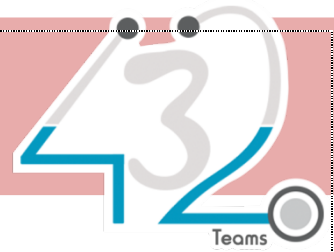


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OBSTETRICS AND GYNECOLOGY

(Tutorial 3) Mechanism of Labor & Abnormal Presentation

Leader: Alanoud Alyousef

Sub-leader: Dana ALdubaib

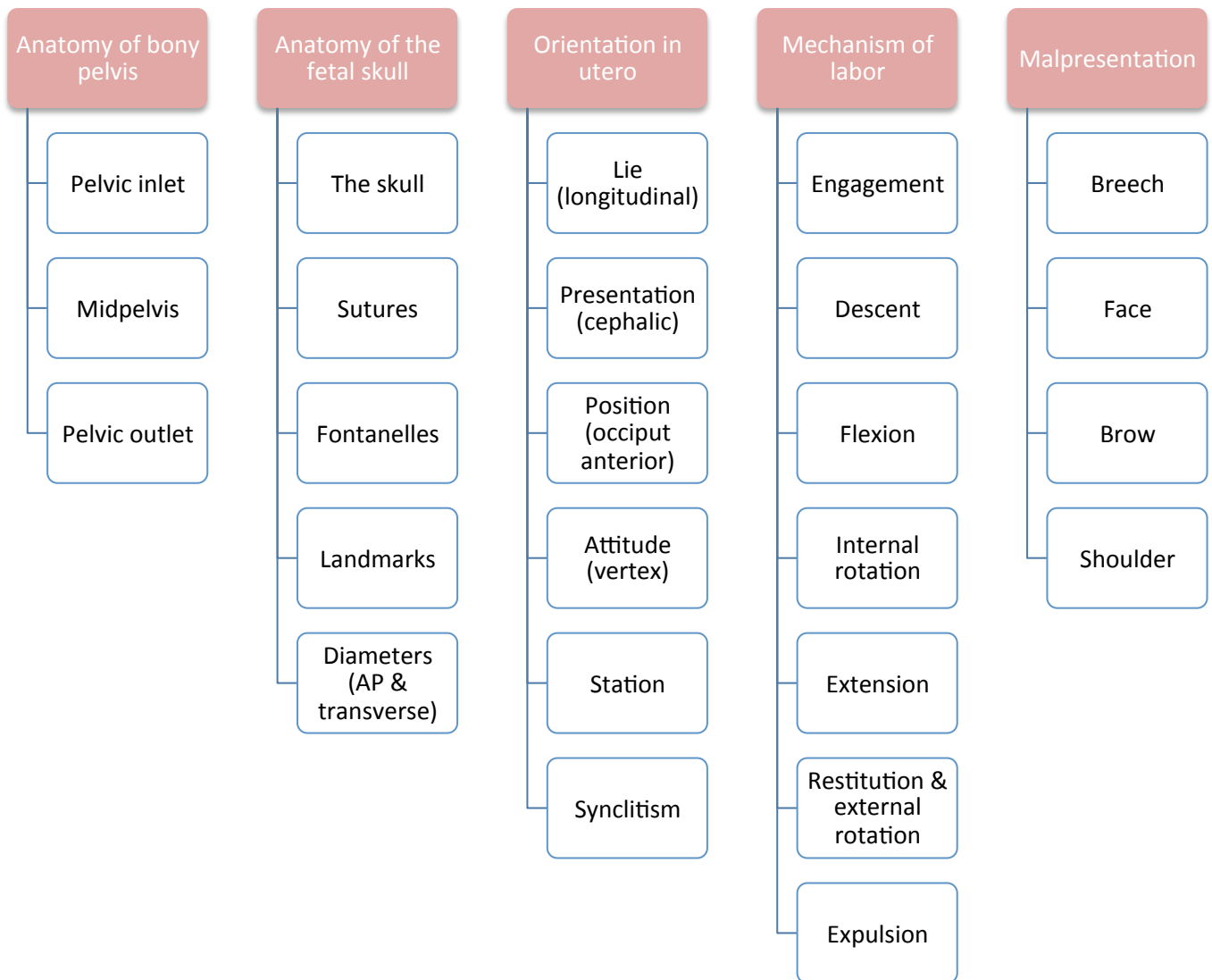
Done by: Nada Alouda

Revised by: Ghadah Alharbi

Doctor's note **Team's note** Not important **Important** **431 teamwork (in yellow box)**

Objectives:

Not given



Anatomy of the bony pelvis:

- **The bony pelvis** is made up of 4 bones: the sacrum, coccyx, and 2 innominates (composed of the ilium, ischium, and pubis).
- **The sacrum** consists of 5 fused vertebrae. The anterior-superior edge of the 1st sacral vertebra is called the **promontory**.
- **The promontory** may be felt on vaginal examination and provide a landmark for **clinical pelvimetry**.
- **The sacrum** forms the posterior wall of the pelvis and its anterior surface is usually concave (curved) to accommodate the rotating fetal head.
- The pelvis is divided into the false pelvis above and the true pelvis below the linea terminalis.
- The true pelvis is the portion important in childbearing is bounded above by promontory, alae of the sacrum, and the linea terminalis and the upper margin of the pubic bone anteriorly, and below by the pelvic outlet.
- **Ischial spines** are of great obstetrical importance because **it is the shortest pelvic diameter and has a valuable landmark in assessing the level of the presenting part of the fetus**.

