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# Management of Labour & Puerperium

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# 3

# Management of First Stage of Labour

*Renu Tanwar, Neha Varun*

## INTRODUCTION

Birth is a life-changing event and the care given in labour affects both the fetus and the mother. Effective communication is an important aspect in today's maternity services. The aim of caring for women during labour and birth is to engender a positive experience for her as well as maintain her physical and emotional health, preventing complications and responding to emergencies.

## DEFINITION OF THE FIRST STAGE

- *Latent first stage of labour:* It is defined as the period before established labour begins and there is some cervical change including cervical effacement and dilation is up to 4 cm.[1] It varies in duration and the mother may experience painful contractions.
- *Established first stage of labour:* Active labour is established when the cervix is fully effaced and 4 cm or more dilated in the presence of regular painful contractions.

## DURATION OF LABOUR[2]

- First stage of labour can last on an average 8 hours and is unlikely to last over 18 hours.
- Second and subsequent labours can last on an average 5 hours and are unlikely to last over 12 hours.

## MANAGEMENT

### Baseline Assessment on Admission[3]

- On admission the clinical records (paper and electronic) and alert records should be reviewed.
- The initial clinical assessment should include:
  - A history to determine the length, strength and frequency of contractions
  - Measurement of the temperature, pulse, respiratory rate, blood pressure and urine analysis for albumin, sugar and ketones
  - Abdominal palpation. The documentation must include symphysiofundal height (in centimeters), lie, presentation, position and engagement. Where there is a doubt about the lie or presentation a scan should be undertaken by an appropriately trained professional.
  - Fetal heart auscultation for one whole minute after a contraction. The maternal heart rate should also be recorded to differentiate it from the fetal heart rate.
  - An admission cardiotocograph (CTG) is not indicated in low risk women
  - Assessment of any vaginal discharge. A vaginal and pelvic examination should be performed with consent if the woman is thought to be in labour.
  - Assessment of the pain and her options for pain relief.

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## Observation During the Established First Stage[2,3]

Partogram should be used once labour is established

- Hourly pulse
- Temperature and blood pressure 4 hourly
- Respiratory rate 4-hourly
- Documentation of frequency and duration of contractions half hourly
- Monitor and record emptying of the bladder at least 4 hourly
- Abdominal palpation findings 4 hourly
- The World Health Organization recommends of a 4-hour action line to be used in the partogram.
- Vaginal examination should be offered 4-hourly, or where there is concern about progress (record effacement, dilatation, position, station of the presenting part, presence of caput/molding and presence/color of the liquor).[3]
- Intermittent auscultation of the fetal heart for at least one minute after a contraction, at least every 15 minutes, and the rate should be recorded as an average (Table 3.1).
- Women should be encouraged to communicate their need for analgesia at any point during labour.

## Mobilization[2]

Women can move and adopt whatever positions they find most comfortable throughout labour.

## Diet and Nutrition[3]

- Women should maintain their hydration.
- Light diet, water and isotonic drinks are acceptable in spontaneous uncomplicated labour.
- If the woman is unable to tolerate oral fluids intravenous fluids, may be indicated.
- The presence of ketonuria should prompt consideration of intravenous hydration.
- If the labour progress deviates from the normal, she should be restricted to clear fluids.

## Controlling Gastric Acidity[2]

- Avoid H2-receptor antagonists and antacids routinely to low-risk women.
- Ranitidine Oral 150 mg 6 hourly or IV 50 mg 12 hourly (most commonly used antacid) can be considered for women who receive opioids or who have or develop risk factors that make a general anesthesia more likely.

## Coping with Pain in Labour[2]

- *Inhalational analgesia:* Entonox (a 50:50 mixture of oxygen and nitrous oxide). It may reduce pain in labour, but it leads to nausea and light-headedness.
- *Intravenous and intramuscular opioids:*

  *Pethidine:*
  - *Dose:* 50 mg IM or IV can be repeated every 4 hourly if required.

  *Morphine:*[4,5]
  - *Dose:*
    i. IM or subcutaneous: 2.5 to 20 mg every 3 to 4 hours as needed
    ii. IV: 4 to 15 mg every 3 to 4 hours as needed. Give very slowly over 4 to 5 minutes
      a. Provides limited pain relief during labour.
      b. This may interfere with breastfeeding.

