OBSTETRICS & GYNECOLOGY

LABOR AND DELIVERY 2

EVALS 2

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Trans Group: 11B, 12B

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REFERENCES:
Dr. Joselito A. Santiago — PPT & Lecture

I. LABOR

- Uterine contractions that bring about demonstrable effacement and dilatation of the cervix
- Traditionally, dilatation must be **3–4 cm or greater**
  - There may be doubts if true labor if less than 3 cm

A. TRUE LABOR VS. FALSE LABOR

TRUE LABOR	FALSE LABOR
Contractions occur at **REGULAR** intervals	Contractions occur at **IRREGULAR** intervals
Intervals gradually shorten	Intervals remain long
Intensity gradually increases	Intensity remains unchanged
Discomfort in the back and abdomen	Discomfort chiefly in the abdomen
Cervix **DILATES**	Cervix **DOES NOT** dilate
Discomfort **NOT** stopped by sedation	Discomfort usually **RELIEVED** by sedation

1. BRAXTON HICKS CONTRACTIONS

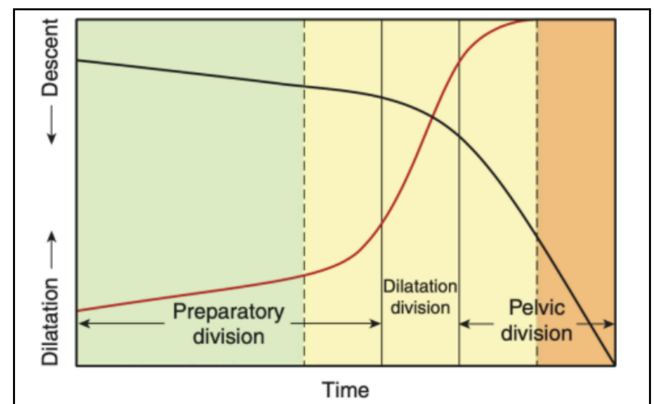
- Also known as **false labor**

B. UTERINE CONTRACTIONS

- From 10 minutes in early labor (latent phase) to as frequent as every 90 seconds in the **second stage of labor**

C. FUNCTIONAL DIVISIONS OF LABOR

1	Preparatory Division
2	Dilatational Division
3	Pelvic Division



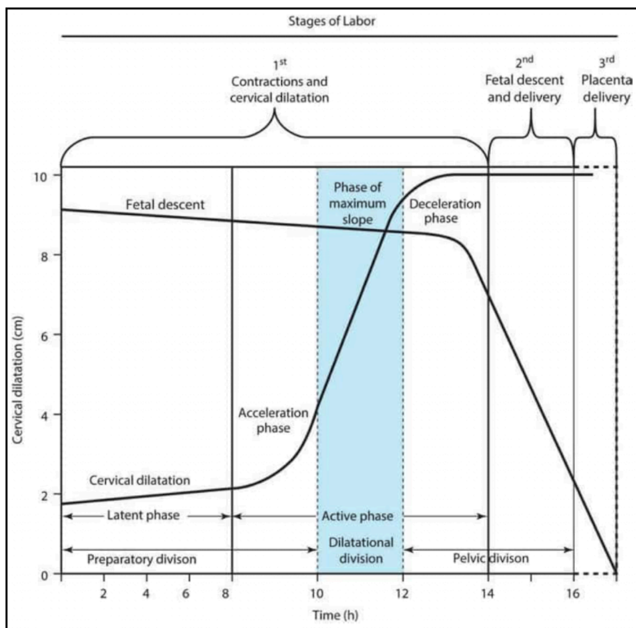


Figure 1. Labour Course Divided Functionally on the Basis of Dilatation and Descent Curves

- **RED line:** Dilatation
- **Black line:** Descent of the fetal head
- Through time, there is an increase in cervical dilatation while the fetal head is descending
- First stage of labor encompasses the true labor until full cervical dilatation

1. PREPARATORY DIVISION

- Encompasses the **latent phase** (green) and **acceleration phase** (yellow), as seen in Figure 2
- Changes in connective tissue components of the cervix
- **Sensitive to sedation and conduction analgesia** (epidural anesthesia)

Professor's Notes (Batch 2026):

- In the preparatory division, there is not much change in the cervical dilatation
- In the latter part, there can be a slight uptake in the rate, but it is only starting to pick up
- There is not much change in terms of dilatation but there are changes in how soft it is and how disruptive the connective tissue material of the cervix is

2. DILATATIONAL DIVISION

- Corresponds to the **phase of maximum slope**
  - Starts at hour 10 on Figure 2
- When **cervical dilatation** is at its most rapid rate
- **Unaffected** by sedation or conduction analgesia
- Once you reach the dilatation division, you cannot stop labor anymore

3. PELVIC DIVISION

- Encompasses the **deceleration phase** and **second stage of labor** (Fig. 1)
- Commences with **deceleration phase** of cervical dilatation
- Cardinal fetal movements take place
- The presenting parts specifically the fetal head is already in the pelvic canal or birth canal

Professor's Notes (Batch 2026):

- Referring to the dilatational curve, you will observe an initial uptake: initial uptake → steep slope → plateau (slowing down) – this is the **cervical deceleration phase**, where the pelvic division commences
- We are superimposing the preparatory, dilatational, pelvic division into somehow a pre labor portion of the labor curve: the green, yellow and orange (as seen in the graph) because most of the time when we are talking about where labor is we do not really describe it as whether it's in the preparatory, dilatational, and pelvic division but in the phases of labor which is divided into the following: latent phase, active phase (which is further divided into three distinct phases), second, and third stage of labor.

II. FIRST STAGE OF LABOR

- Starts at the onset of regular uterine contractions (true labor) and ends when the cervix is fully dilated

A. PHASES OF LABOR

1	Latent Phase
2	Active Phase

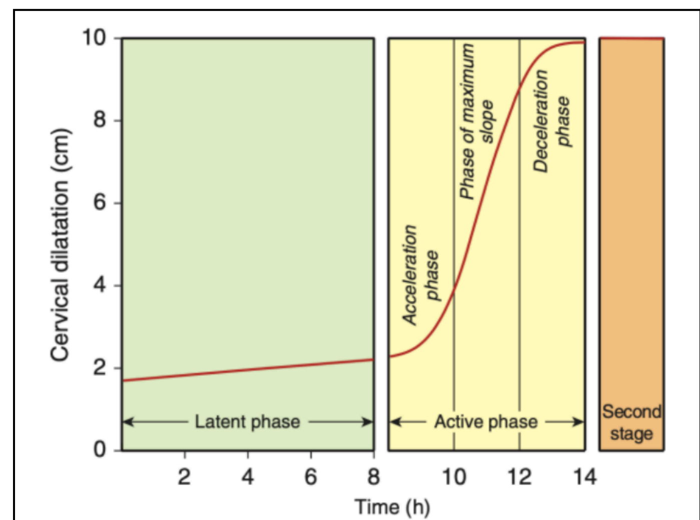


Figure 2. Phases of Labor

1. LATENT PHASE OF LABOR

- Corresponds to about 2⁄3 or 3⁄4 of the pelvic division of labor
- Little cervical change (as it occurs slowly) despite regular uterine contractions
- Traditionally ends at 4 cm, but more recently defined as 6 cm
- The latent phase is prolonged if:
  - **>20 hours** in nulliparas
  - **>14 hours** in multiparas

FACTORS AFFECTING THE LATENT PHASE	
1	Excessive sedation
2	Conduction analgesia
3	Poor cervical condition
4	False labor

2. ACTIVE PHASE OF LABOR

- Divided into three parts:

THREE PARTS OF ACTIVE PHASE OF LABOR		
1	**Acceleration Phase**	Initial upswing
2	**Phase of Maximum Slope**	Cervical dilatation is happening at its most rapid rate
3	**Deceleration Phase**	Reaching full cervical dilatation; starts to slow down

- Cervix dilatation duration:
  - Min **1.2 cm/hour** in nulliparas
  - Min **1.5 cm/hour** in multiparas
- Most of the fetal **cardinal movements** of labor will only start to occur in the **deceleration phase**
  - This marks the start of pelvic division of labor

Professor's Notes:
There will be an overlap with pelvic division of labor and second stage of labor, just like how the preparatory division encompasses the latent phase and the acceleration phase.

B. CARDINAL MOVEMENTS OF LABOR

1	Engagement
2	Descent
3	Flexion
4	Internal Rotation
5	Extension
6	External Rotation (Restitution)
7	Delivery of Shoulders (Expulsion)

- The **cardinal movements of labor** are maneuvers that the fetus undertakes in order to navigate the limited dimension of the pelvic canal

1. ENGAGEMENT

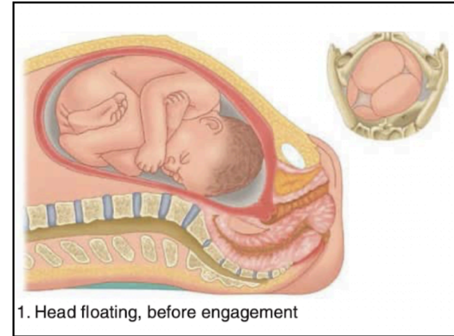


Figure 3. Cardinal movements of labor and delivery from a left occiput anterior position, head floating, before engagement

- Before engagement, the head is floating, and for this case, when you conduct the internal examination, the baby is in left occiput anterior (Fig. 3)

Definition of Terms:
- **Biparietal diameter** - widest transverse diameter of a normal or well-flexed fetal head
- **Pelvic inlet** - at the level of the linea terminalis
  - Theoretically, the biparietal diameter is above this (i.e., not yet engaged)

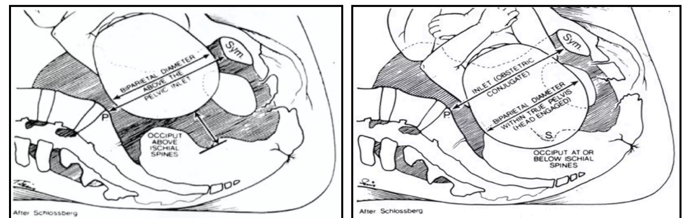


Figure 4. Engagement of the Fetal Head

- Engagement is defined as the **passage of the biparietal diameter through the pelvic inlet**
  - The fetal head may engage within the last few weeks of pregnancy (for nulliparas) or not until after labor has commenced (for multiparas)

ASSESSING THE LEVEL OF THE BIPARIETAL DIAMETER TO DETERMINE ENGAGEMENT OF THE FETAL HEAD	
Above the pelvic inlet	Fetal head is NOT yet engaged
Below the pelvic inlet	Engaged fetal head, now considered within the pelvis
Note: The passage of the biparietal diameter can only be seen on ultrasound. It can only be deduced that the fetal head is engaged if it is at **station 0** or **at the level of the ischial spine**.	

