Labor and Delivery

Definition of LABOR

Labor is the process by which the products of conception (the viable fetus, placenta and membranes) are expelled from the uterus via the vagina into the external environment.

Normal Labor

- Occurs at term (neither premature nor post-mature).
- Has a spontaneous onset (not induced).
- Is completed after 4 hours, and before 24 hours from the time of its onset (neither precipitate nor prolonged).
- Is achieved without artificial aids (such as forceps).
- Involves no complications (such as excessive hemorrhage).
- Has the (single) fetus presenting by the vertex (top of the head), with the occipit in the anterior part of the pelvis.
- Involves spontaneous delivery of the placenta.

The Factors Affecting Labor:

1- The powers:

Primary power

contraction and Retraction of the uterine muscles

Secondary power

Voluntary muscular efforts of the mother i.e. contraction of the abdominal muscle & the diaphragm during the 'pushing' or 'bearing-down' phase).

2- The passages: **the bony pelvis, cervix, vagina and pelvic floor (muscles).**

3- The passengers: **mainly the fetus (specifically the fetal head), plus the placenta, membranes and liquor.**

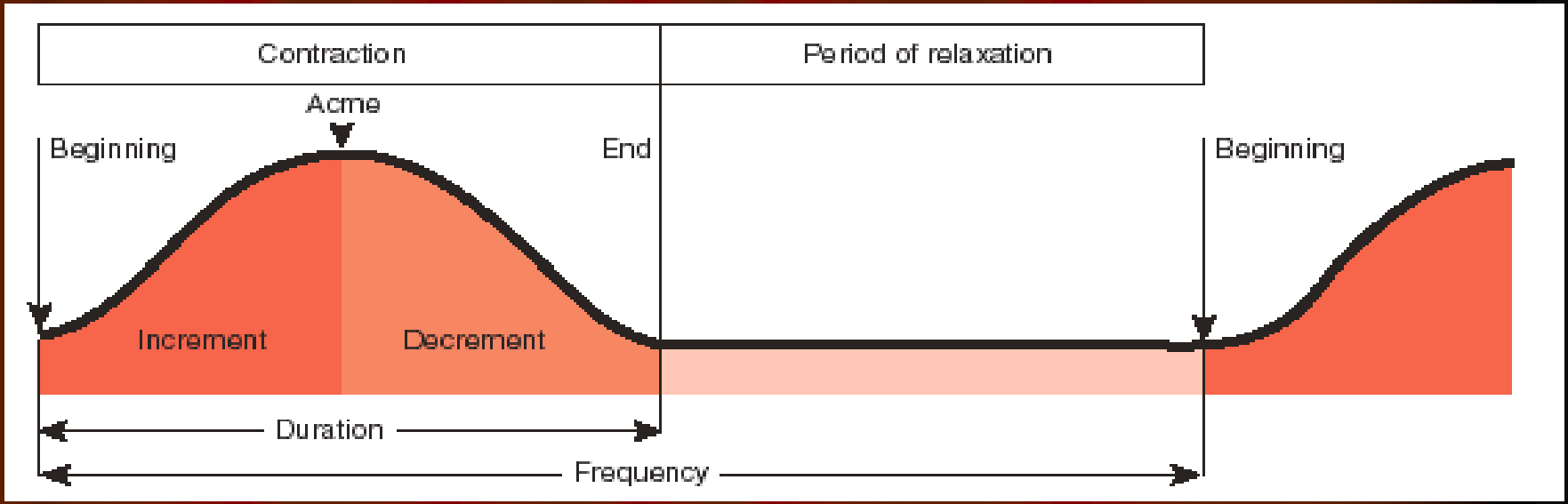
4- Personality & psychological Status : **age, parity.**

Causes of uterine contractions

- Hypoxia of the contracted myometrium
- Compression of nerve ganglia in the cervix and lower uterus.
- Stretching of the cervix during dilatation.
- Stretching of the perineum.

Phases of uterine contraction

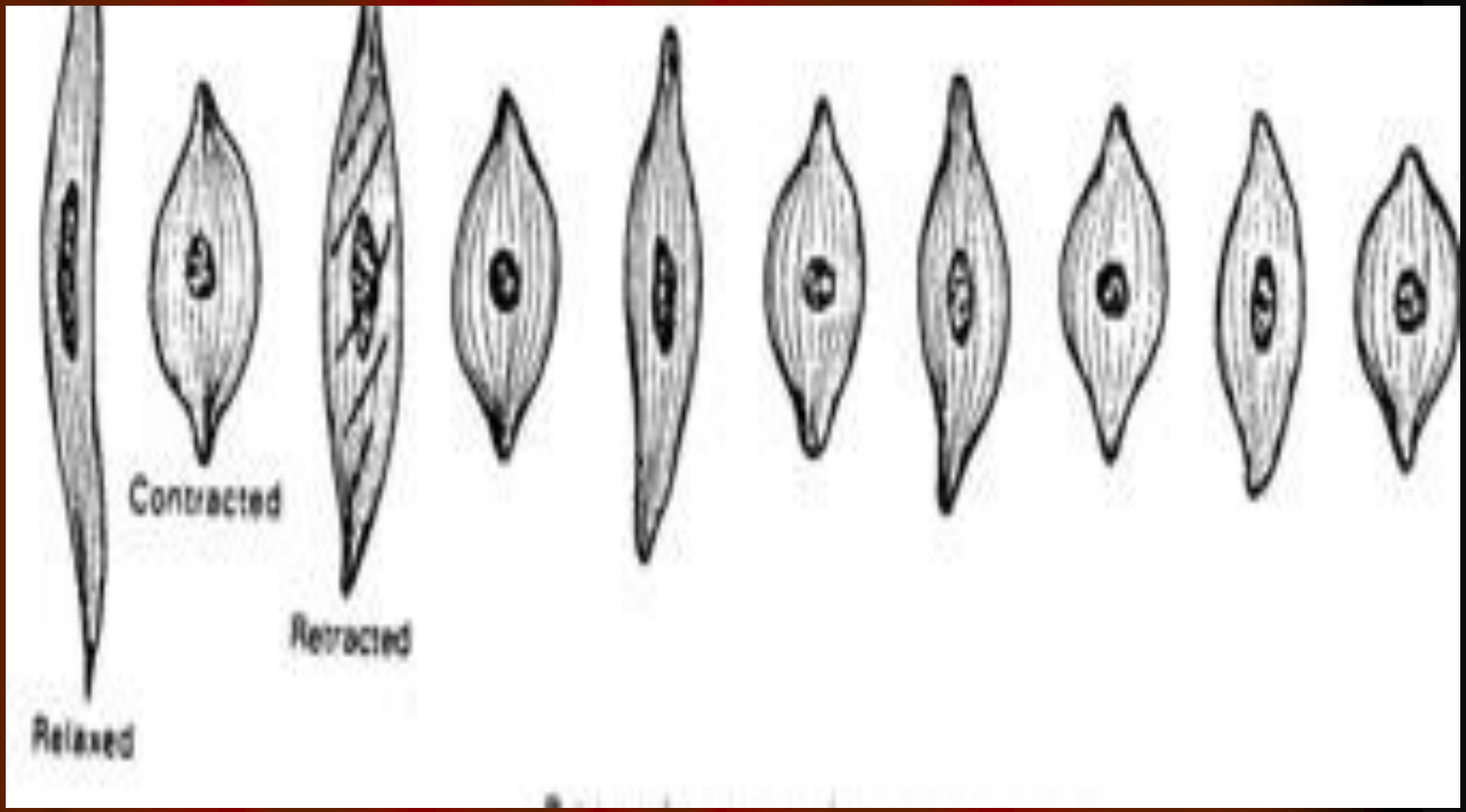
a) Increment
b) Acme
c) Decrement



Retraction

Retraction is shortening that persists after a contraction. The muscle fibers do not relax completely at the end of a contraction, but retain some of the shortening and thickening.

