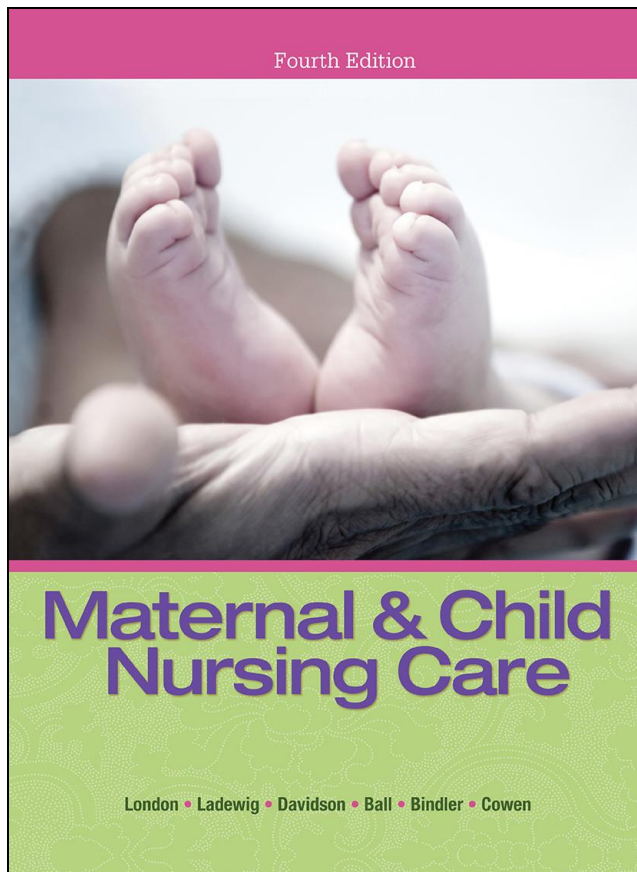


MATERNAL & CHILD NURSING CARE

FOURTH EDITION



CHAPTER 9

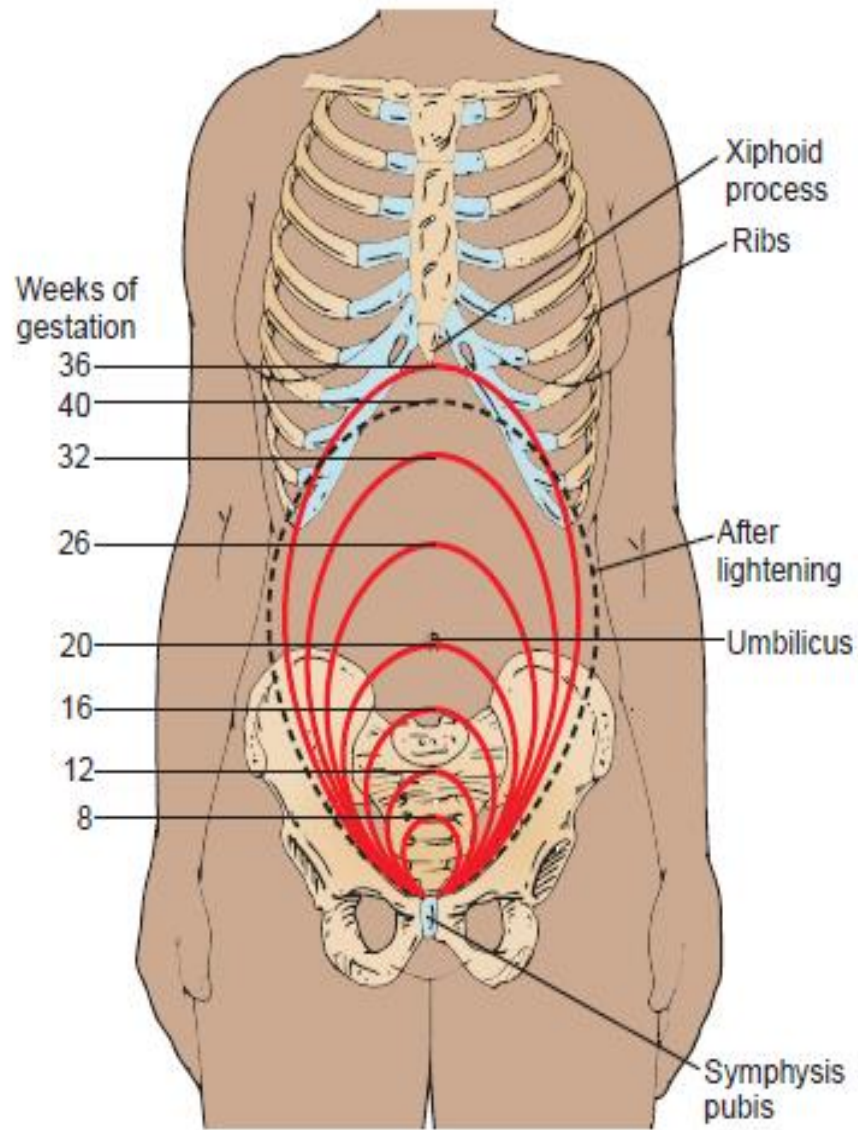
Physical and Psychologic Changes of Pregnancy

Learning Outcome 9-1

Identify the anatomic and physiologic changes that occur during pregnancy.

Anatomic and Physiologic Changes

- Uterus
 - Increased amounts of estrogen and growing fetus
 - Enlargement in size
 - Increase in weight, strength, elasticity, and vascularity
 - At term, the uterus weighs 1100–1200 g.



