

Normal labor and delivery

Csaba Ákos MD
Semmelweis University
Faculty of Medicine
1st Dept. of Obstetrics and Gynecology



Questions to answer

- When does normal labour start?
- How long is labour?
- Stages of labour?
- Mechanism of labour?
- Management of labour?
- Danger during labour?
- What is „normal labour“?



When does normal labour start? How long is labour?

- Labor usually starts within 2 weeks of (before or after) the estimated date of delivery. **Exactly what causes labor to start is unknown.**
- On average, labor lasts 12 to 18 hours in a woman's first pregnancy and tends to be shorter, averaging 6 to 8 hours, in subsequent pregnancies.

Start of labour

- Every woman's labour is different.
 - Persistent lower back pain or abdominal pain, with a pre-menstrual feeling and cramps.
 - Painful contractions that occur at regular and increasingly shorter intervals, and become longer and stronger in intensity.
 - Broken waters. Membranes may rupture with a gush or a trickle of amniotic fluid.

Phases of parturition



- Phase 0 – uterine quiescence
- Phase 1 – preparation for labor
- **Phase 2 – the process of labor**
 - 1st stage of labor – cervical effacement and dilatation
 - 2nd stage of labor – expulsion of the fetus
 - 3rd stage of labor – separation and expulsion of the placenta
- Phase 3 – parturient recovery

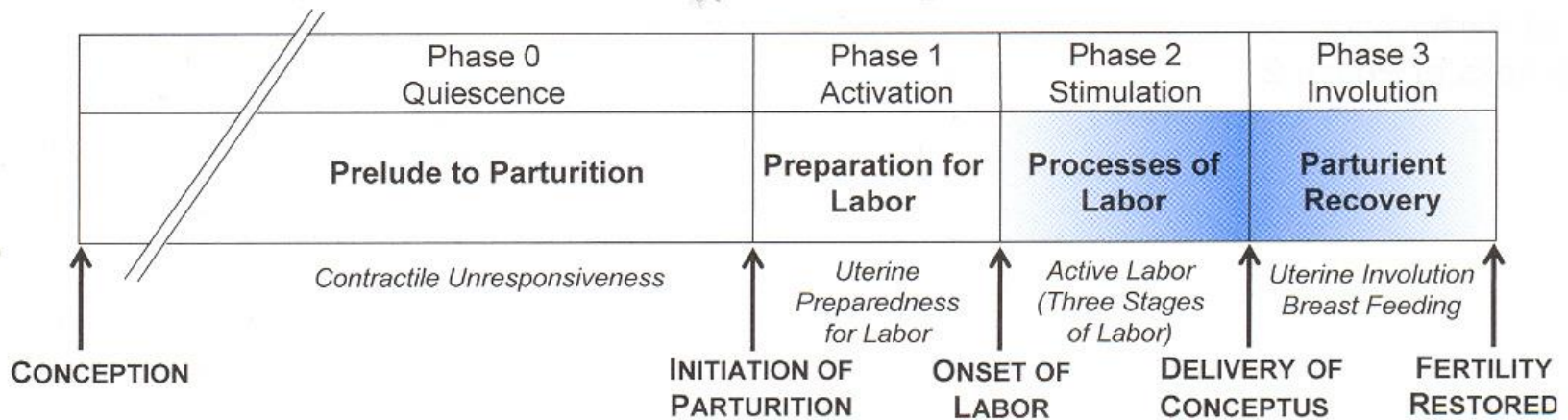


FIGURE 6–1. The phases of parturition and the onset of labor.

AIMS in the management of labour

- To achieve delivery of a normal, healthy child (**malpractice cases!!!**)
- To recognize and treat potential abnormal conditions before significant hazard develops for the mother and/or the fetus

Principles of the management of labour

- **Diagnosis of labour** (recognition of the start)
- **Monitoring of the progress of labour**
- **Ensuring maternal well-being**
- **Ensuring fetal well-being**

Criteria for normal labour

1. Spontaneous expulsion,
2. Of a single,
3. Mature fetus (37. completed weeks-42. weeks),
4. Presented by vertex,
5. Through the birth canal (vaginal delivery),
6. Within a reasonable time (more than 3, less than 18 hours),
7. Without complications to the mother,
8. Without complications to the fetus.



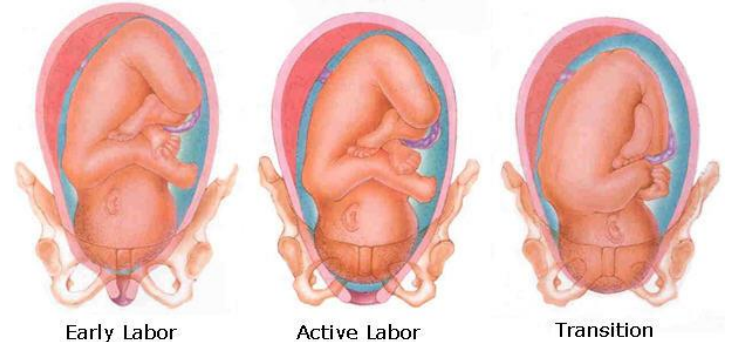
Influencing factors

- The 3 „P“: (progress of labor)
 - **P**ower: uterus (myometrium)
 - **P**assenger: fetus (head mostly)
 - **P**assage: (pelvis of the mother)

Stages of delivery (I.)

■ First stage:

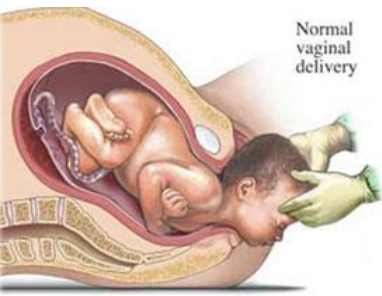
- Starts with the onset of true labor contractions
- Ends when the cervix is fully dilated (10cm)
- Longest stage of labor



■ Second stage:

- Begins with the complete dilatation of the cervix
- Ends with the birth of the baby

Duration is between 30 and 90 minutes



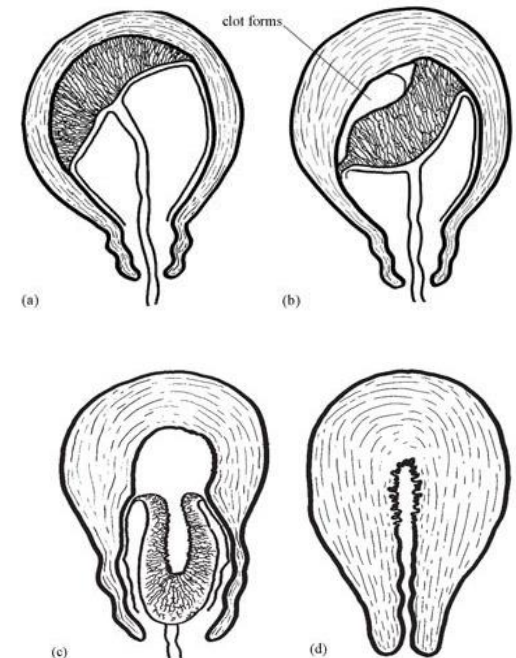
Stages of delivery (II.)

■ Third stage of labor:

- Separation and expulsion of placenta and membranes
- Duration is between 5 and 30 minutes
- Shortest stage of labor

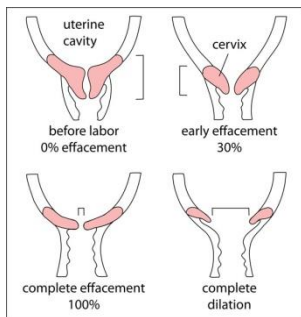
■ Fourth stage of labor:

- After the expulsion of placenta
- Duration is 2 hours
- Increased risk for bleeding



First stage of delivery

- 1. **Regular** contractions
- 2. **Stronger** and stronger contractions
- 3. Increasing in **frequency** (↑)
- 4. **Longer** and longer contractions



causes

Cervical dilatation and effacement

First stage of delivery

- Contraction and retraction of uterine musculature
- Mechanical pressure by the membrane
- The descend of the presenting part
- **Cervical dilatation and effacement**

First stage of delivery

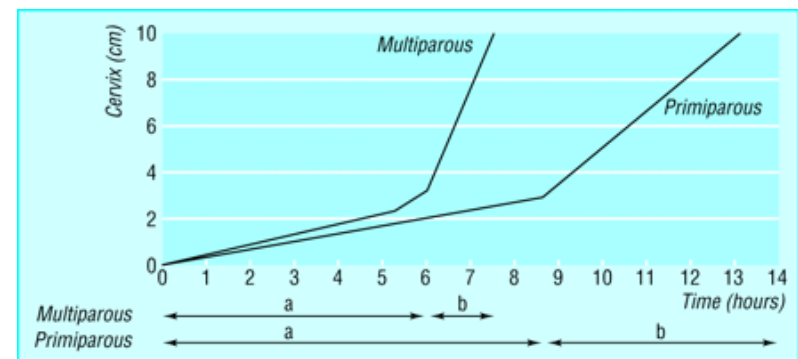
■ Phases of cervical dilatation:

○ Latent phase:

- the first 3 cm of dilatation, it is a slow process {8 hours at nulliparous, 3 hours at multiparous}