Secondary powers ‘bearing down’



Pic (114) Progress of uterine contraction

The Secondary powers (the abdominal muscles and diaphragm) are used in the second stage of labor; They are used during 'bearing down' or 'pushing;' they are the mother's voluntary expulsive efforts.

Pelvic inlet

11 cm anteroposteriorly

13.5 cm laterally (side to side)

Pelvic Cavity :

The pelvic cavity (between the inlet and the outlet) is circular in shape and curves forwards. Its average measurement is 12 cm in diameter.

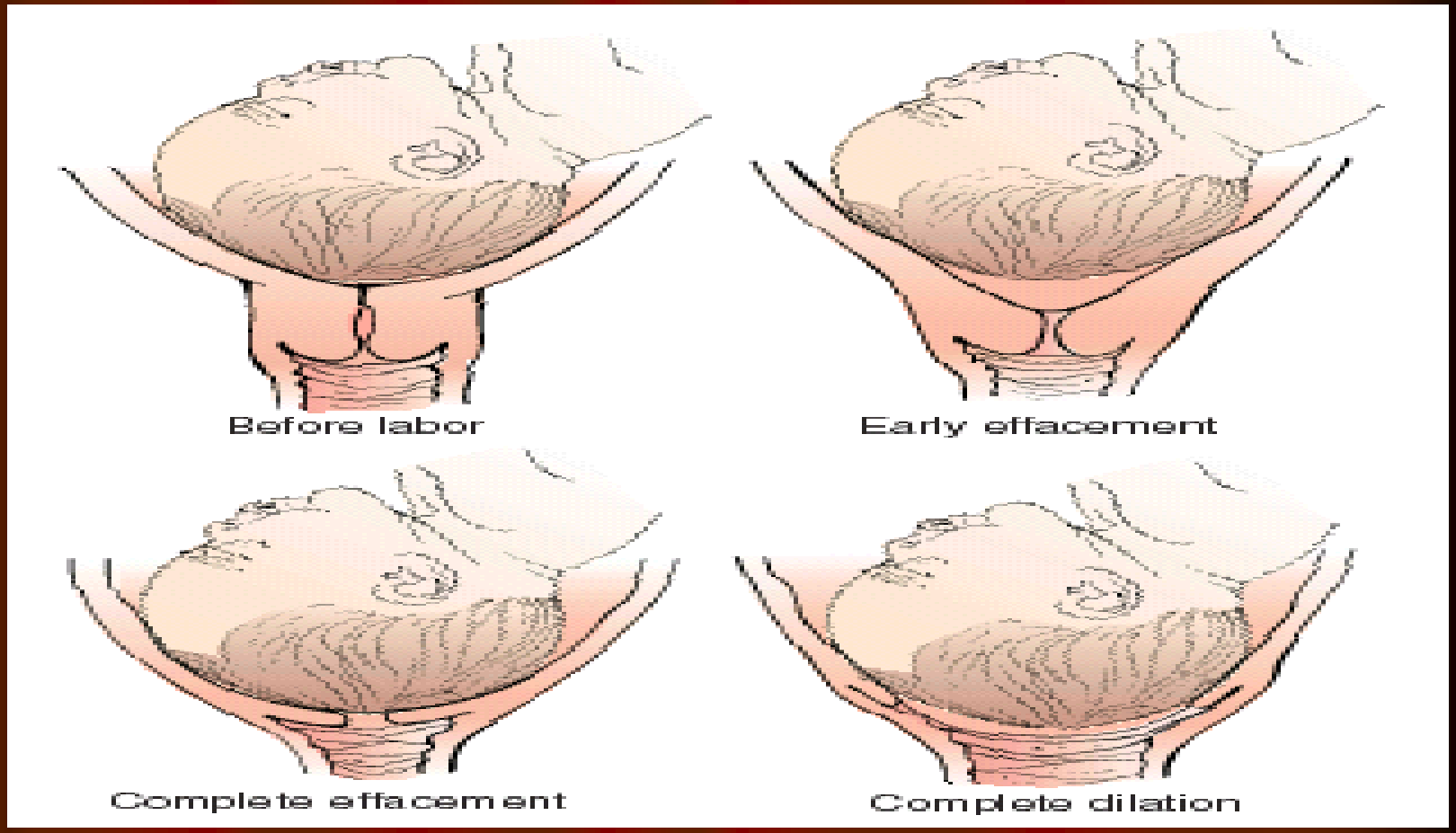
Pelvic outlet :

The pelvic (obstetric) outlet is bordered by the two ischial tuberosities (spines

Soft Tissues

The cervix and vagina
when labor begins, uterine contractions affect the cervix in two ways. Effacement and dilatation

Normally, a primiparous woman will experience effacement before dilation. For a multiparous woman, both processes usually occur at the same time.



Cervical dilation and effacement

The fetal skull:

Made of 5 main bones

- **Two frontal bones**
- **Two parietal bones**
- **One occipital bone**

Sutures:

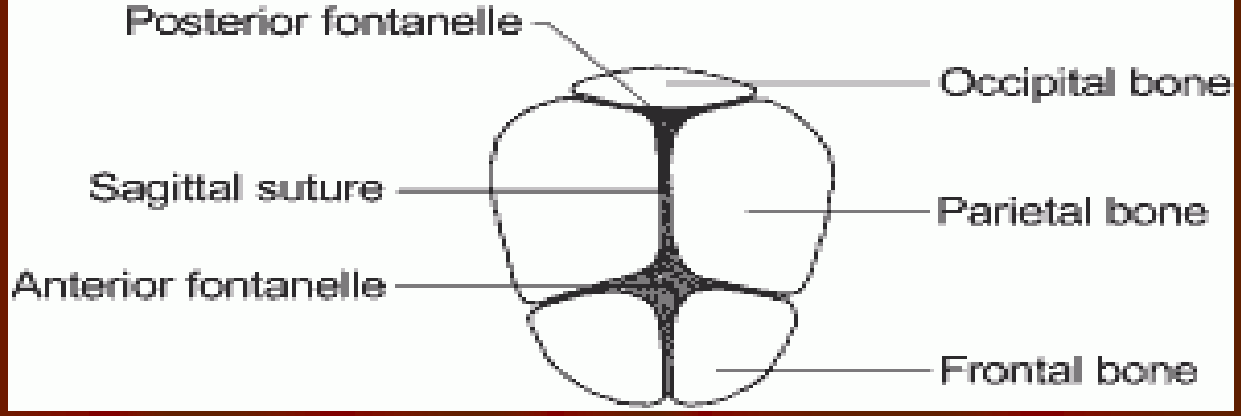
The lines of junction between the bones are called sutures. The main ones are:

