



# LABOR AND DELIVERY 1: FACTORS AFFECTING LABOR AND DELIVERY

Dr. Joselito A. Santiago, MD, FPOGS, FPSMFM, FPSUOG

Trans Group: 9A, 10A

## OUTLINE

- I. Overview
- II. Passenger (Fetus)
  - A. Fetal Lie
  - B. Fetal Presentation
  - C. Fetal Attitude
  - D. Fetal Position
    - 1. Fetal Head
  - D. Leopold Maneuvers
    - 1. First Leopold Maneuver (Fundal Grip)
    - 2. Second Leopold Maneuver (Umbilical Grip)
    - 3. Third Leopold Maneuver (Pawlik's Grip)
    - 3. Fourth Leopold Maneuver (Pelvic Grip)
- III. Passageway
  - A. Pelvic Types (Caldwell- Moley Classification)
  - B. Fetal Station
  - B. Clinical Pelvimetry
    - 1. Inlet
    - 2. Midplane
    - 3. Outlet
- IV. Powers (Labor)
  - A. True Labor Vs. False Labor
  - B. Powers
  - C. Intrapartum Surveillance Of Uterine Activity
  - D. Patterns Of Uterine Activity
  - E. Montevideo Units (MVUS)
  - F. Tachysystole
  - G. Cervical Assessment
    - 1. Cervical Dilatation
    - 2. Cervical Effacement
- V. Psyche
  - A. Women With Continuous Support
  - B. Labor Companions
    - 1. Male Partner As Labor Companion

REFERENCES:

Dr. Joselito A. Santiago — PPT & F2F Lecture

## II. PASSENGER (FETUS)

- In the management of labor and delivery, it is important that we have a good idea of the fetal orientation as it would affect how we manage a pregnant woman
- In describing fetal orientation, we describe them according to the following:

### FETAL ORIENTATION

1	Lie
2	Presentation
3	Attitude
4	Position

### A. FETAL LIE

- Relationship of the long axis of the fetus to that of the mother
- **Longitudinal lie**
  - Parallel with long axis with the mother
  - 99% of labors at term
  - Vaginal delivery is possible
- **Transverse lie**
  - Right angles to each other
  - Generally an indication for abdominal or caesarean delivery
- **Oblique lie**
  - Fetal and maternal axis are at 45° angle to each other
  - Unstable and can become longitudinal or transverse during labor

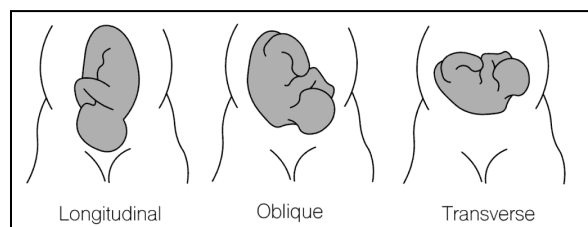


Figure 1. Fetal lie

## I. OVERVIEW

- 4Ps of labor:
  - Passenger (Fetus)
  - Passageway (Pelvis)
  - Powers (Contractions)
  - Psyche

## B. FETAL PRESENTATION

- Portion of the fetal body either within or in closest proximity to the birth canal
- Felt through the cervix on vaginal examination
- Can also be gleaned when doing abdominal exam

### FETAL PRESENTATION IN LONGITUDINAL LIE

FETAL HEAD	Cephalic presentation
FETAL BUTTOCKS	Breech presentation
SHOULDER	Transverse presentation

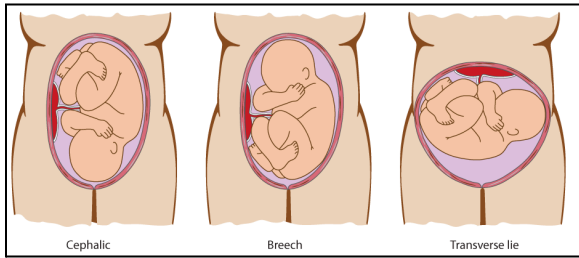


Figure 2. Fetal presentation

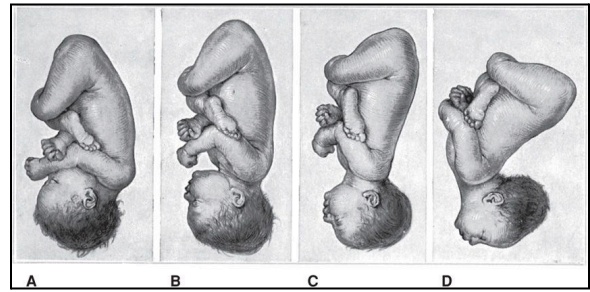


Figure 3. Fetal attitude

**C. FETAL ATTITUDE**

- In the later months of pregnancy, the fetus assumes a characteristic posture described as the fetal attitude or habitus
- As a rule, because of how the uterus is shaped, the fetus forms an **ovoid mass** that corresponds roughly to the shape of the uterine cavity
- The fetus, because of the limited space within the uterus, becomes folded upon itself to create a convex back

**Professor's Notes:**

- Fetal attitude is only considered if the fetus is in **cephalic presentation** because that is where it will matter the most
- Instead of saying a fetus is in "cephalic presentation," it would be more precise to call it, for example, "presenting in occiput" or "occiput presentation"

CEPHALIC PRESENTATIONS	
<b>OCCIPUT/VERTEX PRESENTATION</b>	<ul style="list-style-type: none"> <li>• Majority of fetuses are in this type of presentation</li> <li>• In this presentation, the fetal head is <b>sharply flexed</b> with the chin nearly in contact with the fetal chest</li> <li>• The fetal thighs are flexed over the abdomen and the legs are bent at the knee</li> <li>• The presenting part here is the <b>occipital fontanelle</b></li> </ul>
<b>SINCIPUT PRESENTATION</b>	<ul style="list-style-type: none"> <li>• In this presentation, the neck is only <b>partially flexed</b>, hence the <b>anterior fontanelle</b> becomes the presenting part of the fetal head</li> </ul>
<b>BROW PRESENTATION</b>	<ul style="list-style-type: none"> <li>• In this presentation, the fetal neck is <b>partially extended</b>, making the <b>brow</b> of the fetal head the presenting part</li> </ul>
<b>FACE PRESENTATION</b>	<ul style="list-style-type: none"> <li>• Much less often, the fetal neck may be <b>sharply extended</b> where the fetal back can come in contact with the back of the fetal head</li> <li>• In this presentation, the <b>face</b> is the presenting part of the fetal head</li> </ul>