Pelvic inlet diameters:

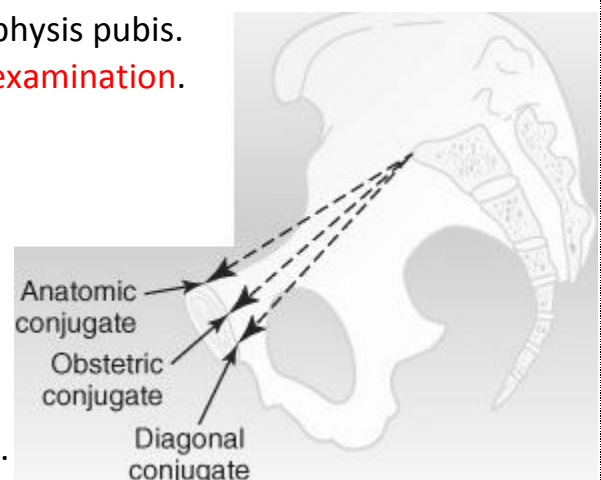
- **Anatomic (true) conjugate:** it extends from the middle of the sacral promontory to the superior surface of the symphysis pubis.
- **Obstetric conjugate** (represents the actual space available to the fetus): it extends from the middle of the sacral promontory to the closest point on the convex posterior surface of the symphysis pubis. **It can be estimated from the diagonal conjugate** by subtracting 1.5-2.0 cm from the diagonal conjugate.
- **Diagonal conjugate:** it is the distance from the middle of the sacral promontory to the lower margin of the symphysis pubis.
 - **This conjugate is obtained on clinical examination.**

Midpelvis:

- It is at the level of **ischial spines**.
- The interspinous diameter is 10 cm.

Pelvic outlet:

- Clinically it is the distance between the ischial tuberosities (**the angle of the pubic arch**).
- It is around 8.0 cm.



Anatomy of the fetal head:

The fetal skull:

- **The head** is the largest and least compressible part of the fetus.
- **The fetal skull consists of a base and a vault (cranium).**
- **The cranium** consists of the occipital bone, 2 parietal bones, 2 frontal, and 2 temporal bones.

Sutures:

- Two frontal bones are separated by **frontal suture**.
- Two parietal bones are separated by **sagittal suture**.
- Two **coronal sutures** between frontal and parietal bones.
- Two **lambdoid sutures** between parietal and occipital bone.

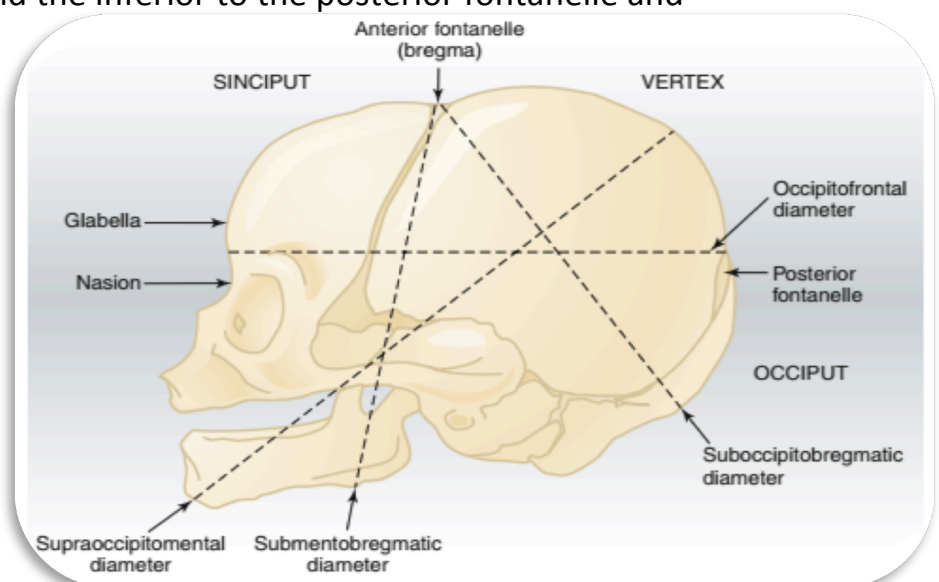
Fontanelles:

- Membrane-filled spaces located at the point where the sutures intersect.
- Clinically, they are helpful in diagnosing the fetal head position.
- **The anterior fontanelle (bregma):** diamond shaped, ossified at 18 months after birth. It's found at the intersection of the sagittal, frontal, and coronal sutures.
- **The posterior fontanelle:** Y or T-shaped, closes at 6-8 weeks of life. It's found at the junction of the sagittal and lambdoid sutures.

The fetal skull landmarks:

1. **Nasion:** the root of the nose.
2. **Glabella:** the elevated area between the orbital ridges.
3. **Sinciput (brow):** the area between the anterior fontanelle and the glabella.
4. **Anterior fontanelle (bregma):** diamond shaped.
5. **Vertex:** the area between the fontanelles.
6. **Posterior fontanelle (lambda):** Y or T shaped.
7. **Occiput:** the area behind the inferior to the posterior fontanelle and lambdoid sutures.

FIGURE 8-2 Lateral view of the fetal skull showing the prominent landmarks and the anteroposterior diameters.