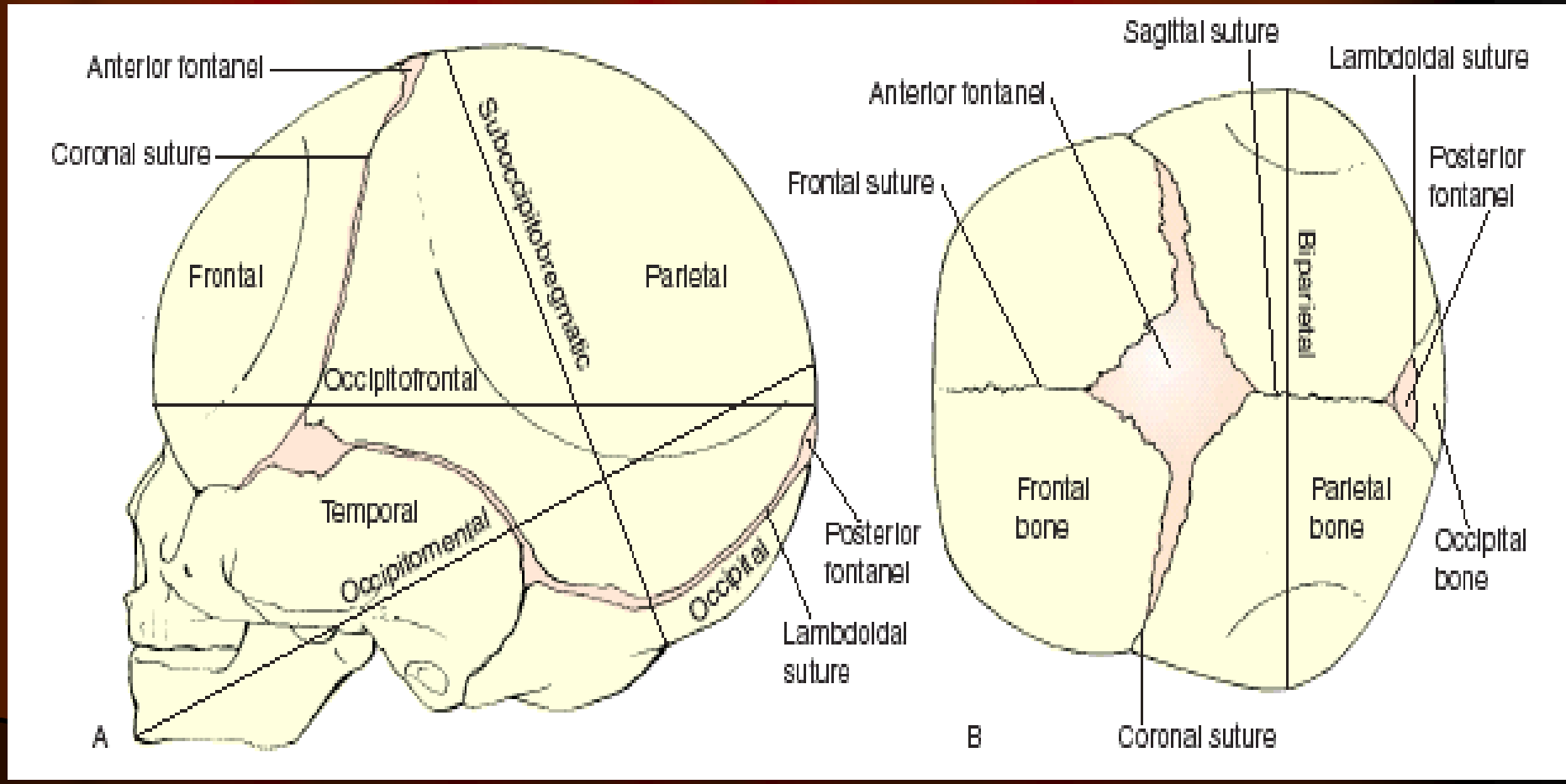
- **Frontal-between the two frontal bones**
- **Coronal-between the frontal and parietal bones**
- **Sagittal-between the two parietal bones**
- **Lambdoidal-between the parietal bones and the occipital.**

Fontanelle

The anterior (called the bregma) is the large diamond-shaped (2.5*1.25cm) formed by the junction of the parietal and frontal bones

The posterior fontanelle is the smaller, triangular-shaped, junction of the parietal and occipital bones.


Posterior fontanelle
Occipital bone
Sagittal suture
Parietal bone
Anterior fontanelle
Frontal bone


Anterior fontanel
Coronal suture
Frontal
Parietal
Sutura sagittalis
Occipitofrontal
Temporal
Occipitomental
Occipital
Posterior fontanel
Lambdoidal suture
A
Sagittal suture
Lambdoidal suture
Anterior fontanel
Frontal suture
Posterior fontanel
Biparietal
Frontal bone
Parietal bone
Occipital bone
Coronal suture
B

Moulding **(Slight overlapping, caused gradually by the pressure of the birth canal**

Attitude : (Relation ship of the fetus body parts to each other. Flexion, or extension).

Lie Relationship of the long axis of the fetus to long axis of the mother. (longitudinal – transverse or oblique)

Position: Relationship between back of the fetus and the anterior abdominal wall of the mother.