DIAMETERS OF THE DIFFERENT CEPHALIC PRESENTATIONS	
<b>SUBOCCIPITOBREGMATIC DIAMETER</b>	<ul style="list-style-type: none"> <li>• Presenting diameter of the fetal head in <b>occiput/vertex presentation</b></li> <li>• Measures to be more or less <b>9.5 cm</b></li> <li>• <b>Smallest</b> diameter out of all cephalic presentations</li> </ul>
<b>SUBOCCIPITOFRONTAL DIAMETER</b>	<ul style="list-style-type: none"> <li>• Presenting diameter of the fetal head in <b>sinciput presentation</b></li> <li>• The distance from the occiput to the frontal bone</li> </ul>
<b>OCCIPITOMENTAL DIAMETER</b>	<ul style="list-style-type: none"> <li>• Also called the "chin" diameter</li> <li>• Presenting diameter of the fetal head in <b>brow presentation</b></li> <li>• Measures to be <b>13.5 cm</b></li> </ul>
<b>SUBMENTOBREGMATIC DIAMETER</b>	<ul style="list-style-type: none"> <li>• Presenting diameter of the fetal head in <b>face presentation</b></li> <li>• Measurement can be as large as the vertex</li> <li>• Is <b>not an absolute contraindication</b> to vaginal delivery, depending on the position of the fetal chin (whether posterior or anteriorly located)</li> </ul>

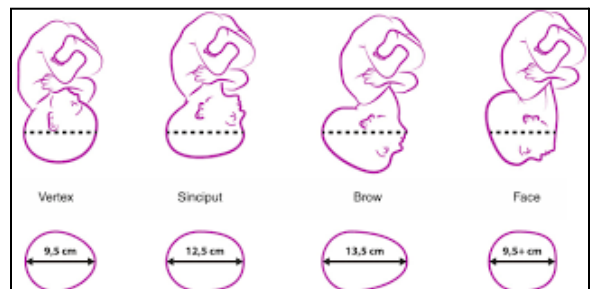


Figure 4. Diameters of the different cephalic presentations

## D. FETAL POSITION

- Relationship of a defined part of the fetal presenting part of either the right or left side of the birth canal
- Do not say 'cephalic position' or 'transverse position' or 'breech position' (these are presentations)

### FETAL POSITION

<b>OCCIPUT PRESENTATION</b>	<ul style="list-style-type: none"> <li>• Occiput as the presenting part <ul style="list-style-type: none"> <li>○ back of the head</li> </ul> </li> <li>• Seen in most patients</li> <li>• Better located by palpating the <b>posterior fontanelle</b>, which is triangular in shape as opposed to the anterior fontanelle, which is more or less diamond-shaped</li> </ul>
<b>FACE PRESENTATION</b>	<ul style="list-style-type: none"> <li>• Chin as the presenting part <ul style="list-style-type: none"> <li>○ Called the <b>mentum</b></li> </ul> </li> </ul>
<b>BREECH</b>	<ul style="list-style-type: none"> <li>• <b>Sacrum</b> as the presenting part <ul style="list-style-type: none"> <li>○ The most bony part</li> </ul> </li> </ul>

### 1. FETAL HEAD

- There are fontanelles and sutures because all of the fetal bones haven't fused yet
- The posterior fontanelle is the one that you locate to find where the occiput is because it is easier.
- Difficult to differentiate just by palpating the bone itself, which is the frontal and occipital bone
  - The anterior fontanelle is diamond-shaped
  - If you feel that it is a triangle, it is the posterior fontanelle and is in the occiput

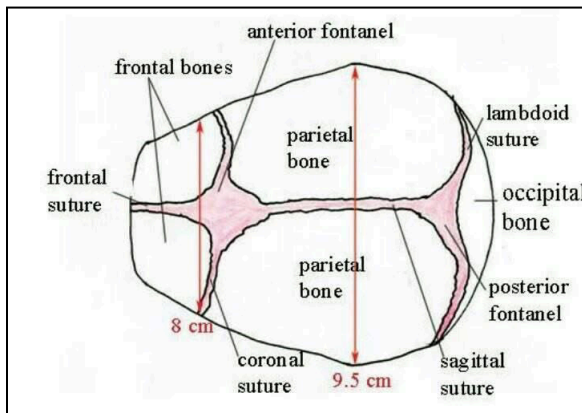


Figure 5. Fetal head with fontanelles

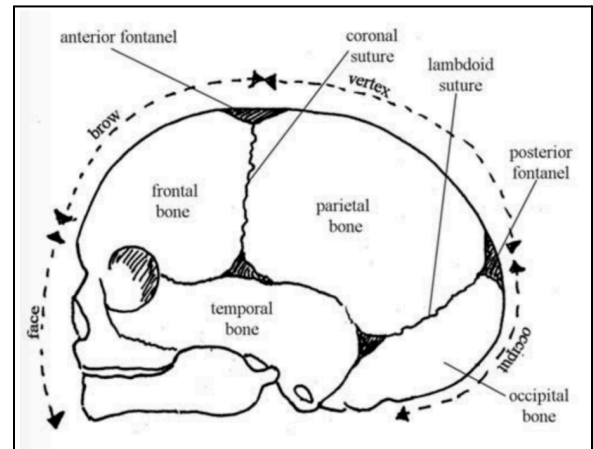


Figure 6. Fetal bones

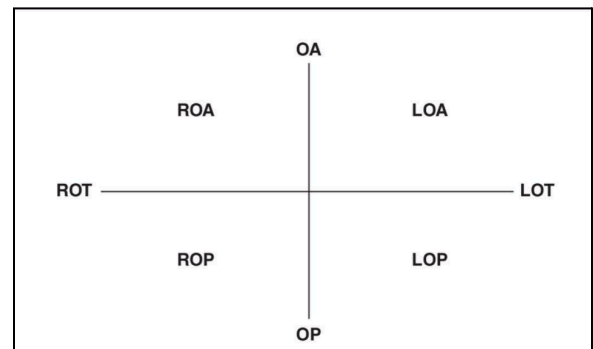
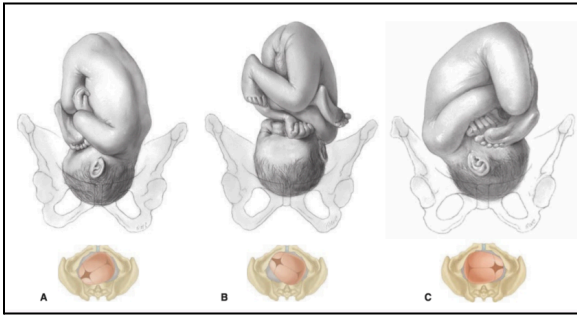