The fetal head diameters:

A- Anteroposterior diameters: (figure 8-2 in the previous pg)

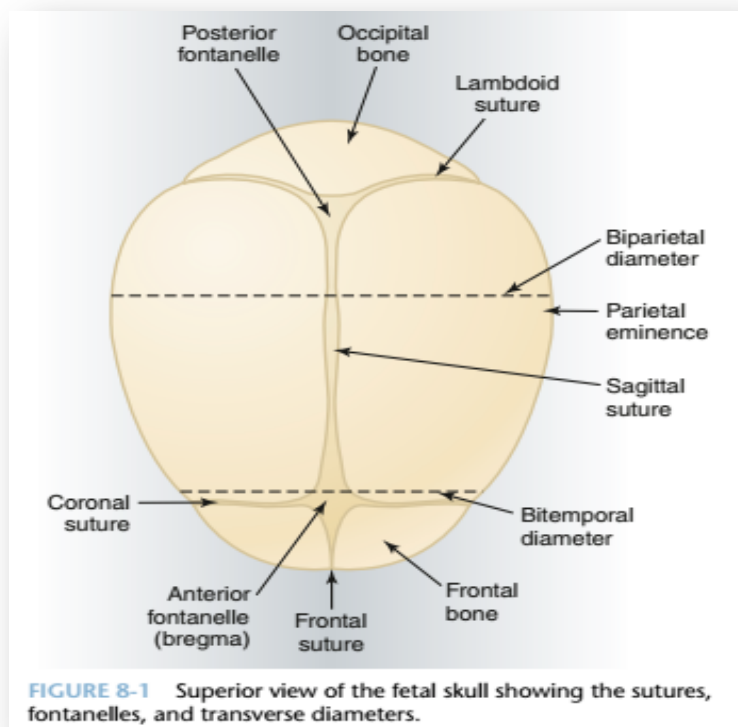
1. Suboccipitobregmatic (9.5 cm): it extends from the undersurface of the occipital bone at the junction with the neck to the center of the anterior fontanelle. It's when the head is **well flexed (vertex presentation)**.
2. Occipitofrontal (11 cm): it extends from the external occipital protuberance to the glabella. It's when the head is **deflexed (military presentation)**.
3. Supraoccipitomenal (13.5 cm): it extends from the vertex to the chin. It's the longest anteroposterior diameter and it's the diameter in **brow presentation**.
4. Submentobregmatic (9.5 cm): it extends from the junction of the neck and lower jaw to the center of the anterior fontanelle. It's the diameter in **face presentation**.

B- The transverse diameters:

1. Biparietal (9.5 cm): the largest transverse diameter.
2. Bitemporal (8 cm): the shortest transverse diameter.

Denominators of fetal presentations:

- In **vertex** presentation, **the occiput** is the denominator.
- In **face** presentation, **the mentum** (chin) is the denominator.
- In **brow** presentation, **frontal bone** is the denominator.
- In breech presentation, the sacrum is the denominator.



Orientation in utero:

Lie:

- Orientation of the long axis of the fetus to the long axis of the uterus.
- The most common lie is **longitudinal**.
- Types:
 1. **Longitudinal**: fetus and mother are in same vertical axis.
 2. **Transverse**: fetus at right angle to mother.
 3. **Oblique**: fetus at 45° angle to mother.

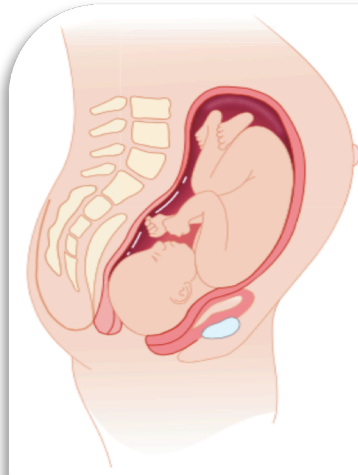


Figure I-13-1. Longitudinal Fetal Lie

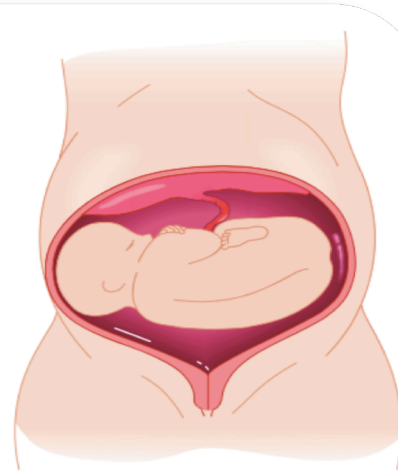


Figure I-13-2. Transverse Fetal Lie

Presentation:

- Portion of the fetus overlying the pelvic inlet.
- The most common presentation is **cephalic**.
- Types:
 1. **Cephalic**: head presents first.
 2. **Breech**: feet or buttocks present first:
 - Complete: both thighs & one or both knees flexed.
 - Frank: both thighs flexed & both knees extended.
 - Footling: one or both thighs extended & one or both knees or feet lying below the buttocks.
 3. **Compound**: more than one anatomic part is presenting.
 4. **Shoulder**: presents first.

At term, 65% of breech fetuses are frank, 25% are complete, and 10% are footling.



Figure I-13-4. Complete Breech



Figure I-13-3. Frank Breech

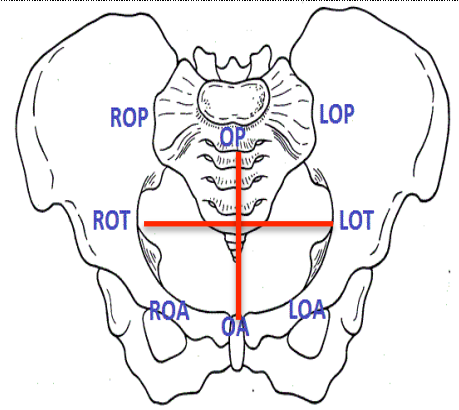


Figure I-13-5. Footling Breech

Note that all are longitudinal lie.