Presentation : part of the fetus lying in the pelvic prim

Well-flexed attitude:
Vertex presentation
Smallest diameter presents–9.5 cm

No flexion or extension:
Military presentation
Occipitofrontal diameter presents–11 cm

Partial extension:
Brow presentation
Largest diameter (occipitomental) presents–13.5 cm

Full extension:
Face presentation
Submentobregmatic diameter presents–9.5 cm

Causes of the onset of labor

1- Hormone level changes are probably due to placental aging

- **Progesterone levels fall**
- **Oestrogen and prostaglandin levels-rise**

2- Fetal pressure•

Preliminary signs of labor :

- Lightening
- Greater pressure below
- False Labor
- Braxton-hicks contractions,
- Formation of fore water

Late signs of labour

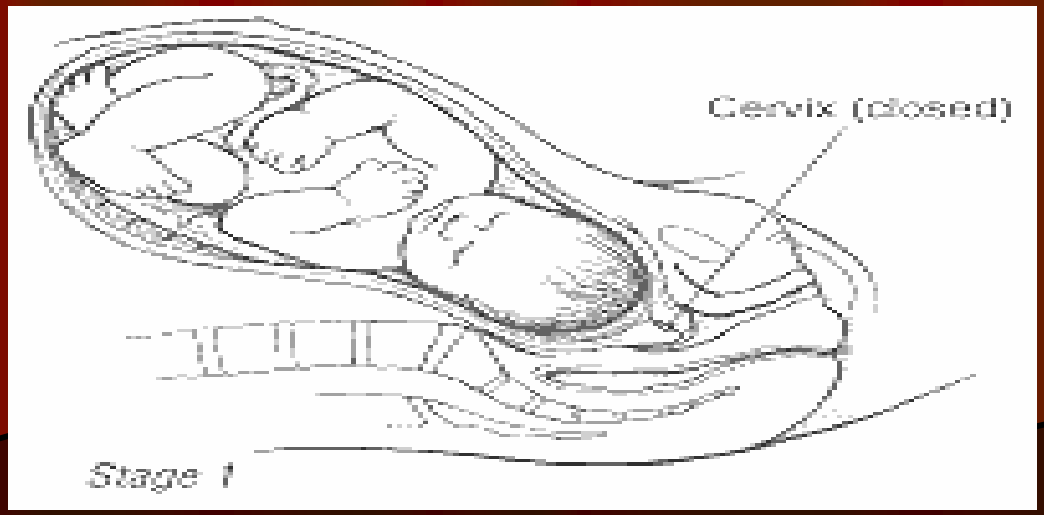
Show

Contraction

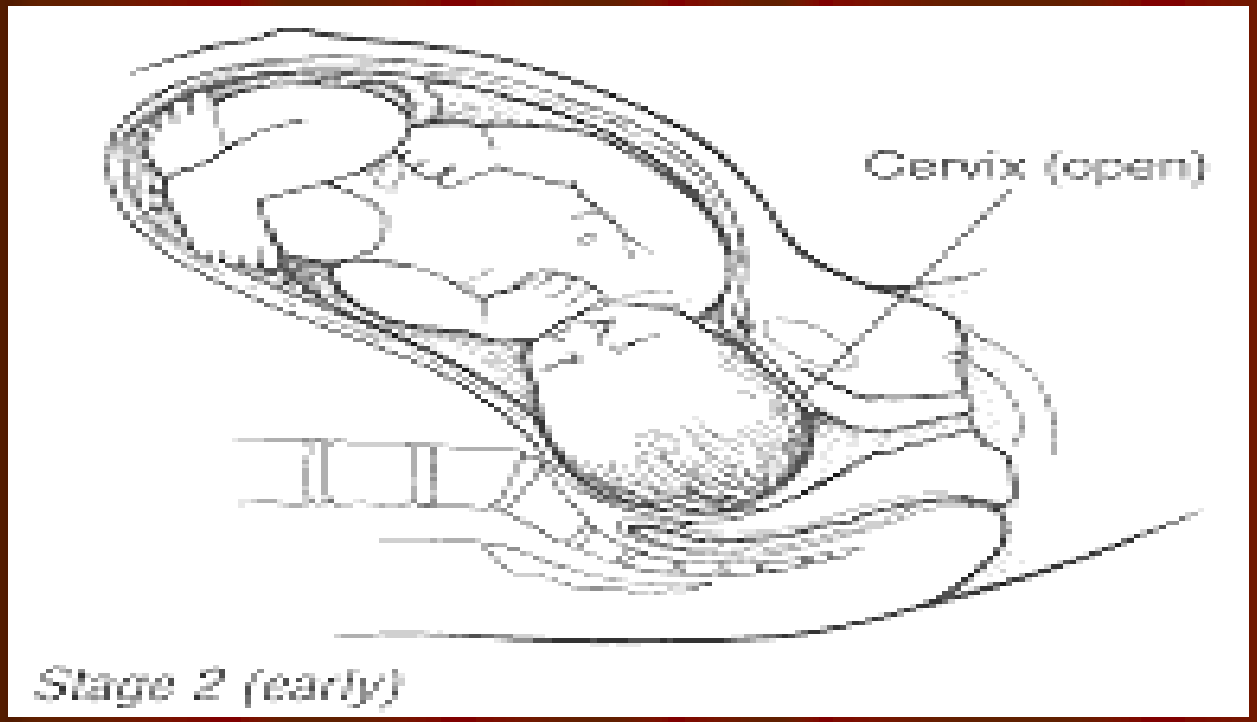
Rupture of membrane

THE STAGES OF LABOR

1)The first stage is the stage of dilatation, starts from the onset of regular contractions until the cervix is fully dilated

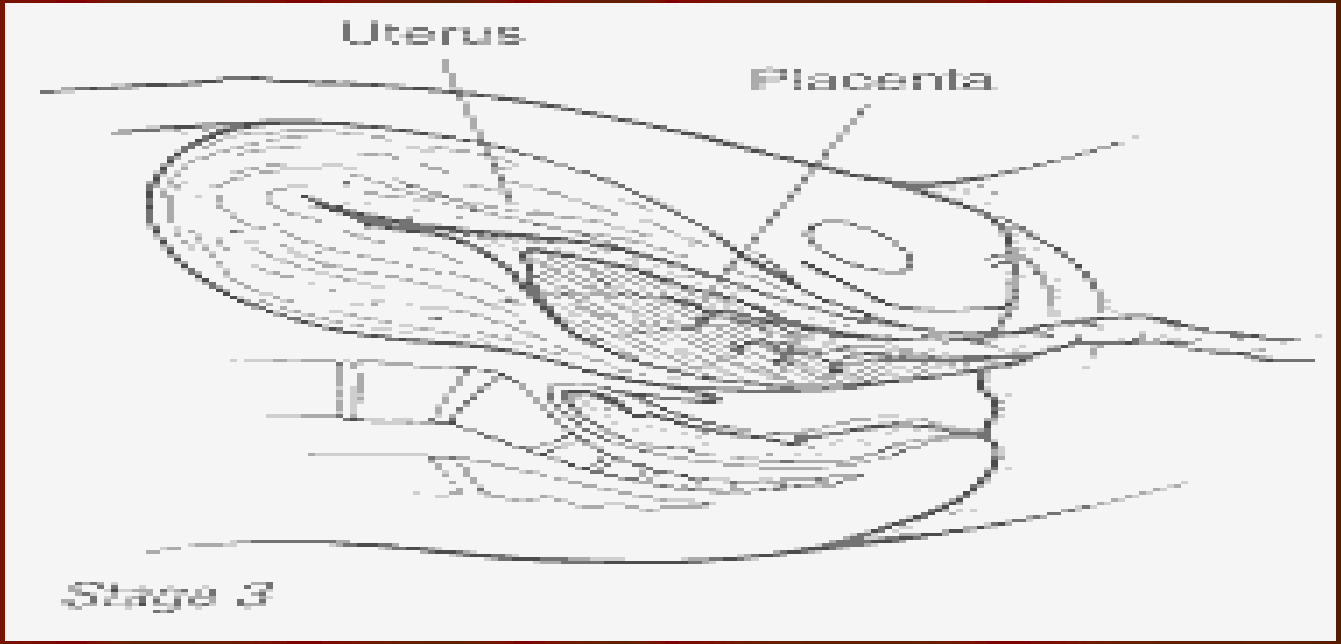


2)The second stage: **is the stage of expulsion, starts from complete cervical dilatation until the expulsion of the fetus.**



Pic (111)

3) The third stage: is the stage of separation, following delivery of the fetus until the complete expulsion of the placenta.



