



جامعة المستقبل
AL MUSTAQBAL UNIVERSITY

Al-Mustaqbal University
Nursing College

➤ **Labor & delivery**

Prof. saadya hadi humade

KEY TERMS:

absent variability

accelerations

acrocyanosis (k-rō-sī--NŌ-sīs,)

adjustment

amnioinfusion (m-nē-ō-ĭn-FYŪ-zhŭn,

amniotomy (m-nēŎT-ŏ-mē,

baseline fetal heart rate

baseline variability

bloody show

cold stress

coping

crowning

decelerations

Dilate doula (DŪ-l,)

efface (ĕ-FĀS,)

episodic changes

fetal bradycardia

fetal tachycardia

fontanelle (FÖN-t-něI,
laboring down
late decelerations
Leopold's maneuver
lie
marked variability
microbiome
microbiota
moderate variability
molding
neutral thermal environment
nitrazine test
nuchal cord (NŪ-kl kōrd,
ophthalmia neonatorum (ōf-THL-mē- nē-ō-n-TÖR-m,
periodic changes
prolonged decelerations
station
sutures
tachysystole
trial of labor after cesarean (TOLAC)
uteroplacental insufficiency (yū-tr-ō-pl-SĚN-tl ĩn-sŭ-FĪSH-n-sē,
vaginal birth after cesarean (VBAC)

Components of the birth process Four interrelated components, often called the “four Ps,” make up the process of labor and birth:

powers,
passage,
passengers,
and psyche.

Powers:

The powers of labor are forces that cause the cervix to open and that propel the fetus downward through the birth canal. The two powers are uterine contractions and the mother's pushing efforts.

Uterine Contractions :

Uterine contractions are the primary powers of labor during the first of the four stages of labor (from onset until full dilation of the cervix). Uterine contractions are involuntary smooth muscle contractions; the woman cannot consciously cause them to stop or start.

*, their intensity and effectiveness are influenced by a number of factors, such as walking, drugs, maternal anxiety, and vaginal examinations.

- **Effect of contractions on the cervix:**
- Contractions cause the cervix to efface (thin) and dilate (open) to allow the fetus to descend in the birth canal (Fig. 6.2).
- Before labor begins, the cervix is a tubular structure about 2 to 3.8 cm long.
- Contractions simultaneously push the fetus downward as they pull the cervix upward .

This causes the cervix to become thinner and shorter. Effacement is determined by a vaginal examination and is described as a percentage of the original cervical length. When the cervix is 100% effaced, it feels like a thin, slick membrane over the fetus.

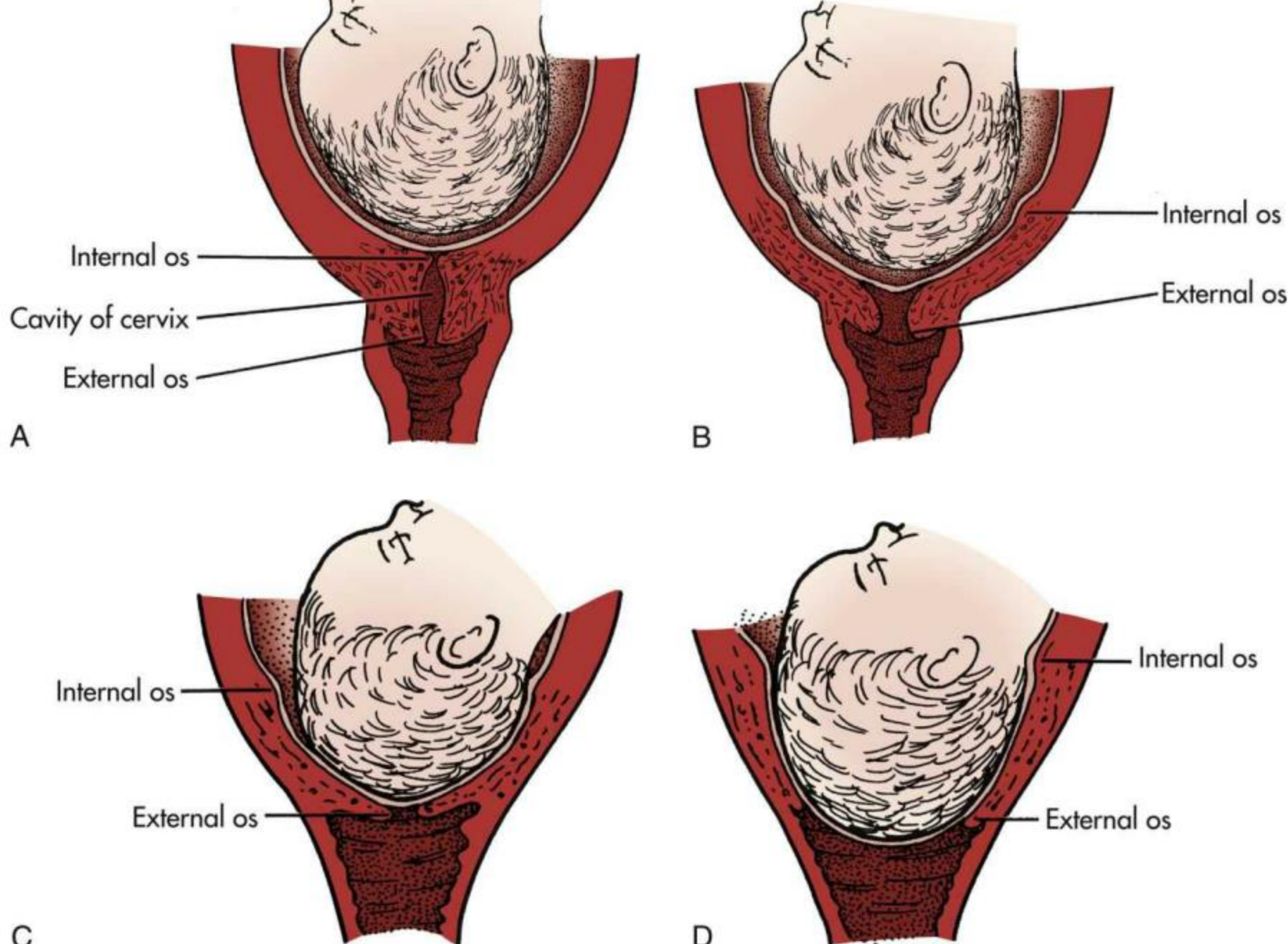


FIG. 6.2 Cervical effacement and dilation. (A) No effacement, no dilation. (B) Early effacement and dilation. (C) Complete effacement, some dilation. (D) Complete dilation and effacement. (From Lowdermilk DL, Perry SE, Cashion K, et al: *Maternity & Women's Health Care*, ed 11, St. Louis, 2016, Elsevier.)

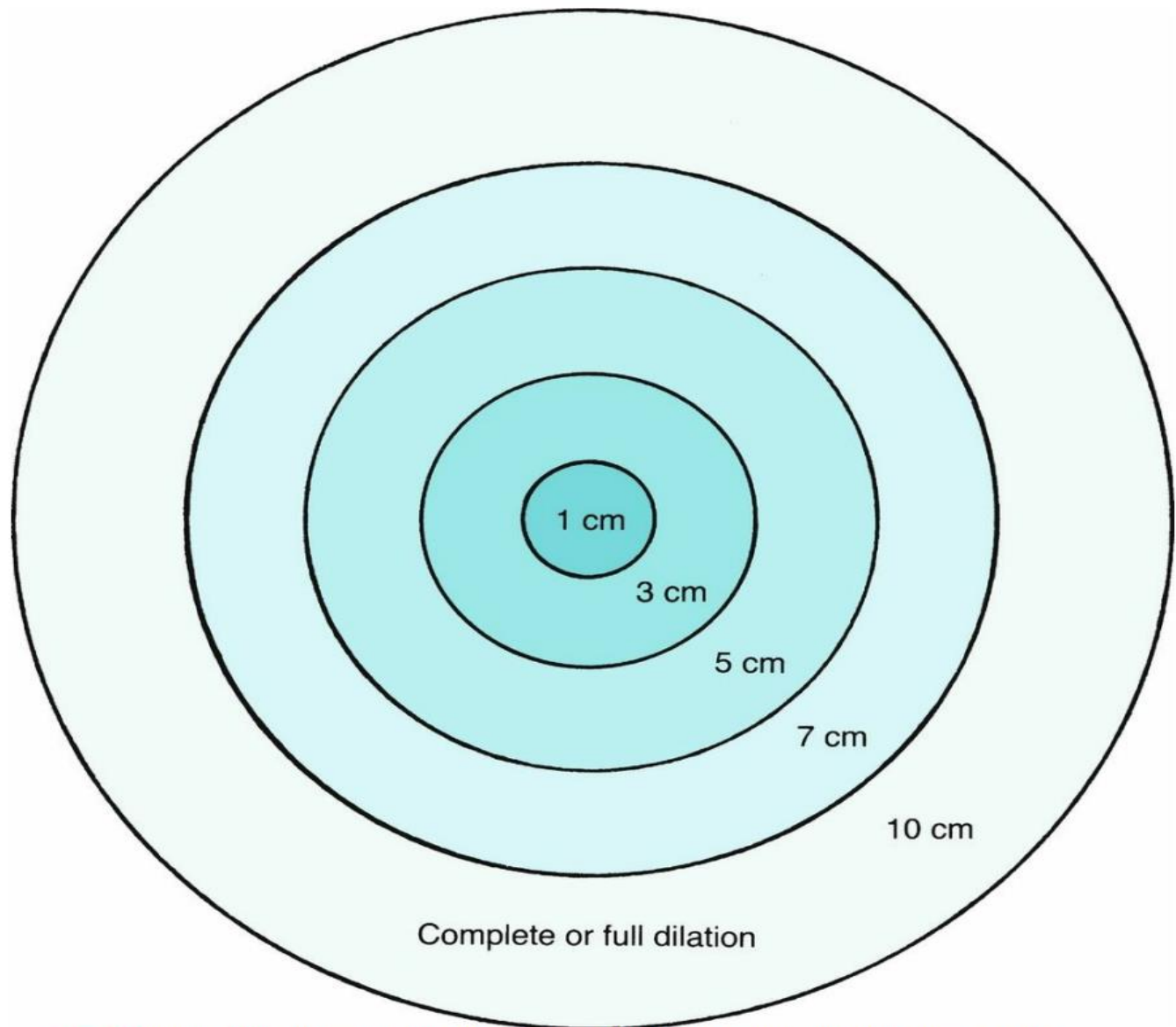


FIG. 6.3 Cervical dilation in centimeters. Full dilation is 10 cm (1 cm is approximately one finger's width).

Phases of contractions Each contraction has the following three phases (Fig. 6.4):

1. **Increment:** The period of increasing strength
2. **Peak, or acme:** The period of greatest strength
3. **Decrement:** The period of decreasing strength

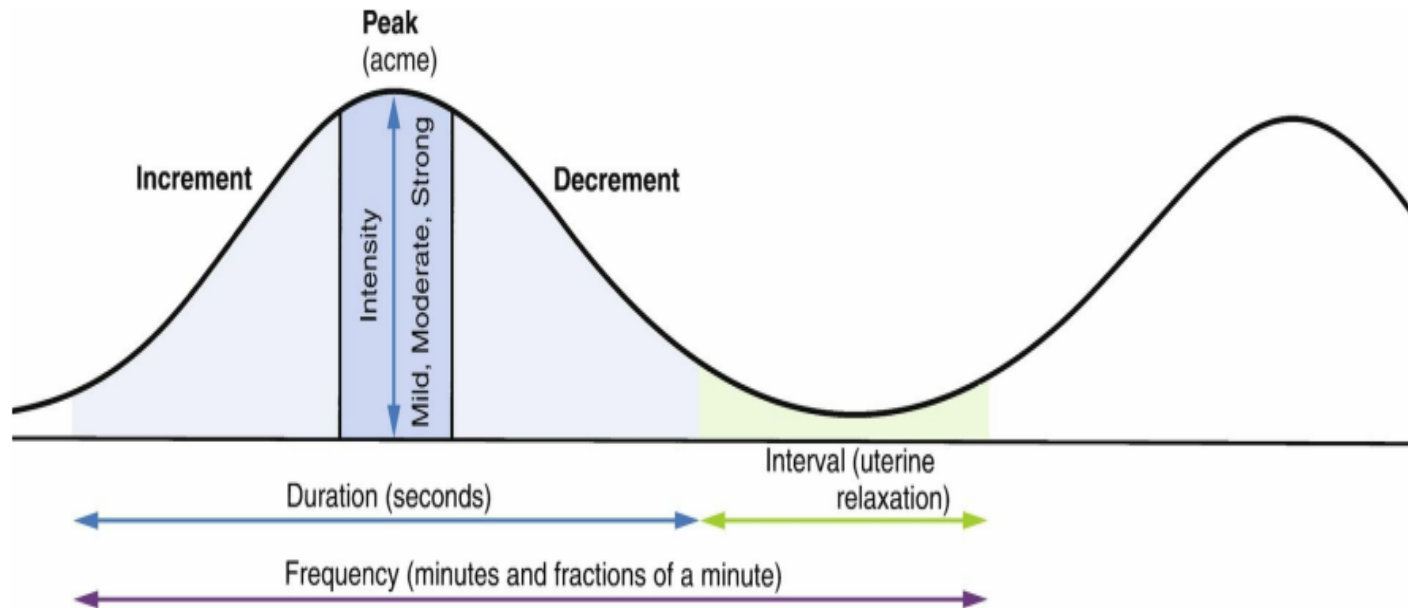


FIG. 6.4 Contraction cycle. Each contraction can be likened to a bell shape, with an increment, peak (acme), and decrement. The frequency of contractions is the average time from the beginning of one to the beginning of the next. The duration is the average time from the beginning to the end of one contraction. The interval is the period of uterine relaxation between contractions.

Contractions are also described by their average frequency, duration, intensity, and interval.

Frequency:

- **Frequency is the elapsed time from the beginning of one contraction until the beginning of the next contraction.**
- Frequency is described in minutes and fractions of minutes, such as “contractions every 4 minutes.” Contractions occurring more often than every 2 minutes may reduce fetal oxygen supply and should be reported.

Duration:

- **Duration is the elapsed time from the beginning of a contraction until the end of the same contraction.**
- Duration is described as the average number of seconds contractions last, such as “duration of 45 to 50 seconds.”
- Persistent contraction durations longer than 90 seconds may reduce fetal oxygen supply and should be reported.

Intensity:

- **Intensity is the approximate strength of the contraction.**
- In most cases, intensity is described in words such as “mild,” “moderate,” or “strong,”

which are defined as follows:

- **Mild contractions:**

Fundus is easily indented with the fingertips; the fundus of the uterus feels similar to the tip of the nose.

- **Moderate contractions:**

Fundus can be indented with the fingertips but with more difficulty; the fundus of the uterus feels similar to the chin.

- **Firm contractions: Fundus cannot be readily indented with the fingertips; the fundus of the uterus feels similar to the forehead.**

Interval :

- **The interval is the amount of time the uterus relaxes between contractions.**
- Blood flow from the mother into the placenta gradually decreases during contractions and resumes during each interval.
- The placenta refills with freshly oxygenated blood for the fetus and removes fetal waste products.
- Persistent contraction intervals shorter than 60 seconds may reduce fetal oxygen supply.

Safety Alert!

- **Report to the registered nurse any contractions that occur more frequently than every 2 minutes,**
- **last longer than 90 seconds,**
- **or have intervals shorter than 60 seconds.**

Maternal Pushing :

- When the woman's cervix is fully dilated, she adds voluntary pushing to involuntary uterine contractions.
- The combined powers of uterine contractions and voluntary maternal pushing in stage 2 of labor propel the fetus downward through the pelvis.
- Most women feel a strong urge to push or bear down when the cervix is fully dilated and the fetus begins to descend.
- **factors such as maternal exhaustion or sometimes epidural analgesia may reduce or eliminate the natural urge to push.**
- Some women feel a premature urge to push before the cervix is fully dilated because the fetus pushes against the rectum.
- This should be discouraged, as it may contribute to maternal exhaustion and fetal hypoxia and tearing of maternal soft tissues.

