

STAGES OF LABOR

BY

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Labor is the process by which a viable fetus (after the end of 28 weeks) is expelled /going to be expelled from the uterus.

Normal labor is: Delivery of

1. Single.
2. Living.
3. Term fetus.
4. presented by vertex.
5. Spontaneously.
6. through the birth canal.
7. within a reasonable time (not less than 3 hours or more than 24 hours).
8. Without intervention (except episiotomy).
9. without complications to the mother or the fetus.
10. With smooth puerperium.

Theories of labor:

Combination of factors start labor:

➤ **Oxytocin & prostaglandin theory:**

- most important biochemical factors in stimulating uterine contractions.
- Near term , there is reflex ↑ oxytocin production resulting from pressure of fetal head on the cervix.
- ↑ prostaglandins in chorio-amnion results in ↑ uterine contraction.

➤ **Estrogen and progesterone theory:**

- **Estrogen ↑ uterus contractility & progesterone ↓ it.**
- Physiological progesterone Withdrawal by fetus allows estrogen to ↑ contractile response of uterus.

➤ **Fetal Cortisol:**

Changes biochemistry of fetal membrane: ↓ progesterone & ↑ prostaglandin in placenta.

➤ **Distention:**

Uterine muscles stretch causing ↑ prostaglandin.

➤ **Amniotic membranes (sac):**

Makes arachidonic Acid → Prostaglandin that stimulates uterine contractility.

Premonitory signs of labor: weeks before real labor

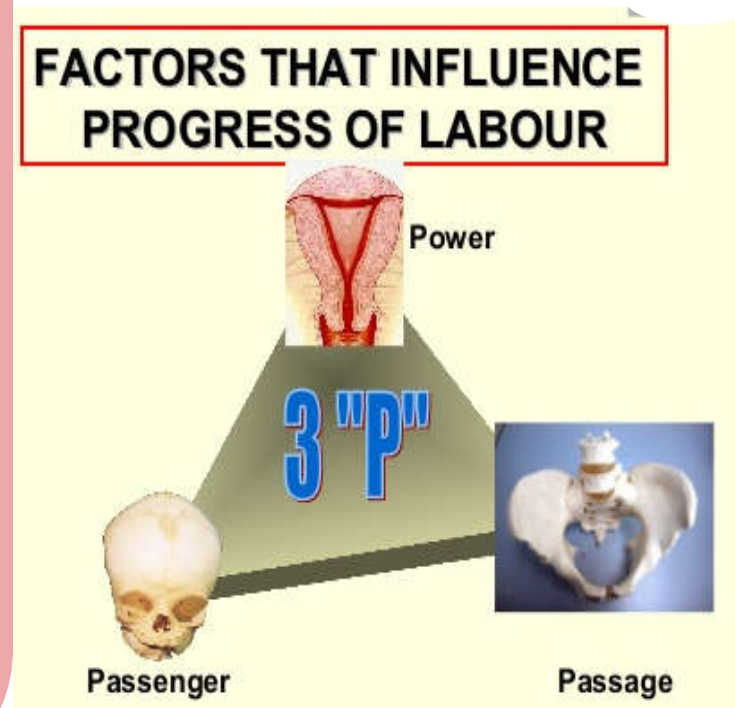
- Lightening: Fetus settles into pelvic cavity.
- Braxton-Hicks: Irregular intermittent contractions; “false labor”; **DO NOT** initiate true labor.
- Cervical changes: cervix effaces [thins], dilates slightly & adopt anterior position.
- Engagement: Baby's head in pelvis pushes against cervix causing relaxation and effacement.

COMPONENT OF NORMAL LABOR



Component of normal labor:

1. Power.
2. Passage.
3. Passenger.



I. Powers:

1. Uterine contractions:
True labour pains.

2. Auxiliary forces:
Bearing down efforts.
Contraction of anterior
abdominal wall
muscles.
Contraction of
diaphragm.



True Labor pain

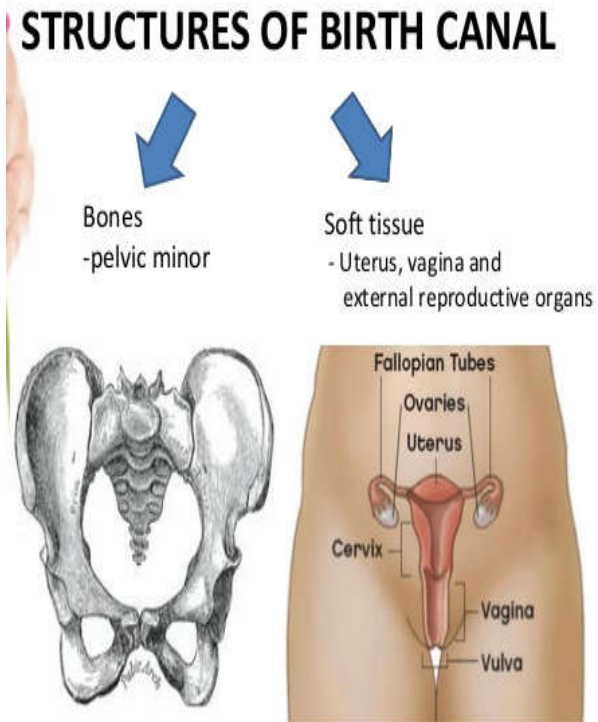
- *Contractions* occur at **regular** intervals.
- *Intensity* gradually **increases**.
- *Discomfort* is in the **back and abdomen**.
- *Cervix* **dilates**.
- Discomfort is **not** stopped by *sedation*.

False labor pain:

- *Contractions* are **irregular**.
- *Intensity* remains **the same**.
- *Discomfort* is in the **abdomen**.
- **No** *cervical* dilatation.
- Discomfort **relieved** by *sedation*.

II. Passage:

1. Soft tissue passage:
 1. Cervix.
 2. Vaginal birth canal
2. Maternal pelvis:
 1. Inlet.
 2. Outlet.



III. Passenger (the fetus):

Fetal size.

Fetal presentation.

Fetal position.

Moulding.



DIAGNOSIS OF LABOR

The determination of whether a woman is in labor is made within one hour of admission .

Diagnosis of labor is made only with:

3 Symptoms:

True labor pains.

Show (blood stained mucous).

ROM.

3 Signs:

Palpable or recorded uterine contraction.

Effacement and dilation of the cervix.

Formation of bag of forewater.

Management on admission:

(A) Taking history or reviewing the antenatal file.

- 1-Last menstrual period - expected date of confinement.
- 2-Time of onset of labor.
- 3-Frequency and duration of contraction (3-4cm/10min).
- 4-Presence or absence of amniotic fluid leakage.
- 5-Presence or absence of show or vaginal bleeding.