4) Fourth Stage:

The hour or two following the completion of Labor,

The first stage

The average duration of the first stage of labor is 10-12 hours in a primi-gravida, and about 4-6 hours in a multipara.

At the end of the first stage:

* The cervix is fully dilated
* The uterus, cervix and vagina form one continuous canal
* The membranes rupture (it this has not already happened)
* There will be strong uterine contractions usually every 2 to 3 minutes, lasting between 50 and 60 seconds each
* The fetal head will have descended into the pelvis.

	True Labor	False Labor
Cervical changes	Progressive dilation and effacement	No change
Membranes	May bulge or rupture spontaneously	Remain intact
Bloody show	Present	Absent; may have pinkish mucous or may expel mucus plug
Contraction pattern	Regular (may be irregular at first) pattern develops in which contractions become increasingly intense and more frequent	Pattern tends to be irregular, although the contractions may seem to have a regular pattern for a time
Pain characteristics	Often starts in the small of the back and radiates to the lower abdomen; may begin with a cramping sensation	May be described as a tightening sensation; usually the discomfort is confined to the abdomen
Effects of walking	Contractions continue and become stronger	May decrease the frequency or eliminate the contractions altogether

Duration of Different Stages of labor

Duration of labor	First stage	Second stage	Third stage
Primigravida	12-16 hours	1-2 hours	10-20 minutes
Multipara	6-8 hours	10-30 minutes	10-20 minutes

True Labor contractions	*Braxton-Hicks contraction*
Regular	Irregular
Increase in frequency	Does not increase in frequency
Not relieved by analgesic	Relieved by analgesic
Increased in frequency by enema	Not
Associated with stretching & dilatation of cervix	Not productive
Associated with bulge of fore water	Not associated with bulge of for water

Phases

Latent phase:

- The cervical dilation is less than 3 cm.

- The uterine contractions are t infrequent, uncomfortable, and irregular, but generate force to cause slow dilation and some effacement of the cervix

- A prolonged latent phase is greater than 20 hours in the primigravida, and greater than 14 hours in the multipara.

Active phase:

The cervix dilates from 3-10 cm.

progressive cervical dilation.

A prolonged active phase is see in the primigravida who dilates at less than 1.2 cm/hr, and in the multigravida who dilates at less than 1.5 cm/hr.

Signs and Symptoms of 2nd stage of labor

- Strong uterine cont, urge to bear down.
- Gaping of anus & vulva.
- Plugging of perineum
- Flashing of the face
- full dilatation, complete effacement.
- Appearance of presenting part from the vulva.
- Spontaneous rupture of membranes.
- Changing in woman cry.

THE MECHANISM OF LABOR

The Mechanism of labor is a series of passive adaptive movements of the fetal head in order to accommodate it self to pass through the irregular birth canal .

1) Engagement

2) Descent

3) Flexion

4) Internal rotation

5) crowning

6) extension

7) restitution

8) external rotation

9) Delivery of shoulder (anterior) &

Engagement Station

THE THIRD STAGE OF LABOR

Following delivery of the baby, the uterus contracts to a twenty week size, causing the detachment of the placenta and expelling the upper vagina.

Signs of placental separation

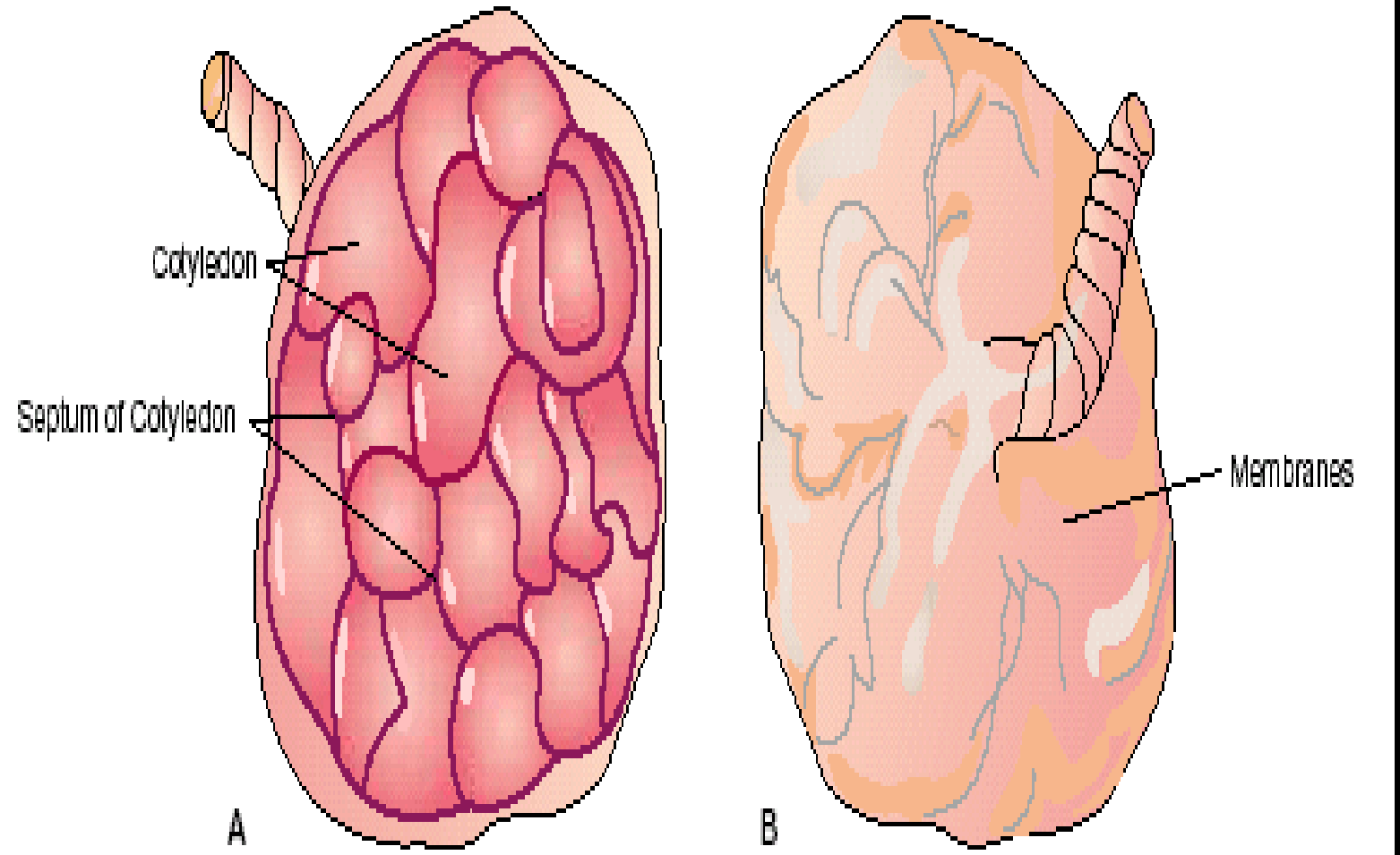
1-The uterus becomes smaller, harder, higher, more globular and more mobile.

