

View this article online at: patient.info/health/ventricular-septal-defect-leaflet

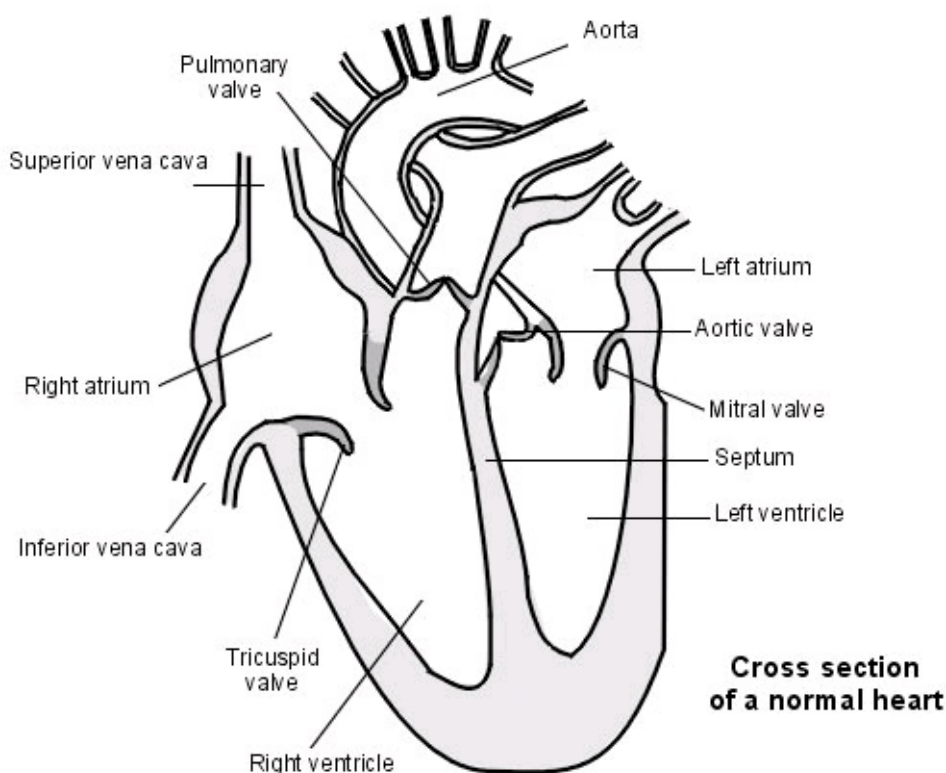
Ventricular Septal Defect

Ventricular septal defect (VSD) is a defect in the septum between the heart's two lower or pumping chambers (ventricles). The septum is a wall that separates the heart's left and right side. Septal defects are sometimes called a 'hole' in the heart.

It is the most common heart problem that babies are born with. Many defects in the ventricular septum close themselves and cause no problems. Otherwise, medicines or surgery can help. Most babies born with a defect in the septum have normal survival.

Understanding the heart

The heart is complex but (looking at the diagram below) you can see there are basically four chambers inside it. The left and right atria are roughly on top and the bigger stronger ventricles are on the bottom.



The left and right sides of the heart are divided by a wall - this is called the septum. When it is between the upper or collecting chambers (atria), it is called the atrial septum. When it is between the lower or pumping chambers (ventricles) it is called the ventricular septum. The septum keeps blood from the right and left sides of the heart from mixing. This is important because the blood in the left ventricle is loaded with oxygen for the rest of the body to use. The blood in the right ventricle has already given all its oxygen to the body and needs to be loaded with oxygen again by the lungs. When the opening between the ventricles is large some of the oxygen-rich blood from the left ventricle leaks into the right ventricle instead of flowing forward to the body. This extra blood coming in the right ventricle is pushed into the lungs. This inefficient blood flow means that the heart needs to pump harder to ensure that enough blood with oxygen reaches the body.

For a full explanation of the structure and function of the heart see separate leaflet called [Heart and Blood Vessels](#).

What is a ventricular septal defect (VSD)?

A VSD is a hole (defect) in the wall (septum) that separates the two lower or pumping chambers (ventricles) of the heart.

Why do ventricular septal defects (VSDs) happen?

The heart starts out as a simple tube. It needs to change a lot as your baby develops within the womb. By the time you are eight weeks pregnant your baby should have four chambers in their heart. The septal wall (septum) develops parts made of muscle and other parts made of membrane. If the septal wall has not developed properly by this time, the baby may be born with a gap in the septum between the lower or pumping chambers (ventricles). This is sometimes called a hole in the heart. There may be more than one hole. The size and position of the hole can also vary. Small holes create fewer problems for the baby and may go unnoticed.

VSDs usually occur by themselves without any other associated birth defects. Sometimes they may occur with other heart problems or as part of an inherited condition. Most often the problem is not associated with any other medical condition.