Nursing Tip

Provide emotional support to the laboring woman so that she is less anxious and fearful.

Excessive anxiety or fear can cause greater pain, inhibit the progress of labor, and reduce blood flow to the placenta and fetus.

Passage :

The passage consists of the mother's bony pelvis and the soft tissues (cervix, muscles, ligaments, and fascia) of her pelvis and perineum .

Bony Pelvis :

The pelvis is divided into the following two major parts:

- (1) the false pelvis (upper, flaring part) and
- (2) the true pelvis (lower part).

The true pelvis, which is directly involved in childbirth, is further divided into :

- 1- the inlet at the top,
- 2- the midpelvis in the middle, and
- 3- the outlet near the perineum.

It is shaped like a curved cylinder or a wide, curved funnel.

The measurements of the maternal bony pelvis must be adequate to allow the fetal head to pass through, or cephalopelvic disproportion will occur, and a cesarean birth may be indicated.

Soft Tissues : women who have had previous vaginal births deliver more quickly than women having their first births because their soft tissues yield more readily to the forces of contractions and pushing efforts.

This advantage is not present if the woman's previous births were cesarean.

Soft tissue may not yield as readily in older mothers or after cervical procedures that have caused scarring.

Passengers :

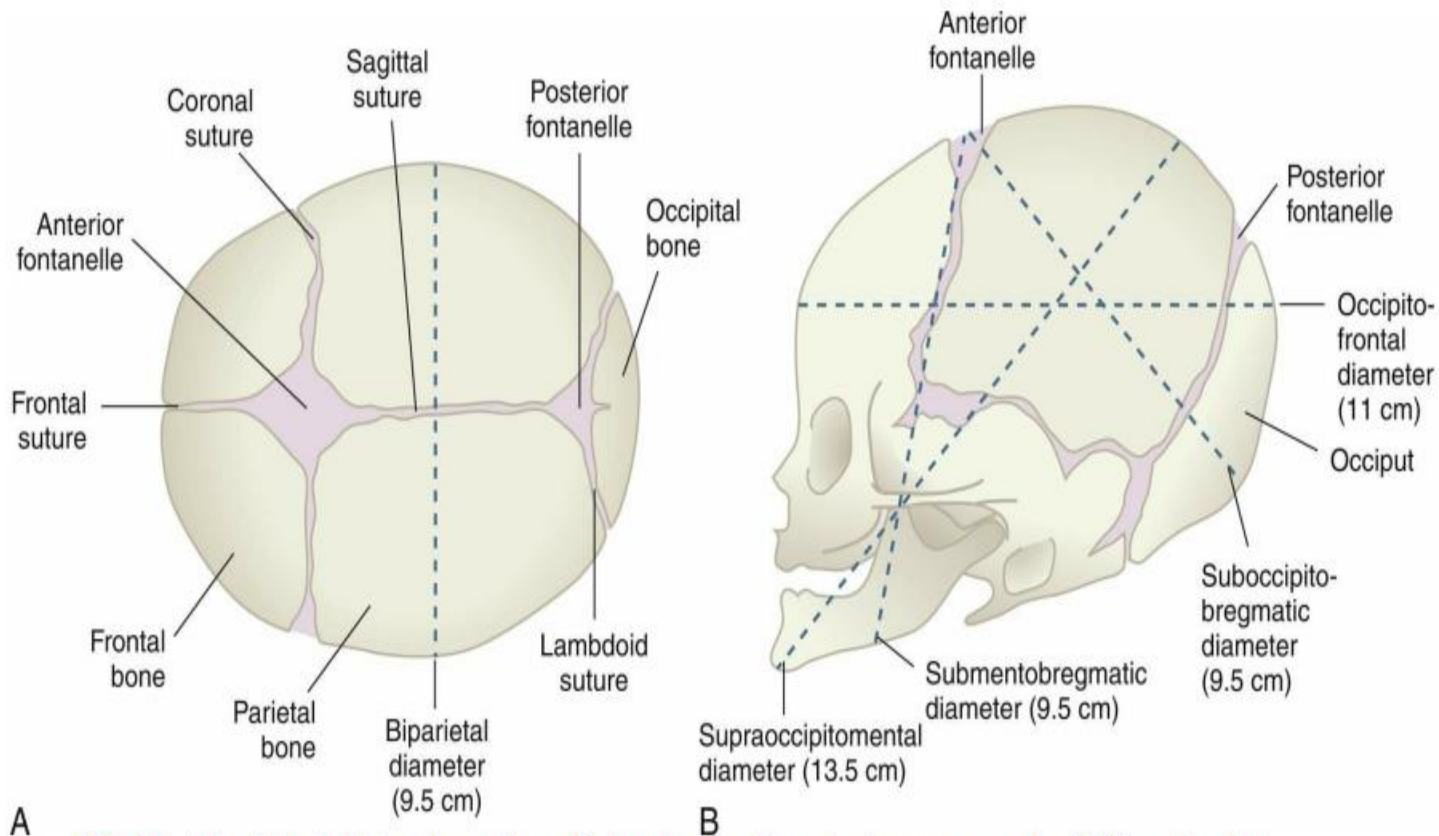
The passengers are the fetus, placenta (afterbirth), amniotic membranes, and amniotic fluid.

The fetal head is composed of several bones separated by strong connective tissue, called sutures .

A wider area, called a fontanelle, is formed where the sutures meet.

The following two fontanelles are important in obstetrics:

1. **The anterior fontanelle**, a diamond-shaped area formed by the intersection of four sutures (frontal, sagittal, and two coronal)
2. **The posterior fontanelle**, a tiny triangular depression formed by the intersection of three sutures (one sagittal and two lambdoid)



A

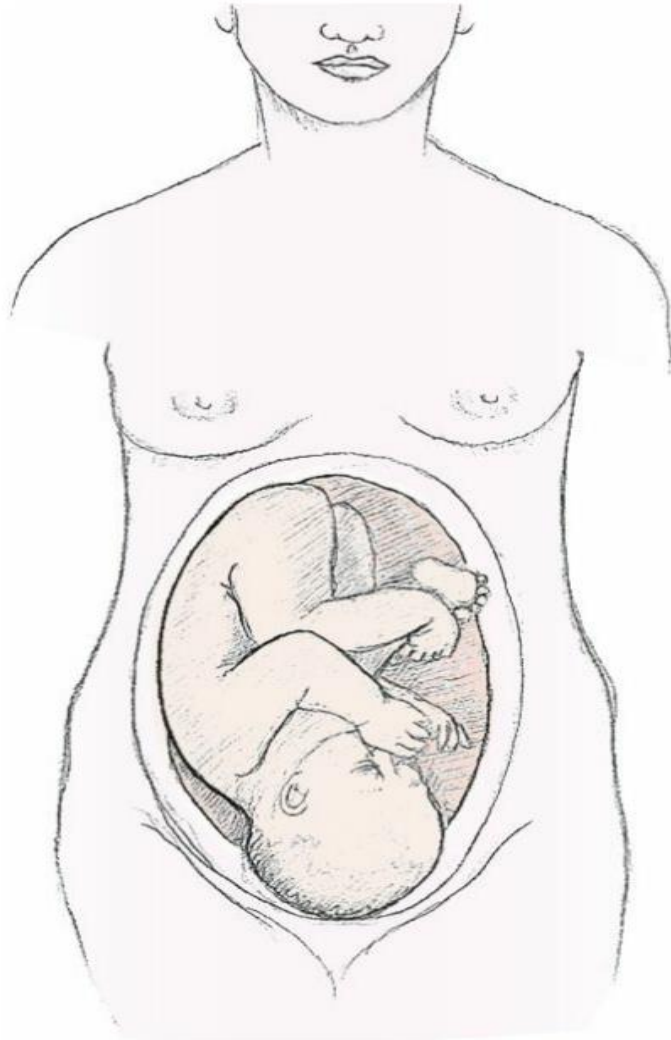
B

FIG. 6.5 The fetal skull, showing sutures, fontanelles, and important measurements. (A) Superior view. The anterior fontanelle has a diamond shape; the posterior fontanelle is triangular. The biparietal diameter is an important fetal skull measurement. (B) Lateral view. The measurements of the fetal skull are important to determine if cephalopelvic disproportion will be a problem. The mechanisms of labor allow the fetal head to rotate so that the smallest diameter of the head passes through the pelvis as it descends. (From Matteson PS: *Women's health during the childbearing years: a community-based approach*, St.

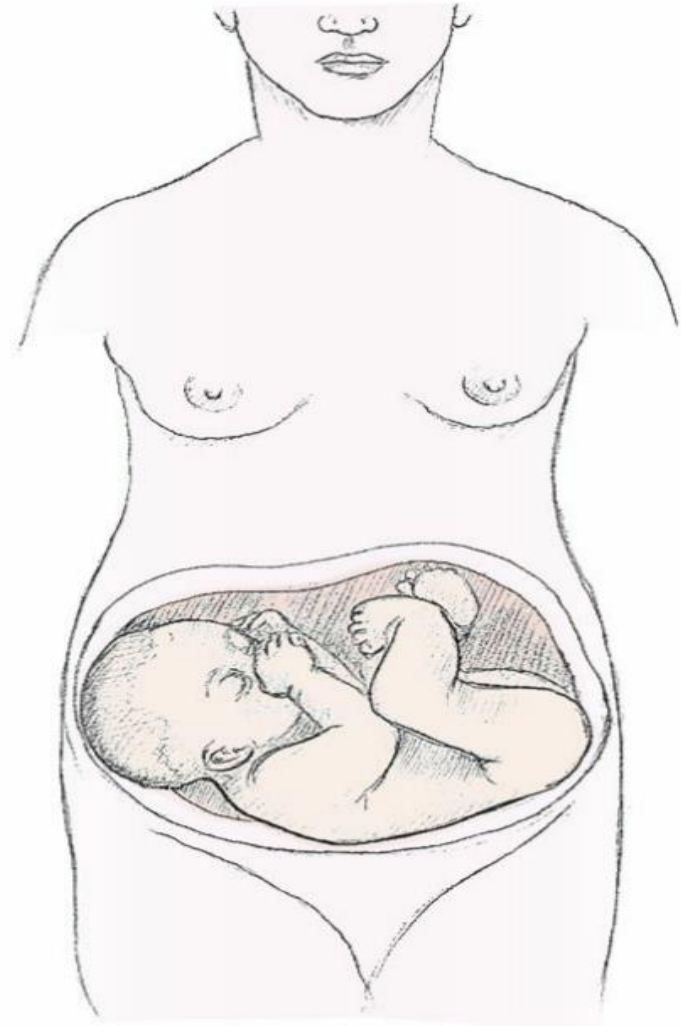
- **The sutures and fontanelles of the fetal head allow it to change shape as it passes through the pelvis (molding).**
- They are important landmarks in determining how the fetus is oriented within the mother's pelvis during birth.
- The main transverse diameter of the fetal head is the biparietal diameter, which is measured between the points of the two parietal bones on each side of the head.
- The anteroposterior diameter of the fetal head can vary depending on how much the head is flexed or extended.

Lie:

- **Lie describes how the fetus is oriented to the mother's spine .**
- **The most common orientation is the longitudinal lie** (greater than 99% of births),
- **in which the fetus is parallel to the mother's spine.**
- **The fetus in a transverse lie** is at right angles to the mother's spine.
- **The transverse lie** may also be called a shoulder presentation.
- **In an oblique lie**, the fetus is between a longitudinal lie and a transverse lie.



Longitudinal lie



Transverse lie

FIG. 6.6 Lie. In the longitudinal lie, the fetus is parallel to the mother's spine. In the transverse lie, the fetus is at right angles to the mother's spine. The shoulder presents at the cervix.

Attitude:

- **The fetal attitude is normally one of flexion,**
- **with the head flexed forward and the arms and the legs flexed.**
- **The flexed fetus is compact and ovoid and most efficiently occupies the space in the mother's uterus and pelvis.**
- **Extension of the head, arms, or legs sometimes occurs, and labor may be prolonged.**

Presentation:

Presentation refers to the fetal part that enters the pelvis first. The cephalic presentation is the most common.

Any of the following four variations of cephalic presentations can occur, depending on the extent to which the fetal head is flexed:

1. Vertex presentation: The fetal head is fully flexed. **This is the most favorable cephalic variation because the smallest possible diameter of the head enters the pelvis. It occurs in about 96% of births.**

2. Military presentation: The fetal head is neither flexed nor extended.

3. Brow presentation: The fetal head is partly extended.

The longest diameter of the fetal head is presenting.

This presentation is unstable and tends to convert to either a vertex or a face presentation.

4. Face presentation: The head is fully extended and the face presents.

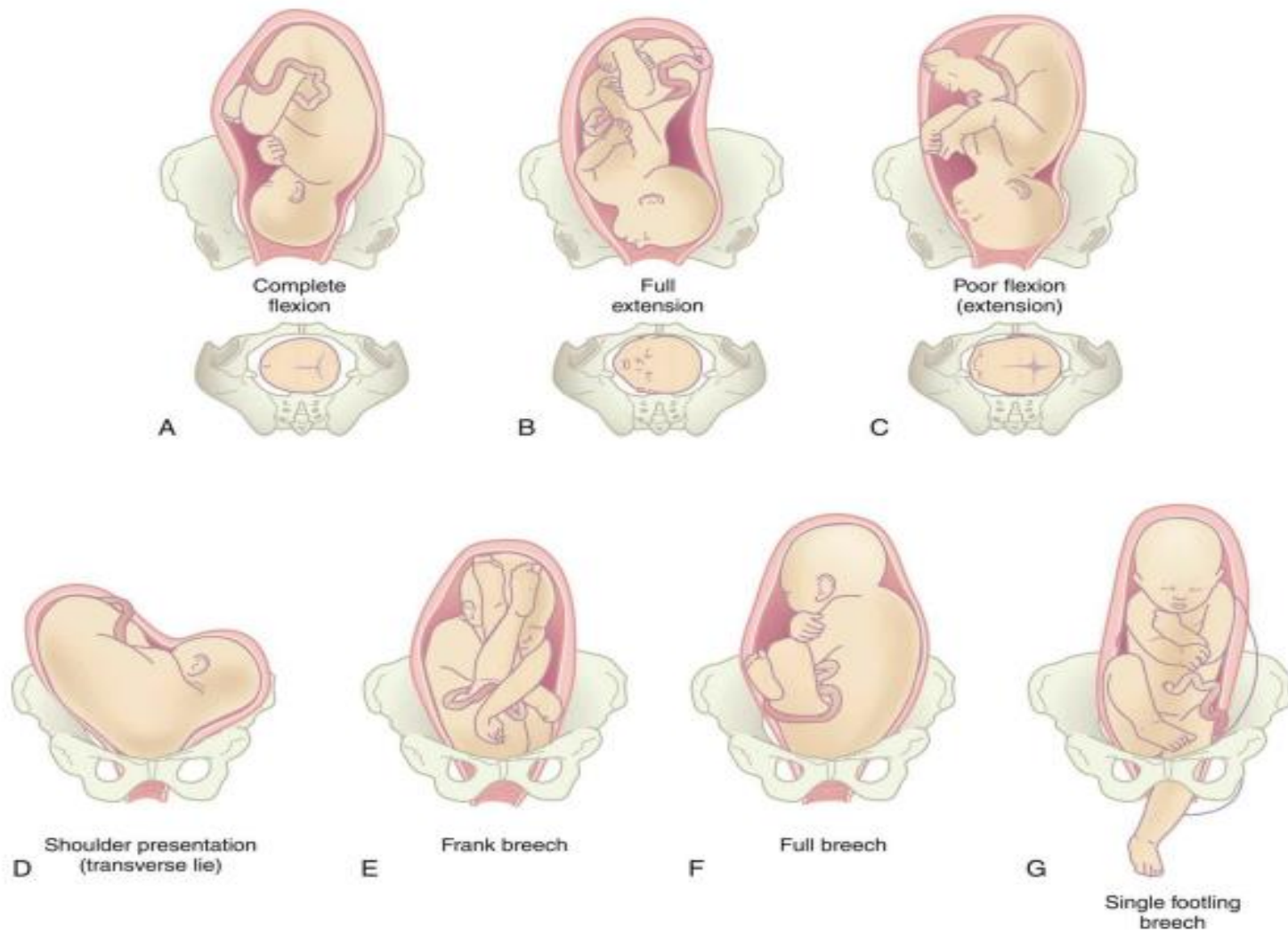


FIG. 6.7 Fetal presentations. (A) Cephalic vertex. (B) Cephalic face. (C) Cephalic brow. (D) Shoulder. (E) Frank breech. (F) Full or complete breech. (G) Footling breech (can be single or double). The vertex presentation in which the fetal chin is flexed on the chest is the most common and favorable for a vaginal birth because it allows the smallest diameter of the head to go through the bony pelvis of the mother. Note how the anterior and posterior fontanelles can be used to determine fetal presentation and position in the pelvis. (From Matteson PS: *Women's health during the childbearing years: a community-based approach*, St. Louis, 2004, Mosby.)