- In internal examination, if you can feel the lowermost portion of the presenting part at or below the level of the ischial spine is described as the fetal head is engaged

Professor's Note:
- Actual engagement has already occurred prior to station 0. Station 0 confirms that the fetal head is truly engaged.

- In most cases, the vertex enters the pelvis with the sagittal suture lying in the transverse pelvic diameter and left occiput transverse (LOT) position
  - LOT is more common than the right occiput transverse (ROT) position

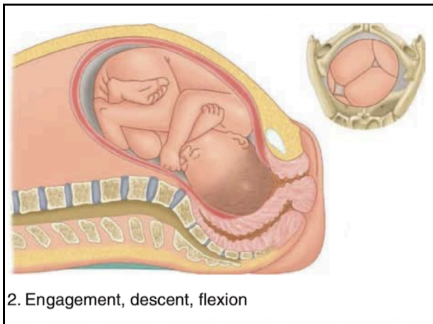


Figure 5. Cardinal movements of labor and delivery from a left occiput anterior position, engagement, descent, flexion

2. DESCENT

- As the fetal head goes down, there will be **engagement** and then **descent**
  - This stems from one or more of **three forces**:
    - Direct myometrial pressure at the fundus due to uterine contraction
    - Bearing-down efforts of abdominal muscles
    - Extension and straightening of the fetal body

3. FLEXION

- Once the descending fetal head meets resistance (e.g., from the cervix or pelvic floor), it **normally flexes**, drawing the chin closer to the fetal thorax
  - Flexion of the fetal head replaces the occipitofrontal diameter with the shorter suboccipitobregmatic diameter, allowing the smallest AP diameter of the head to pass through the pelvis more easily

4. INTERNAL ROTATION

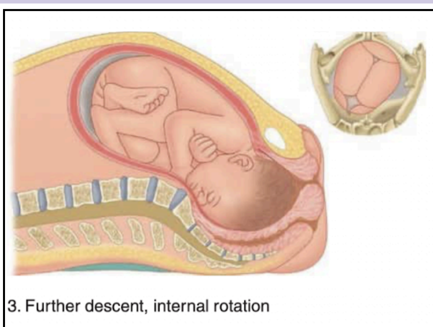


Figure 6. Cardinal movements of labor and delivery from a left occiput anterior position, further descent, internal rotation

- With further descent and as the baby navigates the pelvic cavity, it will now undergo **internal rotation**
  - If the posterior fontanelle approaches the anterior or symphysis pubis, the baby is starting to undergo internal rotation
  - On complete internal rotation, the posterior fontanelle is now direct occiput anterior
- Simply, internal rotation turns the occiput from the transverse position (e.g., LOT) into the anteroposterior (AP) position, which is usually occiput anterior toward the pubic symphysis
  - This aligns the fetal head with the widest AP diameter of the pelvic outlet so the head can be delivered

5. EXTENSION

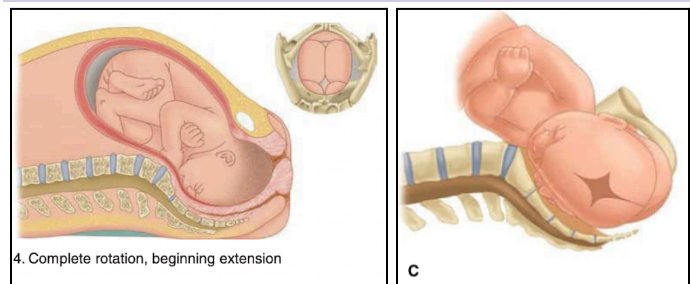


Figure 7. Cardinal movements of labor and delivery from a left occiput anterior position, complete rotation, beginning extension

- After internal rotation, the sharply flexed fetal head reaches the vulva and undergoes **extension**.
- When the head presses down on the pelvic floor, **two forces** will act to push the baby out:
  1. Force exerted by the **uterus**, acting posteriorly
  2. Force supplied by the resistant **pelvic floor** and **symphysis pubis**, acting more anteriorly
- Resultant vector is the direction of the vulvar opening → causes fetal head extension

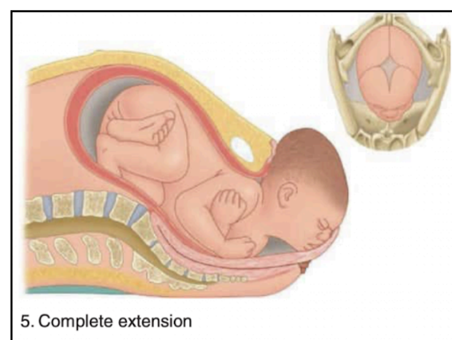


Figure 8. Cardinal movements of labor and delivery from a left occiput anterior position, complete extension

- **End Result**: Base of the occiput comes into direct contact with the inferior margin of the symphysis pubis
- With complete extension of the fetal head, the posterior fontanelle may no longer be palpable during vaginal examination. Instead, the diamond-shaped anterior fontanelle may be the palpable structure

- However, feeling the anterior fontanelle alone does not automatically mean that complete extension has occurred
- The progression of labor and the earlier findings during examination must be considered to determine the true head position

6. EXTERNAL ROTATION

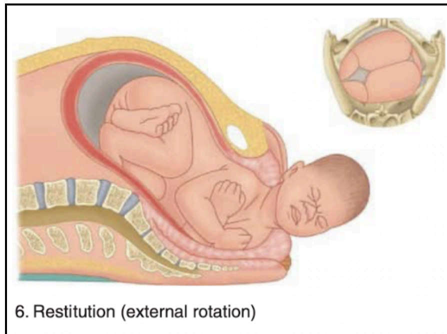


Figure 9. Cardinal movements of labor and delivery from a left occiput anterior position, restitution (external rotation)

- Eventually, once extension has been completed, it will now undergo **external rotation** to go back to its original left occiput anterior position
- Immediately after restitution, the head drops so that the chin lies over the maternal anus
  - Once outside, it undergoes external rotation
  - If the occiput was originally directed toward the maternal left, it rotates toward the mother's left ischial tuberosity
  - If it was directed toward the maternal right, it rotates toward the right ischial tuberosity
- **End Result**: Back to transverse position; fetal body aligns its bisacromial diameter (distance across the shoulders) with the AP diameter of the pelvic outlet
  - Thus, one shoulder is anterior behind the symphysis and the other is posterior

7. EXPULSION

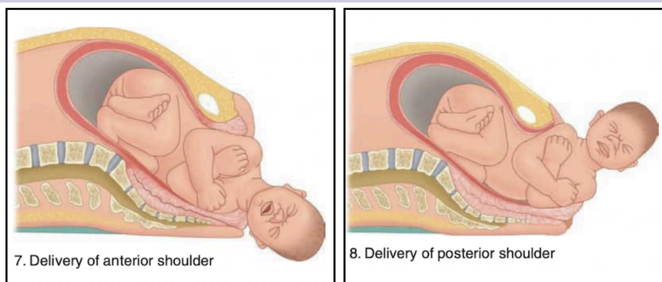


Figure 10. Cardinal movements of labor and delivery from a left occiput anterior position, delivery of the shoulders (expulsion)

- At this point, the head is now fully out of the birth canal or the vagina and there will be delivery of the shoulders
- Most of the time if you just let things happen and let the mother bear down, the **anterior shoulder will be delivered** first and then the posterior shoulder
- This is the mechanism of labor in most occiput or vertex presentations
  - Sometimes it happens when the fetal head is at the right occiput anterior and observations will just be reversed

8. VIDEO: SEVEN CARDINAL MOVEMENTS OF LABOR BY CAL SHIPLEY, M.D. [LINK]

- **Seven cardinal movements**
  - Considered essential to the successful fetal navigation of the birth canal

MATERNAL PELVIC ANATOMY

- Front wall: Maternal pubic bone
- Back wall: Maternal sacrum

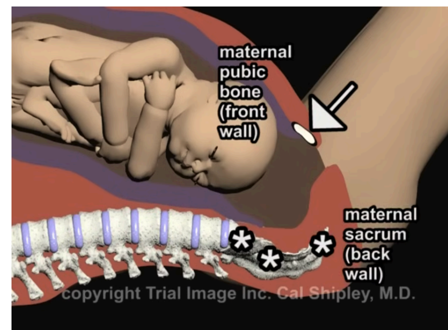


Figure 11. Cross-section view from mother's right

- **Pelvic inlet:**
  - Line going from the top of the pubic bone to the top of the sacrum
  - Wider than it is deep
- **Pelvic outlet:**
  - Line going from the bottom of the pubic bone to the tip of the sacrum
  - The long axis goes from the front to the back
  - Deeper than it is wide
- The fetus enters the birth canal at the pelvic inlet and exits through the pelvic outlet

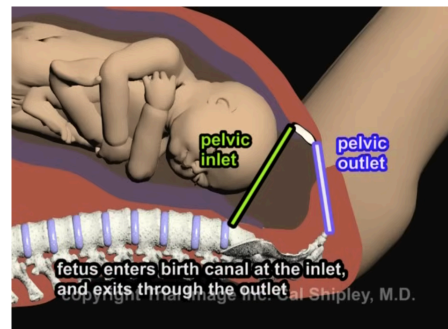


Figure 12. Pelvic inlet and outlet

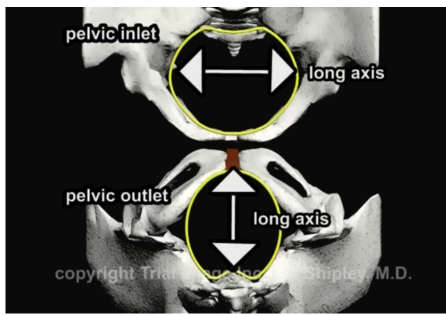


Figure 13. View of pelvic inlet from above (top) and pelvic outlet from below (bottom)

