetal head 3/5 palpable
- cervix dilated 4 cm
- three contractions in 10 minutes, each lasting 20–40 seconds
- clear amniotic fluid draining
- fetal head moulding

At 2 PM:

- fetal head still 3/5 palpable
- cervix dilated 6 cm and to the right of the alert line
- slight improvement in contractions (three in 10 minutes, each lasting 40 seconds)
- second degree moulding.

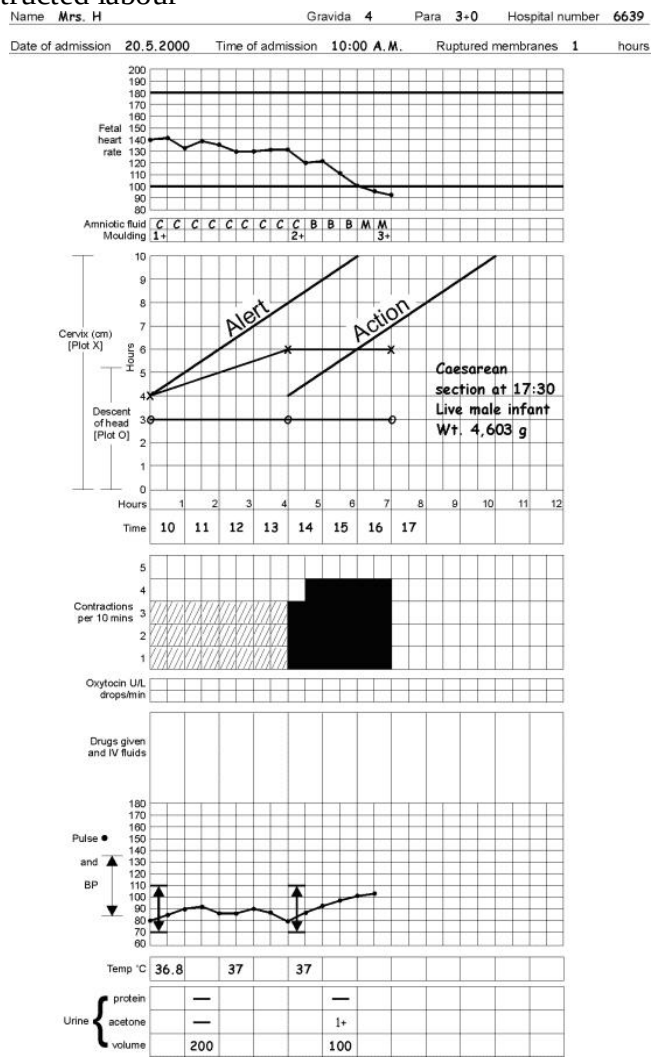
At 5 PM:

- fetal head still 3/5 palpable;
- cervix still dilated 6 cm;
- third degree moulding;
- fetal heart rate 92 per minute.

Caesarean section was performed at 5:30 PM.

The partogram of this labour is shown in Figure 4

Figure 4 Partogram of obstructed labour



Note: The partogram above, on Mrs. H, is characteristic of obstructed labour. There is arrest of cervical dilatation in the active phase of labour, with no descent of the fetal head.

The presence of meconium and a falling fetal heart rate suggest fetal distress. All of these features, plus moulding of the fetal skull bones, point to cephalo-pelvic disproportion.

Oxytocin was rightly withheld as Mrs. H was multiparous, and it would therefore have increased her risk of uterine rupture.

Diagnostic issues in obstructed labour

The mother

- The patient may be dehydrated, tachycardic, ketotic (urine positive for ketone bodies, breath smells of ketones), febrile and exhausted, and there may be infected vaginal secretions.
- The bladder may be distended with retained urine, or may be oedematous.
- Abdominal examination may reveal haemoperitoneum from a ruptured uterus. Blood may not appear vaginally, due to the impacted fetal head, which should be dislodged upwards to allow full assessment. Where ruptured uterus is suspected, a laparotomy should be carried out. (*See* below)
- Abdominal examination may reveal distended bowel from sepsis and ileus.

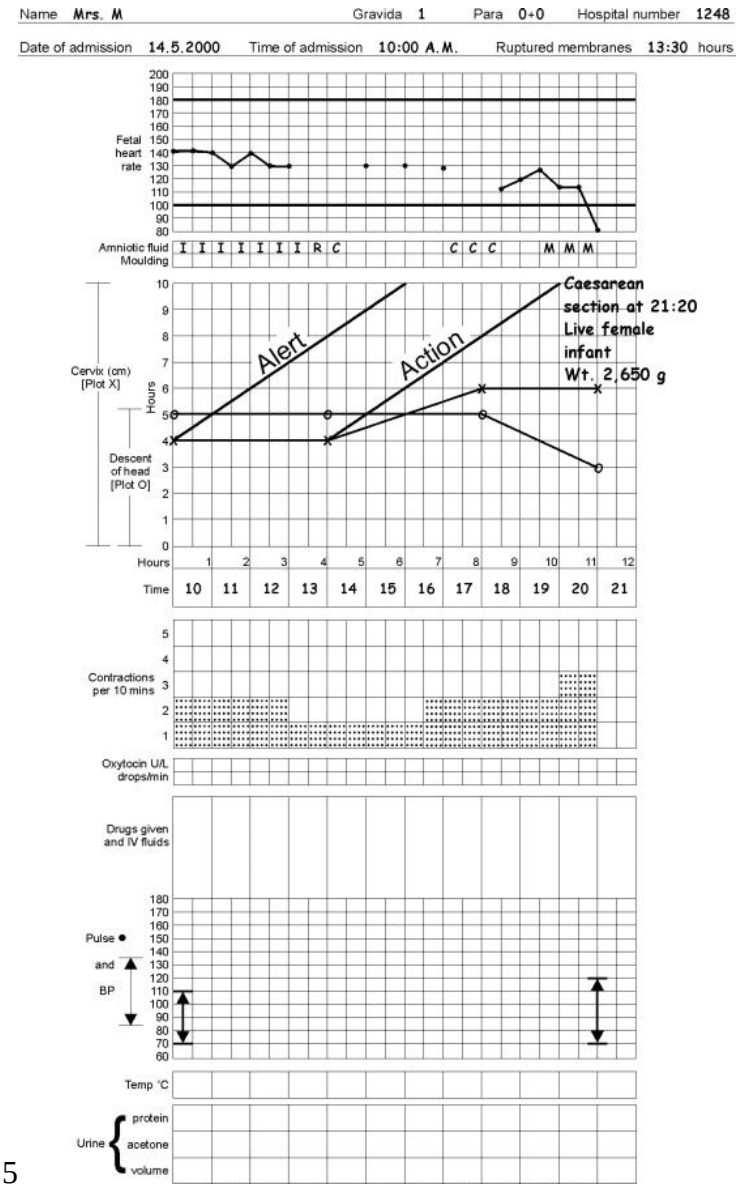
The fetus

- The lie and relationship of the fetus to the pelvis must be assessed.
- Despite visible caput at the introitus, there may still be 60% of the fetal head palpable abdominally.

Table 1 Diagnosis of unsatisfactory progress of labour

Cervix not dilated No palpable contractions/infrequent contractions	False labour
Cervix not dilated beyond 4 cm after 8 hours of regular contractions	Prolonged latent phase
Cervical dilatation to the right of the alert line on the partogram	Prolonged active phase
Secondary arrest of cervical dilatation and descent of presenting part in presence of good contractions	Cephalopelvic disproportion
Secondary arrest of cervical dilatation and descent of presenting part with large caput, third degree moulding, cervix poorly applied to presenting part, oedematous cervix, ballooning of lower uterine segment, formation of retraction band, maternal and fetal distress	Obstruction
Less than 3-4 contractions in 10 minutes each lasting less than 40 secs to one minute with a minute of relaxation between each contraction.	Inadequate uterine activity
Presentation other than vertex with occipito-anterior	Malpresentation
Cervix fully dilated and woman has urge to push, but there is no descent	Prolonged expulsive (second stage) phase

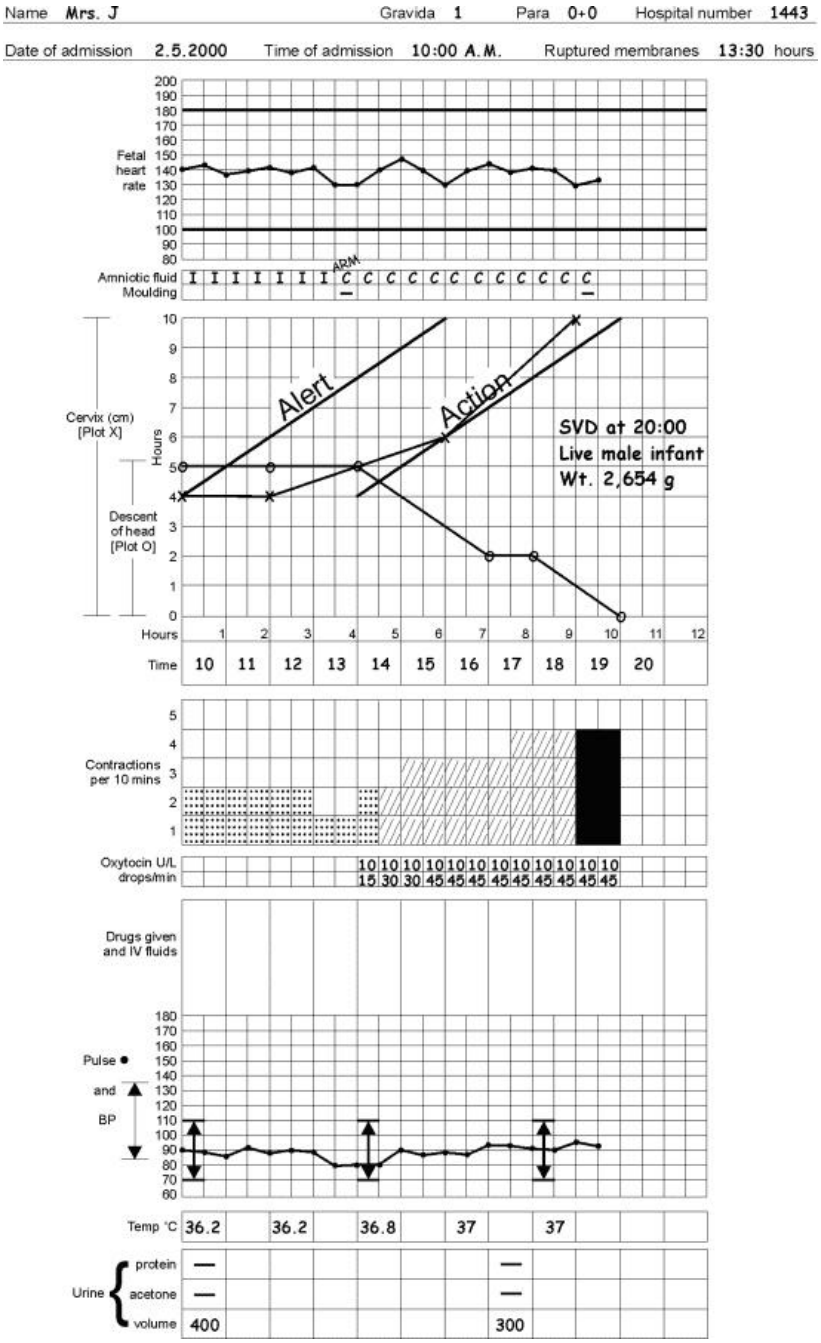
Figure 5 Partograph showing prolonged active phase of labour