6-Past obstetric history especially mode of previous delivery, presentation, mode of delivery, and weight of previous children.

7-Past medical or surgical history that may affect labor or delivery, especially diabetes, heart disease, respiratory disease allergies, and any medication.

Management on admission:

(B) Examination:

1. General:

a-pallor, edema, varicosities, height, and built.

b-Vital signs (BP, P, T)

c-Examination of heart, lungs, breast and other organs if necessary

2. Abdominal Examination:

a-To determine fundal height in cm using tape measure (to determine gestational age clinically), fetal lie, presentation, engagement in fifths, size of the fetus, amount of liquor, fetal heart rate.

b-The frequency and duration of the contraction.

Management on admission:

Vaginal Examination: To assess the following.

- a- Cervical dilatation in cm and effacement in %.
- b- Length of the cervix.
- c- Consistency of the cervix
- d- Position of the cervix
- e- State of the membranes, amount and colour of liquor.
- f- Fetal presentation, position and station.
- g- Pelvic architecture.

DO NOT DO VAGINAL EXAMINATION IN CASES OF VAGINAL BLEEDING BEFORE THE PLACENTA PREVIA IS EXCLUDED.

DO STERIL SPECULUM EXAMINATION IF SUSPECTED PLROM, IF THE WOMAN IS NOT IN LABOUR.

STAGES OF LABOR

NORMAL LABOR is divided into three stages

First stage:

time from the onset of labor until complete cervical dilatation.

Second stage:

time from complete cervical dilatation to expulsion of the fetus .

Third stage:

time from expulsion of the fetus to expulsion of the placenta.

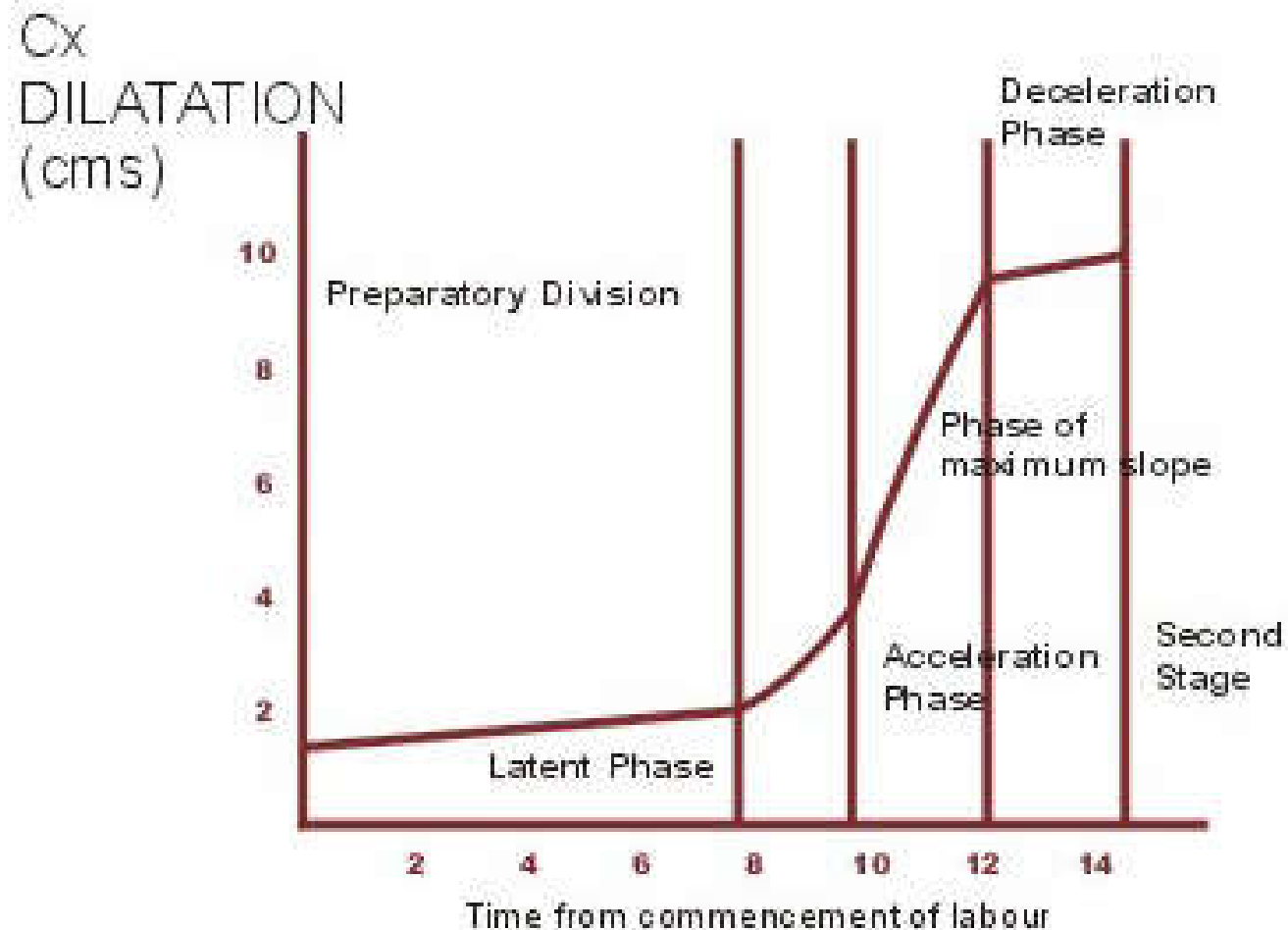
FIRST STAGE OF LABOR



FIRST STAGE OF LABOR:

- Starts from the onset of true labor to complete cervical dilation = 10 cm (5 fingers).
- It takes about 6-18 hrs in primigravida; and about 2-10 hrs in multipara.
- 2 phases: Latent, Active (Friedman curve).