**Table 3.1** Definition of normal, suspicious and pathological FHR tracees[2]

| *Category* | *Definition* |
|---|---|
| Normal | An FHR trace in which all four features are classified as reassuring |
| Suspicious | An FHR trace with one feature classified as nonreassuring, and the remaining features classified as reassuring |
| Pathological | An FHR trace with two or more features classified as nonreassuring, or one or more classified as abnormal |

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c. It should be administered with an antiemetic. Injection promethazine 50 mg IM is commonly used.

- *Regional anesthesia:*
  - More effective pain relief than opioids.
  - Associated with a longer second stage of labour and an increased chance of vaginal instrumental birth.
  - Bupivacaine (0.5, 0.375 or 0.25%) is the preferred anesthetic—a test dose should be injected initially. Lower concentrations of Bupivacaine (0.1–0.25%) combined with an opiate (e.g. fentanyl 1–2 mcg/mL) reduce the motor block and may allow a 'walking epidural.'
  - *Timing of regional analgesia:* It should not be denied, including women in severe pain in the latent first stage of labour. Patients in early labour (< 5 cm) should be given an option of epidural analgesia. It should not be withheld on the basis of achieving an arbitrary cervical dilatation, and should be offered on an individualized basis.

## Fetal Heart Assessment and Reasons for Transfer to Continuous Electronic Fetal Monitoring

- Intermittent auscultation of the FHR is recommended for low-risk women in established labour. It can be undertaken by either Doppler ultrasound or Pinard stethoscope. The maternal pulse should be palpated to differentiate between maternal and FHR
- Once a woman is in established labour, the FHR should be auscultated for a minimum of one minute immediately after a contraction every 15 minutes.
- *Change from intermittent auscultation to continuous EFM in low-risk women should be advised for the following reasons:*
  - Significant meconium-stained liquor
  - Abnormal FHR detected by intermittent auscultation (less than 110 beats per minute [bpm]; greater than 160 bpm; any decelerations after a contraction) (Table 3.2).

**Table 3.2** Classification of FHR trace features[2]

| *Feature* | *Baseline (bpm)* | *Variability (bpm)* | *Decelerations* | *Accelerations* |
|---|---|---|---|---|
| Reassuring | 110–160 | ≥ 5 | None | Present |
| Nonreassuring | 100–109<br>161–180 | < 5 for 40–90 minutes | Typical variable decelerations with over 50% of contractions, occurring for over 90 minutes<br>Single prolonged deceleration for up to 3 minutes | The absence of accelerations with otherwise normal trace is of uncertain significance |
| Abnormal | < 100<br>> 180<br>Sinusoidal pattern<br>≥ 10 minutes | < 5 for 90 minutes | Either atypical variable decelerations with over 50% of contractions or late decelerations, both for over 30 minutes<br>Single prolonged deceleration for more than 3 minutes | |

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- Maternal pyrexia (defined as 38.0°C once or 37.5°C on two occasions 2 hours apart)
- Fresh bleeding seen in labour

## Partogram[6]

It is a graphical information about the progress of labour in which the salient feature about the fetal well-being, maternal well-being and the progress of labour are recorded in Figure 3.1.

### *Significance*

- It is a managerial tool used to record all observations made on a women and fetus in labour in one chart.
- Partogram helps to identify at an early stage those women whose labour is slow.
- It is used for prevention of prolonged labour.