Position:

- Relationship of a definite presenting fetal part to the maternal bony pelvis.
- The most common at delivery is **occipitoanterior (OA)**.
- Types:
 1. **Occiput:** with a flexed head (cephalic presentation).
 2. **Sacrum:** with a breech presentation.
 3. **Mentum** (chin): with an extended head (face presentation).



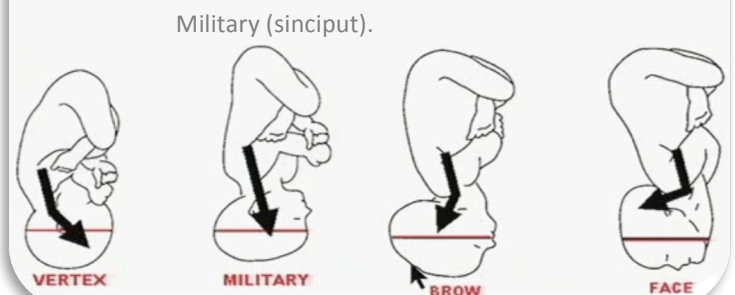
Occiput anterior position (OA) means the presenting fetal part (the occiput) is anterior in relation to the maternal pelvis i.e. it opposes the maternal symphysis pubis.

Occiput (O).
Anterior (A).
Posterior (P).
Transverse (T).
Right (R).
Left (L).

Attitude:

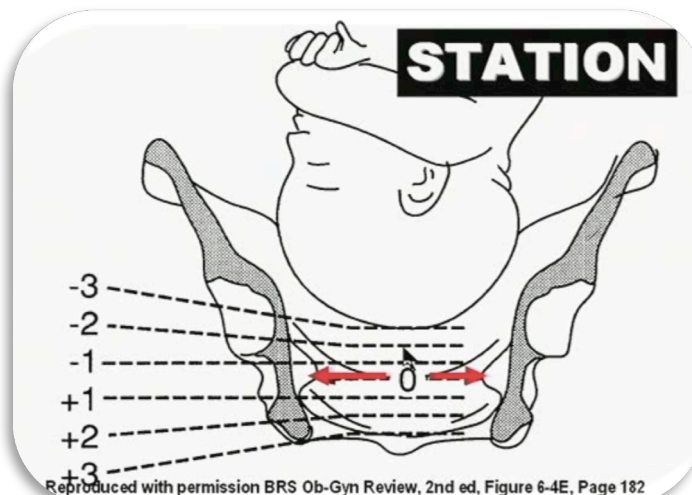
- Degree of extension-flexion of the fetal head with cephalic presentation.
- The most common attitude is **vertex**.
- Types:
 1. **Vertex:** head is maximally flexed.
 2. **Military:** head is partially flexed.
 3. **Brow:** head is partially extended.
 4. **Face:** head is maximally extended.

Notice the degree of flexion-extension



Station:

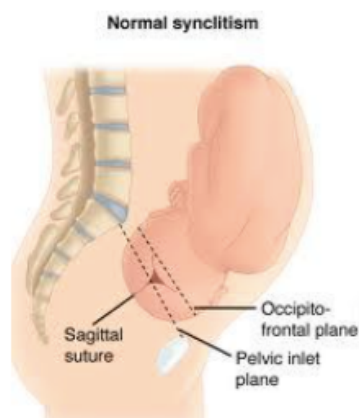
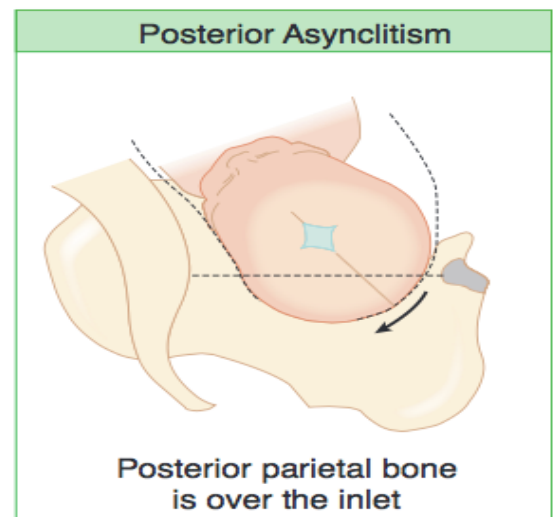
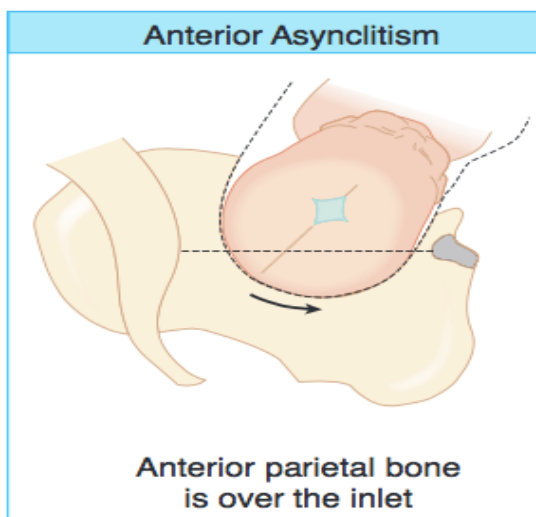
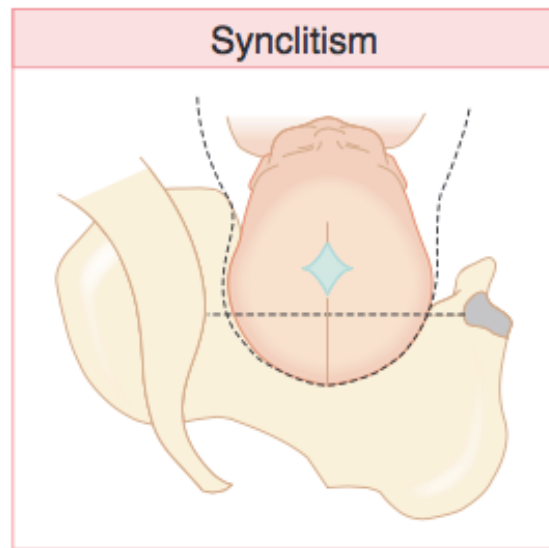
- Degree of descent of the presenting part through the birth canal.
- It's expressed in (cm) above or below the maternal **ischial spine (zero station)**.