FETAL STATIONS

- Chart the progress of fetal passage through the birth canal
- Most commonly used:
  - Pelvic inlet: -5
  - Ischial spines: 0 (approximately halfway between)
  - Pelvic outlet: +5
- Assigned sequential values
  - Each station represents the number of centimeters above or below the ischial spines at 0 station
  - Examples:
    - -3 station: ~3 cm above ischial spines
    - +5 station (pelvic outlet): ~5 cm below ischial spines

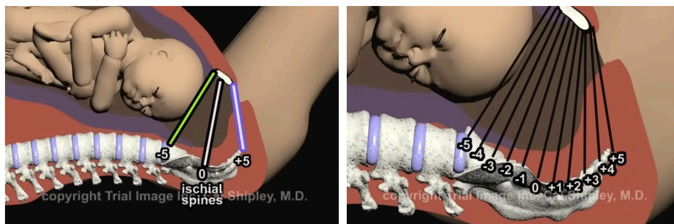


Figure 14. Fetal stations

- The distance between the ischial spines represents the narrowest part of the birth canal
  - The most difficult portion of the canal for the fetal head and shoulders to traverse

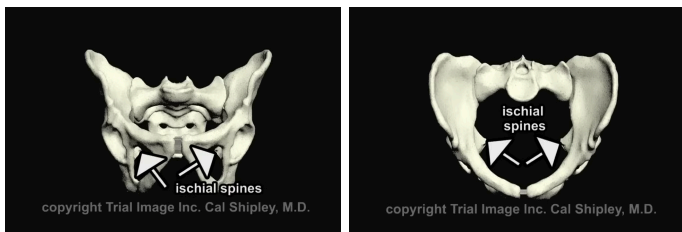


Figure 15. Ischial spines from front (left) and top view (right)

PELVIC INLET TO PELVIC OUTLET

- The path from the pelvic inlet to the pelvic outlet has a significant curvature
- Narrowing of the pelvis at the ischial spines and the curvature of the birth canal make successful movement of the fetus through it difficult

CARDINAL MOVEMENTS OF LABOR

1	Descent*
2	Engagement*
3	Flexion of the head
4	Internal rotation of the head
5	Extension of the head
6	External rotation of the head
7	Delivery of shoulders (expulsion)

Professor's Notes:
Although the video states that descent comes first before engagement, which technically makes sense, we follow that **engagement comes first before descent** as mentioned in the textbook (WIlliams Obstetrics).

DESCENT

- Technically, the fetus is descending the entire time moving through the birth canal
- Point at which the fetal head enters the pelvic inlet (-5) and moves toward the ischial spines

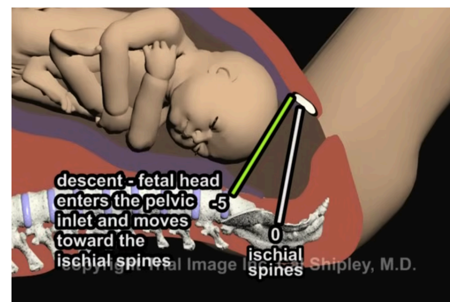


Figure 16. Descent

ENGAGEMENT

- Occurs when fetal head has reached the ischial spines (0)
- At any fetal station with a negative value, the fetal head is "engaged" (no longer floating)
- Descent and engagement may occur prior to labor
  - In many pregnant women, the fetal head has descended into the pelvic inlet in the days or weeks before labor onset
- In a minority of women, the fetal head may also be engaged prior to labor

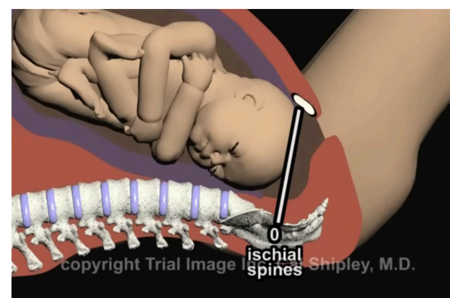


Figure 17. Engagement

FLEXION OF THE HEAD

- The fetal head flexes as it accommodates to the curvature of the sacrum

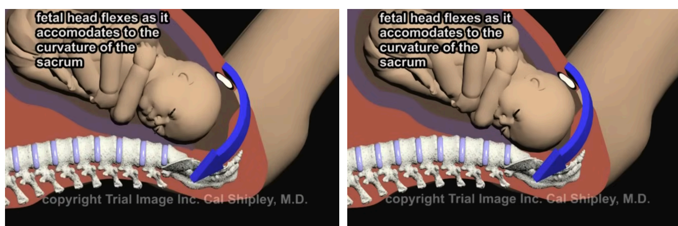


Figure 18. Flexion of the head

INTERNAL ROTATION OF THE HEAD

- Termed “internal” because it occurs within the birth canal
- The long axis of the fetal head is now aligned with the long axis of the pelvic outlet
    - Facilitates passage of the fetal head

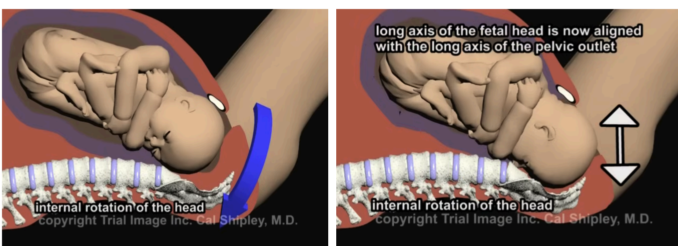


Figure 19. Internal rotation of the head

- Prior to internal rotation, the long axis of the fetal head is in a left-to-right (transverse) position
    - The long axis of the head may exceed the width of the outlet, making delivery difficult
- After internal rotation, the long axes of the head and outlet match, easing delivery of the head

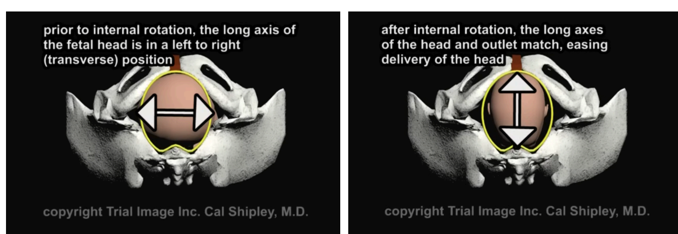


Figure 20. Axes of the fetal head and outlet before (left) and after internal rotation (right)

- Head rotation is followed by rotation of the shoulder
    - Shoulder rotation is not listed separately as a cardinal movement because it is connected to the internal rotation of the fetal head
- As the fetal head rotates, rotational force is transmitted to the lower body
    - As a result, the shoulders have a natural tendency to rotate upon entering the birth canal

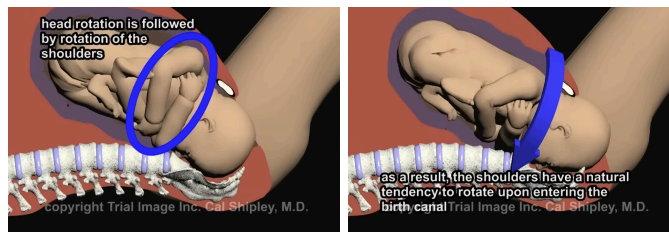


Figure 21. Fetal shoulders before (left) and after rotation (right)

- Once the shoulders have rotated, their long axis now matches the long axis of the pelvic inlet

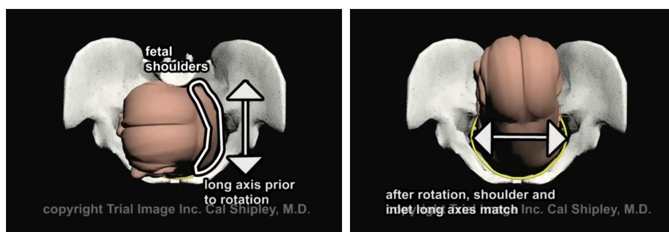


Figure 22. Long axes of the shoulders before (left) and after rotation (right)

EXTENSION OF THE HEAD

- Facilitates its movement beneath the mother’s pubic bone and allows delivery of the head

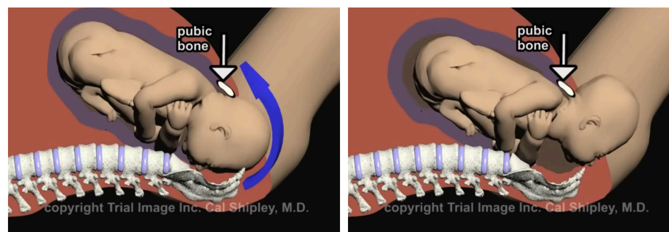


Figure 23. Extension of the head

EXTERNAL ROTATION OF THE HEAD

- Also known as **restitution**
- Once the fetal head delivers and becomes free of the constraints of the pelvis, it rotates slightly to align itself with the shoulders

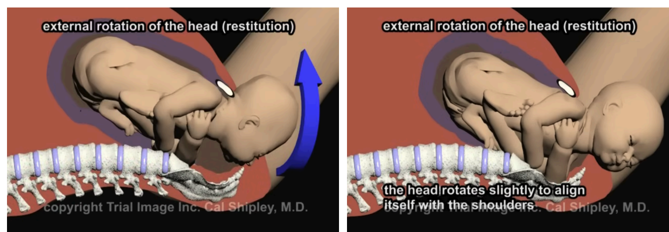


Figure 24. External rotation of the head

EXPULSION

- External rotation of the head is typically associated with the delivery of the anterior shoulder, which allows for completion of the delivery

