

NORMAL LABOUR

By:

Mohammed Ibrahim Mirza

6 th stage

Definitions:

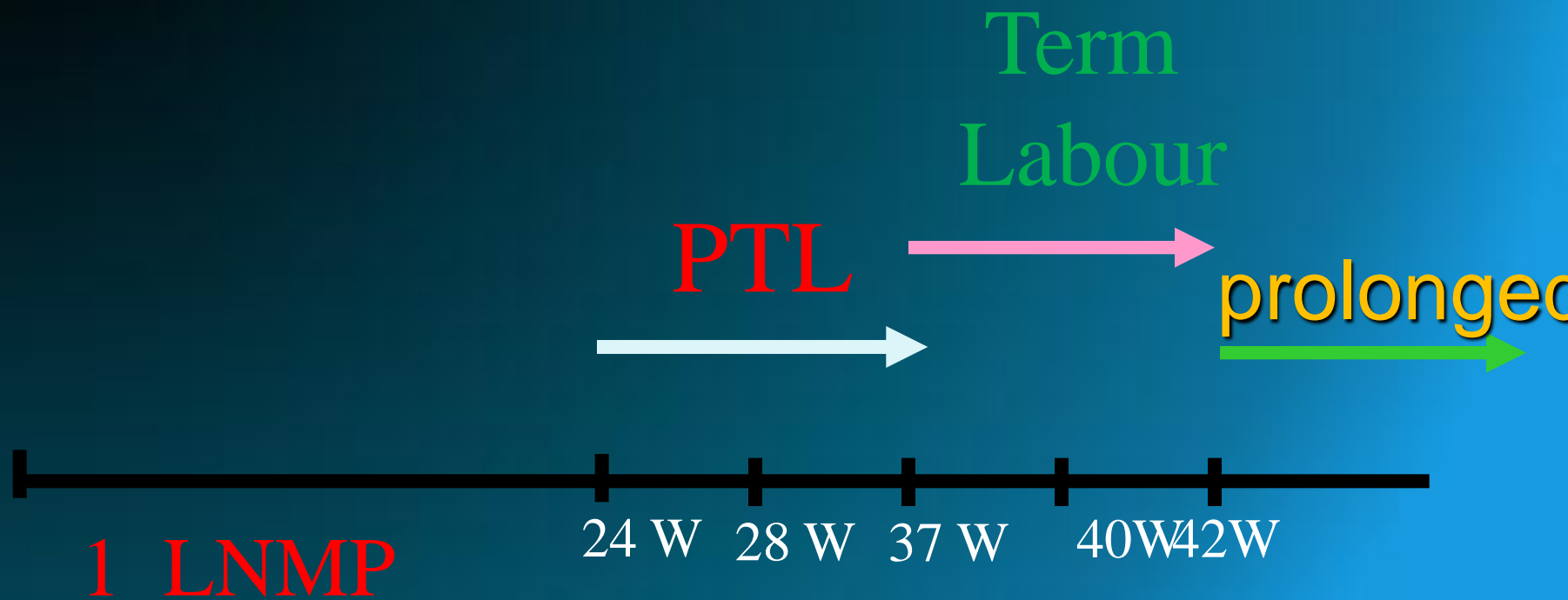
Labour

is the physiological process by which a viable foetus and the products of conception i.e. at the end of 28 weeks or more is expelled or is going to be expelled from the uterus .

Delivery

means actual birth of the foetus.

Labour can occur at:



Criteria for calling it normal labour:

- 1- Spontaneous expulsion, of a single and mature foetus .
- 2- presented by vertex and through the birth canal.
- 3- presentation within a reasonable time (not less than 3 hours or more than 18 hours).
- 4- without complications to the mother and or the foetus.

Cause of Onset of Labour:

It is **unknown???** but the following theories were postulated:

(I) Hormonal factors:

(1) Oestrogen theory:

(2) Progesterone withdrawal theory:

(3) Prostaglandins theory:

(4) Oxytocin theory:

(5) Foetal cortisol theory:

(II) Mechanical factors:

(1) Uterine distension theory:

(2) Stretch of the lower uterine segment:

(I) Hormonal factors:

(1) Oestrogen theory:

During pregnancy, most of the oestrogens are present in a binding form. During the last trimester, more free oestrogen appears increasing the excitability of the myometrium and prostaglandins synthesis.

(2) Progesterone withdrawal theory:

Before labour, there is a drop in progesterone synthesis leading to predominance of the excitatory action of oestrogens.

(3) Prostaglandins theory:

Prostaglandins E₂ and F_{2a} are powerful stimulators of uterine muscle activity.

(4) Oxytocin theory:

Although oxytocin is a powerful stimulator of uterine contraction , its natural role in onset of labour is doubtful. The secretion of oxytocinase enzyme from the placenta is decreased near term due to placental ischaemia leading to predominance of oxytocin's action.

(5) Foetal cortisol theory:

Increased cortisol production from the foetal adrenal gland before labour may influence its onset by increasing oestrogen production from the placenta.

(II) Mechanical factors:

(1) Uterine distension theory:

Like any hollow organ in the body, when the uterus is distended to a certain limit, it starts to contract to evacuate its contents. This explains the preterm labour in case of multiple pregnancy and polyhydramnios.

(2) Stretch of the lower uterine segment:

by the presenting part near term.

Clinical Picture Of Labour

(A) Prodromal (pre - labour) stage:

(1) Shelfing:

(2) Lightening:

(3) Pelvic pressure symptoms:

(4) Increased vaginal discharge.

(5) False labour pain:

(B) Onset of Labour:

(1) True labour pain.

(2) The show:

(3) Dilatation of the cervix:

(4) Formation of the bag of fore - waters:

(A) Prodromal (pre - labour) stage:

(1) Shelfing:

It is falling forwards of the uterine fundus making the upper abdomen looks like a shelf during standing position.

(2) Lightening:

It is the relief of upper abdominal pressure symptoms as dyspnoea, dyspepsia and palpitation due to :

- descent in the fundal level after engagement of the head and
- shelfing of the uterus.

(3) Pelvic pressure symptoms:

With engagement of the presenting part the following symptoms may occur:

- Frequency of micturition.
- rectal tenesmus.
- difficulty in walking.

(4) Increased vaginal discharge.

(5) False labour pain:

(B) Onset of Labour:

(1) True labour pain.

(2) The show:

It is an expelled cervical mucus plug tinged with blood from ruptured small vessels as a result of separation of the membranes from the lower uterine segment. Labour is usually starts several hours to few days after show.

(3) Dilatation of the cervix:

A closed cervix is a reliable sign that labour has not begun. In multigravidae the cervix may admit the tip of the finger before onset of labour.

(4) Formation of the bag of fore - waters:

Which bulges through the cervix and becomes tense during uterine contractions.

Important Information for OB Patients

True Labor vs. False Labor

True

Contractions - regular pattern
Get longer, stronger, closer
Last 30-60 seconds
May have diarrhea, cramping
Get stronger with position change

False

Contractions are irregular
Don't get closer, stronger
May last 1-2 minutes
No diarrhea
Go away with walking, position change, hot bath

[Return to OB Page](#)

PHYSIOLOGICAL EFFECTS OF LABOUR

(I) On the Mother :

(A) First stage:
minimal effects.

(B) Second stage:

- Temperature: slight rise to 37.5°C.
- Pulse: increases up to 100/min.
- Blood pressure: systolic blood pressure may rise slightly due to pain, anxiety and stress.
- Oedema and congestion of the conjunctiva.
- Minor injuries: to the birth canal and perineum may occur particularly in primigravidas.