5

The cervix in this primigravida was 4 cm dilated on admission. Her contractions were ineffective at 2 in 10 minutes, reducing to 1 in 10 minutes. Her membranes ruptured 3.5 hours later, but her cervix dilated only a further 2 cm in 4 hours, with no further dilatation in the subsequent 3 hours. Fetal distress developed, with meconium and a falling fetal heart rate. Caesarean section was carried out. It would have been advisable to start an oxytocin infusion at 13.30 hours, or at least by 15.30 hours.

Figure.6 Partogram showing inadequate uterine contractions corrected with oxytocin



This primigravida started an oxytocin infusion at the time of membrane rupture, which increased the efficacy of contractions. She progressed to a spontaneous vaginal delivery. The fetal heart rate was satisfactory throughout.

Emergency treatment for obstructed labour

Assess ABCs and resuscitate if required

- Place a wide-bore IV cannula (14-16g).
- Place mother in left lateral tilt or recovery position.
- Send blood for haemoglobin, group and crossmatch, and electrolytes if possible.
- Give IV 1 L of Ringer-Lactate or Hartmann's containing 5 or 10% glucose over 1 hour as an infusion, or as rapidly as possible if shocked, then re-assess.

- Catheterise the patient to decompress the bladder, measure urine output and look for haematuria.
    - The presence of haematuria may suggest uterine rupture.
    - If there is concern about the viability of the vaginal and bladder wall, the catheter may be kept in situ for up to 6 weeks to prevent or minimise the formation of a vesico-vaginal fistula.
- Give IV/IM ampicillin (2g 6 hourly), gentamicin (80mg IV/IM 8 hourly or 5mg/Kg body weight IV/IM once every 24 hours) and metronidazole (500 mg 8 hourly). Cefuroxime (1.5 g 8 hourly, if available) can be given instead of ampicillin + gentamicin.
- Measure pulse rate, capillary refill time (CRT), BP, temperature, and urine output frequently.
- If uterine rupture excluded, shock may be due to hypovolaemia, sepsis or both.

If there is recent food intake, or abdominal distension is present, the stomach should be emptied using a nasogastric tube, and then magnesium trisilicate oral suspension (dose= 10 mL) should be given to reduce the acidity of gastric contents.

Overcoming slow progress in labour

- If cervix fully dilated and cephalic presentation and no signs of obstruction, instrumental delivery (ventouse or forceps) can avoid CS. However, if the cervix is fully dilated and there is obstruction, instrumental delivery can make CS very difficult by causing further impaction of the fetal head.
- If cervix not fully dilated, in primigravida with cephalic presentation: Oxytocin infusion.
- If cervix not fully dilated, and abnormal presentation: caesarean section.
- If ruptured uterus: laparotomy/CS hysterectomy.

Urgent referral/transport if the above is not possible. Stabilise mother's ABC before transfer if necessary.

Reasons for fetal death in obstructed labour

- Strong contractions with inadequate relaxation between contractions (sometimes made worse by inappropriate use of oxytocin) interfere with placental exchange.
- Excessive moulding of the head, in cephalic presentation, leading to intracranial haemorrhage. – In breech presentation, the head may be trapped by an incompletely dilated cervix, or may not enter the pelvis because of disproportion.
- Ascending infection, amnionitis and severe intrauterine infection due to prolonged ruptured membranes and labour, and/or unsterile vaginal examinations.
- Ruptured uterus.

Risks of caesarean section in obstructed labour

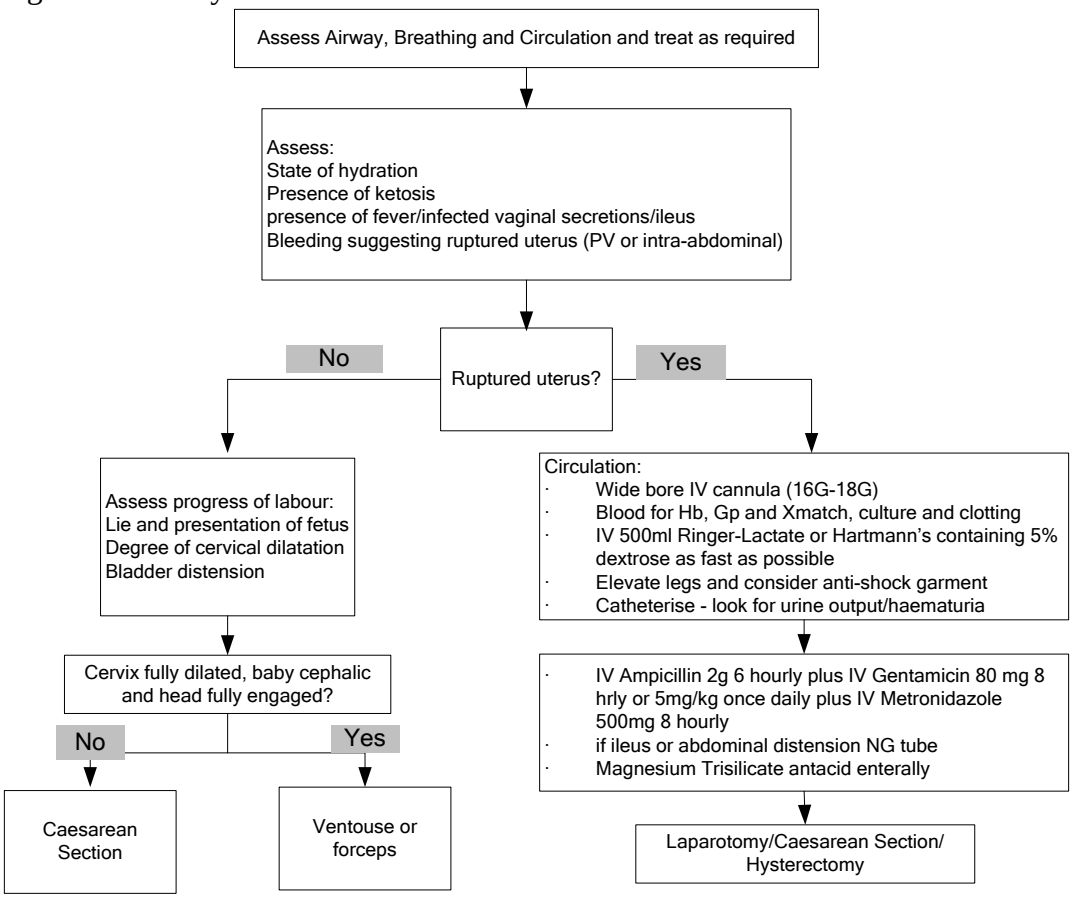
1. Intra-operative hemorrhage
2. Post -operative shock
3. Generalised peritonitis
4. The hazards of general or regional anaesthesia
5. Rupture of the uterine scar in subsequent pregnancies
6. Wound complications
7. Pelvic abscess
8. Visceral damage especially to bladder – it may be difficult to pass a catheter with a very impacted fetal head and the bladder is often oedematous

The management of uterine rupture in this setting depends on the site and extent of uterine rupture. With a straightforward anterior rupture without extension, uterine repair (plus bilateral tubal ligation) may be most appropriate and safe.

If infection is present before a CS is undertaken, dangerous complications can follow. In 107 CS (performed in 156 patients with intra-partum infection) the following complications occurred:

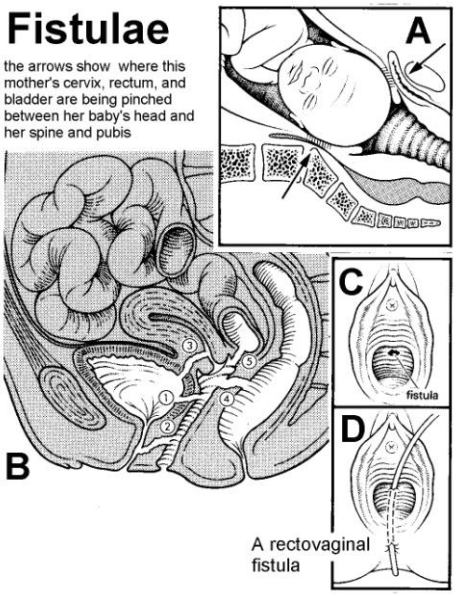
post operative shock	18 (17%)
generalised peritonitis	70 (65%)
mortality	13 (12%)

Figure 7 Pathway of care in obstructed labour



Vesico-vaginal and vesico-rectal fistulae

Figure 8 Mechanism and anatomy of vaginal fistulae



Note: In this drawing:

- A, a baby's head can press the mother's vagina and bladder against the symphysis pubis or the sacrum. This can make the tissues necrose (die) and cause a fistula.
- B, the fistula can be in various places:
  - between the bladder and the vagina.
  - between the urethra and the vagina.
  - between the bladder and the cervix.
  - between the rectum and the vagina (recto-vaginal fistula).
  - between the vagina and the small gut.
- C, a vesico-vaginal fistula.
- D, a catheter has been placed in a recto-vaginal fistula.

