Chapter 22: processes and stages of labor and birth

By Dua’ Al-Maharma

19th October 2019
Critical factors in labor (5 Ps):

1. Birth Passage
2. Birth Passenger (Fetus)
3. The relationship between the Passage and the Passenger (Fetus)
4. Physiologic forces of labor
5. Psychological consideration
Critical factors in labor:

Birth passage:

- Size of the maternal pelvis (diameter of the pelvic inlet, midpelvis, and outlet)
- Type of maternal pelvis (Gynecoid)
- Ability of the cervix to dilate and efface and ability of the vaginal canal and external opening of the vagina (the introitus) to distend.
# Measurements of the pelvic canal in centimeters

<table>
<thead>
<tr>
<th></th>
<th>Anteroposterior</th>
<th>Oblique</th>
<th>Transverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brim</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Cavity</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Outlet</td>
<td>13</td>
<td>12</td>
<td>11</td>
</tr>
</tbody>
</table>

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Figure The bony pelvis.
(a) Inlet: Bean shaped.
(b) Mid-cavity: Circular.
(c) Outlet: Diamond shaped.
Diagram of the human pelvis with labeled anatomical structures:

- Iliac crest
- Sacroiliac joint
- Iliac fossa
- Sacral promontory
- Pelvic brim
- Ischial spine
- Coccyx
- Acetabulum
- Pubic crest
- Pubic symphysis
- Pubic arch
- Ilium
- Sacrum
- Ischium

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Birth Passenger:

1. Fetal head (size and presence of molding):

![Diagram of fetal head with labeled bones and sutures]

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Fetal Head

The fetal skull has three major parts

– The face
– The base of the skull (cranium)
– The vault of the cranium (roof).

**Molding:** The bones composing the vault of cranium overlap under pressure of the powers of labor and the demands of the unyielding pelvis.

*The biparietal diameter is the largest part of the fetal head*
Anteroposterior diameters of the fetal skull.
Transverse diameters of the fetal skull
1. **Fetal attitude** (Flexion or extension of the fetal body and extremities): refers to the relation of the fetal body parts to one another.

The normal attitude of the fetus is termed *general flexion*, where the head is flexed so the chin is on the chest with the arms crossed over the chest, and the legs flexed at the knee with thighs on the abdomen.
2. **Fetal lie:** refer to the relationship of the long, or cephalocaudal, axis (spinal column) of the fetus to the long, or cephalocaudal, axis of the mother.
3. Fetal presentation: is determined by fetal lie and refers to the body part of the fetus that enters the maternal pelvis first and leads through the birth canal during labor.

   - The presenting part or the portion of the fetus that is felt through cervix on vaginal examination determines the presentation. Fetal presentation may be cephalic (head first), breech (buttocks or feet first), or shoulder.

   • Breech and shoulder presentation are associated with difficulties during labor and do not proceed normal; therefore, they are called malpresentations.
Cephalic Presentation

• **A: Vertex Presentation**

• When the presenting part is the occiput.

• The fetal head is completely flexed onto the chest.

• The smallest diameter of the fetal head (*suboccipitobregmatic*) presents to the maternal pelvis.

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Cephalic Presentation:

(B): Sinciput Presentation

- The fetal head is partially flexed.
- The *occipitofrontal diameter* presents to the maternal pelvis
- The top of the head is the presenting part

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(c): Brow Presentation

- The fetal head is partially extended.
- The *occipitomental diameter*, the largest anteroposterior diameter, is presented to the maternal pelvis.
Cephalic Presentation

(D): Face Presentation

- The fetal head is hyperextended (complete extension).
- The submentobregmatic diameter presents to the maternal pelvis.
Breech Presentation

A. Frank breech.
B. Incomplete (footling) breech.
C. Complete breech.
D. On vaginal examination, the nurse may feel the anal sphincter. The tissue of the fetal buttocks feels soft.
Shoulder presentation