(C) Third stage:

Blood loss from the placental site is 100-200 ml and from laceration or episiotomy is 100 ml so the total average blood loss in normal labour is 250 ml.

(II) On the Foetus:

(A) Moulding:

The physiological gradual overlapping of the vault bones as the skull is compressed during its passage in the birth canal.

One parietal bone overlaps the other and both overlap the occipital and frontal bones so fontanelles are no more detectable. It is of a good value in reducing the skull diameters but;

severe and / or rapid moulding is dangerous as it may cause intracranial haemorrhage.

STAGES OF LABOUR

BY: Friedman.....

(I) First stage:

- It is the stage of cervical dilatation.
- Starts with the onset of true labour pain and ends with full dilatation of the cervix i.e. 10 cm in diameter.
- It takes about 10-14 hours in primigravida and about 6-8 hours in multipara.

First Stage:

Phases of cervical dilatation:

(A) Latent phase:

This is the **first 3 cm** of cervical dilatation which is slow takes about 8 hours in nulliparae and 4 hours in multiparae. The latent phase begins with mild, irregular uterine contractions that soften and shorten the cervix

(B) Active phase:

Begin **after 3cm** of cervical dilatation.....

It has 3 components:

- **acceleration phase.**
- **maximum slope.**
- **deceleration phase.**

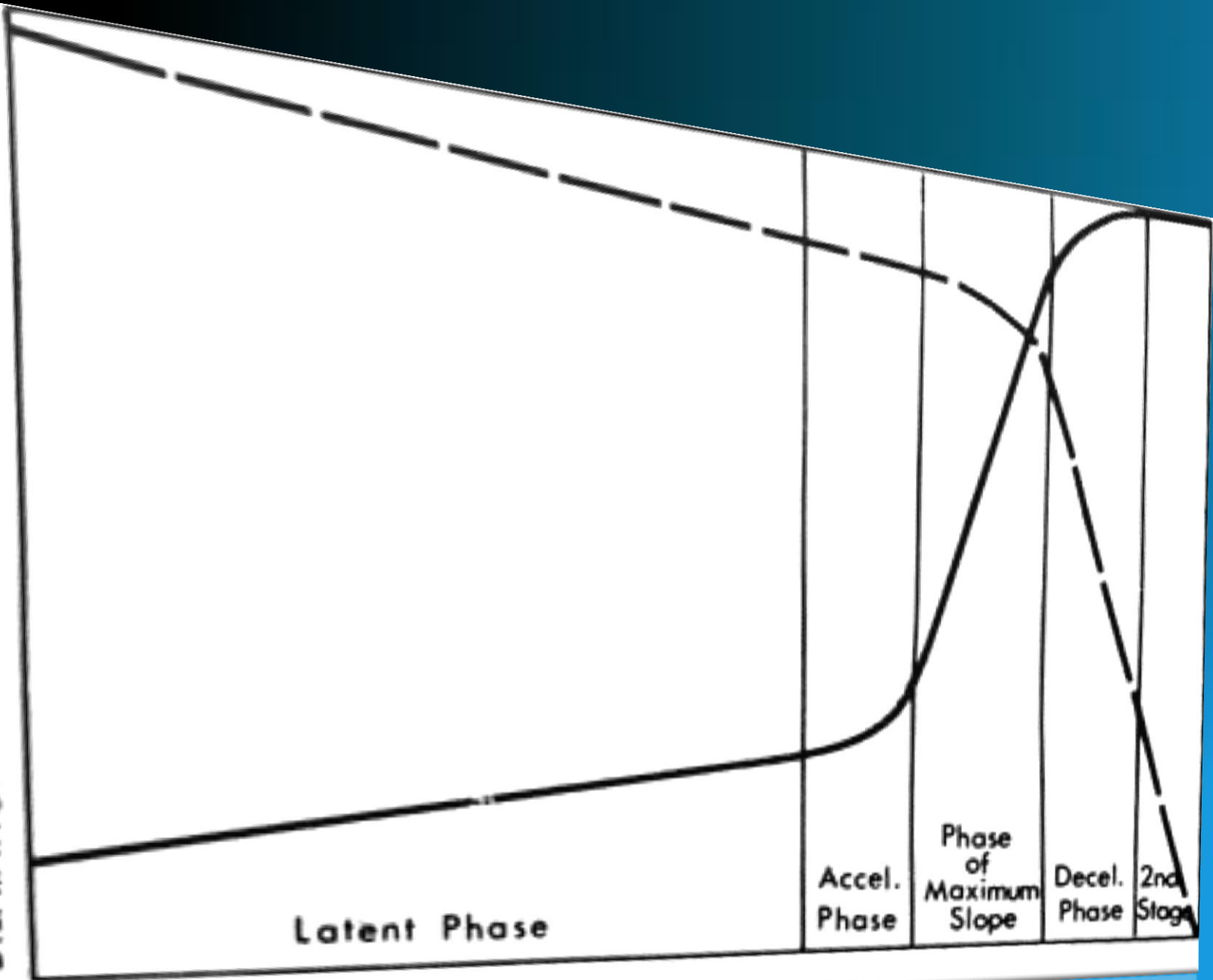
The phase of maximum slope is the most detectable and the two other phases are of shorter duration and can be detected only by frequent vaginal examination.

The normal rate of cervical dilatation in active phase is 1.2 cm/ hour in primigravidae and 1.5 cm/hour in multiparae. If the rate is $< 1\text{cm} / \text{hour}$ it is considered prolonged.

DESCENT

DILATATION

TIME



Latent Phase

Accel.
Phase

Phase
of
Maximum
Slope

Decel.
Phase

2nd
Stage

(II) Second stage:

- It is the stage of expulsion of the foetus.
- Begins with full cervical dilatation and ends with the delivery of the foetus.
- Its duration is about 1 hour in primigravida and ½ hour in multipara.
- **(ACOG)** has suggested that a prolonged second stage of labor should be considered when the second stage of labor exceeds 3 hours in nulliparous and 2 hours in multiparous.

Second Stage: (A) Delivery of the head:

(1) Descent:

It is continuous throughout labour particularly during the second stage and caused by:

- a. Uterine contractions and retractions.
- b. The auxiliary forces brought by contraction of the diaphragm and abdominal muscles.
- c. The unfolding of the foetus

(2) Engagement:

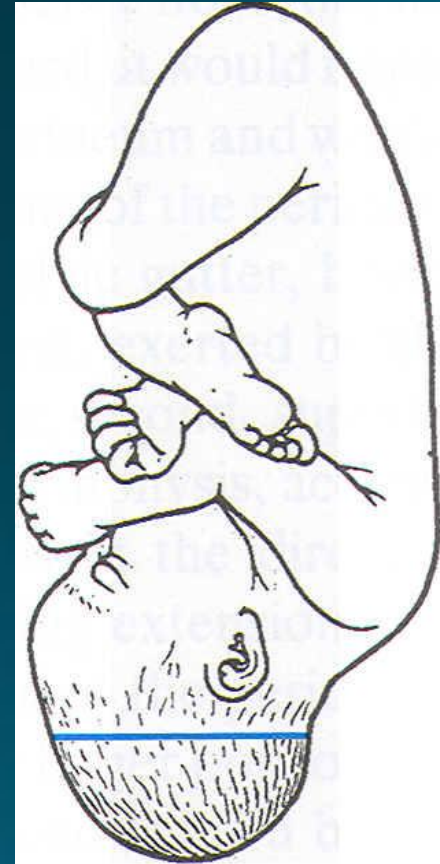
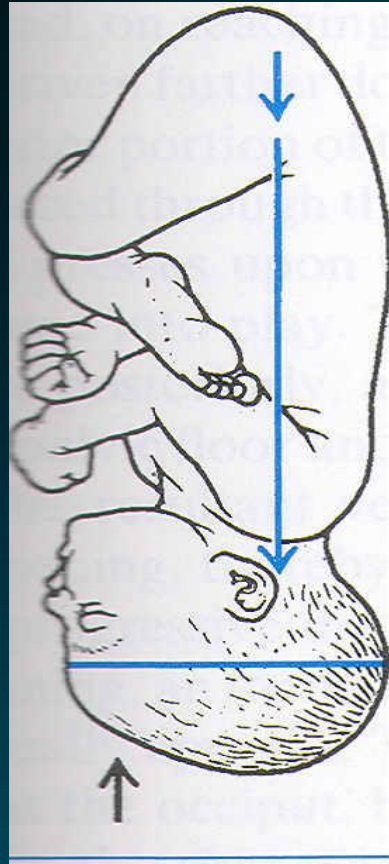
The head normally engages in the oblique or transverse diameter of the inlet.