The next most common presentation is the breech, which can have the following three variations :

1. **Frank breech**: The fetal legs are flexed at the hips and extend toward the shoulders; this is the most common type of breech presentation. **The buttocks present at the cervix.**
2. **Full or complete breech**: A reversal of the cephalic presentation, with flexion of the head and extremities. Both feet and the buttocks present at the cervix.
3. **Footling breech**: One or both feet are present first at the cervix.

Many women with a fetus in the breech presentation have cesarean births because the head, which is the largest single fetal part, is the last to be born and may not pass through the pelvis easily because flexion of the fetal head cannot occur .

After the fetal body is born, the head must be delivered quickly so the fetus can breathe; at this point, part of the umbilical cord is outside the mother's body and the remaining part is subject to compression by the fetal head against the bony pelvis.

Position :

1. Position refers to how **a reference point on the fetal presenting part is oriented within the mother's pelvis.**
2. **The term occiput** is used to describe how the head is oriented if the fetus is in a **cephalic vertex presentation.**
3. The **term sacrum** is used to describe how a **fetus in a breech** presentation is oriented within the pelvis.
4. **The shoulder and back are reference** points if the fetus is in a **shoulder presentation.**

The maternal pelvis is divided into four imaginary quadrants:

right and left anterior and right and left posterior.

If the fetal occiput is in the left front quadrant of the mother's pelvis, it is described as left occiput anterior.

If the sacrum of a fetus in a breech presentation is in the mother's right posterior pelvis, it is described as right sacrum posterior

Box 6.1 Classifications of Fetal Presentations and Positions Cephalic presentations:

Vertex Presentations

LOA—left occiput anterior

ROA—right occiput anterior

ROT—right occiput transverse

LOT—left occiput transverse

OA—occiput anterior

OP—occiput posterior

Face Presentations :

LMA—left mentum anterior

RMA—right mentum anterior

LMP—left mentum posterior

RMP—right mentum posterior:

Breech presentations

LSA—left sacrum anterior

RSA—right sacrum anterior

LSP—left sacrum posterior

RSP—right sacrum posterior

shows various fetal presentations and positions.

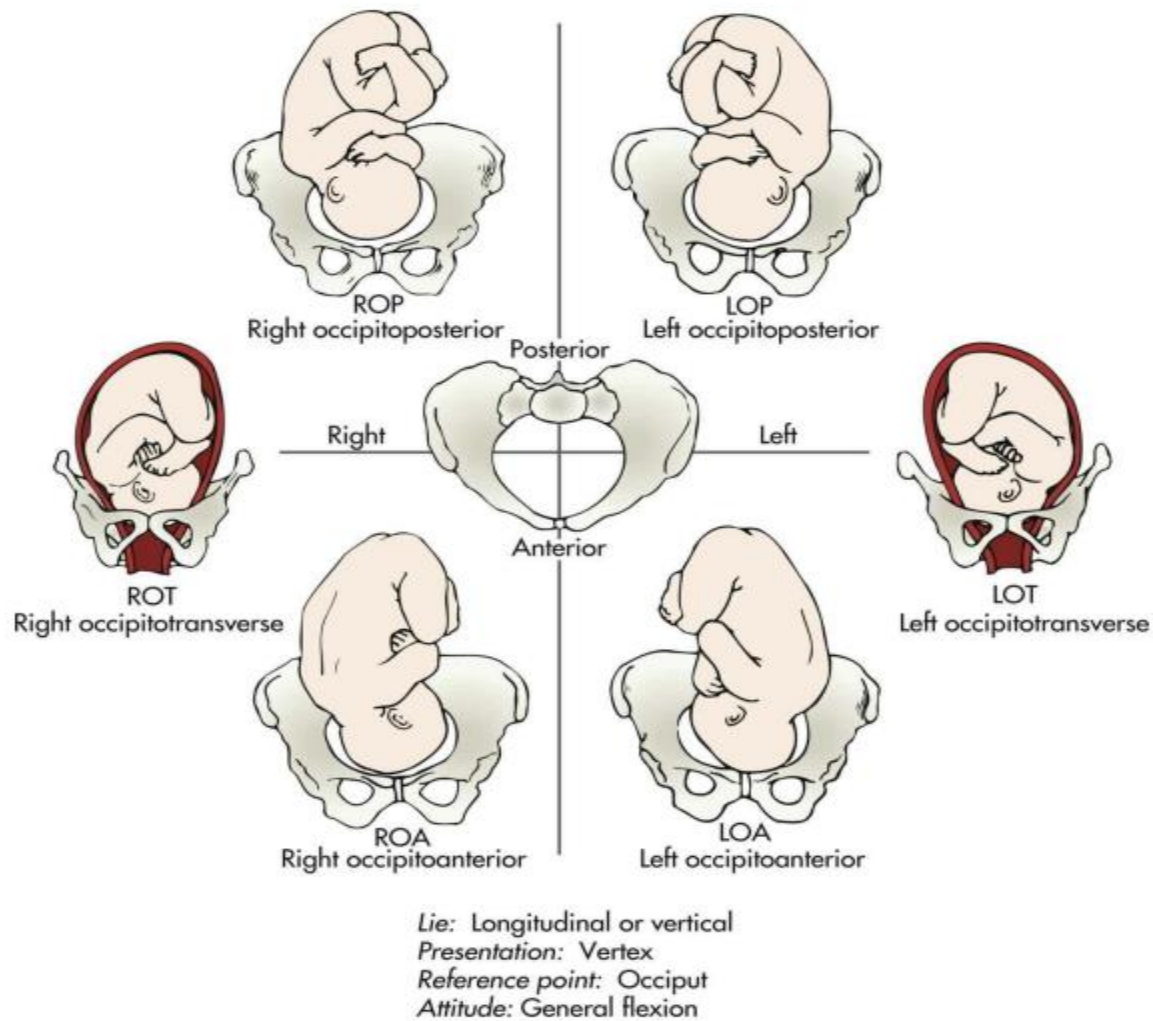


FIG. 6.8 Fetal position. The right occipitoanterior (ROA) or left occipitoanterior (LOA) is most favorable for normal labor. When the occiput faces the posterior section of the woman's pelvis, a longer, "back labor" birth process is anticipated. (From Lowdermilk DL, Perry SE, Cashion K, et al: *Maternity & Women's Health Care*, ed 11, St. Louis, 2016, Elsevier.)

Normal childbirth The specific event that triggers the onset of labor remains unknown.

Many factors play a part in initiating labor, which is an interaction of the mother and fetus.

These factors include:

1. stretching of the uterine muscles,
2. hormonal changes,
3. placental aging,
4. and increased sensitivity to oxytocin.

Labor normally begins when the fetus is mature enough to adjust easily to life outside the uterus yet still small enough to fit through the mother's pelvis.

This point is usually reached between 39 and 40 weeks, or approximately 280 days after the woman's last menstrual period.

Signs of impending labor Signs and symptoms that labor is about to start may occur from a few hours to a few weeks before the actual onset of labor.

1- Braxton Hicks Contractions:

- Braxton Hicks contractions are irregular contractions that begin during early pregnancy and intensify as full term approaches.
- They often become regular and uncomfortable, leading many women to believe that labor has started
- Although Braxton Hicks contractions are often called “false” labor, they play a part in preparing the cervix to dilate and in adjusting the fetal position within the uterus.

2- Lightening and Increased Vaginal Discharge :

- “Lightening” occurs when the fetus settles into the pelvic inlet and the fundus no longer presses on the diaphragm.
- The woman may feel increased pelvic pressure and have increased vaginal secretions.
- Fetal pressure causes an increase in clear and nonirritating vaginal secretions.
- Irritation or itching with the increased secretions is not normal and should be reported to the health care provider because these symptoms are characteristic of infection.

3- Cervical Changes The cervix,:

which is rigid and firm during pregnancy, becomes soft and significantly shortened as labor progresses.

The cervix may open 1 to 2 cm.

4- Bloody Show As the time for birth approaches, the cervix undergoes changes in preparation for labor.

1. It softens (“ripens”),
2. effaces,
3. and dilates slightly.

When this occurs, the mucous plug that has sealed the uterus during pregnancy is dislodged from the cervix, tearing small capillaries in the process.

- **Bloody show is thick mucus mixed with pink or dark brown blood.**
- It may begin a few days before labor, or a woman may not have bloody show until labor is under way.
- Bloody show may also occur if the woman has had a recent vaginal examination or intercourse.

5- Rupture of the Membranes:

The amniotic sac (bag of waters) sometimes ruptures before labor begins.

- **Infection is more** likely if many hours elapse between rupture of the membranes and birth because the amniotic sac seals the uterine cavity against organisms from the vagina.
- In addition, **the fetal umbilical cord may slip down and become compressed between the mother's pelvis and the fetal presenting part.**

For these two reasons, women should go to the birth facility when their membranes rupture, even if they have no other signs of labor.

6- Energy Spurt :

Many women have a sudden burst of energy shortly before the onset of labor (“nesting”).

The nurse should teach women to conserve their strength, even if they feel unusually energetic.

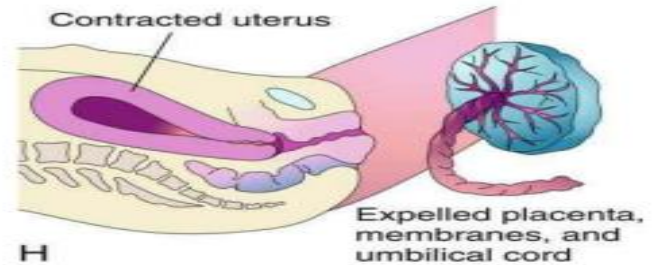
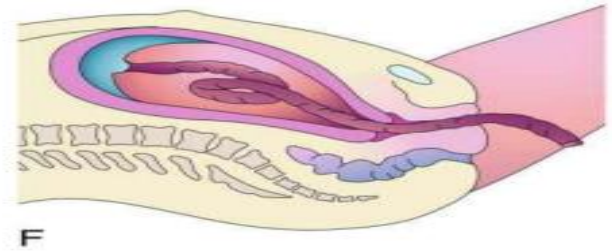
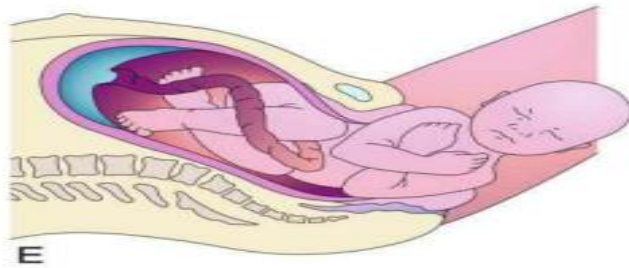
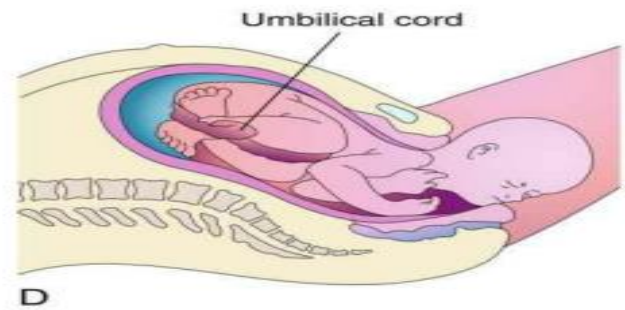
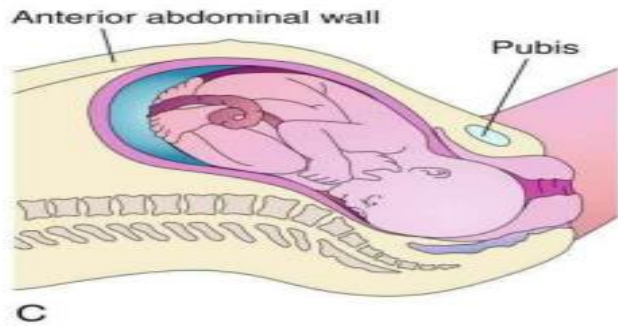
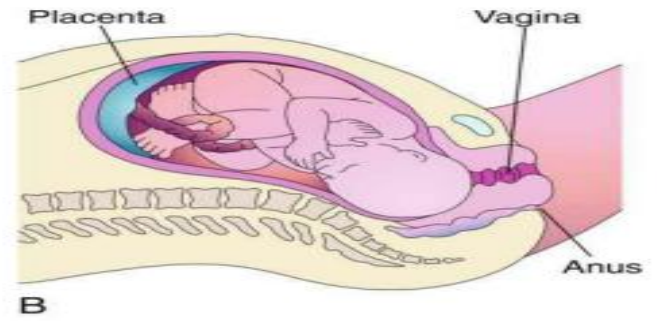
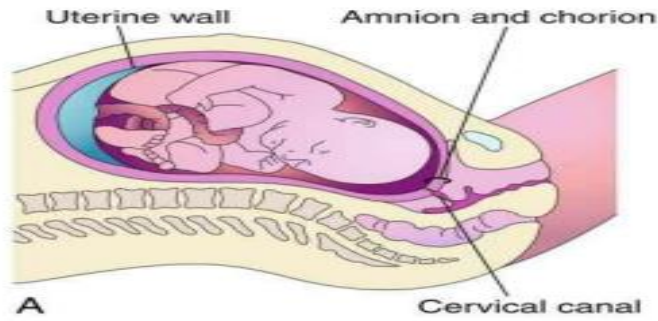
7- Weight Loss :

Occasionally a woman may notice that she loses 1 to 3 lb shortly before labor begins because hormonal changes cause her to excrete extra body water.

Mechanisms of labor :

As the fetus descends into the pelvis, it undergoes several positional changes so that it adapts optimally to the changing pelvic shape and size.

Many of these mechanisms, **also called cardinal movements**, occur simultaneously (Fig. 6.9).



Mechanisms of labor are also called cardinal movements. :

The positional changes allow the fetus to fit through the pelvis with the least resistance.

- (A) Descent, engagement, and flexion.
- (B) Internal rotation.
- (C) Beginning extension.
- (D) Birth of the head by complete extension.
- (E) External rotation, birth of shoulders and body.
- (F) Separation of placenta begins.
- (G) Complete separation of placenta from uterine wall.
- (H) Placenta is expelled and uterus contracts.

Descent:

- **Descent occurs** as each mechanism of labor comes into play.
- **Station describes the** level of the presenting part (usually the head) in the pelvis.
- Station is estimated in centimeters from **the level of the ischial spines** in the mother's pelvis (a 0 [zero] station).
- Minus stations are above the ischial spines, and plus stations are below the ischial spines .
- As the fetus descends, the minus numbers decrease (e.g., - 2, - 1) and the plus numbers increase (e.g., + 1, + 2).

