

## Ventricular Septal Defect

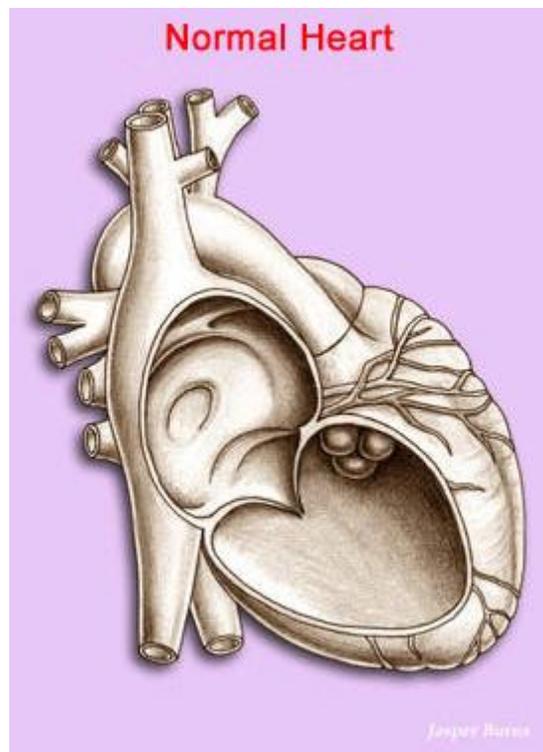


### What Is It?

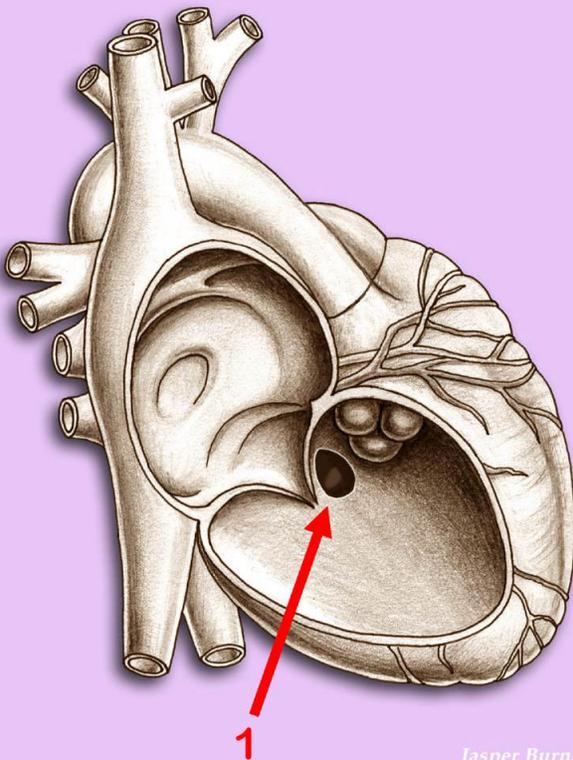
A Ventricular Septal Defect (VSD) is a hole in the ventricular septum - the muscular wall that separates the right and left ventricles, or main pumping chambers, of the heart. This opening allows the movement, or "shunting," of blood between the ventricles. Most commonly, oxygenated blood from the left ventricle enters the right ventricle because there is greater pressure in the left ventricle and the resistance in the lungs is significantly lower than the body. This is known as a "left to right shunt."

Ventricular septal defects are the most common forms of congenital heart disease, accounting for 21% of all cases. They may be single or multiple and may occur in different parts of the ventricular septum.

Small holes usually close spontaneously in the first year or two of life. Large holes almost always require surgical closure in the first year of life. VSDs may be present with other heart defects (For example, Tetralogy of Fallot.)

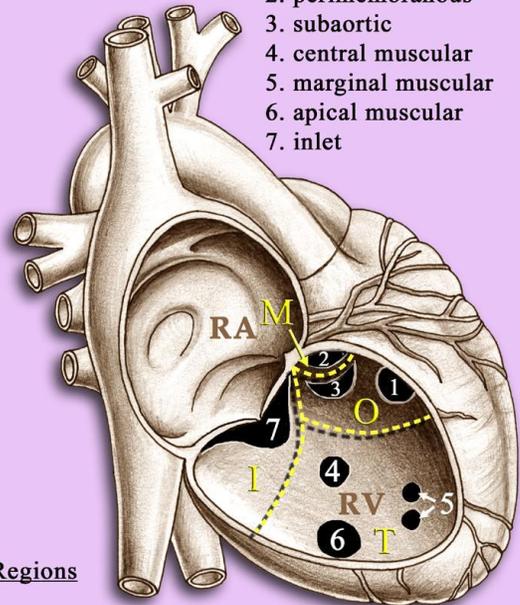


## Ventricular Septal Defect



## Types of VSDs

1. outlet (infundibular)
2. perimembranous
3. subaortic
4. central muscular
5. marginal muscular
6. apical muscular
7. inlet