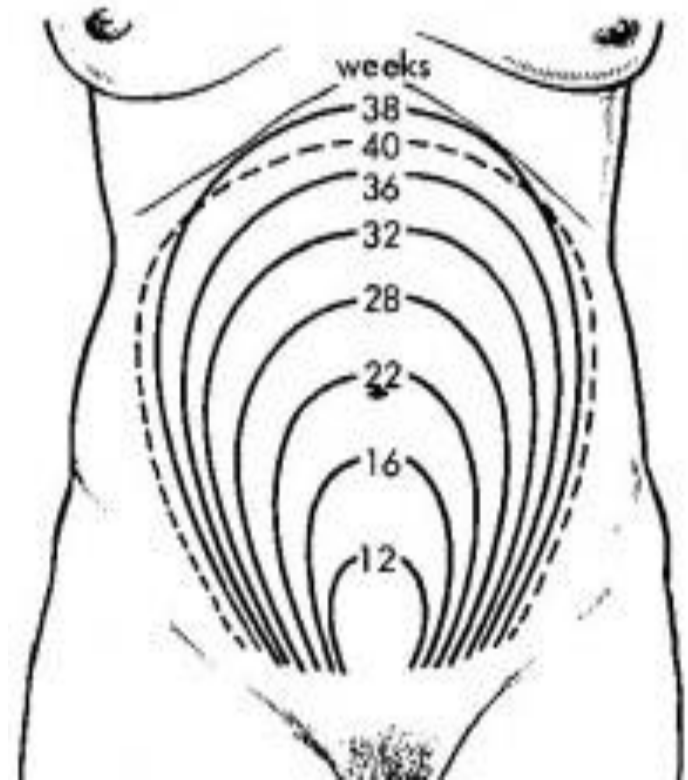
Uterus

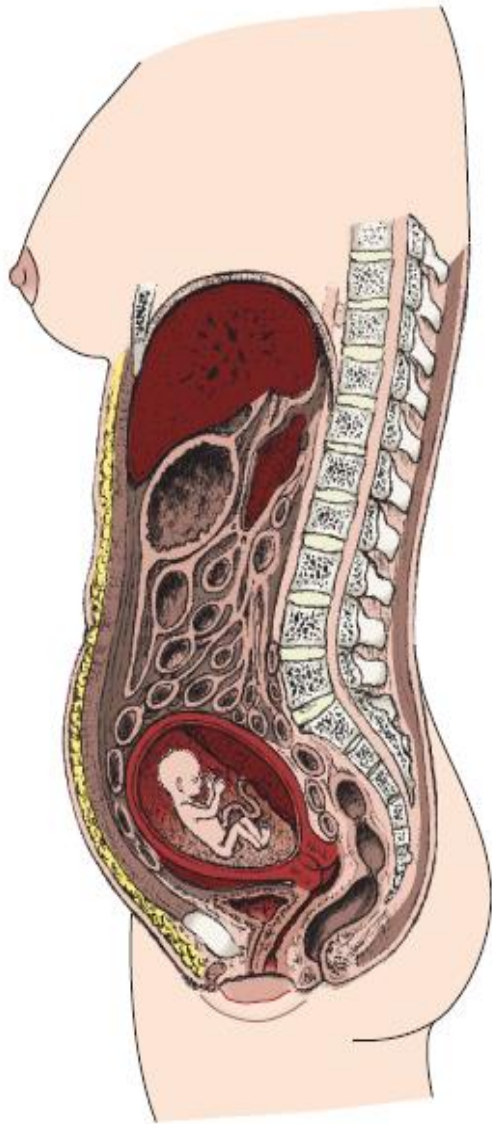
Uterine height:

At 12 weeks --→ at symphysis pubis

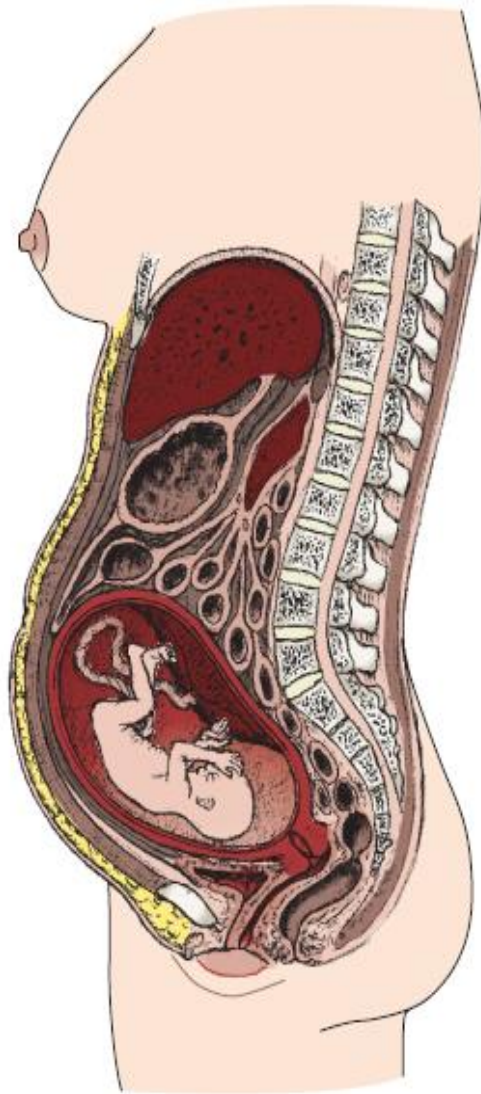
At 20-22 weeks --→ at UM level

At 36 or at 40 weeks when lightening occur --→ at level of xyphoid

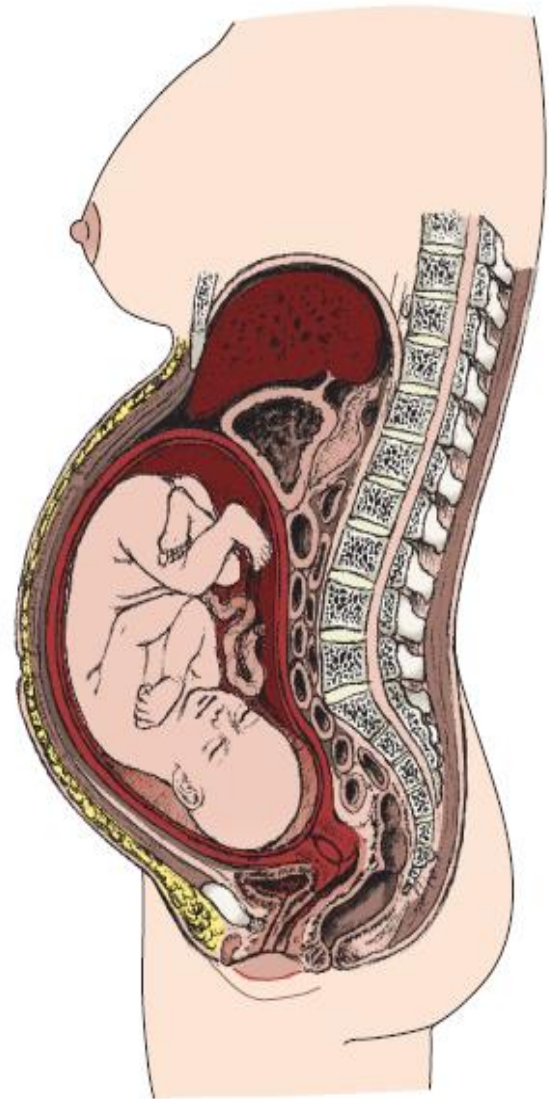




4 Months



6 Months



9 Months

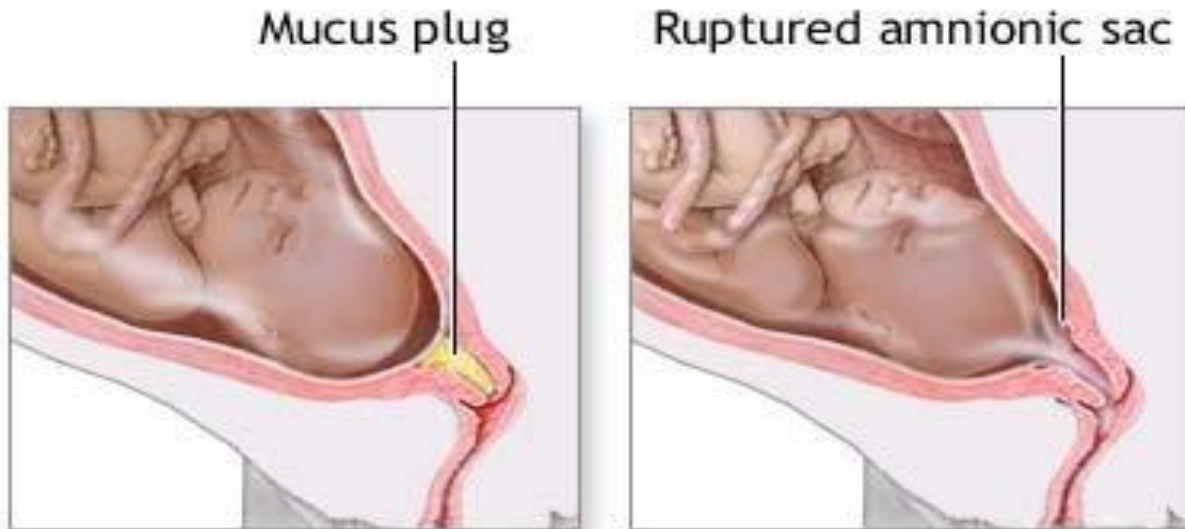
Anatomic and Physiologic Changes

- Cervix
 - Increased estrogen levels
 - Hyperplasia
 - Formation of mucous plug
 - Mucous plug prevents organisms entering uterus.
 - Mucous plug expelled when the cervix dilates.
 - Leukorrhea: an increase of vaginal discharge due to estrogen-induced hypertrophy of the vaginal glands

Anatomic and Physiologic Changes

- Cervix
 - ✓ Change color from pink to violet
 - ✓ Chadwick's sign: bluish discoloration
 - ✓ Increase vascularity, softness --→ Goodell's sign, hypertrophy of cervical glands

Plug of mucus



ADAM.

Anatomic and Physiologic Changes

- Vagina
 - Increased estrogen levels
 - Increased thickness of mucosa
 - Increased vaginal secretions to prevent bacterial infections (Leukorrhoea)
 - Connective tissue relaxes
 - Increased vaginal secretions → good media for *Candida albicans* yeast infection

Anatomic and Physiologic Changes

- Breasts
 - Increased estrogen & progesterone levels
 - Increase in size at 6-8 weeks of pregnancy
 - Breast become full, sensitive & tender
 - Nipples more erectile & areolas darken
 - Colostrum produced during third trimester

