Blood in the left ventricle, ready to be ejected through the aorta into the systemic circulation, has a “high” oxygen concentration. Blood in the right ventricle, ready to be pumped to the lungs to be oxygenated, has a “low” oxygen concentration. In a patient who suddenly (within 5 minutes) develops a small (≤ 1 mm2) hole in their inter- ventricular septum, will the concentration of oxygen (measured within 24 hours of the development of the hole) in the blood ejected into their systemic circulation be higher, lower or the same as in a patient without such a septal hole? Explain briefly. Answer individually;

Right side of the heart serves the lungs and generates less pressure than the left side which feeds the entire systemic circulation. This pressure differential allows blood to flow through the ventricular septal hole from the left ventricle into the right ventricle.

Due to the direction of this blood flow, the “low” oxygenated blood does not dilute into the left ventricle and the aortic blood does not have significant changes in oxygen level.

Within 24 hours of the development of the hole, the concentration in oxygen of the blood ejected into the systemic circulation stays the same compared to a patient without such a septal hole.

Reference: VSL [15] fig. 12.9