### Regions

- I: inlet septum
- T: trabecular septum
- O: outlet septum
- M: membranous septum

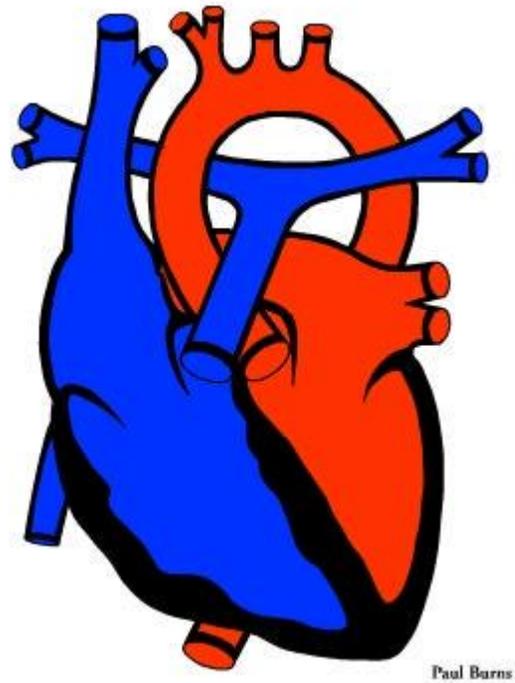
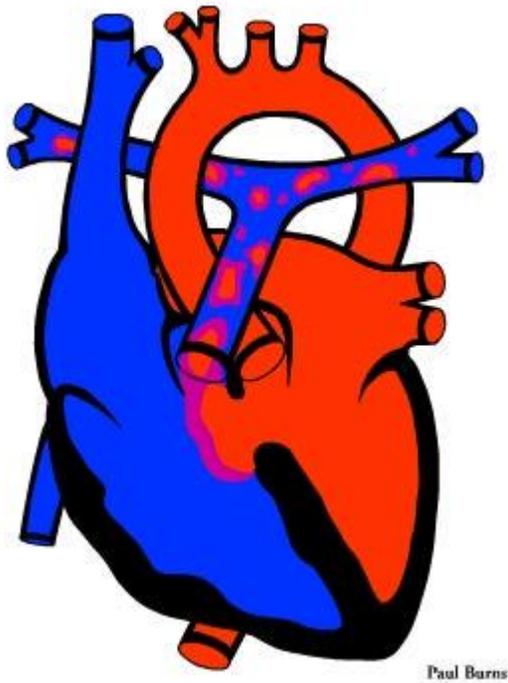
## What Are Its Effects?

In a left to right shunt, blood that just returned from the lungs crosses the VSD and goes back to the lungs again. This causes increased pulmonary (lung) blood flow. A heart murmur occurs because there is a pressure difference between the two ventricles and there is turbulent blood flow crossing the hole. The smaller the hole, the louder the murmur.

Ventricular Septal Defect (VSD) affects boys and girls with equal frequency. Children with VSD are affected differently depending on the size, location, and number of holes in the ventricular septum. Small holes generally cause little or no difficulty and often close naturally as the child grows.

Larger holes may interfere with a child's feeding and growth and may cause rapid breathing, irritability, excessive sweating, and poor weight gain. The vessels which carry blood from the heart to the lungs and back again may become congested, or overloaded, with blood, resulting in congestive heart failure (CHF). This usually occurs when the child is 6 to 8 weeks old.

With large VSDs, the lungs are receiving increased blood under higher than normal pressure. This can result in pulmonary hypertension (high blood pressure in the pulmonary artery) may also occur. If this pressure becomes too high, the heart may be unable to function properly.



**The VSD allows the mixing of oxygen-rich (red) blood with oxygen-depleted (blue) blood**

**Normal circulation – note the absence of mixing**

### **How Is It Treated?**

Babies with congestive heart failure because of volume overload to the lungs may be treated with diuretics such as Lasix (Furosemide) and Aldactone (Spironolactone). These medications can help to reduce the volume of fluid in the lung, which makes it easier for the infant to breathe and eat.