### *Partogram Recording*

- *Mother information:*
  - Name
  - Age
  - Parity
  - Gestational period
  - Time and date of admission
  - Time of rupture of membrane
  - Short antenatal history
- *Fetus information:*
  - *Fetal heart rate* (listen after each contraction for one minute, every half hourly, each small square is half hour)
  - *Membrane and amniotic fluid* (Membrane intact-I, Membrane rupture clear-C, meconium-stained-M, absent liquor-A)
  - *Molding*
- *Labour progress:*
  - *Contractions:*
    i. These are recorded graphically below the fetal assessment information. An area of 5 blank vertical squares go across the width of the graph and record contractions as frequency in 10 minutes.
    ii. Assess frequency and duration
    iii. Each square represents 1 contraction felt in 10 minutes. Therefore if 2 contractions occur in 10 minutes, 2 squares will be shaded.
    iv. Frequency—highlight the number of square
    v. *Duration*—Use the key for shading to demonstrate the strength of contraction
       a. Weak < 20–40 seconds duration
       b. Moderate 20–40 seconds duration
       c. Strong and > 40 seconds duration

*Abdominal palpation:* Note lie, presentation and position of fetus, e.g. LOA, ROA.

- *Cervicograph:* The cervicograph depicts cervical dilatation and descent of the presenting part in relation to time. Use of the cervicograph enables the progress of labour to be ascertained and delay in progress readily recognized
- *Dilatation:* Record X for the cervical dilatation on the appropriate line and at the time the examination is carried out.
- *Descent:* Descent of the head is measured by abdominal palpation and is expressed in terms of fifths above the pelvic brim. Record O for the level of descent at each vaginal examination. At 0/5, the sinciput is at the level of the symphysis pubis (Fig. 3.2).
- *Alert and action lines:*
  i. Lines are to be drawn on the partogram at the time of the first vaginal examination in active labour, i.e. when the woman is 4 cm or more dilated.
  ii. *Alert line:* A line drawn from the point of cervical dilatation noted at the first vaginal examination in active labour. This line denotes a dilatation rate of 1 cm/hour.
  iii. *Action line:* A line parallel and 4 hours to the right of the alert line

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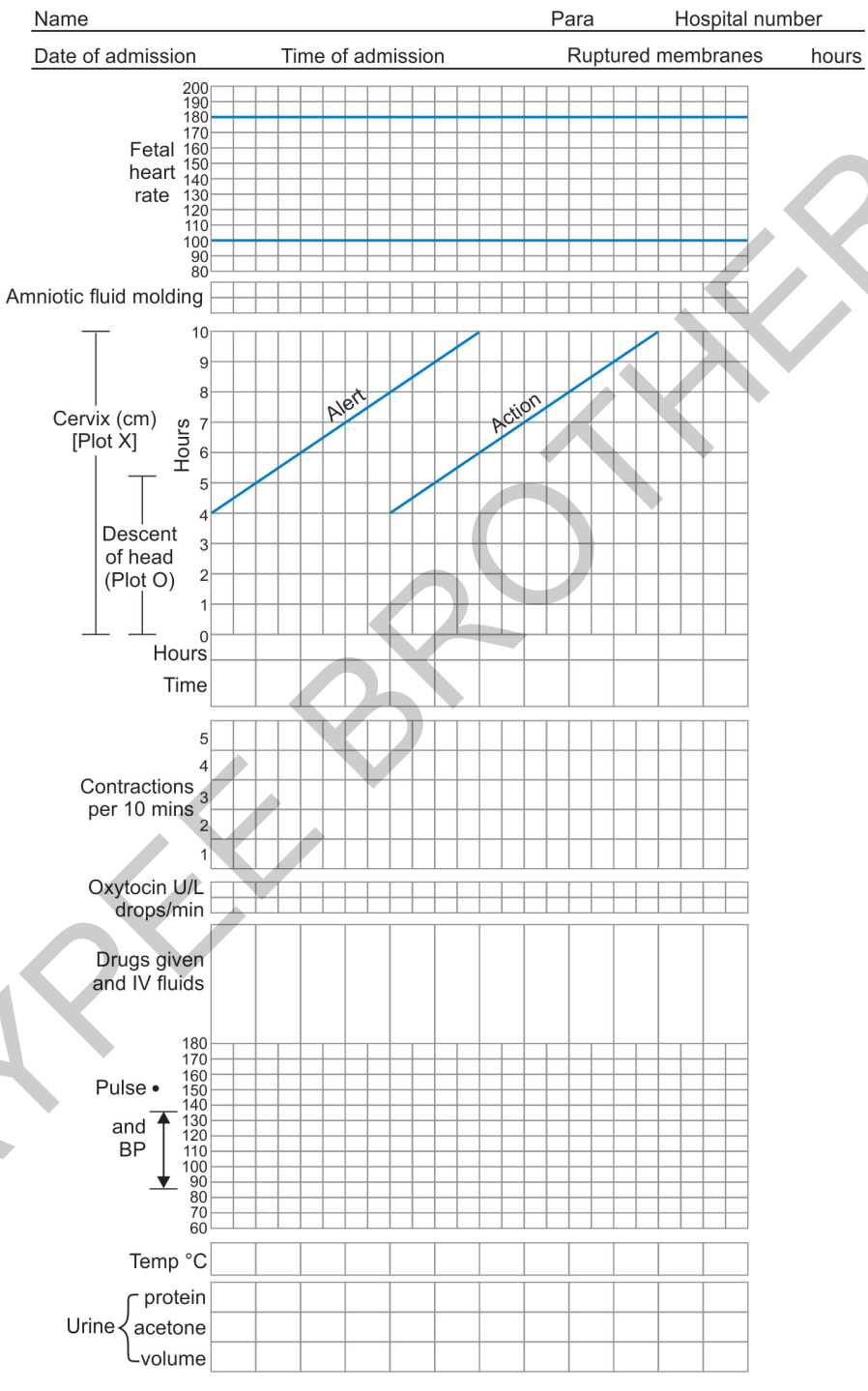


