**PARTOGRAPH SEMINAR**

**INTRODUCTION**

The partograph is a graphic record of the progress of labour and relevant details of the mother and fetus. It was initially introduced as an early warning system to detect labour that was not progressing normally. This would allow for timely transfer to occur to a referral centre, for augmentation or Caesarean section as required. The partograph indicates when augmentation is needed, and can point to possible cephalopelvic disproportion before labour becomes obstructed.

It increases the quality and regularity of observations made on the mother and fetus, and it also serves as a one-page visual summary of the relevant details of labour. The partograph has been used in a number of countries, and has been shown to be effective in preventing prolonged labour, in reducing operative intervention, and in improving the neonatal outcome.

It is important to ensure that adequate supplies of the form are always available.

The WHO partograph begins only in the active phase of labour, when the cervix is 4 cm or more dilated. However, it is a tool which is only as good as the health-care professional who is using it. The observations that are recorded will document the following:

O Maternal well-being: record pulse rate every 30 minutes, blood pressure and temperature 4-hourly, urine output and dipstick testing for protein, ketones (if available) and glucose after voiding, and record all fluids and drugs administered. If the findings become abnormal, increased frequency of observation and testing will be required, and intervention may be implemented.

O Fetal well-being: record fetal heart rate for 1 minute every 15–30 minutes after a contraction in the first stage, and every 5 minutes in the second stage. If abnormalities are noted, resuscitative and corrective measures are started and urgent delivery can be considered.

O Liquor: clear, meconium stained (thick or thin), bloody or absent. Thick meconium suggests fetal distress, and closer monitoring of the fetus is indicated.

O Frequency, duration and strength of uterine contractions (assessed by palpation): record every 30 minutes.

O Abdominal examination: to assess descent of the fetal head.

O Abdominal examination: to assess descent of the fetal head.



The modified WHO partogram without latent phase.

O **Vaginal examination**: this should be done no less than every 4 hours to assess cervical dilatation, descent of the fetal head, and moulding of skull bones. More frequent examination is only undertaken if indicated.



**Sample partogram showing normal progression of labour**

**Fetal condition**

The fetal heart rate should be measured every 15 to 30 minutes immediately after a contraction, for 1 minute, with the mother sitting or in the lateral tilt position.

The normal baseline fetal heart rate is 110–160 beats/ minute. The fetus’s baseline heart rate should remain stable throughout labour. Fetal heart rate accelerations are healthy features, whereas decelerations may suggest fetal compromise. This applies particularly if the decelerations do not recover immediately after the contraction (this is described as a late deceleration). A baseline rate of > 160 beats/minute (tachycardia) or < 110 beats/minute (bradycardia) may indicate fetal distress, as can a rising baseline.

**Membranes and liquor**

If the membranes are intact, write ‘I’. If the membranes are ruptured:

* if liquor is clear, write ‘C,
* if liquor is meconium-stained, write ‘M’
* if liquor is absent, write ‘A’
* if liquor is bloodstained, write ‘BS’.

If liquor is absent, or if there is meconium staining of liquor, draining, fetal distress should be considered and monitored for closely (meconium staining is present in 15–30% of all pregnancies, with a higher prevalence after 41 weeks’ gestation).

**Moulding of fetal skull bones**



*Figure showing Degrees of moulding of the bones of the fetal skull.*

Increasing moulding may be a sign of cephalo-pelvic disproportion, as the fetal skull bones overlap to aid passage through the maternal pelvis.

O Moulding: 0 = bones are separated and sutures can be easily felt

 + 1 = bones are just touching each other

 + 2 = bones are overlapping but can be reduced

 + 3 = bones are severely overlapping and irreducible.

### **Stages of labour**

Labour is divided into latent and active phases.

O The latent phase is cervical dilatation from 0 cm to 4 cm (NB:This has now been reviewed to 5cm) with gradual shortening of the cervix.

O The active phase is cervical dilatation from an effaced 4 cm(Now 5 cm) cervix to full dilatation with good contractions. Progress should be at the rate of at least 1 cm/hour.