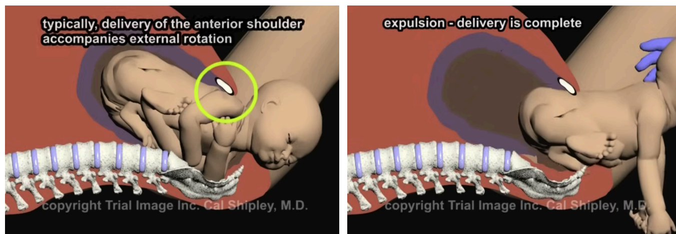


Figure 25. Delivery of the anterior shoulder and expulsion

C. SYNCLITISM AND ASYNCLITISM

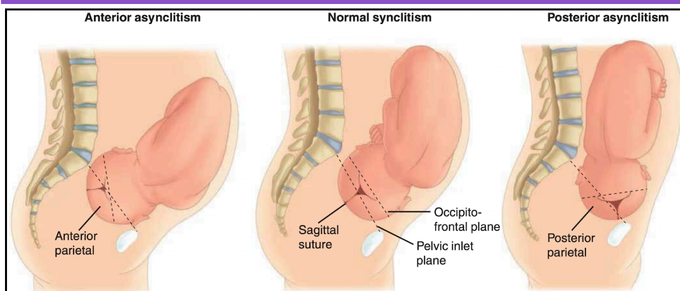


Figure 26. Synclitism and Asynclitism

- Recall that the vertex usually enters the pelvis with the sagittal suture lying the transverse pelvic diameter. In this case, the sagittal suture is presenting, called **normal synclitism**. However, this is not always the case.
  - If the sagittal suture is felt more posteriorly, the anterior parietal bone will be presenting, called **anterior asynclitism**
  - If the sagittal suture is closer to the symphysis pubis, the posterior parietal bone will be presenting and is called **posterior asynclitism**

POSITION OF THE SAGITTAL SUTURE IN ASYNCLITISM	
Anterior Asynclitism	Near the <u>sacrum</u>
Posterior Asynclitism	Near the <u>symphysis pubis</u>
Note: This is in relation to the parietal bone.	

- With asynclitism, there might be some difficulty for the normal cardinal movements of labor to occur
  - Asynclitism is more commonly seen in:
    - Fetuses with **larger heads**, where the head tilts to fit into the pelvis
    - Multiparous patients with **weaker abdominal muscles**, which provide less support to guide the fetal head into the pelvis in proper alignment
- You can prognosticate if there is asynclitism, vaginal delivery may not occur
- Some of the reasons there is asynclitism is due to a lax anterior abdominal wall due to obesity or multiple pregnancies

D. PARTOGRAM/PARTOGRAPH

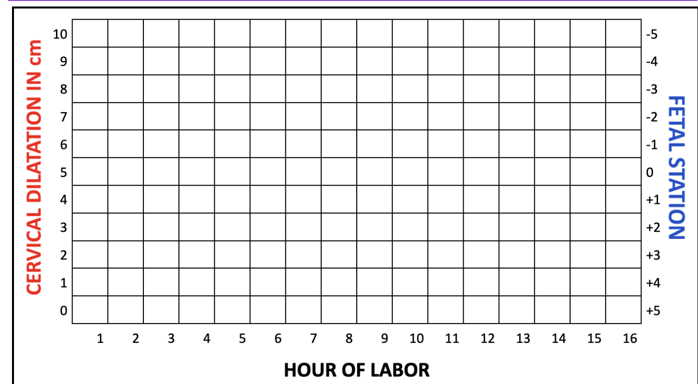


Figure 27. Basic Partogram (*shown by Dr. Santiago*)

- **Easiest way** to document the progress of labor and delivery
- To document cervical dilatation, plot it in a graph, where:
  - The **x-axis** represents the <u>hours of labor</u>
    - Hour 0: Start of regular uterine contractions
  - The **left y-axis** represents the <u>cervical dilatation in cm</u>, while the **right y-axis** represents the <u>fetal station/descent of the head</u>

WHO LABOUR CARE GUIDE

Figure 28. WHO Partogram

- The **WHO Partogram** is more complicated but allows for the documentation of more information, such as:
  - Quality of the amniotic fluid

- Quality and quantity of uterine contractions
- Maternal vital signs
- Medications given

1. WHO LABOR CARE GUIDE

Figure 29. WHO Labor Care Guide

- Allows for a **more comprehensive** look at labor
- The labor care guide has **seven sections**, which were adapted from the previous partograph design:

SECTIONS INDICATED IN THE WHO LABOR CARE GUIDE CHECKLIST	
1	Identifying information and labor characteristics at admission
2	Supportive care
3	Care of the baby
4	Care of the woman
5	Labor progress
6	Medication
7	Shared decision making

- For supportive care, the following are assessed:
  - *Is there a companion available?*
  - *Is pain relief being provided?*
  - *What is the oral fluid intake?*
  - *What is the posture of the mother?*
- This shows you some information regarding the baby:
  - Fetal heart rate
  - Presence of decelerations
  - Fetal position
  - Amniotic fluid character if it ruptured
- This also allows to **not ignore** the **vital signs** of the **mother**
  - Sometimes in labor and delivery, the focus might mistakenly be only on labor, but the mother's health should also be monitored
    - Pulse rate
    - BP
    - Temperature
    - Urine
    - Contractions
    - Labor progress (i.e., cervical dilatation)
- If labor reaches first cervical dilatation, you have now entered the second stage of labor

2. LABOR PARAMETERS

LABOR PHASE: Labor Disorder	Traditional Criteria and Treatment: Nulliparas	Multiparas		Obstetrical Care Consensus Criteria
LATENT PHASE				
Prolongation Disorder				
Prolonged latent phase	>20 hr	>14 hr	Supportive care Oxytocin or amniotomy CD not indicated	Supportive care Oxytocin or amniotomy CD not indicated
ACTIVE PHASE				
Protraction Disorders				
Protracted active-phase dilation	<1.2 cm/hr	1.5 cm/hr	Expectant care CD for CPD	CD not indicated
Protracted descent	<1 cm/hr	<2 cm/hr		
Arrest Disorders				
Prolonged deceleration phase	>3 hr	>1 hr	CD for CPD No CPD: oxytocin	CD indications: Ruptured membranes ***and*** No progress after 4 hr of adequate contractions ***or*** No progress after 6 hr of inadequate contractions despite oxytocin stimulation
Secondary arrest of dilation	>2 hr	>2 hr		
Arrest of descent	>1 hr	>1 hr		
Failure of descent	No descent in deceleration phase or second stage			

Figure 30. Labor Parameters

- Figure 30 shows the needed parameters to find out if labor is progressing normally or not
- In the active phase of labor, there can be **protraction disorders** (slower than expected progress of labor) or **arrest disorders** (cessation of progress or lack of progress of labor)

Professor's Note:

- For the exam, just know that there are certain thresholds or criteria for normal labor. For example:
  - The cervix must dilate ≥1.2 cm/hour during the active phase and progress ≥1 cm/hour if descent is already happening
  - Also shows how long to wait for no progress of labor depending on the abnormal labor pattern present
- In most situations, faster labors are expected in multiparas as opposed to nulliparas

ACTIVE LABOR

- The American College of Obstetricians and Gynecologists (ACOG) recommends a cervical dilatation of 6 cm to be considered the start of the active phase of labor

CASE QUESTION 1

Patient AB	Patient CD	Patient DE
24 y/o, G1, 39 weeks AOG	30 y/o, G3P2 (2002), 37 weeks AOG	35 y/o, G4P3 (3003), 38 weeks AOG
CC: mild uterine	CC: labor pain (mild	CC: prenatal

contractions every 4-5 minutes	contractions every 8-10 minutes)	checkup, no contractions
IE: 4cm, 80% effaced, (+) BOW, station 0	IE: closed, station -1	IE: 1 cm dilated, 20% effaced, (+) BOW, station -2

- Who among the patients is in labor?
    - **Patient AB**
        - Normal external genitalia, nulliparous vagina
        - Cervix 4 cm dilated, 80% effaced
        - Fetal head at station 0
        - Fetal position at left anterior occiput
        - Membranes intact
        - **Leopold maneuvers**
            - Cephalic presentation, engaged
            - Fetal attitude is occiput
            - Fetal heart tones best heard at LLQ (140 bpm)

PARAMETER	ASSESSMENT
Diagonal conjugate	12.0 cm
Bispinous diameter	10.0 cm
Sacral curvature	Hallow
Sacral inclination	Posterior
Sacrosciatic notch	2 fingerbreadths
Pelvic sidewall	Slightly convergent
Ischial Spines	Not prominent
Pubic arch	>90 degrees
Bituberous diameter	10.0 cm

- Is the patient's pelvis adequate?
    - **Adequate**

Patient AB is in the first stage of labor and is currently in the latent phase/preparatory division.

E. MANAGEMENT OF FIRST STAGE OF LABOR

	MANAGEMENT OF NORMAL LABOR
1	Identification of labor
2	Initial evaluation
3	**Management of first stage of labor**
4	Management of secondary stage of labor

1. IDENTIFICATION OF LABOR

- First, identify if the patient is in labor
    - If yes, begin the **initial evaluation** and manage the **first and second stage**
- **Labor**
    - Uterine contractions that bring about demonstrable effacement and dilatation of the cervix (3 or 4 cm)
    - ≥12 contractions in 1 hour (every 5 minutes)

2. INITIAL EVALUATION

	Initial Evaluation

1	**Vital signs**
	• Blood pressure
	• Temperature
	• Pulse rate
	• Respiratory rate
	• Fetal heart rate
	  ○ Monitored adequately during labor and delivery
	• Complete blood count (Hb/Hct)
	  ○ Can request for Hb/Hct only if time is limited

2	**Vaginal examination** • If placenta previa or low lying placenta is already ruled out
3	**Cervical assessment** • Cervical dilatation and effacement • Identify fetal position and station

FREQUENCY OF MONITORING FETAL HEART RATE

Surveillance	Low-risk Pregnancies	High-risk Pregnancies
Acceptable methods:		
• Intermittent auscultation • Continuous electronic fetal monitoring (EFM)	• Yes • Yes	• Yes • Yes
Evaluation intervals:		
• First-stage labor (active) • Second-stage labor	• Yes • Yes	• Yes • Yes

Professor's Notes (Batch 2026):
You should get the fetal heart rate after every uterine contraction, not before, not in between contractions, and not during. It should be immediately after a contraction.