2-Suprapubic bulge appears due to presence of the placenta in the lower uterine segment.

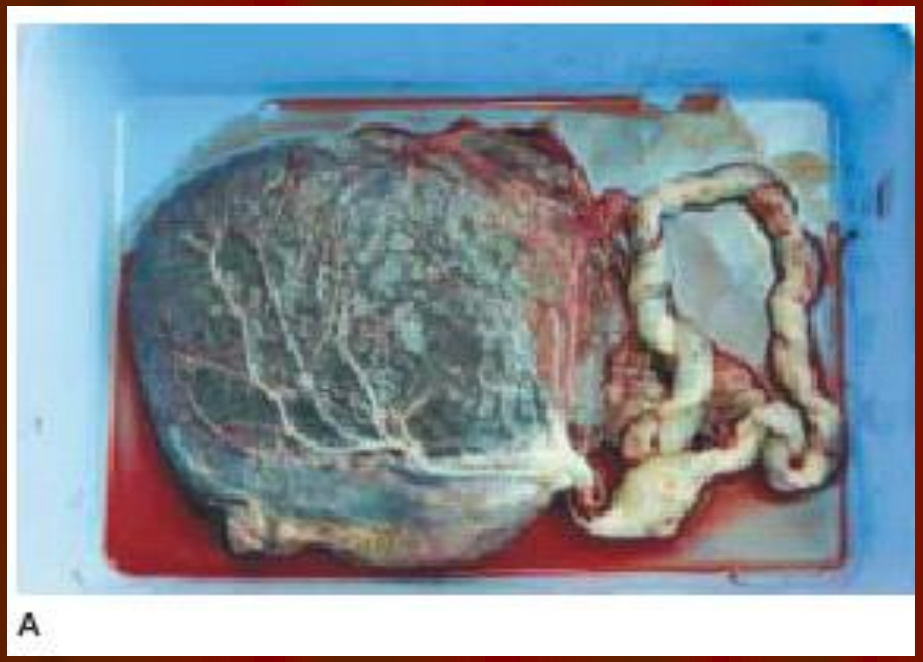
3- The passage of gush of blood per vagina.

4- The umbilical cord outside the vulva increases in length.

5- Loss of pulsation in the cord when pressure is exerted on the funds.


Cotyledon
Septum of Cotyledon
A
B
Membranes

Pic (127)



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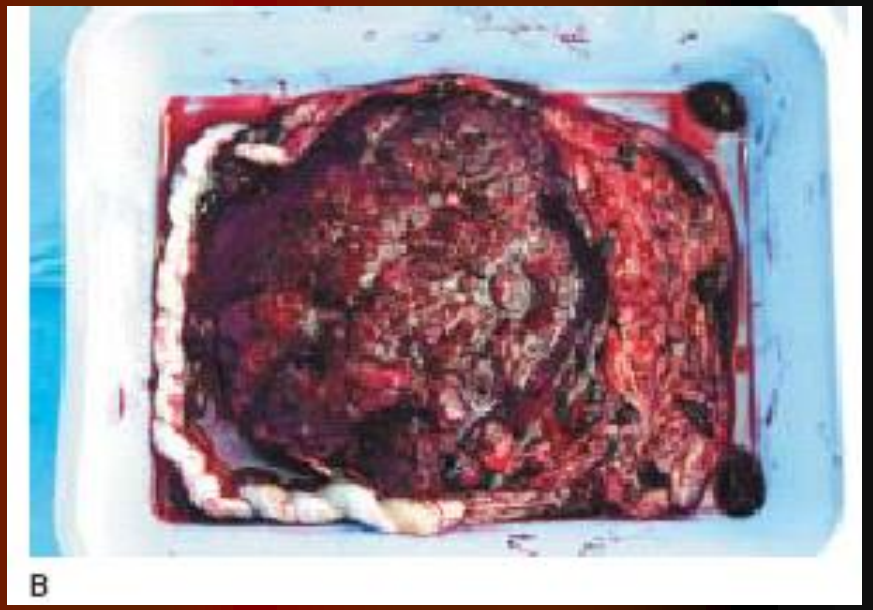
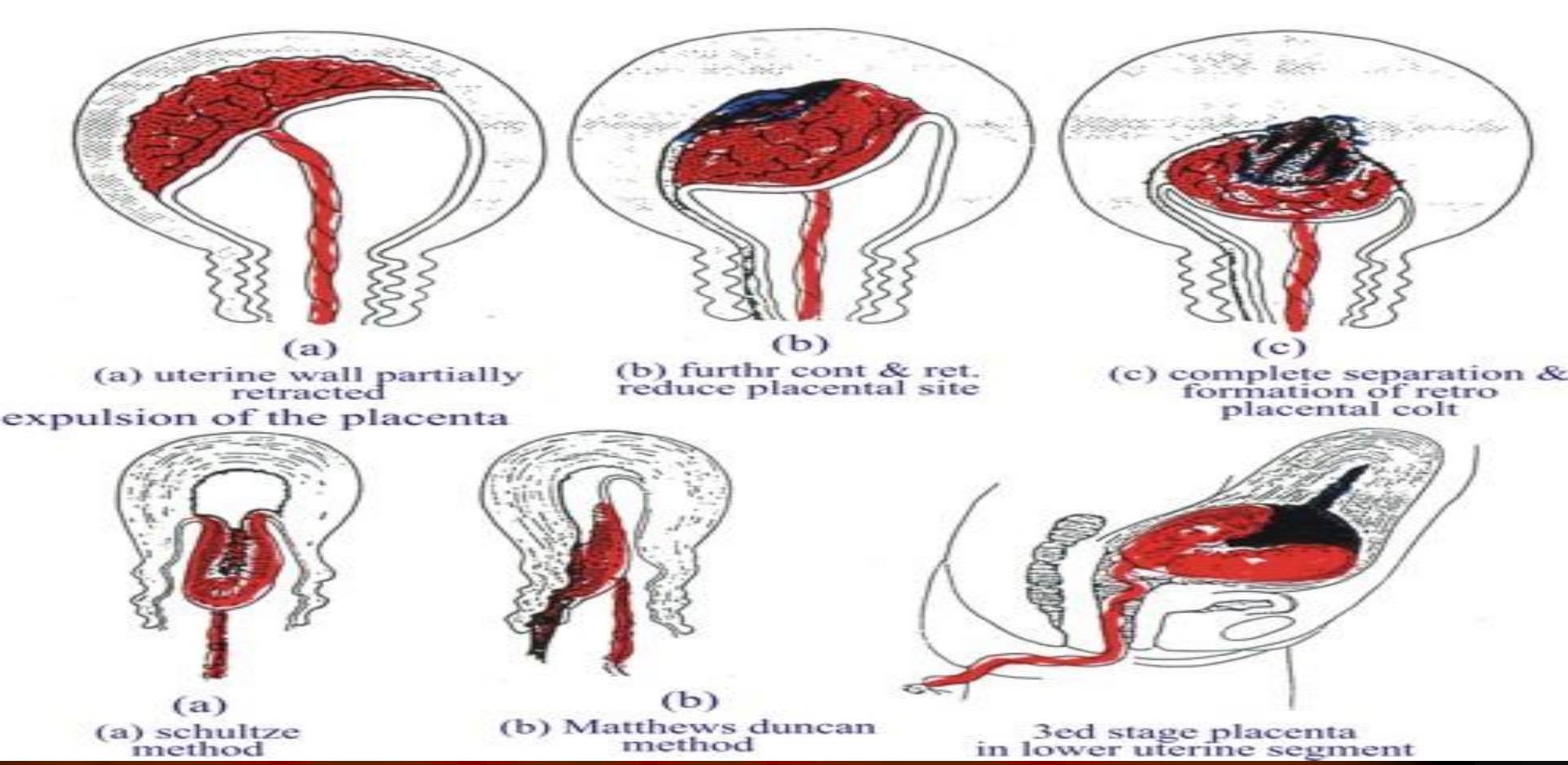