A. Shoulder presentation.
B. On vaginal examination, the nurse may feel the acromion process as the fetal presenting part.
Relationship of maternal pelvis and presenting part

1. *Engagement* of the presenting parts occurs when the largest diameter of the presenting part reaches or passes through the pelvic inlet. When the fetal head is flexed, the biparietal diameter is the largest dimension of the fetal skull to pass through the pelvic inlet in a cephalic presentation.
Process of engagement in cephalic presentation

A. Engaged. The biparietal diameter (BPD) of the fetal head is in the inlet of the pelvis. In most instances, the presenting part (occiput) will be at the level of the ischial spines (0 station).
Process of engagement in cephalic presentation

B. Floating. The fetal head is directed down toward the pelvis but can still easily move away from the inlet.
Process of engagement in cephalic presentation

C. Dipping. The fetal head dips into the inlet but can be moved away by exerting pressure on the fetus.
2. **Station**: refers to the relationship of the presenting part to an imaginary line draw between the ischial spines of the maternity pelvis.

- Station **-5** is at the **inlet**,  
- and station **+4** is at the **outlet**.
3. **Fetal position**: refers to the relationship of the **landmark** on the presenting fetal part to the anterior, posterior, or sides (right or left) of the maternal pelvis.

- Three notations are used to describe the fetal position:
  
  - Right (R) or left (L) side of the maternal pelvis
  - The landmark of the fetal presenting part: occiput (O), Mentum (M), sacrum (S), or acromion (scapula {Sc}) process (A)
  - Anterior (A), Posterior (P), or transverse (T), depending on whether the landmark is in the front, back, or side of the pelvis.
Fetal position
Fetal position
Fetal position

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Fetal position

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Physiologic forces of labor

• **The primary force** is uterine muscular contractions, which cause the changes of the first stage of labor—complete effacement and dilatation of the cervix.

• **The secondary force** is the use of abdominal muscles to push during the second stage of labor. The pushing adds to the primary power after full dilatation.
Characteristics of uterine contractions

First contraction
- Increment
- Intensity
- Duration
- Frequency
- Acme
- Decrement
- Resting

Second contraction
- Intensity

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Each contraction has three phases:

- *Increment*, the “building up” of the contraction (the longest phase)
- *Acme*, or the peak of the contraction
- *Decrement*, or the “letting up” of the contraction.
• **Frequency**: refers to the time between beginning of one contraction and the beginning of the next contraction.

• **Duration** of each contraction is measured from the beginning of the contraction to the completion of the contraction.

• **Intensity** refers to the strength of the uterine contraction during the peak of the contraction.
Estimating intensity by palpation: the nurse judges the amount of indentability of the uterine wall during the acme of a contraction.

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• Clinical Tip:
  
  – To assess uterine contraction frequency counts the number of contractions in a 10-minute period, and assesses their duration in seconds (Mild- less than 20 seconds, moderate- 20- 40 seconds, and strong- 40-60 seconds).

  – Normal uterine contractions are five contractions/ 10 minutes and all of them less than 60 seconds.

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Bearing down

- After the cervix is completely dilated, the maternal abdominal musculature contracts as the woman pushes. The **pushing** aids in the expulsion of the fetus and placenta. If the cervix is not completely dilated, bearing down can cause cervical edema (which retard dilatation), possible tearing and bruising of the cervix.

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Psychosocial Considerations

Schematic representation of the WHO intrapartum care model
Effacement is the taking up (or drawing up) of the internal os and the cervical canal into the uterine side walls.