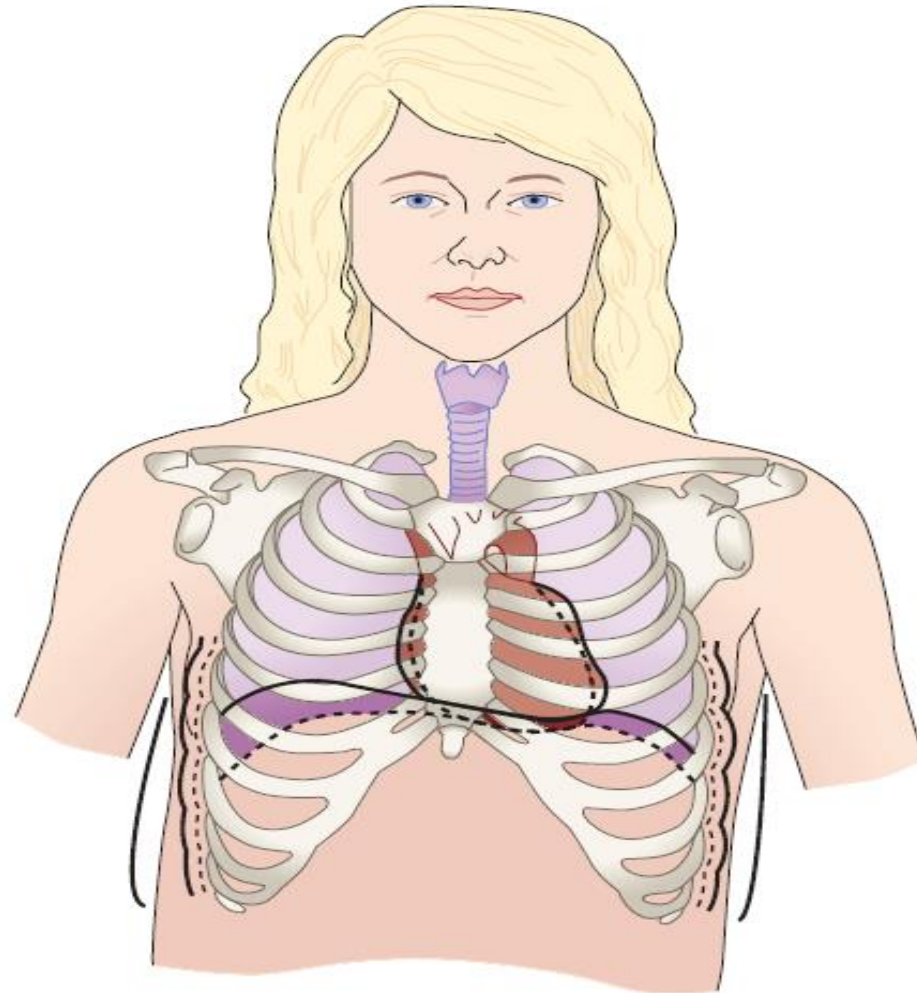
Anatomic and Physiologic Changes

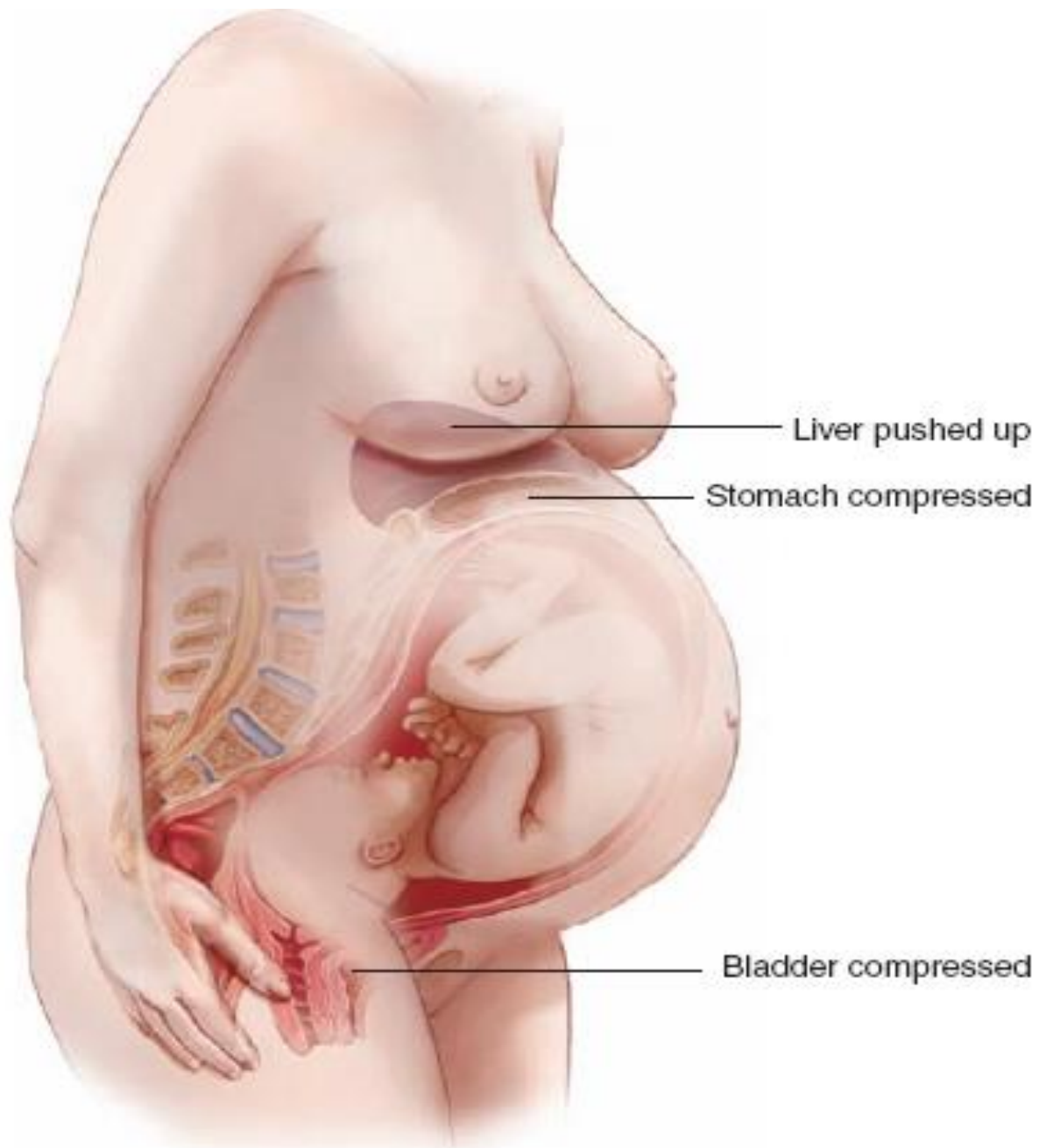
- Respiratory system
 - Increasing levels of progesterone causes:
 - Increased need for oxygen
 - Increased volume of breathed air each minute
 - Decreased airway resistance, allows a 15-20% increase of O₂ consumption
 - Thoracic breathing occurs as uterus enlarges

Anatomic and Physiologic Changes

- Respiratory system
- When uterus enlarges, it presses upward & elevates the diaphragm → subcostal angle increases → rib cage flares → Increased anteroposterior diameter & chest circumference expands by 6 cm → some hyperventilation/difficulty may occur
- Nasal stuffiness & epistaxis may occur due to estrogen-induced edema & vascular congestion

Changes in position of heart, lungs, and thoracic cage in pregnancy





Anatomic and Physiologic Changes

- Cardiovascular system
 - Increased levels of estrogen & progesterone
 - Cardiac output & blood volume increases at the 1st trimester until 30 weeks about 40-50% above pre-pregnant volume due to increase of erythrocytes and plasma
 - Increased size of uterus interferes with blood return from lower extremities
 - Increased level of red cells to increase oxygen delivery to cells

Anatomic and Physiologic Changes

- Cardiovascular system
 - ✓ Clotting factors increase
 - ✓ Pulse increase by 10-15 beats per minute
 - ✓ Blood pressure decrease slightly, lowest point during 2nd semester, then increases to near prepregnant levels by end of 3rd trimester → due to decrease in systemic vascular resistance (this decrease is not well understood),, but could be related to progesterone

Anatomic and Physiologic Changes

- GI system
 - Action of increasing levels of progesterone
 - Delayed gastric emptying
 - Decreased peristalsis
 - Enlargement of uterus displaces stomach upward & intestine posterior → smooth muscle relaxation → delay gastric emptying & decrease peristalsis → bloating & constipation
 - Relaxation of cardiac sphincter → heartburn

Anatomic and Physiologic Changes

GI system

- Relaxation of smooth muscles → Hemorrhoids are common due to increased venous pressure and are exacerbated by constipation
- Relaxation of smooth muscles & elevated level of cholesterol → delay in emptying gallbladder → predispose women to gallstone formation
- Gum tissue may soften & bleed
- Saliva secretion may increase, & may be excessive → ptyalism

Anatomic and Physiologic Changes

- GU system
 - Increased blood volume
 - Glomerular filtration rate increases by 50% starting from the 2nd trimester until birth
 - Renal tubular reabsorption increases due to kidney inability to reabsorb all glucose filtered by glomeruli → glycosuria may be normal or may indicate gestational diabetes

Anatomic and Physiologic Changes

- GU system
 - ✓ Enlargement of uterus → urinary frequency at 1st trimester
 - ✓ In 3rd trimester, presenting part descend to pelvis → press on bladder → reduce bladder capacity & irritates the bladder → urinary frequency

Anatomic and Physiologic Changes

- Skin and Hair
 - Increased skin pigmentation caused by increased estrogen & progesterone
 - Linea nigra: a pigmented line extends from pubic area to umbilicus or higher
 - Facial chloasma known as mask of pregnancy. Exposure to sun may darken pigmentation to develop Melasma
 - Sweat & sebaceous gland are hyperactive

Figure 9-2 Linea nigra. *Source: George Dodson/Lightworks Studio/Pearson Education.*



Anatomic and Physiologic Changes

- Skin and Hair
 - ✓ Striae gravidarum (stretch marks) reddish wavy streaks appear on abdomen, thighs, buttocks & breasts due to reduced connective tissue because of elevated adrenal steroid levels



Anatomic and Physiologic Changes

- Musculoskeletal
 - increase weight & change in center of gravity → change of posture, backache, & lordosis → abdominal muscle (rectus abdominis) may separate → diastasis recti → may cause pendulous abdomen after birth
 - Lordosis: Abnormal anterior curvature of the lumbar spine.