Ruptured uterus

Complete rupture of the uterus is life- threatening to both mother and baby.

Causes

A previous caesarean section scar may rupture during labour. However, obstructed labour, even without a uterine scar, particularly in a woman of high parity, may cause uterine rupture. It may be caused by inappropriate use of oxytocic drugs, especially in multiparous women, or in the presence of cephalopelvic disproportion. No woman receiving an oxytoxin infusion should be left alone.

Ideally, always use a burette giving set to administer IV oxytocin to avoid too paid infusion and overdosage. *In the absence of a burette, refer to the progressive oxytocin dosage, and use as described in the chapter on normal delivery, making sure to slow/stop once labour is well established***.**

Uterine rupture may be caused by violence or trauma during pregnancy, sometimes as part of intimate partner violence.

Risk factors for uterine rupture

- Malpresentation and malposition.
- Previous CS, especially if oxytocic agents used, or if a classical CS scar is present.
- Previous uterine surgery e.g. myomectomy, or uterine perforation at the time of dilatation and curettage (D&C) or manual removal of placenta (MR). It may be recognised or (more often) unrecognised.
- The multiparous woman who has delivered normally before and has a significantly bigger baby or a malposition in the current pregnancy and is allowed a prolonged second stage.

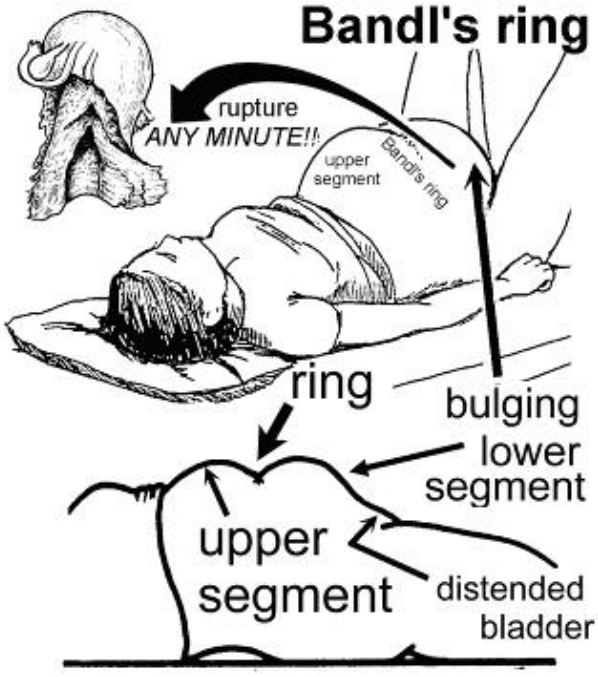
Symptoms and signs

This usually presents with hypovolaemic shock, but vaginal bleeding can be concealed. The baby is usually dead

50% of ruptures occur at or near full dilatation.

- Change in nature of pain, from severe intermittent to constant dull ache.
- Vaginal bleeding may or may not be present.
- Maternal shock due to blood loss +/- vagal stimulation, plus dehydration, exhaustion, ketoacidosis if prolonged obstructed labour.
- Abdominal distension, tender to palpation, fetal parts may be very easily palpated, absent fetal heart,
- On vaginal examination, the presenting part may be high or impacted
- May be preceded by the appearance of Bandl's ring (*see* figure 9)

Figure.9 Bandl's ring in obstructed labour, uterine rupture may be imminent



Suspect rupture in the patient with any risk factors

Primary assessment and resuscitation

Call for help, especially for a surgeon and anaesthetist, urgent laparotomy will be required

Airway

- If the airway is not open - use an airway opening manoeuvre and keep it open. Consider an airway adjunct such as an oropharyngeal airway or intubation.
- The oropharynx may need gentle suctioning under direct vision, being careful to avoid inducing laryngospasm.
- The recovery position should be adopted to minimise the risk of aspiration of vomit (*see* Figure 10).

Figure 10 Recovery position

Breathing

- If there is spontaneous breathing, give high concentration of oxygen via a facemask with reservoir. Give 100% oxygen (mask with reservoir and flow rate of at least 6L/min) regardless of mother's oxygen saturation. This increases fetal O_2 delivery as well as improving maternal tissue oxygenation.
- If apnoeic or hypoventilating, provide chest inflations with bag-valve-mask-reservoir ventilation and high flow oxygen.

Circulation

Evaluate pulse rate and volume, peripheral circulation (capillary refill time) and blood pressure

- If signs of life are absent, initiate CPR
- Perform left lateral tilt or manual displacement of uterus
- If signs of shock, support circulation as below
    - Insert a 14G-16G IV cannula and take 20 mL blood for full blood count, crossmatch (4 units = 2 L) and clotting. Undertake whole blood clotting time (WBCT) test if laboratory studies not available.
- Give 500 ml to 1 L of Ringer-Lactate or Hartmann's by rapid bolus IV
- Re-assess, and if shock still present, give blood if available (500 mL as rapidly as possible after warming) or another 500ml to1 L of Ringer-Lactate or Hartmann's.
- If ketotic from prolonged obstructed labour, add 50 mL of 50% glucose to the second litre of Ringer-Lactate or Hartmann's.
- Central venous access may be needed for volume replacement if peripheral access not possible.

Emergency treatment

1. Obtain consent for laparotomy and hysterectomy.
2. Try to place a second IV cannula.
3. Perform urgent laparotomy under general anaesthesia.
4. The type of operation will depend upon the size and site of rupture, and the degree of haemorrhage.
5. Give IV prophylactic antibiotics (ampicillin 2 g or cefuroxime 1.5 g plus metronidazole 500 mg).

The rupture may extend anteriorly towards the back of the bladder, laterally towards the uterine arteries, or into the broad ligament plexus of veins and leading to massive haemorrhage.

Posterior rupture may occur and is usually associated with intrauterine malformations, but has occurred in patients who have had a previous CS or uterine trauma, or after rotational forceps. Fundal rupture

has been documented, and detailed history usually elicits previous D and C or manual removal of placenta.

Continuing haemorrhage is an indication for performing a total or subtotal hysterectomy. Subtotal hysterectomy is a simpler procedure than total hysterectomy, and has a reduced risk of ureteric or bladder damage.

The choice of uterine repair depends on the site of the injury. In one series of 23 cases of ruptured uterus, hysterectomy was undertaken in 15 (65%) cases and repair in the other 8. Five successful further pregnancies were reported without repeat rupture (all delivered by CS). In another Middle Eastern series of 11 cases of uterine rupture, 8 had uterine repair - all became pregnant again and delivered by CS.

SECTION 9 Quiz 9

1) Which of the following are some of the symptoms or signs of a ruptured uterus?

a) shock
b) change in pain from intermittent to constant
c) chest pain
d) fetal parts easily palpable

2) Put the following causes of PPH into order of frequency with the most frequent placed first

Uterine atony	1
Retained products of conception	2
Genital tract injury	3
Coagulation failure	4

ANSWERS:

1. abd 2. sequence is 1,2,3,4

Shoulder dystocia (see video for download on www.mcai.org.uk)

Shoulder dystocia is due to impaction of the shoulders against the bony pelvis. Special manoeuvres are required to deliver the shoulders. The reported incidence is between 0.15% and 2% of all vaginal deliveries. It carries a significant risk to the baby due to hypoxia, fractures of the clavicle and humerus and injuries to the brachial plexus.

The problem lies at the *pelvic brim* where the anterior shoulder gets caught, while the posterior shoulder has usually entered the pelvis. Treatment therefore aims to encourage the anterior shoulder into the pelvis, or if this fails either rotating the posterior shoulder round into the anterior position or delivering the posterior arm first. Traction on the head when the anterior shoulder is caught above the pelvic brim will not work and is dangerous.

Delivery should occur within five minutes of the delivery of the head, and hypoxic injury to the baby is increasingly likely the longer the delay.

Post-partum haemorrhage is common after shoulder dystocia, and there is a risk of serious vaginal and perineal lacerations.

Risk factors for shoulder dystocia

Antepartum	**Intrapartum**
Fetal macrosomia	Prolonged first stage
Maternal obesity	Prolonged second stage
Diabetes	Oxytocin augmentation of labour
Prolonged pregnancy	Assisted delivery
Advanced maternal age	
Male gender	
Excessive weight gain	
Previous shoulder dystocia	
Previous big baby	

These risk factors often do not help in the prediction of individual cases of shoulder dystocia, and so the practice of emergency drills is essential for good management of the unexpected case.

Slow progress in labour, particularly in the multiparous patient or a woman with a past history of a big baby or difficulty delivering the shoulders, should alert one to the possibility.

During delivery, signs include:
- difficulty delivering the face and chin
- head retractions between contractions
- head bobbing
- the delivered head becomes tightly pulled back against the perineum (*turtle sign*).

As soon as the situation is suspected, a plan of action should be initiated.

Management of shoulder dystocia

If risk factors are present, try if possible to have an experienced obstetrician present in the second stage. Fifty percent, however, are unexpected.

Be prepared for the problem, including post partum haemorrhage, which may follow.

Try each manoeuvre for 30-60 seconds only: if it does not work, move on. Try to recognize it early-on and before applying any traction to the head which can delay helpful procedures and cause Erb's paralysis.

The ALSO acronym below is helpful see www.also.org.uk

HELPERR: H = HELP
E = EVALUATE/EPISIOTOMY
L = LEGS (McRoberts)
P = PRESSURE (suprapubic)
E = ENTER (posterior arm and Wood's screw)
R = ROTATE (onto all 4's)
R = REPEAT

1. *Call for help: it needs the most experienced team and extra helpers*

2. McRobert's manoeuvre (Legs) See figures 11 and 12 below.
Both thighs are sharply flexed, abducted and rotated outwards ideally by two assistants. Each assistant holds the leg in the region of the thigh and flexes the leg until the thigh lies parallel to the anterior abdominal wall. This will reduce the angle between the sacrum and the lumbar vertebrae to help free the impacted shoulder. If two assistants are not available, the mother may be placed in the all fours position (see below).