Figure 7. Fetal positions

### Professor's Notes:

- The **biparietal diameter (BPD)**, in a well-flexed fetal head, is the greatest transverse diameter (approximately **9.5 cm** on average)
    - This measurement is clinically important, especially when discussing abnormal labor
  - If the widest portion of the fetal head is about 9.5 cm, then the maternal pelvis must have an internal diameter that is at least equal to or greater than this measurement to accommodate the passage of the fetus
  - Although the biparietal diameter averages about 9.5 cm, the fetal head can still accommodate a slightly narrower maternal pelvis because the fetal skull is not fully calcified
- 
- Assesses the uterine fundus
  - Permits identification of fetal lie and determination of which fetal pole (i.e., cephalic or podalic) occupies the fundus
  - **Breech**: Sensation of a large, nodular mass
  - **Cephalic**: feels hard and round and is more mobile



**Figure 8.** Fetal positions

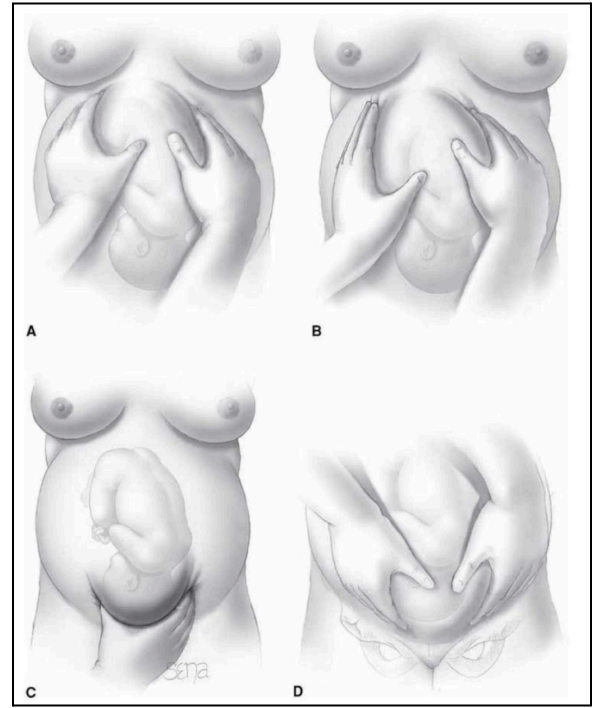
- **Figure 8A:** Left occiput anterior (LOA)
  - Cannot see this inside the uterus
  - If palpated in the cervix, you can imagine the fetus configured in this manner
  - The baby is facing the right and a little tilted towards the back
- **Figure 8B:** Left occiput posterior (LOP)
  - The anterior fontanelle is on the right side of the mother and is near the anterior, while the posterior fontanelle is on the left side but nearer the posterior
  - The baby's face is a little bit faced to the front towards the maternal abdomen
- **Figure 8C:** Right occiput transverse (ROT)
  - Comes into play later on in the cardinal movements of labor
  - In the transverse plane, the anterior and posterior fontanelles have almost 0 degree angle when you draw a horizontal line
- **Most favorable for vaginal birth:**
  - Occiput anterior
  - Well-flexed fetal head
  - Smallest head diameter presents
- The smallest AP diameter of the well-flexed fetal head can be seen in vertex or occiput and it is the suboccipital bregmatic

#### D. LEOPOLD MANEUVERS

- During pregnancy, we utilize ultrasound or sonology in order to find out the following:

1	If there is a pregnancy
2	How many fetuses there are
3	Fetal lie
4	Fetal presentation

- Without access to the aforementioned technologies, we can still find out the fetal lie and presentation by conducting the Leopold maneuvers



**Figure 9.** Leopold maneuvers

#### 1. FIRST LEOPOLD MANEUVER (FUNDAL GRIP)

- Fundal grip (Figure 9A)
- Stand on one side of the mother
  - Both hands are placed at the uterine fundus and you try to palpate
- **Purpose:** To find out what is occupying the uterine fundus
- **Example:** A baby in cephalic presentation
  - You should be able to palpate a large nodular mass, which may indicate that the fetal buttocks or the fetal breech is the one occupying the uterine fundus

#### 2. SECOND LEOPOLD MANEUVER (UMBILICAL GRIP)

- Umbilical grip (Figure 9B)
- Position yourself at the right or left side of the mother
  - Slide your palms down to the paraumbilical and you press down on each side
  - You can do so simultaneously or one at a time to find out what is occupying the right or left portion of the middle part of the uterus
- **Example:** Cephalic presentation
  - In the first Leopold maneuver, you will notice a large mass at the uterine fundus
  - As you slide down, you will feel a convex rigid mass on the maternal left side with small moving nodular parts on the right
  - The assumption here is that the convex hard structure felt on the left must be the fetal back while the small nodular, movable structures are the fetal extremities

### 3. THIRD LEOPOLD MANEUVER (PAWLIK'S GRIP)

- Pawlik's grip (Figure XC)
- Facing the mother's head
- Place one hand in the area just above the symphysis pubis and try to grasp or palpate whatever structure is located in that area or which fetal parts are in closest proximity to the birth canal
  - **Recall:** Pubis symphysis represents the area which contains linea terminalis or the border of the pelvic inlet
- Cephalic presentation: hard round ballotable mass
  - Depending if it is engaged or not, it can be movable or not
  - If unengaged, you can rock the ballotable structure from side to side
  - Otherwise, it is engaged

### 3. FOURTH LEOPOLD MANEUVER (PELVIC GRIP)

- Pelvic grip (Figure XD)
- Helps determine the degree of descent

### ENGAGEMENT

- Facing the mother's feet, you place the fingers of each hand to the side of the presenting part and you slide them down along the side of the presenting part to symphysis pubis or towards the midline
  - If the fingers meet in the midline as you are sliding alongside, it is **unengaged**
  - If they fail to meet in the middle and get stuck by the symphysis pubis, it is already **engaged**