FIRST STAGE OF LABOR



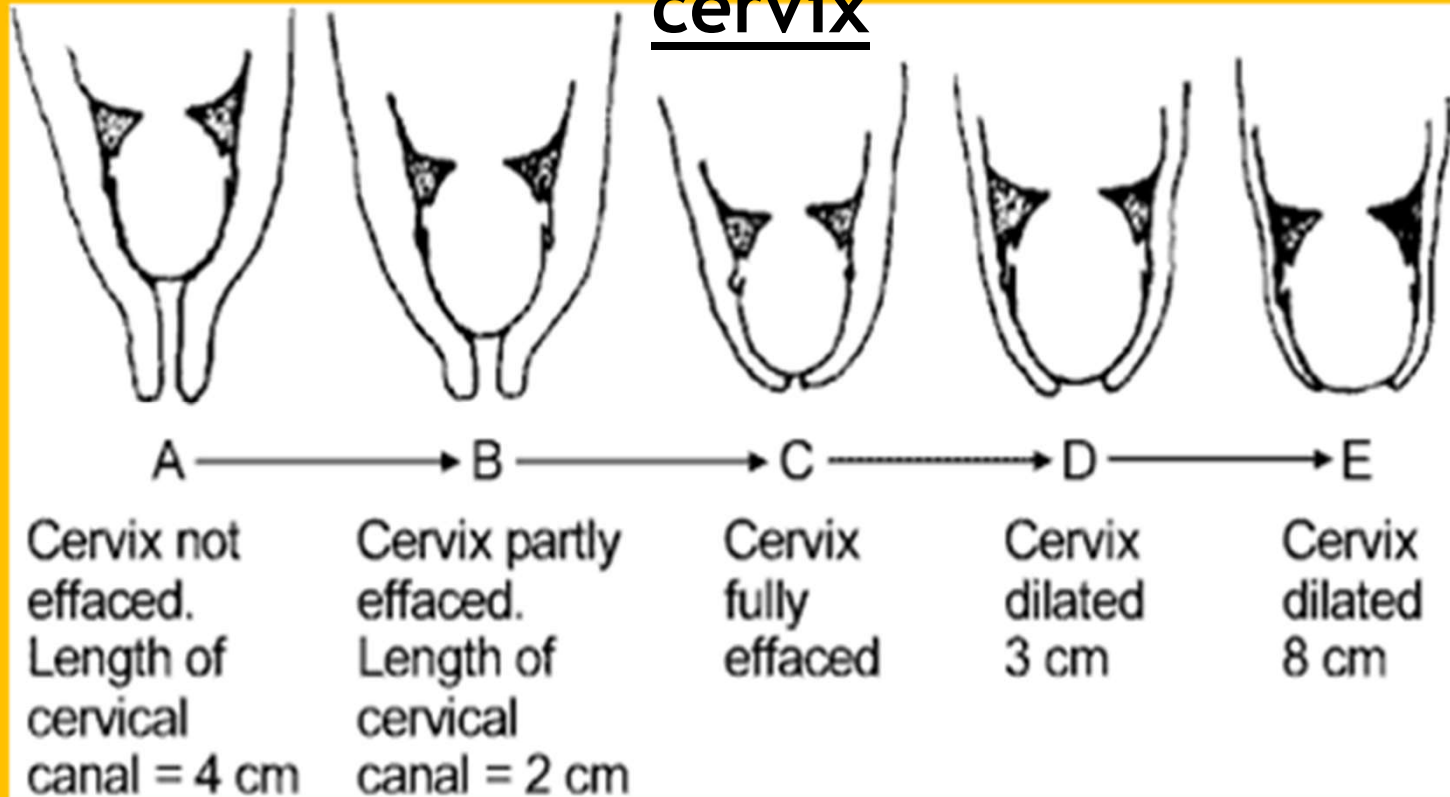
Friedman's curve showing phase of maximum slope

- **Latent phase:**
 - It begins from 0-3 cm.
 - It is typically characterized by mild, infrequent, irregular contractions with gradual change in cervical dilation (usually <1 cm/ h) and effacement.
 - It takes from 8 hours in primigravida and from 4 hours in multipara.

- **Active phase:**

- Begins at 3 to 4 centimeters when cervical dilatation is plotted against time: this is the beginning of the active phase.
- Characterized by: painful contractions of increasing frequency, intensity, and duration accompanied by more rapid (usually >1 cm /h) cervical change.

Effacement and dilatation of the cervix



Factors affecting cervical dilatation:

1. Contraction and retraction of the uterus.
2. The bag of fore-water (PROM).
3. Absence of membranes.
4. Fitting of the presenting part to the lower segment and the cervix(malpresentation).
5. Pre-labour changes in the cervix (eg, softening)

Management of the first stage of labor:

Preparation:

- Antisepsis.
- Evacuation of the U. B. and rectum.

Observation: of

A) Mother:

- Vital signs.
- Uterine contractions.
- Cervical dilatation.
- Membrane.

B) Fetus:

- Fetal station.
- FHS

Pain relief:

- Pethidine 50mg.
- Epidural analgesia

FIRST STAGE OF LABOR:

External Electronic Fetal Heart Rate Monitoring With 3 Types of Output

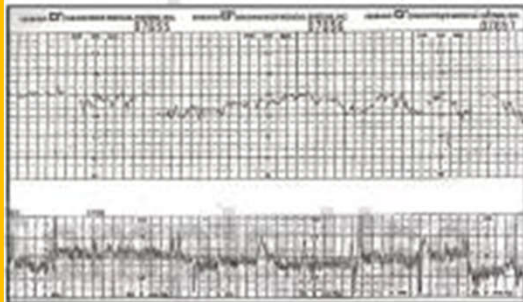
1. A SPEAKER IN THE BACK OF THE MONITOR GIVES AN AUDIBLE REPORT OF EACH FETAL HEART BEAT.



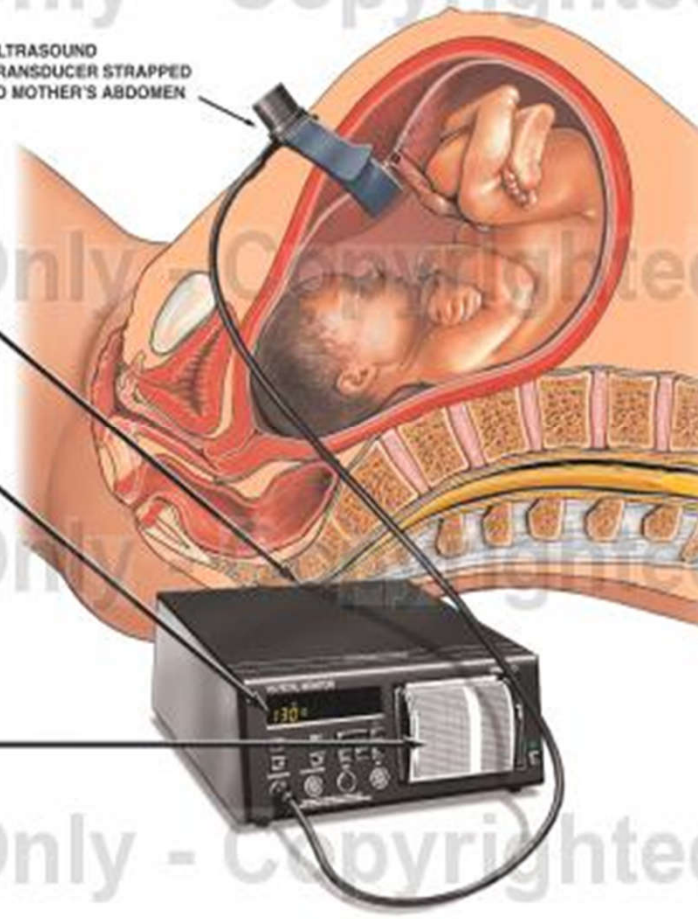
2. A DIGITAL DISPLAY INDICATES THE FETAL HEARTBEAT IN BEATS PER MINUTE.