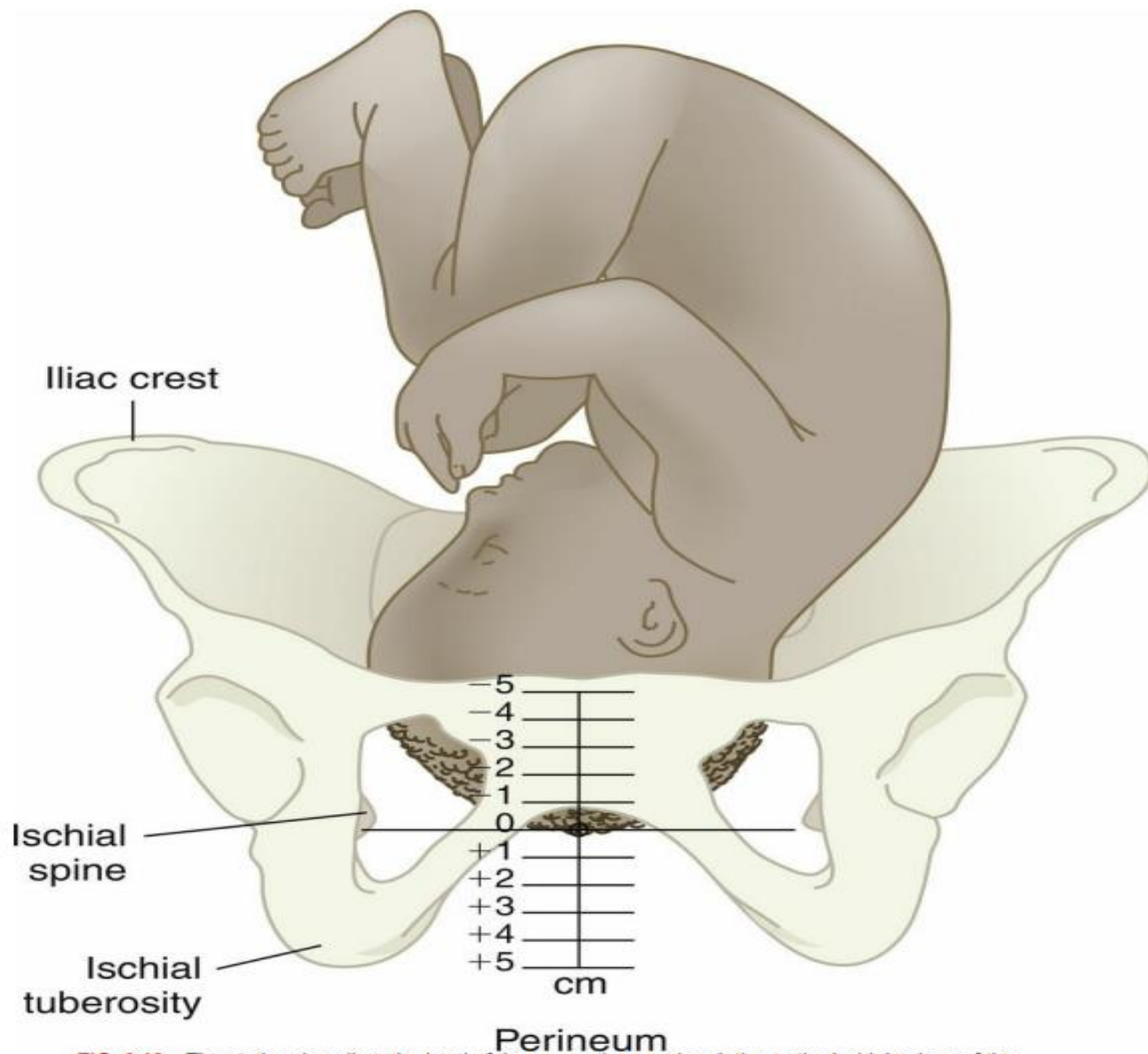


FIG. 6.10 The station describes the level of the presenting part in relation to the ischial spines of the mother's pelvis. The "minus" stations are above the ischial spines, and the "plus" stations are below the ischial spines. (From Matteson PS: *Women's health during the childbearing years: a community-based approach*, St. Louis, 2001, Mosby.)

Engagement :

- Engagement occurs when the presenting part (usually the biparietal diameter of the fetal head) reaches the level of the ischial spines of the mother's pelvis (presenting part is at 0 station or lower).
- Engagement often occurs before the onset of labor in a woman who has not previously given birth (a nullipara);
- if the woman has had previous vaginal births (a multipara), engagement may not occur until well after labor begins.

Flexion:

The fetal head should be flexed to pass most easily through the pelvis.

As labor progresses, uterine contractions increase the amount of fetal head flexion until the fetal chin is on the chest.

Internal Rotation :

When the fetus enters the pelvis head first, the head is usually oriented so that the occiput is toward the mother's right or left side.

As the fetus is pushed downward by contractions, the curved, cylindrical shape of the pelvis causes the fetal head to turn until the occiput is directly under the symphysis pubis (occiput anterior [OA]).

Extension:

As the fetal head passes under the mother's symphysis pubis, it must change from flexion to extension so that it can properly negotiate the curve.

To do this, the fetal neck stops under the symphysis, which acts as a pivot.

The head swings anteriorly as it extends with each maternal push until it is born.

External Rotation :

When the head is born in extension, the shoulders are crosswise in the pelvis and the head is twisted in relation to the shoulders.

The head spontaneously turns to one side as it realigns with the shoulders (restitution).

The shoulders then rotate within the pelvis until their transverse diameter is aligned with the mother's anteroposterior pelvis.

The head turns farther to the side as the shoulders rotate within the pelvis.

Expulsion:

The anterior shoulder followed by the posterior shoulder are born, quickly followed by the rest of the body.

During late pregnancy the woman should be instructed about when to go to the hospital or birth center. :

- **Contractions:** The woman should go to the hospital or birth center when the contractions have a pattern of increasing frequency, duration, and intensity. The woman having her first child is usually advised to enter the facility when contractions have been regular (every 5 minutes) for 1 hour.

Women having second or later children should go sooner, when regular contractions are 10 minutes apart for a period of 1 hour.

- **Ruptured membranes:** The woman should go to the facility if her membranes rupture or if she thinks they may have ruptured.

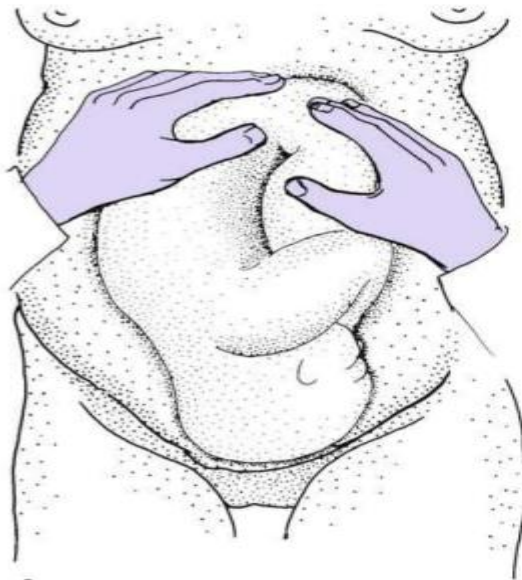
- **Bleeding other than bloody show:** Bloody show is a mixture of blood and thick mucus.

Active bleeding is free flowing, bright red, and not mixed with thick mucus.

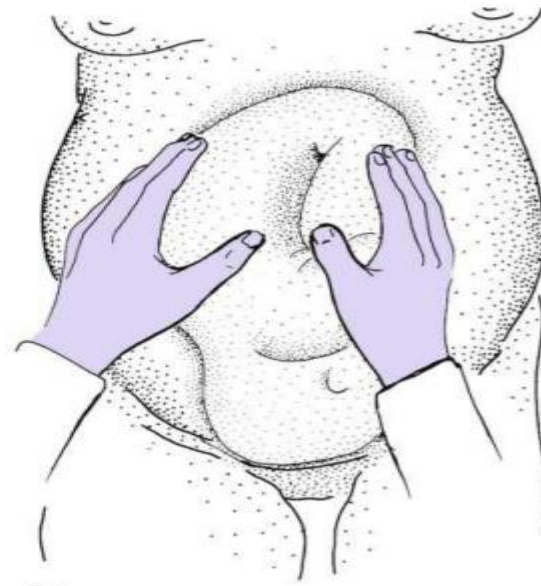
- **Decreased fetal movement:** The woman should be evaluated if the fetus is moving less than usual.

Many fetuses become quiet shortly before labor, but decreased fetal activity can also be a sign of fetal compromise or fetal demise.

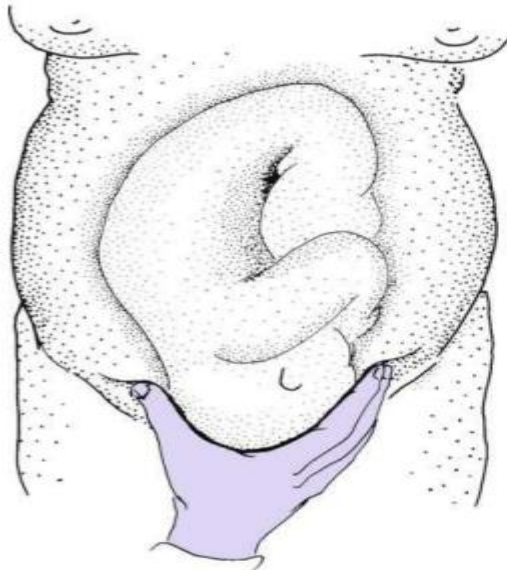
- **Determining fetal position and presentation** The nurse may assist the health care provider in determining the fetal position and presentation **by abdominal palpations called Leopold's maneuver** (Fig. 6.11).
- Sometimes performance of this technique at the time of admission shows a previously unidentified multifetal pregnancy.
- **Leopold's maneuver is also helpful in locating the fetal back, which is the best location for hearing the FHR, and thus determining optimal placement of the fetal monitor sensor.**



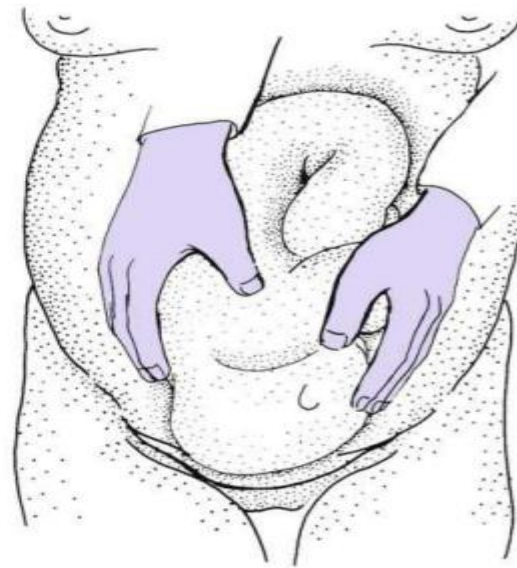
A First palpation



B Second palpation



C Third palpation



D Fourth palpation

Nursing care of the woman in false labor True labor is characterized by changes in the cervix (effacement and dilation), which is the key distinction between true and false labor. Table 6.2 lists other characteristics of true and false labor.

Table 6.2

Comparison of False Labor and True Labor

False labor (prodromal labor or prelabor)	True labor
Contractions are irregular or do not increase in frequency, duration, and intensity.	Contractions gradually develop a regular pattern and become more frequent, longer, and more intense.
Walking tends to relieve or decrease contractions.	Contractions become stronger and more effective with walking.
Discomfort is felt in the abdomen and groin.	Discomfort is felt in the lower back and the lower abdomen; often feels like menstrual cramps at first.
Bloody show is usually not present.	Bloody show is often present, especially in women having their first child.
There is no change in effacement or dilation of the cervix.	Progressive effacement and dilation of the cervix occur.

- A better term for false labor might be prodromal labor because these contractions help prepare the woman's body and the fetus for true labor.
- Many women are observed for a short time (1 to 2 hours) if their initial assessment suggests that they are not in true labor and their membranes are intact.
- The mother and fetus are assessed during observation as if labor were occurring. Most facilities run an external electronic fetal monitor strip for at least 20 minutes to document fetal wellbeing.
- The woman can usually walk .
- If she is in true labor, walking often helps to intensify the contractions and bring about cervical effacement and dilation.
- After the observation period, the health care provider, who performs another vaginal examination, reevaluates the woman's labor status.
- If there is no change in the cervical effacement or dilation, the woman is usually sent home to await true labor.
- Sometimes the woman in very early labor is sent home if it is her first child and she lives nearby because the latent phase of most first labors is quite long.

- Each woman in false labor (or early latent-phase labor) is evaluated individually.
- Factors to be considered include the number and the duration of previous labors, distance from the facility, and availability of transportation.
- If the woman's membranes are ruptured, she is usually admitted even if labor has not begun because of the risk for infection or a prolapsed umbilical cord .
- The woman in false labor is often frustrated and needs generous reassurance that her symptoms will eventually change to true labor.

Nursing care before birth After admission to the labor unit, nursing care consists of the following elements:

- Monitoring the fetus
 - Monitoring the laboring woman
 - Helping the woman cope with labor
- Monitoring the fetus Intrapartum care of the fetus includes assessment of FHR patterns and the amniotic fluid.
- several observations of the mother's status, such as vital signs and contraction pattern, are closely related to fetal well-being because they influence fetal oxygen supply.
 - **Fetal Heart Rate** The goal of fetal monitoring is to enable early detection of fetal hypoxia, which can have many causes, and to allow prompt interventions that will avoid fetal injury.
 - The FHR can be assessed by intermittent auscultation, by using a fetoscope or Doppler transducer, or by continuous electronic fetal monitoring (EFM).
 - EFM is more widely used in the United States, but intermittent auscultation is a valid method of intrapartum fetal assessment when performed according to established intervals and with a 1:1 nurse–patient ratio.

Skill 6.2

Determining Fetal Heart Rate



Purpose

To assess and document the fetal heart rate (FHR)

Steps

1. Determine best location for assessing FHR.
2. Identify where the clearest fetal heart sounds will most likely be found, over the fetal back and usually in the mother's lower abdomen (see Fig. 6.12).

3. Assess fetal heart rate using one of the following methods:

Fetoscope

- a. Place the head attachment (if there is one) over your head and the earpieces in your ears.
- b. Place the bell in the approximate area of the fetal back and press firmly while listening for the muffled fetal heart sounds. When they are heard, count the rate in 6-second increments for at least 1 minute.
- c. Multiply the low and high numbers by 10 to compute the average range of the rate (for example, 130 to 140 beats/min).
- d. Assess rate before and after at least one full contraction cycle.
- e. Check the mother's pulse rate at the same time if uncertain whether the fetal heart sounds are being heard; the rates and rhythms will be different.

Doppler Transducer

External Fetal Monitor

4. Report the following:

- a. Promptly report rates below 110 beats/min or above 160 beats/min for a full-term fetus.
- b. Report slowing of the rate that lingers after the end of a contraction.
- c. Report a lack of variability in FHR.

5. Chart the rate. The guidelines for a normal FHR at term are as follows:

- Lower limit of 110 beats/min
- Upper limit of 160 beats/min

When to Auscultate and Document the Fetal Heart Rate Use these guidelines for charting the fetal heart rate when the woman has intermittent auscultation or continuous electronic fetal monitoring.

1- Low-risk women (no risk factor identified) Every hour in the latent phase Every 30 minutes in the active phase Every 15 minutes in the second stage

2- High-risk women (a risk factor is identified) Every 30 minutes in the latent phase Every 15 minutes in the active phase Every 5 minutes in the second stage, before and after contractions .