### FLEXION/EXTENSION OF HEAD

- Can also know here if the head is well flexed or extended
- In this maneuver, sometimes a bump is encountered, which you need to move your hand over
  - If your examination finger is stumped with the so-called bump (the **cephalic prominence**), the fetal presentation is cephalic
  - Felt on the opposite side of the fetal back → you can make an assumption that the baby's head is **well flexed**
- If you feel the cephalic prominence on the same side as the fetal back, depending on how the cephalic prominence is protruding from the midline, it can be sinciput, brow, or face presentation
  - In a **face presentation**, the fetal back seems to be straight or slightly concave
  - Sometimes, you can palpate a hard structure that is not convex
- If the fetal back is on the same side as the cephalic prominence, depending on the degree of protuberance of the cephalic prominence, it can be a brow or face
- Nowadays, the availability of **ultrasound** helps in identifying whether the fetal head is flexed or not
  - Superior to Leopold maneuvers

- However, Leopold maneuvers are skills that every doctor should have, which can help in managing the patient (e.g., deciding on doing a cesarean or a normal delivery)

### III. PASSAGEWAY

- The maternal bony pelvis and soft tissues, such as the cervix and vagina
- Shows what to assess regarding the adequacy of the fetal pelvis
- True pelvis is bounded at the uppermost portion by the linea terminalis which is the entry of the pelvic inlet

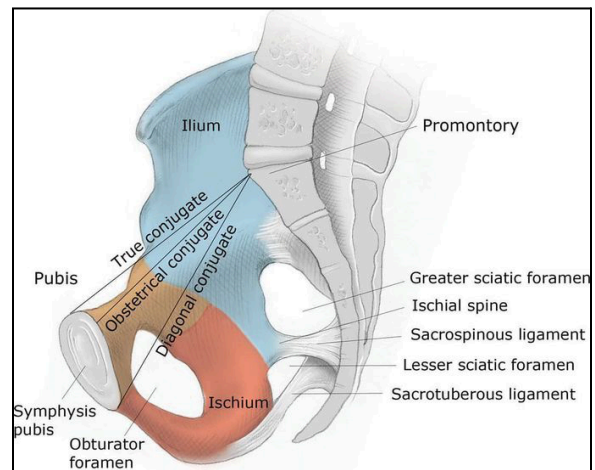


Figure 10. Pelvic bone with conjugates

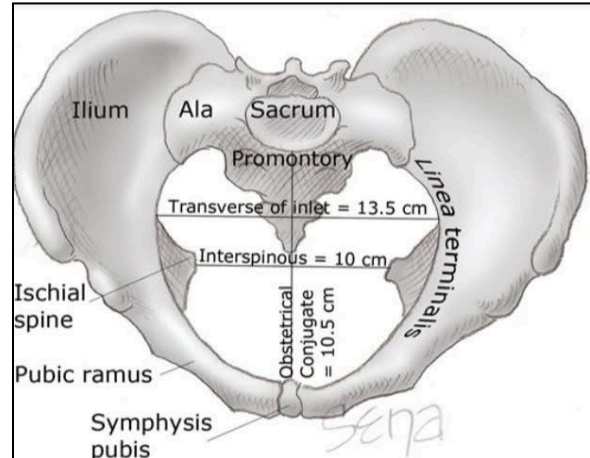


Figure 11. Female pelvic inlet

- The **pelvic inlet** is described in three ways:
  1. **True conjugate** - starting point of pelvic inlet
  2. **Obstetrical Conjugate** - plane with least dimension or the narrowest part of pelvic inlet
  3. **Diagonal conjugate** - only feature to clinically assess the pelvic inlet's adequacy
- The **pelvic outlet** is from the obturator foramen to sacrum
- Most of the pelvis is composed of the pelvic midplane, which is from the pelvic inlet to the outlet
- **Interspinous diameter**

- Located at the pelvic mid-plane
- The narrowest transverse portion of the maternal pelvis
- **Biparietal diameter** - the largest diameter that the fetal head must pass through

### A. PELVIC TYPES (CALDWELL- MOLOY CLASSIFICATION)

- Each blue line passes through the widest transverse diameter of the pelvis and divides the inlet into a posterior and anterior part

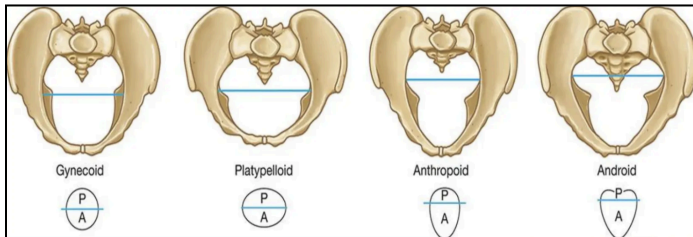


Figure 12. Pelvic types (Caldwell-Moloy classification)

PELVIC TYPES (IN ORDER OF FAVORABILITY)		
1	<b>Gynecoid</b>	Round, with more or less equal anterior portions
2	<b>Anthropoid</b>	Avocado-shaped, with a bigger anterior portion bigger than the posterior portion
3	<b>Android</b>	Heart-shaped, with a larger anterior portion
4	<b>Platypelloid</b>	Flattened, but the anterior and posterior portions are more or less equal

- For the anthropoid pelvic type, there is a chance that the fetus would be in an occiput posterior presentation of the fetal head
- Android and platypelloid pelvic types are less favorable for a vaginal delivery

### B. FETAL STATION

- Used to describe how far down the presenting part of the fetus has descended during labor
  - Progress of the fetal head from pelvic inlet downwards (**In this lecture, only the normal labor will be discussed – cephalic presentation**)

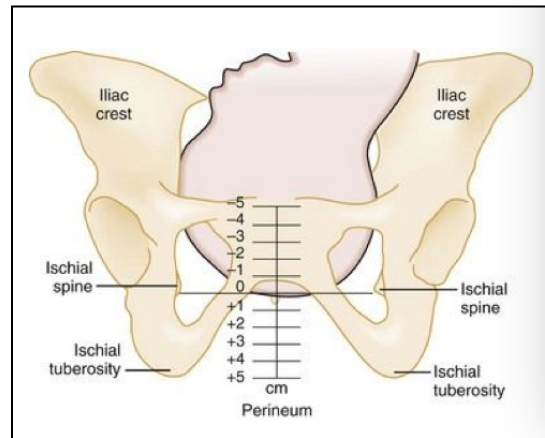


Figure 13. Fetal station

- **Ischial spine** serves as the landmark, while the **perineum** serves as the farthest
- **Negative stations** if the fetus presenting head is above the ischial spines
  - -5 station: Fetus has not entered the pelvic inlet
  - -4 to -3 station: Fetus is high up in the pelvis
  - -1 station: Fetus is above the zero mark
- If the fetus presenting head was palpated at the level of the ischial spine, then report the fetus station at level 0
  - **Engagement** occurs when the fetus's widest portion has successfully entered the pelvis
- **Positive stations:** Anything below the Ischial spine
  - +1 to +3 station: Fetus is moving through the birth canal
  - +4 station: The baby is crowning, the top of the head can be seen at the vaginal opening
  - +5 station: The baby is being born by the perineum