3. THE FETAL HEARTBEAT AND MATERNAL CONTRACTIONS ARE RECORDED ON A PAPER PRINTOUT.



ULTRASOUND
TRANSDUCER STRAPPED
TO MOTHER'S ABDOMEN



Nutrition:

- Early (in latent phase): sugary fluid is allowed.
- In active phase: avoid oral feeding due to vomiting that may cause aspiration.
- If labor is prolonged >8 hours; I.V. fluids are given.

Instruction:

- Rest in bed and antibiotic prophylaxis if ROM.
- Walking is allowed if not ruptured.
- Avoid straining.
- Positions: sitting, side Lying, standing, squatting, All Fours, Kneeling

SECOND STAGE OF LABOR

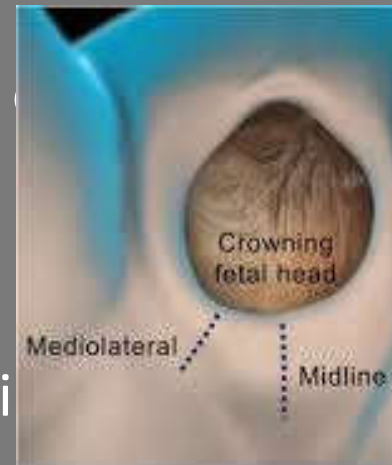


SECOND STAGE OF LABOR



SECOND STAGE: “BIRTHING OF BABY”

- Up to 1 hr in primigravidae. 20 min. in multipara.
- Cardinal movements occur here.
- Most difficult & uncomfortable part
- Crowning occurs at +4 - +5 station.
- Strong urge to push & reflex bear down as the baby passes through vagina.
- ROM .



SECOND STAGE OF LABOR

The second stage of labor had two phases:

1. Passive phase -

stage of descent of the presenting part and dilatation of the vagina - due to contraction and retraction of the uterine muscle.

2. Expulsive phase -

stage of bearing down - due to contraction and retraction of the uterine muscle and voluntary efforts by diaphragm and abdominal muscles.

Mechanism of labor in vertex presentation:

Delivery of fetus:

I. Delivery of the head:

1. Descent.
2. Engagement.
3. Increased flexion.
4. Internal rotation.
5. Extension.
6. Restitution.
7. External rotation.

II. Delivery of the shoulder and body:



I. Delivery of the fetal head:

A- Descent:

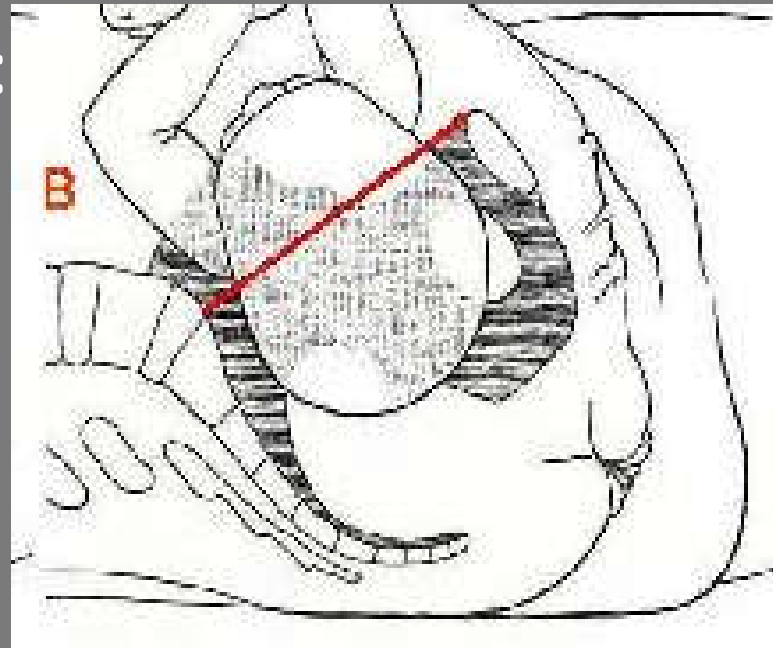
It is a continuous movement throughout the process of delivery, caused by:

- Uterine contraction and retraction.
- Bearing down effort – mainly in the second stage of labour.
- Unfolding of the fetus.



B- Engagement :

- It is defined as **passage of the biparietal diameter (BPD) of the fetal head through the pelvic brim.**
- It can be assessed:
 - abdominally:
(role of fifth)
 - or vaginally
(role of three).