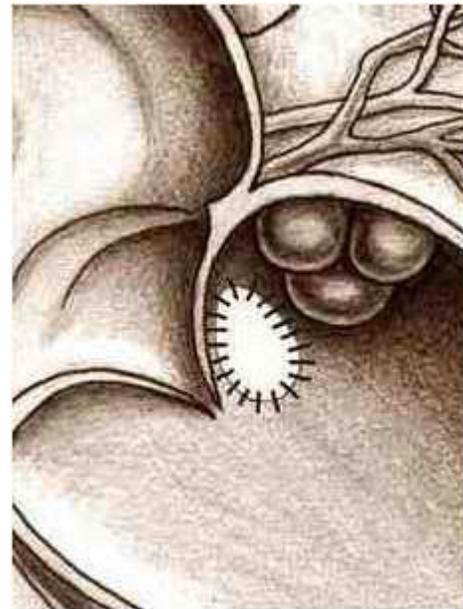
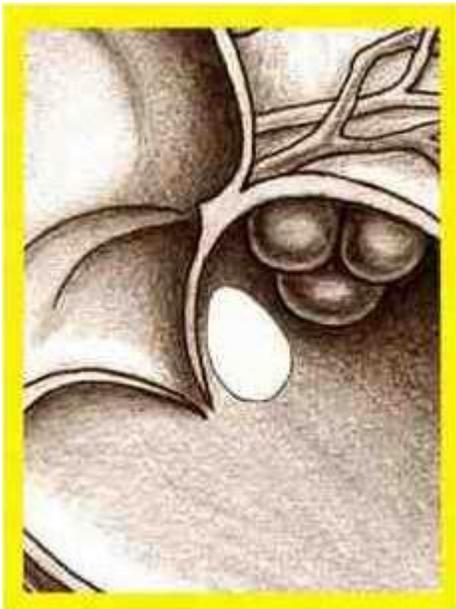
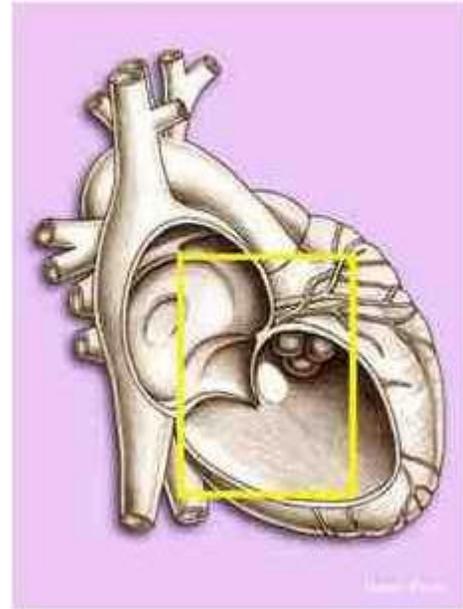
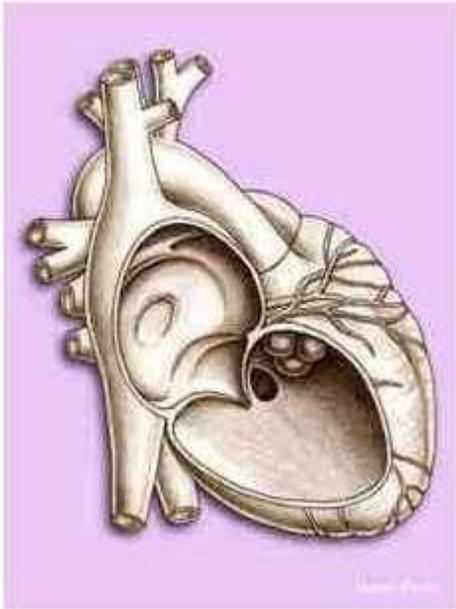
Digoxin may also be prescribed. It increases the squeeze (contraction) of the heart muscle and helps it to function more effectively.

For those infants whose feeding is affected, nutritional additives may be used to fortify the baby's milk. In more severe cases, nourishment with a naso-gastric tube may be necessary.

If slow growth and other symptoms continue despite treatment with medication, surgery may be required to close the ventricular septal defect. The benefits of this surgery are usually dramatic: paleness and rapid breathing are corrected and the rate of growth becomes normal. The mortality risk in this type of surgery is very low.

VSDs may be closed by patching (see illustration) or suturing during open heart surgery. Small defects may be closed with simple sutures using a monofilament thread made of Prolene or

Polypropylene. Larger holes may be covered with patches made of pieces of pericardium (the membrane that covers the heart) or of silk or a synthetic material such as Dacron or Teflon.



**Surgical Repair of Ventricular Septal Defect by Patching**