**Latent stage of labour (0 cm to 4 cm cervical dilatation)**

In the latent phase of labour, contractions usually start off as irregular, establishing into regular painful uterine contractions. In the primigravida, this can take up to a few days to occur, but usually takes less time in the multigravida.

The well-being of the mother and fetus in the latent phase should be assessed without unnecessary interventions, and mobilisation should be encouraged. Adequate hydration and nutrition are important, and the woman should be enabled to empty her bladder as required. During this time it is important to check the haemoglobin level and review the notes with regard to possible future problems with delivery.

Unnecessary vaginal examinations in the latent phase can lead to life-threatening infections in the mother and baby.

**Active phase of labour**

***First stage***

There should be regular painful contractions, and the cervix should efface and dilate at a rate of about 1 cm/hour from 4 cm to full dilatation (10 cm).

Vaginal examinations during labour must be recorded and only done by those caring for and monitoring the mother. They should not be undertaken more than 4-hourly unless there is a reason for doing so. During such examinations, the use of Hibitane cream or similar disinfectant cream can help to prevent infections. Care should be taken when diagnosing active labour as misdiagnosis can lead to unnecessary medical intervention and risk to the mother and fetus. The cervix should be 4 cm and effaced and there should be regular contractions. It should be noted that in multiparae the cervix is often soft and easily stretchable to 4 cm and even beyond. This can be the case in the latent phase and sometimes even before the onset of contractions.

**Measurement of cervical dilatation**

Cervical dilatation is assessed by vaginal examination, which should be performed every 4 hours, unless there are indications to do so more frequently.

The cervical dilatation is plotted on a partograph against time. **When the patient is admitted in active labour, the dilatation is immediately plotted on the alert line**, the first line drawn upwards on the graph illustrating a rate of 1 cm/hour from this first plot. If subsequent progress is satisfactory, the cervical dilatation will be on, or to the left of, this alert line in later vaginal examinations.



Measuring cervical dilatation. A cervical dilatation board shows the diameter of the cervix from 1 cm to 10 cm.



 **Effacement and dilatation.**

Before the onset of labour, the cervix will usually be tubular. Effacement is the process whereby the cervix subsequently loses its length, to become flattened against the fetal presenting part.

In primigravid women, effacement occurs in early labour, followed by cervical dilatation. In multiparous women, the cervix commonly dilates before full effacement.

 **Diagnosis of the stages and phases of labour**

Cervix not dilated = not in labour

Cervix dilated < 5 cm = first stage and latent phase

Cervix dilated 5–9 cm = first stage and active phase (usually 1 cm/hour) and onset of fetal descent

Cervix fully dilated (10 cm) = second stage (non-expulsive phase), no urge to push and fetus continues to descend Cervix fully dilated (10 cm) = second stage (expulsive phase), urge to push and fetus reaches pelvic floor

Delivery of the baby = Onset of third stage

Delivery of the placenta = End of third stage

**Bishop’s Score:** The early pre-labour/early labour changes that occur to the cervix can be quantified by using the Bishop’s score which assigns a score of 0 to 2 for each of the following characteristics: dilatation, effacement, consistency, position of cervix and station of the head (see below). It is useful both for assessing progress in the latent phase of labour, and also for assessing the ‘favourability’ of the cervix for induction of labour. A patient with a favourable cervix has a Bishop score of 6 or more and is likely to be easier to induce. It should also be possible to rupture the membranes by the time the Bishop score is 6.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Characteristic |  | 0 | 1 | 2 | 3 |
| Dilatation |  | Closed | 1–2 cm | 3–4 cm | 5 cm or more |
| Effacement/Cervical length |  | >4 cm | 3–4 cm | 1–2 cm | Effaced |
| Consistency |  | Firm | Medium | Soft | – |
| Station of head |  | –3 or above | –2 | –1/0 | +1/+2 |
| Position of cervix |  | Posterior | Mid | Anterior | – |

*NB: Modified Bishop’s score now used- READ*

**Uterine contractions**

For labour to progress satisfactorily there must be good contractions. They normally become more frequent and longer-lasting as labour progresses.

