UNIT 4 CHAPTER 5

The Circulatory System

OBJECTIVES

- To describe the anatomy and physiology of the heart.
- To compare and contrast the three types of blood vessels and describe the function of each.
- To identify the major components of blood.
- To describe the pulmonary, systemic and coronary circulations.
- To recognize, define, spell and pronounce the terms related to the cardiovascular system.

FUNCTIONS OF THE CARDIOVASCULAR SYSTEM

This system is a transport system.

Blood transports nutrients and oxygen to all body tissues and picks up waste to be excreted.

The heart pumps the blood and the vessels carry it through the body.

THE THREE MAJOR STRUCTURES OF THE CARDIOVASCULAR SYSTEM

Heart

Blood Vessels

Blood

UNIT 5 VOCABULARY-HEART

Define and locate on diagram

- **coronary arteries and veins**: blood vessels that supply the heart muscle with blood
- <u>atria</u>: 2 upper chambers of the heart
- interatrial septum: the muscular wall that separates the right and left atria
- ventricles: the two lower chambers of the heart
- interventricular septum: the muscular wall that separates the right and left ventricles
- cardiac apex: the lower tip or point of the heart
- tricuspid valve: the valve that separates the right atrium from the right ventricle
- pulmonary semilunar valve: the valve that separates the right ventricle from the pulmonary arteries
- **mitral/bicuspid valve**: the valve that separates the left atrium from the left ventricle
- **aortic semilunar valve**: the valve that separates the left ventricle from the aorta
- systemic circulation: the blood flow outside of the heart and lungs. (to and from the cells) Includes the arteries, arterioles, veins, venules and capillaries
- cardiopulmonary circulation: Blood flow to and from the heart and lungs.
- **sinoatrial node**: the natural pacemaker of the heart.

THE EXTERIOR OF THE HEART



CROSS-SECTION OF THE HEART



VOCABULARY-BLOOD VESSELS

BLOOD VESSELS

- **artery**: blood vessel that carries blood away from the heart
- Aorta: the largest artery in the body. (ascending and descending portions)
- arterioles: small arteries
- **capillaries:** microscopic blood vessels where gas and nutrient exchange occurs
- **veins**: blood vessel that carries blood toward the heart
- venules: small veins
- Vena Cava: the largest vein in the body (superior and inferior portions)

ARTERIES AND VEINS



Arteries are vessels that carry blood away from the heart. The largest is the aorta. Small arteries are called arterioles.



Veins are vessels that carry blood toward the heart. The largest are the vena cavae. Small veins are called venules



Capillaries are microscopic vessels where gas exchange occurs



VOCABULARY- BLOOD

plasma: liquid portion, makes up 55%

erythrocytes: red blood cells

hemoglobin: protein on red blood cells that carries oxygen

Ieukocytes: white blood cells (fight infection)

thrombocytes: platelets (clotting cells)

4 MAIN COMPONENTS OF BLOOD



3 TYPES OF CIRCULATION

Cardiopulmonary Circulation

Blood flow between the heart and lungs. Blood enters heart with low oxygen levels. Heart sends blood to lungs where it picks up oxygen. Blood goes back to heart to be pumped to body.

Systemic Circulation

Once blood leaves the aorta, it travels through arteries and arterioles. Once at the capillary level, gas exchange occurs and the blood re-enters the venules, veins and back to the vena cavae.

Coronary Circulation

A specialized part of systemic circulation to provide the heart itself with blood flow. Blood leaves the aorta, enters the coronary arteries of the heart. Oxygenated blood is supplied to the heart muscle, returns via the coronary veins to the vena cavae.

VOCABULARY-PATHOLOGY

- angina pectoris: spasmodic chest pain caused by a lack of oxygen to the heart muscle
- **myocardial infarction** (MI): heart attack
- **CHF** (congestive heart failure)
- **palpitation**: abnormally fast, racing heartbeat
- fibrillation (atrial and ventricular): random, rapid and ineffective contractions of the heart
- **aneurysm**: sac-like ballooning of the walls of an artery
- anemia: disorder characterized by lower than normal level of rbc's in the blood

CAD (coronary artery disease)

Cholesterol: lipds (fatty substances that travel in the blood in packages called lipoproteins)

- LDL (bad cholesterol) low density lipoproteins
- HDL (good cholesterol) high density lipoproteins

Hypertension: high blood pressure*Hypotension*: low blood pressure

VOCABULARY-PULSE AND BLOOD PRESSURE

- Pulse: heart rate
 - Normal resting value: 60-80 bpm (beats per minute)
 - Common sites: carotid (neck), radial (wrist), brachial (arm)
- Blood Pressure: measured with a sphygmomanometer and stethoscope or electronic device in mmHg (millimeters of mercury)
 - **Systolic**: upper number in the fraction. Represents the pressure in the artery when the ventricles contract.
 - Diastolic: lower number in fraction. Represents the pressure in the artery when the ventricles relax
 - Normal values: 120/80

VOCABULARY-PROCEDURES

- **Echocardiography**: ultrasound of the heart
- **CABG** (Coronary Artery Bypass Graft)
- Defibrillation: (aka cardioversion) use of electric shock to restore the heart's normal rhythm
- **Pacemaker**: artificial mechanism implanted to start the heart beat
- **CPR** (Cardiopulmonary resuscitation)