Anatomic and Physiologic Changes

Musculoskeletal

- Diastasis recti: this is the separation of the rectus abdominis muscle in the midline caused by the abdominal distention.
- It is a benign condition that can occur in the third trimester



Separation of the Rectus Abdominis
as the abdomen expands

source: stability & core concepts

Anatomic and Physiologic Changes

Musculoskeletal

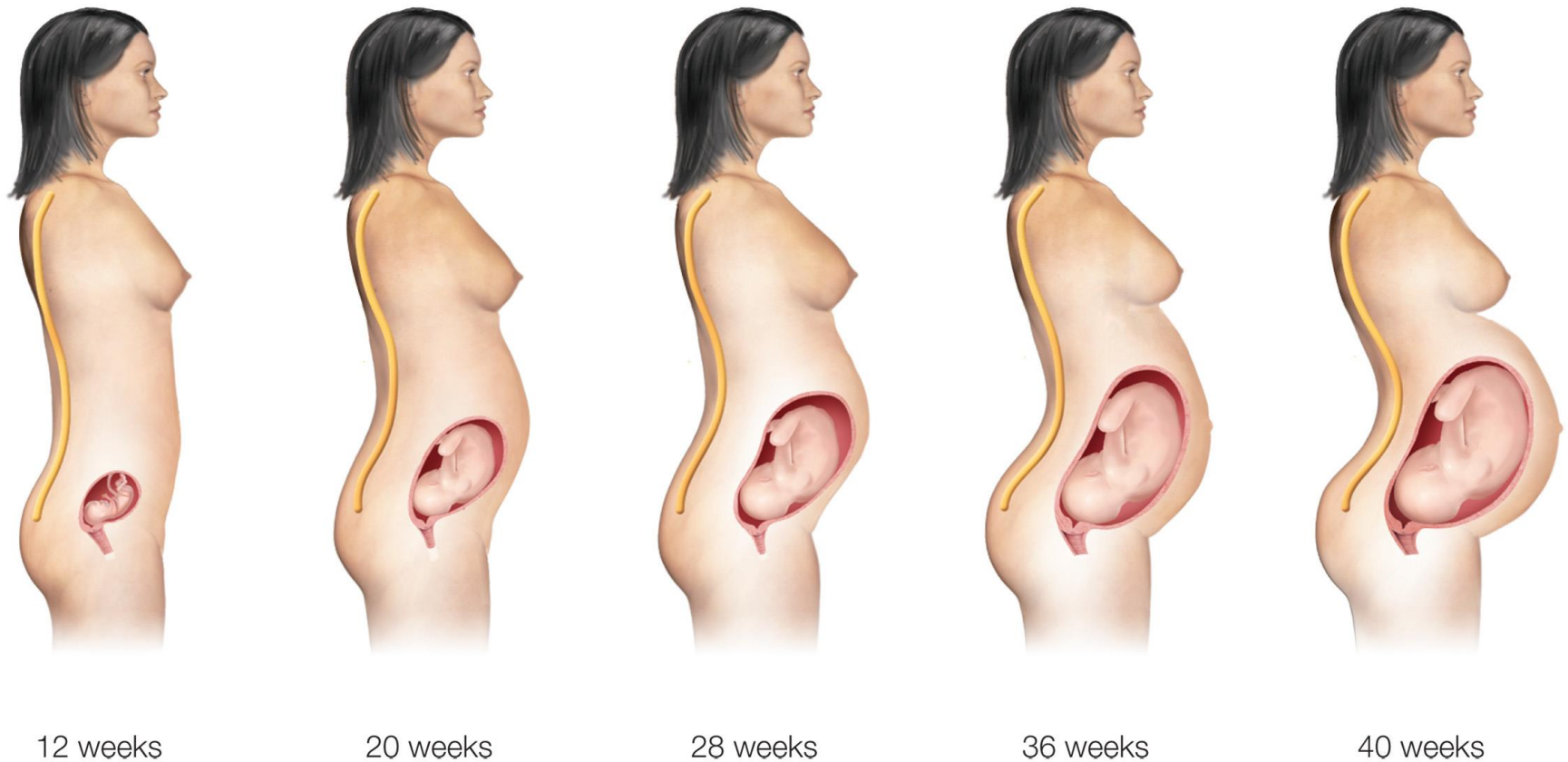
- Relaxation of joints caused by increased estrogen & progesterone → altered gait (waddling gait or pregnant waddle): joint mobility
- Lordosis: Abnormal anterior curvature of the lumbar spine.
- No changes in teeth during pregnancy

Anatomic and Physiologic Changes

Musculoskeletal

- Joint discomfort: Hormonal influences of progesterone and relaxin soften cartilage and connective tissue, leading to joint instability.
- Round ligament spasm: estrogen and relaxin increase elasticity and relaxation of ligaments, and abdominal distention stretches round ligaments causing spasm and pain.

Figure 9-3 Postural changes during pregnancy. Note the increasing lordosis of the lumbosacral spine and the increasing curvature of the thoracic area.