Uterine contractions are assessed by palpation, usually hourly in the latent phase, and every 30 minutes in the active phase. The frequency is measured by the number of contractions felt in a 10-minute period, and the duration is measured from the start of the contraction until it passes off (e.g. 3 in 10 minutes, each lasting for 45 seconds).



How to record contraction frequency and length. The number of squares filled in records the number of contractions in 10 minutes. The shading shows the length of contractions.

**Descent of the fetal head**

Dilatation of the cervix should be accompanied by descent of the head, although this may not occur until advanced labour. Sometimes descent does not occur until full dilatation, especially with the pelvis of African women.

The descent of the head is measured in fifths (20% increments) palpable above the pelvic brim.

Abdominal examination should always be performed immediately before vaginal examination, and plotted on the partogram with the cervical dilation

#### *Assessing fetal descent*

**By abdominal palpation**

This method involves measuring by fifths of the head palpable above the symphysis pubis.

O 5/5: head entirely above the inlet of the pelvis (head totally free)

O 0/5: head deep in the pelvis.



**By vaginal examination**

This method measures the descent of the head past the mother’s ischial spines. When the presenting fetal head is at the level of the spines, this is designated ‘0’.

Feel the vertex with your index finger and feel for an ischial spine with your third finger. Is the vertex higher or lower than the ischial spines? You may only be feeling caput. Measuring fifths abdominally is more reliable but can be difficult, especially in obesity.



**Artificial rupture of membranes (ARM)**

This is undertaken to either induce or augment labour.. Slow progress in labour can often be corrected by ARM. However, in areas of high HIV prevalence, leaving the membranes intact for as long as possible may reduce the risk of perinatal transmission.

ARM risks infection and cord prolapse. It is contraindicated where placenta praevia is possible, in the first episode of active herpes infection, and in vasa praevia. It is more risky with a high fetal head or polyhydramnios.

#### *Procedure for ARM*

ARM is best delayed until the cervix is ‘favourable’ as this will reduce the length of time the membranes are ruptured (and hence risk of chorioamnionitis), and limit the duration of any oxytocin infusion used. It is also likely to result in a reduced risk of failed inductions and thus unnecessary caesarian sections. Confirm absence of contraindication to ARM.

* Listen to – and note – the fetal heart rate.
* Ensure that the woman has emptied her bladder.
* Palpate the abdomen. If the presenting part is well descended, cord prolapse is less likely.
* Wearing sterile gloves and with chlorhexidine obstetric cream on your fingers, examine the cervix, and note the consistency, position, effacement and dilatation. Confirm the fetal presentation.
* With the other hand (again with obstetric cream) insert an amniotic hook or a Kocher clamp into the vagina.Guide the clamp or hook along the fingers of your first hand towards the membranes in the vagina.
* Place two fingers against the membranes and gently rupture them with the instrument in the other hand. Allow the amniotic fluid to drain slowly around your fingers.
* Check that no cord can be felt.
* Note the colour (clear, yellow, greenish or bloody) and smell of the fluid. If thick meconium is present, suspect fetal distress. Some light bleeding may occur.
* After ARM, listen to the fetal heart during and after a contraction. If the fetal heart rate is abnormal (less than 110 beats/minute or more than 160 beats/minute), suspect fetal distress.
* If delivery has not occurred within 18 hours, give prophylactic in order to prevent infection in the baby and the mother. If there are no signs of infection in the mother after delivery, discontinue antibiotics.
* If the liquor is foul smelling or there is a maternal fever or other indication of uterine infection/chorioamnionitis treat with the antibiotics as above but with the addition of metronidazole 500mg IV 8 hourly