**Fig. 3.1** Modified WHO partogram[7]

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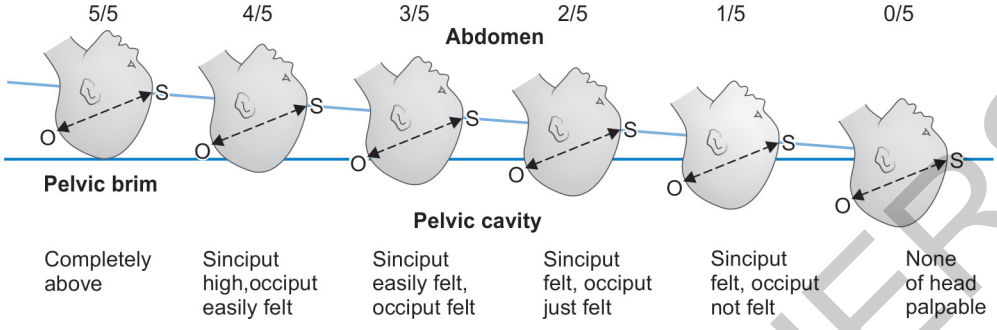


**Fig. 3.2** Descent of fetal head

– *Management:*
  i. A vaginal examination is performed 4 hours after the initial one or earlier if clinically warranted.
  ii. If subsequent examination shows dilatation between Alert line and Action line a repeat vaginal examination is carried out in 2 hours.
  iii. At this examination if the cervical dilatation is touching/crossing the Action line, an appropriate intervention is require.

  If labour progresses well plotting of cervical dilatation should always remain to the left of alert line.

  If it crosses to right of action line this warns that labour may be prolonged.

- *Oxytocin administration:*
  *Units:* Record half hourly in black the number of units per 500 mL of intravenous fluid.
  *mL/h:* Record half hourly in black the number of mL/h that has infused in the half-hour just passed.
- *Investigations:* Document any investigations performed since labour admission or those prior to induction of labour. For example: Full blood count, blood group and vaginal swab.
- *Intrapartum medications:*
  – *Epidural:* Draw an arrow to indicate the time of epidural insertion and subsequent medications administered.
  – *Other medications:* In the box provided, write the name, dose and route of administration of medication. Draw an upwards arrow along the page to indicate the correct time of administration.
- *Fluid balance:*
  *Input:*
  – Oral fluids (Record type and volume in mL)
  – *IV fluids:*
    i. When an intravenous infusion is commenced record the fluid type, total volume and any medication added (e.g. Syntocinon).
    ii. Record the commencement time with an arrow along the time lines.
    iii. When complete, record the total volume infused in the appropriate time box. When bag/pack is completed and infusion is to be maintained, record another arrow at commencement time.
    iv. Where a record of input fluid volume is required hourly (e.g. in patients with known risk factors such as pre-eclampsia), a progressive volume total may also be documented.