(3) Increased flexion:

increased flexion of the head occurs when it meets the pelvic floor according to **the lever theory**.

Increased flexion results in :

- a. The suboccipito - bregmatic diameter (9.5cm) passes through the birth canal instead of the suboccipito- frontal diameter (10 cm).
- b. The part of the foetal head applied to the maternal passages is like a ball. The circumference of this ball is 30 cm.
- c. The occiput will meet the pelvic floor.



Lever action producing flexion of the head; conversion from occipitofrontal to suboccipitobregmatic diameter typically reduces the anteroposterior diameter from nearly 12- to 9.5 cm.

(4) Internal rotation:

The rule is that the part of foetus meets the pelvic floor first will rotate anteriorly.

As the head descends, the presenting part, usually in the transverse position, is rotated about 45° to anteroposterior (AP) position under the symphysis.

(5) Extension:

The suboccipital region lies under the symphysis then by head extension the vertex, forehead and face come out successively.

The head is acted upon by 2 forces:

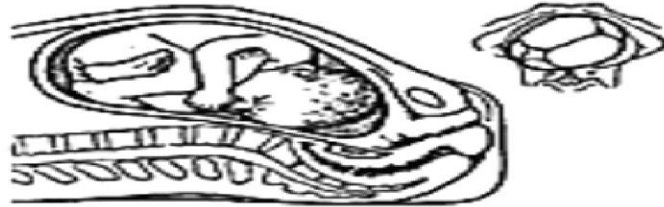
- the uterine contractions acting downwards and forwards.
- the pelvic floor resistance acting upwards and forwards so the net result is forward direction i.e. extension of the head.

(6) Restitution:

After delivery, the head rotates $1/8$ of a circle in the opposite direction of internal rotation to undo the twist produced by it.

(7) External rotation:

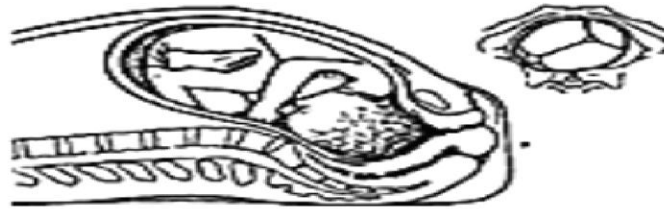
The shoulders enter the pelvis in the opposite oblique diameter to that previously passed by the head. When the anterior shoulder meets the pelvic floor it rotates anteriorly $1/8$ of a circle. This movement is transmitted to the head so it rotates $1/8$ of a circle in the same direction of restitution.



1. Head floating, before engagement



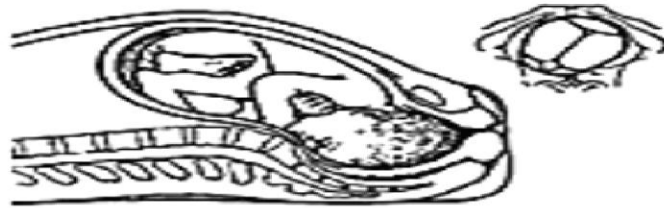
5. Complete extension



2. Engagement, flexion, descent



6. Restitution, external rotation



3. Further descent, internal rotation



7. Delivery of anterior shoulder



4. Complete rotation, beginning extension



8. Delivery of posterior shoulder

4. Complete rotation, beginning extension

8. Delivery of posterior shoulder

(B) Delivery of the shoulder and body:

The anterior shoulder hinges below the symphysis pubis and with continuous descent the posterior shoulder is delivered first by lateral flexion of the spines followed by anterior shoulder then the body.

(III) Third stage:

- It is the stage of expulsion of the placenta and membranes.
- Begins after delivery of the foetus and ends with expulsion of the placenta and membranes.
- Its duration is about 10-20 minutes in both primi and multipara.

A-Expectant management of the third stage of labor involves spontaneous delivery of the placenta.

B-Active management often involves prophylactic administration of oxytocin or other uterotonics (prostaglandins or ergot alkaloids), cord clamping/cutting, and controlled cord traction of the umbilical cord

Third Stage:

(1) Schultze's mechanism(80%):

The central area of the placenta separates first and placenta is delivered like an inverted umbrella so the foetal surface appears first followed by the membranes containing small retroplacental clot.

There is less blood loss and less liability for retention of fragments.

(2) Duncan's mechanism (20%):

The lower edge of the placenta separates first and placenta is delivered side ways.

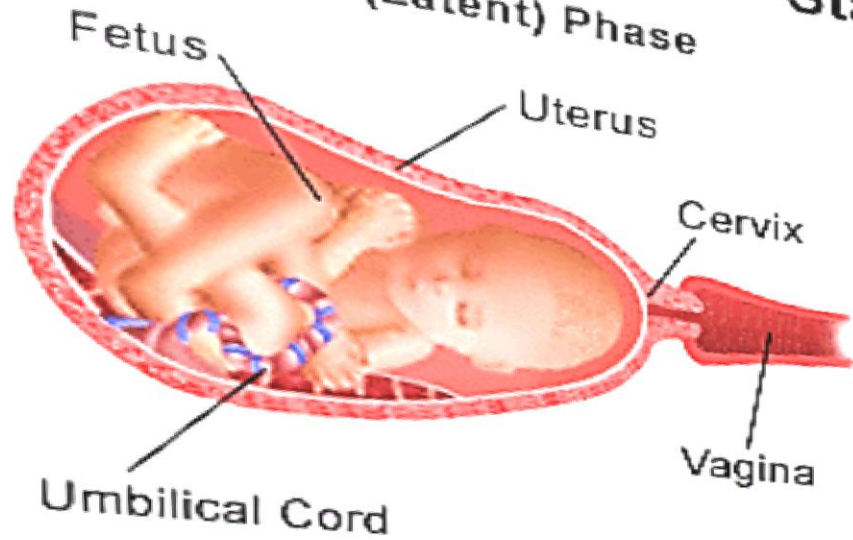
There is more liability of bleeding and retained fragments.

