Ch13 – Cardiovascular Notes

Cardiovascular system = _____ system

- Function: _____ to and from cells
- Structure: Heart, blood vessels, and blood

Heart Anatomy

- Size: person's _____
- Location: within _____ and medial to _____
- Parts: _____ (pointed part of heart that rests on diaphragm)
  _____ (posterosuperior aspect of heart)
- Chambers:
  - _____ (atrium) – receiving chambers
  - Interatrial septum – separates atria
  - _____ – discharging, contracting chambers
  - Interventricular septum – separates ventricles
- Serous Membranes:
  - _____ (epicardium) – touches external surface of heart
  - _____ – attaches to surrounding cavity
- Heart Walls:
  - Epicardium – _____ layer of heart
  - Myocardium – middle layer that is made up of muscle and _____
  - Endocardium – _____ layer that lines chambers of heart and is continuous with walls of blood vessels

Blood Vessel Anatomy

- Layers (outside to inside): tunica externa, tunica media (_____), tunica interna
- Arteries
  - Function: carries blood _____ the heart
  - Structure: has _____ layer of smooth muscle to withstand _____ pressures and _____
- Arterioles
  - Smaller and thinner than arteries
- Capillaries
  - Function: site of _____ from blood to body cells
  - Structure: _____ diameter blood vessel, one cell layer thick, large _____ because they are the most numerous blood vessel
- Venules
  - Smaller and thinner than veins
- Veins
  - Function: carries blood _____ the heart
  - Structure: thin layer of smooth muscle because they are _____ pressure vessels, contains _____ for movement back to heart,
  - _____ contractions help with venous return

Heart is a Double Pump

Pulmonary Circuit Steps

- Right side of heart works as _____ (lung) circuit pump
- Right atria receives oxygen _____ blood from superior and inferior vena cava
- Blood spills into right ventricle and _____ contracts
- Blood is pumped out through the right and left pulmonary _____, then through arterioles
- Blood is carried to _____ where they receive oxygen and unload carbon dioxide
- Oxygen _____ blood drains into venules and then to the _____ atria through the pulmonary _____

Systemic Circulation Steps

- Left atria receives oxygen rich blood from the lungs
- Blood spills into the left _____ and atria contracts
- Blood is pumped out through the _____ when the ventricle contracts
- Blood travels from aorta to a series of smaller _____, then to arterioles
- When arteries reach the outermost tissues they form _____
- Capillaries connect arteries (arterioles) and veins (venules) and this is where _____ is released from the blood
- Venules and then _____ carry oxygen poor blood from the bodies tissues back to the heart through the superior and inferior _____

Four Valves of Heart – allows blood to flow in only _____ direction through the heart

- Atrioventricular (_____) valves – between atria and ventricle on each side
  - Prevent _____ into atria when ventricles contract
  - Left AV valve – _____ (mitral) valve
    - 2 flaps of endocardium
  - Right AV valve – _____ valve
    - 3 flaps
  - Chordae tendineae – "_____"
    - Anchor cusps or flaps to walls of ventricles
    - Tighten when valve closes

- _____ valves – guards bases of two large arteries leaving ventricular chambers
  - Pulmonary and Aortic semilunar valves
  - ____ cusps or flaps
  - _____ when ventricles contract and _____ when ventricles relax to prevent backflow into the heart

- Difference between valves
  - AV valves open during heart relaxation and semilunar are closed curing relaxation

Disorders

- Angina pectoris – _____
  - Heart beats at a rapid rate, myocardium does not receive adequate supply of oxygen
  - Heart cells can become deprived of oxygen resulting in a crushing chest pain
- Angina pectoris can lead to _____ (heart attack or coronary) – part of cardiac muscle dies off and no longer functions

Physiology of the Heart

Conduction System = pathway that _____ take to stimulate the contraction of the cardiac muscle

- Contract spontaneously and _____

Two types of controlling systems

1. Autonomic nervous system – acts as the brakes and accelerators to increase or decrease the heart rate
2. _____ – built into the heart tissue
    a. Sinoatrial node (_____) – located in right atrium
        i. _____ – starts each heartbeat
        ii. Sends signal to AV node and to left atrium
    b. Atrioventricular node (_____) – located at junction between of the atria and ventricles
    c. Atrioventricular bundle (_____) – located in Interventricular septum
    d. _____ – located within in the muscle of the ventricle walls

Electrocardiography – clinical procedure for mapping the electrical signal of the heart

1. _____ – atrial depolarization
2. _____ – ventricular depolarization and atrial repolarization (hidden by big wave)
3. _____ – ventricular repolarization

Cardiac Cycle – events of one complete heartbeat in which both atria and ventricles contract and relax

- Heart beats about _____ times per minutes – each cycle is 0.8 seconds

Blood pressure (BP) – pressure blood exerts against _____ of blood vessels

- _____ – pressure of contraction of ventricles
- _____ – pressure of relaxation of ventricles

- Typical BP for a healthy person is _____ mmHg

Pulse – the _____ of the arteries as blood passes

- Typical resting pulse is 60-100 beats per minute (BPM)

Heart Sounds

- Lub-Dup
- Lub = closing of _____ valve
    - Louder and longer
- Dup = closing of _____ valve
    - Short and sharp

Cardiac Output (CO) – amount of _____ pumped out by each side of the heart in 1 minute

- CO = _____ and _____
- CO = HR (75 beats/min) X SV (70 mL/beat)

Stroke volume – volume of blood pumped out by a ventricle with each _____

- Entire blood supply passes through heart about once per minute

Regulation of Stroke Volume

- SV rises or falls with volume of _____
- About 60% of blood that enters the heart is pumped out
- SV = how much the heart muscles are _____ before contraction

Regulation of Heart Rate

- HR influenced by:
  - Nerves of _____ nervous system
  - Nerves of parasympathetic nervous system
  - _____ and other chemicals
  - _____ levels in blood

Disorders

- Congestive heart failure – when pumping efficiency of heart is depressed so that _____ can not meet tissue needs
  - Caused by coronary atherosclerosis (clogging of coronary vessels), high blood pressure, or multiple myocardial infarctions

Special Types of Circulation

Coronary Circulation – how heart gets blood

- Right and left _____ arteries branch from aorta and encircle heart
- Brings oxygen and nutrients to heart cells
- _____ drained by cardiac veins, which dumps the oxygen poor blood directly into the right _____

Circle of Willis

- Two arteries connect to form a _____ in the brain
  - Allows for blood to continue to circulate when there are _____ and helps regulate _____ in the brain