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Synclitism:

- It's the parallelism between the plane of the pelvis and that of the fetal head.
- The head position is considered to be synclitic when the biparietal diameter is parallel to the pelvic plane and the sagittal suture is midway between the anterior (symphysis pubis) and posterior (sacral promontory) planes of the pelvis.
- When this relationship is **not** present, the head is considered to be **asynclitic**.



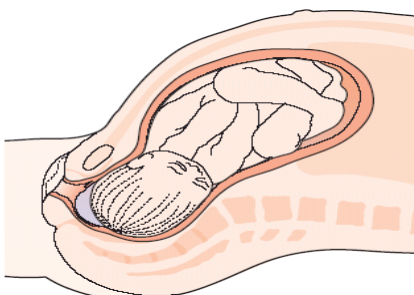
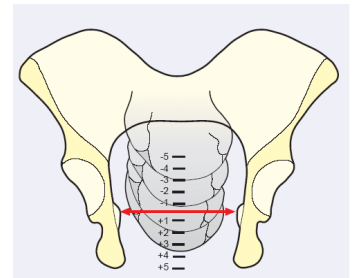
Mechanism of labor:

- It's a series of changes in position and attitude that the fetus undergoes during its passage through the birth canal.

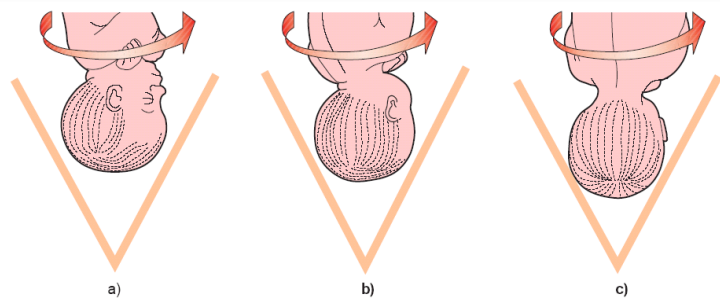
Cardinal movements of labor:

Simultaneous

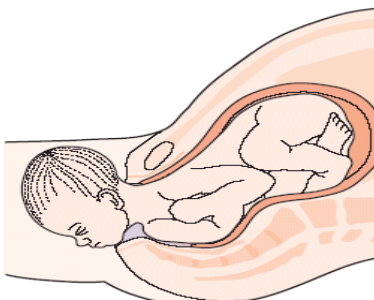
- Engagement:** descent of biparietal diameter (BPD) (the widest diameter of the head) to below the plane of pelvic inlet (ischial spines).
- Descent:** movement of the presenting part down through the curve of the birth canal.
- Flexion:** placement of the fetal chin on the thorax.
- Internal rotation:** rotation of the position of the fetal head in the mid pelvis from transverse to anterior-posterior diameter.
- Extension:** movement of the fetal chin away from the thorax. The head is born by rapid extension as the occiput, sinciput, nose, mouth, and chin pass over the posterior vaginal opening and the perineum.
- Restitution:** once the head is delivered it returns to its original position at the time of engagement to align itself with the fetal back and shoulders.
- External rotation:** rotation of the fetal head outside the mother as the head passes through the pelvic outlet. In order to deliver the shoulders it's necessary to rotate into the direct anterior-posterior plane. The doctor will rotate the head making the face of the fetus looking to medial aspect of the maternal thigh.
- Expulsion:** delivery of the fetal shoulders and body. The anterior shoulder delivers under the symphysis pubis, followed by the posterior shoulder.



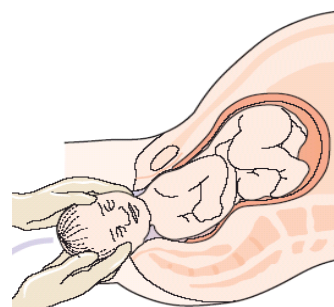
1. Descent and flexion.



2. Internal rotation from (a) occiput transverse to (c) occiput anterior.



3. Extension: head is delivered by extension.



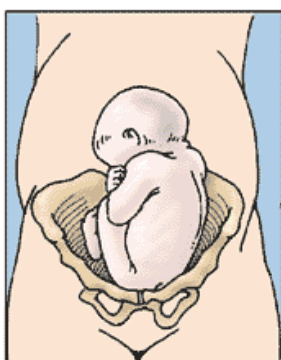
4. Restitution and external rotation.

Abnormal presentation (malpresentation):

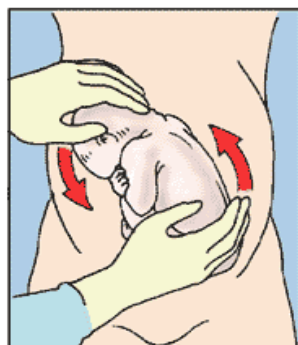
- Any fetal presentation other than vertex including breech, face, brow, shoulder, and compound presentations.
- The most common malpresentation is breech.