3- Routine auscultations When the membranes rupture (spontaneously or artificially) Before and after ambulation

4- Before and after medication or anesthesia administration or a change in medication

5- At the time of peak action of analgesic drugs

6- After a vaginal examination

7- After the expulsion of an enema

8-After catheterization If uterine contractions are abnormal or excessive

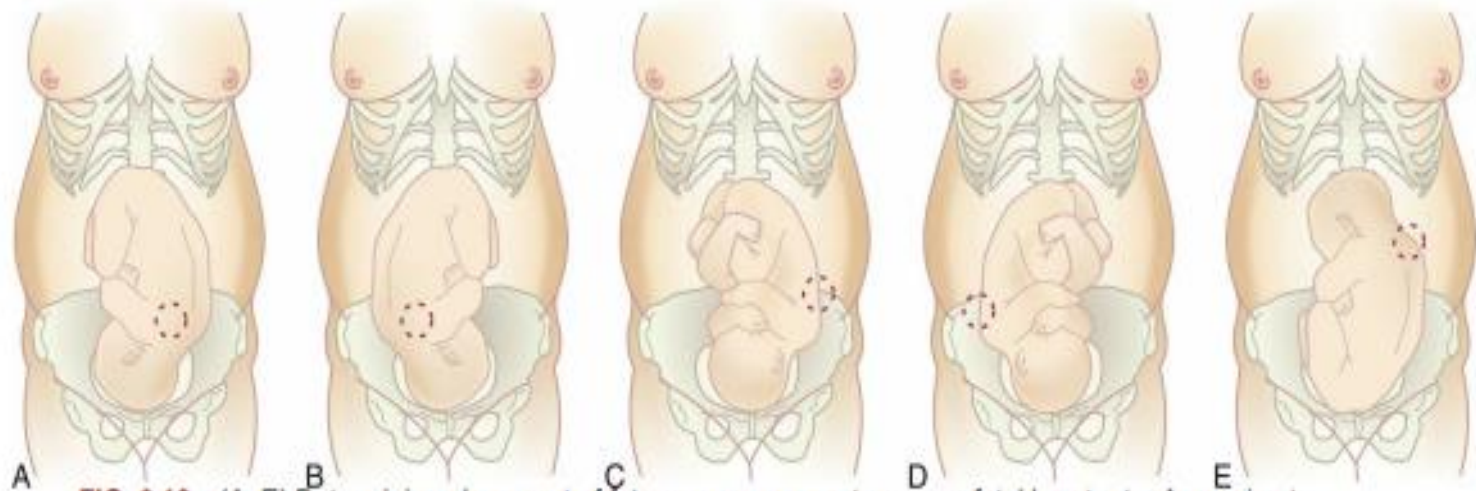
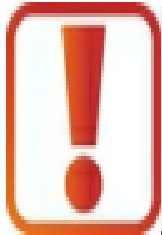


FIG. 6.12 (A–E) Determining placement of fetoscope or sensor to assess fetal heart rate. Approximate the location of the strongest fetal heart sound when the fetus is in various positions and presentations. The fetal heart sounds are heard best in the lower abdomen in a cephalic (vertex) presentation and higher on the abdomen when the fetus is in a breech presentation (E). (A) Left occipitoanterior (LOA); (B) right occipitoanterior (ROA); (C) left occipitoposterior (LOP); (D) right occipitoposterior (ROP); (E) left sacrum anterior (LSA). (From Matteson PS: *Women's health during the childbearing years: a community-based approach*. St. Louis, 2004, Mosby.)



Safety Alert!

Standard FHR monitoring is every 30 minutes in the active phase of the first stage of labor and every 15 minutes in the second stage. If any risk factor is present, FHR monitoring is every 15 minutes in the active first stage and every 5 minutes in the second stage.

Skill 6.3

External Electronic Fetal Monitoring



Purpose

To monitor the fetal heart rate continuously

Steps

1. Turn on the fetal monitoring device per hospital protocol.
2. Apply and secure the sensors on the mother's abdomen.
 - a. Place one sensor over the fundus of the uterus to record uterine contractions.
 - b. Place one sensor over the location of the strongest fetal heart sound to record the FHR.



This woman has twins and requires two fetal heart sensors. (Courtesy Pat Spier, RN-C.)

Evaluating fetal heart rate patterns

Periodic changes are transient and brief changes in the FHR that are associated with uterine contractions such as accelerations and decelerations.

1-The baseline FHR should be 110 to 160 beats/min for at least a 2-minute period.

2-Fetal bradycardia occurs when the FHR is less than 110 beats/min for 10 minutes or longer.

1. Causes of fetal bradycardia can include fetal hypoxia,
2. maternal hypoglycemia,
3. maternal hypotension, or
4. prolonged umbilical cord compression.

When bradycardia is accompanied by a loss of baseline variability or by late decelerations,

immediate intervention is required for a favorable outcome.

3- Fetal tachycardia is a baseline FHR greater than 160 beats/min that lasts 2 to 10 minutes or longer .

It can be caused by maternal fever or maternal dehydration.

When fetal tachycardia occurs along with loss of baseline variability or with late decelerations, immediate intervention is required.

- Baseline variability describes fluctuation or constant changes in the baseline FHR above and below the baseline in a 10-minute window . Baseline variability is a reflection of an intact central nervous system and cardiac status of the fetus.



FIG. 6.13 Recording of the fetal heart rate (FHR) in the upper grid and the uterine contractions in the lower grid. The sawtooth appearance of the FHR tracing is a result of the constant changes in the rate (variability). NOTE: The space between each dark black line on the strip represents 1 minute. The space between each light black line (i.e., the small squares) represents 10 seconds. (Courtesy Corometrics Medical Systems, Wallingford, CT. Redrawn with permission.)

- Moderate variability, defined as changes of 6 beats/min to 25 beats/min from the baseline FHR, is desirable because it indicates good oxygenation of the central nervous system and fetal well-being.
- Marked variability occurs when there are more than 25 beats of fluctuation over the FHR baseline, and it can indicate cord prolapse or maternal hypotension.
- Absent variability is less than 6 beats/min change from baseline for a 10-minute period and is typically caused by uteroplacental insufficiency but can also be caused by maternal hypotension, cord compression, or fetal hypoxia.

Nursing interventions for marked or absent variability include :

positioning the mother on her side, increasing regular IV fluid flow rate to improve maternal circulation, administering oxygen at 8 to 10 L/min by mask, 300 and notifying the health care provider.

- Episodic changes are changes in the FHR that are not associated with uterine contractions. They are brief and quickly return to baseline.
- Periodic changes are temporary changes in the baseline rate associated with uterine contractions that quickly return to baseline.

Classifications and Interpretation of Fetal Heart Rate and Uterine Activity Patterns :

Normal baseline FHR of 110 to 160 beats/min (term fetus)

Moderate baseline variability No late or variable decelerations or prolonged decelerations.

Absent baseline variability and one of the following:

Recurrent late decelerations or variable decelerations

*Recurrent variable decelerations Fetal bradycardia for 10 minutes (heart rate less than 110 beats/min)

- Tachycardia: FHR greater than 160 beats/min
- Bradycardia: FHR less than 110 beats/min
- Decreased or absent variability: little fluctuation in rate
- Late decelerations: decrease in FHR begins after contraction starts and persists after contraction is over
- Variable decelerations: if FHR abruptly falls to less than 60 beats/min, lasting 60 seconds or more, and the return to baseline is prolonged
 - Abnormal uterine activity: More than five uterine contractions in a 10-minute period; duration more than 90 seconds, with less than 60 seconds relaxation between contractions FHR, Fetal heart rate..

Categories of fetal heart tracings :

- Category 1 Category 3 Category: 2 NOTE: Category 2 and category 3 require close monitoring and prompt intervention.
- Uterine Activity Tachysystole is more than five uterine contractions within 10 minutes, observed over 30 minutes.
- Contractions last more than 90 seconds with less than 60 seconds between contractions.
- Tachysystole must be reported promptly.
- Corrective action, such as oxygen or position change, may be indicated.

Nonreassuring patterns Accelerations:

- Accelerations are temporary, abrupt rate increases of at least 15 beats/min above the baseline FHR that last 15 seconds but less than 2 minutes from onset to return to baseline.
- This pattern suggests a fetus that is well oxygenated and is known as a “reassuring pattern.”
- Accelerations occur with fetal movement and are the basis for interpretation of the non–stress test (NST).
- An acceleration that lasts 2 to 10 minutes is considered a prolonged acceleration. An acceleration that lasts longer than 10 minutes may be considered a baseline FHR change .
- Early decelerations Early decelerations are temporary, gradual rate decreases during contractions no more than 40 beats/min below baseline; the FHR always returns to the baseline rate by the end of the contraction.
- The peak of deceleration occurs at the same time as the peak of the contraction.
- This shows a U shaped pattern that begins early with the uterine contraction and ends near the end of the uterine contraction.
- This is caused by compression of the fetal head and is a reassuring sign of fetal wellbeing.

Variable decelerations

- Variable decelerations are abrupt decreases of 15 beats/min below baseline, lasting 15 seconds to 2 minutes.
- They do not always exhibit a consistent pattern in relation to contractions.
- **Variable decelerations suggest that the umbilical cord is being compressed, often because it is around the fetal neck (nuchal cord) or because there is inadequate amniotic fluid to cushion the cord.**
- It is not associated with fetal hypoxia but is associated with fetal respiratory acidosis.
- Variable decelerations are further classified as follows:
 1. Mild: Deceleration less than 30 seconds and less than 80 beats/min below baseline
 2. Moderate: Deceleration more than 80 beats/min below baseline.
 3. Severe: Deceleration more than 70 beats/min below baseline for more than 60 seconds



FIG. 6.14 Variable decelerations, showing their typically abrupt onset and offset. They are caused by umbilical cord compression. The first response to this pattern is to reposition the mother to relieve pressure on the cord. (Courtesy Corometrics Medical Systems, Wallingford, CT. Redrawn with permission.)

Late decelerations:

- Late decelerations of the FHR look similar to early decelerations except that they begin after the beginning of the contraction and do not return to the baseline FHR until after the contraction ends.
- Late decelerations suggest that the placenta is not delivering enough oxygen to the fetus (uteroplacental insufficiency).
- This is known as a “nonreassuring pattern.” Late decelerations less than 15 beats/min below baseline are a central nervous system response to fetal hypoxia.
- The occurrence of late decelerations more than 45 beats/min below baseline may be a result of placental aging (postmaturity) or fetal heart depression, and this is an ominous sign.
- Late decelerations that are accompanied by decreased variability and absent accelerations are nonreassuring and require immediate intervention by the health care provider.

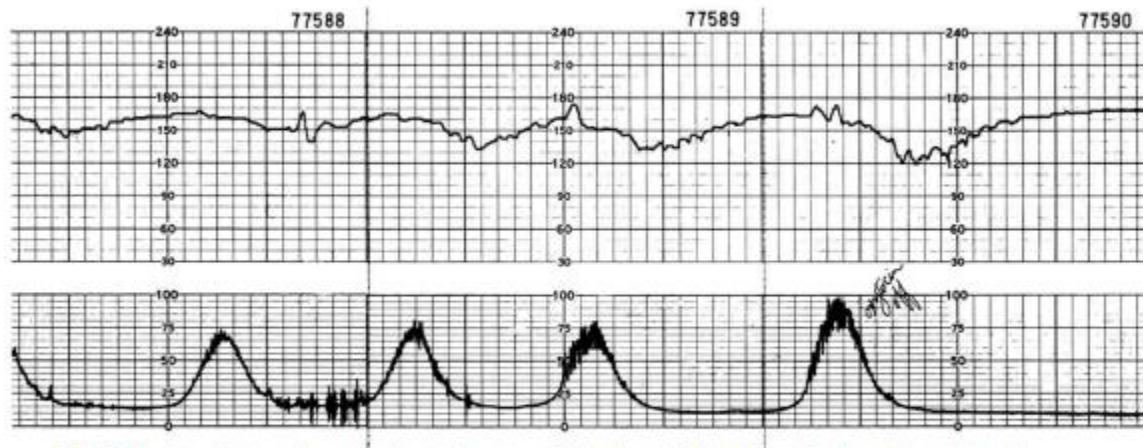


FIG. 6.15 Late decelerations, showing their pattern of slowing, which persists after the contraction ends. The usual cause is reduced blood flow from the placenta (uteroplacental insufficiency). Measures to correct this include repositioning the woman, giving oxygen, increasing nonmedicated intravenous fluid and stopping administration of oxytocin if it is being given, and administering drugs to reduce uterine contractions. (Courtesy Corometrics Medical Systems, Wallingford, CT. Redrawn with permission.)

Prolonged decelerations

- Prolonged decelerations are abrupt FHR decreases of at least 15 beats/min from baseline that last longer than 60 seconds.
- **This is caused by an interruption of oxygen supply to the fetus, possibly caused by cord compression or prolapse, maternal supine hypotension, or regional anesthesia.**
- A prolonged deceleration that lasts longer than 10 minutes may be considered a change in the baseline rate.
- Recurrent decelerations Recurrent decelerations are decelerations that occur in more than 50% of uterine contractions in a 20- minute period.
- Intermittent decelerations Intermittent decelerations are decelerations that occur in less than 50% of uterine contractions within a 20-minute period.

Sinusoidal pattern

- Sinusoidal pattern is a specific FHR pattern that has a smooth, wavelike appearance or undulating pattern that recurs every 3 to 5 minutes and persists for 20 minutes or more.
- **It may be caused by fetal response to medication provided to the mother in labor such as meperidine (Demerol) or butorphanol (Stadol) or fetal anemia .**

Nursing response to monitor patterns of FHR changes :

1. Changing the mother's position can relieve pressure on the umbilical cord and can improve blood flow through it.
2. The woman is turned to her left side.
3. Other positions, such as the knee-chest or a slight Trendelenburg (headdown) position, may be tried if the side-lying position does not restore the pattern to a reassuring one.

Table 6.3

Fetal Heart Rate Categories and Nursing Care

Category	Fetal heart rate tracings	Nursing responsibilities
I	Normal baseline rate and variability (no late decelerations)	Provide routine labor care.
II	Variable (other than listed in Category I)	Provide close observation and documentation.
III	Abnormal (e.g., absent baseline variability, recurrent late decelerations)	Prompt interventions are indicated to have a positive outcome for the woman and fetus.

The purpose of FHR monitoring is :

- to assess the adequacy of oxygenation and uterine activity during labor to avoid hypoxic injury to the fetus.
- FHR patterns are not diagnostic, as they have many possible causes, but instead are used to detect possible identifiable complications that may be causing interruptions in fetal oxygen supply.

That places the FHR pattern in Category 2, where corrective actions can be taken to restore oxygenation to the fetus such as the following:

- Implement position changes to relieve the pressure on the fetal umbilical cord (knee-chest position) or pressure on the inferior vena cava (left-lateral position)
- Administer oxygen via facemask at 10 L/min for 30 minutes to increase fetal oxygenation
- Administer IV fluids such as a saline solution to improve cardiac output, circulatory volume, and uteroplacental perfusion.

The nurse should observe for fluid volume overload and pulmonary edema.

- Correct hypotension, which is often caused by dehydration or response to analgesic drugs.
- Implement measures to reduce uterine activity.

Excess uterine activity (tachysystole) is more than five contractions in 10 minutes, averaged over 30 minutes (the normal is five contractions or fewer in 10 minutes).

Discontinuing oxytocin or administering tocolytic drugs that decrease uterine activity may be prescribed by the health care provider.

- Implement amnioinfusion, which involves instilling a saline infusion by catheter into the uterine cavity to restore amniotic fluid volume to relieve umbilical cord compression that can interrupt fetal oxygenation.

** Use altered pushing and breathing techniques in the second stage of labor, as follows:

- Changing from Valsalva (holding the breath and pushing) to open glottis pushing
- Fewer pushing efforts during contractions
- Pushing with every other contraction
- Pushing only with the urge to push

- **Inspection of Amniotic Fluid** The membranes may rupture spontaneously, or the health care provider may rupture them artificially in a procedure called an **amniotomy**.
- The color, odor, and amount of fluid are recorded.
- The normal color of amniotic fluid is clear, possibly with flecks of white vernix (fetal skin protectant).
- The amount of amniotic fluid is usually estimated as scant (only a trickle), moderate (about 500 mL), or large (1000 mL or more).
- Green-stained fluid may indicate the fetus has passed meconium (the first stool) before birth, a situation associated with fetal compromise that can cause respiratory problems at birth.
- Cloudy or yellow amniotic fluid with an offensive odor may indicate an infection and should be reported immediately.
- The FHR should be assessed for at least 1 full minute after the membranes rupture and must be recorded and reported.
- **Marked slowing of the rate or variable decelerations suggests** that the fetal umbilical cord may have descended with the fluid gush and is being compressed.

A nitrazine test or fern test may be performed if it is unclear whether the mother's membranes have ruptured.

Nitrazine paper is a pH paper; alkaline amniotic fluid turns it dark blue-green or dark blue.

In the fern test, a sample of amniotic fluid is spread on a microscope slide and allowed to dry.

It is then viewed under the microscope; the crystals in the fluid look like tiny fern leaves

Purpose To determine the presence of amniotic fluid in vaginal secretions :

1. Place piece of nitrazine paper into fluid from vagina.
2. Read the color on the strip of paper.

A blue-green or deep blue color of the nitrazine paper indicates the fluid is alkaline and most likely amniotic fluid.

b. A yellow to yellow-green color of the strip paper indicates the fluid is acidic and is most likely urine.

