

- 1  **Unit 2**  
**Biopsychosocial Concepts**  
Chapter 6  
The Fetal Period
- 2  **Prenatal Development**
  - ◆ Weeks 9 through 12
    - ✓ Head 1/2 total length of fetus
    - ✓ Intestinal contents enter abdomen
    - ✓ Fetus begins producing urine and excretes it into the amniotic fluid
    - ✓ Fetal gender can be determined by the end of this period
- 3  **Prenatal Development**
  - ◆ Weeks 13 through 16
    - ✓ Fetus grows rapidly in length
    - ✓ Movements strengthen enough for some women to detect...*quickenings*
    - ✓ Face looks human, eyes and ears positioned
- 4  **Prenatal Development**
  - ◆ Weeks 17 through 20
    - ✓ Changes in hair and skin
    - ✓ Vernix caseosa: fatty, cheese like substance secreted by fetal sebaceous glands
    - ✓ Lanugo: fine hair covers the fetal body
    - ✓ Brown fat: heat producing fat, located on the back of the neck, behind the sternum, and around the kidneys
- 5  **Prenatal Development**
  - ◆ Weeks 21 through 24
    - ✓ Minimal subQ fat
    - ✓ Skin translucent and red
    - ✓ Lungs begin to produce surfactant: a surface active lipid substance, reduces surface tension in the lung alveoli and prevents them from collapsing
    - ✓ Capillary network still immature
    - ✓ Fetus less likely to survive if delivered at this gestation
- 6  **Prenatal Development**
  - ◆ Weeks 25 through 28
    - ✓ Fetus more likely to survive as maturation of lungs, pulmonary capillaries, and CNS
    - ✓ Blood formation shifts from spleen to bone marrow
    - ✓ Eyes reopen
    - ✓ Usually assume a head down position
- 7  **Prenatal Development**
  - ◆ Weeks 29 through 32
    - ✓ Skin is pigmented according to race
    - ✓ Toenails and finger nails present
    - ✓ Fetus has more subQ fat

- ✓ Good chance of survival if delivered at this gestation

## 8 Prenatal Development

### ◆ Weeks 33 through 38

- ✓ Growth continues, but slows as the fetus reaches full term
- ✓ Primarily gaining weight
- ✓ Pulmonary system matures
- ✓ Large amount subQ fat
- ✓ Vernix and lanugo diminish
- ✓ Testes descend

## 9 Auxiliary Structures

### The Placenta

#### ◆ Maternal Side:

- ♥ Endometrial cell changes provide nutrition to the embryo and develop into the decidua
- ♥ Exchange of substances occurs within the intervillous space
- ♥ Requires circulation of 450 to 750ml per minute for perfusion
- ♥ Oxygenated and nutrient rich blood flows through 80-100 spiral arteries to the chorionic villi containing fetal vessels then returns to the maternal circulation through endometrial veins for elimination of fetal waste products

## 10 Auxiliary Structures

### The Placenta

#### ◆ Fetal Side:

- ⊗ Develops from trophoblasts simultaneously with the embryo
- ⊗ Blood is transported from the fetus to the fetal side of the placenta by two umbilical arteries and one umbilical vein
- ⊗ Blood is circulated to and from the fetal side of the placenta by the fetal heart

## 11 Auxiliary Structures

### The Placenta

- ◆ Produces glycogen, cholesterol, and fatty acids
- ◆ Exchange of oxygen, nutrients, and waste products
- ◆ Gas exchange: O<sub>2</sub> and CO<sub>2</sub>
  - Fetal HGB carries 20-50% more O<sub>2</sub>
  - ↑ O<sub>2</sub> carrying capacity, ↑ HGB/HCT
  - HGB carries more O<sub>2</sub> at low PCO<sub>2</sub> levels

## 12 Auxiliary Structures

### The Placenta

- ◆ IgG provides passive immunity against diseases
- ◆ Placental hormones:
  - Estrogen
  - Progesterone
  - HPL Human Placental Lactogen

13  **Fetal Membranes and Amniotic Fluid**

- ◆ Amnion: inner membrane
- ◆ Chorion: outer membrane
- ◆ Amniotic fluid provides protection and is necessary for normal prenatal development
  - Cushions
  - Temperature
  - Symmetric development
  - Protects fetal parts
  - Room and buoyancy

14  **Fetal Membranes and Amniotic Fluid**

- ◆ Sources: Fetal urine and fluid transported by maternal blood
- ◆ Volume: 700-800ml @ term
- ◆ Oligohydramnios: less than 50% expected
- ◆ Hydramnios (polyhydramnios): excessive fluid, may exceed 2000ml

15  **Fetal Circulation**

- ◆ Umbilical cord
  - o Two arteries carry deoxygenated blood and waste away from fetus
  - o One vein to carry oxygenated and nutrient rich blood to the fetus
  - o Wharton's jelly: cushions cord from compression

16  **Fetal Circulation**

- ◆ Fetal circulatory circuit
  - ♥ Ductus venosus
  - ♥ Foramen ovale
  - ♥ Ductus arteriosus
  - ♥ Bypasses lungs and liver during fetal life and sends high oxygen rich blood to brain and fetal heart