

## **VENTRICULAR SEPTAL DEFECT**

### **What is a ventricular septal defect?**

A ventricular septal defect (VSD) is the most common type of congenital heart defect. The wall between the two pumping chambers (ventricles), or ventricular septum, does not form correctly, leaving a hole, or ventricular septal defect (VSD). The hole can be in different locations in the ventricular septum and can be many different sizes.

### **What causes VSDs?**

VSDs may occur in patients who have genetic syndromes. However, this heart defect can develop in otherwise healthy people. In those cases, we don't know what causes the heart to form abnormally.

### **How is a VSD diagnosed?**

VSDs are usually diagnosed with an echocardiogram, or ultrasound of the heart. First trimester screening for chromosomal abnormalities is a good screening tool to identify patients who might be at an increased risk for cardiac defects. VSDs defects can be diagnosed as early as 12 weeks gestation. This can be discovered before birth, but is sometimes not noted until after birth. There may be a murmur (abnormal heart sound) or other abnormality that indicates the problem.

### **How will your pregnancy be managed?**

If your baby is diagnosed with a VSD, a high-risk obstetrician will participate in your obstetric care. Overall care should be transferred to a specialized center, where multidisciplinary care is available. The team may include a perinatologist, fetal and pediatric cardiologists, a genetic counselor, a neonatologist and a pediatric cardiac surgeon. Fetal well being will be followed closely by fetal ultrasound and nonstress tests. If there is no specific maternal or fetal reason for a C-section, vaginal delivery is often possible.

### **Why do VSDs make babies sick?**

Many patients with VSDs do not develop problems. The symptoms depend on the size and location of the defect. Before birth, babies are not generally affected by this heart defect. The pressures on the right and left sides of the heart are similar, and the blood flows normally.

After birth there are changes in the baby which lead to new patterns of blood flow. The pressures are high in the lungs before birth and start to decrease right after birth and through the first few months. When there is a VSD, blood from the right and left ventricles can go through the hole to either side of the heart. Blood will follow the path of least resistance (to the lower pressure). As the pressure in the lungs drops, more and more blood will flow across the VSD (from left to right) and into the lungs. The heart will continue to pump enough blood so that the body gets what it needs, but it will have to pump extra blood to compensate for the blood going to the lungs.

When the VSD is small, the heart does not have to work that much harder than usual, so babies don't develop any symptoms. If the VSD is large, a lot of blood will be able to cross the VSD and go to the lungs. The heart will deal with this extra work by enlarging and pumping more blood with each beat. The process is inefficient, sending blood with oxygen back to the lungs where it came from, and this makes the heart have to work very hard. The heart is able to deal with this extra work for a while, but eventually it will lead to babies developing symptoms. Babies will start to breathe harder and faster, they will have trouble feeding, and they will not be able to gain weight.

### **What can I expect after my baby is born?**

Most babies do very well right after birth. If the baby does not have any other medical problems, the baby should be able to stay with you after birth. An echocardiogram will be done to confirm the diagnosis. The baby would be discharged with you and come back for follow-up appointments. If there are other issues, or if there are any problems after birth, the baby will go to the neonatal intensive care unit. The baby would be stabilized and an echocardiogram would be done. The care that the baby needed would depend on the other problems.

### **What is the treatment/surgery for VSDs?**

Babies with small VSDs may never develop symptoms. As long as the defect is small enough that the left side of the heart doesn't enlarge and the pressure in the right ventricle is able to decrease normally, surgery is unlikely. Some types of VSDs can get smaller on their own, and many close off completely. Babies with large defects may start to have symptoms of heart failure (due to the extra work the heart is doing) after a month or two. There are medications that can help to decrease these symptoms. The need for surgery depends on the symptoms that the baby develops and whether or not the medications relieve the symptoms. When there is a large defect or uncontrolled symptoms, the babies will have surgery, usually between 3-6 months. The surgeon will repair the VSD by closing the hole with a patch. Babies are usually in the hospital for 5 to 10 days after surgery.