### B. CLINICAL PELVIMETRY

- Often used to gauge whether a successful vaginal delivery is possible
- Palpate certain portions of the maternal canal to determine if it is adequate or not
- In nulliparas: Assessment of the adequacy of the pelvic anatomy will allow you to prognosticate whether labor may be successful or not

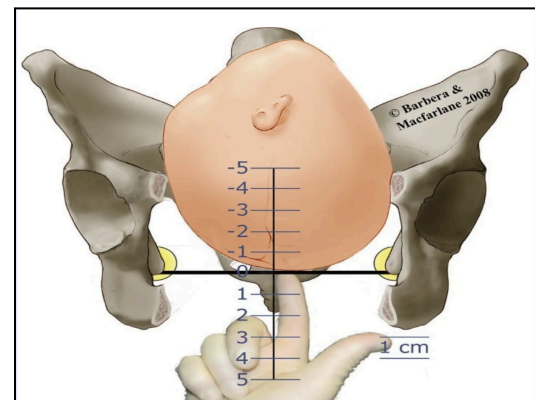
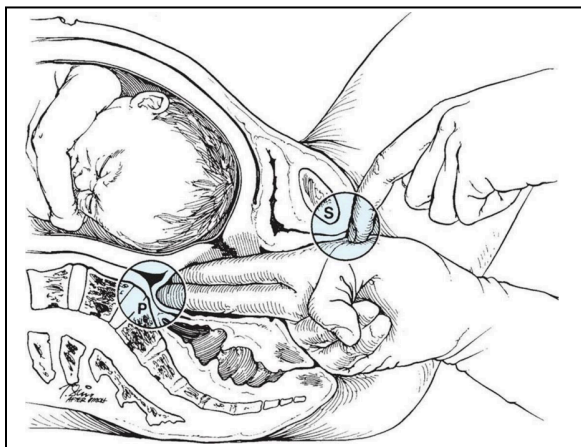


Figure 14. Clinical pelvimetry

- Female pelvis: space of limited dimension
- Divided into three portions:
  1. **Inlet** - begins at the linea terminalis
  2. **Midplane**
  3. **Outlet**

### 1. INLET

- **Diagonal conjugate**
  - From the lower margin of symphysis pubis to sacral promontory
  - Normally  $\geq 11.5$  cm (indicates the pelvic inlet is adequate)



**Figure 15.** Vaginal examination to determine the diagonal conjugate

- **Obstetrical conjugate**
  - Most important diameter of the inlet, shortest AP diameter of the pelvic inlet
  - Distance from the inner portion (midpoint) of the symphysis pubis to the sacral promontory
    - Impossible to make assessment clinically
  - Instead, the distance from lowermost border of symphysis pubis to sacral promontory is measured and 1–1.5 cm is subtracted to get the obstetrical conjugate
  - Estimating the diagonal conjugate is the only way to clinically assess the pelvic inlet

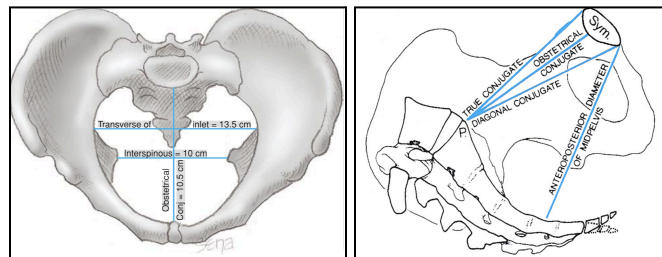
#### Professor's Notes:

- The diagonal conjugate does not actually represent the dimensions of the pelvic inlet
  - Instead, it is the **obstetric conjugate** that actually represents the inlet size
- It is measured from the middle or midpoint of the symphysis pubis to the sacral promontory
- The obstetric conjugate cannot be measured anatomically
  - In order to estimate the obstetric conjugate, deduct 1-1.5 cm from the diagonal conjugate
- The only way to clinically measure is by using the diagonal conjugate

### 2. MIDPLANE

- The biggest portion of the maternal pelvis
  - Where most of the fetal head will be traversing
- Plane of least dimension

1	<b>BISPINOUS DIAMETER</b>	At least <u>9.5 cm</u> in Filipino patients
2	<b>SACROSCIATIC NOTCH</b>	At least two fingerbreadths
3	<b>PELVIC SIDEWALL</b>	<ul style="list-style-type: none"> <li>• Area above the ischial spines</li> <li>• Should be parallel or always slightly convergent</li> </ul>
4	<b>ISCHIAL SPINES</b>	Not prominent Narrowest transverse portion
5	<b>SACRUM</b>	Should be hollow when you sweep your fingers from the sacral promontory downwards
6	<b>SACRAL INCLINATION</b>	Posterior <ul style="list-style-type: none"> <li>• Angled away from the symphysis pubis in such a way that when drawing a straight line from the back, it should be away from the midline</li> </ul>
7	<b>COCCYX</b>	Should be moveable up and down (if fingers are long enough to palpate)



**Figure 16.** Midplane pelvimetry

#### Professor's Notes:

- Based on the textbook, the minimum bispinous diameter is 10 cm, which is based on Caucasian women. For Filipinos, the threshold is 9.5 cm.
- The table is based on the textbook. However, according to Dr. Santiago, it does not matter if the ischial spines are prominent or not as the measurement is what is important.
  - It can be prominent but wide
  - It can be not prominent but short
  - But in the books, it should not be prominent.
- If you can palpate the sacrum when sweeping your fingers downwards, it means the sacrum is not curved and is more flat, providing less space. The sacrum must be hollow.

