

**Instructor's Response(s) - Discussion Question(s) - Module 7**

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 ( $\leq 1 \text{ mm}^2$ ) hole in their interventricular 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; **post your answer to the Discussion Board by 9:00 PM of Day 4 of the module.**

The presence of a hole in the interventricular septum will allow passage of blood from one ventricle to the other, depending on the pressure difference between the ventricles. When the ventricles are relaxed (and filling with blood) the pressure in the left and right ventricles is nearly the same; there is likely to be little, if any, left/right or right/left transfer of blood.

During isovolumic ventricular contraction, ventricular ejection, and isovolumic ventricular relaxation left ventricular pressure is higher than (or at least equal to) right ventricular pressure. Therefore, any flow of blood through an interventricular septal hole will be from the left (higher pressure) ventricle to the right (lower pressure) ventricle.

Therefore the oxygen concentration of the blood delivered to the systemic circulation of a patient with a hole in their interventricular septum will be the same as that of a patient without such a septal hole since, in the patient with the hole, the blood in their left ventricle will not be mixed with blood of lower oxygen concentration from their right ventricle.

Refer to the Vander[14] (or Vander[13]) textbook, section 12.5.