○ Active phase:

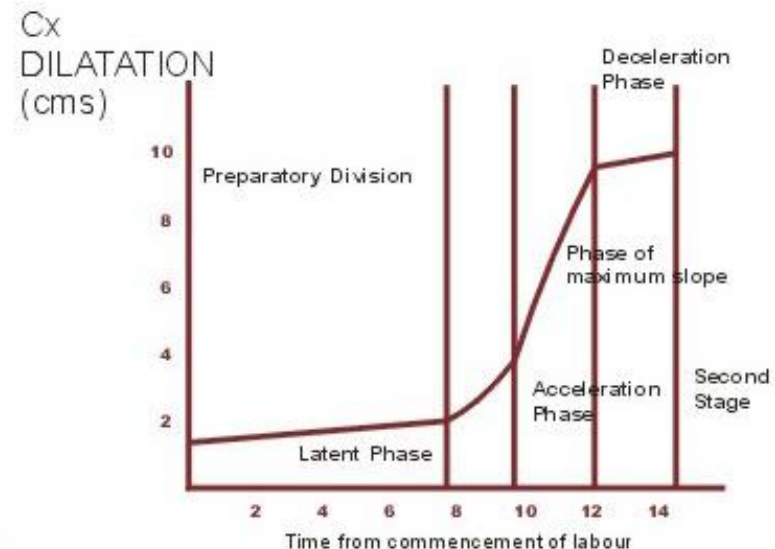
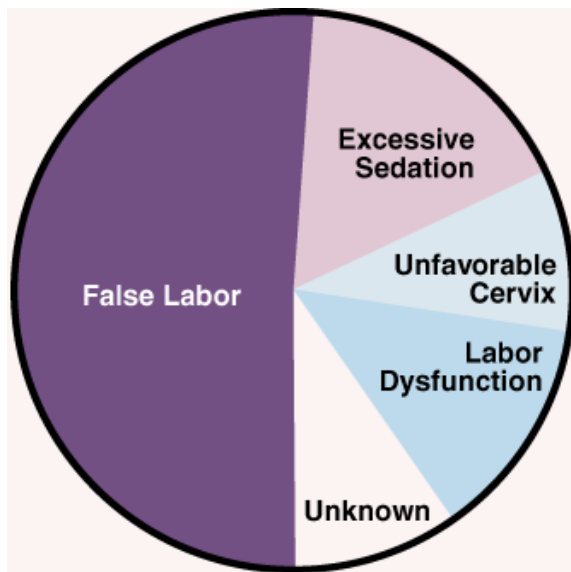
- faster dilatation, from 3 cm to fully dilatation (appr. 10cm) {Normal rate is 1 cm / hour}



First stage of delivery

■ Latent phase

- Onset – regular contractions
- Ends – 3 cm of dilatation
- *Prolonged latent phase* - >20 hours in the nullipara, >14 hours in the multipara – 95th percentiles

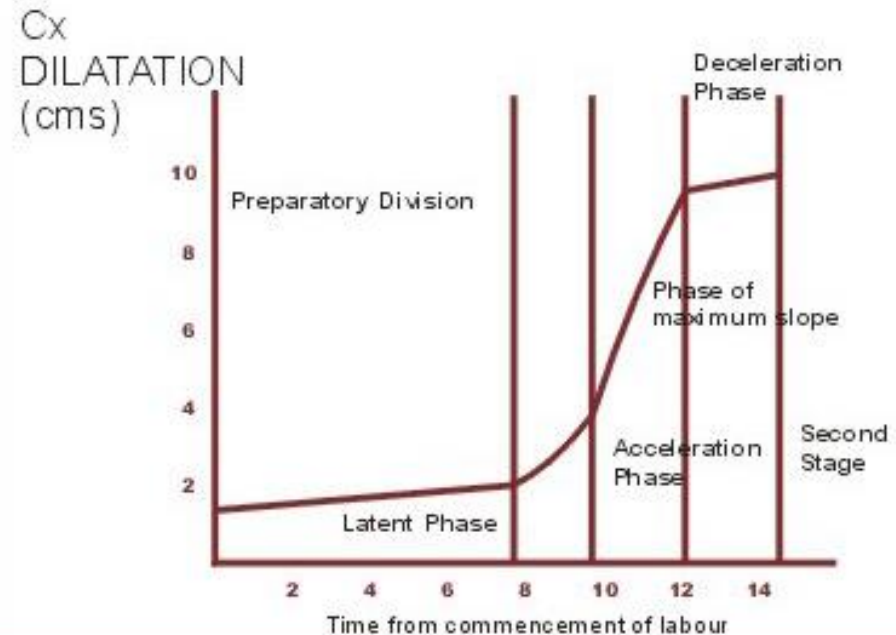
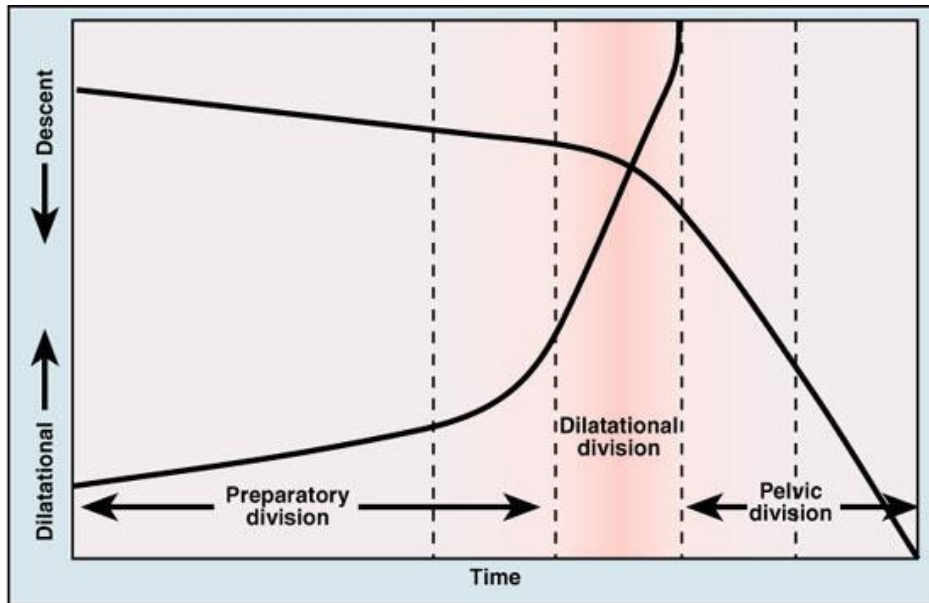


Friedman's curve showing phase of maximum slope

First stage of delivery

■ Active phase

- Onset – cervical dilatation of 3 cm
- Protraction – slow rate of cervical dilatation
- Arrest – complete cessation of dilatation or descent



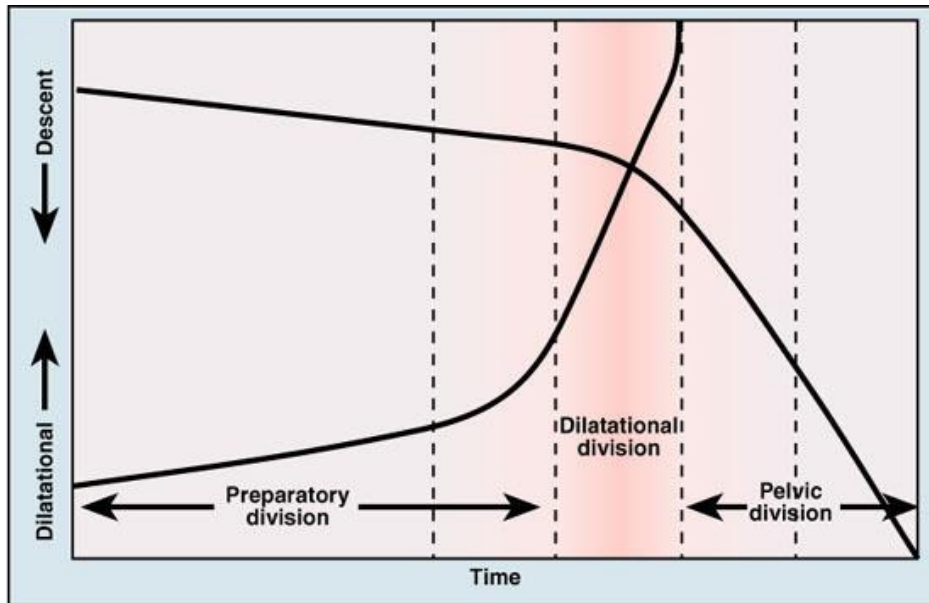
Friedman's curve showing phase of maximum slope

Second stage of delivery

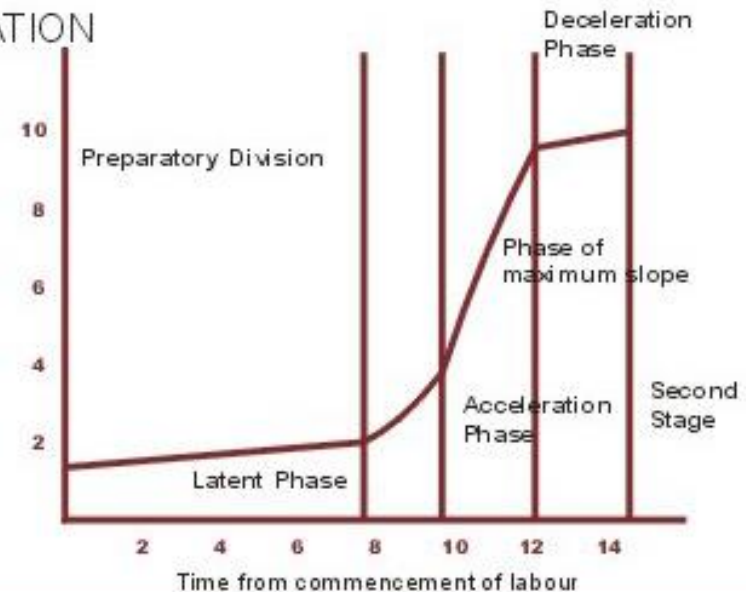
- Begins with full dilatation of the cervix
- Ends with the delivery of the baby
- It have TWO phases:
 - Propulsive phase:
 - From full dilatation until presenting part has descended to the pelvic floor
 - Expulsive phase:
 - Ends with the delivery of the fetus

2nd stage of labor – expulsion of the fetus

- Begins when cervical dilatation is complete and ends with fetal delivery.
- Median duration 40-60 min for nulliparas and 20-30 min for multiparas.