### 3. OUTLET

- To test the adequacy of the pelvic outlet, measure the distance between the two ischial tuberosities (**bituberous diameter**)

<b>1</b>	<b>BITUBEROUS DIAMETER</b>	<ul style="list-style-type: none"> <li>8.0 cm</li> <li>Can accommodate width of closed fist</li> <li>Not that applicable because of differences in width of closed fists in different persons</li> </ul>
	<b>PUBIC ARCH</b>	At least 90°

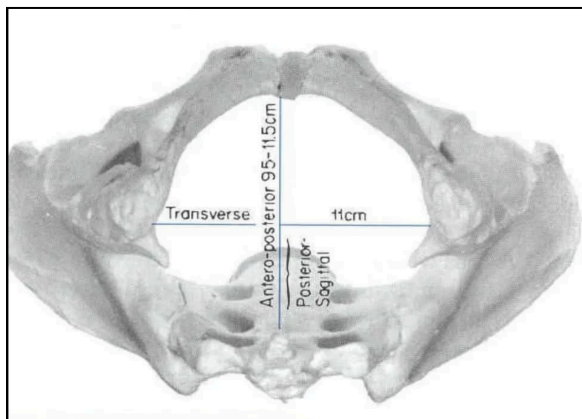


Figure 17. Outlet pelvimetry

#### SUMMARY OF CLINICAL PELVIMETRY

<b>DIAGONAL CONJUGATE</b>	≥ 11.5 cm
<b>BISPINOUS DIAMETER</b>	≥ 9.5 cm
<b>SACRAL CURVATURE</b>	Hollow
<b>SACRAL INCLINATION</b>	Posterior
<b>SACROSCIATIC NOTCH</b>	2 fingerbreadths
<b>PELVIC SIDEWALL</b>	Parallel/slightly convergent
<b>ISCHIAL SPINES</b>	Not prominent
<b>COCCYX</b>	Movable
<b>PUBIC ARCH</b>	> 90 degrees
<b>BITUBEROUS DIAMETER</b>	≥ 8.0 cm

### IV. POWERS (LABOR)

- Uterine contractions that bring about demonstrable effacement and dilatation of the cervix
- ≥ 12 contractions in 1 hour (every 5 minutes)
- Traditionally, cervix dilatation must be 3 or 4 cm
  - Usually 3 cm in the Philippines

#### A. TRUE LABOR VS. FALSE LABOR

- False labor is also known as **Braxton-Hicks contractions**

<b>TRUE LABOR</b>	<b>FALSE LABOR</b>
Contractions occur at <b>REGULAR</b> intervals	Contractions occur at <b>IRREGULAR</b> intervals

Internals gradually shorten	Intervals remain long
Intensity gradually increases	Intensity remains unchanged
Discomfort in the back and abdomen	Discomfort chiefly in the abdomen
<b>Cervix DILATES</b>	<b>Cervix DOES NOT</b> dilate
Discomfort <b>NOT</b> stopped by sedation	Discomfort usually <b>RELIEVED</b> by sedation

### B. POWERS

- Passageway represents the uterus, the cervix (internal os, endocervical canal, and external os), the vagina of the mother, and the bony prominences hindering birth or parturition
- Together with this, power represents the uterine contractions responsible for releasing the fetus out of the uterus, in synergy with the compliance of the passageway
- Labor** occurs when there are constant uterine contractions that bring out demonstrable cervical effacement
- Interval of contractions gradually lessen from about **10 minutes** in the first stage of labor to as little as **1 minute** in the second stage of labor
- Periods of relaxation between contractions are essential to prevent uteroplacental insufficiency (which may cause **fetal hypoxemia**)
  - As long as there are uterine contractions, there will be temporary interruption of blood flow to the placenta
  - Periods of relaxation are needed to let the interrupted blood flow recover to again supply the placenta and eventually the baby with blood and eventually oxygen

#### Professor's Notes:

- Placental blood supply is from maternal blood vessels
  - Uterine artery → arcuate artery → terminal artery
- Uterus contraction → constriction of blood vessels → interruption of blood flow to the placenta
- The baby has its own compensatory mechanisms in which it can tolerate the periods of temporary hypoxemia
  - Increased oxygen reserves
  - Circulating bases to counteract any metabolic acidosis

### C. INTRAPARTUM SURVEILLANCE OF UTERINE ACTIVITY

- A cardiotocograph monitor is used
  - A contraction monitor sensor is placed on the maternal abdomen, which is recorded into a machine
- Once membranes have ruptured during labor, you can place an intrauterine pressure catheter to measure the actual uterine pressure
- In most situations, external monitoring is used
  - The upper portion of Figure X shows a recording of fetal heart rate, and the lower portion shows the uterine activity

