Name: _____ **Date:** _____

Answer Key: Why Does Your Pulse Race? 7th Grade Exercise Physiology Quiz

How does your body adapt to a 400-meter dash? Analyze the mechanics of homeostasis, lactic acid, and cardiac output during physical stress.

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1. During a vigorous soccer match, your body maintains homeostasis by increasing your breathing rate. What primary chemical change in the blood triggers this response?

Answer: B) An increase in carbon dioxide concentration

High levels of carbon dioxide make the blood more acidic, signaling the brain to increase respiration to expel the waste gas and bring in more oxygen.

2. When an athlete transitions from a slow jog to a 50-meter max-effort sprint, they shift from using oxygen for energy to the _____ system for immediate power.

Answer: B) Anaerobic

Short, explosive movements rely on anaerobic metabolism, which generates energy without waiting for the slow delivery of oxygen to the muscles.

3. Hypertrophy, or the increase in muscle fiber size, is considered an acute response rather than a chronic adaptation.

Answer: B) False

Hypertrophy is a chronic adaptation because it occurs over weeks or months of consistent training, not immediately during a single exercise session.

4. Vasodilation occurs during exercise when blood vessels near the skin expand. What is the physiological purpose of this change?

Answer: C) To radiate excess heat away from the body

Vasodilation brings warm blood closer to the surface of the skin, allowing heat to escape to prevent the body from overheating during exertion.

5. Stroke volume refers to the amount of blood pumped by the _____ with each individual contraction.

Answer: B) Left Ventricle

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The left ventricle is the heart chamber responsible for pumping oxygenated blood to the rest of the body; increasing its strength increases stroke volume.

6. A marathon runner often hits 'the wall' when their body runs out of stored glycogen. Which fuel source does the body primarily switch to at this point?

Answer: C) Fatty acids

When carbohydrate (glycogen) stores are depleted, the body increases its reliance on fat metabolism, which provides energy more slowly and makes high intensity difficult.

7. Delayed Onset Muscle Soreness (DOMS) is primarily caused by an accumulation of lactic acid that stays in the muscles for several days.

Answer: B) False

DOMS is actually caused by microscopic tears in muscle fibers and the subsequent inflammation/repair process, not lactic acid, which clears shortly after exercise.

8. The measurement of the maximum amount of oxygen an individual can utilize during intense exercise is known as _____.

Answer: B) VO2 Max

VO2 Max is the gold standard for measuring aerobic fitness, representing the maximum capacity of the body to transport and use oxygen.

9. Which of these is a long-term skeletal adaptation to weight-bearing exercises like dancing or hiking?

Answer: A) Increased bone density

Weight-bearing exercise puts stress on bones, which stimulates osteoblasts to lay down more bone mineral, making the skeleton stronger over time.

10. A lower resting heart rate in a trained athlete is a sign that their heart has become more efficient at pumping blood.

Answer: A) True

Through chronic adaptation, the heart muscle becomes stronger and the chambers larger, allowing it to pump more blood per beat so it doesn't have to beat as often.