Cx
DILATATION
(cms)



Friedman's curve showing phase of maximum slope

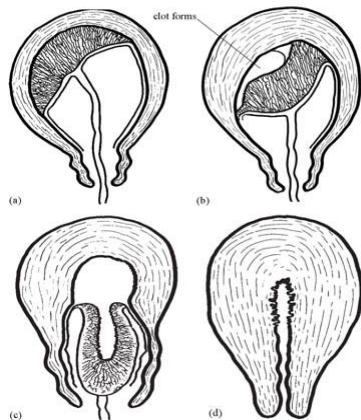
Third stage of labour

- Begins after delivery of the baby and ends with the delivery of the placenta and membranes
- It contains two phases
 - A., Separation
 - B., Expulsion



Duration: 5-20minutes (if actively managed)

Blood loss: 150-250 ml (average)



Physiological effect of labour

	First stage	Second stage	Third stage
Mother	Minimal effects	<ul style="list-style-type: none">-Pulse increases-Systolic BP incr.-Minor injuries to the birth canal	<ul style="list-style-type: none">-Blood loss from the site of the placenta (200ml)-Blood loss from the laceration (100ml)
Fetus	<ul style="list-style-type: none">-Moulding-overlapping of the bones-Caput succedaneum	<ul style="list-style-type: none">-Moulding-overlapping of the bones-Caput succedaneum	

***Mechanism* of labor**

- Lie
- Presentation
- Attitude or posture
- Position

At the onset of labor, the position of the fetus with respect to the birth canal is critical to the route of delivery.

It is thus of paramount importance to know the fetal position within the uterine cavity at the onset of labor.

Mechanism of labor

- Lie
- Presentation
- Attitude or posture
- Position

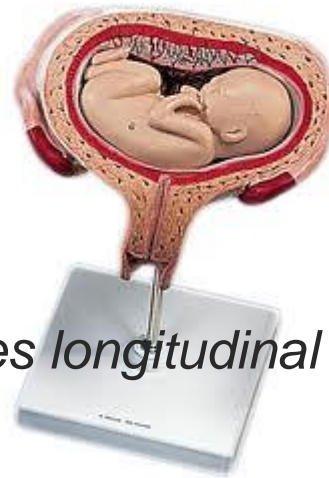
Fetal lie

- The relation of the long axis of the fetus to that of the mother!

- Longitudinal lie (~99%)



- Transverse lie (<1%)



- *Oblique lie*

unstable and always becomes longitudinal or transverse during the course of labor

Mechanisms of labor

- Lie
- **Presentation**
- Attitude or posture
- Position

Fetal presentation

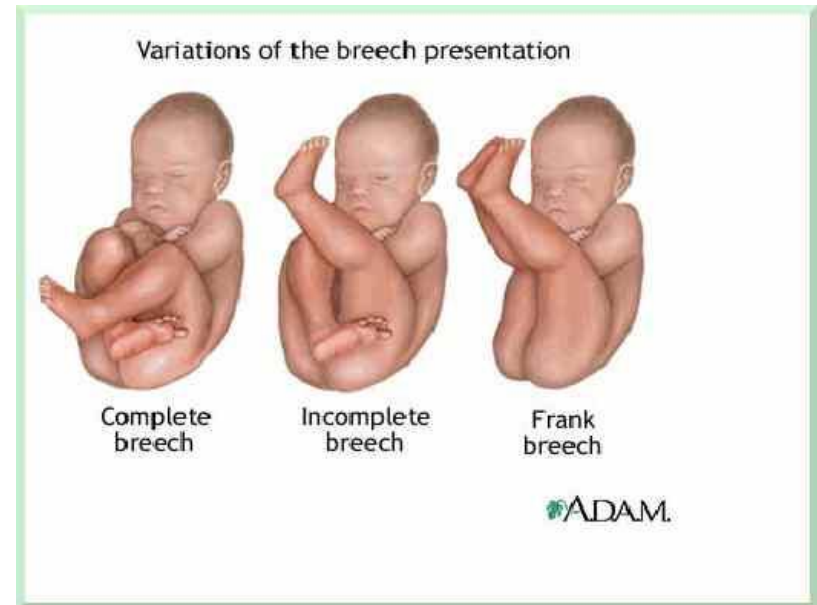
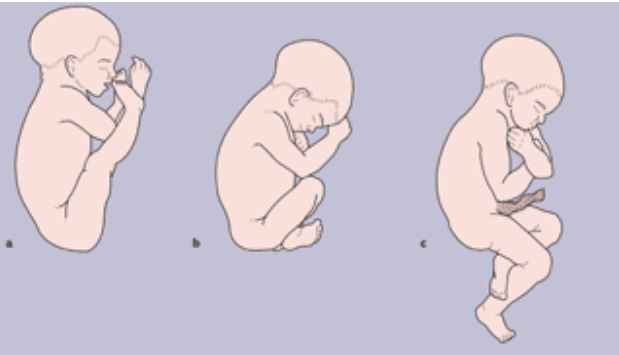
The presenting part is that portion of the fetal body that is either foremost within the birth canal or in closest proximity to it.

■ Cephalic ~94%

- Vertex or occiput presentation
(the head is flexed sharply so that the chin is in contact with the thorax, the **occipital fontanel** is the presenting part)
- Sinciput – brow – face presentation
(the fetal neck is sharply extended)

■ Breech

- **Frank breech** presentation
- Complete breech presentation
- Incomplete breech presentation



Presentation



Face presentation



Brow presentation



Vertex presentation



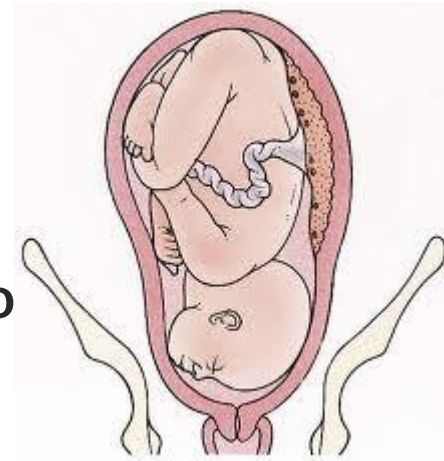
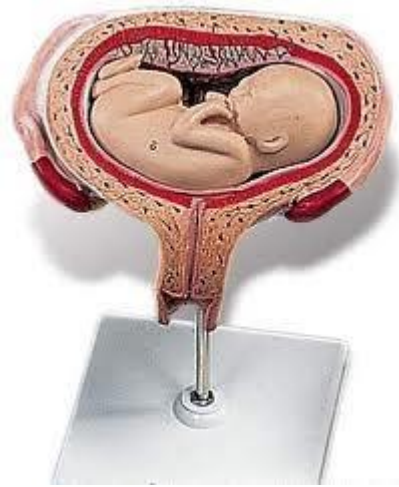
Breech presentation



Shoulder presentation

[Incidences of fetal presentation]

- Cephalic 96,8 %
- Breech 2,7 %
- Transverse 0,3 %
- Compound 0,1 %
- Face 0,5 %
- Brow 0,01 %

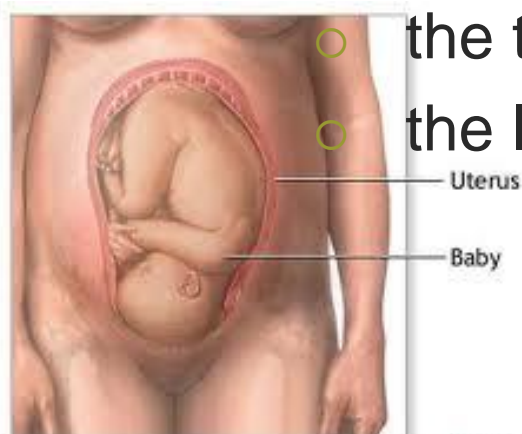


Mechanism of labor

- Lie
- Presentation
- **Attitude or posture**
- Position

Fetal attitude or posture

- In the later months of pregnancy the fetus forms an **ovoid mass** that corresponds roughly to the shape of the uterine cavity
- The fetus becomes **folded upon itself**:
 - the back becomes markedly convex,
 - the head is sharply flexed,
 - the thighs are flexed over the abdomen,
 - the legs are bent at the knees,