**Administration of oxytocin for augmentation of labour**

* The individually needed effective dose of oxytocin varies greatly; so all patients must be monitored carefully.
* Fluids are calculated in drops per minute. Identify from the IV giving set what the ‘drop factor’ is (in standard giving sets it may be 10, 15 or 20 drops/1 mL). Set the infusion rate with the flow controller below the chamber where the drops occur, and always count the rate over a full minute.
* Cautiously administer oxytocin in IV fluids (Ringer-lactate or Hartmann’s solution), gradually increasing the rate of infusion until adequate contractions are achieved (three contractions in 10 minutes, each lasting more than 40 seconds). Maintain this rate until delivery. The uterus must relax between contractions.
* Record on a partogram every 30 minutes:
	+ rate of infusion of oxytocin (note that changes in the woman’s arm position may alter the flow rate)
	+ duration and frequency of contractions
	+ fetal heart rate: listen every 30 minutes, always immediately after a contraction; if less than 100 beats/minute, stop the infusion.
	+ Monitor pulse, blood pressure and contractions every 30 minutes.
	+ Keep a fluid balance chart.
	+ Regularly reassess for contraindications.
	+ Regularly monitor vital signs.

**Details of oxytocin infusion**

* An ampoule of oxytocin usually contains 5 international units in 1 mL. Insert oxytocin 5 international units (5000 milliunits) in 500 mL of Ringer-lactate or Hartmann’s solution. The concentration of this solution is 10 milliunits in 1 mL.
* Start infusion at 2.5 milliunits/minute (i.e. at 5 drops/ minute with a standard giving set with a drop factor of 20 drops/1 mL).
* Increase infusion rate by 2.5 milliunits/minute (5 drops/ minute using a standard giving set with a drop factor of 20 drops/1 mL) every 30 minutes until a good contraction pattern is established – that is, contractions lasting more than 40 seconds, and occurring 3 times in 10 minutes.
* Maintain this rate until delivery is completed.
* If there are not three contractions in 10 minutes, each lasting more than 40 seconds, with the infusion rate at 20 milliunits/minute (40 drops/minute if using a giving set with a drop factor of 20 drops/1 mL):
* In multigravida, further increases may risk uterine rupture. The reason for this may be cephalo-pelvic disproportion or malposition. Therefore consider Caesarean section.
* In the primigravida, infuse oxytocin at a higher concentration (rapid escalation).
* Change to a more concentrated solution with oxytocin 10 international units (10 000 milliunits) in 500 mL of Ringer-lactate or Hartmann’s at a concentration of 20 milliunits/mL.
* Give an initial infusion of 20 milliunits/minute (20 drops/minute if using a giving set with a drop factor of 20 drops/1 mL).
* Increase the infusion rate by 5 milliunits/minute (additional 5 drops/minute if using a giving set with a drop factor of 20 drops/1 mL) every 30 minutes until good contractions are established.
* If good contractions are not established at 40 milliunits/minute (40 drops/minute if using a giving set with a drop factor of 20 drops/1 mL), deliver by Caesarean section.
* Do not use oxytocin 10 international units in 500 mL (i.e. 20 milliunits/mL) in multigravida.
* If hyperstimulation occurs (i.e. any contractions lasting longer than 60 seconds or more than 4 contractions in 10 minutes), stop the infusion. The half-life of oxytocin is short (between 1 and 5 minutes), and therefore any hyperstimulation should stop with appropriate titration of the dose given. If hyperstimulation resolves, restart oxytocin infusion at half of the last dose given.
* Consider terbutaline, 250 micrograms subcutaneously if the uterus does not relax.

**Possible side effects of oxytocin infusion**

These include the following:

* uterine hyperstimulation (see above).
* hyponatraemia due to water retention from vasopressin- like actions (unlikely if diluted with Ringer-lactate or Hartmann’s and more likely with prolonged infusions). Monitor urine output carefully and, if possible, measure plasma sodium concentrations.
* hypotension, flushing and tachycardia if oxytocin is given as a bolus IV by mistake

**Hours:** this refers to the time elapsed since the onset of the active phase of labour (observed or extrapolated).

**Time:** record the actual time at 30-minute intervals.

**Contractions:** chart every 30 minutes; palpate the number of contractions in 10 minutes and their duration in seconds (< 20 seconds, 20–40 seconds, > 40 seconds).

**Oxytocin**: record the amount (in units) of oxytocin per volume of IV fluids, and the number of drops per minute, every 30 minutes when used.