  *Output:*
  *Urine*
  – Measure and record the volume of urine (if required) for each void.
  – Record urinalysis (if required) for protein and ketones in the appropriate time box.

  *Vomitus*
  – Record volume in mL in the appropriate time box.

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*Blood loss*
- Record volume in mL in appropriate time box.
- Blood loss should be weighed. Weigh the pad, incontinence sheet, etc. then subtract the weight of a dry pad, incontinence sheet, etc. to give the amount of total blood loss.

- *Mother condition:*
  - *Vital signs:* BP, pulse, temperature
  - *Urine analysis:* Acetone, albumin, glucose
- *Doctor initials:*
  - Carers who have performed observations are to provide their initials in the allocated boxes.
  - Full name, signature, designation and initial are to be recorded on the reverse side of the partogram.
- *Vaginal examination:*
  - *Date/time:* Record for each examination.
  - *Indication:* Specify the reason for the vaginal examination, e.g. to assess progress of labour.
  - *Cervical effacement/length:* Estimate length in cm.
  - *Dilatation:* Measured dilatation in cm.
  - *Cervical position:* Stated as either anterior, posterior or midline.
  - *Application*
    0: not applied
    L: loosely applied
    M: moderately applied
    T: tightly applied.
  - *Consistency*
    F: the cervix is firm to touch.
    M: the cervix is medium to touch
    S: the cervix is soft to touch.
  - Membranes/liquor
    Use 'I,' 'C,' 'R,' 'M,' 'A'
  - *Presentation:* Stated as cephalic,breech, cord, etc.
  - *Position:* Record LOA, ROP, etc.
  - *Caput:*
    0: no caput
    +: small caput
    ++: moderate
    +++: large caput
  - *Molding:*
    0: no molding
    +: sutures are apposed
    ++: sutures overlapped but reducible
    +++: sutures overlapped and not reducible
  - *Station:* This is measured in cm above (–) or below (+) the ischial spines, e.g. –5, –4, –3. –2, –1, 0 (at spines), +1, +2, +3, +4, +5.
  - Head above brim (as per abdominal palpation)
  - *FHR:* Record the fetal heart rate after a vaginal examination and the result of a fetal blood sample here.
  - *Bishops score:* Record if induction of labour is required.
  - *Performed by:* Include signature, printed name and designation.

## DELAY IN THE ESTABLISHED FIRST STAGE OF LABOUR

- *Latent phase:* A prolonged latent phase of labour should be managed conservatively in the absence of fetal compromise.
- *Established phase:* Progress in the first stage of labour is judged by changes in the cervix and descent of the presenting part. A diagnosis of delay in the established first stage of labour should take into consideration all aspects of progress in labour and should include:
  - Cervical dilatation of less than 2 cm in 4 hours for first labours
  - Cervical dilatation of less than 2 cm in 4 hours or a slowing in the progress of labour for second or subsequent labours
  - Failure of descent and rotation of the fetal head
  - A reduction in the strength, duration and frequency of uterine contractions.
- When there is delay in the established first stage of labour the following should be considered:
  - Parity
  - Hydration

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  - Presentation
  - Uterine contractions
  - Cervical dilatation and rate of change
  - Station and position of presenting part
  - The woman's emotional state
  - Effective pain relief
- If delay is suspected an amniotomy should be advised; and the woman reassessed after two hours. If there is no progress 2 hours after amniotomy, delay is established.
- Management of protracted labour Stage I:
  Evaluate potential causes[8]
  Possible interventions
  - IV fluids
  - Amniotomy
  - Decrease anesthesia
  - Oxytocin augmentation
  - Evaluate passenger and passageway.