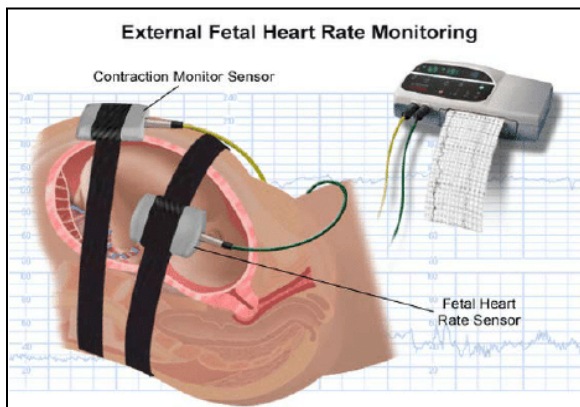


Figure 18. External fetal heart rate monitoring

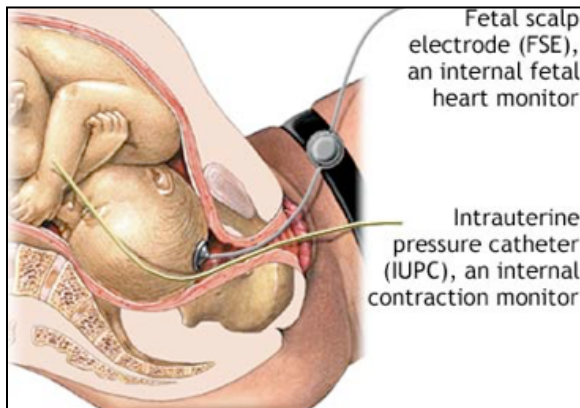


Figure 19. Internal electronic fetal monitoring

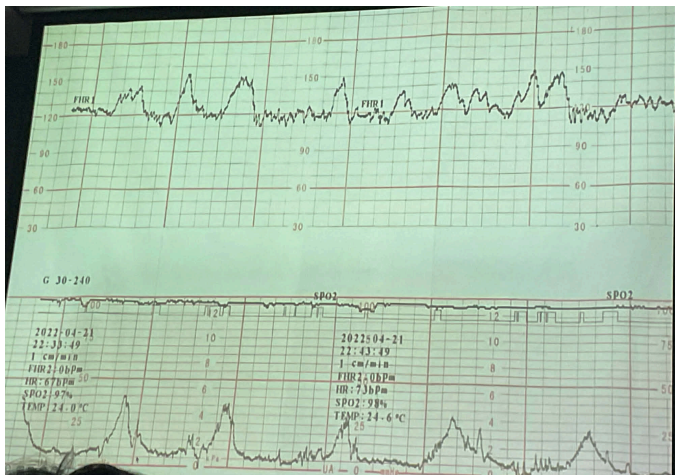


Figure 20. Recording of Fetal Heart Rate through Time

- Lower portion: Uterine activity
  - Uterine contractions peak and eventually abate
    - In the example: The contraction lasted for about a minute
      - 1 small box is around 30 seconds
    - Frequency is every 3–4 minutes

**Professor's Notes:**

- In the Philippines, we usually record the actual frequency (e.g., every 3-4 minutes)
- However, in literature abroad, they will record (the example above) as 3 contractions in 10 minutes
  - This is actually easier
  - 1 big box = 3 minutes

**D. PATTERNS OF UTERINE ACTIVITY**

- 2–3 contractions in 10 minutes latent phase
- 3–5 contractions in 10 minutes active phase
- Not more than 120 seconds in duration

**E. MONTEVIDEO UNITS (MVUs)**

- Contraction forces are usually reported in **Montevideo units (MVUs)**, which represent the total of the intensity of each contraction in a 10-minute period

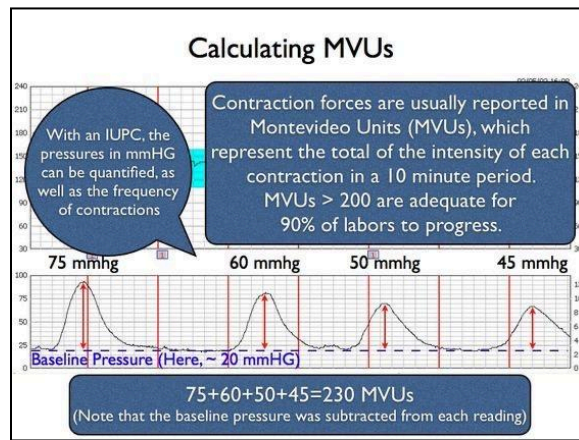


Figure 21. Calculating MVUs

- Take the peak pressure and subtract the baseline pressure (20 in the example)
  - **Example:**
    - $95 - 20 = 75$
    - $80 - 20 = 60$
    - Sum up the pressures:
      - $75 + 60 + 50 + 45 = 230$  MVUs
    - 230 means that these contractions are adequate for labor to progress
- **MVUs > 200** are adequate for 90% of labors to progress
  - Less than 200 means that the forces of uterine contractions are not strong enough to allow labor to proceed
    - Need to do augmentation of labor using oxytocin
- With an IUPC, the pressures in mmHg can be quantified, as well as the frequency of contractions

**Professor's Notes:**

- Clinical labor
  - When uterine activity reaches 80-120 Montevideo units in preparation for the actual labor
    - Around 3 contractions of 40mmHg each
    - Every 10 minutes
      - Usually 45–120 seconds in duration (for rest for placental flow to be reestablished)

**F. TACHYSYSTOLE**

- Previously called **uterine hyperstimulation**
- Excessive frequency of contractions
  - **More than 5 contractions in 10 minutes** or contraction every 2 minutes in the active phase of labor
  - 5 contractions in 10 minutes is okay because most of the time it is near the delivery of the baby
- This is bad because at least 90–120 seconds of rest period is needed in between contractions for placental circulation to be re-established after it has been interrupted by uterine contractions
  - Can lead to fetal hypoxemia and metabolic acidosis if **more than 5** contractions in 10 minutes

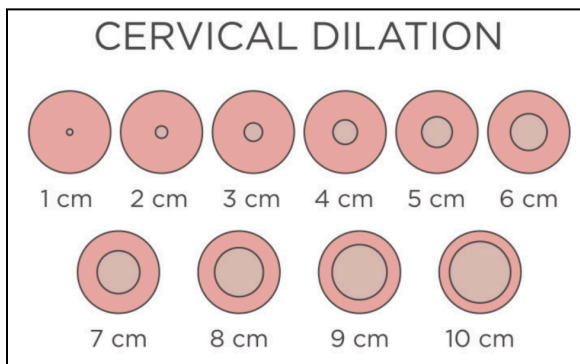
**G. CERVICAL ASSESSMENT**

- Assess the following:

1	Cervical dilatation
2	Cervical effacement
3	Cervical position
4	Fetal station

**1. CERVICAL DILATATION**

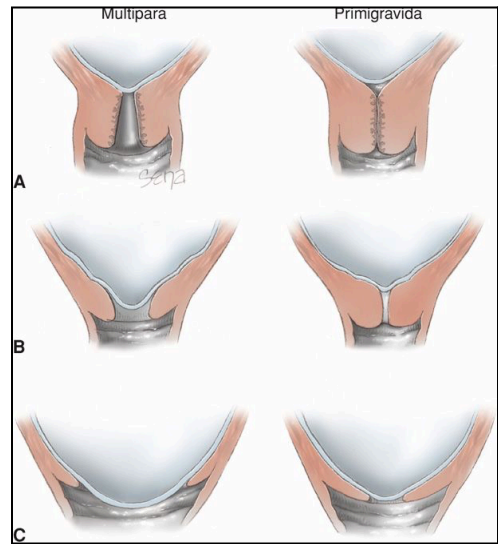
- How wide the cervical opening is (from 1 cm to 10 cm)
- Can be measured by using the 2nd and 3rd digits
- Fully dilated: Cervical dilatation of 10 cm or more