*Assessing descent
of the fetal head by
abdominal
Examination*



A. Head is mobile
above the
symphysis
pubis = 5/5



B. Head accommodates
full width of five
fingers above the
symphysis pubis

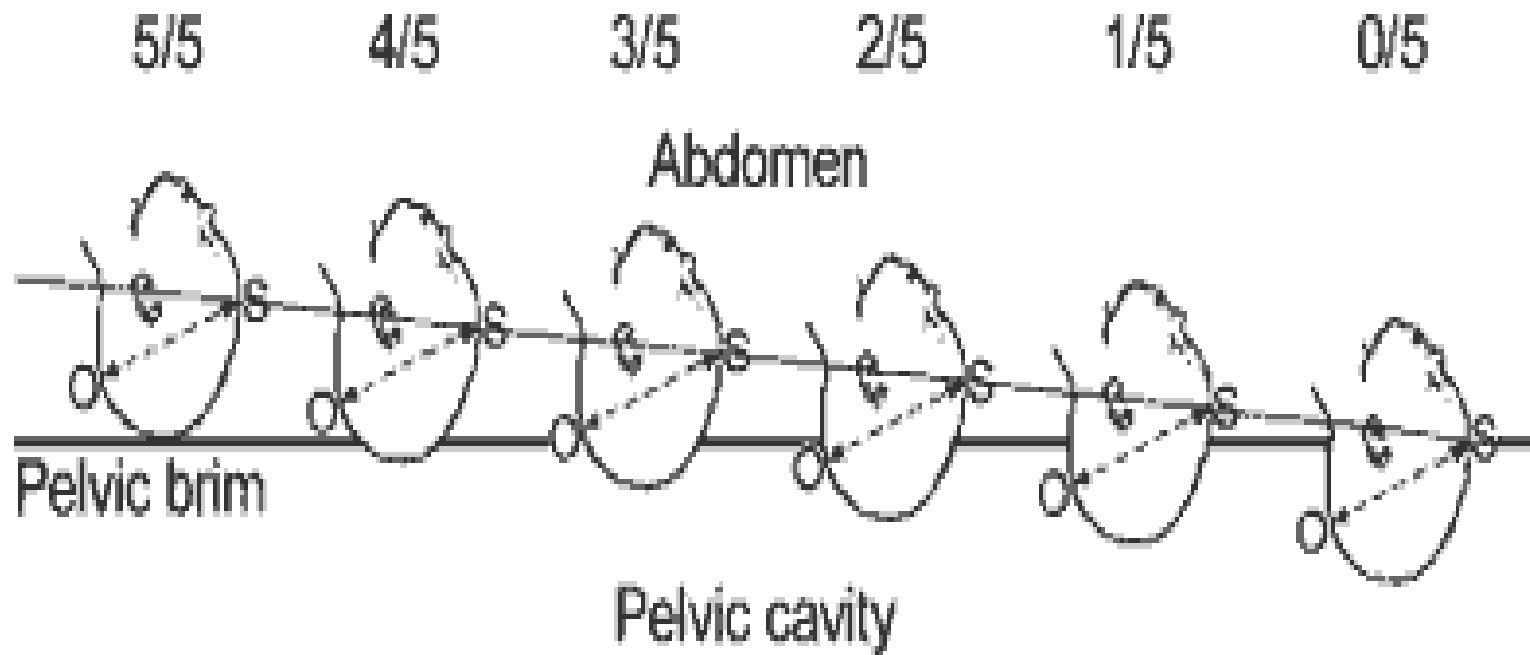


C. Head is 2/5
above symphysis
pubis



D. Head accommodates
two fingers above
the symphysis pubis

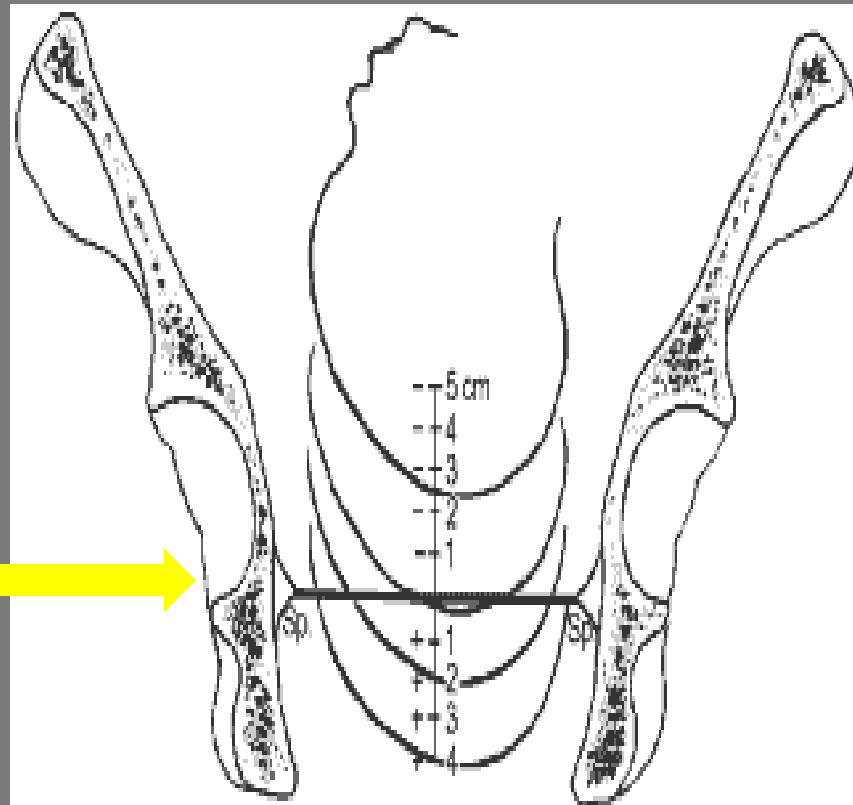
MECHANISM OF LABOR



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
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Assessing descent of the fetal head by vaginal examination.

0 station is at the level of the ischial spine .



Causes of non-engagement:

A) Maternal :

I. Extra-uterine factors:

- full bladder or loaded rectum
- Pelvic tumors
- Pendulous abdomen and marked lumbar lordosis.
- High angle of inclination of the pelvis.
- Contracted pelvis.

II. Uterine factors:

- Poor uterine tone.
- Congenital deformities.
- Fibromyomata.
- Placenta previa.

B) Fetal:

1. Polyhydramnios.
2. Short umbilical cord (actual or relative, due to entanglement)
3. Large baby.
4. Deflexion attitude, and malposition.
5. Multiple pregnancy.
6. Hydrocephalus.

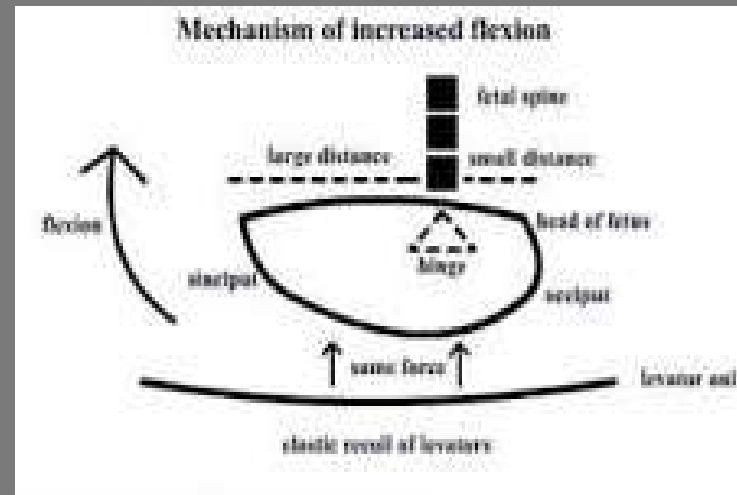
C- Increased flexion:

Flexion is explained by the (two armed lever theory):

