UNIT 6: PHYSIOLOGY
Chapter 30: Respiratory and Circulatory Systems

I. Respiratory and Circulatory Functions (30.1)

A. The respiratory and circulatory systems work together to maintain _______________

1. Every cell in body needs ____________ and ______________ to function

   a. Circulatory system- transports blood and other materials vital to the cells and carries away ______________

   b. Respiratory system- _______ exchange takes place (pick up ___________ and get rid of carbon dioxide)

2. Two systems work together to maintain homeostasis

B. The respiratory system moves gases into and out of the __________

1. Functions to bring _____ into body and to expel _____ and _________________

2. Respiratory system consists of specialized structures

   a. nose and mouth- __________ points.

      1). nose ___________ and __________ the air

      2). Tiny hairs (__________) and __________ help filter dust and pathogens from air

   b. ______________- “windpipe” (tube to lungs)

      1). ______________ open and closes to keep food or saliva from entering the airway

      2). Branches divides into two ____________ leading to each lung

   c. __________ - organ that absorbs O₂ from air

      1). Bronchi _________ into tiny bronchioles

      2). __________ - clusters of tiny sacs where gas exchange takes place
C. The **circulatory system** moves blood to all parts of the body

1. Functions to transport $O_2$ and _________ to body cells and carry **oxygen poor blood** and $CO_2$ back to the _________ and _________

2. Main parts of system are **heart**, **blood**, and **blood vessels**

   a. **Heart**- muscular _________

   b. **Blood**- circulates through a _________ system

      1). About ___ liters

      2). Takes about ____ seconds for round trip

   c. **Blood vessels**- _____ types

      1). **Arteries**- carries blood _________ from heart (oxygen _________)

      2). **Veins**- carries blood _________ to heart (oxygen _________)

      3). **Capillaries**- smallest vessels where materials can _________ into and out of cells

3. **Circulatory system** performs two other important functions to maintain **homeostasis**

**Diagram:**
- Sinuses
- Pharynx
- Larynx
- Trachea
- Bronchial tube
- Lung
- Bronchiole
- Alveoli

**Label:**
- Dome-shaped muscle at base of rib cage that allows lungs to expand and contract
a. Collects waste materials produced by_________ and ___________ and delivers to kidneys and liver to be filtered out of blood

b. Helps maintain body__________ by distributing ________ produced by muscles and internal organs

II. Respiration and Gas Exchange (30.2)

A. Gas ______________ occurs in the alveoli of the lungs

1. O₂ and CO₂ move in and out of blood by ____________

2. Red blood cells contain ____________ that carries O₂

3). Gas exchange regulated by ____________ system (brain stem)

B. Respiratory diseases interfere with ______ exchange

1. Emphysema- caused mainly by ____________ and destroys ____________.

2. Asthma- causes bronchioles to ____________ due to muscle spasms. Can be triggered by allergies, stress, exposure to smoke and chemicals or exercise.

III. The Heart and Circulation (30.3)

A. The tissues and structures of the heart make it an efficient _______

1. Consists of four ______________

   a. ___________ - right and left sides (smaller chambers)

   b. _______________ - right and left sides (larger chambers)

   c. Valves- flaps of tissue that prevent blood from flowing ______________

2. Heartbeat consists of two ______________

   a. Starts in _________ and then _____________

   b. _______________ - group of cells that generates electrical signal that starts contractions
3. Blood flow in heart
   
a. Oxygen ________ blood enters right atrium and pumped into right ventricle
   
b. **Right ventricle** pumps blood to _______ for gas exchange
   
c. Returns to left _________ and pumped to left ventricle
   
d. **Left ventricle** pumps blood to rest of _______ (this is the largest chamber)
   
B. The heart pumps blood through two main ______________

   1. **Pulmonary circulation**- between ________ and ________
   
   2. ________________ circulation- between heart and rest of body

IV. Blood Vessels and Transport (30.4)

A. Arteries, veins, and capillaries transport blood to all parts of the body

   1. **Arteries**- __________ and ____________ because blood under great pressure

      a. surrounded by layer of smooth __________ and elastic fibers

      b. Pumping heart moves blood

   2. **Veins**- large diameter but thinner walls because under less ____________.

      a. Skeletal ____________ help maintain circulation

      b. Contain __________ that keep blood from moving backwards

   3. **Capillaries**- thin walled to allow ____________ of gases.
B. Blood pressure- ___________ with which blood pushes against wall of an artery (E.g. 120/70)

1. _____________ pressure (top, higher number)- pressure when ventricle contracts

2. _____________ pressure (bottom, smaller number)- pressure when ventricle relaxes

**Blood pressure is the measurement of force applied to artery walls**

3. Blood pressure depends on how ___________ and ______________ the arteries are and strength of heart contractions

4. High blood pressure (________________) can lead to heart attack or stroke

C. **Lifestyle** plays a key role in circulatory ______________

1. Increased _______ of developing circulatory disease with: smoking, lack of exercise, excessive weight, long-term stress, diet high in saturated fats

2. **Arteriosclerosis**- artery walls become _______ and _______________

3. **Artherosclerosis**- blood flow partially or fully blocked by sticky material called ______________

V. Blood (30.5)

A. Blood is composed mainly of cells, cell fragments, and plasma

1. **Blood cells**- includes _______ and _______ blood cells as well as **platelets** (cell _______________)
a. Produced in _______ _____________

b. Each has specialized shape and function

2. Plasma- mostly ___________ and includes many types of molecules that help maintain homeostasis

Artery

White blood cells

Platelets

Red blood cell

B. ABO Blood Groups and Rh Factors

1. Red blood cells have surface ___________ markers that define your blood type

2. Important if you give or receive blood ___________

C. Platelets and blood clotting

1. Platelets are cell fragments that help form _______ that control ______________

2. Example of ______________ feedback mechanism

3. ________________ is genetic disorder in which key clotting factor is missing

VI. Lymphatic System (30.6)

A. Lymph is collected from ___________ and returned to the circulatory system

1. Lymphatic system- complex network of _________, vessels, and ___________ throughout the body
a. **Collects** excess _______ that leaks out of blood

b. ___________ fluid to remove dead cells and microorganisms

c. **Returns** cleaned fluid to circulatory system

2. **Lymph** (fluid) is transported in vessels and collects in ___________ (small rounded structures) that filter and trap bacteria, viruses, fungi, and cell fragments

B. The lymphatic system is a major part of the ____________ system

1. **Tonsils, thymus**, and ___________ also function as part of immune system

2. Function to help body _________ itself

3. Help _________ pathogens and produce special white blood cells called ________________ that attack pathogens