Breech presentation: (Review pg 6 for types).

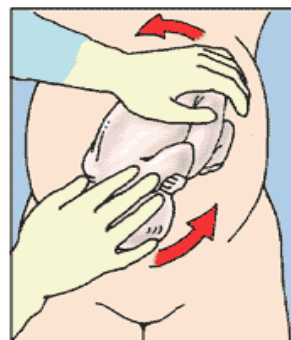
- It's when the buttocks or lower extremities present into the maternal pelvis.
- Etiology:
 - The major predisposing factor is **prematurity (preterm labor)**.
 - Fetal causes: hydrocephalus (may restrict the ability of the fetus to present as a vertex), polyhydramnios, oligohydramnios, placenta previa, and short umbilical cord.
 - Maternal causes: uterine anomalies, pelvic tumors (e.g. fibroid), and small pelvis.
- Diagnosis:
 1. Clinically: Leopold maneuvers.
 2. Ultrasound.
- Management: The patient can be offered the option of external cephalic version, vaginal breech delivery, or caesarian section.
 1. Pregnancy management:
 - **External cephalic version (ECV)**: is a procedure in which the obstetrician manually converts the breech fetus to a vertex presentation through external uterine manipulation under ultrasonic guidance.
 - **Timing**: done after 38 weeks (at term before the onset of labor) **NOT** before 36-37 weeks' gestation because of the tendency for the premature fetus to revert spontaneously to breech.
 - **Contraindications**: placenta previa, hypertensive patient, Hx of previous uterine surgery, and contracted pelvis.
 - **Complications**: placental abruption, cord prolapse, membrane rupture, and uterine rupture.
 - ECV must be done in a theater equipped to perform an emergency C-section.



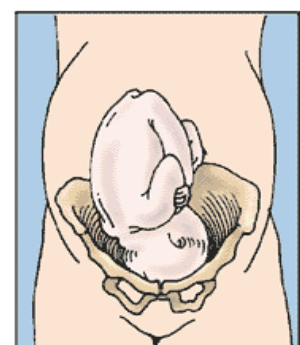
1. The baby is in breech position.



2. The doctor feels for the baby's head and bottom.



3. The doctor turns the baby around.

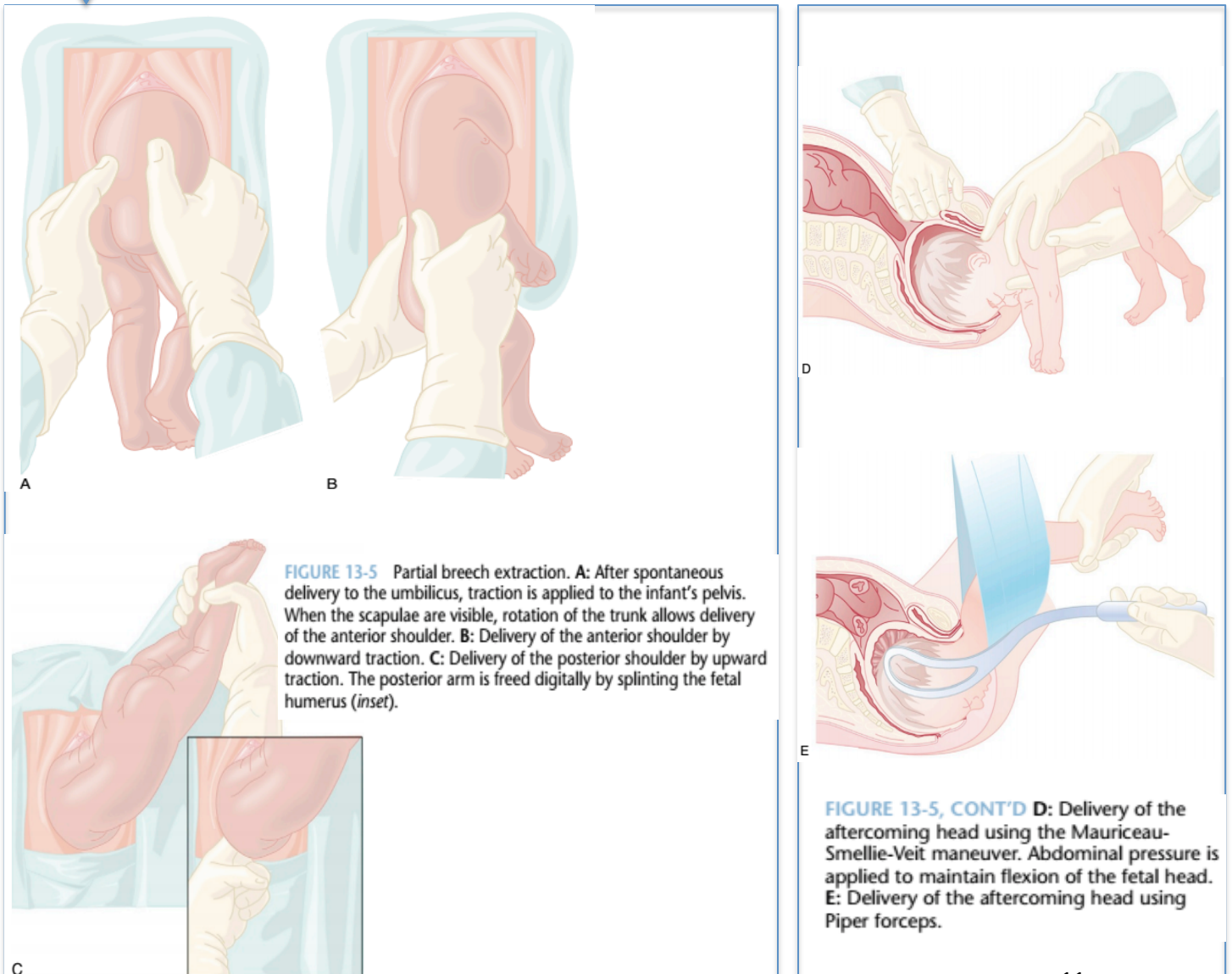


4. The baby is in position for normal delivery.

- Management (Cont.):