Andersson et al found that delayed cord clamping (≥ 180 seconds after delivery) improved iron status and reduced prevalence of iron deficiency at age 4 months and also reduced prevalence of neonatal anemia, without apparent adverse effects

(IV) Fourth stage:

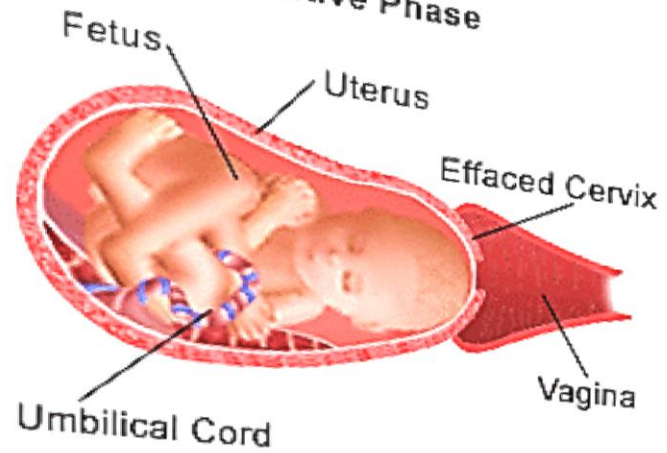
- It is the stage of early recovery.
- Begins immediately after expulsion of the placenta and membranes and lasts for one hour.
- During which careful observation for the patient, particularly for signs of postpartum haemorrhage is essential. Routine uterine massage is usually done every 15 minutes during this period.

Initial (Latent) Phase

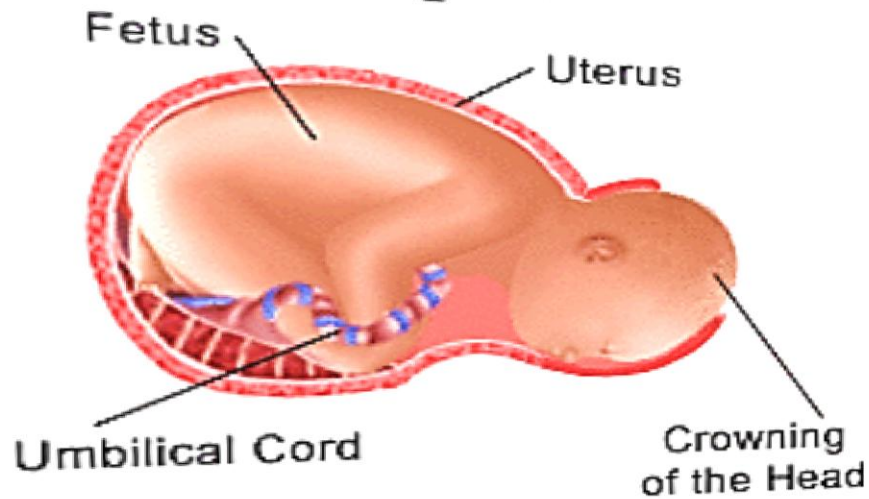


Stage 1

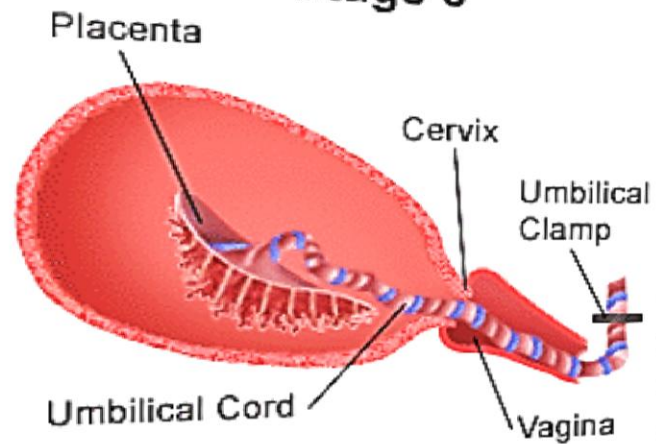
Active Phase



Stage 2



Stage 3



Vagina

Clinical History

- Review of the patient's prenatal care.
- Confirmation of the estimated date of delivery.
- Frequency and time of onset of contractions.
- Status of the amniotic membranes: time and color.
- The fetus' movements.
- Presence or absence of vaginal bleeding.

Physical examination

- ✓ documentation of the patient's vital signs
- ✓ assessment of the fetal well-being
- ✓ The frequency, duration, and intensity of uterine contractions should be assessed

A-Abdominal examination: begins with the **Leopold maneuvers** :

1-Initial maneuver involves upper quadrant of the patient's abdomen palpating the fundus with the tips of the fingers to define which fetal pole is present in the fundus

2-Second maneuver involves palpation in the paraumbilical regions to differentiate the fetal spine (a hard, resistant structure) from its limbs (irregular, mobile small parts) to determine the fetus' position

3-Third maneuver is suprapubic palpation As with the first maneuver, the examiner ascertains the fetus' presentation and estimates its station

4-Fourth maneuver involves palpation of bilateral lower quadrants determining if the presenting part of the fetus is engaged in the mother's pelvis

B-Pelvic examination

- ✓ using sterile gloves to decrease the risk of infection
- ✓ If membrane rupture is suspected, examination with a sterile speculum is performed
- ✓ pelvic examination should be deferred until placenta previa is excluded with ultrasonography
pattern of contraction and the patient's presenting history may provide clues about placental abruption.

C-Digital examination

to determine the following:

(1) the degree of cervical dilatation, which ranges from 0 cm to 10 cm

(2) the effacement normal 3- to 4-cm-long cervix

(3) the position, ie, anterior or posterior.

(4) the consistency, ie, soft or firm.

(5) Palpation of the presenting part of the fetus and quantifying the distance of the body (-5 to +5 cm) that is presenting relative to the maternal ischial spines, where 0 station is in line with the plane of the maternal ischial spines).

Workup

As soon as the mother arrives at the Labor and Delivery suite.

- ✓ External tocometric monitoring for the onset and duration of uterine contractions
- ✓ Use of a Doppler device to detect fetal heart tones and rate should be started.
- ✓ If the intensity/duration of the contractions cannot be adequately assessed, an intrauterine pressure catheter can be inserted

Often, fetal monitoring is achieved using **cardiotography** If nonreassuring fetal heart rate tracings by **cardiotography** (eg, late decelerations) are noted, a **fetal scalp electrode** may be applied to generate sensitive readings of beat-to-beat variability

First stage management:

- ✓ According to **Friedman** the rate of cervical dilation should be at least 1 cm/h in a nulliparous woman and 1.2 cm/h in a multiparous woman.
- ✓ Vaginal examinations should be performed only when necessary to minimize the risk of chorioamnionitis
- ✓ Fetal heart rate at least every 15 minutes, particularly during and immediately after uterine contractions

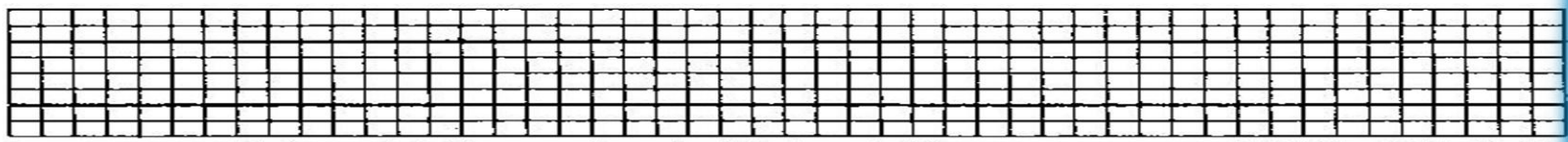
PARTOGRAPH

Name _____ Gravida _____ Para _____ Hospital no. _____

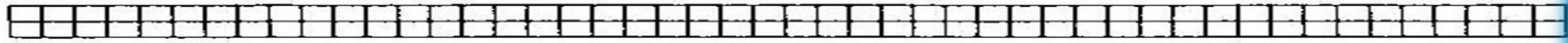
Date of admission _____ Time of admission _____ Ruptured membranes _____ hours _____

