

Cardiovascular System

- 1) What are the two divisions of the circulatory system? What does each one do?

Systematic

Blood Flow between heart and tissues

- Oxygenated: L-ventricle to tissues
- Deoxygenated: tissues to R-atrium

Pulmonary

Blood Flow between lungs and heart

- Deoxygenated: R-ventricle to lungs
- Oxygenated: Lungs to L-atrium

- 2) What are the two vascular systems?

Lymph and Blood

- 3) What are the types of blood vessels, and what are the characteristics/functions of each?

Arteries

- Thick muscular walls; high in elasticity; high pressure
- Oxygenated blood away from heart
- Continuous blood flow; no valves; bright red

Veins

- Thinner walls; less pressure; valves
- Deoxygenated blood back to the heart
- Less elastic

Capillaries

- Connect veins & arteries
- One cell thick
- ↳ Allows for gas exchange
- Low pressure & no valves

- 4) Explain how electrical conduction works in the heart.

- a. Sinoatrial (SA) node → Atrial Contraction

- "Pace-Maker": Impulse for heart beat comes from here
- Localized in the right atrium
- Specialized area of muscle cells that generate Electrical Impulse

Lag between these two allows for separate contractions [dub-dub]

- b. Atrioventricular (AV) node → Ventricular Contraction

- Receives the electrical impulse from the SA node
- Passes impulse to Purkinjie fibers and Bundle of His

- c. Purkinjie fiber

- Carries electrical impulse up to the ventricular myocardium

- d. Bundle of His

- Carries electrical impulse to the apical end of the L & R ventricles (bottom)

- 5) What are the four valves in the heart, what do they separate, and which type of valve are they (AV/SL valve)?

Atrio-Ventricular

- ★ Tricuspid: Right Atrium & Ventricle

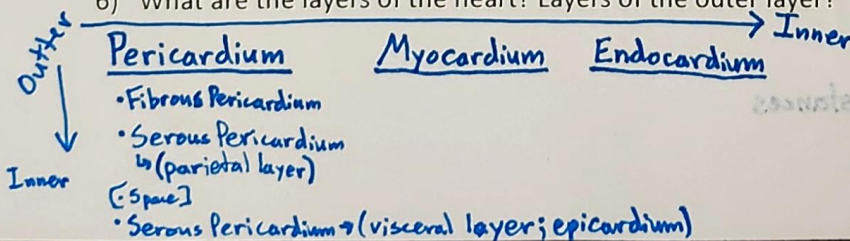
- ★ Mitral: Left Atrium & Ventricle

Semi-Lunar

- ★ Pulmonary Valve
- ↳ Right Ventricle & Pulmonary Artery

- ★ Aortic Valve
- ↳ Left Ventricle & Aorta

- 6) What are the layers of the heart? Layers of the outer layer?



Left ventricle is thicker than the right

7) What is the equation for cardiac output?

$$Q = HR \cdot SV$$

cardiac output Heart Rate Stroke volume

8) How can the cardiac output be increased?

- ↑ SV
- ↑ HR
- ↑ SV & ↑ HR

9) What is the Frank Starling Relationship?

Relationship between stroke volume & contraction strength [direct]

Positive Inotropic Effect

- ↑ Strength of contraction & ↑ stroke volume
- Sympathetic Nervous System
- Digoxin

Negative Inotropic Effect

- ↓ Strength of contraction & ↓ stroke volume
- β-Blockers

10) Blood is a type of connective tissue. What are the functions of blood?

Transport

Body defense

Fluid balance & pH

11) What makes blood red?

Hemoglobin's Heme Groups

↳ oxygenated blood cells
 ↑ red

12) Blood is about 9 to 10% of our body weight. What are the four components of blood?

- Plasma
- WBC
- RBC
- Platelets

13) What is plasma composed of?

- 92% water
- 6% protein
- Dissolved Substances

Review

What are the characteristics of connective tissue?

- 1) Derived from Mesenchymal Stem Cells
- 2) Has multiple types of cells (or lots of cells)
- 3) Connects, Protects, & Supports
- 4) Is vascular
- 5) Extracellular Fibers
- 6) Ground Substance
↳ (plasma in blood)

What are the necessary life functions?

- 1) Maintaining Balance
- 2) Movement
- 3) Responsiveness
- 4) Digestion
- 5) Metabolism
- 6) Excretion
- 7) Growth
- 8) Reproduction