3. Document and report results; offer and provide perineal care; remove gloves and wash hands.
4. Document the presence of bloody show, which may alter the accuracy of the results.

Monitoring the woman Intrapartum care of the woman includes :

1. **assessing** her vital signs, contractions, progress of labor, intake and output, and responses to labor.
2. **Vital Signs** The temperature is checked every 4 hours, or every 2 hours if it is elevated or if the membranes have ruptured (frequency varies among facilities).
3. A temperature of 38°C (100.4°F) or higher should be reported.
4. If the temperature is elevated, the amniotic fluid is assessed for signs of infection. IV antibiotics are usually given to a woman who has a fever because of the risk that the infant will acquire group B streptococcus infection.
5. The pulse, blood pressure, and respirations are assessed every hour.
6. Maternal hypotension (particularly if the systolic pressure is less than 90 mm Hg) or hypertension (greater than 140/90 mm Hg) can reduce blood flow to the placenta.

Contractions:

1. Contractions can be assessed by palpation or by continuous EFM.
2. Some women have sensitive abdominal skin, especially around the umbilicus. When palpation is used to evaluate contractions, the entire hand is placed lightly on the uterine fundus .
3. Normal contractions are fewer than five in a 10-minute period for 30 minutes.



FIG. 6.16 The nurse helps the mother maintain control and use breathing techniques during active labor. The use of an electronic monitor for fetal heart rate and contractions is *not* a substitute for personal hands-on care during labor. Note that the nurse places the entire hand on the fundus to determine the intensity of the contraction. (Courtesy Pat Spier, RN-C.)

Describing Uterine Activity

Uterine activity	Description
Normal	Five contractions within 10 minutes averaged over 30-minute period
Tachysystole (increased uterine activity)	More than five contractions within 10 minutes averaged over 30 minutes

NOTE: Relate the uterine contractions to the occurrence of fetal heart rate decelerations or loss of variability and account for frequency, intensity, duration, and relaxation time of the uterine contraction.

Data from Gabbe S, et al: *Obstetrics: normal and problem pregnancies*, ed 7, St. Louis, 2017, Elsevier; ACOG: *Management of intrapartum FHR tracings: practice bulletin #116*, Washington, DC, 2010, American College of Obstetricians and Gynecologists; Miller A: Intrapartal fetal evaluation. In Gabbe S, et al: *Obstetrics: normal and problem pregnancies*, ed 7, St. Louis, 2017, Elsevier.

Response to Labor:

- The nurse assesses the woman's response to labor, including her use of breathing and relaxation techniques, and supports adaptive responses.
- Nonverbal behaviors that suggest difficulty coping with labor include a tense body posture and thrashing in bed.
- The health care provider is notified if the woman requests added pain relief, such as epidural analgesia.

- **Safety Alert!**
- **Signs that suggest rapid progress of labor are promptly addressed.: Bloody show may increase markedly, and the perineum may bulge as the fetal head stretches it.**

- **Physiological Changes in Labor and Nursing Interventions**

System	Physiology	Clinical symptoms	Nursing interventions
Cardiovascular	Uterine contractions release 400 mL of blood into vascular system, causing increase in cardiac output	BP increases by 10 mm Hg; pulse rate slows	Assess BP between contractions
			Assess level of consciousness
	Ascending vena cava and descending aorta are compressed by weight of uterus	Supine hypotension can occur	Have the woman avoid lying on back Encourage left side-lying position
	Holding the breath and forceful pushing increase intrathoracic pressure and reduce venous return and can cause fetal hypoxia	Forceful rather than spontaneous pushing (Valsalva maneuver) causes redness of face, increase in blood pressure, slowing of pulse rate	Encourage open glottis pushing and discourage forceful pushing during second stage
	WBC count increases to 25,000/mm ³	Increase in WBC count is not related to infection	Correct interpretation of laboratory results intrapartum and postpartum is important
	Alterations in FHR and rhythm may occur in response to contraction patterns	Normal FHR is 110–160 beats/min	Monitor FHR frequently; time frequency and duration of contractions
Respiratory	Increased physical activity of labor increases oxygen consumption	Respiratory rate increases	Encourage relaxation between contractions
	Anxiety can also increase oxygen consumption		
	Paced breathing techniques can prevent development of respiratory alkalosis	Tingling of hands and feet, dizziness, or numbness may indicate hyperventilation, which can cause respiratory alkalosis	Coach the laboring woman in breathing techniques
Renal (kidneys)	Breakdown in muscle tissue resulting from work of labor can cause proteinuria	Palpate above symphysis pubis to detect full bladder	Encourage voiding every 2 hours
			Catheterize if bladder is distended and if the woman is unable to void
	Full bladder can be obstructed by full uterus and fetal head	Spontaneous voiding may occur during contractions	Do not confuse spontaneous urination with rupture of bag of waters
			Nitrazine paper can detect whether fluid discharge is urine or amniotic fluid
Musculoskeletal	Muscle activity increases during labor	Observe for diaphoresis, fatigue, increased temperature	Encourage rest between contractions; use comfort measures for diaphoresis and positioning for back and joint pain
	Increased joint laxity can cause backaches		

	increased joint laxity can cause backaches		
Neurological	Euphoria changes to self-centeredness as labor progresses	Behavior of woman may change during each stage of labor	Provide support and acceptance of behavior; allow sleep whenever possible; provide for safety and privacy
	Amnesia during second stage is common, and fatigue and elation occur in third and fourth stages		
	Endorphins produce natural general sedation, whereas ischemia of perineal tissues by pressure of presenting part causes decrease in perception of perineal pain		
GI	Mouth breathing during labor dries the lips and tongue	Dry lips and mouth may be noted	Assess for signs of dehydration
	GI motility is decreased during labor	Nausea and vomiting of undigested food may occur	Use ice chips to moisten lips and tongue during active labor
			Do not allow food or drink during active labor
			Rectal pressure and urge to defecate may indicate imminent delivery
Endocrine	Estrogen increases and progesterone decreases	Close monitoring of the woman with diabetes (including blood glucose levels) during labor is essential	Encourage rest whenever possible between contractions and during fourth stage
	Metabolism increases during labor; work of labor may decrease glucose levels		
Blood	Increased blood volume during pregnancy enables 500-mL blood loss during delivery without problems unless the woman is anemic	Decrease in BP and increase in pulse rate should be reported	Monitor vital signs during labor and delivery
	Increased levels of fibrinogen and other clotting factors during pregnancy prevent hemorrhage during delivery but increase risk for thrombosis	If possible, avoid prolonged use of stirrups to support legs during delivery	
	Increased fetal hemoglobin level enables fetus to carry increased level of oxygen during labor	Contractions that exceed 90 seconds should be reported to health care provider	Monitor contraction patterns and FHR closely during labor
	Placental exchange of oxygen and waste occurs between contractions		

BP, Blood pressure; FHR, fetal heart rate; GI, gastrointestinal; WBC, white blood cell.

- **Helping the woman cope with labor :**
- Coping is a dynamic process in which emotions and stress affect and influence each other; coping changes the relationship between the individual and the environment. Adjustment is the outcome of coping at a specific point in time.
- The nurse must understand the physiology of the normal process of labor to recognize abnormalities.
- The nurse collects, records, and interprets data during labor, such as FHR responses to uterine contractions, maternal physical responses (e.g., vital signs and duration of contractions), and psychological responses (e.g., anxiety and tension).
- The nurse also maintains open communication with the health care provider and provides general hygiene and comfort measures for the woman according to the needs presented.
- In addition to consistent assessment of the fetal and maternal conditions, the nurse helps the woman to cope with labor by comforting, positioning, teaching, and encouraging her .
- Another aspect of intrapartum nursing is care of the woman's partner.

Childbirth is a normal and natural process, but today, with modern medicine and technology, few women in the hospital setting give birth without some intervention. These routine interventions include:

limited oral intake,
IV fluids, bed rest, external or internal fetal monitoring, separation of mother and infant immediately after birth, and elective cesarean sections.

The Lamaze Institute for normal birth recommends six basic principles to use **as a guide for maternity care whenever possible:**

1. Labor should begin on its own.
2. The woman should have freedom of movement.
3. The woman should have a birth support person or doula.
4. No interventions should be performed simply because they are routine.
5. The woman should be in nonsupine positions.
6. The woman should not be separated from the infant.

The nurse should provide continuous labor support in a hands-on, in-person manner rather than rely on monitors viewed from outside the labor room.

- **Labor Support:**

- The environment of the labor room can be controlled by having the woman listen to familiar music brought from home, which can produce a calming effect. Maintaining an upright position during labor can shorten the first stage.
- The recommended positions of comfort for the laboring woman include sitting upright on a rocking chair or birthing ball, which uses the natural force of gravity to promote fetal descent.
- The “towel-pull” involves the woman pulling on a towel that is secured to the foot of the bed during contractions, which uses the abdominal muscles and aids in expulsion efforts.
- The lateral Sims position encourages rest and helps prevent pressure on the sacrum.

- **Body support:**
- can be provided by use of pillows to prevent back strain.
- This position can also be used to facilitate anterior rotation of the fetus when the woman lies on the side of the fetal spine.
- The “lunge,” in which the mother places her foot on a chair and turns that leg outward, helps the femur press on the ischium to increase pelvic space and facilitates rotation of the fetus that is in occiput posterior (OP) position.
- The lunge is held for 3 seconds and repeated.
- Squatting during a contraction increases the diameter of the pelvis, facilitating fetal rotation and descent .
- In addition to controlling the environment, nonpharmacological pain relief techniques such as touch, effleurage, massage, back pressure, application of heat or cold, and various relaxation techniques are effective means of labor support. Walking or resting during labor is based on the woman’s preference for comfort .
- When IV fluids are administered, 5% dextrose has been shown to shorten labor compared with saline .
- Emotional support, encouragement, communication concerning progress, and promoting positive thoughts are also essential.

Teaching:

- Teaching the laboring woman and her partner is an ongoing task of the intrapartum nurse. Even women who attended prepared childbirth classes often find that the measures they learned are inadequate or need adaptation.
- Positions or breathing techniques different from those learned in class can be tried.
- A woman should usually try a change in technique or position for two or three contractions before abandoning it.
- Many women are discouraged when their cervix is about 5 cm dilated because it has taken many hours to reach that point.
- They think they are only halfway through labor (full dilation is 10 cm);
- however, a 5-cm dilation signifies that about two thirds of the labor is completed, as the rate of progress increases.
- Laboring women often need support and reassurance to overcome their discouragement at this point.

- The nurse must often help the woman to avoid pushing before her cervix is fully dilated.
- She can be taught to blow out in short puffs when the urge to push is strong before the cervix is fully dilated.
- Pushing before full dilation can cause maternal exhaustion and fetal hypoxia, thus slowing progress rather than speeding it.
- When the cervix is fully dilated, stage 2 of labor begins, and the nurse teaches or supports effective pushing techniques.
- If the woman is pushing effectively and the fetus is tolerating labor well, the nurse should not interfere with her efforts.
- The woman takes a deep breath and exhales at the beginning of a contraction.
- She then takes another deep breath and pushes with her abdominal muscles while exhaling.
- Prolonged breath holding while pushing can impair fetal blood circulation (Valsalva maneuver).
- The woman should push for about 4 to 6 seconds at a time.
- If she is in a semisitting position in bed, she should pull back on her knees, with her hands behind her thighs, or use the handholds on the bed.

Laboring Down

The term laboring down describes an intervention during the second stage of labor that allows passive fetal descent before active pushing is encouraged.

Laboring down is a nursing intervention often practiced in privately insured facilities for women with induced labors or epidural anesthesia for the purpose of increasing the likelihood of vaginal delivery.

Studies have shown that it may possibly increase the length of the second stage of labor .

Providing Encouragement Encouragement is a powerful tool for intrapartum nursing care because it helps the woman to summon inner strength and gives her courage to continue.

After each vaginal examination, she is told of the progress in cervical change or fetal descent.

Liberal praise is given if she successfully uses techniques to cope with labor.

Her partner needs encouragement as well, as labor coaching is a demanding job. Some women may use a doula, a person whose only job is to support and encourage the woman in the task of giving birth .

Patient Teaching Teaching the Father or Partner What to Expect

The father or partner should be taught the following:

- How labor pains affect the woman's behavior and attitude
- How to adapt responses to the woman's behavior
- What to expect in his or her own emotional responses as the woman becomes introverted or negative
- Effects of epidural analgesia

- **Stages and phases of labor** Women giving birth display common physical and behavioral characteristics in each of the four stages of labor.
- Women who receive an epidural analgesic during labor may not exhibit the behaviors and sensations associated with each stage and phase.
- The nurse must also realize that women are individuals and that each responds to labor in her own way.

- **Nursing care during birth There is no exact time when the woman should be prepared for delivery.**
- *the woman having her first child is prepared for delivery when about 3 to 4 cm of the fetal head is visible (crowning) at the vaginal opening.
- The multiparous woman is usually prepared when her cervix is fully dilated but before crowning has occurred.
- If the woman must be transferred to a delivery room rather than giving birth in a LDR room, she should be moved early enough to avoid a lastminute rush.
- If the woman does not have full sensation or movement of the legs because of an epidural anesthetic, padded stirrups may be used, and the woman should be observed closely for excess pressure behind the knees, which can cause thrombophlebitis (blood clot).
- A woman can give birth in many different positions. The “traditional” position—semisitting and using foot supports—improves access to her perineum but may not be the most comfortable for her or the best one to expel the infant.
- She may give birth in a side-lying position, squatting, standing, or in other positions

Nursing responsibilities :

The registered nurse who cares for the woman during labor usually continues to do so during delivery.

Typical delivery responsibilities include the following:

- Preparing the delivery instruments and infant equipment
- Doing the perineal scrub preparation
- Administering drugs to the mother or infant
- Providing initial care to the infant such as suctioning secretions from the airway with a bulb syringe, drying the skin, and placing the infant in a radiant warmer to maintain body heat
- Assessing the infant's Apgar score
- Examining the placenta to be sure it is intact and recording if it was expelled via the Schultze or the Duncan mechanism .

- Any abnormalities of the placenta, cord, or insertion site should be promptly reported, as they may be correlated with fetal anomalies
- The maternal perineum should be examined for lacerations or bleeding.
 - Assessing the infant for obvious abnormalities
 - Making a note if the infant has a stool or urinates
- Identifying the mother and infant with like-numbered identification bands (the father or other support person usually receives a band as well; infant footprints and the mother's fingerprints are often obtained)
 - Promoting parent–infant bonding and initial breastfeeding by encouraging parents to hold and explore the infant while maintaining the infant's body temperature (observe for eye contact, fingertip or palm touch of the infant, and talking to the infant, all of which are associated with initial bonding; these observations continue throughout the postpartum period).

- Preparing the delivery instruments and infant equipment (Fig. 6.20)



FIG. 6.20 The table contains the sterile instruments that the health care provider will use for delivery. The table is kept covered with a sterile sheet in the labor, delivery, and recovery room until it is ready for use.

- Doing the perineal scrub preparation (Fig. 6.21)

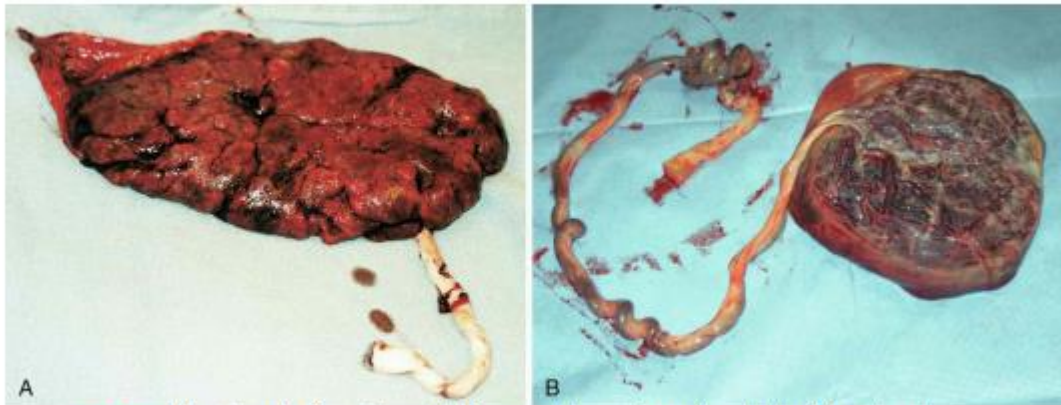


FIG. 6.22 The placenta after delivery. (A) Duncan delivery. The maternal side of the placenta, which is dull and rough, is delivered first. (B) Schultze delivery. The fetal side of the placenta, which is shiny and smooth, is delivered first. (Courtesy Pat Spier, RN-C.)

