

Study Guide — HBS Unit 3: Adventure Awaits (Mid-Unit Test)

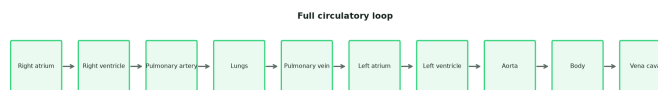
Human Body Systems · Unit 3 — Adventure Awaits · Modeled on the PLTW Guided Review format

Vocabulary to know cold

Term	Definition
Myocardium	Muscular middle layer of the heart wall that contracts to pump blood.
Atrium	Upper receiving chamber of the heart (right and left).
Ventricle	Lower pumping chamber of the heart; the left is the most muscular.
Capillary	Smallest blood vessel; site of gas, nutrient, and waste exchange.
Systole	Phase of the cardiac cycle when the ventricles contract (top BP number).
Diastole	Phase when the ventricles relax and fill (bottom BP number).
SA node	Sinoatrial node; the heart's natural pacemaker in the right atrium.
vas/o	Combining form for vessel; vasoconstriction = narrowing, vasodilation = widening.
tachy- / brady-	Prefixes for fast / slow; tachycardia = fast HR, bradycardia = slow HR.
Pulmonary circuit	Loop carrying blood from the heart to the lungs and back for gas exchange.
Pulmonary vein	Vessel returning oxygen-rich blood from the lungs to the left atrium.
ECG (EKG)	Recording of the heart's electrical activity; the QRS spike marks ventricular contraction.

Worked examples (follow the reasoning)

Example 1. Trace one complete loop of a red blood cell starting in the right atrium until it returns to the right atrium.



- Right atrium -> right ventricle (through the tricuspid valve).
- Right ventricle -> pulmonary artery -> lungs (pick up oxygen, drop off CO₂).
- Lungs -> pulmonary vein -> left atrium.
- Left atrium -> left ventricle (through the mitral/bicuspid valve).
- Left ventricle -> aorta -> body (deliver oxygen).
- Body -> vena cava -> back to the right atrium.

Answer: RA -> RV -> pulmonary artery -> lungs -> pulmonary vein -> LA -> LV -> aorta -> body -> vena cava -> RA.

Example 2. Explain why a blood pressure of 145/92 mmHg is considered hypertension while 118/75 mmHg is normal.

- Identify systolic (top) and diastolic (bottom) values for each reading.
- Compare to standard categories: normal is <120 AND <80.
- 145 exceeds 130 and 92 exceeds 80, placing it in Stage 2 hypertension (>=140 systolic or >=90 diastolic).
- 118/75 is below both normal thresholds.

Answer: 145/92 exceeds the normal cutoffs (>=140/>=90 = Stage 2 hypertension); 118/75 is below 120/80, so it is normal.

Practice questions (with reasoning)

1. Blood leaving the left ventricle enters which great vessel?

- A. Vena cava
- B. Pulmonary artery
- C. Aorta
- D. Pulmonary vein

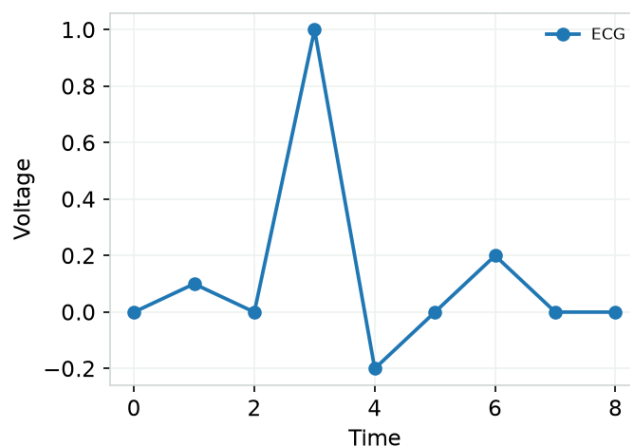
Answer: C. The left ventricle ejects oxygenated blood into the aorta to supply the body.

2. The term bradycardia describes a heart rate that is:

- A. Fast
- B. Slow
- C. Irregular only
- D. Normal

Answer: B. Brady- = slow; bradycardia is an abnormally slow heart rate (typically <60 bpm).

3. On an ECG, the tall QRS spike corresponds to:



- A. Atrial filling
- B. Ventricular contraction
- C. Valve replacement
- D. Breathing in

Answer: B. The QRS complex reflects ventricular depolarization that drives ventricular contraction.

4. Vasodilation of arterioles will tend to:

- A. Raise blood pressure
- B. Lower blood pressure
- C. Stop the heart
- D. Thicken the blood

Answer: B. Widening vessels lowers resistance, decreasing blood pressure.