Figure 11. McRoberts manoeuvre

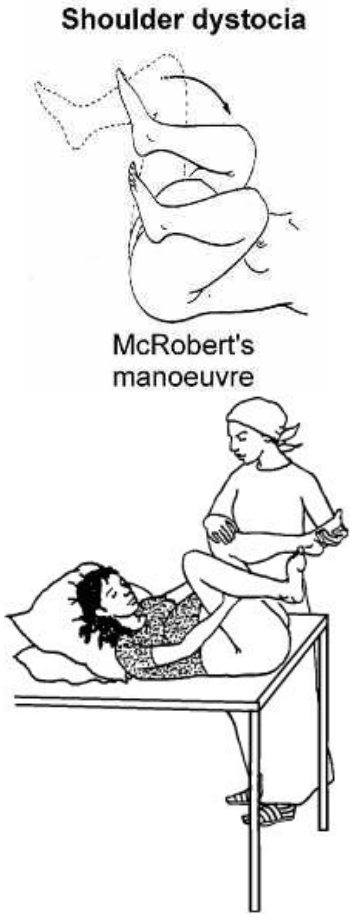


Figure 12 McRoberts manoeuvre

3. *Supra-pubic pressure with moderate traction (not fundal pressure)*
Supra-pubic pressure is applied to reduce the diameter between the shoulders and push the anterior shoulder underneath the symphysis pubis. It is important to know where the fetal back lies so that

pressure is applied in the right direction (that is from the fetal back forwards towards the fetal chest). If unsure of position of back, confirm by vaginal examination. Pressure should be applied to the back of the shoulder with the heel of the hand and sometimes a rocking movement may be helpful. Strong traction and fundal pressure should be avoided.

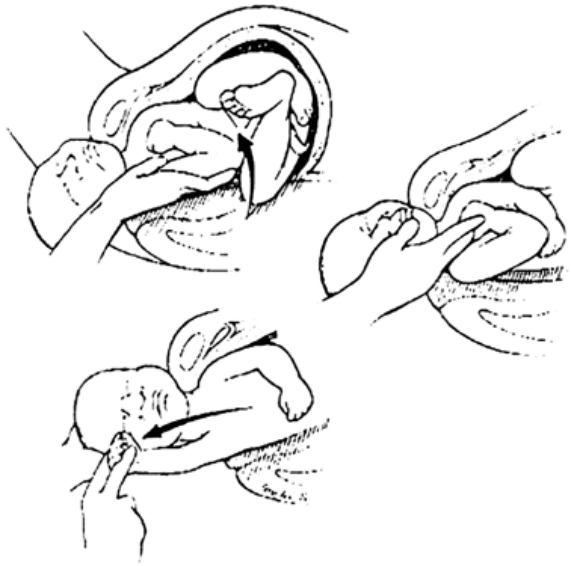
Figure 13 Suprapubic pressure

4. *Apply moderate traction (harder pulling can make impaction worse and cause Erb's paralysis)*
Once both McRobert's and supra-pubic pressure are in place, moderate traction can be applied while discouraging maternal efforts (which can increase the impaction of the shoulders).

5. *Consider an episiotomy*
A medio-lateral episiotomy is recommended to allow more room for manoeuvres such as delivering the posterior shoulder, allowing the operator to use the sacral hollow and reducing vaginal trauma.

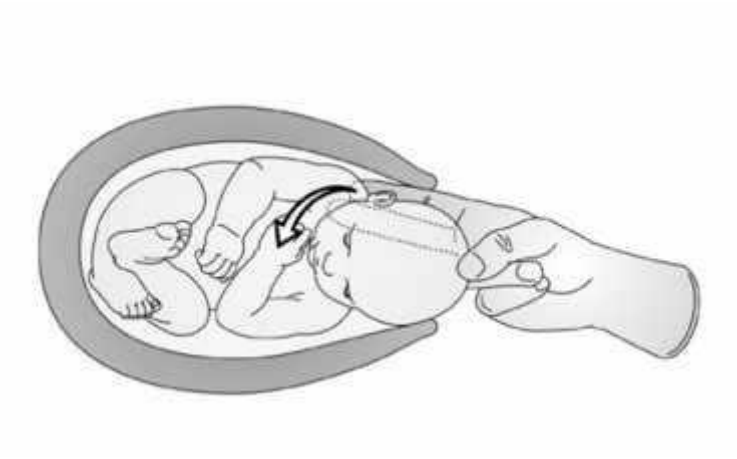
6. *Deliver posterior arm and shoulder*
Insert a hand up to the fetal axilla and hook the posterior shoulder down. Traction on the posterior axilla then brings the posterior arm within reach: run your index or middle finger or both along the back of the fetal humerus, then flex the elbow at the ante-cubital fossa which will disengage the arm which can then be brought down (hold the hand and sweep it across the chest). Sometimes it comes out directly lying alongside the head. Sometimes it comes out with an element of rotation anteriorly.

Figure 14 Delivery of the posterior arm



7. Internal rotational manoeuvres Rubin's and Wood's screw manoeuvres
These measures are rarely required.

Figure 15 Rubin's manoeuvre



Rubin's manoeuvre. The operator inserts the fingers of one hand vaginally, positioning the fingertips behind the anterior shoulder. The shoulder is then pushed towards the fetal chest.

Wood's screw manoeuvre. If Rubin's manoevre is unsuccessful the fingers of the opposite hand may be inserted vaginally to approach the posterior shoulder from the front of the fetus. The combination of these two movements may allow rotation of the shoulders and aid delivery. If delivery of the posterior shoulder or arm is not successful try to rotate the posterior shoulder 180 degrees in a corkscrew fashion (clockwise or anticlockwise) to bring it to an anterior position from whence the delivery can continue as normal (this rotation releases the impacted anterior shoulder that ends up in the posterior pelvis). It is important not to twist the fetal head or neck during this manoeuvre.

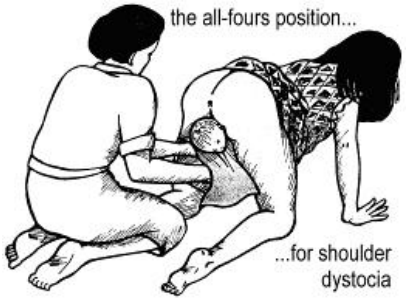
Figure 16 Wood's screw manoeuvre

Figure 17 Reverse Wood's screw manoeuvre

8. All fours position

This is another procedure which can be useful if no help is available. The mother quickly positions herself evenly on hands and knees. (Gaskin manoeuvre). In many cases this alone relieves the dystocia. It also can assist with the delivery of the posterior arm. The other manoeuvres described above can also be performed with the mother in this position. Early on try to deliver posterior shoulder from this position. Sometimes pushing one or other leg forward into the "starting of a race" position can open up the pelvis from this position.

Figure 18 All fours position for shoulder dystocia. Guide the head downwards so that the posterior shoulder which has now become upwards with the adoption of the all 4's position is delivered.



9. Symphysiotomy

If the baby is still undelivered, symphisiotomy should be considered.

10. Check vagina and perineum for trauma and repair accordingly

11. Prepare for PPH.

SECTION 10 Quiz 1

1) Which of the following are measured by the partogram?

a) maternal heart rate, BP, temperature, urine output and urine for protein and glucose
b) maternal breathing rate
c) fetal heart rate and its relationship to contractions
d) liquor (clear, meconium, bloody or absent)
e) progress of labour in terms of cervical dilatation, descent of the presenting part and moulding of the head, frequency and strength of contractions

ANSWERS:

1. acde

SECTION 10 Quiz 2

1) In the active phase of the first stage of labour which of the following statements are true?

a) the cervix should dilate at least 1 cm/hour
b) slow progress can be corrected by rupture of the membranes
c) slow progress due to obstructed labour can be overcome with an oxytocin infusion
d) if progress is good initially then slows there may be malpositions/malpresentations, dehydration, ketosis and/or exhaustion, and a small pelvis

ANSWERS:

1. abd (oxytocin is dangerous in obstructed labour)

SECTION 10 Quiz 3

1) Which of the following are important in preventing slow progress in labour?

a) knowing the presentation of fetus before the onset of labour
b) the use of the WHO partogram
c) knowing the blood group and having X matched blood
d) the administration of adequate fluids/glucose during labour

2) Complete the following table concerning the specific dangers of a slow progress in labour

Danger	For Baby	For pregnant woman or girl
Death	Yes	Yes
Uterine rupture	No	Yes
Infection	a)	b)
Fistula	c)	d)
Brain damage	e)	f)

ANSWERS:

1. abd 2. a. Yes b. Yes c. No d. Yes e. Yes f. No

SECTION 10 Quiz 4

1) Which of the following are causes of a slow progress in labour?

a) poor quality uterine contractions
b) malpresentations
c) disproportion between sizes of baby and pelvis
d) differences in blood group between pregnant woman or girl and baby
e) malpositions
f) infection in the pregnant woman or girl

2) When treating obstructed labour which of the following actions are essential?

a) ABC assess and treat
b) look for and treat ruptured uterus
c) look for and treat infection
d) transfer to hospital early

ANSWERS:

1. abcef 2. abcd

SECTION 10 Quiz 5

1) Which of the following statements regarding risk factors for shoulder dystocia are true?

a) advanced maternal age
b) maternal obesity
c) female gender of fetus
d) short first stage
e) risk factors are reliable predictors for individual cases of shoulder dystocia.

2) Which of the following represent risks to the baby of shoulder dystocia?

a) hypoxia
b) fractures of clavicle and humerus
c) nerve injuries

3) Management of shoulder dystocia includes which of the following?

a) episiotomy
b) traction on the head as soon as turtle sign is seen
c) suprapubic pressure
d) McRobert's maneuver
e) Anticipation of post partum haemorrhage

ANSWERS:

1. a,b 2. a,b,c 3. a,c,d,e

Inverted uterus

Introduction

*Definition***:** the uterus, after or during delivery of the placenta, is inverted and can appear at the introitus. The inverted uterus has the endometrium and sometimes the placenta on the 'outside'

Prevention: prevent by avoiding cord traction until the uterus is contracted and placental separation and ensuring uterus is held back with one hand during cord traction.

Clinical signs

Most commonly presents as a pelvic mass, sometimes protruding from the vagina. Where the inverted uterus does not protrude from the vagina, it may go undetected resulting in a sub-acute or chronic inversion which is very dangerous and may even present as a sudden unexpected maternal death.

Symptoms and signs include severe lower abdominal pain in the third stage of labour, haemorrhage, shock out of proportion to blood loss, uterus not palpable on abdominal examination, and vaginal examination showing a mass in the vagina.