### **What other procedures or follow up will my baby need?**

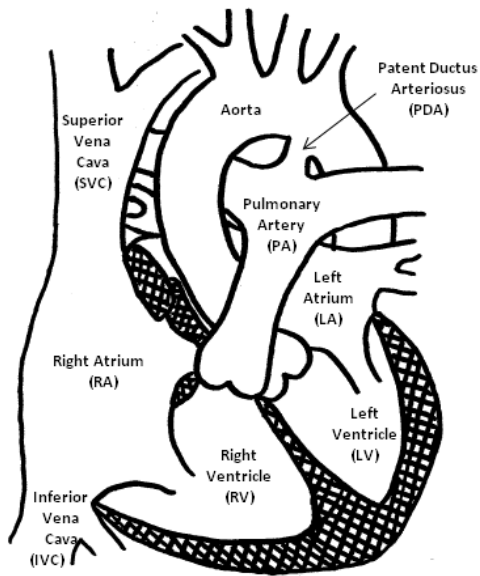
Children with VSDs that do not require surgery are followed by a cardiologist as long as the hole remains open. Surgical repair is very effective, so most patients will never need another surgery. However, they should continue to see a cardiologist throughout their life. Visits to the cardiologist may be frequent in the first year of life, but are eventually once a year. Echocardiograms and electrocardiograms (EKGs) will be done at visits.

### **What is the long term prognosis for VSDs?**

The long term outlook for VSDs is very good. The survival from the surgery is very high. Children are able to do normal activities, including sports. It is very rare for patients to develop complications or need medications after surgery.

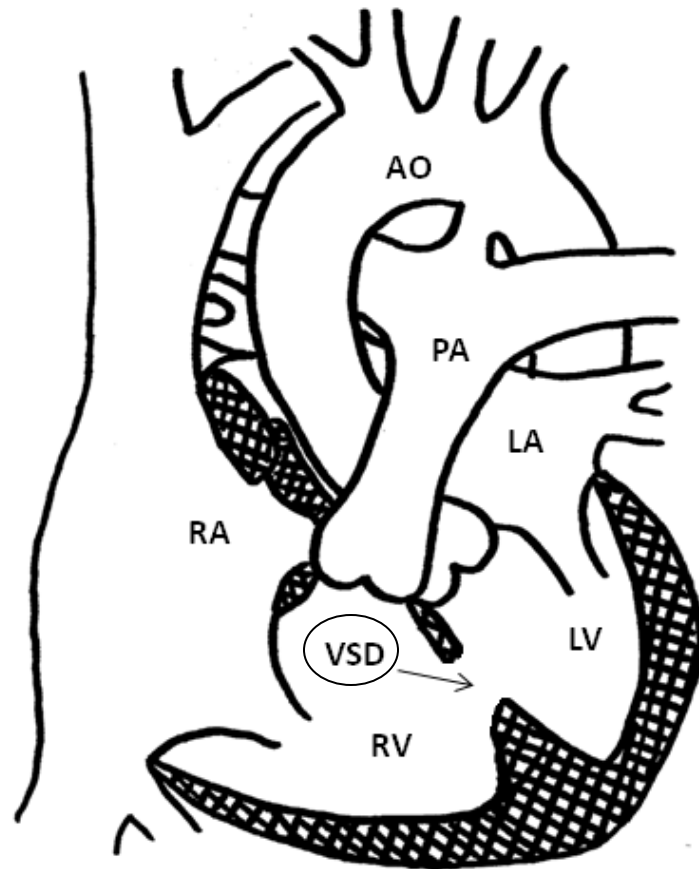
### **If I have had one baby with a VSD, am I more likely to have other babies with VSDs?**

If your baby's VSD is related to a chromosome abnormality or a genetic syndrome, a genetic counselor can tell you what the chances are that a future pregnancy would have the same condition. When a VSD is not associated with an underlying genetic problem, future children are at a slightly increased risk for heart defects. In future pregnancies, nuchal translucency ultrasound (at the end of the first trimester), targeted anatomy ultrasound (between 18-20 weeks) and fetal echocardiography are recommended.



## Normal Newborn Heart

## Ventricular Septal Defect (VSD)





**Before  
surgery**

**After surgery:  
Patch closure  
of VSD**