2. Labor management:

- **Vaginal breech delivery:**
 - **Complications:** cord prolapse, lower limb fracture, abdominal organs injuries, brachial plexus injury (Erb's palsy), difficulties in delivering the head, and intracranial bleeding.
- **Assisted breech delivery:**
 - The patient is in lithotomy position (supine with legs apart).
 - The cervix should be fully dilated.
 - When buttocks protrude through the vulva an episiotomy should be performed.
 - Legs are delivered easily unless they are extended that need to be flexed.
 - With delivery of the umbilicus small loop of cord is pulled down to feel the pulsations.
- **Cesarean delivery:**
 - It's currently preferred for both preterm and term breech infants.



Face presentation:

- Occurs as the result of complete extension of the head.
- Etiology:
 - In majority of cases, the cause is unknown but is frequently attributed to excessive tone of the extensor muscles of the fetal neck.
 - Rare causes like tumor of the neck, thyroid, thymus gland and cord around the neck.
- Diagnosis:
 1. Clinically: vaginal examination during labor by palpating the nose, mouth, and the eyes.
 2. Ultrasound for confirmation.
- The presenting diameter of the face is the **submentobregmatic**, which measures 9.5 cm and the denominator is **the mentum**.
- Mechanism of labor:
 - It's similar to the vertex presentation (the face presentation enters the pelvis transversely then the face descends to the midplane and internal rotation occurs into the vertical axis).
 1. If the mentum rotates **anteriorly** under the symphysis pubis → **vaginal delivery** should be expected.
 2. If the mentum rotates **posteriorly** → vaginal delivery is not possible and must be delivered by **C-section**.

Brow presentation:

- Occurs as the result of extension of the head such that it's midway between flexion (vertex presentation) and hyperextension (face presentation).
- The presenting diameter of the brow is the **supraoccipitomenal**, which measures 13.5 cm.
- Diagnosis:
 - Clinically: vaginal examination during labor by palpating the anterior fontanelle, supra orbital ridges, and the nose.
- Delivery: must be delivered by **C-section**.

Shoulder presentation:

- Occurs due to oblique or transverse lie in labor.
- Etiology:
 - Common in women with high parity
- Diagnosis:
 - Diagnosed in early labor with intact membrane and no other pathology.
 - External cephalic version can be tried.
 - In case of rupture of the membranes exclude cord prolapse.
- Delivery of shoulder presentation in labor with ruptured membrane is by **caesarian section**.

Summary

- **The promontory** may be felt on vaginal examination and provide a landmark for **clinical pelvimetry**.
- The true pelvis is the portion important in childbearing.
- **Ischial spines** are of great obstetrical importance because it is the shortest pelvic diameter and has a valuable landmark in assessing the level of the presenting part.
- Pelvic inlet diameters:
 1. Anatomic (true) conjugate.
 2. Diagonal conjugate: this conjugate is obtained on **clinical examination**.
 3. Obstetric conjugate: **it can be estimated from the diagonal conjugate** by subtracting 1.5-2.0 cm from the diagonal conjugate.
- Midpelvis: it is at the level of **ischial spines**.
- Pelvic outlet: **the angle of the pubic arch**.
- **Pelvic shapes**:
 1. **Gynecoid**: is the classic female pelvis and is found in 50% of women. The fetal head generally rotates into the OA position in this type of pelvis.
 2. **Android**: is the typical male pelvis and is found in 30% of women.
 3. **Anthropoid**: is found in 20% of women. The fetal head can engage only in AP diameter often in occiput posterior making delivery difficult.
 4. **Platypelloid**: the fetal head has to engage in the transverse diameter.
- Denominators of fetal presentation:
 1. In **vertex** presentation, the occiput is the denominator.
 2. In **face** presentation, the mentum (chin) is the denominator.
 3. In **brow** presentation, frontal bone is the denominator.
- Mechanism of labor: it's a series of changes in position and attitude that the fetus undergoes during its passage through the birth canal.
- **Abnormal presentations: presentations other than vertex and positions other than (OA) are considered to be abnormal in the laboring patient.**
- Breech presentation delivery is either vaginal (following strict criteria) or by CS.
- Face presentation:
 1. Mentum anterior → vaginal delivery.
 2. Mentum posterior → CS.
- Brow and shoulder presentations must be delivered by CS.

Orientation in utero

Lie	1. Longitudinal. 2. Transverse. 3. Oblique.	The most common is longitudinal.
Presentation	1. Cephalic. 2. Breech. 3. Compound. 4. Shoulder.	The most common is cephalic.
Position	1. Occiput. 2. Sacrum. 3. Mentum.	The most common at delivery is occiput anterior.
Attitude	1. Vertex. 2. Military. 3. Brow. 4. Face.	The most common is vertex.
Station	It's expressed in cm above or below the maternal ischial spines.	Ischial spine = 0 station.