Early recognition is vital as *shock* is the most common complication. Shock out of proportion to blood loss may be due to increased vagal tone, which may also produce a *bradycardia* (<60/minute), worsening the shock and confusing its diagnosis. Inversion is associated with haemorrhage in >90% of cases. Alternatively, concealed bleeding may produce tachycardia and other signs of shock.

Incomplete inversions present more subtly with continuing PPH despite a contracted uterus; the fundus of the uterus may feel dimpled.

Suspect a diagnosis of inverted uterus if there is:

- shock with little obvious bleeding.
- continuing PPH despite an apparently well- contracted uterus.
- associated lower abdominal pain.
- dimpled uterine fundus, or fundus not palpable abdominally.

Management

It is urgent to replace the uterus as soon as inversion is recognised, as this becomes more difficult over time. Call for help and try and push it back whilst ABC resuscitation is being undertaken.
Primary assessment and resuscitation
Call for senior help, including surgeon and anaesthetist
If shock is present, manage ABC as described below

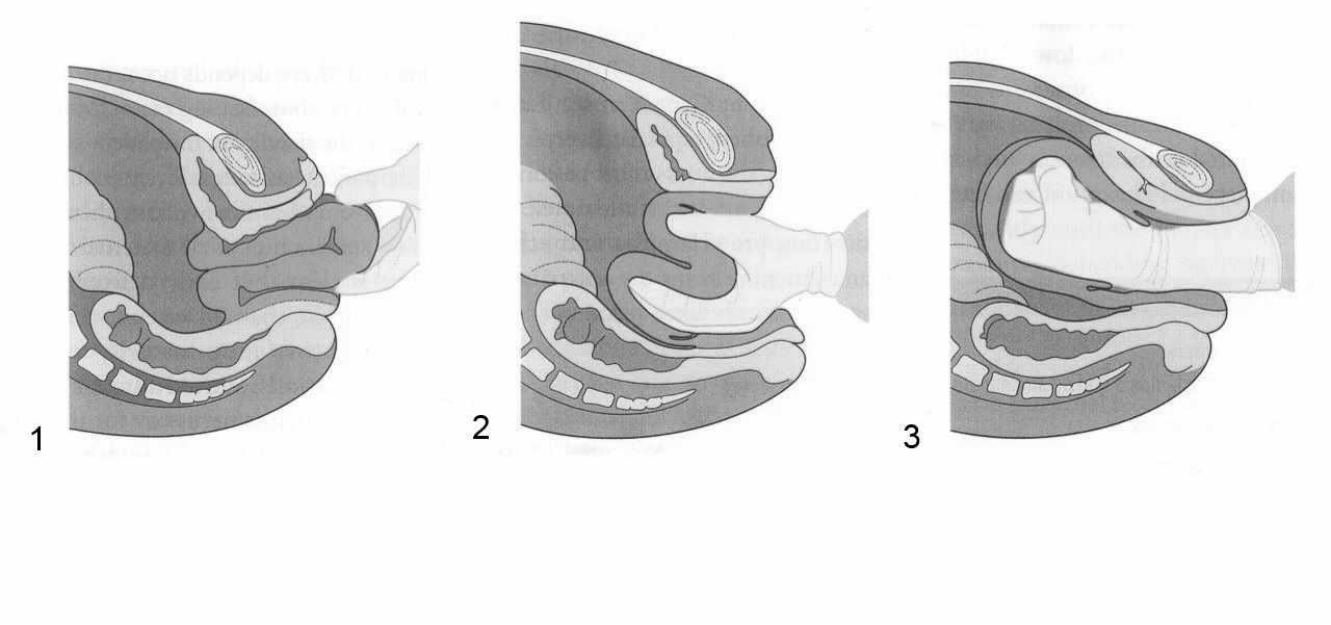
Manual replacement of the uterus

As soon as possible and **wearing sterile gloves,** attempt manual replacement of the uterus by pushing the fundus back through the cervix (the longer the delay the more difficult it will be to achieve resolution).

Grasp the uterus and push it through the cervix towards the umbilicus to its normal position, using the other hand to support the uterus (*see* figure 1). If the placenta is still attached, perform manual removal **after** correction.

It is important that the part of the uterus that came out last (the part closest to the cervix) goes in first.

Figure 1 Bimanual replacement of inverted uterus



Do not attempt to separate the placenta until inversion corrected.

However, if the inversion has been present for some time (for example occurring at home) and replacement is not possible without placental removal, then be prepared, if undertaken, for possible severe bleeding.

Hydrostatic correction

- If manual replacement is unsuccessful, hydrostatic correction should be attempted
- Place the woman in deep Trendelenburg position (lower her head about 0.5 metres below the level of the perineum).
- Prepare a high-level sterile douche system with large nozzle and long tubing (2 metres) and a reservoir (1 to 2 L of sterile Ringer-Lactate or Hartmann's at room temperature not from a refrigerator).
    - **Note**: This can also be done using Ringer-Lactate or Hartmann's and an ordinary IV administration set.
      Identify the posterior fornix. This is easily done in partial inversion when the inverted uterus is still in the vagina. In other cases, the posterior fornix is recognized by the place where the ridged vagina becomes the smooth vagina.
- Place the nozzle of the douche in the posterior fornix.
- At the same time, with the other hand hold the labia sealed over the nozzle and use the forearm to support the nozzle.
- Ask an assistant to start the douche with full pressure (raise the water reservoir to at least 2 metres). Ringer-Lactate or Hartmann's will distend the posterior fornix of the vagina gradually so that it stretches. This causes the circumference of the orifice to increase, relieves cervical constriction and results in correction of the inversion.
- If a silc-cup ventouse is available, this can be used to occlude the vagina and give a seal. Two IV infusion sets are inserted into the narrow end whilst the wide end lies against the inverted uterus vaginally.
- Terbutaline 250 micrograms subcutaneously may help stop any uterine contractions which prevent correction of the inversion.

Manual correction under general anaesthesia

If hydrostatic correction is not successful, try manual repositioning under general anaesthesia, using halothane. Halothane is recommended because it relaxes the uterus, but be aware of possible atonic uterus and haemorrhage.

Grasp the inverted uterus and push it through the cervix in the direction of the umbilicus to its normal anatomic position. If the placenta is still attached, perform a manual removal after correction.

Airway

- Use an opening manoeuvre, if the airway is not open or is partially obstructed. Keep the airway open. If there is improvement but the airway closes without active opening support, consider using an airway adjunct to support the airway.
- Suction, only under direct vision and only if necessary
- The airway may need to be secured by intubation using experienced senior help (if available).

Breathing

Provide a high concentration of oxygen through a face mask with a reservoir bag if there is adequate spontaneous respiration. Give 100% oxygen (mask with reservoir and flow rate of at least 61/min) regardless of SaO_2. This increases fetal O_2 delivery as well as improving material tissue oxygenation. For inadequate ventilation or depressed conscious level (AVPU), respiration should be supported with oxygen via a **bag-mask,** and experienced senior help summoned (if available).

Circulation

Primary assessment suggesting shock:

- *Fast, weak pulse* (100 to 110 per minute or more). Normal heart rates in a pregnant mother at rest are 60-90 bpm. Tachycardia is the first sign of shock.
- *Bradycardia* < 60 bpm may occur as a result of increased vagal tone due to the inversion.
- *Low volume (weak) pulse.*
- Pallor (especially of inner eyelid, palms or around mouth).
- Sweatiness or cold clammy skin.
- *Prolonged capillary refill time* (> 3 seconds).
- *Rapid breathing* (> 30 breaths per minute) Normal respiratory rates in a pregnant mother at rest are 15 to 20/minute: tachypnoea can be due to acidosis.
- *Low BP* (systolic less than 90 to 100 mm Hg) is *a very late sign.* Healthy women and girls can maintain a normal or even high blood pressure while large volumes of blood are lost.
- Anxiety, reduced conscious level, confusion or unconsciousness.

If the woman or girl is shocked, obtain vascular access to give large volumes quickly. Insert two wide-bore IV cannulae (14 G-16 G) and send blood for full blood count, cross-match (2 units) and clotting. If peripheral veins are difficult to access, external jugular or long saphenous vein cut-down are good alternatives.

1. Give an initial *rapid* bolus 500ml to 1 L of Ringer-Lactate or Hartmann's solution *or blood if available*. It is essential that the bolus is given as rapidly as possible. In the absence of syringe pumps, they should be manually pushed in using 20-50 mL syringe (using a 3 way tap and link to an IV giving set)
2. Further 500-1000ml boluses may be required in the first 1 hour. Once >2 litres has been given IV, complications such as pulmonary or cerebral oedema may occur. If available, expert help, including CVP monitoring are valuable.

3. A BP cuff can be used to speed up infusions in emergency situations. Wrap the cuff around the blood/fluid bag and place inside a non-compressible bag.
4. Keep patient warm but do not overheat as will cause peripheral vasodilatation and reduce blood to vital centres. Hypothermia will exacerbate poor peripheral perfusion, acidosis and coagulation abnormalities.
5. *Elevate legs (raise foot of bed).*
6. Give O negative or group specific blood if no time for full cross-match. Have O negative blood ready in the ward at all times if possible.
7. Consider atropine 100 micrograms IV and repeat every 2 minutes up to maximum of 400 micrograms IV if bradycardia < 60 bpm.
8. Consider the Non-pneumatic Anti-Shock Garment (NASG)