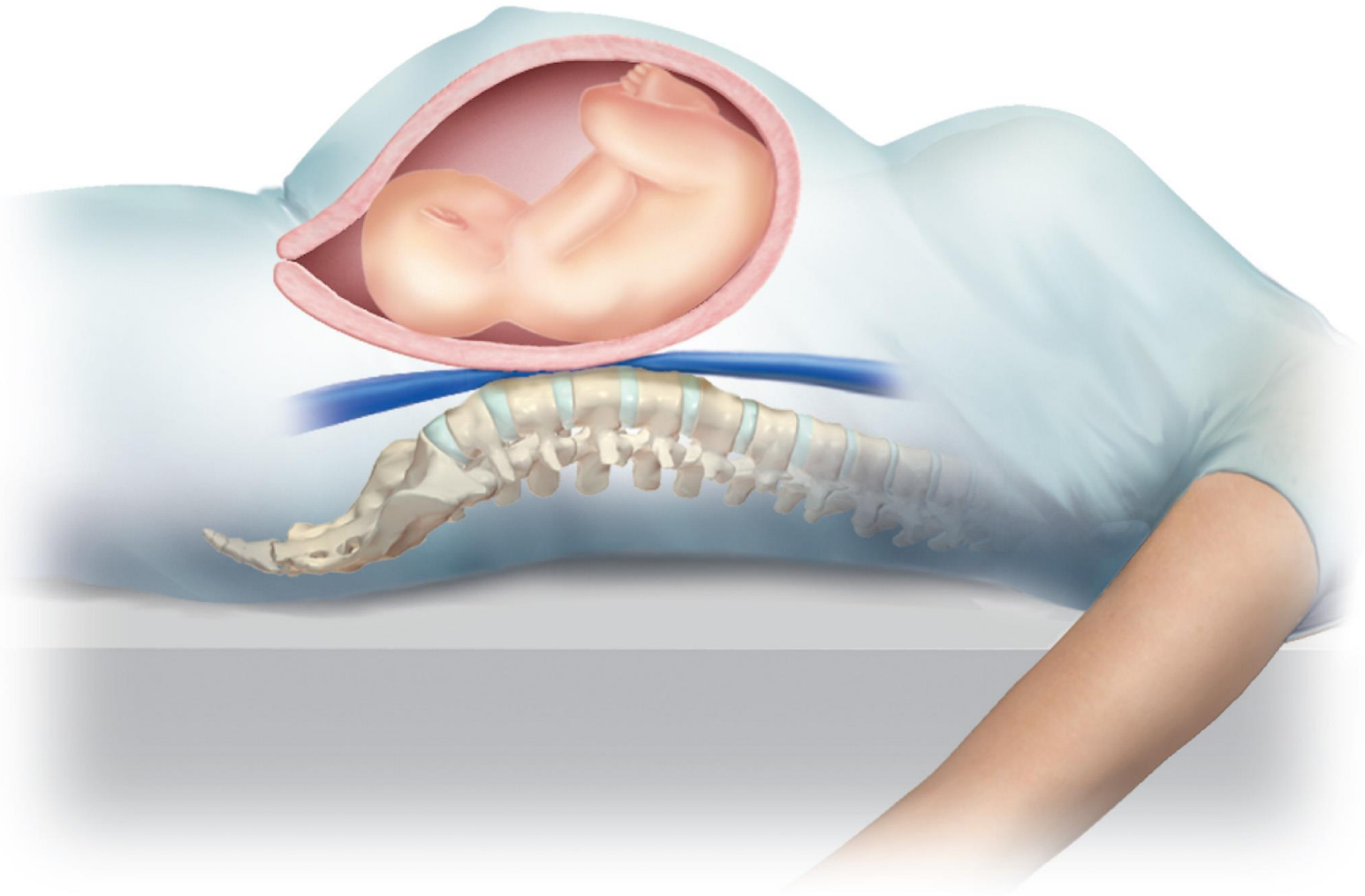
Anatomic and Physiologic Changes

- Central Nervous System
 - Decreased attention, concentration & memory
- Metabolism
 - Increased during pregnancy
 - Demands of the growing fetus & its support system

Anatomic and Physiologic Changes

- Weight Gain
 - Recommended 25 to 35 lb (11.4-15.9 kg)
 - 1.6-2.3 kg @1st trimester, 5.5-6.8 kg @ last 2 trimesters
 - Overweight, recommended gain is 15 lb (6.8 kg)
 - Underweight: May gain up to 40 lb (18 kg)

Figure 9-1 Supine hypotensive syndrome (vena caval syndrome). The gravid uterus compresses the vena cava when the woman is supine. This reduces the blood flow returning to the heart and may cause maternal hypotension.



Learning Outcome 9-2

Assess the subjective (presumptive), objective (probable), and diagnostic (positive) changes of pregnancy in patients.

Changes of Pregnancy

- Subjective (presumptive) changes
 - Amenorrhea: (Absence of menses) 1st signs alert the woman
 - Nausea & vomiting (morning sickness): common from week 2–12
 - Fatigue: feels drowsy
 - Urinary frequency
 - Breast changes: heaviness, tingling, tenderness, pigmentation of nipples & areola

Changes of Pregnancy

Subjective (presumptive) changes

- Quickening:
 - ✓ mother's recognition/perception of baby's movement
 - ✓ Usually between 18-20 weeks gestation in primigravidas & 14-16 weeks in multigravidas
- All of these changes could have causes outside of pregnancy and are not considered diagnostic

Table 9-1**Differential Diagnosis of
Pregnancy—Subjective Changes**

Subjective Changes	Possible Alternative Causes
Amenorrhea	<i>Endocrine factors:</i> early menopause; lactation; thyroid, pituitary, adrenal, ovarian dysfunction <i>Metabolic factors:</i> malnutrition, anemia, climatic changes, diabetes mellitus, degenerative disorders, long-distance running <i>Psychologic factors:</i> emotional shock, fear of pregnancy or sexually transmitted infection, intense desire for pregnancy (pseudocyesis), stress Obliteration of endometrial cavity by infection or curettage Systemic disease (acute or chronic), such as tuberculosis or malignancy
Nausea and vomiting	Gastrointestinal disorders Acute infections such as encephalitis Emotional disorders such as pseudocyesis or anorexia nervosa
Urinary frequency	Urinary tract infection Cystocele Pelvic tumors Urethral diverticula Emotional tension
Breast tenderness	Premenstrual tension Chronic cystic mastitis Pseudocyesis Hyperestrogenism
Quickening	Increased peristalsis Flatus ("gas") Abdominal muscle contractions Shifting of abdominal contents

Changes of Pregnancy

Objective (probable) changes:

- Objective signs of pregnancy & include all physiological & anatomical changes that can be perceived by the health care provider

Changes of Pregnancy

- Objective (probable) changes:
 - Goodell's: softening of the cervix @ 8 weeks of pregnancy, normally cervix is quit firm with increased leukorrheal discharge.
 - Chadwick's sign: dark bluish or purplish discoloration of cervix, vagina & mucus membranes due to pelvis vascularity, congestion & estrogen. Can be seen at 6-8 weeks.