Mechanism of labor

- Lie
- Presentation
- Attitude or posture
- **Position**

Fetal position

Position refers to the **relationship** of an arbitrarily chosen portion of the fetal presenting part to the **right or left side of the maternal birth canal.**

With each presentation there may be two positions, **right or left.**

Fetal position

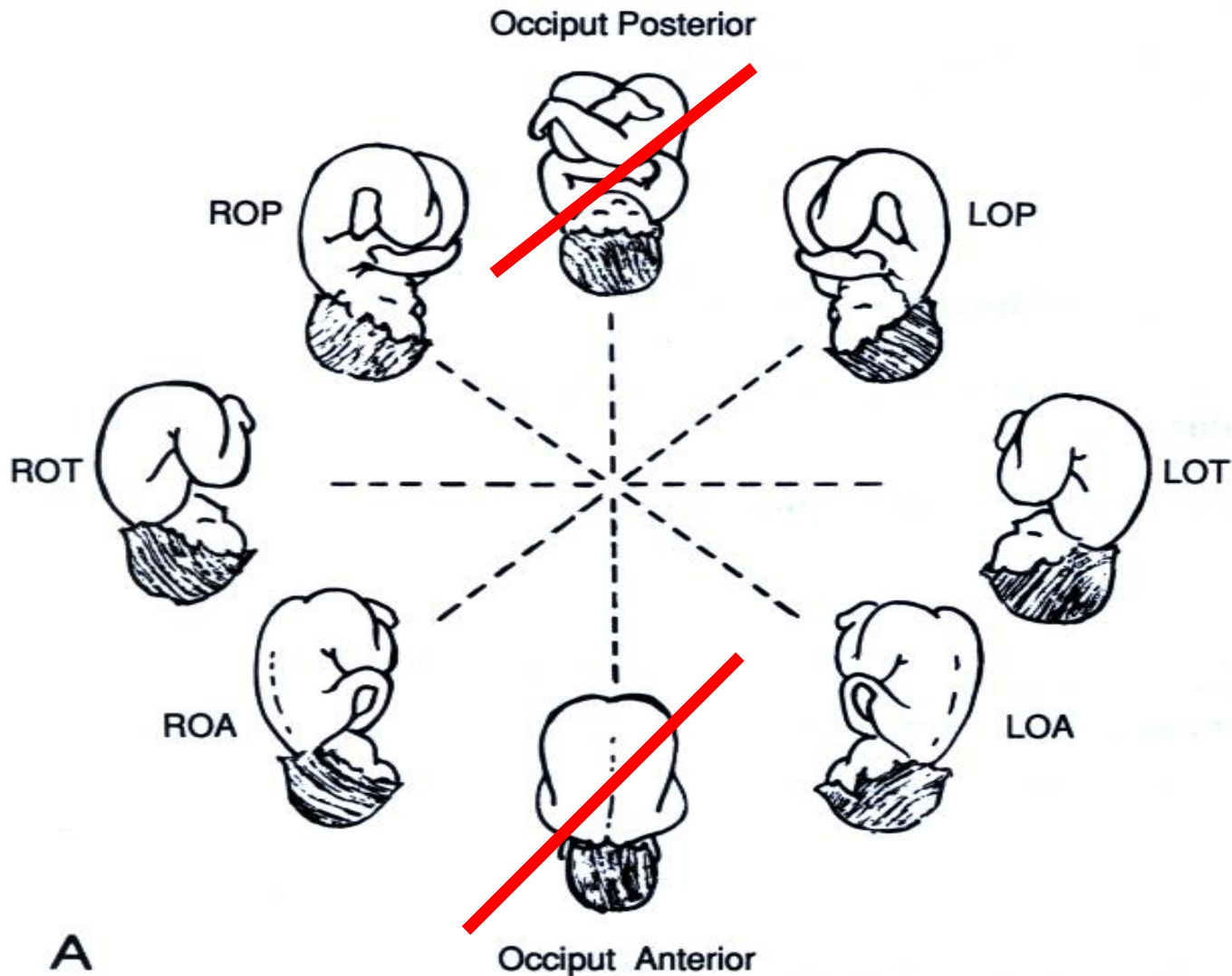
According to the determining points:

- the fetal occiput (vertex) – left or right occipital,
 - the fetal face (mental) – left or right mental,
 - breech (sacrum) – left or right sacral
 - shoulder (scapula is the arbitrarily chosen for orientation)
- presentations.

Varieties of presentations and positions

- For still more accurate orientation, the relationship of a given portion of the presenting part to the *anterior*, *transverse*, or *posterior* portion of the maternal pelvis is considered
- The presenting part in right or left positions may be directed anteriorly (A), transversely (T), or posteriorly (P).

There are six varieties of each of the three presentations



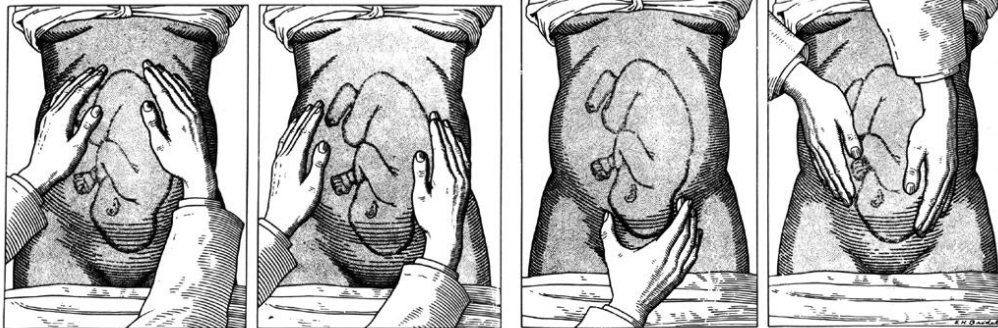
Left occiput position (LOA,
LOT, LOP) 2/3



Right Occiput position (ROA,
ROT, ROP) – 1/3



Diagnosis of fetal presentation and position



First maneuver

Second maneuver

Third maneuver

Fourth maneuver

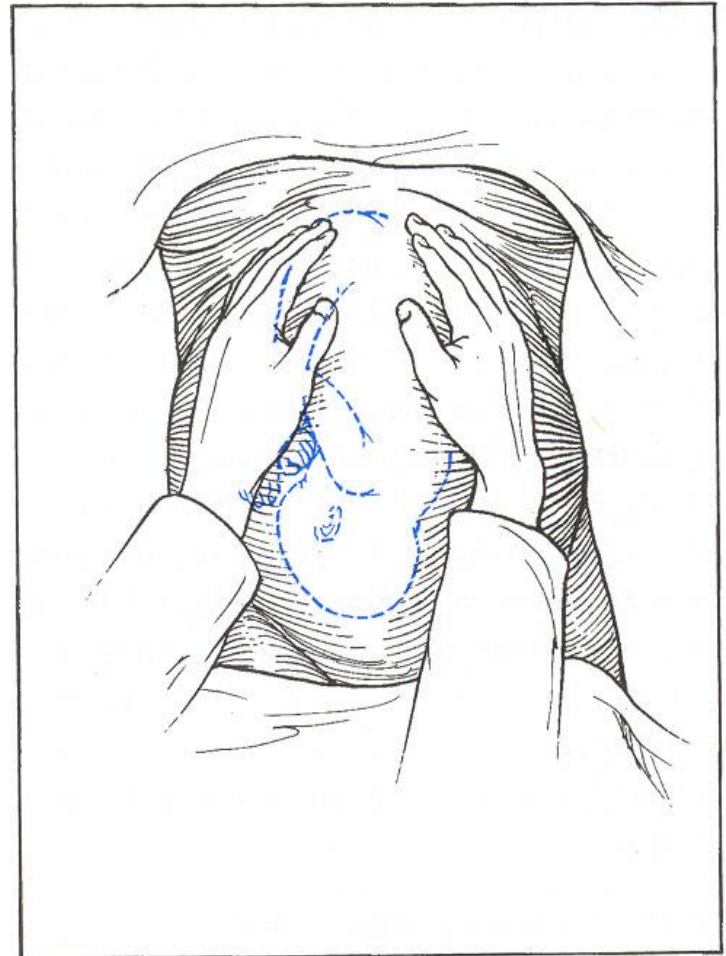
- Abdominal palpation – Leopold maneuvers (4)
- Vaginal examination
- Auscultation
- Ultrasonography and radiography



Leopold maneuvers

■ First maneuver

- palms are placed at the uterine fundus
- permits identification of which fetal pole – breech or head – occupies the uterine fundus