3. MANAGEMENT OF FIRST STAGE OF LABOR

- **General physical examination** must still be performed
- Parturient can assume the **position** she is most comfortable in (see Fig. 31)
    - She can squat with support
    - She can be in bed or sitting upright
    - She can place a big pillow
- Can even **ambulate** (supervised)
- Maternal vital signs are usually monitored **every 4 hours**
    - Unless there is prolonged rupture of membranes, in which vital signs, specifically **maternal temperature**, are taken **every hour** (to monitor possible intrapartum infection)
- **Fetal heart rate** should be monitored
- Perform **vaginal examinations** every 2–3 hours
    - May be every 4 hours if patient is nulliparous
    - Do not perform if there is known placenta previa or vasa previa

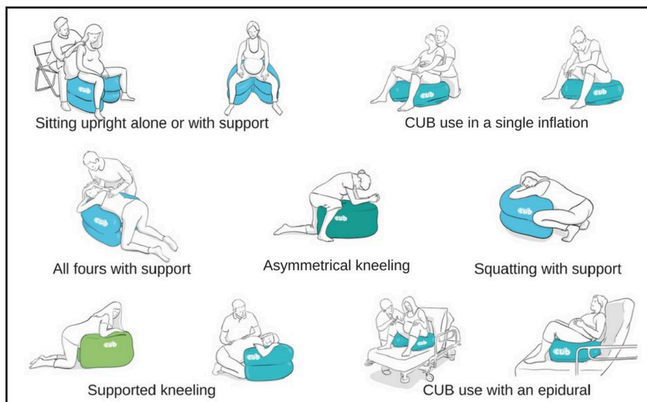


Figure 31. Possible Birthing Positions

4. PAIN MANAGEMENT

- Uterine contractions are quite painful
  - Discuss with the patient on how to manage pain
  - Even before uterine contractions, ask about the pain management plan
  - Recall that as the uterus contracts, there is hypoxemia (but it is not the only factor)
- Pain management should be **patient-directed**
  - All of these are valid options
  - Some may not want any form of analgesia or anesthesia and just go through the relaxation techniques or the lamaze method
    - **Relaxation techniques** needs practice to be effective
  - Some may opt to **ambulate**
    - Some may find walking around to help relieve pain
  - In the majority of women, they would ask for **epidural analgesia and sedation**
  - **Water birth** wherein the woman is immersed in water during the first stage of labor has been shown to actually reduce pain

Patient-directed	
1	Relaxation techniques
2	Ambulation
3	Water immersion
4	Sedation
5	Epidural analgesia

5. ORAL INTAKE

- Parturients with uncomplicated labor are allowed **moderate amounts of clear liquid**
  - **Note**: In those with planned CS delivery, there should be no liquids 2 hours before and no solids 6 hours before the operation to lessen the chance of aspiration of gastric contents

6. INTRAVENOUS FLUIDS

- No clear need for IV infusion system in a normal pregnant woman
- Advantage of giving IV is that it allows:
  - Parenteral analgesia prior to regional analgesia
  - Giving of necessary IV medications
- Some studies have also shown that having an IV may shorten labor

7. RUPTURE OF MEMBRANES

- Amniotomy **DOES NOT** hasten labor
- Early amniotomy allows detection of meconium-stained amniotic fluid and attachment of fetal electrodes or intrauterine pressure catheter (especially when dealing with post-term pregnancies), if available
- Antibiotics recommended for prolonged membrane rupture or unknown Group B *Streptococcus* status
  - Prolonged membrane rupture = 12 hours in the Philippines
- Normally, unless there is an indication, allow spontaneous amniotomy
- If your patient requires augmentation of labor or induction of labor, amniotomy will actually reduce duration of labor.
  - For those in spontaneous labor, amniotomy will not hasten labor

8. URINARY BLADDER FUNCTION

- The suprapubic region should be palpated regularly to detect urinary gallbladder distention
- Sometimes women cannot pee due to the lowered fetal head impinging the urethra
- **Recommend**: Regular voiding of urine during the first stage of labor

CASE QUESTION 2: AB, 24 Y/O, G1, 39 WEEKS

- Patient in the latent phase of labor
- Observe progress of labor
- May have light meals or fluids
- May do cardiotocography every 3–4 hours

TIME	CERVICAL DILATATION	FETAL STATION
12 nn		
1 pm		
2 pm		
3 pm	4 cm	0
4 pm		
5 pm		
6 pm		
7 pm	7 cm	0
8 pm		
9 pm	9 cm	+1
10 pm	10 cm	+3
11 pm	10 cm	+5

- Came in 3 hours from the onset of regular uterine contractions, at 3 pm with cervix dilated to 4 cm
- Reassessment after 4 hours, at 7 pm, cervix is now at 7 cm with the head still at station 0

- At this point, cervical dilatation is now at its most rapid phase. An internal exam is performed after 2 hours and the cervix is now at 9 cm with the head at Station +1, after an hour at Station +3, and after another hour, 10 cm at Station +5

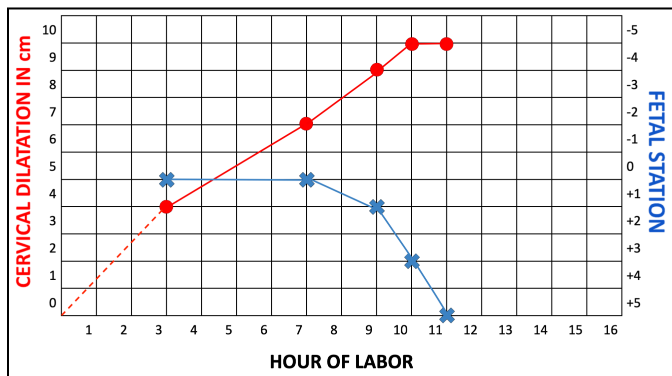


Figure 32. Partogram for Patient AB's Case

- The partogram gives a graphical view of how labor is progressing
- Cervical dilatation is usually "O" and station "X"
- At full cervical dilatation, the first stage of labor ends and the second stage of labor begins

III. SECOND STAGE OF LABOR

- **Begins** when cervical dilatation is complete (10 cm) and **ends** with the delivery of the fetus
- Uterine contractions at this point in time are typically more than >1 minute in duration and 90 seconds or less apart
  - **Dystocia:** Prolonged second stage labor → vaginal delivery will not be effective → do abdominal delivery

MEDIAN DURATION OF THE SECOND STAGE OF LABOR	
NULLIPARAS	50 minutes
MULTIPARAS	20 minutes

- At this stage, the fetal head position can be determined more easily
  - The fingers are placed posteriorly and then swept forward over the fetal head towards the symphysis pubis, with the fingers necessarily crossing the sagittal suture (Fig. 18, left)
  - Next, the position of the two fontanelles are ascertained by identifying the location of the triangular suture (posterior fontanelle), forming the basis for fetal position(Fig. 33, right)
- Figure 33 is in the occiput anterior

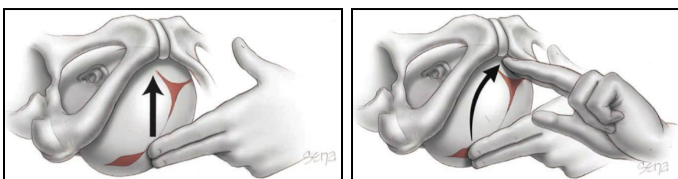


Figure 33. Determining Fetal Position

- In the **second stage of labor**:
  - Parturient typically starts to bear down
  - Bearing down is reflexive and spontaneous
  - Those on neuraxial analgesia may require coaching
    - Some anesthesiologists are able to mix medications in which there is no pain but there is still the sensation of bearing down.
  - **Bearing down efforts** should be timed **DURING** during a uterine contraction
    - A woman is not encouraged to push at each contraction
    - After a uterine contraction has ceased, she is instructed to stop bearing down so that she and her fetus is allowed to rest and recover
  - **Fetal heart tones** are auscultated **AFTER** a contraction because we want to take up any late decelerations.
    - It will not matter if you are using continuous electronic fetal monitoring
      - ➢ Sometimes, the sensor gets displaced
    - During electronic fetal monitoring or auscultation during a contraction, it is not unusual to hear a slowing down of fetal heart rate
      - ➢ However, it is important that the fetal heart rate will recover to the normal range after a contraction

A. MATERNAL POSITIONING

- Patients in the hospital are usually placed in the **dorsal lithotomy position** (see Fig. 34)
- After transferring mother from the labor room to the delivery room or converting the labor table into a delivery table, she is positioned in dorsal lithotomy
  - Vulva and perineum cleaning either with povidone iodine or chlorhexidine
  - Drain the bladder
    - Because the fetal head will be going down → to avoid impinging on a full bladder
  - Sterile drapes are placed to cover the legs and abdomen
- At station +4 and +5, you should now be anticipating with each push that the fetal head will now be going to the vulva.