## Syntocinon Infusion[3]

- The following principles should be adopted when a syntocinon infusion is commenced to augment labour:
  - Continuous electronic fetal monitoring
  - Maternal observations should be recorded in the same format as those recommended for labour
  - The rate of administration of the Syntocinon is to be recorded in milliunits per minute in the Intrapartum Booklet
  - The infusion is to be prescribed on the maternal drug card
  - Consideration should be given to an epidural and/or other analgesia
  - Aim for 3 to 4 contractions in 10 minutes
  - Do not increase infusion rate more frequently than half hourly
  - An individualized management plan must be documented in the Intrapartum Booklet when Syntocinon commences, to include timing of next vaginal assessment to monitor progress in labour
- The Syntocinon infusion should be stopped, if any of the following situations arise:
  - Pathological CTG
  - Fresh vaginal bleeding
  - If the decision is made to perform an emergency LSCS
- The time the Syntocinon infusion is stopped must be recorded in the Intrapartum Booklet and the infusion should not be restarted without an obstetric review.
- The Syntocinon infusion should be reduced, if there is:
  - Hypercontractility (>5 contractions in 10 minutes)
  - The cardiotograph becomes suspicious
- *Syntocinon regimen:* The following regimen should be followed when Syntocinon is to be used for augmentation of labour (as well as induction of labour), when fluid restriction is not necessary.
  - Syntocinon 10 international units in 500 mL of normal saline (final concentration = 20 mU/mL)
  - Start infusion at 3 mL/hr = 1 mU/minute and increase
  - Higher doses than those indicated should not be used
  - The time interval between increments of dose should be after every 30 minutes
  - Studies suggest that adequate contractions can usually be achieved at 12 milliunits per minute.
  - This should normally be considered the upper dose limit for multiparous women.
  - The minimum possible dose of Syntocinon should be used, aiming for 4 to 5 contractions every 10 minutes.
  - In grand multiparous women, the standard Syntocinon regimen may increase the risk of uterine rupture. Consideration should be given to lengthening the interval between Syntocinon increments to 45 minutes.
- In patients at risk of fluid overload, i.e. with pre-eclampsia, diabetes, cardiac disease, the following alternative regimen should be used. Syntocinon 10 international units in 49 mL of normal saline to make it up to 50 mL (200 milliunits in 1 mL) in syringe driver. Start infusion at 0.3 mL/hr = 1 mU/minute and increase.

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## SUMMARY

**Management of diagnosed delay for nulliparae**

- Referral and consultation with medical staff should be according to ACM guidelines
- Recommend artificial rupture of membranes (ARM), if forewaters present and no contraindications, and inform medical staff
- Assess the following prior to commencement of syntocinon:
  - Fetal compromise and malpresentation
  - Any signs of obstructed labour
  - Significant uterine scar
  - Contraction frequency and duration
- Recommend IV Syntocinon, if no forewaters present and no contraindications, after review by obstetric registrar
- Commence continuous fetal monitoring once Syntocinon infusion begins
- Recommend repeat abdominal and vaginal examination:
  - After 2 hours, if ARM only
  - After 4 hours, if syntocinon commenced
  - After 2 hours, if cervix was ≥ 8 cm
  - After 2 hours, if ARM +/– syntocinon is declined
- Inform medical officer and midwifery team leader of ongoing progress
- Continue with the labour, if cervical dilatation is ≥ 0.5–1 cm per hour, +/– descent and rotation of the presenting part, and reassuring maternal-fetal status, otherwise arrange medical review

**Management of diagnosed delay for multiparae**

- Referral and consultation with medical staff should be according to ACM guidelines
- Recommend artificial rupture of membranes (ARM), if forewaters present and no contraindications, and inform medical staff
- Assess the following prior to commencement of Syntocinon:
  - Fetal compromise and malpresentation
  - Any signs of obstructed labour
  - Previous cesarean section/other significant uterine scar
  - Grand multiparity
  - Contraction frequency and duration
- Recommend IV Syntocinon, if no forewaters present and no contraindications after review by obstetric registrar, and discussion with senior registrar or consultant
- Commence continuous fetal monitoring once Syntocinon infusion begins
- Recommend repeat abdominal and vaginal examination after 2 hours
- Inform medical officer and midwifery team leader of ongoing progress
- Continue with the labour, if cervical dilatation is ≥ 1 cm per hour, +/– descent and rotation of the head, and reassuring maternal-fetal status, otherwise arrange medical review

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