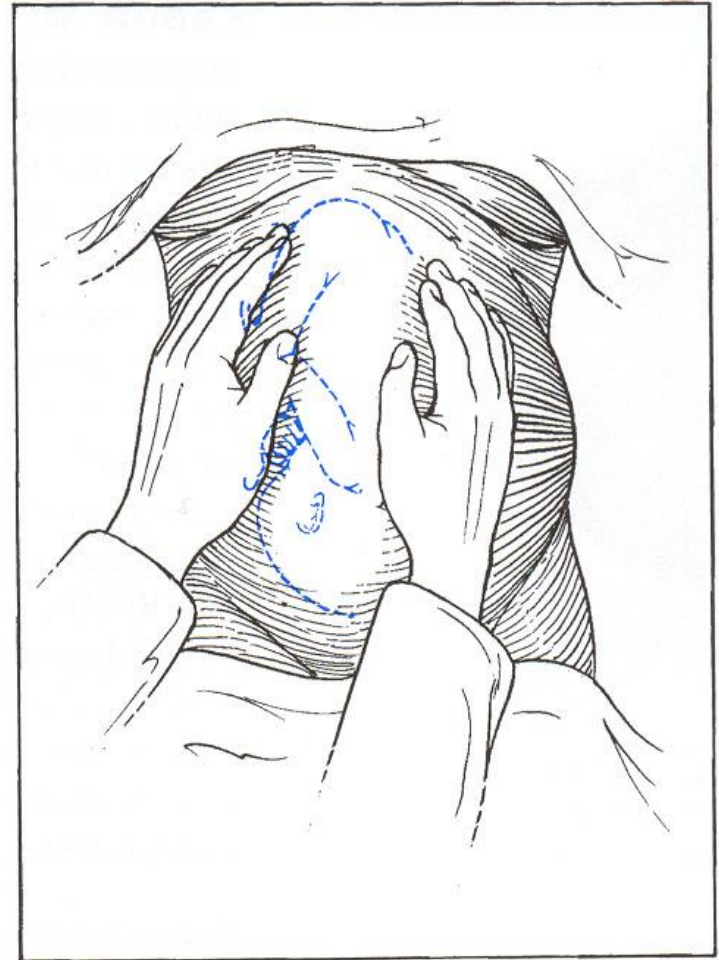


First maneuver

Leopold maneuvers

■ Second maneuver

- palms are placed on either side of the maternal abdomen
- gentle but deep pressure
- on one side a hard, resistant structure – **the back (convex shape)**
- on the other, numerous small, irregular, mobile parts – **fetal extremities**

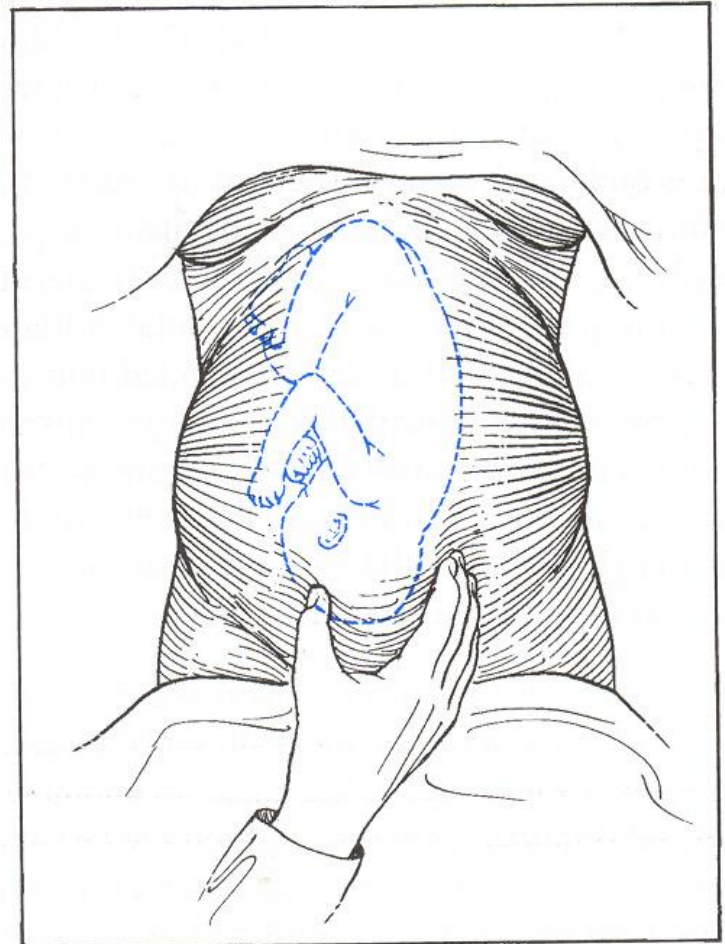


Second maneuver

Leopold maneuvers

■ Third maneuver

- using the thumb and fingers of the right hand, the lower portion of the maternal abdomen is grasped just above the symphysis
- **movable mass** – the presenting part is not engaged
- differentiation between **head and breech**

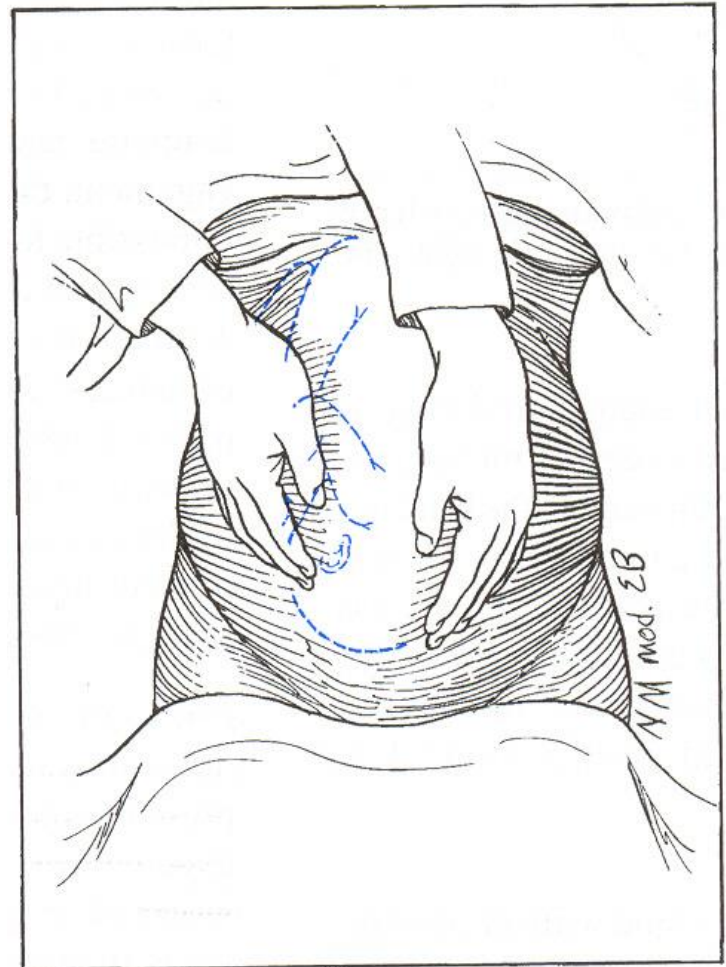


Third maneuver

Leopold maneuvers

■ Fourth maneuver

- the examiner faces the mother's feet
- with the tips of the fingers of each hand, exerts deep pressure in the direction of the axis of the pelvic inlet.



Fourth maneuver

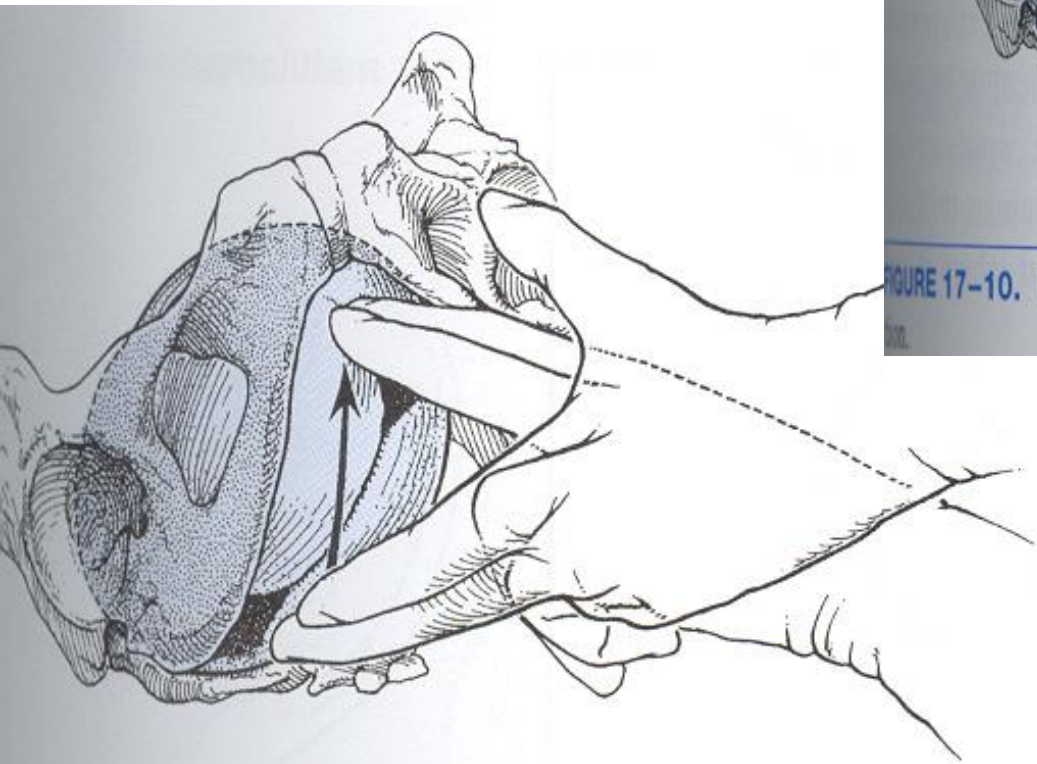
Vaginal examination

- Before labor vaginal examination is often inconclusive
- With the onset of labor, after cervical dilatation, **vertex presentation** and their **positions** are recognized by palpation of the various sutures and fontanelles.
- **Face and breech** presentation can be identified by palpation.