**Drugs given**: record any additional drugs given.

**Maternal condition**

Maternal vital sign observations are crucial in labour, in order to detect pre-eclampsia, haemorrhage (accompanied by a rise in heart rate, or, as it worsens, a fall in blood pressure) and sepsis (fever). A fall in blood pressure is usually a late and ominous sign. The pulse rate and respiratory rate are valuable early features of worsening maternal condition.

* Pulse: record every 30 minutes and mark with a dot (•).
* Blood pressure: record every 4 hours and mark with arrows, unless the patient has a hypertensive disorder or pre-eclampsia, in which case record every 30 minutes, or as appropriate
* Temperature: record every 4 hours.
* Urine, ketones and volume: ideally record every time urine is passed.

**Delay in the first stage of labour**

If progress is initially good, but then slows down or stops, there may be:

O malpositions or malpresentations

O obstructed labour

O an increased risk of shoulder dystocia.

#### *Prolonged active phase (first stage) of labour*

#### *If cervical dilatation crosses the alert line, this warns that labour is slow and there may be problems. If possible, transfer the patient to an obstetric unit practicing comprehensive EmOC. If the action line is reached, the mother must be reassessed to ascertain the reason for lack of progress and further management determined.*

**Other complications of the first stage of labour**

Urgent help may be required to diagnose and manage cord prolapse ,placental separation, or ruptured uterus

Non reassuring fetal status

CPD

Obstructed labour

### **Second stage of labour**

This begins when the cervix is fully dilated. Fetal descent occurs, but initially there may be no urge to push usually occurring only when the fetal head reaches the pelvic floor. It may be helpful for the mother to stand up or squat during this time to assist pushing. (Note; some patients have an urge to push early in labour with a high head, generally with an occipito-posterior presentation)

Duration of second stage of labour

During delivery, trauma to the perineum should be minimized. Routine episiotomy is not indicated, but should be performed if significant perineal trauma is anticipated, or to aid more rapid delivery if indicated

Episiotomy is recommended for the following:

O complicated vaginal delivery (breech, shoulder dystocia, forceps and some vacuum extractions)

O scarring from female genital mutilation (see above) or poorly healed third- or fourth-degree tears

**Delivery of the baby**

O Ask the mother to pant or give only small pushes with contractions.

O Control the birth of the head by placing the fingers of one hand against the baby’s head to ensure that it does not deliver too quickly.

O Support the perineum with your other hand as it distends and the head is delivered.

O Call the paediatrician (if available) if you consider that the baby might need resuscitation.

O Once the head is delivered, ask the mother not to push.

O Feel around the baby’s neck for the umbilical cord:

— If it is round the neck but loose, slip it over the baby’s head..

O Allow the baby’s head to turn spontaneously.

O After the head has turned, place a hand on each side of the head and ask the mother to push gently without the need to wait for contractions.

O Avoid tears by delivering one shoulder at a time. Routine traction of the baby’s head in an axial direction should be used and should result in delivery of the anterior shoulder.

O Lift the baby’s head anteriorly to deliver the shoulder that is posterior.

O Support the baby’s body as it slides out.

O After delivery of the baby, give the mother 10 units of oxytocin IM to reduce the risk of haemorrhage, but only do this if the possibility of a second twin has been excluded by earlier ultrasound examination or by abdominal palpation. Alternatively, 10 units of oxytocin plus 500 micrograms of ergometrine (called Syntometrine) IM can be given, but never give ergometrine if the mother has hypertension or pre-eclampsia, as it can increase blood pressure and cause a cerebrovascular accident.

O Dry the baby, cover with a dry clean towel and assess the baby.

O If the baby does not need resuscitation, place on the mother’s abdomen for 1 to 3 minutes to provide a transfusion of placental blood to the baby, but keep warm

O Then cut the umbilical cord and place the baby in skin- to-skin contact with the mother, ensuring that the body and head are covered to keep the baby warm. The baby may seek to suck on the breast which should be encouraged.

O If the baby needs resuscitation, cut and clamp the cord immediately, and proceed to open the airway and breathe for the baby

O If the mother is not well, ask an assistant or relative to care for the baby.