Fetal heart rate

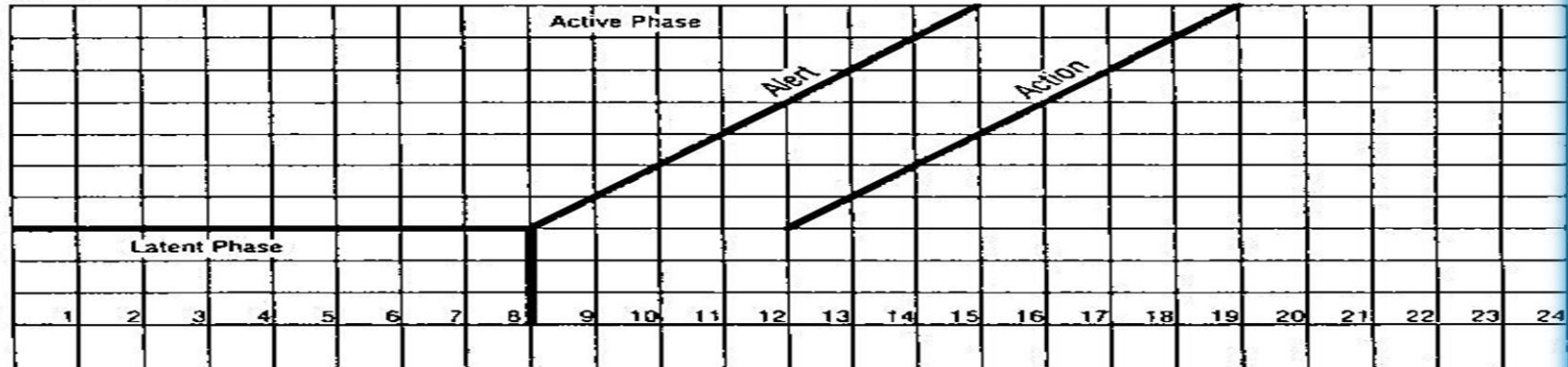
180
170
160
150
140
130
120
110
100



Liquor Moulding



Cervix (cm) [Plot X]
Descent of head [Plot O]
Hours
Time

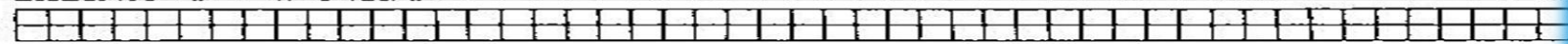


Contractions per 10 mins

5
4
3
2
1



Oxytocin U/L drops/min

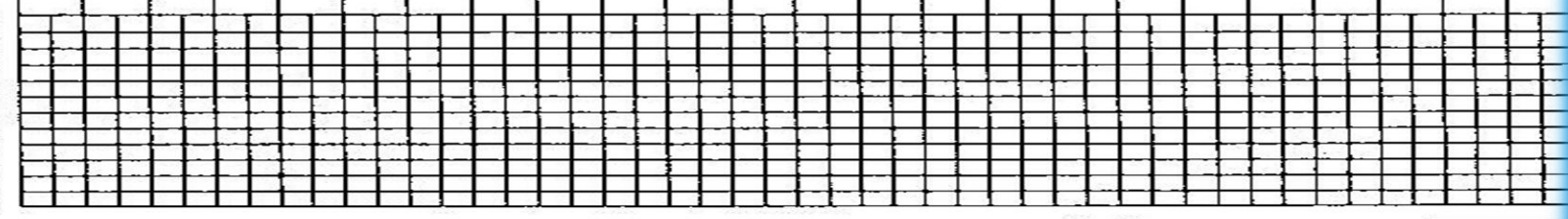


Drugs given and IV fluids



Pulse and BP

180
170
160
150
140
130
120
110
100
90
80
70
60



Temp °C



Urine { protein
acetone
volume

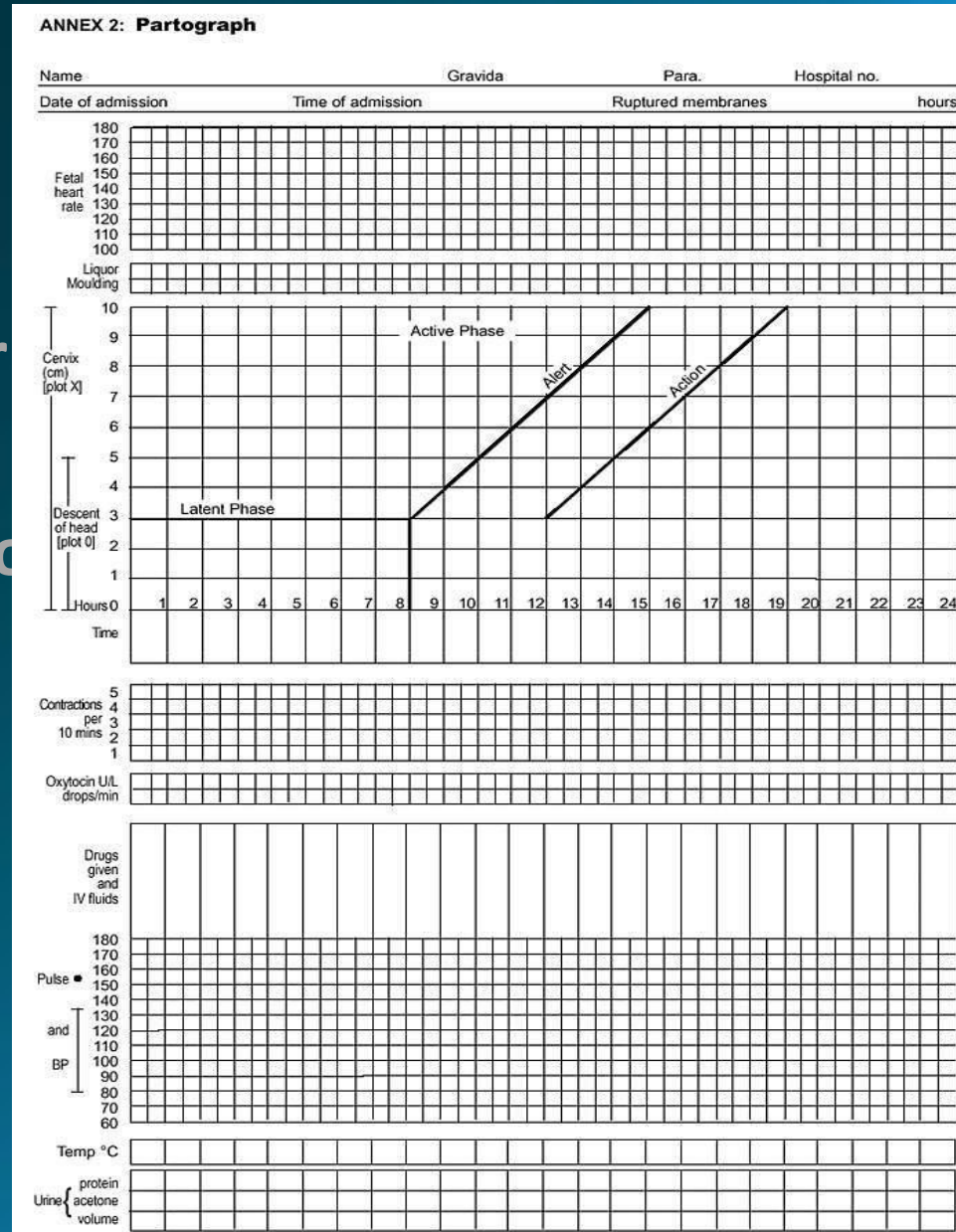


Objectives

- Early detection of abnormal progress of a labour
- Prevention of prolonged labour
- Assist in early decision on transfer , augmentation , or termination of labour
- Increase the quality and regularity of all observations of mother and fetus
- Early recognition of maternal or fetal problems
- The partograph can be highly effective in reducing complications from prolonged labor :
for the mother (postpartum hemorrhage, sepsis, uterine rupture and its sequelae)
for the newborn (death, anoxia, infections, etc.).