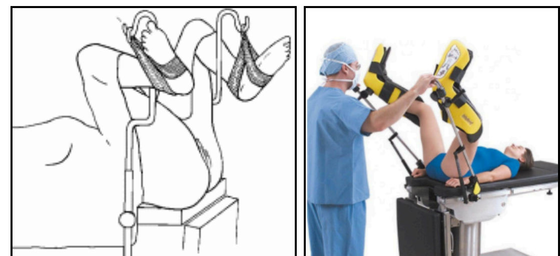


Figure 34. Dorsal lithotomy position

B. CROWNING

- Vulvovaginal opening dilated by fetal head
- Ovoid → Circular opening
- When the largest head diameter has encircled the vulvar ring
  - The vulvovaginal opening is dilated with the fetal head

- The opening starts out as ovoid but will be circular as more of the fetal head is going down
  - In 95% of cases, the position is occiput anterior or is slightly rotated in the oblique
  - In 5% of cases, it is in the occiput posterior
- Once crowning has occurred, this is the signal that the baby will come out in either one or two maternal expulsive efforts
  - The time where we traditionally provide perineal support
- At this point, delivery is very imminent

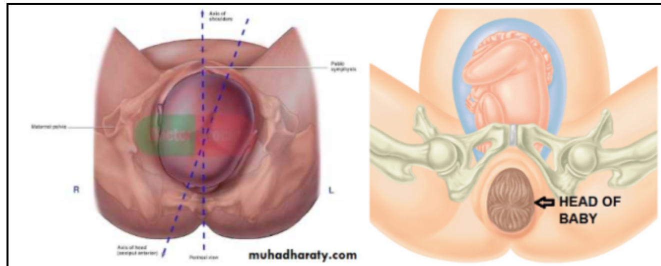


Figure 35. Crowning

C. PERINEAL SUPPORT

1. FMPP

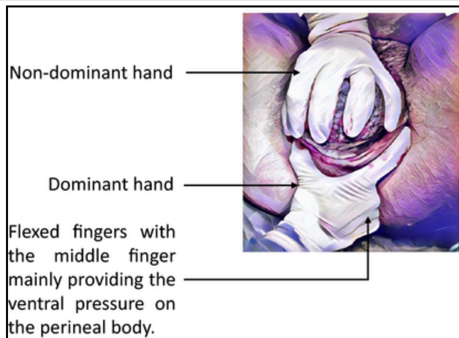


Figure 36. Perineal Support Maneuver: FMPP

- The non-dominant hand is placed above the fetal head
- Dominant hand pushes down the perineum/perineal body
  - Provide counter traction
  - Flexed fingers with the middle finger (V) mainly providing ventral pressure on the perineal body
- Allows **lesser chance of laceration** in the perianal area
- Allows **controlled delivery** of the fetal head

2. VMPP

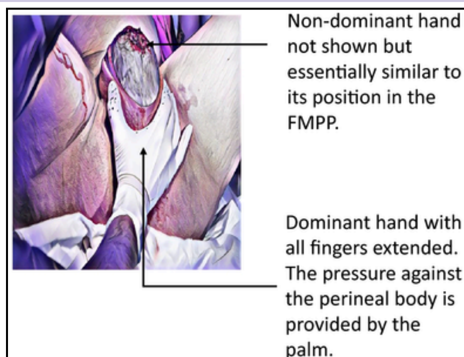


Figure 37. Perineal Support Maneuver: VMPP

- Non-dominant hand will be placed above the fetal head
  - Provide counter-traction
  - Dominant hand with all finger extended
- The pressure is against the perineal body is provided by the palm

3. MODIFIED RITGEN MANEUVER

- After crowning, as more of the head is being delivered, support the fetal head
  - Using a towel, push on the fetal chin and pull upwards
- So you are able to deliver the fetal head
- Favors extension
- Most favorable for second-stage labor

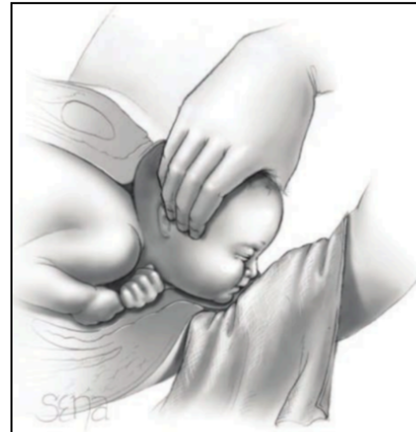


Figure 38. Modified Ritgen Maneuver

4. DELIVERY OF THE SHOULDERS

- Put downward pressure on the shoulders
- Deliver the anterior shoulder first, and the posterior shoulder afterwards
- After both shoulders have been delivered, the rest of the fetal body will be easily delivered
  - Unless the fetus has a large abdomen

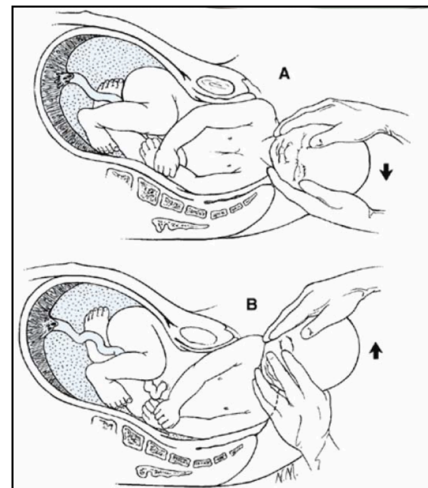


Figure 39. Delivery of Shoulders

5. DELAYED CORD CLAMPING

- Wait for umbilical pulsations to cease
    - Should be replaced with appropriately-timed cord clamping: not more than 3 minutes
- Clamp **2–5 cm** above the fetal abdomen
- Plastic clamp is placed on the fetal side, (usually) metal clamp on the maternal side → then cut in between
- Cutting of the umbilical cord **ends the second stage of labor**

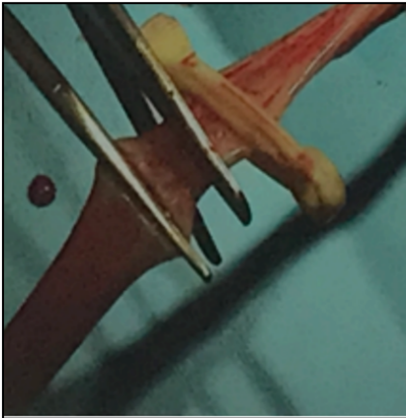


Figure 40. Clamping of the Umbilical Cord

IV. THIRD STAGE OF LABOR

- From delivery of the fetus to the delivery of the placenta

SIGNS OF PLACENTAL SEPARATION	
1	Sudden gush of blood
2	Uterus becomes globular and firm
3	Outward movement of the umbilical cord
4	Uterus rises in the abdomen

- As the placenta is separating from the decidual layer, there will be a sudden gush of blood, meaning the placenta is already detaching from the uterus
- The uterus becomes globular and firm
- There will be outward movement or "lengthening" of the umbilical cord until you are able to deliver
- As most of the placenta detaches from the uterine wall, the uterus then rises in the abdomen

SCHULTZE MECHANISM	DUNCAN MECHANISM
Central (usual) type	Placental separation occurs peripherally
Retroplacental hematoma pushes the placenta toward the uterine cavity	Blood collects between the membranes and the uterine wall
Central portion first then the rest	Blood escapes from the vagina
Blood from the placenta site does not escape externally until after extrusion of the placenta	Placenta descends sideways
"Shiny Schultz"	*"Dirty Duncan"*

- **Schultze mechanism**
    - More common
    - The hemorrhage happens after the entire placenta has been separated
- **Duncan mechanism** is known as "Dirty Duncan" because there is allegedly a lot of blood

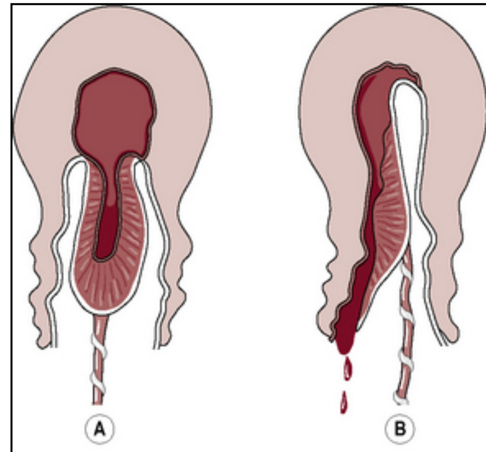


Figure 41. Schultze (A) and Duncan (B) Mechanisms

A. CONTROLLED CORD TRACTION

- In order to lessen the period of the second stage of labor and to decrease blood loss or postpartum hemorrhage
- "Pull or tug on the cord" with just enough pressure not to actually detach the cord from the placenta
- **Brandt-Andrews maneuver**
    - One hand is placed above the symphysis pubis and pushes outwards on the fundus
    - Pulling with counter traction upwards in order to facilitate delivery of the placenta

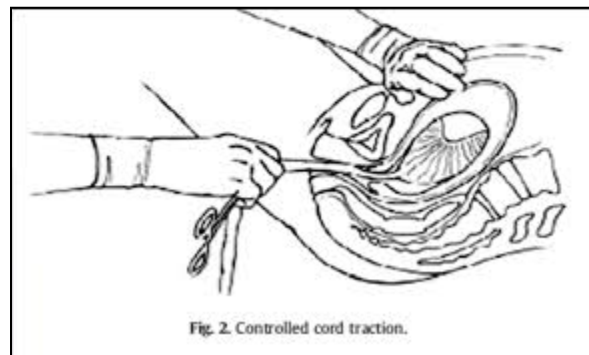


Fig. 2. Controlled cord traction.

Figure 42. Brandt-Andrews Maneuver

- It is important to deliver the placenta gracefully and completely.
    - Deliver all placental membranes all at once by using ovum forceps, or;
    - Clean the inside of the uterine cavity after delivery of placenta using wet gauze
- After delivery of the placenta, examine **both** the maternal and fetal side of the placenta

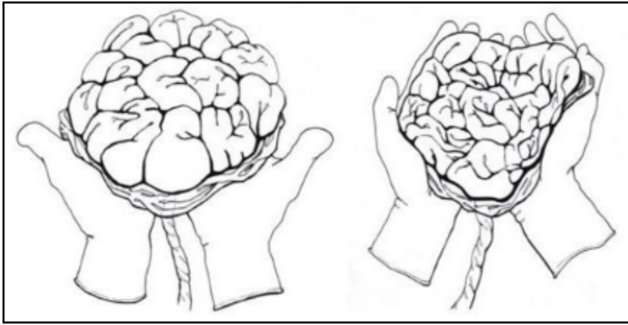


Figure 43. Examining the maternal side of the placenta

- **Maternal side**: After delivery of the placenta, you should examine the maternal side of the placenta
    - Place the placenta on your palm, open it up, then close it
    - Basically "cupping" the placenta
    - Note whether the **placental cotyledons** are complete or an area is missing, because there could be retained placental tissue