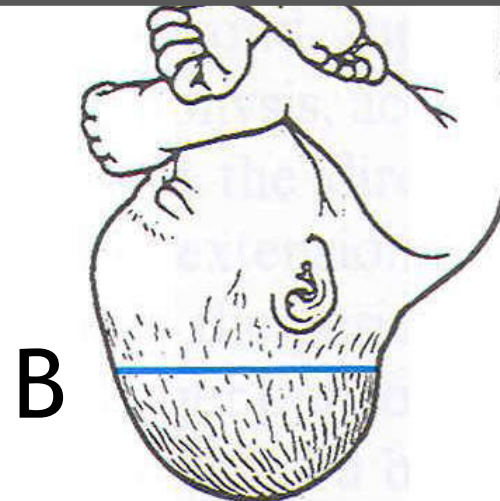
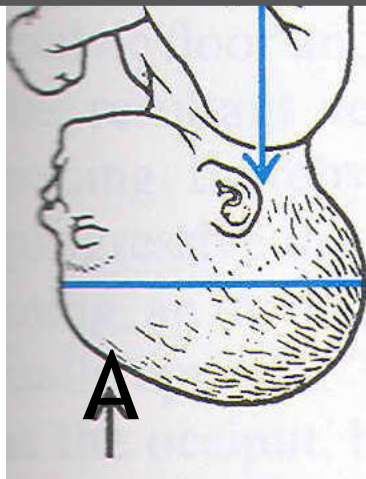
The short lever from the occiput to atlanto-occipital joint.

The long lever from the sinciput to atlanto-occipital joint.

As the head descend, it meet resistance from the pelvic Floor and side walls, thus the force on sinciput is greater, this results in increased flexion.

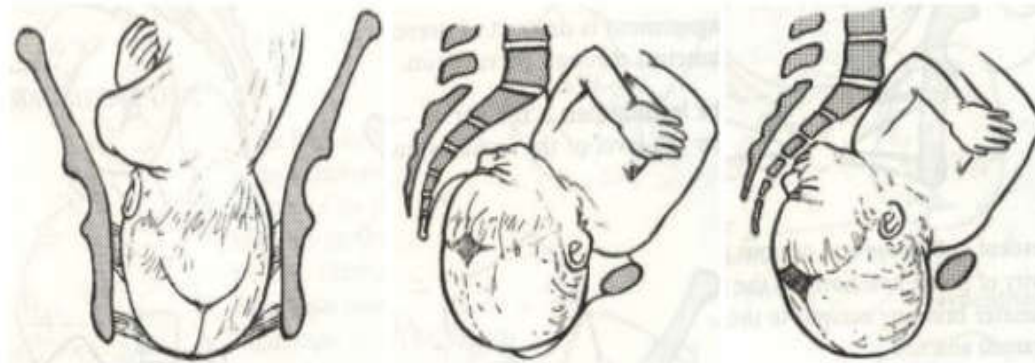


Lever action producing flexion of the head; resulting in conversion from occipito-frontal (A) to suboccipito-bregmatic diameter (B) typically reduces the anteroposterior diameter from nearly 12- to 9.5 cm.



D- Internal Rotation:

The internal rotation occurs as the head descends through the pelvic cavity. As the head enters the pelvic inlet in transverse diameter will **rotate 1/8 of the cycle** to pass through the pelvic outlet in antero-posterior diameter.



The rotation is favored by:

- The slopping shape of the pelvic floor.
- Angling the leading point of the head (occiput) in downward and forward direction.
- By the effect of the contraction and retraction of the uterus.

E- Extension:

The sub occipital 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.



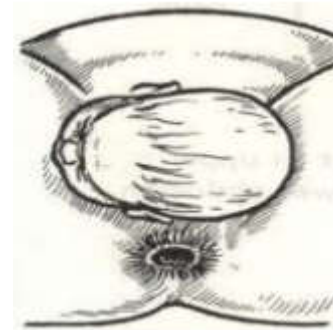
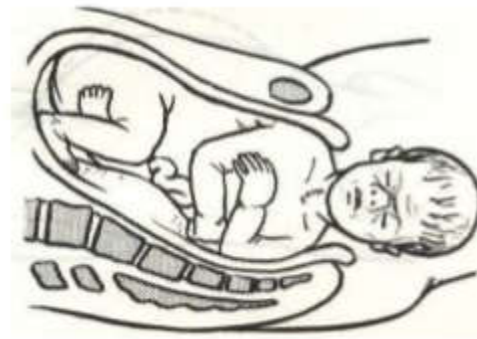
F- Restitution:

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



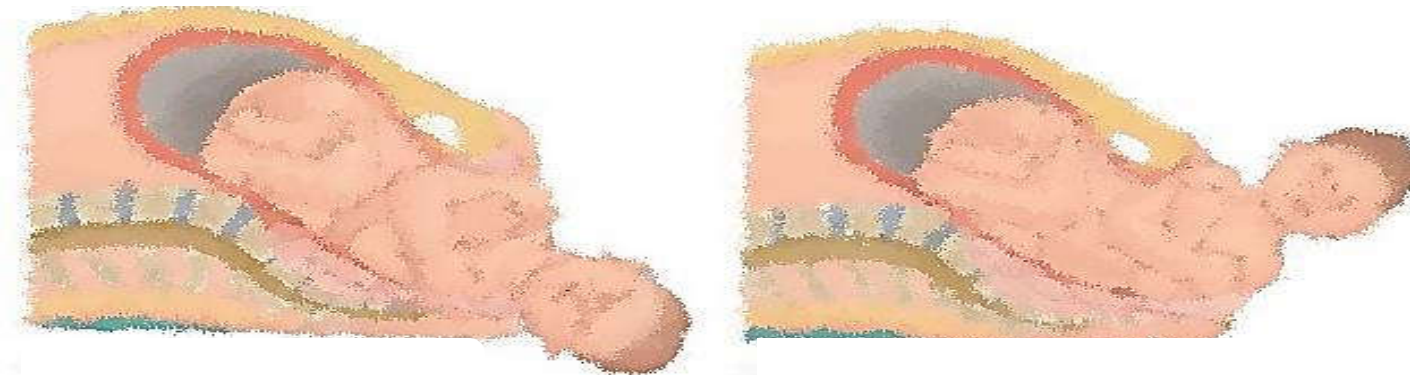
G- External rotation:

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.



II. 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.



Management of second stage of labor:

Preparation:

- In operative theater.
- Patient in lithotomy or dorsal position.
- Asepsis.