A healthy placenta after delivery.
(A). Notice the shiny surface of the fetal side. The umbilical cord is inserted in the center of the fetal surface.
(B). The maternal side is rough and divided into segments (cotyledons).


(a)
(a) uterine wall partially retracted
expulsion of the placenta
(b)
(b) furthr cont & ret. reduce placental site
(c)
(c) complete separation & formation of retro placental colt
(a)
(a) schultze method
(b)
(b) Matthews duncan method
3ed stage placenta in lower uterine segment

Pic (129)

	Schuitze's Method	Methews Duncan's Method
Percentage	**80% of cases**	**20% of cases**
Bleeding	**Less liability for bleeding**	**More liability for bleeding**
Separation	**Start in the center as an inverted umbrella**	**Start in periphery as a button and button hole**
Mode	**Presented by fetal surface**	**Presented by maternal surface**

MANAGEMENT OF LABOR

The expertise to management of normal labor begins well before the onset of labor, enabling proper preparation of the mother for the birth.

This primarily involves education about what happens at each stage and in addition, a variety of methods which enable the mother to control pain to some degree and to regulate expulsive efforts during the second stage.

In the Egypt today most of women are confined to hospital because obstetric emergencies like

fetal hypoxia and postpartum haemorrhage can spontaneously occur in apparently normal deliveries and the facilities are readily at hand, a long with deal with these here.

No labor is normal until the fourth stage is safely concluded and since danger can arise at anytime to the mother and the fetus.

1- complete history taking:

Personal, gynecological &obstetrics, medical &surgical etc.....

2- Full examination:

Temperature, pulse, BP, respiratory rate, state of hydration are all stated. Check urine for ketones, protein and glucose.

3- Abdominal/obstetric examination:

Inspection, palpation, auscultation to determine fetal lie, position and the state of the presenting part. It will also show the frequency and strength of uterine contractions. The fetal heart rate is checked and any abnormalities of the rate and rhythm is noted.

4- Vaginal examination:

This should be performed after cleansing the vulva and introitus and using an aseptic technique. It will show:

Degree of dilatation of the cervix, consistency and effacement.

Whether the membranes are intact or ruptured.

The nature and position of the presenting part and fetal head.

Assessment of the bony pelvis, particularly the pelvic outlet.

5- Examination of the vulva:

- Inspect for gaping of introitus.
- Observe colour and odour of liquor amnii, and presence of meconium or blood. Offensive odour indicates infection.
- Check for oedema of the vulva. If present, it indicates pre-eclampsia.

During labor the woman should always be informed about the dilatation of the cervix, and the condition of her baby, if the fetal hear rates monitored, you must explain the purpose of the fetal heart rate monitor to the mother too.

The reason for any intervention should also be discussed with the mother and her partner fully.

Therefore the general principles of management are:

Observations and intervention if the labor becomes abnormal.
Pain relief and emotional support for the mother.
Adequate hydration throughout labor.

FETAL HEART RATES

Table 1 Fetal heart rate definitions

Definition	Heart Rate (Beats per minute)
Normal	1.(110 - 150)
	160-180 (150 -180)
Tachycardia -	>180
moderate -	100-120 (100 - 110)
severe	<100
Bradycardia -	
moderate	
- severe	

Table (7)

5-Signs of maternal distress

Increased pulse rates over 100 b/min.
Elevated temperature, more than 37.5 c0
Decreased blood pressure.
Sweating and pale face.
Signs of dehydration.
Dark vomitus.
Ketone bodies in urine
Irritability and restlessness.
Anxious expression.

Signs of an Increasingly Distressed Fetus

As the fetus becomes hypoxic, certain physiologic signs can be noted. These signs are listed in order of least distress to most distress. As you move down the list, the signs are indicative of ever-worsening hypoxia.

1. Absent accelerations
2. Gradual increase in FHR baseline
3. Loss of baseline variability
4. Late deceleration pattern develops
5. Decelerations gradually increase in length and take longer to recover to baseline
6. Persistent bradycardia
7. Death

Nursing diagnosis:

- Alteration in comfort: acute pain related to uterine contraction.
- Anxiety related to impending labor and delivery.
- Rest is important in the first stage of labor to reserve energy, prevent and anxiety, and maintain mental equilibrium.

6-Signs of fetal distress:

Increase or decrease of fetal heart rate .

Excessive fetal movements.

Excessive moulding of the fetal head.

Passage of meconium in cephalic presentation

Excessive formation of caput succedanum.

1. Propulsive: from full dilatation to the presenting part reaching the pelvic floor.

Nursing Diagnosis:

- Pain related to descent of the fetus and stretching of vagina and perineum.
- Fatigue related to inability to rest and pushing efforts.
- Anxiety related to unknown outcome of labor process.
- High risk for infection.
- Risk for Trauma related to pushing techniques and positioning for delivery

The advantages of this position are:

Voluntary efforts are better brought up.
Change of position is not needed to check FHS and to conduct 3rd stage of labor.
Draping woman and preserving aseptic techniques are easy.
Left lateral position: Woman lies on left side, her thighs are partly flexed and her knees are held apart by the help of another person.