- The best pelvimetry is the fetus head.
- In primigravida the engagement occurs two weeks before the delivery.
- The following could delay the engagement: occipitoposterior position, abnormal placenta, narrow pelvis, and local lesions.

MCQ's:

Q1. A 25-year-old G1 at 37 weeks presents to labor and delivery with gross rupture of membranes. The fluid noted to be clear and the patient is noted to have regular painful contractions every 2 to 3 minutes lasting for 60 seconds each. The fetal heart rate tracing is reactive. On cervical examination she is noted to be 4 cm dilated, 90% effaced with the presenting part a -3 station. The presenting part is soft and felt to be the fetal buttock. A quick bedside ultrasound reveals a breech presentation with both hips flexed and knees extended. What type of breech presentation is described?

- a. Frank
- b. Incomplete, single footling
- c. Complete
- d. Double footling

Q2. A 25-year-old G1P0 patient at 41 weeks presents to labor complaining of gross rupture of membranes and painful uterine contractions every 2 to 3 minutes. On digital examination, her cervix is 3 cm dilated and completely effaced with fetal feet palpable through the cervix. The estimated weight of the fetus is about 6 lb, and the fetal heart rate tracing is reactive. Which of the following is the best method to achieve delivery?

- a. Deliver the fetus vaginally by breech extraction
- b. Deliver the baby vaginally after external cephalic version
- c. Perform an emergent cesarean section
- d. Perform an internal podalic version
- e. Perform a forceps-assisted vaginal delivery

Q3. A 16-year-old G1P0 at 38 weeks gestation comes to the labor and delivery suite for the second time during the same weekend that you are on call. She initially presented to labor and delivery at 2:00 pm Saturday afternoon complaining of regular uterine contractions. Her cervix was 1 cm dilated, 50% effaced with vertex at -1 station, and she was sent home after walking for 2 hours in the hospital without any cervical change. It is now Sunday night at 8:00 pm, and the patient returns to labor and delivery with increasing pain. She is exhausted because she did not sleep the night before because her contractions kept waking her up. The patient is placed on the external fetal monitoring. Her contractions are occurring every 2 to 3 minutes. You reexamine the patient and determine that her cervix is unchanged. Which of the following is the best next step in the management of this patient?

- a. Perform artificial rupture of membranes to initiate labor
- b. Administer an epidural
- c. Administer Pitocin to augment labor
- d. Achieve cervical ripening with prostaglandin gel

4 - Normal labour is the process by which contraction of the gravid uterus expel the fetus and other product of conception :

- A. Between 37 and 42 weeks from the last menstrual period
- B. Befor 37 wks
- C.after 42 wks
- D.after 24 wks

5 - How long do you left women push for ?

- A. 1hr if multi 2 hrs if nuli ,add 1hr if epidural
- B. 21hr if multi 3 hrs if nuli ,add 1hr if epidural
- C. 1.5 hr if multi 3hrs if nuli ,add 1hr if epidural
- D. 1.5 hr if multi 2.5 hrs if nuli ,add 1hr if epidural

6- . 32 to po 36 wks G1 presented with contraction looks uncomfortable and is contracting every 3 minutes but the cervix is 2 cm and 50% effaced was seen the previous day with similar complaints what is the diagnosis?

Prolonged latent phase

Q1: A

Q2: C

Q3: E

Q4: A

Q5 : A

Explanation:

Q1 + Q2: The patient described here has a fetus in the double footling breech presentation. In cases of frank breech presentations, the lower extremities are flexed at the hips and extended at the knees so that feet lie in close proximity to the head and fetal buttocks is the presenting part. With a complete breech presentation, one or both knees are flexed. In the case of an incomplete breech presentation, single footling, one hip is not flexed and one foot or knee is lowermost in the birth canal. Because of the risk of a prolapsed cord, it is generally recommended that fetuses with footling breech presentations undergo delivery by cesarean section. External cephalic version is a procedure whereby the presentation of the fetus is changed from breech to cephalic by manipulating the fetus externally through the abdominal wall. It is not indicated in this patient because the membranes are ruptured and the risk of cord prolapse is great. In addition, this procedure generally requires that the uterus be soft and relaxed, which is not the case with this patient in labor. Internal podalic version is a procedure used in the delivery of a second twin. It involves turning the fetus by inserting a hand into the uterus, grabbing both feet, and delivering the fetus by breech extraction.

Q3: This patient is either experiencing prolonged latent labor or is in false labor. The latent phase of labor begins with the onset of regular uterine contractions and is accompanied by progressive but low cervical dilation. The latent phase ends when the cervical dilation rate reaches about 1.2 cm/h in nulliparous patients and 1.5 cm/h in multiparous patients; this normally occurs when the cervix is about 3 to 4 cm dilated. In nulliparous patients, the latent phase of labor usually lasts less than 20 hours (in multiparous patients, it lasts > 14 hours). To correct prolonged latent labor, it is generally recommended that a strong sedative such as morphine be administered to the patient. This is preferred over augmentation with Pitocin or performing an amniotomy, because 10% of patients will actually have been in false labor and these patients will stop contracting after administration of morphine. If a patient truly is in labor, then, after the sedative wears off, she will have undergone cervical change and will have benefited from the rest in terms of having additional energy to proceed with labor. An epidural would not be recommended because the patient may be in false labor. There is no role for cervical ripening in this patient because of the fact that she might be in false labor and can go home and wait for natural cervical ripening contractions resolve with a therapeutic rest with morphine.