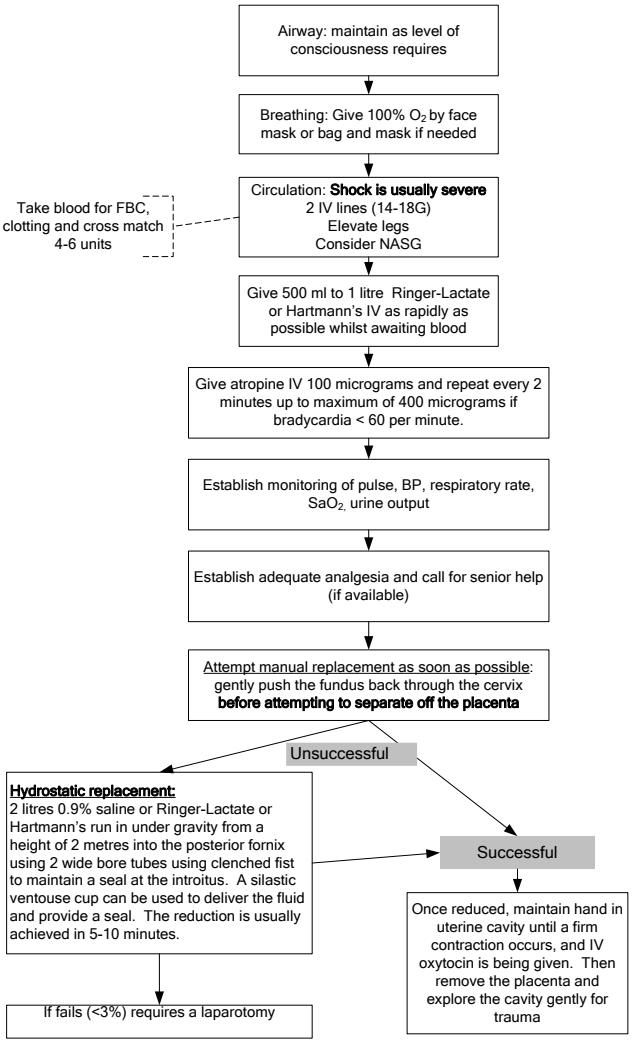
Post procedure care

Once the inversion is corrected, infuse IV oxytocin 40 units in 500 mL Ringer-Lactate or Hartmann's over 4 hours:

If the *uterus does not contract after oxytocin*, give misoprostol 3 tablets each of 200 microgram orally or 600 micrograms of powder sublingually if conscious, or 4 x 200 micrograms rectally if drowsy.

Give a single dose of prophylactic antibiotics after correcting the inverted uterus**.** Use ampicillin 2 g IV PLUS metronidazole 500 mg IV and give appropriate analgesia.

Figure 2 Pathway of care for inverted uterus



Preterm, Pre-labour Rupture of Membranes (PPROM) and/or preterm labour

Introduction

PPROM is defined as spontaneous rupture of membranes before the onset of labour and prior to 37 weeks gestation. It occurs in 2-4% single pregnancies, 7-20% of multiple pregnancies and accompanies 60% or more preterm births.

Risk factors for PPROM are intrauterine infection and abruption.

PPROM is associated with maternal mortality and morbidity from infection and associated with neonatal complications which include cord prolapse, neonatal sepsis and respiratory failure, pulmonary hypoplasia and malpresentations.

Preterm labour is that beginning before 37 weeks gestation and has serious implications for the neonate when before 36 weeks.

Clinical findings in the woman with PPROM and/or premature labour
In PPROM the fluid may come out quickly as a sudden large flow or trickle out over 1-2 hours after which recognition is more difficult. About half women go into labour within 24-48 hours and 70-90% within a week. The gap is longer the earlier in pregnancy the rupture occurs.

There may be no history or signs to suggest that PPROM has occurred and therefore the woman may present with preterm labour. Preterm labour may also occur without PPROM.

It is important if possible to distinguish PPROM from urinary incontinence, bacterial vaginal infection or a 'show' cervical mucus indicating the onset of labour.

Management of PPROM and/or premature labour
Avoid digital vaginal examination unless active labour is underway and/or birth is imminent as it increases the risk of infection.

A sterile speculum examination should be undertaken looking for amniotic fluid passing through the cervix or in the posterior fornix. A swab should be taken of the fluid and sent to the laboratory for microscopy and culture (if bacteriological facilities available), looking especially for group B streptococcus.

Monitor vital signs (temperature, heart rate, BP, vaginal discharge (check sanitary towels regularly: do not use tampons), uterine activity and possible tenderness, and fetal heart rate and where possible perform an ultrasound examination.

Also check full blood count and MSSU.

Although there is no evidence that bed rest is appropriate, if it is undertaken apply anti embolism stockings (if available) and encourage leg exercises to prevent deep vein thrombosis.

Inform the paediatricians if available.

Sexual intercourse should not occur after PPROM.

When to consider antibiotics

1. Symptomatic ascending infection in-utero in the mother (fever, maternal and/or fetal tachycardia, foul smelling vaginal discharge, uterine tenderness and signs of systemic illness) needs *urgent treatment with IV/IM antibiotics (ampicillin plus gentamicin plus metronidazole).* If this is overlooked both the mother and the baby's life will be in danger.
    - Ampicillin 2 gram IV/IM then 1 gram IV 6 hourly
    - Gentamicin 80mg IV/IM 8 hourly or 5mg/Kg body weight IV/IM once every 24 hours
    - Metronidazole (vial containing 500 mg in 100 ml) 500 mg or 100 ml IV infusion every 8 hours. Do not give metronidazole IM.

    Usually there will be uterine contractions but whether or not they are present, the baby must be delivered as soon as possible.

2. Asymptomatic infection (no fever and no systemic signs of illness) is a much commoner problem. This occasionally progresses so rapidly once labour starts that, unless treatment is started urgently, the baby and possibly the mother will die even if the most appropriate antibiotic is given immediately after birth. Because such infection by definition is silent*, it is important that antibiotic treatment therefore be given in any mother going into active spontaneous labour before 37 weeks gestation.* If the membranes are **definitely not** ruptured give ampicillin or amoxicillin 500 mg 8 hourly or erythromycin 250 mg orally 6-hourly (if allergic to penicillin) for 10 days and if the membranes **are** ruptured give IV ampicillin 2 gram IV/IM then 1 gram IV 6 hourly. Discontinue antibiotics immediately after delivery if no signs of infection in the mother. Antibiotics in PPROM without premature labour (with uterine contractions) may delay the onset of labour for a short period of time.

3. Treatment with IV/IM ampicillin in the dose above should also be given at *any gestation if the mother's membranes have ruptured for more than 18 hours and they are not delivered.* If premature rupture of membranes occurs before the onset of premature labour contractions then infection is more likely.

4. Maternal fever (>38C) in labour is also a strong indication for initiating IV penicillin/ampicillin and gentamicin for the mother. Similarly *foul-smelling or purulent liquor requires intravenous antibiotic treatment of the newborn infant from birth without waiting for any signs of infection to become apparent.*

Minimising the risk of surfactant deficiency in the newborn by antenatal steroids

High dose corticosteroids can achieve improved surfactant production in the newborn but steroids must not be given if there is evidence of tuberculosis or HIV infection. A transient increase in blood glucose can occur with the use of steroids in diabetes. Even one dose of steroids can be effective to improve lung maturity in the newborn.

betamethasone 12 mg IM 2 doses 24 hours apart
or
dexamethasone 6 mg IM 4 doses 12 hours apart,

A second course of dexamethasone or betamethasone can ~~should not~~ be given if > 2 weeks has passed since a first course of treatment has been given and delivery has not occurred but premature labour has restarted. More than 2 courses should not be given.

Stopping premature labour ONLY if the membranes are considered to be intact (tocolysis).

Premature labour is considered to be present if there are regular contractions at least every 10 minutes associated with cervical effacement and/or dilatation

It is unsafe to try to stop labour if the membranes are ruptured~~, especially in low resource situations.~~

However, tocolysis (as with antibiotics-*see* above) can be useful in providing a few days for corticosteroids to become active and thereby protecting the baby from lung surfactant deficiency as well as allowing transfer of the mother to a hospital where safer therapy can be provided for a preterm baby.

Although tocolysis is not recommended after 34 weeks gestation in well resourced situations, it may possibly be helpful between 34 and 36 weeks in low resource settings as well as between 28 and 34 weeks.

If labour is well advanced and cervix < 5cm dilated, tocolysis will probably not be helpful.

Tocolysis should not be given for > 48 hours.

Drugs given for tocolysis:
The most appropriate drug is nifedipine orally.

Side effects of nifedipine include facial flushing, headache, nausea, tachycardia, dizziness, fall in BP, heart failure and rarely increased liver enzymes.

Contraindications are where early labour is required, for example with APH, severe pre-eclampsia, infection, fetal distress and all cases of PPROM in low resource settings. It should not be given if there is heart disease.

Before starting nifedipine and, where possible, measure urea and electrolytes and liver function tests.

Regular and frequent vital signs measurements on the mother should be undertaken, as well as the fetal heart rate. Closely observe for signs of heart failure. If the BP falls give a bolus of 250-500 mL of Ringer-Lactate or Hartmann's.

Doses of nifedipine: Initial dose 20 mg oral nifedipine (not the slow release version)

Up to three further doses can be given at 30 minute intervals if uterine contractions persist

If this stops labour and BP is stable, maintenance dose of 20 mg three times a day for the next 2-3 days. The maximum daily dose is 120 mg of nifedipine.

Other tocolytic drugs if nifedipine is not available
There is always the option of not to try and stop uterine contractions since the evidence for benefit is very limited except for the possibility of gaining time for the patient to receive prophylactic steroids and to move the patient to a safer place for delivery.

If there is premature labour and PPROM, tocolytics should not be used.

In low resource situations, women with PPROM and/or premature labour should be resident in a facility where comprehensive EMOC is available.

How long should you wait before inducing labour when there is PPROM?

This is a difficult decision and depends on the stage of pregnancy, the availability of comprehensive EmOC and the quality of neonatal care available. If there is any sign of infection, delivery is urgent at any stage of the pregnancy.

Clinical problems in the neonate associated with preterm birth

- surfactant deficiency leading to increasing levels of respiratory difficulty with decreasing gestational age
- increased risk of infection and hypothermia
- nutritional problems: maturity is more important than weight in the ability to feed and digest. Babies born before 36 weeks of gestation nearly always need some help with feeding. Breast milk is ideal, and everything possible should be done to help the mother sustain her lactation until the baby is ready to feed reliably from the breast. A limited ability to suck and swallow usually appears from 32 weeks of gestation but it remains unpredictable, unreliable and uncoordinated until 36 weeks gestation. In the event that breastfeeding cannot be initiated immediately after birth, mothers should be encouraged to start expressing breast milk, to be given by nasogastric tube or cup and spoon. Partial breast feeding can also help the mother to sustain her lactation but in any event the mother should regularly express milk.