Changes of Pregnancy

- Objective (probable) changes:
 - Hegar's: softening of the lower uterine segment, palpated @ 6 weeks
 - McDonald's sign: flexing of body of uterus against the cervix
 - Enlargement of the abdomen due to uterine and abdominal growth

Chadwick's sign

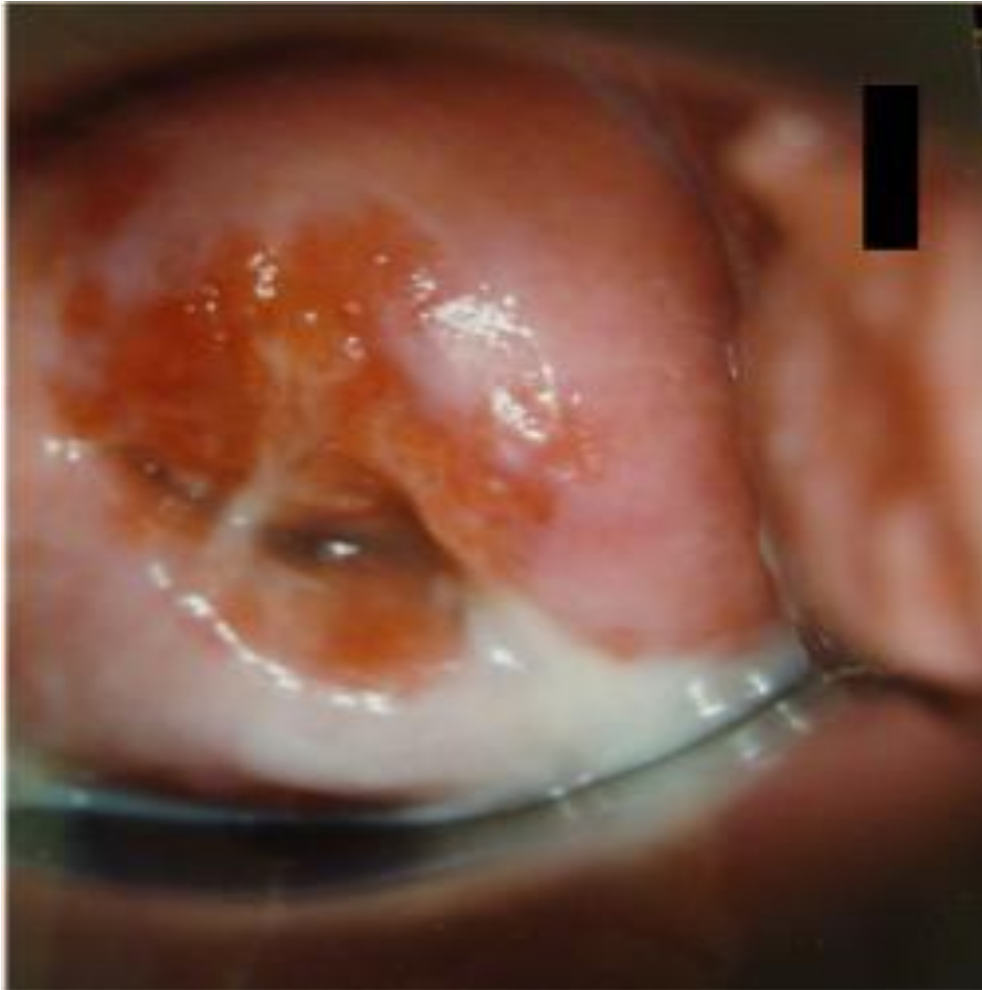
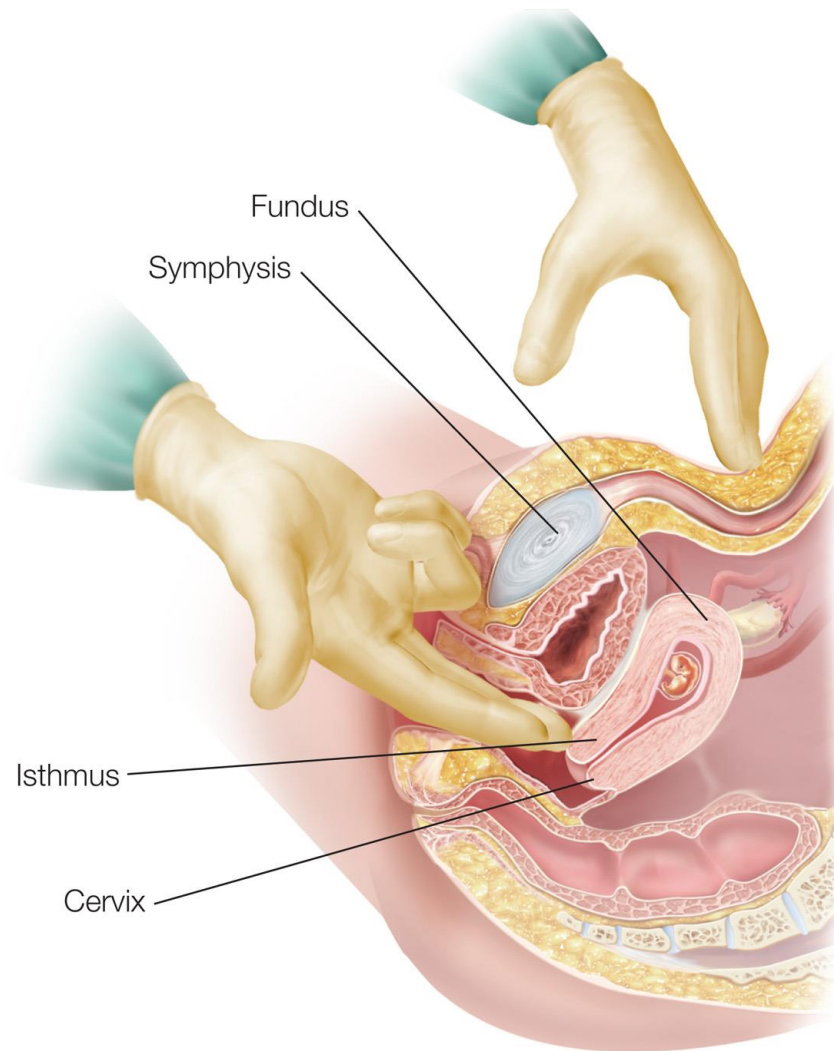


Figure 9-4 The presence of Hegar's sign, which is a softening of the isthmus of the uterus, can be determined by the examiner during a vaginal examination.