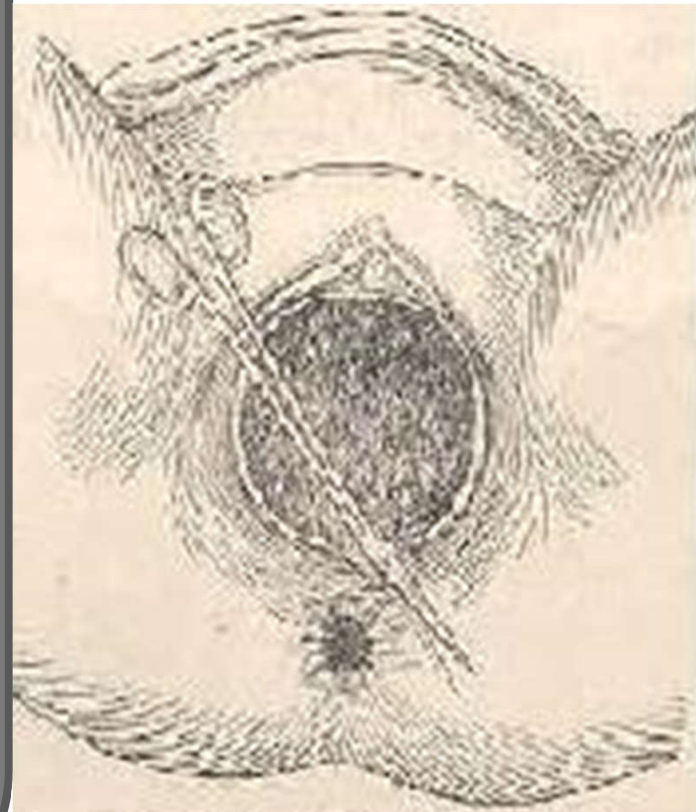
Instruction :

- Bearing down is allowed during contraction and relax in between.
- Use syntocinon if progress is slow and no contractions

- When the head appears at the vulva, the perineum is supported during uterine contraction by sterile pad to promote flexion and prevent premature extension of the head by pressing up on the sinciput until crowning occur.
- After crowning the head is allowed to be delivered by extension slowly in between the contractions by sliding the perineum over the face.
- DO episiotomy if necessary under local anesthetic (10-20 ml) of 1% lignocain, but should not be routine.
- Wait for the next contraction to deliver the shoulder and trunks

Episiotomy

- Anesthetize with pudendal block
- Put two fingers into the vagina along the posterior wall
- Place one blade of scissors between fingers inside vagina, other blade outside vagina toward anus
- Cut to approximately 1 inch away from anus during a contraction



THIRD STAGE OF LABOR

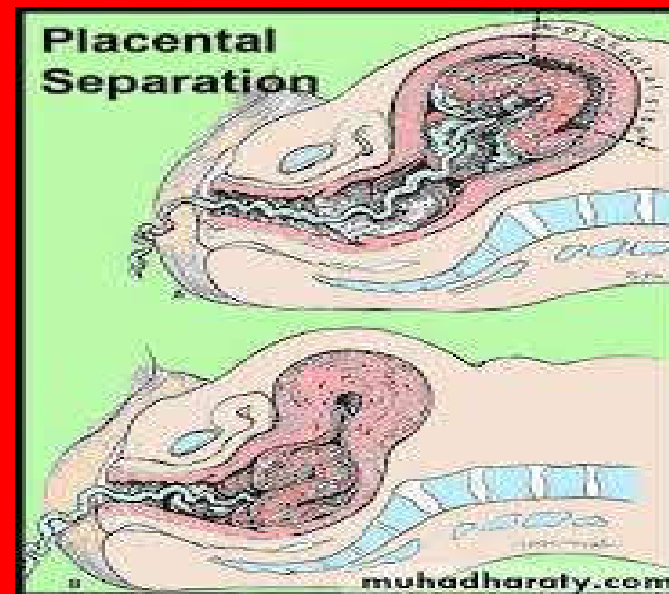


THIRD STAGE (DELIVERY OF THE PLACENTA)

- It is the stage of expulsion of the placenta and membranes.
- Its duration is about 10-30 minutes in both primi and multipara.

Signs of separation:

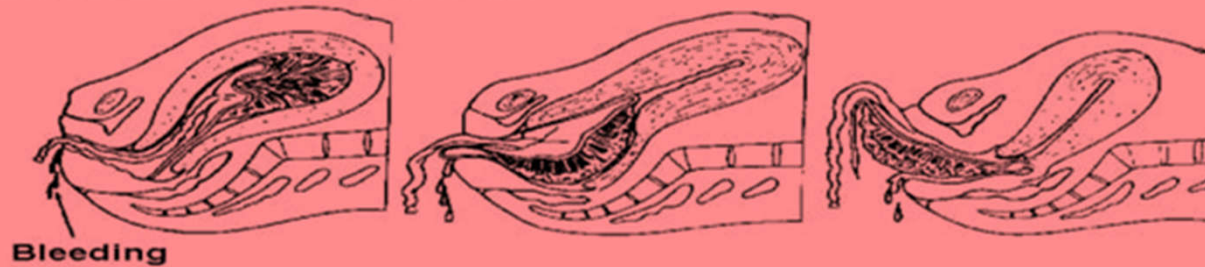
- Suprapubic bulge .
- Uterus rises to become globular.
- Gush of blood from vagina.
- Prolongation of the cord.



Mechanisms of placental separation:

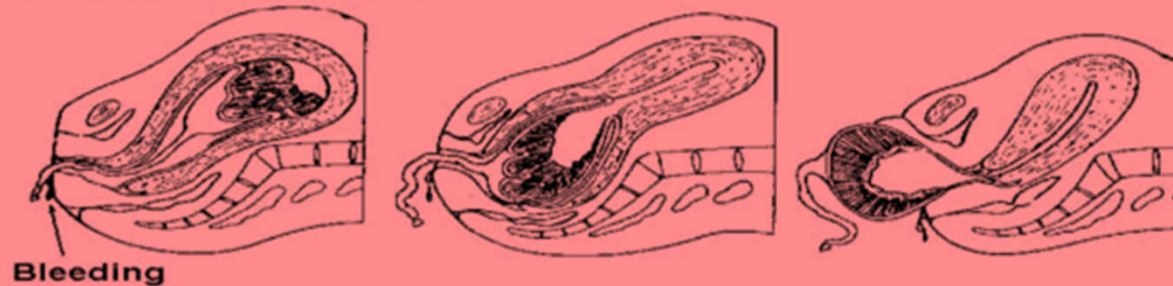
1. Marginal:

Duncan mechanism



2. Central:

Schultze mechanism



Methods of placental delivery:

- Passive method (Brandt- Andrew method).
- Active method (Crede's Maneuver).
- If no spontaneous delivery of placenta, it can be manually removed.