Manual removal of placenta

If the placenta does not separate within 1 hour of delivery or immediately if there is heavy bleeding:

- start an IV infusion.
- Ensure the bladder is emptied either by the mother or by catheterisation
- give a slow IV injection of ketamine (1-2 mg/Kg or 50-100mg) or morphine (10mg) ideally in the presence of an anaesthetist.
- give a single dose of prophylactic antibiotics:
    - ampicillin 2 g IV PLUS metronidazole 500 mg IV;
    - OR cefotaxime 1 g IV PLUS metronidazole 500 mg IV.

- Ensure full aseptic drapes
- hold the umbilical cord with a clamp. Pull the cord gently until it is taught.
- wearing sterile gloves (ideally covering the forearm) insert a hand into the vagina and follow the cord up into the uterus until you reach the edge of the placenta (Figure 27). If the cervix is closed gentle pressure with 1-2 fingers will usually relax it and make it open.
- Let go of the cord with the other hand and move the hand up over the abdomen in order to support the fundus of the uterus and to provide counter-traction during removal to prevent inversion of the uterus (Figure 28).
    - *Note*: If *uterine inversion occurs*, reposition the uterus immediately.
- Move the fingers of the hand laterally until the edge of the placenta is located.
- If the *cord has been detached previously*, insert a hand into the uterine cavity.
    - Explore the entire cavity until a line of cleavage is identified between the placenta and the uterine wall.

Figure 1 Entering the uterus along the cord

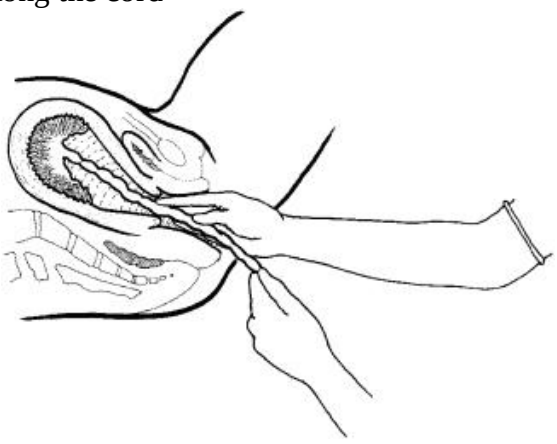
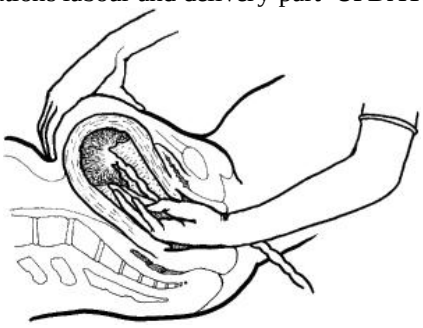
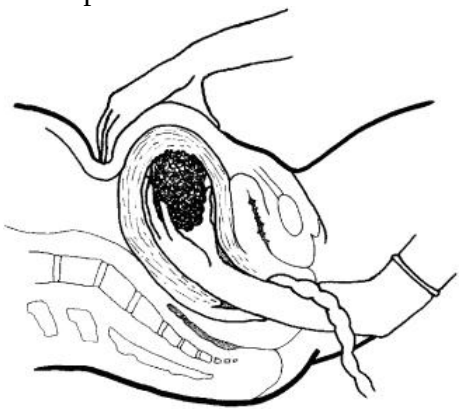


Figure 2 Supporting the fundus while detaching the placenta {near here}reach the placenta from the implantation site by keeping the fingers tightly together and using the edge of the hand to gradually make a space between the placenta and the uterine wall.



- Proceed slowly all around the placental bed until the whole placenta is detached from the uterine wall.
- If the *placenta does not separate from the uterine surface* by gentle lateral movement of the fingertips at the line of cleavage, suspect placenta accreta.
    - Consider laparotomy and possible subtotal hysterectomy.
    - Alternatively the placenta can be left in-situ to spontaneously degenerate.
    - The main risk is that of infection and follow up needs to be maintained to assess the woman for signs of sepsis.
- Hold the placenta and slowly withdraw the hand from the uterus, bringing the placenta with it (Figure 24).
- With the other hand, continue to provide counter-traction to the fundus by pushing it in the opposite direction of the hand that is being withdrawn.

Figure 3 Withdrawing the hand plus the placenta from the uterus



- Palpate the inside of the uterine cavity to ensure that all placental tissue has been removed.
- Give oxytocin 40 units in 500 mL IV fluids (Ringer-Lactate or Hartmann's) over 4 hours.
- Ask an assistant to massage the fundus of the uterus to encourage a tonic uterine contraction.
- If there is *continued heavy bleeding*, give 10 units oxytocin IM. If this does not work try ergometrine 200 to 500 micrograms IM and, if that does not work, give misoprostol rectally as 4 x 200 microgram tablets or pessaries (800 micrograms total) or, if conscious, misoprostol orally 3 x 200 microgram tablets.
- Examine the uterine surface of the placenta to ensure that it is complete. If any *placental lobe or tissue is missing*, explore the uterine cavity under strict surgical asepsis to remove it.
- Examine the mother carefully and repair any tears to the cervix or vagina, or repair episiotomy.

Problems

- If the *placenta is retained due to a constriction ring* or *if hours or days have passed since delivery*, it may not be possible to get the entire hand into the uterus. Consider a general anaesthetic to help relax the cervix and extract the placenta in fragments using two fingers or ovum forceps but be very careful not to penetrate the soft uterine wall. If hours or days have passed and/or signs of sepsis are present, treat for puerperal sepsis with full course of IV

antibiotics.

Post procedure care

Observe the mother closely until the effect of IV analgesia has worn off.

- Monitor the vital signs (pulse, blood pressure, respiration and temperature) every 15 minutes for the first hour and then every 30 minutes for the next 6 hours or until stable.
- Palpate the uterine fundus to ensure that the uterus remains contracted.
- Check for excessive lochia.
- Continue infusion of IV fluids.
- Transfuse as necessary, especially if mother is severely anaemic before procedure.
- Warn mother of the increased risk of this occurring at time of next pregnancy and therefore advise to deliver in a well-equipped comprehensive EmOC facility.

Multiple births

Introduction

Twins occur in around 1: 80 pregnancies. Non-identical twin rates vary depending on age, parity and racial background; rates are higher than world average in Africa. The incidence of monozygous (identical) twins is relatively constant worldwide, at 3.5 per 1,000 births.

Multiple pregnancies are associated with greater risks for both the mother and the fetus. Ultrasound scanning should be undertaken if the uterine size is larger than expected, or if abdominal examination of fetal parts leads to suspicion of multiple fetuses.

If ultrasound scan is not available, abdominal examination after delivery of any first baby should be performed to **exclude a second twin before oxytocin or syntometrine is given to aid delivery of the placenta.**

Maternal risks associated with multiple pregnancy

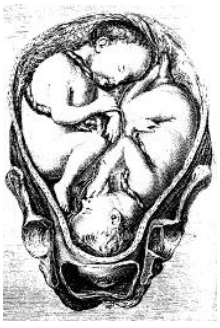
- Miscarriage
- Anaemia
- Pre-term labour
- Hypertension
- Polyhydramnios
- Operative delivery
- Post-partum haemorrhage

Fetal risks associated with multiple pregnancy

- Stillbirth or neonatal death
- Pre-term delivery
- Intra-uterine growth restriction
- Congenital abnormalities
- Cord accident

1) Specific complications of twin pregnancies, e.g. twin to twin transfusion syndrome
2) Difficulties with delivery

Figure 1 Twin pregnancy



When a twin pregnancy is diagnosed, additional care should be provided. Iron and folate treatment must be ensured, due to the increased risk of anaemia. Pre-term labour and delivery presents the greatest risk of fetal illness and death. If the mother develops premature labour, a course of ante-natal steroid injections should be given.

betamethasone 12 mg IM 2 doses 24 hours apart

or

dexamethasone 6 mg IM 4 doses 12 hours apart.

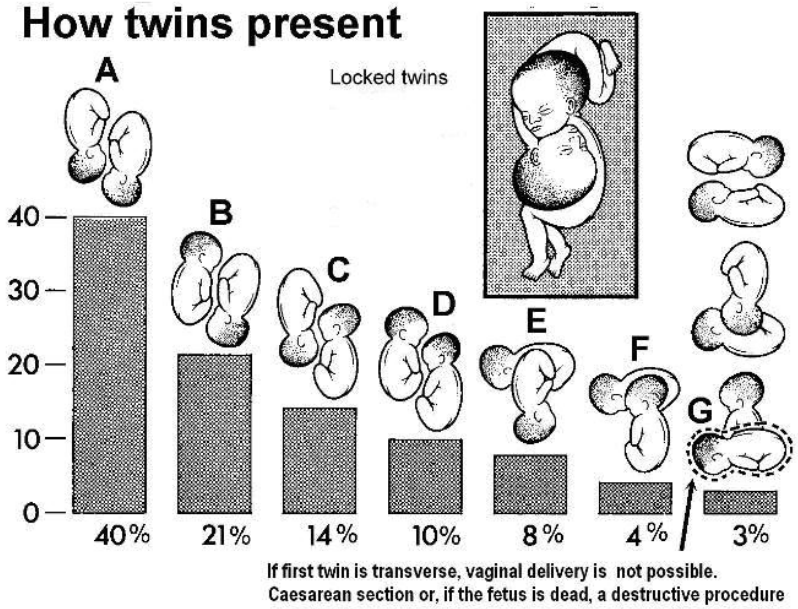
A second course of dexamethasone or betamethasone can be given if > 2 weeks has passed since a first course of treatment has been given and delivery has not occurred but premature labour has restarted. More than 2 courses should not be given.

Steroid injections improve the maturity of the fetal lungs and reduce the risk of respiratory distress syndrome in the newborn.

How twins present

In 40% of cases, both twins are cephalic. In 21%, the second twin is a breech. In 14%, the first twin is a breech. In 10% of cases, both twins are breeches. In all remaining cases, one twin or other, or occasionally both, are transverse. In figure 2.6.D.2, the first twin is the lower one.

Figure 2 The variety of twin positions in utero at birth



Antenatal monitoring in multiple pregnancy

1) Check-up (urine for protein, BP, ultrasound if possible) two-weekly from 28 - 36 weeks; warn about the risk of preterm delivery
2) Check-up weekly from 37 weeks
3) Watch for signs of pre-eclampsia and premature labour

Twin delivery

Vaginal delivery is usually safe but must be undertaken in a health facility where comprehensive EmOC is available. If labour has not started by 39-40 weeks gestation, consider induction.