Changes of Pregnancy

- Objective (probable) changes
 - Braxton Hicks contractions: periodic uterine tightening. Irregular uterine contractions, painless, begin early in pregnancy & may increase by 7th month
 - Uterine soufflé: heard by auscultation. A soft blowing sound occurs at the same rate of maternal pulse, caused by increased uterine blood flow & blood pulsating through the placenta

Changes of Pregnancy

Objective (probable) changes

- Skin pigmentation changes (chloasma), also referred to as the mask of pregnancy: Brownish pigmentation over the forehead, temples, cheek, and/or upper lip

Chloasma: “mask of pregnancy”



Changes of Pregnancy

Objective (probable) changes

- **Ballottement:** A light tap of the examining finger on the cervix causes fetus to rise in the amniotic fluid and then rebound to its original position; occurs at 16–18 weeks
- **Pregnancy tests:** 90-98% accurate based on the presence of B-HCG hormone

Ballottement's sign

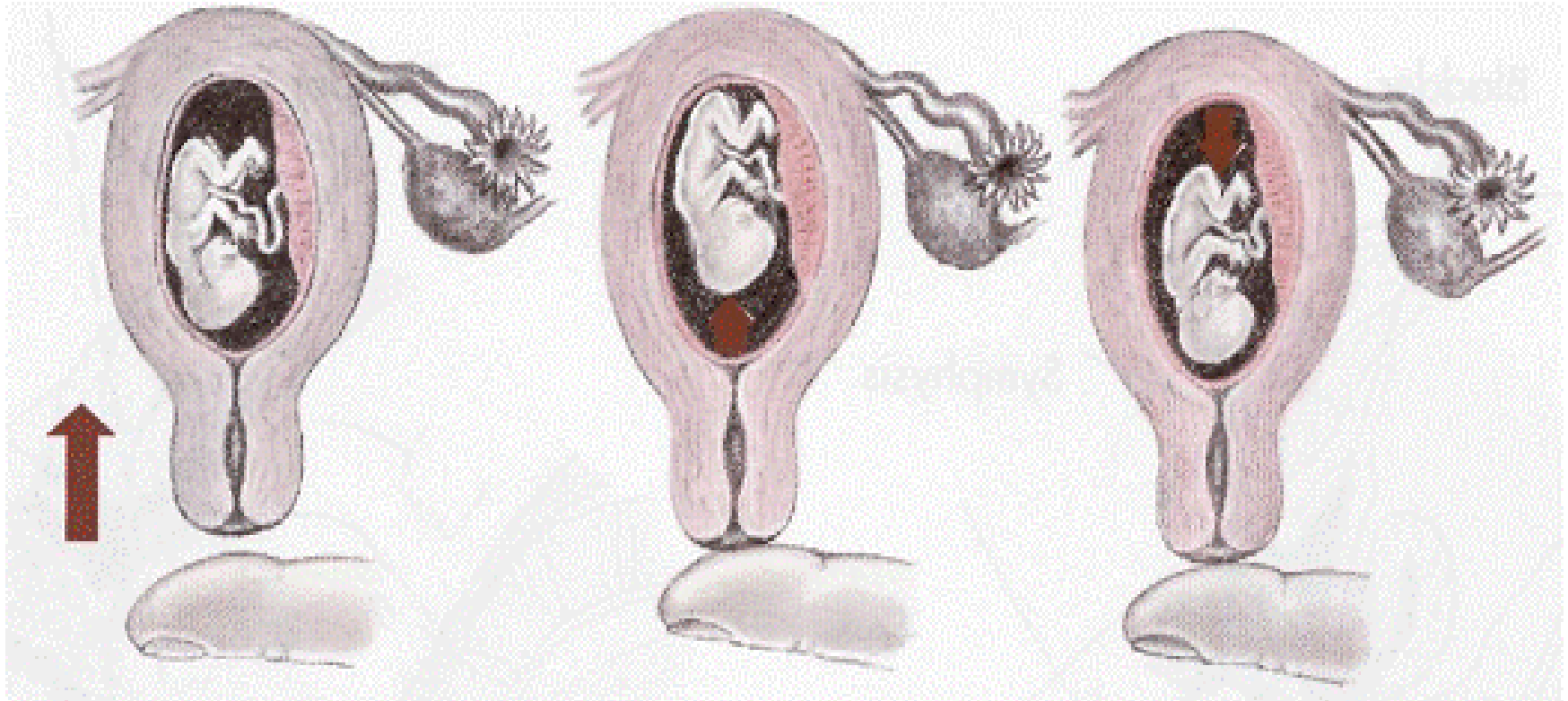


Table 9–2**Differential Diagnosis of
Pregnancy—Objective Changes**

Objective Changes	Possible Alternative Causes
Changes in pelvic organs: Goodell's sign Chadwick's sign Hegar's sign Uterine enlargement	Increased vascular congestion Estrogen-progestin oral contraceptives Vulvar, vaginal, cervical hyperemia Excessively soft walls of nonpregnant uterus Uterine tumors
Enlargement of abdomen	Obesity, ascites, pelvic tumors
Braxton Hicks contractions	Hematometra, pedunculated, submucous, and soft myomas
Uterine souffle	Large uterine myomas, large ovarian tumors, or any condition with greatly increased uterine blood flow
Pigmentation of skin: Chloasma (melasma) Linea nigra Nipples/areolae	Estrogen-progestin oral contraceptives Melanocyte hormonal stimulation
Abdominal striae	Obesity, pelvic tumor
Ballottement	Uterine tumors/polyps, ascites
Positive pregnancy test	Increased pituitary gonadotropins at menopause, choriocarcinoma, hydatidiform mole
Palpation for fetal outline	Uterine myomas

Changes of Pregnancy

- Diagnostic (positive) changes
 - Fetal heartbeat can be auscultated @ 10-12 weeks
 - Fetal movement can observed & palpated by examiner @ 20 weeks
 - Sonographic visualization of the fetus: cardiac movement noted # 4-8 weeks



a fetoscope



Learning Outcome 9-3

Contrast the various types of pregnancy tests.

Pregnancy Tests

- Urine tests
 - Hemagglutination-inhibition test (Pregnosticon R test)
 - Latex agglutination test (Gravindex and Pregnosticon Slide tests)
 - The two tests are done on first early morning urine specimen as it will be adequately concentrated

Pregnancy Tests

- Urine tests
 - Positive within 10 to 14 days after the first missed period
 - Detect hCG during early pregnancy

Pregnancy Tests

- Several pregnancy tests are done on maternal serum, such as:
- Serum tests
 - β -subunit radioimmunoassay: Positive a few days after presumed implantation
 - Immunoradiometric assay (IRMA) (Neocept, Pregnosis); requires only about 30 minutes to perform

Pregnancy Tests

- Serum tests
 - Enzyme-linked immunosorbent assay (ELISA) (Model Sensichrome, Quest Confidot)
 - Detects hCG levels as early as 7 to 9 days after ovulation and conception, 5 days before the first missed period
 - Fluoroimmunoassay (FIA) (Opus hCG, Stratus hCG); takes about 2 to 3 hours

Pregnancy Tests

- Over-the-counter pregnancy tests
 - Enzyme immunoassay tests
 - Performed on urine
 - Sensitive
 - Detect even low levels of hCG
 - Instructions must be followed carefully
- Negative result, test may be repeated in 1 week if period has not occurred

Learning Outcome 9-4

Examine the emotional and psychologic changes that commonly occur in a woman, her partner, and her family during pregnancy when providing nursing care.

Mother's Emotional and Psychologic Changes

Self Learning 😊

END