Immediate postpartum period:

the third and fourth stages of labor:

The third stage of labor is the expulsion of the placenta.

The nurse examines the placenta and monitors the woman's vital signs

The fourth stage of labor is the first 1 to 4 hours after birth of the placenta or until the mother is physiologically stable.

Nursing care during the fourth stage of labor includes the following general care:

- Identifying and preventing hemorrhage
- Evaluating and intervening for pain
- Observing bladder function and urine output
- Evaluating recovery from anesthesia
- Providing initial care to the newborn infant
- Promoting bonding and attachment between the infant and family

The Labor Process and Nursing Interventions

Characteristics	Patient behaviors	Nursing interventions
First Stage—Dilation and Effacement		
Latent Phase (4–6 Hours)		
Cervix dilation is 1–4 cm.	Cooperative	Establish positive relationships.
Amniotic membranes may be intact.	Alert	Encourage alternating ambulation and rest.
There may be “bloody show.”	Talkative	Review breathing and relaxation techniques with coach.
Contractions: every 20 minutes decreasing to every 5 minutes	Welcomes diversions	Assess FHR.
Duration: 15–40 seconds	Frequent urination	Time contractions.
Intensity: mild to moderate	Thirsty	Document color of vaginal discharge.
		Assess for distended bladder.
		Provide opportunity to void.
		May provide lollipops for mother to hold and suck on between contractions for carbohydrate and fluid intake.
		Assess vital signs every 2 hours.
		Woman may take showers.
		Teach what to expect as labor progresses.
Active Phase (2–6 Hours)		
Cervix dilation is 4–7 cm.	Apprehensive	Help coach implement coping strategies learned in prenatal classes (breathing, relaxation).
Amniotic membranes may rupture.	Anxious	Continue maternal and fetal assessments.
Effacement of cervix occurs.	Introverted	Reassure woman.
Contractions: 2–5 minutes apart	Less social	Praise progress.
Duration: 40–60 seconds	Focused on breathing	Provide back massage.
Intensity: moderate to firm	Perspires	Facilitate position changes (avoid lying flat on back).
	Facial flushing	If woman is NPO, moisten mouth.
	Requests pain relief	Maintain communication with health care provider.
	Fears losing control	Monitor IV fluid intake.
	May need epidural analgesia at this time	Watch for bladder distention.
		Encourage voiding.
		Report color, odor, and amount of vaginal discharge; report if meconium is seen.
		Maintain warmth.
		Woman may shower if allowed.
		Provide general comfort measures.
Transition Phase (30 Minutes to 2 Hours)		

Transition Phase (30 Minutes to 2 Hours)		
Cervix dilation is 7-10 cm; cervix fully effaced.	Irritable	Provide firm coaching of breathing and relaxation techniques, focusing.
Amniotic membranes rupture.	Rejects support person	Support coach.
Contractions: every 2-3 minutes	Introverted	Praise and reassure woman.
Duration: 60-90 seconds	Wants to give up	Assess monitor strips of FHR and contractions.
Intensity: firm	Restless	Assess color of vaginal discharge.
	Tremor of legs	Keep woman informed of progress with each contraction.
	Fears losing control	Accept negative comments from woman.
	Requests medication	Maintain positive approach.
Second Stage--Expulsion of Fetus (30 Minutes to 2 Hours)		
Cervix dilation is 10 cm.	Bulging perineum	Assist woman to assume position that helps her push.
Contractions: q1(1/2)-3 minutes	Woman may pass stool	Assist with open glottis pushing technique and coping strategies.
Duration: 60-80 seconds	Uncontrollable urge to push	Support coach.
Intensity: firm	States "baby is coming"	Maintain communication with health care provider.
Episiotomy may be performed by health care provider.	Exhaustion after each contraction	Monitor contractions and FHR every 5 minutes.
Second stage ends with birth of infant.	Unable to follow directions easily	Assess perineum and vaginal discharge.
	Excitement concerning imminent birth	Report bulging or crowning.
		Observe for bladder distention.
		Prepare sterile supplies for delivery.
		Prepare infant resuscitation equipment.
		Provide feedback to woman and partner.
Third Stage--Expulsion of Placenta		
Duration: 5-30 minutes	Elation	Observe and document blood loss.
Contractions: intermittent	Relief	Document delivery of placenta.
Intensity: mild to moderate	Tremors	Examine placenta to determine if all of it was expelled (retained placenta causes hemorrhage because it prevents uterus from contracting).
Umbilical cord is cut.	Increased physical energy	Monitor mother's vital signs every 15 minutes.
Signs of placental separation include the following:	Curiosity about infant	Assess vaginal discharge.
• Lengthening of cord	Desire to nurse infant	Massage uterus until it is firm in midline at or below level of umbilicus.

Characteristics	Patient behaviors	Nursing interventions
• Uterine fundus rises and becomes firm	Pain is minimal as placenta is expelled	Administer oxytocin to mother as ordered.
• Fresh blood expelled from vagina		Obtain cord blood if needed.
Placenta is expelled by Schultz mechanism (shiny fetal side first) or by Duncan mechanism (dull, rough maternal side first) (see Fig. 6.22).		Note parent–infant interaction.
Uterus contracts to size of grapefruit.		Dry newborn and place in radiant warmer.
Episiotomy is sutured by health care provider.		Attach heart and temperature monitor.
		Assess and provide immediate newborn care (see Care of the Newborn Immediately After Delivery).
		Perform Apgar evaluation.
		Apply proper identification to mother, infant, and partner.
Fourth Stage—Recovery		
Uterus remains midline, firmly contracted at or below umbilicus level.	Get-acquainted period between mother, partner, and infant	Provide proper identification of mother, partner, and newborn.
Lochia rubra saturates perineal pad (no more than one pad per hour).	Mother breastfeeds infant	Obtain cord blood if needed.
Cramping may occur.		Assess woman's vital signs every 15 minutes.
Woman may have shaking chills that may be a thermoregulation response.		Assess maternal voiding.
		Monitor heart rate and temperature of newborn.
		Provide warmth to newborn.
		Assess newborn for anomalies.
		Assess fundus and massage to maintain firm contraction (a fundus that is displaced to the side indicates a full bladder is pressing against it).
		Assess lochia (no more than one saturated pad per hour).
		Change mother's gown and underpads.
		Encourage breastfeeding.
		Encourage bonding between parent and infant.

FHR, Fetal heart rate; *IV*, intravenous; *NPO*, nothing by mouth.

Nursing care immediately after birth Care of the mother:

the schedule for assessing the mother during the fourth stage is every 15 minutes for 1 hour, every 30 minutes during the second hour, and hourly thereafter until transfer to the postpartum unit.

After transfer to the postpartum unit, routine assessments are made every 4 to 8 hours.

The following should be included at each assessment during the fourth stage:

- Vital signs (temperature may be taken hourly if normal)
- Skin color
 - Location and firmness of the uterine fundus
- Amount and color of lochia
- Administration of oxytocin as needed to contract uterus.
- Presence and location of pain
- IV infusion and medications
- Fullness of the bladder or urine output from a catheter
- Condition of the perineum for vaginal birth
- Condition of dressing for cesarean birth or tubal ligation
- Level of sensation and ability to move lower extremities if an epidural or spinal block was used

Observing for Hemorrhage
The uterine fundus is assessed for firmness, height in relation to the umbilicus, and position

- **Observing for Hemorrhage**

- The uterine fundus is assessed for firmness, height in relation to the umbilicus, and position (midline or deviated to one side).
- for assessment of the fundus.
- Vaginal bleeding should be dark red (lochia rubra).
- No more than one pad should be saturated in an hour, and the woman should not pass large clots.
- A continuous trickle of bright red blood suggests a bleeding laceration.
- The blood pressure, pulse rate, and respirations are checked to identify a rising pulse rate or falling blood pressure, which suggest shock.
- An oral temperature is taken and reported if it is 38°C (100.4°F) or higher or if the woman has a higher risk for infection.
- **Observing for Bladder Distention** The bladder is assessed for distention, which may occur soon after birth.
- The woman often does not feel the urge to urinate because of the effects of the anesthetic, perineal trauma, and loss of fetal pressure against the bladder.
- If her bladder is full, the uterus will be higher than expected and often displaced to one side.
- A full bladder inhibits uterine contraction and can lead to hemorrhage. Catheterization will be needed if the woman cannot urinate.

- **Promoting Comfort:**

- Many women have a shaking chill after birth yet deny that they are cold.
- A warm blanket over the woman makes her feel more comfortable until the chill subsides.
- The warm blanket also maintains the infant's warmth while parents get acquainted.
- An ice pack may be placed on the mother's perineum to reduce bruising and edema.
- A glove can be filled with ice and wrapped in a washcloth.
- Perineal pads that incorporate a chemical cold pack are often used.
- These pads do not absorb as much lochia as those without the cold pack, and this must be considered when evaluating the quantity of bleeding.
- Cold applications are continued for at least 12 hours.
- A warm pack pad may be used after the first 12 to 24 hours to encourage blood flow to the area.
- The infant usually stays with the mother or parents during recovery if there are no complications.
- The priority care involves promoting respiratory function and maintaining the temperature.

Care of the newborn immediately after deliver:

Care of the newborn immediately after delivery :

Care of the newborn after delivery is divided into the following “transition phases” that are involved in adapting to extrauterine life:

- Phase 1: Immediate care after birth; from birth to 1 hour (usually in delivery room) (discussed in the next section)
- Phase 2: From 1 to 3 hours after birth; usually in the transition nursery or postpartum unit
- Phase 3: From 2 to 12 hours after birth; usually in the postpartum unit if rooming-in with the mother

Phase 1: Care of the Newborn Initial care of the newborn includes the following:

- Maintaining thermoregulation
- Maintaining cardiorespiratory function
- Observing and documenting for urination and/or passage of meconium
- Identifying the mother, the father or partner, and the newborn
- Performing and documenting a brief assessment for major anomalies
- Encouraging bonding and breastfeeding.

The infant will be covered in blood and amniotic fluid at birth.

All caregivers should wear gloves and fluid-resistant covergowns when handling the newborn until after the first bath.

Maintaining thermoregulation:

- A critical factor in the transition of the newborn is maintaining a neutral thermal environment in which heat loss is minimal and oxygen consumption needs are the lowest.
- Hypothermia (low body temperature) can cause hypoglycemia (low blood glucose level) because the infant's body uses glucose to generate heat.
- Hypoglycemia is associated with the development of neurological problems in the newborn.
- Hypothermia can also cause cold stress, in which the increased metabolic rate required to generate body heat causes increased respiratory rate and oxygen consumption.
- If the infant cannot supply the increased demand for oxygen, hypoxia will result and cause further problems.

Essential nursing interventions to maintain a neutral thermal environment include the following:

- Drying the infant with a towel to prevent heat loss caused by evaporation of amniotic fluid on the skin: the body and head should be gently dried with a warm towel.
- Placing infant in radiant warmer: A skin probe can be placed on the right upper abdomen (over the spleen or liver) to act as a thermostat to the radiant warmer so that the proper setting of heat will be supplied .
- Placing a hat on the infant's head after the head is dried: The head is the largest body surface area in the newborn, and significant heat loss can occur if the moist head is left open to room air.
- Wrapping the infant in warm blankets when taken out of the warmer .
- skin-to -skin (kangaroo) contact between mother and newborn during bonding or breastfeeding can also prevent heat loss.
- An incubator may be necessary if the infant is unable to stabilize body temperature.
- The first bath is delayed until the infant's temperature is stabilized at 36.5°C to 37°C.



FIG. 6.24 The nurse applies the sensor and assesses the newborn in the radiant warmer. *Note:* This nurse is wearing purple nitrile (latex-free) gloves when handling the newborn. (Some newborns can be allergic to latex.)

Maintaining cardiorespiratory function :

Respiratory support immediately after delivery includes the following:

- The face, nose, and mouth are gently wiped to remove mucus and excess amniotic fluid.
- Gentle bulb suctioning of secretions from nose and mouth is performed to clear airways.

At birth, the infant may be placed on the mother's abdomen.

The health care provider may initiate suctioning before cutting the cord. Further need for suctioning is determined when the infant is placed in the radiant warmer.

- A cord clamp is applied when the infant is stabilized in the radiant warmer



FIG. 6.25 The nurse assists the father in cutting the umbilical cord to a proper length so the umbilical clamp can be applied.

Spontaneous breathing usually begins within a few seconds after birth.

- The infant's color at birth may be cyanotic (blue) but quickly turns pink (often except for the hands and feet).
- As the infant cries, the skin color will be pink.
- Acrocyanosis is the bluish color of hands and feet of the newborn that is normal and is caused by sluggish peripheral circulation.
- Administration of oxygen by facemask may be performed until the infant is crying vigorously.

Some signs of respiratory distress that should be immediately reported include the following:

- Persistent cyanosis (other than the hands and feet)
 - Grunting respirations: A noise heard without a stethoscope as the infant exhales
 - Flaring of the nostrils
 - Retractions: Under the sternum or between the ribs
 - Sustained respiratory rate higher than 60 breaths/min
 - Sustained heart rate greater than 160 beats/min or less than 110 beats/min
- Narcan (naloxone) is kept on hand to reverse narcotic-induced respiratory depression.

Performing Apgar scoring :

Dr. Virginia Apgar devised a system for evaluating the infant's condition and response to resuscitation that was provided at birth.

Five factors are evaluated **at 1 minute and 5 minutes** after birth and are ranked in order of importance:

1. Heart rate
2. Respiratory effort
3. Muscle tone
4. Reflex response to suction or gentle stimulation on the soles of the feet
5. Skin color

Apgar Scoring System

SIGN	SCORE		
	0	1	2
Heart rate	Absent	< 100 beats/min	≥ 100 beats/min
Respiratory effort	No spontaneous respirations	Slow; weak cry	Spontaneous, with a strong, lusty cry
Muscle tone	Limp	Minimal flexion of extremities; sluggish movement	Active spontaneous motion; flexed body posture
Reflex irritability	No response to suction or gentle slap on sole of foot	Minimal response (grimace) to stimulation	Prompt response to suction, with cry or active movement in response to gentle slap on sole of foot or backrub
Color	Blue or pale	Body pink, extremities blue	Completely pink (light skin) or absence of cyanosis (dark skin)
	1 Minute	5 Minutes	10 Minutes
Oxygen			
PPV/NCPAP			
Endotracheal tube			
Chest compression			
Epinephrine			

NOTE: The nurse evaluates each sign in the Apgar and totals the score at 1, 5, 10, and 15 minutes after birth to assess the condition of the infant and to determine what interventions the infant needs. A score of 8–10 requires no action other than continued observation and support of the infant's adaptation. A score of 4–7 means the infant needs gentle stimulation such as rubbing the back; the possibility of narcotic-induced respiratory depression should also be considered. Scores < 3 mean that the infant needs active resuscitation. If resuscitative measures are applied, the following scoring chart is added to the routine Apgar:

NCPAP, Nasal continuous positive airway pressure; *PPV*, positive pressure ventilation.

- If resuscitative measures are required during Apgar scoring, a separate chart indicating the interventions and responses is attached to the routine Apgar form .
- The Apgar score is not a predictor of future intelligence or abilities and disabilities.
- It is meant to identify only the infant's condition and any response to neonatal resuscitation measures given.
- Equipment, medications, and personnel must be readily available for resuscitation at any birth because the need cannot always be anticipated.