The advantages of this position are:

- Decrease liability of perineal laceration.
- Easy removal of feces.
- Easy manipulation of shoulders.
- Woman feel more comfort

1-Preparations:

A- Preparation of the delivery room:

- Delivery room should always be ready for the conduction of labor. Delivery trolley and emergency drug tray should be ready.
- The delivery room should be warm enough for the baby.

- All equipment needed for baby's care, and resuscitation trolley should be ready for use at all times.
- Safety of woman should be ensured. She should be transferred between contractions, and supported adequately.
- Enough privacy should be provided.
- Strict aseptic technique should be maintained.\

B- Preparation of the woman:

- Place the woman on the delivery table and put her legs in leg holders.
- The legs and thighs should be dressed with sterile leggings. Sterile towels should be laid over abdomen and under buttocks, leaving only vulva and perineum exposed.
- Empty the bladder. Swab external genitalia and apply sterile pad.

C-Preparation of the attendant:

- The attendant should put on cap and mask, wash and scrub hands, and put on a sterile gown and gloves.
- The attendant starts to scrub up for primigravida when head is seen at the vulva during contractions, and for multipara towards the end

2-Promotion of comfort:

- Encourage the woman to rest and to let all muscles relax between contractions, e.g. breathing exercises.
- Give few sips of water to provide moisture, and relieve dryness of mouth.
- Sponge the face and hands with cool water.
- Keep the woman informed of her progress.

3-Bearing down:

- Prop up the woman with additional pillows to assume semi-recumbent position.
- Encourage her to push during contractions, and to relax between contractions.
- Teach the woman how to bear down .She takes a deep breath, holds it, closes her lips and glottis, and bears down.
- The woman must not cry out or make any sound because much of the expulsive force will be wasted.

4-Observations:

- Close and frequent observation is very important for both the woman and fetus.
  - The fetal heart should be checked after 2-3 contractions.
  - If fetal distress is suspected, check it after each contraction.
  - The maternal pulse should be taken every 10 minutes.
  - The strength and frequency of the contractions, and whether the uterus is relaxed between them must be closely watched.

5-Protection of perineum:

- Obtain the woman's co-operation. She should only push when instructed, and must desist while the head is actually being born.
- Maintain flexion, and control too rapid extension of the head.
- Deliver the head between contractions.

6-After delivery of the head:

- Wipe the eyelids with separate swabs of sterile cotton.
- Wipe any mucus from the mouth and nostrils with a gauze swab.
- If the umbilical cord is looped round the baby's neck, slip it over the head if it is loose, or clamp and cut it, if it is tight.
- Give the woman IM syntometrine, 1 ml after delivery of the baby's anterior shoulder, or after expulsion of placenta, to stimulate uterine contractions and prevent bleeding.
- Note and record the time of birth.

Evaluation (expected outcomes):

- The woman is able to push effectively.
- She gains support and comfort from the nursing personnel.
- Her physiological and psychological status has been maintained.
- The baby is born without difficulty

EPISIOTOMY

The decision to perform an episiotomy requires considerable experience and judgment. The aim of this procedure is to deliver the fetal head but minimize perineal tears. However not all women experience a severe tear and certainly most multi-gravidae will be able to deliver with an intact perineum. Primi-gravidae may also be able to avoid an episiotomy.

Aim:

To enlarge the outlet in order to

- **Hasten delivery of a distressed baby.**
- **For instrumental or breech delivery.**
- **To** **ture**

COMPLICATIONS OF EPISIOTOMY

1.Bleeding
2.Infection and breakdown.
3. Haematoma formation.
4. Superficial dyspareunia.
5.Incorrect repair leading to change in size of introitus.

Management of third stage of labor

Assessment:

- Assess uterine contractions.
- Observe maternal vital signs.

Nursing Diagnosis:

- Fatigue related to inability to rest and pushing efforts during labor.
- Alteration of comfort, pain related to episiotomy, perineal distension, and muscle strain during labor.
- Alteration of fluid less than body requirements.
- Knowledge deficit related to physiological changes of normal labor, new-born care, and self care.
- High risk for infection secondary to episiotomy during delivery.

Immediate care of the newborn

- ABCW principles of delivery: Remember the following ABCW principles of delivery to ensure adequate resuscitation of the baby:
  - Airway.
  - Breathing.
  - Circulation.
  - Warmth.

Objectives of immediate care of the newborn:

- To establish and maintain respiratory function.
- To provide warmth and prevent hypothermia.
- To provide safety from injury and infection.
- To identify actual and potential problems that might require immediate action.

Assessment of the baby's condition:

1. The airway: to clear the airway, hold the baby upside down for few seconds and perform gentle suction to establish breathing, and improve baby's colour.
2. The APGAR Score: APGAR score involves consideration of 5 signs, and the degree to which they are present or absent. It is recorded at 1 and 5 minutes after birth.

Sign	0	1	2
Heart rate	absent	Slow below 100	Fast above 140
Respiration	absent	Weak crying	Good crying
Muscle tone	Limp or flaccid	Some flexion	Active flexion
Reflex irritability	No response	Grimace	Good response
Colour	Blue and pale	Body pink and extremities blue	Completely pink

Normal = 7 - 10

Total Score = 10

Severe asphyxia = 0 - 3

Mild asphyxia= 4 - 6

3-Wamth: It is very important to keep the baby warm at birth because he will lose heat rapidly through evaporation . So, labor room should be arm and the baby should be dried gently, and wrapped in a warm dry towel to avoid exposure.

4-Umbilical cord:

Use sterile plastic clamp at 3-5 cm from umbilicus to prevent strangulation, and a congenital umbilical hernia.

Then cut away from the clamp about 1cm.

Nowadays, alcohol gauze and bandage are not applied to the stump.

5-Weight and measurements:

- Weigh the baby after birth. The normal weight is 2.5 – 3.5 kg.
- Measure its length. The average length is 50 cm.

6-Measure its circumferences. The head and chest circumferences are 13 inches.

Care of eyes:

- The eyes are washed with sterile warm water.
- Erythromycin ointment is the drug of choice now.

7-Vitamin K should be given to prevent bleeding.

8-Identification:

- It is very important to label the baby by its sex, and its mother's name.
- Identity bracelet is placed around wrist or ankle.
- Neck strand of lead, or footprint, may be used.

Fourth stage of labor

Definition:

The Fourth stage of labor involves the very close observation of mother and infant after the delivery of the placenta. It begin with the delivery of the placenta and ends after one hour postpartum.

Duration:

One to two hours after the delivery of the placenta

Care during the fourth stage of labor:

- Note & record vital signs & blood pressure.
- Observe and record the amount of vaginal blood loss every 15 minutes or more often if necessary.
- Make sure that the uterus is hard and well contracted. Massage the uterus gently and frequently to maintain firm contraction.