Vaginal examination

- **It is advisable to pursue a definite routine, comprising four movements:**
 1. Two fingers are introduced into the vagina and carried up to presenting part. The ***differentiation of vertex, face, and breech*** is then accomplished readily.
 2. If the vertex is presenting, the fingers are directed into the posterior aspect of vagina. The fingers are then swept forward over the fetal head toward the maternal symphysis. During this movement, the fingers necessarily cross the fetal ***sagittal suture*** and its course is delineated.
 3. The ***positions of the two fontanels*** then are ascertained. The fingers are passed to the most anterior extension of the sagittal suture, and the fontanel encountered there is examined and identified. Then the fingers pass along the suture to the other end of the head until the other fontanel is felt and differentiated.
 4. The ***station*** (the extent which the presenting part has descended) can also be established at this time.

[



17-9. Locating the sagittal suture by vaginal examination.

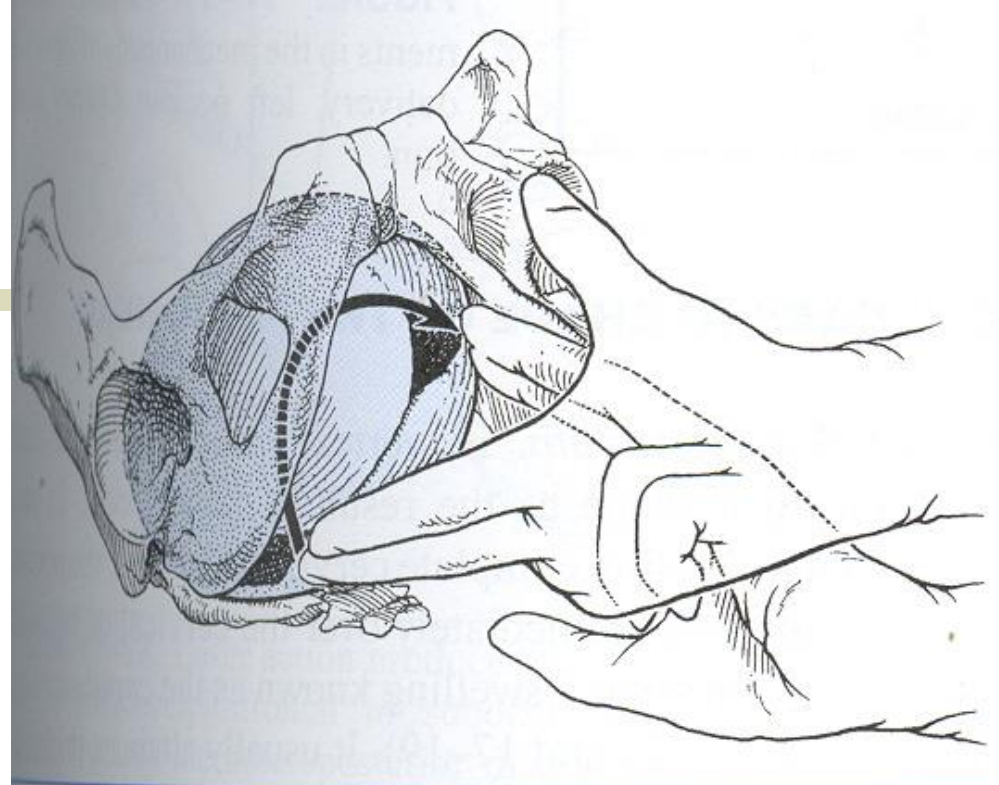


FIGURE 17-10. Differentiating the fontanel by vaginal examina-
tion.

Auscultation

- The region of the maternal abdomen in which fetal heart sounds are most clearly heard varies according to the presentation and the extent to which the presenting part has descended.
- Auscultatory findings sometimes reinforce results obtained by palpation

Ultrasonography and radiography

- Ultrasonographic techniques can aid identification of fetal position, especially in obese women or in women with rigid abdominal walls.
- In some clinical situations, the value of information obtained radiographically far exceeds the minimal risk from a single x-ray exposure.

Essential factors of labor

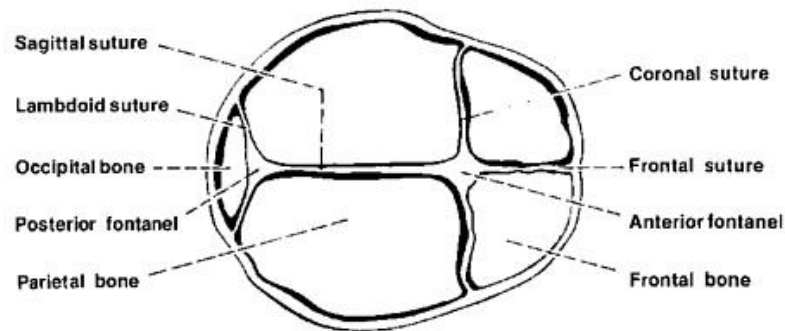
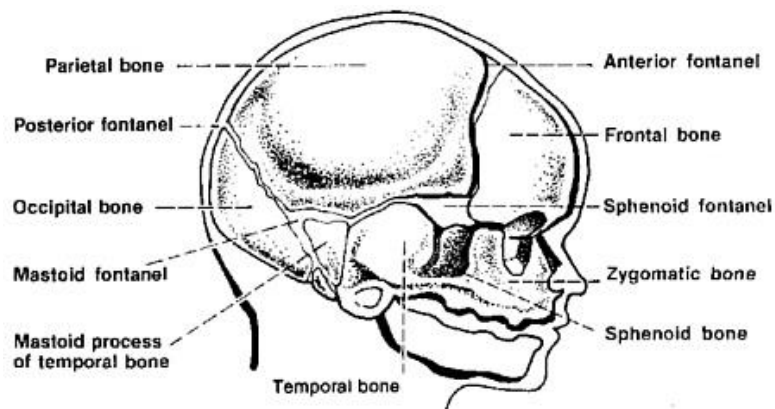
- The **p**assage – bony pelvis
- The **p**owers – myometrium (uterus)
- The **p**assenger – fetus
- The **p**syche
 - The „3P” rule (+1)

The powers

- Contractions of the intensity of **10-15 mmHg** lasting 30 seconds once per hour – Braxton Hicks contractions
- Contractions of the intensity of 20-30 mmHg at intervals of 5-10 minutes – about 48 h prior to onset of labor
- Contractions of the intensity of 20-30 mmHg, 2-4 contractions during each 10 min – during the latest phase of labor
- Increasing to 50 mmHg as the cervix approaches full dilatation, with the maternal pushing effort reaches about **100-150 mmHg**.

The passenger

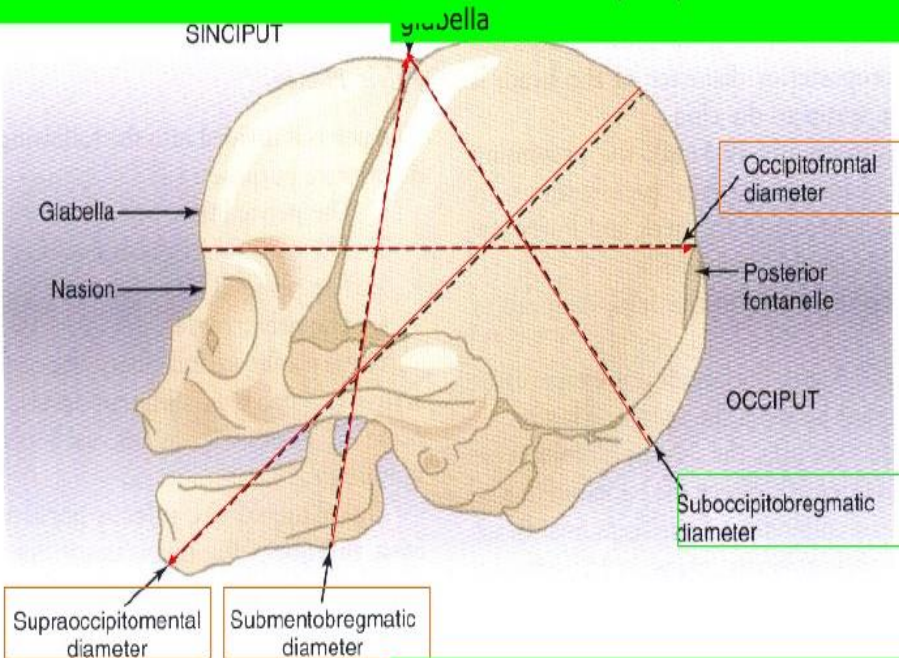
Anatomy of fetal head



- The fetal skull is characterised by a number of landmarks
 - Nasion (the root of the nose)
 - Glabella (the elevated area between the orbital ridges)
 - Sinciput (brow)
 - Anterior fontanelle (bregma)
 - Vertex (the area between the fontanelles)
 - Posterior fontanelle
 - Occiput