Always prepare for the need to resuscitate the baby, especially if there is a history of eclampsia, prolonged or obstructed labour, bleeding, preterm birth or infection. Always have a bag-valve-mask of the right size available next to the mother, and ideally on a Resuscitaire®, in case assisted ventilation is required.

If the head retracts on to the perineum during delivery (the turtle sign), this suggests shoulder dystocia

### Active management of the third stage of labour

This is advised for preventing postpartum haemorrhage (PPH), and it consists of four possible interventions:

1 a prophylactic uterotonic drug after delivery of the shoulders of the baby and after ensuring that another fetus is not present in the uterus

2 early cord clamping and cutting

3 controlled cord traction

4 uterine massage after delivery of the placenta.

Of these, a uterotonic drug (see above), is the most important, with oxytocin the first choice because it causes uterine contraction to prevent atony rapidly with minimal adverse effects. Atony is the most common cause of PPH (around 80% of cases). If oxytocin is unavailable, or does not work, other uterotonic drugs should be used, including ergometrine or misoprostol.

All uterotonic drugs should be given within 1 minute of the complete birth of the fetus, to aid separation of the placenta by enhancing uterine contractions and reducing the risk of bleeding from an atonic (relaxed) uterus. It is essential that you are certain there is not another fetus in the uterus before such drugs are given.

Ensure that both oxytocin and ergometrine are protected from heat damage by close attention to the cold chain and their storage, otherwise they may not be effective. Ideally oxytocin should be stored in a fridge, but it can be kept at 15–30°C for 3 months. Oxytocin must never be frozen. Always store ergometrine in a fridge at 2–8°C. Misoprostol is not affected by ambient temperature.

Ergometrine is contraindicated in patients with heart disease, hypertension, pre-eclampsia or eclampsia, as it raises the blood pressure by vasoconstriction, with the risk of cerebrovascular accidents.

Early cord clamping and cutting (the second intervention listed above) as part of the active management of the third stage of labour is no longer recommended unless the infant needs resuscitation.

Controlled cord traction (the third intervention listed above) is optional where delivery is undertaken by a skilled birth attendant, but contraindicated if a skilled attendant is not available. It must not be undertaken if a uterotonic drug has not been given.

1 After the cord has been clamped, use cord clamp/ straight clamp to hold the cord close to the perineum.

2 Place the other hand just above the pubis, and counter the uterus during traction of the cord to prevent it from inverting.

3 Keep slight tension on the cord and wait for a uterine contraction.

4. Do not wait for or expect a gush of blood before applying traction. Continue to apply counter traction on the uterus with your other hand.

5 If the placenta does not descend and deliver within 1 minute of cord traction the placenta is not separating. Therefore stop traction, wait for the next contraction and repeat the process.

6 As the placenta delivers, the membranes can tear off. To avoid this, hold the placenta in two hands and gently turn it until the membranes are twisted.

7 Gently pull to complete the delivery.

8 If the membranes do tear, wearing sterile gloves gently examine the upper vagina and cervix and use a sterile sponge forceps to remove any fragments of membrane that are present.

9 If the cord is pulled off the placenta, uterine contractions may still push it out, but if this does not happen a manual removal may be needed.

.



Examine the patient for tears in the cervix or vagina, and repair these as well as any episiotomy

Monitor for PPH. Examine every 15 minutes for the first hour after delivery, and then every 4 hours until 24 hours after delivery.

Monitor the patient’s vital signs, blood pressure, pulse rate and volume, and the state of the uterus (is it contracted?) every 15 minutes for 2 hours after delivery of the placenta.

Examine the placenta for completeness.

**Skin-to-skin contact between mother and baby**

If neither the mother nor the baby need resuscitation, ensure that the newborn baby is placed in skin-to-skin contact with the mother for at least 1 hour after birth, and encourage and support the baby to attach to and suck on the breast. This approach recommended by the Baby Friendly Hospital Initiative (step 4) improves temperature control and respiratory function, increases milk production and helps to ensure weight gain for the baby.