Trace the Trouble

Follow changes in circulation from cause to effect

HAP.10.6 "Research and analyze the effects of various pathological conditions (e.g., hypertension, myocardial infarction, mitral valve prolapses, varicose veins, and arrhythmia)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline what changes in each of the five conditions. Circle one effect of each change to trace how the condition affects circulation.

Five Problems, Different Pathways

1. At a community health fair, five visitors describe problems that sound similar: fatigue, dizziness, or discomfort. The causes may lie in different parts of the circulatory system. Blood pressure measures the force of blood against artery walls. With hypertension, that pressure stays high over time, making the heart work harder and increasing the risk of damage to arteries, kidneys, and the brain. A myocardial infarction, or heart attack, occurs when blood flow through a coronary artery is blocked long enough to injure heart muscle. Unlike a gradual rise in pressure, this blockage can suddenly deprive tissue of oxygen.

2. Other problems begin with valves or electrical signals. The mitral valve normally helps keep blood moving from the left atrium into the left ventricle without flowing backward. In mitral valve prolapse, its leaflets bulge toward the atrium as the ventricle contracts. Many people have no symptoms, but significant leakage can let blood flow backward and make the heart work harder. An arrhythmia is an abnormal heart rhythm caused by a change in electrical signaling. Some rhythms are harmless; others pump blood less effectively and may cause fainting or raise the risk of stroke.

3. Leg veins face a different challenge: blood must return upward against gravity. One-way valves in these veins help prevent backward flow. If the valves weaken, blood can pool and veins may become enlarged and twisted, producing varicose veins. They can cause aching or swelling, especially after long periods of standing. A visible leg vein does not show that a coronary artery is blocked, just as an irregular pulse does not prove heart muscle has been injured. When comparing conditions, trace what changes first, how blood movement changes, and which effects follow. Check medical sources for evidence, not just matching symptoms.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does hypertension put the heart under strain differently from a myocardial infarction?

2. Trace how mitral valve prolapse can change blood flow when the valve leaks.

3. Why might two people with arrhythmias have different effects on their bodies?

4. A person has aching, swollen legs after standing. Which condition in the passage could explain this, and how does it change blood flow?

3 YOUR TURN

Your own words

A visitor says, “An irregular pulse proves that a heart attack damaged the heart muscle.” Write four sentences assessing this claim. Contrast what changes in an arrhythmia and a heart attack, explain why the pulse alone is not proof, and give one question you would check in a reliable medical source.

Trace the Trouble

PART 1 · READ AND MARK

Underline what changes in each of the five conditions. Circle one effect of each change to trace how the condition affects circulation. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does hypertension put the heart under strain differently from a myocardial infarction?	**Hypertension keeps pressure in the arteries high over time, making the heart work harder. A myocardial infarction blocks blood flow in a coronary artery long enough to injure heart muscle.**
2	Trace how mitral valve prolapse can change blood flow when the valve leaks.	**The valve leaflets bulge toward the atrium. If the valve leaks significantly, blood can flow backward, making the heart work harder.**
3	Why might two people with arrhythmias have different effects on their bodies?	**Some abnormal rhythms are harmless, while others reduce effective pumping and may cause fainting or increase stroke risk.**
4	A person has aching, swollen legs after standing. Which condition in the passage could explain this, and how does it change blood flow?	**Varicose veins could explain the symptoms. Weakened valves in leg veins allow blood to pool instead of moving upward effectively.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

An arrhythmia begins with altered electrical signaling that changes the heartbeat. A heart attack occurs when blocked coronary blood flow injures heart muscle. An irregular pulse alone cannot show that coronary blood flow was blocked, because rhythm changes have different causes. I would check a hospital or public health source to learn which tests can identify heart muscle injury.

Accept accurate descriptions of the underlying change and its effect, even if students use different wording. For Part 3, look for a clear distinction between electrical signaling and blocked coronary blood flow, without treating a symptom as a diagnosis.