Cervical dilatation. The cervical os and cervical canal widen from less than 1 cm to approximately 10 cm, allowing birth of the fetus.
Effacement of the cervix in the primigravida

A. At the beginning of labor, there is no cervical effacement or dilatation. The fetal head is cushioned by amniotic fluid
Effacement of the cervix in the primigravida

B. Beginning cervical effacement. As the cervix begins to efface, more amniotic fluid collects below the fetal head.
Effacement of the cervix in the primigravida

C. Cervix is about one half (50%) effaced and slightly dilated. The increasing amount of amniotic fluid below the fetal head exerts hydrostatic pressure on the cervix.
Effacement of the cervix in the primigravida

D. Complete effacement and dilatation
Balloon & A Ping Pong Ball

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Premonitory Signs of Labor

• **Lightening** the fetus begins to settle into the pelvic inlet (engagement). With fetal descent, the uterus moves downward, and the fundus no longer presses on the diaphragm, which eases breathing.
Premonitory Signs of Labor

• **Braxton Hicks Contractions:** the irregular, intermittent contractions that have been occurring throughout the pregnancy (when strong enough - false labor).
Premonitory Signs of Labor

• **Bloody show:** during pregnancy, cervical secretions accumulate in the cervical canal to form a barrier called mucus plug. With softening and effacement of the cervix, the mucus plug is often expelled, resulting in a small amount of blood loss from exposed cervical capillaries. The resulting pink-tinged secretions are called bloody show. Impending labor, within 24 to 48 hours.
Premonitory Signs of Labor

- Rupture of membrane (ROM)
- Spontaneous rupture of membrane (SROM)
- Amniotomy Or Artificial Rupture Of Membranes (AROM)
- Premature Rupture Of Membranes (PROM)
- Preterm Premature Rupture Of Membranes (PPROM)

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Premonitory Signs of Labor

• **Sudden Burst of Energy:** Some women report a sudden burst of energy approximately 24 to 48 hours before labor
# TABLE 22-5 Comparison of True Labor and False Labor

<table>
<thead>
<tr>
<th>TRUE LABOR</th>
<th>FALSE LABOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractions are at regular intervals.</td>
<td>Contractions are irregular.</td>
</tr>
<tr>
<td>Intervals between contractions gradually shorten.</td>
<td>Usually no change.</td>
</tr>
<tr>
<td>Contractions increase in duration and intensity.</td>
<td>Usually no change.</td>
</tr>
<tr>
<td>Discomfort begins in back and radiates around to abdomen.</td>
<td>Discomfort is usually in abdomen.</td>
</tr>
<tr>
<td>Intensity usually increases with walking.</td>
<td>Walking has no effect on or lessens contractions.</td>
</tr>
<tr>
<td>Cervical dilatation and effacement are progressive.</td>
<td>No change.</td>
</tr>
<tr>
<td>Contractions do not decrease with rest or warm tub bath.</td>
<td>Rest and warm tub baths lessen contractions.</td>
</tr>
</tbody>
</table>
Stages of labor and birth:

- **First stage of labor** begins at the onset of true labor contraction and ends when the cervix is 100% effaced and completely dilated to 10 centimeters. The first stage of labor is divided into the **latent** or **early**, **active** and **transition** phases.
Latent or Early Phase

- Cervical dilatation 0–3 cm
- Frequency of 3 to 30 minutes
- Duration 20–40 sec
- Begin as mild and progress to moderate
- The woman able to cope, be relieved that labor has finally started, elated, anxious, talkative and smiling and is eager to talk about herself and answer questions.
Active Phase

• Cervix dilates from about 4 to 7 cm.

• Fetal descent is progressive. The cervical dilatation should be at least 1.2 cm per hour in nulliparas and 1.5 cm per hour in multiparas

• Frequency every 2–5 min

• Begin as moderate and progress to strong

• Duration 40-60 second

• Woman senses the intensification of contractions and pain, fear a loss of control, use a variety of coping mechanisms or some women exhibit a decreased ability to cope and a sense of helplessness

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Transition Phase

• Cervical dilatation slows as it progresses from 8 to 10 cm and the rate of fetal descent increases.

• The average rate of descent is at least 1 cm per hour in nulliparas and 2 cm per hour in multiparas.