Components of the partograph

- Part 1 : fetal condition (at top)
- Part 11 : progress of labour (at middle)
- Part 111 : maternal condition (at bottom)
- Outcome..... :



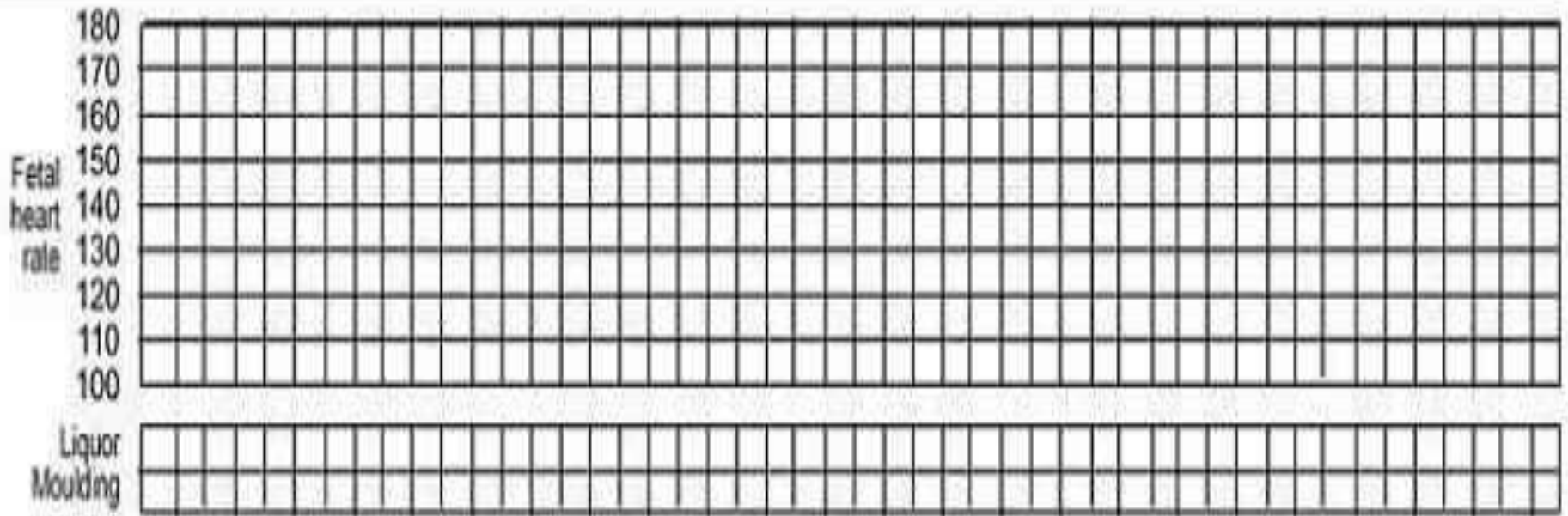
Part 1 : Fetal condition

- this part of the graph is used to monitor and assess fetal condition

1 - Fetal heart rate

2 - membranes and liquor

3 - moulding the fetal skull bones



Fetal heart rate

Basal fetal heart rate?

- > 160 beats/min = tachycardia
- < 120 beats/min = bradycardia
- < 100 beats/min = severe bradycardia

Decelerations? yes/no

Relation to contractions?

- **Early**: fetal HR coincides with contraction
- **Variable**: fetal HR varies with contraction
- **Late**: fetal HR follows contraction

----- Auscultation - return to baseline

≥ 30 sec \rightarrow contraction

----- Electronic monitoring

 peak and trough (nadir)

$\rightarrow > 30$ sec

membranes and liquor

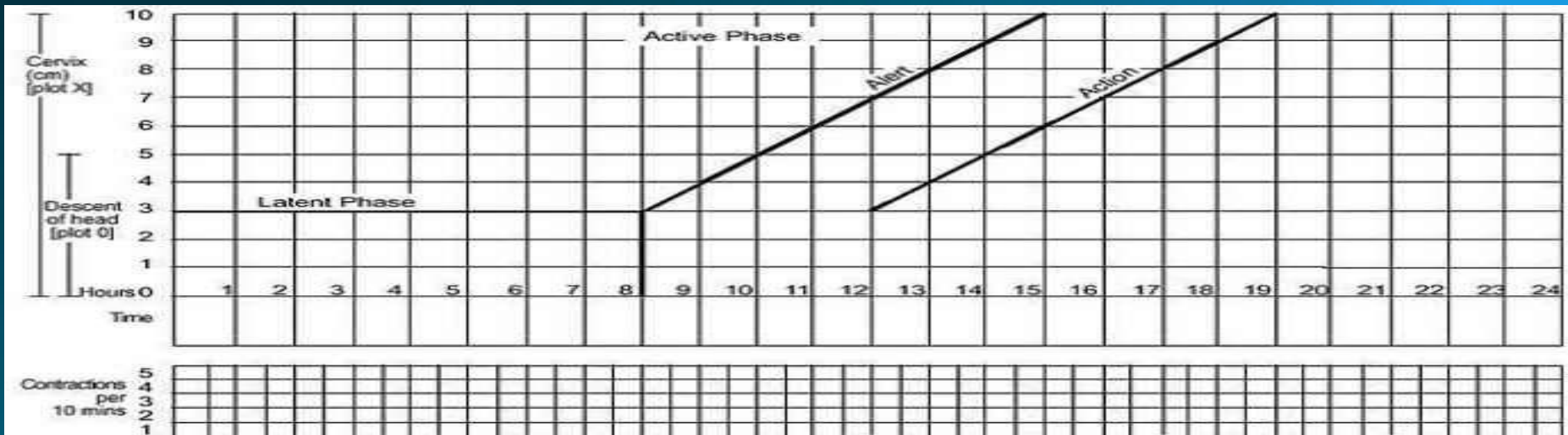
- Intact membranesI
- Ruptured membranes + clear liquorC
- Ruptured membranes + meconium- stained liquor
.....M
- Ruptured membranes + blood – stained liquorB
- Ruptured membranes + absent
liquor.....A