- **Identifying the infant Wristbands with preprinted numbers are placed on the mother, the infant, and often the father or other support person in the birthing room as the primary means of identifying the infant.**
- The nurse should check to be sure that all numbers in the set are identical.
- Other identifying information is completed, such as mother's name, the birth attendant's name, the date and time of birth, the sex of the infant, and usually the mother's hospital identification number.
- The bands are applied relatively snugly on the infant's wrist and ankle with only a finger's width of slack because infants lose weight after birth.
- The nurse must check the preprinted identification band numbers to see that they match every time the infant returns to the mother after a separation or the mother goes to the nursery to retrieve her infant.
- The nurse should either look at the numbers to see that they are identical or have the mother read her own band number while looking at the infant's band.
- Often, the identification band is embedded with a security chip compatible with the hospital's security system.
- Footprints of the infant and one or both index fingerprints of the mother are often taken.
- Many birth facilities take a photograph of the infant in the birthing room or very soon after admission and record birthmarks or unique features.
- This is primarily for identification of the infant in the event of an abduction and for keepsake purposes.

- **Observing urinary function and passage of meconium Newborns may not urinate for as long as 24 hours after delivery.**
- If the infant voids in the LDR room, it must be documented on the chart. Meconium, the first stool of the newborn, may be passed anytime within 12 to 24 hours.
- If meconium is passed in the LDR room, it should be documented in the chart. The infant cannot be discharged to the home until documentation is made that the gastrointestinal and genitourinary tracts are functioning.
- Passing meconium and voiding help determine the status of these systems.
- Promoting maternal–infant bonding

- **Promoting maternal–infant bonding Every attempt should be made to facilitate maternal–infant contact.**
- As soon as the infant is dried and warmed, and cardiorespiratory function is stable, the infant should be warmly wrapped and placed in the mother’s arms or in skin-to-skin contact with the mother .
- The infant is alert in the first hour of life, and therefore this is the best time to initiate breastfeeding and bonding.
- This practice is supported by the awarding of a “baby-friendly hospital” designation to facilities that encourage skin-to-skin contact and breastfeeding immediately after birth in the LDR room .
- Breastfeeding .
- Referral to a nurse who is a lactation specialist may be initiated if the mother needs assistance with breastfeeding.



FIG. 6.26 The mother and father bond with the newborn infant in the labor, delivery, and recovery room.



FIG. 6.27 The naked infant placed on the bare chest of the mother will move toward the breast and breastfeed. Studies show this is beneficial to infant neurodevelopment and behavior and parent–infant bonding. (From Leifer G: *Maternity nursing*, ed 11, St. Louis, 2012, Saunders.)

- **Eye care All newborn infants are given specific eye care to prevent ophthalmia neonatorum, which is caused by Neisseria gonorrhoeae.**
- The American Academy of Pediatrics also recommends protection against Chlamydia trachomatis.
- Therefore erythromycin eye ointment (administered from single-dose tubes) is placed in each eye .
- Eye care is administered 1 hour after birth (so that the infant and mother can bond in that first hour), but it must be given and documented before the infant leaves the delivery room.

Purpose

To protect against ophthalmia neonatorum and chlamydia infections (all newborns have this prophylactic treatment before leaving the delivery room)

Steps

1. Apply an antimicrobial ointment to the lower conjunctival sac of the newborn's eyes.



(Courtesy Pat Spier, RN-C.)

- **Administering medications** After the first hour of life the infant begins a sleep pattern with decreased motor activity.
- This is the best time to place the infant in the warmer for medication administration before leaving the delivery room.
- **Intramuscular injections** When drawing up medications from a glass ampule, a change of needles is important before injecting the infant, but a change of needles is not necessary if drawing up medication from a vial.
- **The desirable site for an intramuscular injection in an infant is the thickest part of the vastus lateralis muscle in the anterolateral thigh.**
- **Because there are no large vessels in the recommended injection site, aspiration is not necessary .**
- The medication should be introduced rapidly, **and the infant should be held skin to skin and be given a sweetened sucrose nipple to suck on or be breastfed immediately.**
- **Vitamin K** Newborns need vitamin K to assist in blood clotting.
- **Vitamin K is naturally produced from intestinal flora, which is absent in the newborn.**
- **One single dose of vitamin K (AquaMEPHYTON) is injected into the vastus lateralis muscle (thigh) before the infant leaves the delivery room, usually at 1 hour of age.**

Administering Intramuscular Injections to the Newborn

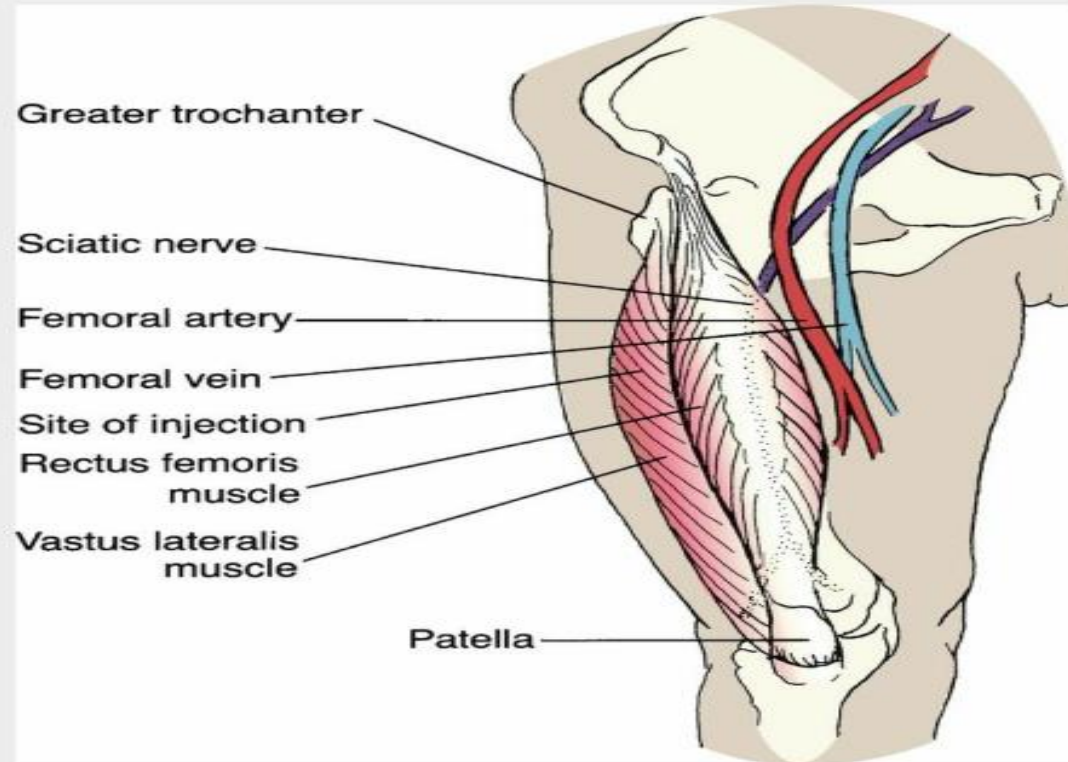


Purpose

To administer an intramuscular injection to the newborn effectively

Steps

1. Prepare medication for injection.
 - a. A 1-mL syringe with a {5/8}-inch, 25-gauge needle is often used. A small needle reaches the muscle but potentially prevents striking the bone.
2. Put on gloves to protect against contamination with blood.
3. Locate the correct site. The middle third of the vastus lateralis muscle is the preferred site (see illustration). The middle third of the rectus femoris is an alternate site, but its proximity to major vessels and the sciatic nerve necessitates caution during injection.



4. Cleanse the area with an alcohol wipe.
5. Stabilize leg while grasping tissues (upper thigh) between thumb and fingers to prevent sudden movement by newborn and possible injury. (NOTE: When an injection is administered to the newborn *after* the first bath, the infant should be held in the "hug position" or breastfeeding position and given a sucrose-sweetened nipple to suck on.)
6. Insert needle at 90-degree angle to the thigh.
7. Do not aspirate, and inject rapidly.
8. Remove needle quickly, and gently massage the site with an alcohol swab. Massage helps medication absorb.
9. Calm and soothe infant; reposition infant. Remove gloves, wash hands, and document in medical record.



Observing for major anomalies The nurse notes signs of injury or anomalies while performing other assessments and care. The infant's movements and facial expressions during crying are observed for symmetry and equality of movement.

The head and face should be assessed for trauma, especially if forceps were used.

A small puncture wound is usually apparent on the scalp if an internal spiral electrode was used for fetal monitoring.

If the infant was born vaginally in a breech presentation, **the buttocks may be bruised.**

Many anomalies, such as spina bifida (open lesion over the spine) or a cleft lip are immediately obvious.

The fingers and toes should be counted to identify abnormal numbers or webbing.

The feet are observed for straightness; if deviated, it should be determined whether they can be returned to the straight position.

Length of arms and legs should be checked for equality.

Urination and meconium passage are assessed, both of which confirm patency.

A detailed assessment for anomalies and gestational age is completed on admission to the newborn nursery or postpartum unit.

- **Cord blood banking Blood from the placenta and umbilical cord had traditionally been treated as a waste product and discarded.**
- **However, cord blood, similar to bone marrow, contains regenerative stem cells that can be stored and used for transplant to replace diseased cells or to treat many malignant or genetic diseases in children and adults; these cells are less likely to cause a potentially fatal rejection response.**

- **Microbiomes and nursing care during labor and delivery:**
- Microbiota are a community of microorganisms, both pathogenic and nonpathogenic, that are in every human body.
- Microbiomes contain the genetic material of a variety of organisms consisting of bacteria, fungi, and single-cell organisms (Archaea) that live in every human body and influence health and disease.
- The introduction of microbiomes to the newborn infant occurs at birth when the mother transfers these microbiomes to the infant, either by mouth or via vaginal contact.
- The transfer of these microbiomes to the infant plays an important role in the future health of the infant .
- Therefore labor and birth practices can enhance or interfere with this transfer.
- For example, the route of birth (transfer is enhanced by vaginal birth) and frequent vaginal examinations or antibiotic administration can interfere with successful transfer of microbiomes.
- Infants born via cesarean section are not exposed to vaginal microbiota and may be at risk for health problems in later life.

- **Skin-to-skin contact in the first hours after birth and breastfeeding also contribute to the positive transfer of protective microbiomes from mother to infant resulting in a healthy newborn with a healthy future.**
- The nurse plays an important role in the care of mothers during labor and delivery to promote successful transfer of maternal/newborn microbiomes by promoting practices such as vaginal birth, early skin-to-skin contact and breastfeeding in the first hours after birth and beyond, and limiting the use of antibiotics and interventions during the birth process.
- These practices influence the future health of the newborn infant.
- The microbiomes of the mother and infant are also influenced by postpartum care .
- The maternal diet influences lactation, which helps establish the newborn microbiome.
- Postpartum nurses can have a positive impact on the integrity of the newborn microbiome by supporting breastfeeding, safe infant skin care practices (use of plain water to maintain microbial colonization), adequate maternal dietary intake and rest, proper perineal care, and detailed patient education.

Tess is admitted to the obstetric unit in her 40th week of pregnancy, complaining of frequent contractions.

She states that a sudden gush of fluid has been expelled into her underwear.

Questions :

1. What is the probable cause of the gush of fluid that she expelled? What is the nursing responsibility when this happens to a woman during pregnancy?
2. What findings would indicate that Tess is close to delivering her infant?
3. The health care provider performs a Leopold's maneuver. What information can be obtained by this procedure?
4. The nurse auscultates the fetal heart. What kind of variations of the FHR are normal, and what findings should immediately be reported to the health care provider?
5. If late decelerations of the fetal heart are noted, what nursing action is indicated?
6. Tess' husband Luis is standing in the corner of the labor room. How can the nurse offer support to Luis during the labor process?

Get Ready for the NCLEX® Examination! Key Points

- The four components, or “four Ps,” of the birth process are the powers, the passage, the passengers, and the psyche.

All interrelate during labor either to facilitate or to impede birth.

- True labor and false labor have several differences; however, the conclusive difference is that true labor results in cervical change (effacement or dilation or both).
- The woman should go to the hospital if she is having persistent, regular contractions (every 5 minutes for nulliparas and every 10 minutes for multiparas); if her membranes rupture; if she has bleeding other than normal bloody show; if fetal movement decreases; or for other concerns not covered by the basic guidelines.
- Three key assessments on admission are fetal condition, maternal condition, and nearness to birth.
- There are four stages of labor, and each stage includes different characteristics. The first stage is the stage of dilation, lasting from onset of labor to full (10 cm) cervical dilation. First-stage labor is subdivided into three phases: latent, active, and transition. Second-stage labor, the stage of expulsion, extends from full cervical dilation until birth of the infant. The third stage, the placental stage, is from the birth of the infant until the placenta is delivered. The fourth stage is the immediate postbirth recovery period and includes the first 1 to 4 hours after placental delivery.

- The main fetal risk during first-stage and second-stage labor is fetal compromise caused by interruption to the fetal oxygen supply.

The main maternal risk during fourth-stage labor is hemorrhage caused by uterine relaxation.

- Nursing care during the first and second stages focuses on observing the fetal and maternal conditions and on assisting the woman to cope with labor.
- Continuous EFM is most common in hospital births, but intermittent auscultation is a valid method of fetal assessment.
- The normal baseline FHR should be between 110 and 160 beats/min.
- The FHR tracing demonstrates the relationship between the baseline FHR and uterine contractions.
- Periodic changes in the FHR are temporary changes from the baseline rate associated with uterine contractions that occur in a pattern over time. The presence of accelerations and moderate variability in the FHR pattern reassures that the fetus is well oxygenated.
- Abnormal FHR patterns must be reported to the health care provider promptly to ensure a favorable outcome.

- Laboring women can assume many positions. Upright positions add gravity to the forces

Hands-and-knees or leaning-forward positions promote normal internal rotation of the fetus if “back labor” is a problem .

Squatting facilitates fetal descent during the second stage.

The supine position should be discouraged because it causes the heavy uterus to compress the mother’s main blood vessels, which can reduce fetal oxygen supply.

- The immediate care of the newborn after birth includes maintaining warmth, maintaining cardiorespiratory function, assessing for major anomalies, encouraging parent–infant bonding, and providing proper identification and documentation.

Review Questions for the NCLEX® Examination

1. To determine the frequency of uterine contractions, the nurse should note the time from the:

1. **beginning to end of the same contraction.**
2. end of one contraction to the beginning of the next contraction.
3. beginning of one contraction to the beginning of the next contraction.
4. contraction's peak until the contraction begins to relax.

2. Excessive anxiety and fear during labor may result in a(n):

1. **ineffective labor pattern.**
2. abnormal fetal presentation or position.
3. release of oxytocin from the pituitary gland.
4. rapid labor and uncontrolled birth.

3. A woman who is pregnant with her first child phones an intrapartum facility and says her “water broke.” The nurse should tell her to:

1. wait until she has contractions every 5 minutes for 1 hour.
2. take her temperature every 4 hours and come to the facility if it is over 38°C (100.4°F).
3. **come to the facility promptly, but safely.**
4. call an ambulance to bring her to the facility.

4. A laboring woman suddenly begins making grunting sounds and bearing down during a strong contraction. The nurse should initially:

1. leave the room to find an experienced nurse to assess the woman.
2. **look at her perineum for increased bloody show or perineal bulging.**
3. ask her if she needs pain medication.
4. tell her that these are common sensations in late labor.

5. A woman in active labor has contractions every 3 minutes lasting 60 seconds, and her uterus relaxes between contractions. The electronic fetal monitor shows the FHR reaching 90 beats/min for periods lasting 20 seconds during a uterine contraction. The appropriate priority nursing action is to:

1. **continue to monitor closely.**
2. administer oxygen by mask at 10 L/min.
3. notify the health care provider.
4. prepare for a cesarean section.

6. The nurse is caring for a woman in labor. Which of the following observations require immediate nursing intervention?

- a. FHR of 90 beats/min between contractions
 - b. maternal tachysystole
 - c. contractions lasting 60 seconds with an interval of 90 seconds
 - d. FHR baseline variability
- 1. b and c
 - 2. a and d
 - 3. **a and b**
 - 4. c and d

Critical Thinking Question

1. A para 0, gravida 1 woman is admitted in active labor. She states she has completed prenatal care and wishes for a natural, unmedicated childbirth. However, she states she now does not feel she can cope with the increasing levels of pain and asks if it is okay if she takes pain medication. What is the best response of the nurse?

Thanks for listening