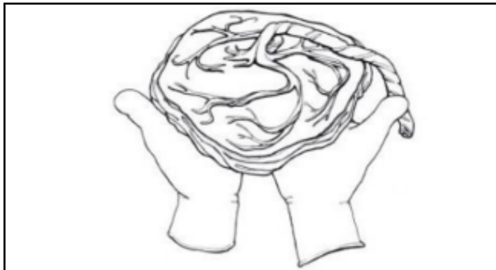


Figure 44. Examining the fetal side of the placenta

- **Fetal side**: Look where the umbilical cord is implanted
    - Majority: near the middle (paracentrally)
    - In certain situations: peripherally or intramembranous

	CHECK FOR:
1	Uterine atony • The adequacy; should be well contracted, very hard
2	Genital tract lacerations
3	Cervical lacerations

B. PROLONGED THIRD STAGE OF LABOR

ACTIVE MANAGEMENT	SPONTANEOUS DELIVERY OF PLACENTA
30 minutes	60 minutes

- Uterotonic is given during active management

C. ESSENTIAL NEWBORN CARE

- Called "Unang yakap", after delivery of the baby

Figure 45. Essential Newborn Care

	PRINCIPLES OF ESSENTIAL NEWBORN CARE	
1	**IMMEDIATE DRYING**	• Using a clean, dry cloth, thoroughly dry the baby, wiping the face, eyes, head, front and back, arms and legs • To thermoregulate to avoid complications
2	**SKIN-TO-SKIN CONTACT**	• Use a different cloth to "dress the baby" and place it prone to the mother's abdomen or chest for initial skin-to-skin contact • Lesser hypothermia and better fetal outcomes
3	**PROPER CORD CLAMPING AND CUTTING**	• Clamp and cut the cord after cord pulsations have stopped (typically at 1–3 minutes) • Put ties tightly around the cord at 2 cm and 5 cm from the newborn's abdomen • Cut between ties with sterile instruments • Observe for oozing blood • Do not milk the cord towards the newborn • After cord clamping, ensure oxytocin 10 IU • IM is given to the mother
4	**NON-SEPARATION OF BABY FROM MOTHER AND BREASTFEEDING INITIATION**	• Observe the newborn ○ Make sure they are not in distress or have poor APGAR. If this happens, they need to be resuscitated.

		• Place the baby with the mother for about 1 hour or more • Counsel on positioning and attachment • Initiate breastfeeding ○ Some babies will have a rooting reflex (know where the nipple is) ○ But some are not, only initiate breastfeeding after an hour (considered normal) • Note: if the baby cries, it's too late which means he is very hungry

D. PREVENTION OF POSTPARTUM HEMORRHAGE (PPH)

- **Postpartum hemorrhage** remains one of the top three complications of childbirth in the Philippines.
  - Active management for third stage labor is used to prevent postpartum hemorrhage
- In order to prevent postpartum hemorrhage, certain intrapartum interventions can be done:

Context	Recommendation	Category of recommendation
Intrapartum interventions to prevent postpartum haemorrhage	**5.** For women in the second stage of labour, techniques to reduce perineal trauma and facilitate spontaneous birth (including perineal massage, warm compresses and a hands-on guarding of the perineum) are recommended, based on a woman's preferences and available options. Updated	Recommended
	6. Routine or liberal use of episiotomy is not recommended for women undergoing spontaneous vaginal birth.[b] Revalidated	Not recommended
Postpartum interventions to prevent postpartum haemorrhage	**7.** The use of a quality-assured uterotonic is recommended for the prevention of postpartum haemorrhage during the third stage of labour for all births. To effectively prevent postpartum haemorrhage, only ***one*** of the following uterotonics should be used: oxytocin, carbetocin and misoprostol, as outlined in the specific recommendations below: **7.1** Oxytocin (10 IU, intramuscularly/intravenously) is recommended for the prevention of postpartum haemorrhage for all births. **7.2** Carbetocin (100 µg, intramuscularly/intravenously) is recommended for the prevention of postpartum haemorrhage for all births; the heat-stable carbetocin formulation is recommended in settings where cold chain cannot be guaranteed. **7.3** Misoprostol (either 400 µg or 600 µg, orally) is recommended for the prevention of postpartum haemorrhage for all births. Updated	Recommended

- **Oxytocin** is used, preferably <u>intramuscularly</u>
- Unfortunately, the prostaglandin **misoprostol** is banned for use in the Philippines
- Can be given as soon as the baby is out or even as the baby is being delivered
  - Others start at the beginning of the 3rd stage of labor.

	8. In situations where women giving birth vaginally already have intravenous access, the intravenous administration of 10 IU oxytocin – diluted and administered slowly over 1 to 2 minutes – is recommended in preference to intramuscular administration. Edited	Context-specific recommendation

- Note that those who are called OB-normal or low-risk pregnants <u>**do not**</u> necessarily need to have IV access.

	9. Uterotonic options that are not recommended for the prevention of postpartum haemorrhage include ergometrine/methylergometrine, fixed-dose combination of oxytocin and ergometrine, and injectable prostaglandins, as outlined in the specific recommendations below: **9.1** Ergometrine/methylergometrine is not recommended for the prevention of postpartum haemorrhage. **9.2** Fixed-dose combination of oxytocin and ergometrine (5 IU/500 µg, intramuscularly) is not recommended for the prevention of postpartum haemorrhage. **9.3** Injectable prostaglandins (carboprost or sulprostone) are not recommended for the prevention of postpartum haemorrhage. Updated	Not recommended

- **Ergometrine/methylergometrine** used to be mandatory after labor and delivery, but it is <u>no longer recommended</u> now
- **Carboprost** has a role later on if PPH actually occurs

	10. In settings where multiple uterotonic options are available, oxytocin (10 IU, intramuscularly/intravenously) is the recommended uterotonic agent of choice for the prevention of postpartum haemorrhage for all births. Updated	Recommended

	11. Heat-stable carbetocin (100 µg intramuscularly/intravenously) is the recommended choice for the prevention of postpartum haemorrhage in settings where the oxytocin cold chain cannot be consistently maintained. If heat-stable carbetocin is not available, misoprostol (400 µg or 600 µg, orally) can be used as an alternative. Updated	Context-specific recommendation
	12. The administration of misoprostol (400 µg or 600 µg, orally) by community health workers and lay health workers is recommended for the prevention of postpartum haemorrhage in settings where skilled health personnel are not present to administer injectable uterotonics. Updated	Context-specific recommendation

- Oxytocin needs to be kept in a cold storage room/place
  - If not available, **carbetocin** should be given

	13. In settings where women give birth outside a health facility and in the absence of skilled health personnel, a strategy of antenatal distribution of misoprostol to pregnant women for self-administration is recommended for the prevention of postpartum haemorrhage, only with targeted monitoring and evaluation.[c] Revalidated	Context-specific recommendation
	14. Tranexamic acid is not recommended for the prevention of postpartum haemorrhage at vaginal birth. New	Not recommended
	15. Tranexamic acid is not recommended for the prevention of postpartum haemorrhage at caesarean birth. New	Not recommended

	17. In settings where skilled birth attendants are unavailable, controlled cord traction is not recommended.[b] Revalidated	Not recommended
	18. Cord traction is the recommended method for the removal of the placenta in caesarean section.[b] Revalidated	Recommended
	19. Early cord clamping (<1 minute after birth) is not recommended unless the neonate is asphyxiated and needs to be moved immediately for resuscitation. Revalidated	Not recommended
	20. Sustained uterine massage is not recommended as an intervention to prevent postpartum haemorrhage in women who have received prophylactic oxytocin.[b] Revalidated	Not recommended

Table 1: Recommendation status of the individual components of the active management of the third stage of labour, based on who delivers the intervention

	Skilled birth attendant	Non-skilled birth attendant	Self-administered
Uterotonics	In favour	In favour	Research*
Early cord clamping	Against	Against	Against
Controlled cord traction	Conditional**	Against	Against
Continuous uterine massage	Against***	Against	Research****

* Distribution of misoprostol during the antenatal period for self-administration during the third stage of labour

** Small reduction in blood loss and in the length of the third stage; adoption based on the values and preferences of the woman and the health care provider

*** Routine uterine tone assessment remains a vital part of clinical decision making and should be practised during the third stage of labour

**** Self-administered uterine massage in the absence of uterotonics

Figure 46. Recommendations for the Prevention of PPH

- To prevent PPH:
  - Give uterotonics, specifically oxytocin
  - Delayed cord clamping
  - Controlled cord traction
  - Continuous uterine massage (not recommended if you have already given uterotonic)

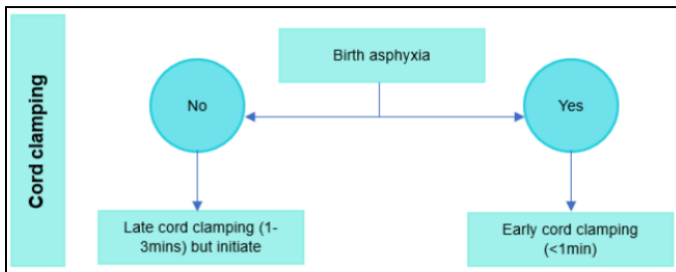


Figure 47. Cord clamping in Response to Birth asphyxia

CORD CLAMPING IN RESPONSE TO BIRTH ASPHYXIA		
BIRTH ASYPHYXIA		
Present	No	Yes
Cord Clamping	Late cord clamping (1-3 mins) but initiate	Early cord clamping (<1min)

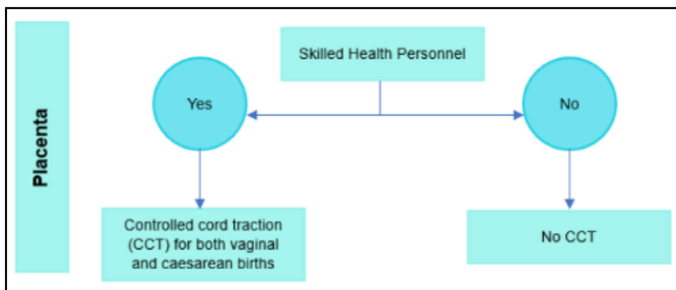


Figure 48. Controlled cord traction of the placenta in the presence of a Skilled Health Personnel