part11 – progress of labour

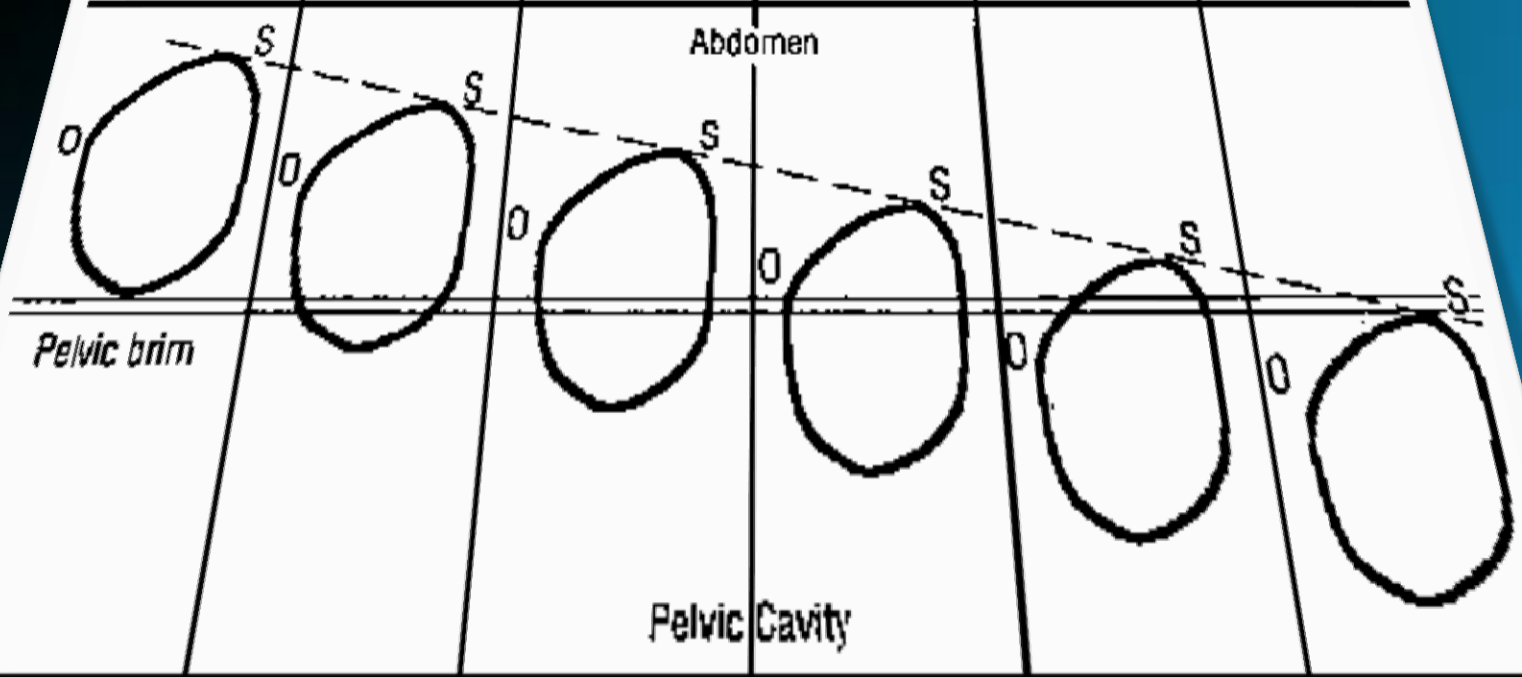
. Cervical dilatation

- Descent of the fetal head
- Fetal position
- Uterine contractions

- this section of the paragraph has as its central feature a graph of cervical dilatation against time
- it is divided into a **latent phase** and an **active phase**



5/5 4/5 3/5 2/5 1/5 0/5



Completely above

*Sinciput High
Occiput Easily felt*

*Sinciput Easily felt
Occiput Felt*

*Sinciput Felt
Occiput Just felt*

*Sinciput Felt
Occiput Not felt*

None of head palpable

latent phase :

- it starts from onset of labour until the cervix reaches 3 cm diltation
- once 3 cm diltation is reached , labour enters the active phase
- lasts 8 hours or less
- each lasting > 20 sceonds
- at least 2/10 min contractions

Active phase :

- Contractions at least 3 / 10 min
- each lasting > 40 seconds
- The cervix should dilate at a rate of 1 cm / hour or faster

Alert line

- The alert line drawn from 3 cm dilatation represents the rate of dilatation of 1 cm / hour
- Moving to the right of the alert line means referral to hospital for extra vigilance

Action line

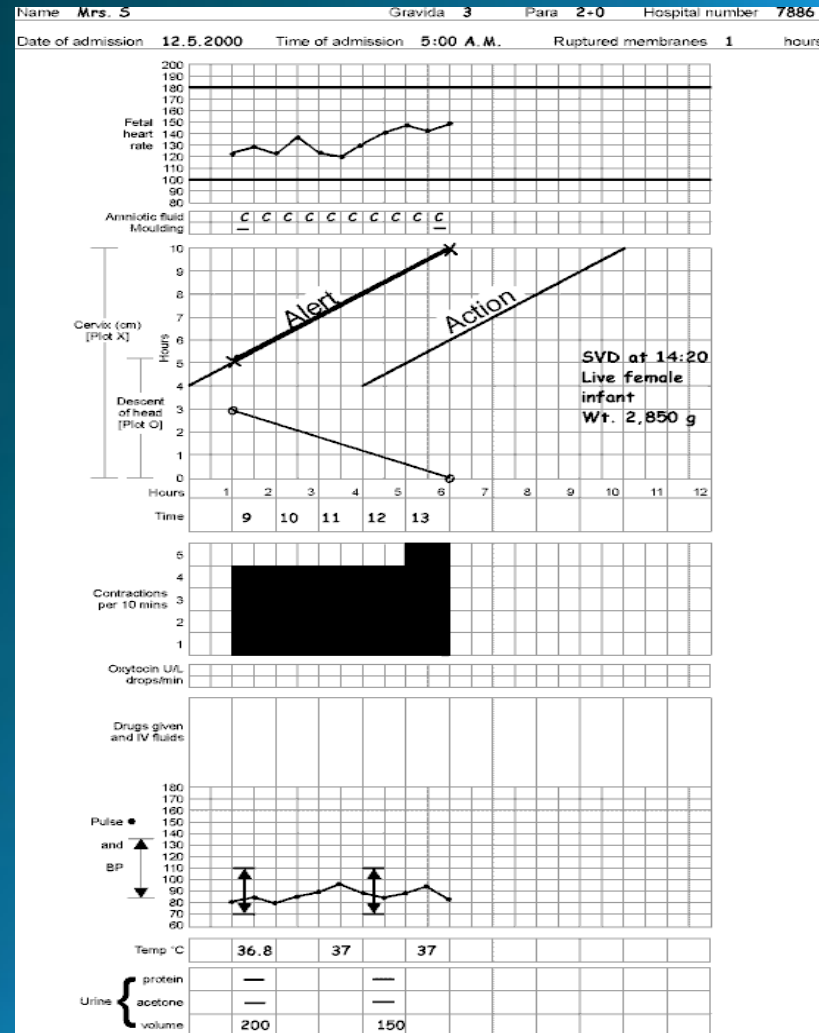
- The action line is drawn 4 hours to the right of the alert line and parallel to it
- This is the critical line at which specific management decisions must be made at the hospital

Management of labour using the partograph

- latent phase is less than 8 hours
- progress in active phase remains on or left of the alert line

Do not augment with oxytocin if latent and active phases go normally

Do not intervene unless complications develop



Between alert and action lines

- In health center , the women must be transferred to a hospital with facilities for cesarean section , unless the cervix is almost fully dilated
- Observe labor progress for short period before transfer
- Continue routine observations
- ARM may be performed if membranes are still intact

At or beyond action line

- **Conduct full medical assessment**
- **Consider intravenous infusion / bladder catheterization / analgesia**
- **Options**
 - **Deliver by cesarean section if there is fetal distress or obstructed labour**
 - **Augment with oxytocin by intravenous infusion if there are no contraindications**

POINTS TO : USING THE PARTOGRAPH

REMEMBER:

- It is important to realize that the partograph is a tool for managing labor progress only
- The partograph does not help to identify other risk factors that may have been present before labor started
- Only start a partograph when you have checked that there are no complications of pregnancy
- A partograph chart must only be started when a woman is in labor

Pain Control

- Uterine contractions result in visceral pain, which is innervated by T10-L1
- While in descent, somatic pain transmitted by the pudendal nerve (innervated by S2-4)
- Drugs : meperidine 25-50 mg IV every 1-2 hours Or fentanyl 50-100 mcg IV every hour Or morphine 2-5 mg IV or 10 mg IM every 4 hours
- As an alternative, regional anesthesia may be given. Options are epidural, spinal, or combined spinal epidural anesthesia
- NSAIDs are relatively contraindicated in the third trimester of pregnancy. The repeated use of NSAIDs has been associated with early closure of the fetal ductus arteriosus in utero and with decreasing fetal renal function leading to oligohydramnios.