Summary of management during labour

Delivery of first twin

1) Insert I.V. cannula. Maternal blood should be obtained for a full blood count and blood group. A blood sample should be kept for cross-match
2) Ensure longitudinal lie of the first baby
3) Augment contractions only when indicated.

4) Prepare two delivery packs / extra clamps. Remember there are almost always two membranes to rupture with twins.
5) Make sure the cervix is fully dilated.
6) Empty mother's bladder.
7) Deliver first baby as normal
8) After birth of first baby: stabilise the lie of the second twin if it is longitudinal. If not undertake version (see below)
9) Tie a marker (eg gauze) to the clamp on the cord of first baby to identify it.

Delivery of second twin

1. The second baby should preferably be born within 30 minutes.
2. Check FHR of second baby.
3. Stabilise the lie of the second twin with version if necessary.
4. Provided lie is longitudinal and contractions do not restart 5 - 10 minutes after delivery of the first baby, then start oxytocin infusion 5 Units in 500 mL 5% dextrose, commenced at a rate of 1 milliunit per minute, that is 6 mL/hour (in a standard giving set where 20 drops per mL), increasing carefully to achieve adequate contractions. Note that contractions may not be felt by the mother, so it is important to keep your hand on the uterus to identify these.
5. When the presenting part is well into the pelvis, rupture of membranes can be performed during a uterine contraction.
6. Delivery of the second baby should not be rushed, but assisted delivery should be considered if the baby has not been delivered by 30 minutes after delivery of the first.
7. If the lie of the second twin is transverse, attempt external version.
8. If external version is successful, or the second twin is longitudinal, wait for the presenting part to enter the pelvis then do artificial rupture of membranes (ARM) and allow normal cephalic or breech delivery if there is no fetal distress
9. If ECV is unsuccessful, either carry out internal version with breech extraction or perform a CS.
10. *Internal podalic version*: It is essential that every manoeuvre undertaken ensures that the fetal back is kept anterior. Grasp the correct fetal foot (by pulling on the correct foot the fetal back must go anterior for delivery). (*Ensure it is a foot not a hand*). Pull gently down in to the birth canal so that the fetal back goes anterior. The membranes are ruptured as late as possible. The baby is delivered as an assisted breech or breech extraction.
11. If the fetal back is inferior , the operator's hand needs to grasp the foot nearest to the mother's back so that when pulling on this the fetal back goes anterior (see figure 3).
12. If there is fetal distress or delay, carry out assisted vaginal delivery

Figure 3 Internal version for transverse lie in a second twin

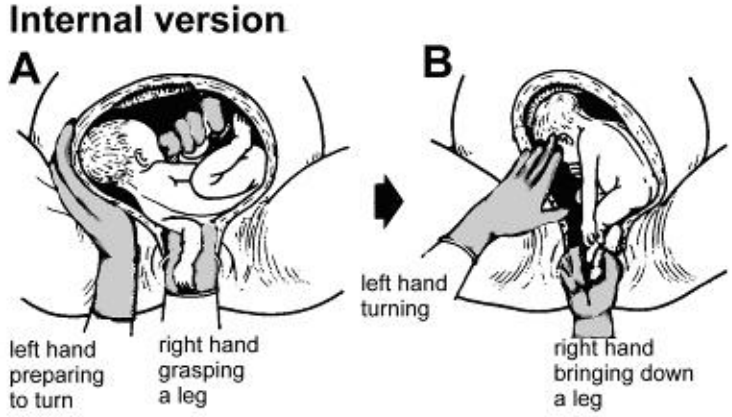
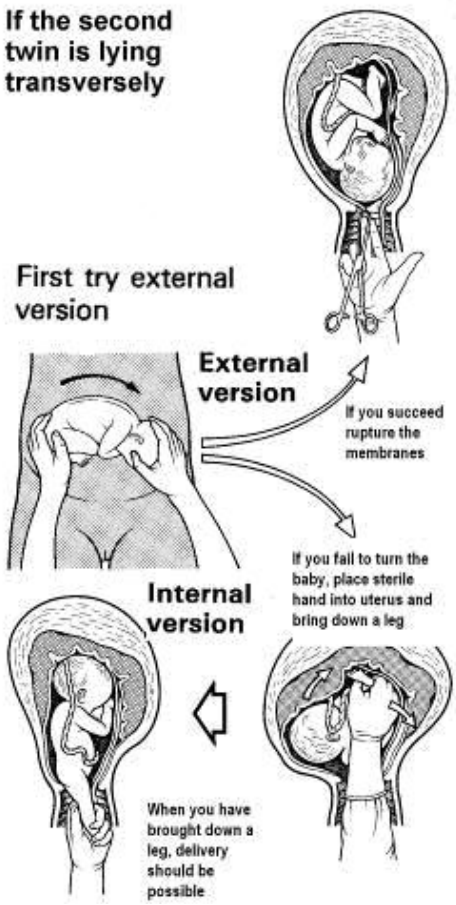


Figure 4 Transverse lie in a second twin, ensuring the correct foot is pulled so that the fetal back becomes anterior in the birth canal



Postpartum management of twin birth

1. After birth of second baby, give10 IU oxytocin IM after ensuring that there is no third baby in the uterus. Then give oxytocin 40 units IV in 500 mL of Ringer-Lactate or Hartmann's over 4 hours, to reduce the risks of PPH due to atonic uterus. .
2. Deliver the placenta by controlled cord traction after oxytocin IM.
3. After birth of placenta and membranes, examine and record in chart the number of placentas, amnions, chorions and cord vessels. Check the placenta and membranes for completeness.
4. Check and repair any vaginal and perineal damage.
5. Monitor carefully for post-partum bleeding over the next few hours.
6. Provide extra support to assist with the care of the babies.
7. At least 24 hours stay in hospital
8. Observe vaginal bleeding closely, because of risk of PPH

Hooking/locking of heads

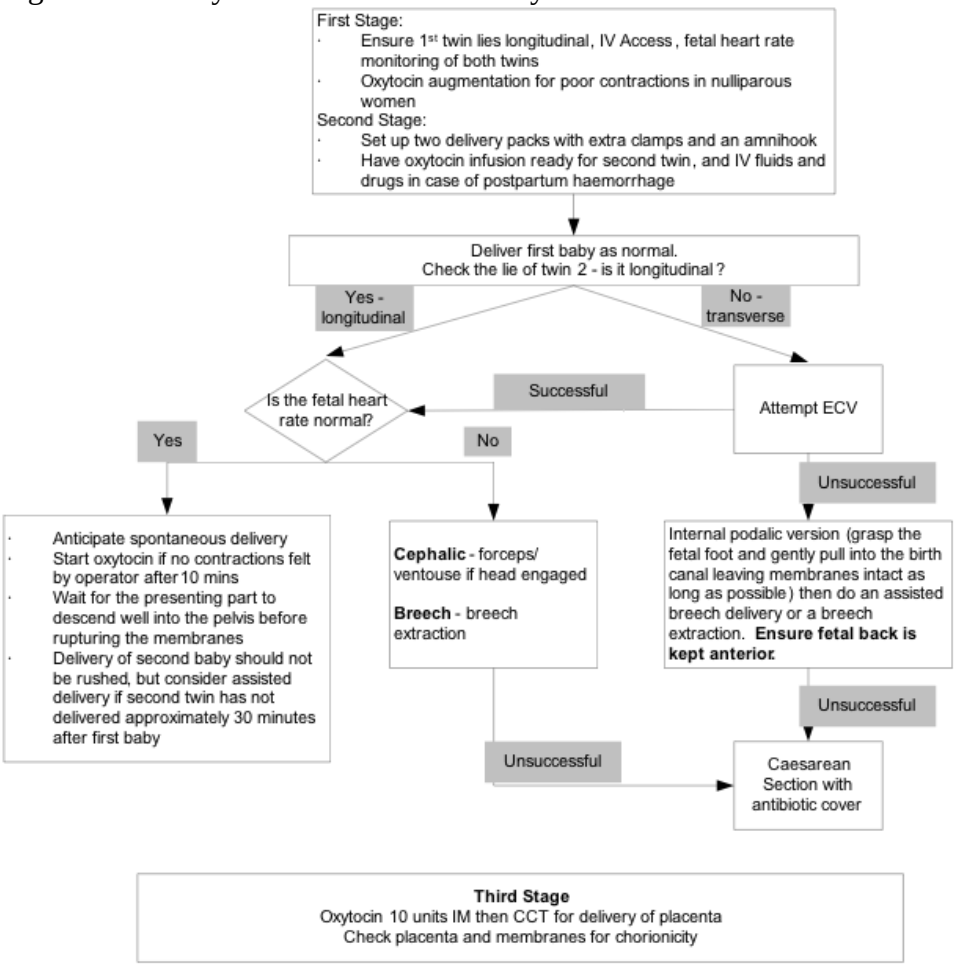
This **i**s a rare complication during vaginal delivery.

Women may present with locked twins with the first trunk partially delivered. The head of the second twin will have entered the maternal pelvis, and needs to be pushed upwards to allow descent of the head of the first twin. If the first baby is already dead, it can be delivered by decapitation. After delivery of the body, the head is dis-impacted and the second twin is delivered. Finally the first head is delivered with a volsellum.

If, fortunately, the first baby is still alive (e.g. if delivering in hospital), or if despite decapitation the second baby cannot be delivered, then proceed immediately to caesarean section if safe for the mother to do so.

Figure 5 Locked twins

Figure 6 Pathway of care for twin delivery



SECTION 10 Quiz 9

1) **In the pathway of care for twin delivery and after delivery of the first baby which of the following statements is true?**
   a) if the lie of the 2nd twin is longitudinal and there is no fetal distress, oxytocin should be started if there are no contractions after 30 minutes
   b) if the lie of 2nd twin is longitudinal, head is engaged and there is fetal distress, delivery should be by immediate Caesarean section
   c) if the lie of 2nd twin is transverse the only option is delivery by Caesarean section
2) **Twin pregnancy is associated with increased risk when compared with single pregnancy of which of the following complications?**
   a) miscarriage
   b) anaemia
   c) post partum haemorrhage
   d) stillbirth or neonatal death
   e) cord prolapse
   f) pre-term labour

ANSWERS: 1. none correct 2. a,b,d,e,f,