CONTROLLED CORD TRACTION OF THE PLACENTA IN THE PRESENCE OF A SKILLED HEALTH PERSONNEL		
SKILLED HEALTH PERSONNEL		
Present	Yes	No
Controlled Cord Traction	Perform for both Vaginal and Cesarean births followed by administration of oxytocin 10IU, IV/IM immediately after delivery	CCT not performed administer **Misoprostol** (400 micrograms or 600 micrograms, orally)

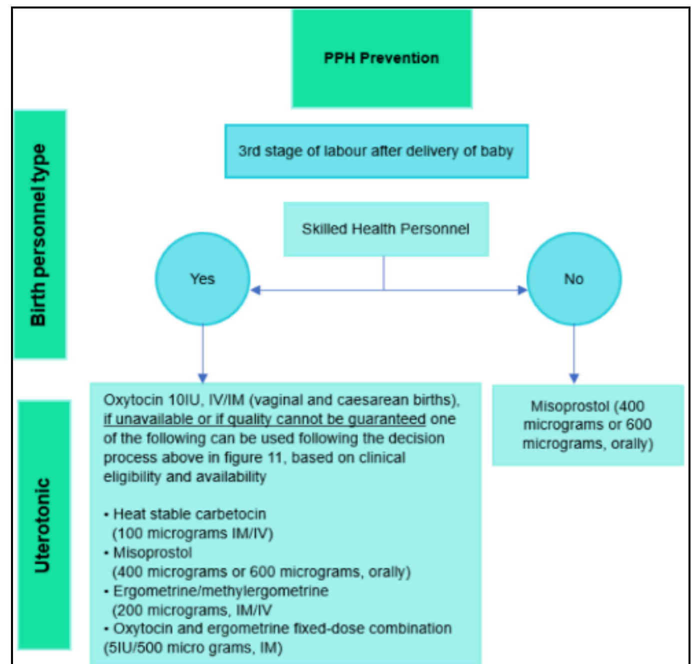


Figure 49. Controlled cord traction of the placenta in the presence of a Skilled Health Personnel

- If oxytocin is unavailable or if quality cannot be guaranteed one of the following can be used:
  - Heat stable carbetocin
    - 100 micrograms IM/IV
  - **Misoprostol**
    - 400 micrograms or 600 micrograms, orally
    - Not available for use in the Philippines
  - **Ergometrine/methylergometrine**
    - 200 micrograms, IM/IV
  - **Oxytocin** and **ergometrine** fixed-dose combination
    - 5IU/500 micrograms, IM

E. ASSESSMENT OF GENITAL TRACT LACERATIONS

- After delivery of the baby, delivery of the placenta is done and the uterus is assessed whether it is well-contracted or if there are presence of any genital tract lacerations.

LACERATION	STRUCTURES INVOLVED
First Degree	Injury to only the vaginal epithelium or perineal skin
Second Degree	Injury to perineum that spares the anal sphincter complex but involves the perineal muscles, which are the bulbospongiosus and superficial transverse perineal muscles
Third Degree: 3A	<50% of the external anal sphincter (EAS) is torn
Third Degree: 3B	>50% of the EAS is torn, but the internal anal sphincter (IAS) remains intact
Third Degree: 3C	EAS and IAS are torn

Fourth Degree	The perineal body, entire anal sphincter complex, and anorectal mucosa are lacerated

- Lacerations may occur even with perineal support and adequate anesthesia

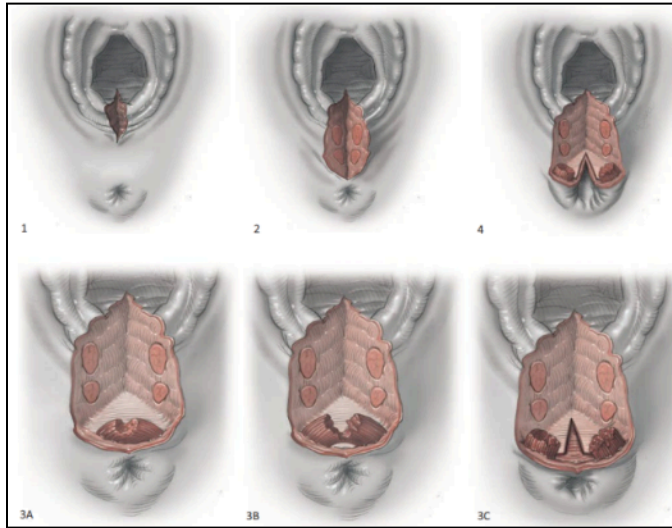


Figure 50. Degrees of Laceration

- Because of this, it is assumed that substituting a straight surgical incision for a ragged laceration that may occur during delivery allows **better repair and better anatomic approximation of structures**
  - Hence, episiotomy is advocated by some to avoid ragged lacerations and is thought to promote proper healing and help prevent pelvic relaxation

F. EPISIOTOMY

- Substitution of a straight surgical incision for a ragged laceration that may occur
- Supposedly improves healing and prevention of pelvic relaxation
- Can either be a:
  1. **Midline episiotomy**: The concern is that because the incision goes straight down, it may involve not only the muscles of the **perineal body** but also the **anal sphincter**
  2. **Mediolateral episiotomy**: The incision is made **45° or ideally 60° from the midline** to reduce the risk of involving the **anal sphincter**, which may occur if the angle is too acute

DEGREES OF LACERATION		
	MIDLINE	**MEDIOLATERAL**
Surgical Repair	Easy	More difficult
Faulty Healing	Rare	More common
Postoperative Pain	Minimal	Common
Anatominal Results	Excellent	Occasionally faulty
Blood Loss	Less	More
Dyspareunia	Rare	Occasional
Extensions	Common	Uncommon

- According to the **American College of Obstetricians and Gynecologists (ACOG)**, **routine episiotomy is not recommended**
  - Instead, episiotomy should be performed selectively, while many women can be managed with perineal support alone
- The argument of many obstetricians in the Philippine setting:
  - Because Filipino women are generally smaller, their perineal bodies tend to be shorter
    - In these situations, some perform routine episiotomy
  - The decision often depends on the obstetrician's skill and clinical judgment
  - Episiotomy is thought to reduce the extension of tears that may lead to third-degree lacerations

V. IMMEDIATE POSTPARTUM CARE

- **Watch out for:**
  - Postpartum hemorrhage (uterine atony)
  - Lacerations
- Maternal blood pressure and pulse rate **every 15 minutes** for the **next 2 hours**
- Maternal temperature **every 4 hours** for the **first 8 hours**, then **every 8 hours**
- Unfortunately, there might be some injuries of the fetal head during labor and delivery
  - Some parents may be surprised why their babies look like coneheads or why their baby's head looks weird or elongated
  - This is normal because of fetal head molding due to the limited space in the pelvic canal
  - You have to reassure the parents that this is temporary and it will go back to its "normal shape" after 24 hours
  - However, sometimes there can be some findings in the fetal head that may be of concern to parents

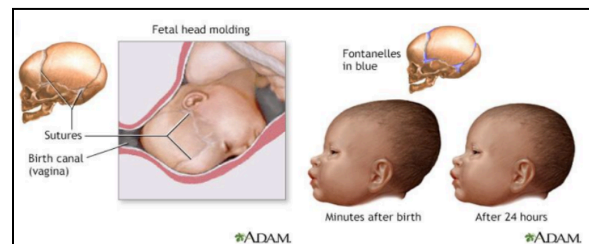


Figure 51. Fetal Head Molding

A. CAPUT SUCCEDANEUM

- The most common "injury"
  - *Not really an injury per se*
- **Soft-tissue edema** of the scalp
- Sometimes happens in normal labor, but is also a sign that there could be dysfunctional labor going on

- Maximal at birth, rapidly grows smaller, and usually disappears within hours or days
- It forms from repetitive contractions that press the head against an unyielding cervix

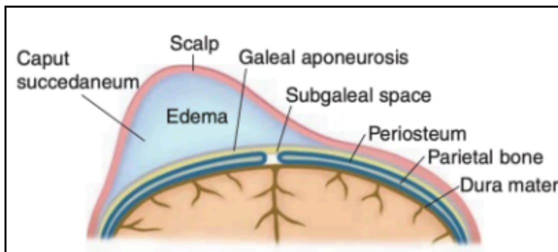


Figure 52. Caput Succedaneum

B. CEPHALOHEMATOMA

- A cranial **subperiosteal hematoma**
- Can involve both the parietal bones, but collections <u>cannot cross suture lines</u> (unlike in subgaleal hematoma)
- Unfortunately, this may not be apparent until hours after birth, it often goes larger and persists for weeks or even months
- Bleeding may cause anemia or hyperbilirubinemia
- It develops from shearing forces during labor and delivery, which lacerate the emissary or diploic veins

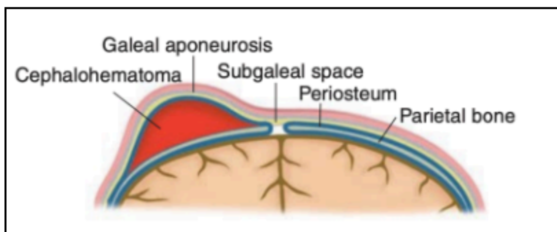


Figure 53. Cephalohematoma

C. SUBGALEAL HEMORRHAGE

- Rare
- Results from emissary vein laceration, and bleeding between the galea aponeurotica and the skull periosteum
- This is the kind of hemorrhage that <u>can cross suture lines</u>
- Both the galea aponeurotica and subgaleal space span across the occipital, parietal, and frontal bones
- Significant blood volumes can collect in this potential space and may extend from the neck to the orbits and laterally to the temporal fascia above the ears
- If not detected, it can lead to shock and even death
- Its rate is 0.05% (very rare) with spontaneous birth but can be 10x higher with vacuum-assisted delivery

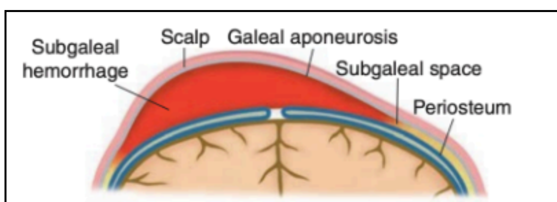


Figure 54. Subgaleal hemorrhage