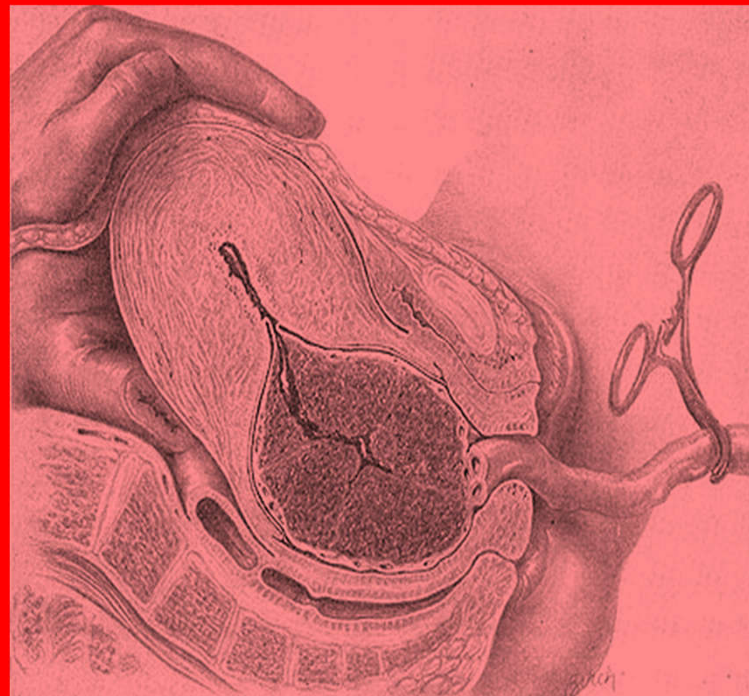
Passive method (Brandt- Andrew method):

- Pushing the uterus upwards with sustained
- gentle traction on the cord.



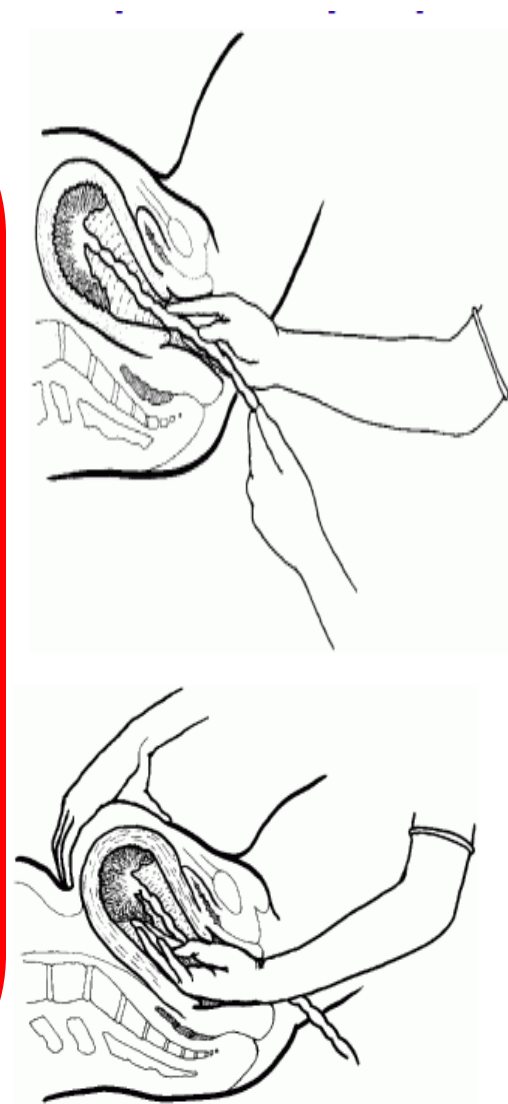
Active method (Crede's Maneuver):

- Squeezing the uterus between the thumb and other fingers.
- Obsolete in modern obstetrics

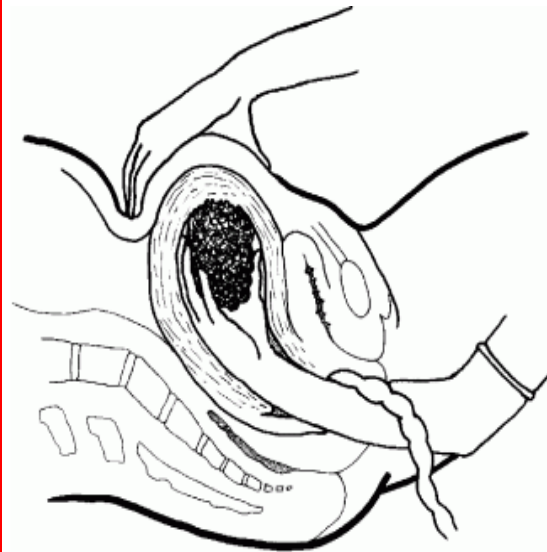


Manual removal of the placenta:

- U.G.A. insert a hand into the vagina and up into the uterus.
- Let go of the cord and move the hand up over the abdomen in order to support the fundus of the uterus.
- Explore the entire cavity until a line of cleavage is identified between the placenta and the uterine wall.



- Detach 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 by sawing movement of the hand until the whole placenta is detached from the uterine wall.
- Hold the placenta and slowly withdraw the hand from the uterus, bringing the placenta with it.



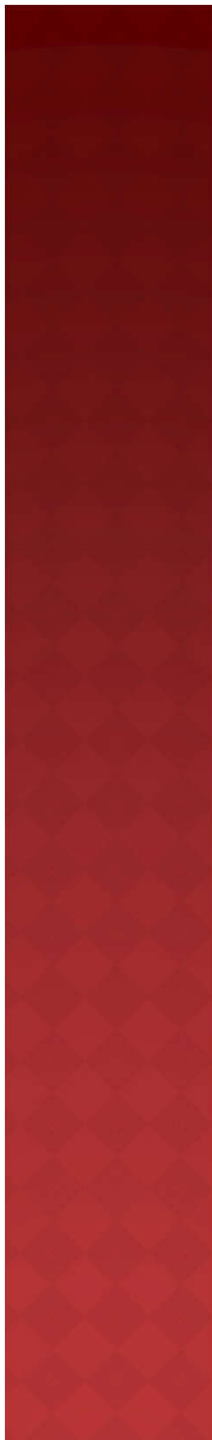
Management of third stage :

The management of third stage is aimed at:

- 1-Complete delivery of the after birth (placenta and membranes).
- 2-Prevention of acute inversion of the uterus.
- 3-prevention of postpartum hemorrhage

IV-Post Delivery:

- 1-Examine the placenta for their completeness, anomalies, length, and number of vessels in the cord and record the placental weight.
- 2-Suture the episiotomy or any laceration.
- 3-Estimate blood loss, count swabs, and take cord blood for Hb, blood group, Rh, bilirubin, and coomb's test for Rh negative mother.
- 4-Check BP, P, T, Lochia and firmness of the uterus before transferring the patient.
- 5-Continue an infusion of syntocinon through the first hour if necessary.
- 6-Allow no food during the first hour, sips of water may be taken, encourage nursing.





Thanks