Monitor HR:::.....

A-External fetal heart rate monitor :

guidelines were developed to unify the interpretation of fetal heart tracings :

- ✓ **Category One:** Normal fetal heart tracings. Continue expectant management.
- ✓ **Category Two:** Indeterminate fetal heart tracings. These tracings require close observation or interventions to determine whether the fetus has acidemia.
- ✓ **Category Three:** Abnormal fetal heart tracings. These tracings require immediate intervention.

B-Internal fetal heart rate monitor (fetal scalp electrode)

An internal fetal heart rate monitor may be placed to more accurately assess fetal heart rate patterns when the external monitor tracing may be inaccurate or difficult to trace.

A small electrode is passed through the cervix, after the membranes have ruptured, and placed on the fetal scalp.

C-Intrauterine pressure catheter (IUPC)

External monitoring of contractions only measures the timing of contractions. The strength of contractions can only be measured with an IUPC.

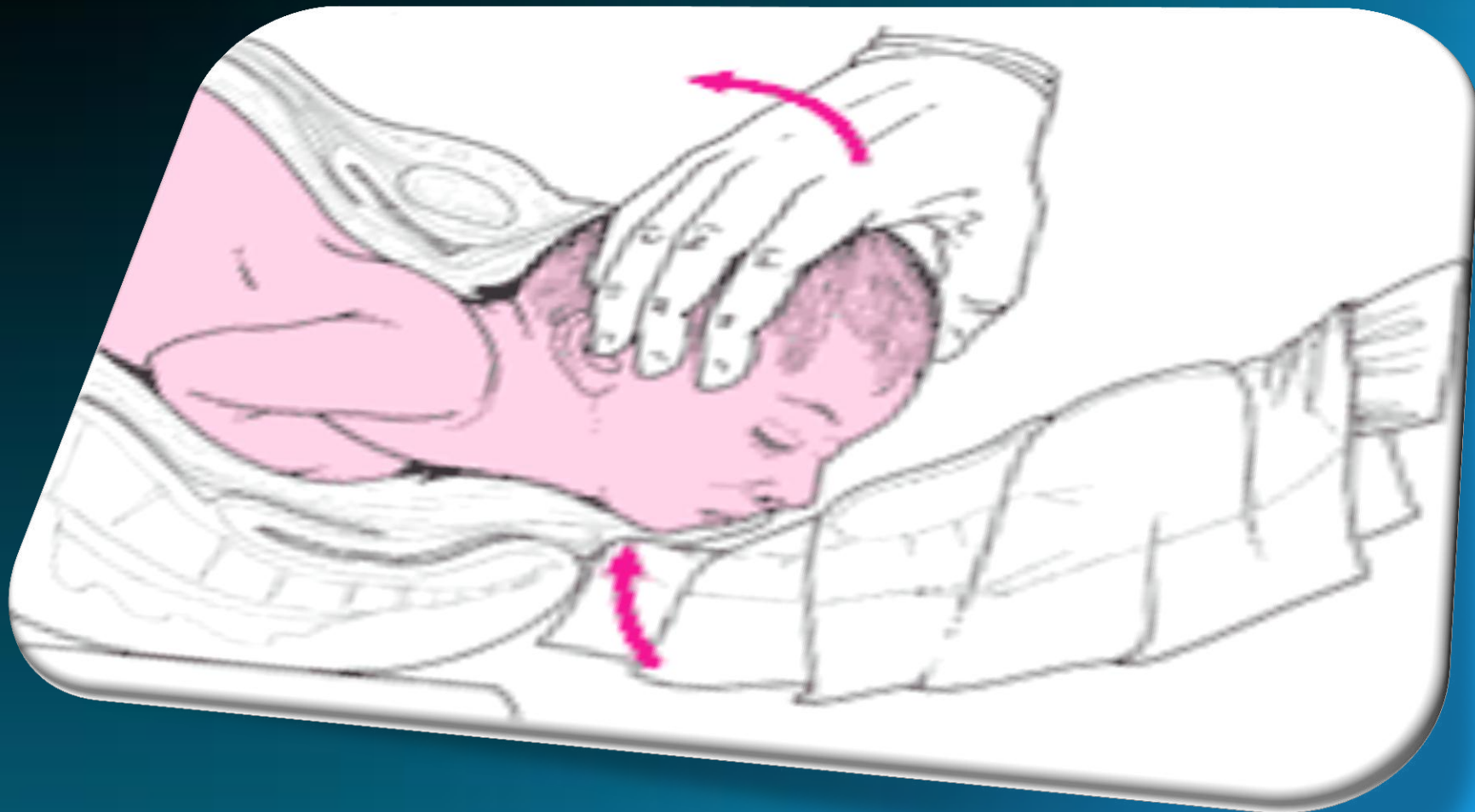
Second stage management:

- ✓ Fetal heart rate should be monitored or auscultated at least every 5 minutes and after each contractions during the second stage
- ✓ A randomized controlled trial performed by Api et al determined that application of fundal pressure on the uterus does not shorten the second stage of labor

Delivery of the fetus

- The mother is usually positioned supine with her knees bent (ie, dorsal lithotomy position) so delivery will be progress as mentioned above in 2 nd stage (**Mechanism Of Labour**)
- A modified **Ritgen maneuver** can be performed to deliver the head.
 1. Draped with a sterile towel.
 2. the heel of the clinician's hand is placed over the posterior perineum overlying the fetal chin.
 3. pressure is applied upward to extend the fetus' head.
- Next, the fetus' anterior shoulder is delivered with gentle downward traction on its head and chin

Ritgen maneuver / 2nd stage



Third stage management:

- Three classic signs indicate that the placenta has separated from the uterus:
 - (1) The uterus contracts and rises.
 - (2) The cord suddenly lengthens.
 - (3) A gush of blood occurs.
- Delivery of the placenta usually happens within 5-10 minutes after delivery of the fetus, but it is considered normal up to 30 minutes after delivery of the fetus.
- Excessive traction should not be applied to the cord to avoid inverting the uterus
- After the placenta is delivered, inspect it for completeness
- Oxytocin can be administered throughout the third stage to facilitate placental separation by inducing uterine contractions and to decrease bleeding.

Fourth stage management

Care of the new born infant:

1-Clearance of the new passages.

2-Determine the Apgar score one and five minutes

heart rate

respiratory rate

muscle tone

colour

reflex irritability

3-Care of the umbilical cord stump

4-General assessment of the infant to exclude any congenital anomalies.

5-Identification of weight, estimate the gestational age, dress it and put a mask to identify it.

6-Protect the baby against cold.

(B) Caput succedaneum:

It is a soft swelling of the most dependent part of the foetal head occurs in prolonged labour before full cervical dilatation and after rupture of the membranes.

It is due to obstruction of the venous return from the lower part of the scalp by the cervical ring.

Large caput may:

- i) obscure the sutures and fontanelles making identification of the position difficult. This can be overcome by palpation of the ear ,**
- ii) give an impression that the head is lower than its true level.**

Artificial caput succedaneum (chignon): is induced during vacuum extraction.

Caput succedaneum disappears spontaneously within hours to days of birth.

As it is a vital manifestation, so it is not detected in intrauterine foetal death.

The presence of caput indicates that:

i) the foetus was living during labour,

ii) labour was prolonged and difficult,

iii) the attitude of foetal head during labour can be expected as caput is present in the most dependant part of it.

uoy hon knoht