**Figure 22.** Cervical dilation

**2. CERVICAL EFFACEMENT**

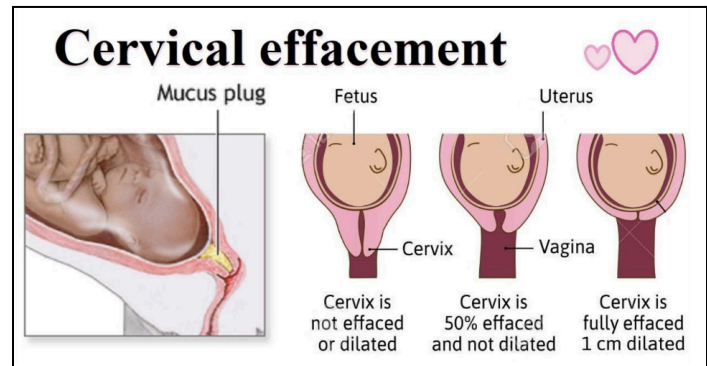
- Thinning out or the obliteration of the cervical canal
- Compare the length of a cervical canal to an unlabored cervix
- How much of the cervix is in relation to its thickness



**Figure 23.** Cervix effacement and dilatation

**Professor's Notes:**

- **Primigravida**
  - Usually has a very close cervical opening
  - Leads to effacement first before it can dilate
- **Multipara**
  - The opening is not as tightly closed
  - Can appear dilated even though the cervix is not fully effaced



**Figure 24.** Cervical effacement

<b>1st picture</b>	The cervix is not effaced nor dilated
<b>2nd picture</b>	The canal is 50% of original length (effaced) but not dilated
<b>3rd picture</b>	At 1 cm, when the cervix is opened, it is fully effaced. Virtually, no canal and is very thin

- Sometimes need to do **induction of labor**
  - Need the baby out of the uterus, whether because of fetal or maternal causes
  - Avoid fetal or maternal compromise
    - Example: Uncontrolled hypertension, pre-eclampsia, uncontrolled diabetes mellitus

- Giving of uterotonic (i.e., oxytocin) to induce uterus contractions and make the cervix dilate
  - However, in order to know whether the induction of labor will be effective, the cervix must be in a certain stage where the uterine contractions will actually produce changes
- **BISHOP scoring system** - used to predict the success of labor induction
  - By evaluating 5 parameters:
    1. Cervical dilatation
    2. Cervical effacement
    3. Position
    4. Consistency of cervix
    5. Fetal head's station
  - Cut-off score for inducibility: <8
    - **Example:** A bishop score of 5 indicates that the cervix won't dilate despite the induction of labor; hence, priming of the cervix should be done first
    - Methods/techniques to prime the cervix include:
      - Mechanical preparation of cervix
      - Medications/drugs (uterotonic medicines)

FEATURE	BRAXTON HICKS	REAL CONTRACTIONS
<b>LOCATION OF FORCE</b>	Side of the uterus → Minimal cervix movement	Uterine fundus → Waves downward  Contraction of the uterine fundus: Muscle fibers shorten, pulling upward
<b>EFFECT ON CERVIX</b>	Little change	Thinning (effacement) → Dilatation
<b>FREQUENCY</b>	Irregular, mild	Coordinated, stronger rhythm

CERVICAL CHANGES OBSERVED IN THE MODEL	
<b>EFFACEMENT (SHORTENING)</b>	<ul style="list-style-type: none"> <li>● Early contractions analogous to cervical effacement in early labor</li> <li>● Minimal dilatation during this phase</li> </ul>
<b>DILATION (OPENING)</b>	<ul style="list-style-type: none"> <li>● Sufficiently thinned cervix, subsequent contractions begin to widen the opening</li> <li>● This transition marks the shift from effacement to dilation in active labor</li> </ul>

Bishop Scoring System Used for Assessment of Inducibility					
Cervical factor					
Score	Dilatation (cm)	Effacement (%)	Station (-3 to +2)	Consistency	Position
0	Closed	0-30	-3	Firm	Posterior
1	1-2	40-50	-2	Medium	Midposition
2	3-4	60-70	-1	Soft	Anterior
3	≥5	≥80	+1, +2	–	–

**CERVICAL EFFACEMENT AND DILATION DURING LABOR**  
VIDEO [\[LINK\]](#)

<b>BALLOON</b>	Uterus
<b>NECK OF THE BALLOON</b>	Cervix
<b>PING-PONG BALL</b>	Fetal head



Figure 25. Ping-pong ball and balloon exercise

**Professor's Notes:**

- Effacement and dilatation during labor is demonstrated by the balloon simulation
- Likewise, the **upper segment of the uterus stays the same**, while the **lower segment becomes taller and thinner** in accommodation of the fetal head
- **Uterine contractions** start in the fundus (contractile part) and weigh downward (gradient)
- The lower uterine segment gives way for the passage of the fetus

**V. PSYCHE**

- **“Well-being of the woman in labor”**
- Historically and cross-culturally, women have been attended and supported by other women during labor and birth
- Since the **middle of the twentieth century**, in many countries, most **women gave birth in hospital** rather than at home
- **Continuous support** during labor has become the exception rather than the routine
  - Due to the following reasons: no accreditation and higher risk of infection
- **Women benefit from and value the presence of a support person in labor**
- Provide psychological, physical, emotional, informational, and practical support

**Professor's Notes:**

- In a meta-analysis in 2017 for continuous support for women during labor involving 26 trials (15,858 women) in 13 high-income and 13 medium-income countries
- Low-income countries lack hospitals for childbirth, where most likely delivered with midwives

**A. WOMEN WITH CONTINUOUS SUPPORT**

- More likely to have spontaneous vaginal delivery and shorter labors
- Less likely to have a negative childbirth experience
- Less likely to use any forms of intra-partum analgesia
- Less likely to have Cesarean deliveries
- Less likely to have instrumental deliveries
- Less likely to have baby with low APGAR score
- Lower postpartum depression (?)

**B. LABOR COMPANIONS**

- Does not necessarily mean the husband, but those who can **provide emotional support**
- Someone in the hospital who can provide information about childbirth
- Serve as a communication bridge between the parturient and the health workers
- Facilitate non-pharmacological pain relief (e.g., breathing exercises)
- Act as patient advocates
- Provide practical support

**Professor's Notes:**

The only limitation is that they cannot act as a legal guardian or as a proxy in making decisions, unless explicitly said by the patient.

**1. MALE PARTNER AS LABOR COMPANION**

- Might not always be allowed in labor room/wards
  - Lack of physical space
  - Privacy concerns
  - Crowding
  - Risk of transmitting infection

**Professor's Notes:**

- In a labor room/wards, there are other women who are in labor, and they are vulnerable because they are practically naked and only wear a hospital gown
- Male labor companions might not always be allowed unless they are in confined labor/delivery suites