The passenger Anatomy of fetal head

Supraoccipitomenstrale (13.5cm) - from the vertex to the chin
Occipitofrontale (11cm) - from external occipital protuberance to the



Submentobregmatic (9.5cm) - from the junction of the neck and lower jaw to the center of the ant fontanelle
Suboccipitobregmatic (9.5cm) - from the surface of occipital to the ant fontanelle

- Diameters of the fetal head
 - Suboccipitobregmatic (9.5 cm) - vertex
 - Occipitofrontal (11 cm) - brow
 - Supraoccipitomenstrale (13,5 cm) - sinciput
 - Submentobregmatic (9,5 cm) - face

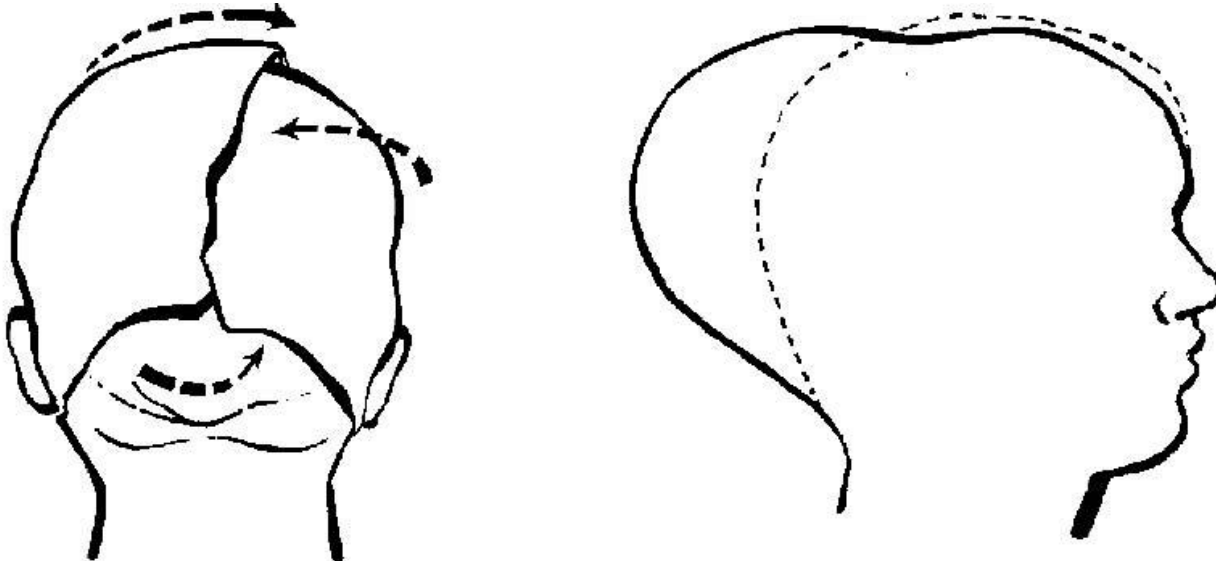
The passenger

- **The fetal head is the most difficult part to deliver.**
- Changes in shape are possible as the head passes through the pelvis and is subjected to constriction by external forces – **Molding**

Changes in shape of the fetal head

■ Molding

- The changes in fetal shape from external **compressive forces**.
- Results shortened suboccipitobregmatic diameter and a lengthened mentovertical diameter.
- Importance in women with contracted pelves or asynclitic presentations.
- The degree to which the head is capable of molding may make the difference between spontaneous delivery versus operative delivery.

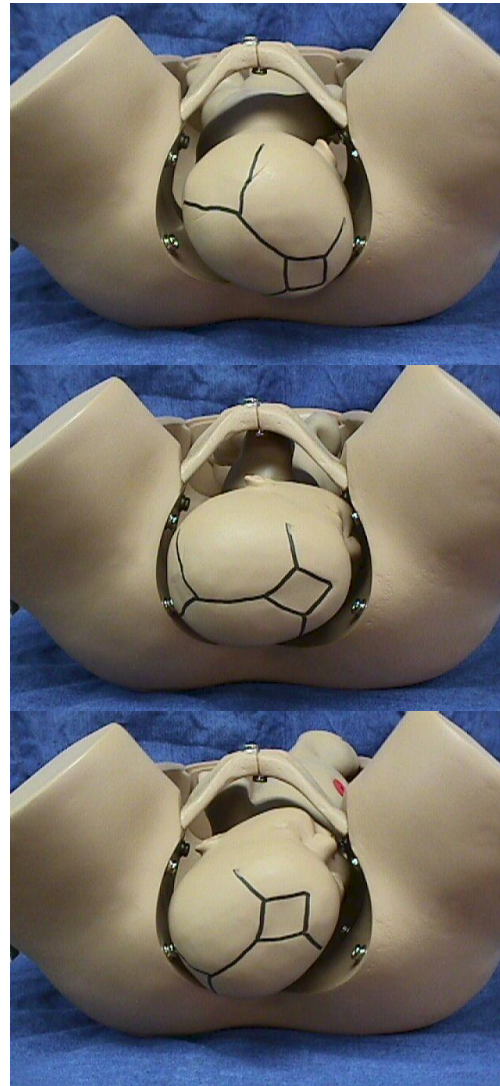


The Psyche

- High level of anxiety during pregnancy – decreased uterine activity, longer and dysfunctional labor.
- Various psychoprophylaxis – to alleviate pain during labor.

Labor with occiput presentations

- Occiput anterior position (ROA)
- Occiput transverse position (ROT)
- Occiput posterior position (ROP)



Characteristics of normal labor

- Definition of labor: uterine contractions that bring about demonstrable effacement and dilatation of the cervix.
- True labor – false labor (diagnosis can be confirmed retrospectively)
- **Characteristics which define the onset of labor:**
 - Ruptured membranes
 - Bloody „show”
 - Complete cervical effacement

Management of normal labor and delivery

■ Admission procedures

- Identification of labor
- **True labor**
 - Contractions occur at regular intervals
 - Intervals gradually shorten
 - Intensity gradually increase
 - Discomfort is in the back and abdomen
 - Cervix dilates
 - Discomfort is not stopped by sedation

Management of normal labor and delivery

■ Admission procedures

- Identification of labor
- **False labor**
 - Contractions occur at irregular intervals
 - Intervals remain long
 - Intensity remains unchanged
 - Discomfort is chiefly in the lower abdomen
 - Cervix does not dilate
 - Discomfort is usually is relieved by sedation

Management of normal labor and delivery

■ Admission procedures

- Recording the medical and obstetrical history
- General examination of the mother
 - Skin, edema, maternal height, weight, scar
- Vital signs and review of pregnancy record
 - Blood pressure, pulse, respiration, temperature
- Heart and lungs
- Urine analysis (protein, sugar, ketons)

Management of normal labor and delivery

■ Admission procedures

- Abdominal examination (Leopold, fetal heart-auscultation, uterine contractions)
- Vaginal examination:
 - Detection of ruptured membranes
 - Possibility of cord prolapse
 - Labor is likely to begin soon if the pregnancy at term
 - If the delivery is delayed for 24 hours or more, intrauterine infection is more likely
 - Cervical effacement
 - Cervical dilatation
 - Presenting part, attitude, position
 - Position of the cervix
 - Posterior, midposition, anterior

Management of normal labor and delivery

■ Admission procedures

○ Station

- The **level of the presenting part** in the birth canal is described in relationship **to the ischial spines**, which are halfway between the pelvic inlet and pelvic outlet.
- The **level of ischial spines – zero (0)** station.
- If the head is unusually molded, or if there is an extensive caput formation, or both, engagement might not have taken place even though the head appears to be at 0 station.