• The transition phase should not be longer than 3 hours for nulliparas and 1 hour for multiparas

• Contractions frequency 1 1/2 to 2 minutes,

• Duration of 60 to 90 seconds, and are strong in intensity

• Increased rectal pressure, an uncontrollable urge to bear down, hyperventilation, loss of control, and difficulty understanding directions… etc

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Second stage of labor

- Begins when the cervix is completely dilated (10 cm) and ends with birth of the infant.
- Contractions continue with a frequency of 1 1/2 to 2 minutes, a duration of 60 to 90 seconds, and strong intensity.
- Nullipara up to 3 hr, Multipara 0–30 min
- Crowning occurs when the fetal head is encircled by the external opening of the vagina (introitus) and means birth is imminent.
Mechanism of labor (cardinal movements):

The cardinal movements are described as the following 7 discrete sequences:

1. Engagement
2. Descent
3. Flexion
4. Internal rotation
5. Extension
6. Restitution and external rotation
7. Expulsion
• **Third stage of labor** is defined as the period of time from the birth of the infant until the complete delivery of the placenta. Placental separation appears 5 minutes after birth of the infant, but can take up to 30 minutes.

  **Signs of placental separation are:**
  
  – A globular-shaped uterus
  – A rise of the fundus in the abdomen
  – Sudden gush or trickle of blood
  – Protrusion of umbilical cord out of the vagina

• **A placenta is considered to be retained if more than 30 minutes** have elapsed from completion of the second stage of labor
Placental separation methods

Schultze mechanism (shiny Schultze): If the placenta separates from the inside to the outer margins, it is expelled with the fetal (shiny) side presenting

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Placental separation methods

Duncan mechanism (dirty Duncan): The placenta separates from the outer margins inward, it will roll up and present sideways with the maternal surface delivering first.

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Fourth stage of labor

- Is the time from 1 to 4 hours after birth in which physiologic readjustment of the mother’s body begins.
WHO recommendations - Intrapartum care for a positive childbirth experience

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Respectful maternity care – which refers to care organized for and provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labour and childbirth – is recommended.

(Recommended)
Effective communication between maternity care providers and women in labour, using simple and culturally acceptable methods, is recommended. (Recommended)
A companion of choice is recommended for all women throughout labour and childbirth (Recommended)
The use of the following definitions of the latent and active first stages of labour is recommended for practice.

- The latent first stage is a period of time characterized by painful uterine contractions and variable changes of the cervix, including some degree of effacement and slower progression of dilatation up to 5 cm for first and subsequent labours. *(Recommended)*

- The active first stage is a period of time characterized by regular painful uterine contractions, a substantial degree of cervical effacement and more rapid cervical dilatation from 5 cm until full dilatation for first and subsequent labours. *(Recommended)*
Women should be informed that a standard duration of the latent first stage has not been established and can vary widely from one woman to another. However, the duration of active first stage (from 5 cm until full cervical dilatation) usually does not extend beyond 12 hours in first labours, and usually does not extend beyond 10 hours in subsequent labours. (Recommended)
Labour may not naturally accelerate until a cervical dilatation threshold of 5 cm is reached. Therefore the use of medical interventions to accelerate labour and birth (such as oxytocin augmentation or caesarean section) before this threshold is not recommended, provided fetal and maternal conditions are reassuring. (Not recommended)
Digital vaginal examination at intervals of four hours is recommended for routine assessment of active first stage of labour in low-risk women. 

(Recommended)
• The use of the following definition and duration of the second stage of labour is recommended for practice.

– The second stage is the period of time between full cervical dilatation and birth of the baby, during which the woman has an involuntary urge to bear down, as a result of expulsive uterine contractions.

– Women should be informed that the duration of the second stage varies from one woman to another. In first labours, birth is usually completed within 3 hours whereas in subsequent labours, birth is usually completed within 2 hours.
Reference

Important notes

- The slides are not the official reference for your study. Please refer to your book chapter 22, page (530-553) / ninth edition