○ +++ Laboratory findings

Station

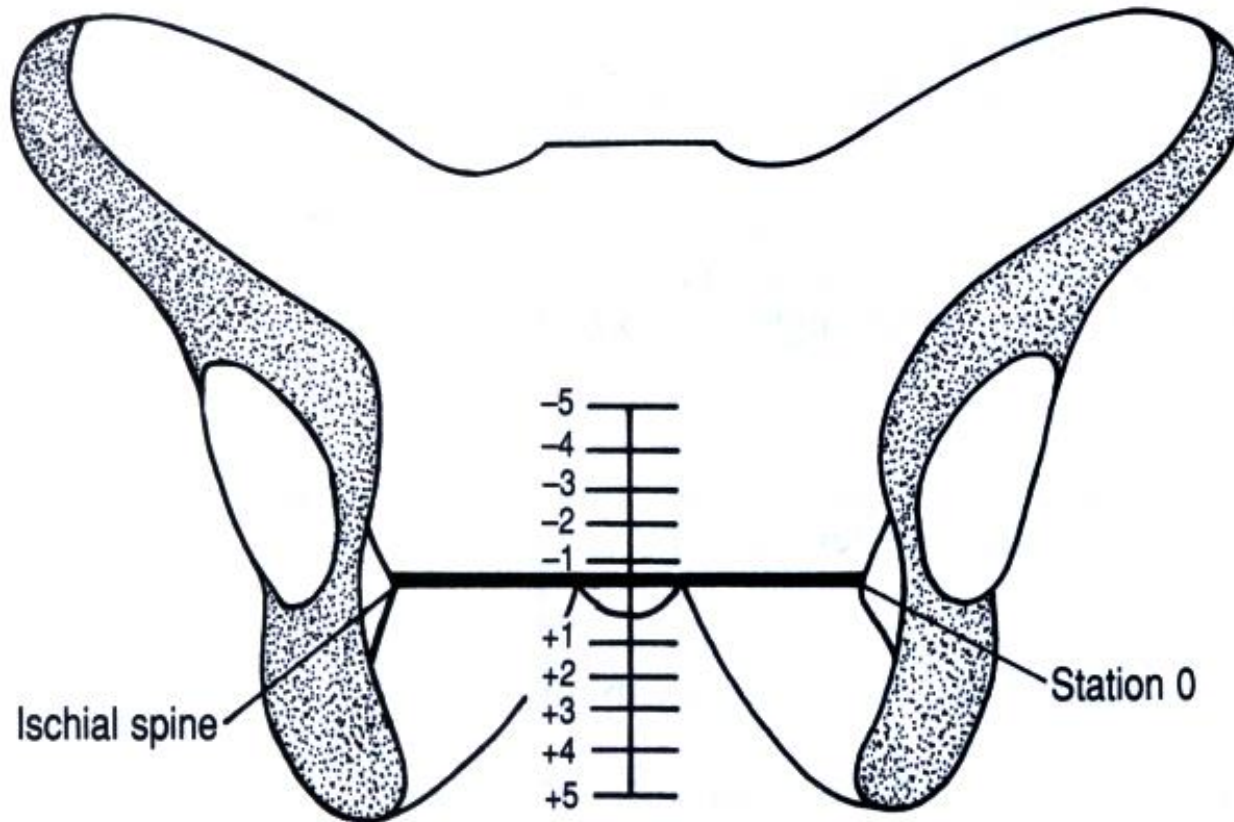
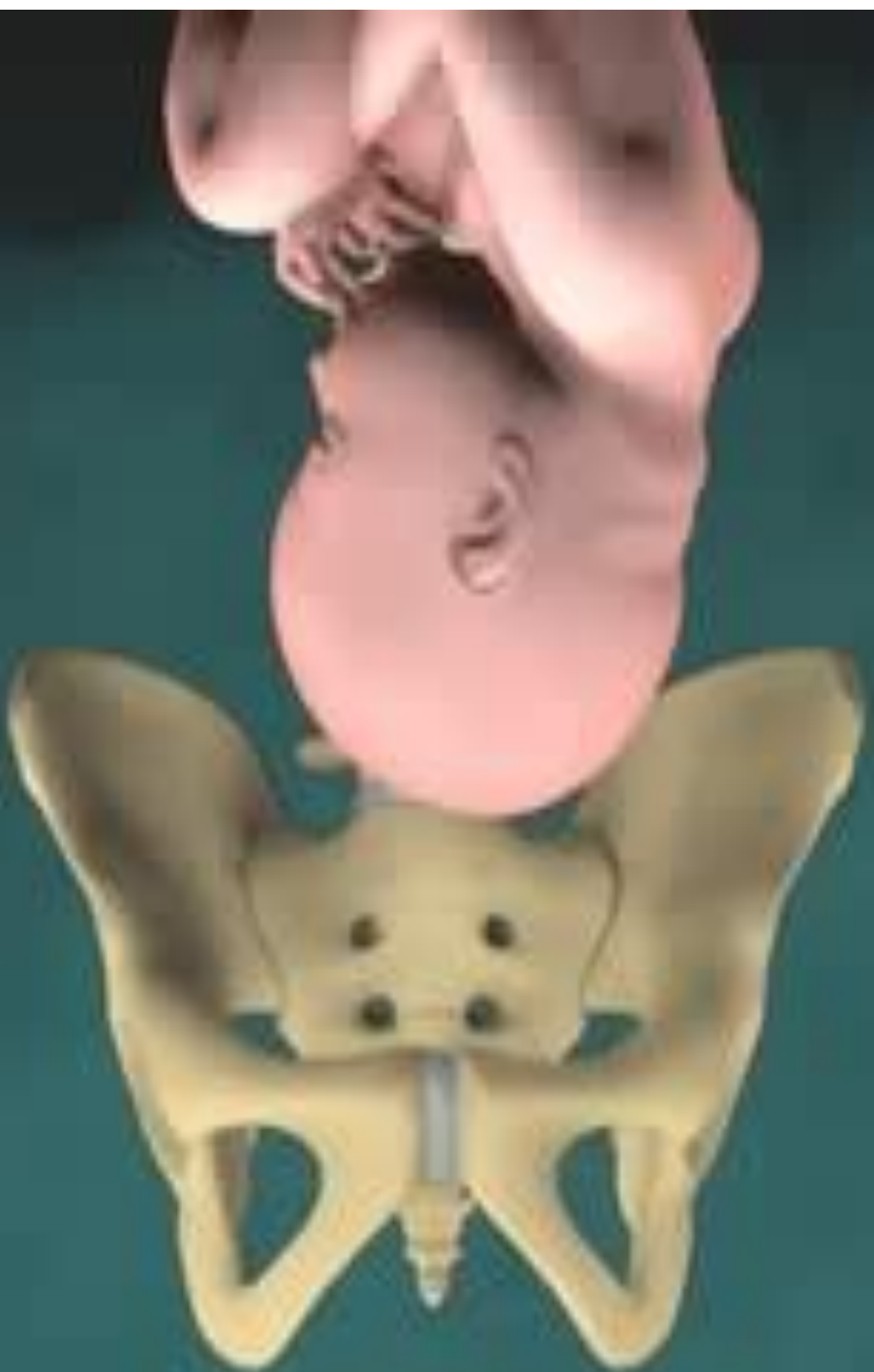


Figure 2.29. Levels of progress through the pelvis using a scale of -5 to +5.



Management of normal labor and delivery

■ Management of the first stage of labor (in the hospital, after admission)

- Monitoring of the fetal well-being (CTG, amnioscopy)
- Uterine contractions (by hand and/or by CTG)
 - Evaluate the frequency, duration, and intensity
- Maternal vital signs (BP, P, urine, breathing)
- Subsequent vaginal examinations
- Oral intake
 - Food should be withheld
- Intravenous fluids (not necessary in all cases)
- Maternal position during labor (lying, walking, sitting, use of ball)
- Analgesia (intramuscular and/or epidural)
- Amniotomy
 - More rapid labor
 - Earlier detection of meconium-stained amniotic fluid
 - Applying electrode to the fetus, insert pressure catheter
- Urinary bladder function

Management of normal labor and delivery

- **Management of the second stage of labor**
 - Maternal expulsive efforts
 - Taking a deep breath as soon as the next uterine contraction begins, and with her breath held, to exert downward pressure exactly as though she were straining at stool.
 - The fetal heart rate is likely to be slow, but should recover to normal range before the next expulsive effort.

Management of normal labor and delivery

■ Management of the second stage of labor

○ Spontaneous delivery

■ *Delivery of the head*

- Crowning –encirclement of the largest head diameter by the vulvar ring.
- Episiotomy
- Ritgen maneuver
 - Controlled delivery of the head

■ *Delivery of the shoulders*

- External rotation – bisacromial diameter has rotated into the anteroposterior diameter of the pelvis
- Gentle downward traction of the head
- The rest of the body almost always follows the shoulders

■ Clearing the nasopharynx

■ Nuchal cord

■ Clamping the cord

Types of episiotomy

Type of episiotomy		
characteristic	<u>midline</u>	mediolateral
surgical repair	easy	more difficult
faulty healing	rare	more common
postop. pain	minimal	common
anat. results	excellent	occ. faulty
blood loss	less	more
dyspareunia	rare	occasional
extensions	common	uncommon

[Management of normal labour and delivery]

Management of the third stage of labor

From the birth of the baby to the delivery of the placenta

- The cervix and vagina should be immediately inspected for lacerations and surgical repair performed if necessary!
- Duration: 0 – 30 min

Management of normal labour and delivery

■ Management of the third stage of labor

○ Signs of placental separation

1. The uterus becomes globular and firmer
2. There is often a sudden gush of blood
3. The placenta passing down into the lower uterine segment, where its bulk pushes the uterus upward
4. The umbilical cord protrudes further out of the vagina

○ Delivery of the placenta

- Traction on the umbilical cord must not be used to pull the placenta out of the uterus
- Manual removal of the placenta
- Active management of the third stage
 - Oxytocin
 - Controlled cord traction

Fourth stage of labour

From the delivery of the placenta to stabilisation of the patient's condition, usually at about 2-6 hours postpartum

- The hour immediately following delivery is critical
- Uterine atony is more likely
- Checking of the birth-canal all the way
- Suturing the wound (internal and external lesions)
- RDV at the end of the suture



Thank you very much!!!!