Medical conditions in the mother, such as diabetes, use of cannabis or high alcohol intake in pregnancy, are also associated with increased chance of a baby having some heart defects including VSDs.

Holes can also develop in the ventricular septum after a heart attack (myocardial infarction) in adults. These are slightly different and happen because of damage to the muscle part of the septum.

How common is a ventricular septal defect (VSD)?

VSDs are the most common heart problem that babies are born with. About 8 babies in every 1,000 born will have a problem with their heart or major blood vessels. Of these, half will have a VSD either alone or in association with another heart defect.

What problems will the baby have?

The problems depend on the size of the hole (defect). Small holes cause few or no symptoms. However, when babies have their checks with the doctor, a murmur may be noticed. This is caused by the unusual blood flow in the heart.

With slightly bigger holes, early symptoms may include sweating and becoming out of breath and tired quickly when feeding. Feeding is exercise for a baby and the extra effort needed brings out the symptoms. Not putting on weight is another warning sign and these babies also tend to have more chest infections than usual. These things usually start to happen between 4 and 6 weeks of age.

When the holes are large the things that happen are similar but more severe.

Babies who only have holes in their heart do not tend to go blue. Babies who go blue when they are stressed tend to have more complex heart or lung problems.

How is a ventricular septal defect (VSD) diagnosed?

Your doctor may hear a murmur, or you have concerns that your baby is not putting on weight or is finding feeding difficult. Then your doctor may ask a children's specialist (paediatrician) to see your baby. They may ask for a [chest X-ray](#) or a special ultrasound scan of the baby's heart. [This is called an echocardiogram](#) and will show the structure of their heart. It will also show where the hole (defect) is and how big it is. It will check that there are no other heart problems present. These are important when deciding how to help the problem.

If the echocardiogram could not see all the problems, or the problems were very complex, it may be necessary to do cardiac catheterisation. In this test, dye that can be seen by X-rays is put into the blood vessels. X-rays are then taken as the blood passes through the heart. This allows the doctors to see exactly where the problems are in the heart.

What can be done to help?

Small holes (defects) quite commonly close on their own in the first year of life. A small number continue to close as the child grows older. However, if they haven't closed by the time the child is 10 years old, they are very unlikely to close on their own. Most small holes do not require any treatment.

Medicines can be used to help the symptoms that can occur if the hole is larger. These may include medicines to relieve the pressure on the heart and lungs, and also to help the heart pump effectively. Feeding can be changed to special high-calorie feeds. As these need to be given in smaller amounts, the effort your baby needs to make when feeding is therefore reduced.

Large holes affecting the child's growth need surgery to close the hole. There are various ways to close the hole. The most common way is to open the ribcage and operate directly on the heart. Whilst the procedure is taking place, a machine (called a bypass machine) does the heart's job.

With advances in technology and skill, surgical treatment for ventricular septal defect (VSD) is safe, with excellent results. Available data indicate that patients whose VSD has been closed and who have no associated heart or lung problems can be expected to have normal life expectancy.

Sometimes abnormalities of the heart rhythm can happen during or after surgery. These can usually be treated. Small residual holes are often found after surgery. If they become problematic, it may be necessary to re-operate.

More recently, techniques have been developed where a small blocking device (called an occluder) is placed into the heart. This is inserted through a blood vessel so that there is no need for open heart surgery. Instead, it is done as a keyhole procedure. The occluder is then moved into place with guide wires to block the hole. The keyhole procedure is done by specialist doctors who are experts in the plumbing of the heart (paediatric cardiologists). It is not possible to use this procedure in very young children and in certain types of VSDs. The best treatment option is decided by the cardiology team in specialist hospitals.

What is the outlook (prognosis)?

Most children with ventricular septal defects (VSDs) do very well. However, they will need to be seen by a heart specialist for the rest of their lives, unless the hole (defect) closes itself. Testing (after treatment) will allow doctors to advise on what amount of exercise is safe for the child.

Children born with a hole in the heart should be advised how to take good care of their teeth. This is to minimise the risks of developing serious infections (endocarditis) which can damage the heart valves.

An adult with a VSD who has no symptoms is unlikely to need any treatment. However, they should have regular check-ups by a doctor who specialises in adult congenital heart disease. Some adults may develop further problems, usually with the heart valves. These control the normal flow of blood around the heart.

Women who have had holes in the heart may need specialist advice when they are planning to become pregnant. Those with repaired VSDs or with small holes and normal heart function can have children without a higher than normal risk for problems during pregnancy. However, those with unrepaired VSDs or closed VSDs with heart or lung complications will need to be checked regularly throughout their pregnancy. These checks will be carried out by an adult congenital heart disease specialist.

Is heart function normal after surgical closure of a ventricular septal defect (VSD)?

In people with a VSD but no associated heart or lung problem, repair of the defect (hole) makes the heart function normally. These patients can participate in normal physical activity without any restriction.

People with complications related to a VSD, such as heart rhythm or heart valve problems, may have some physical restrictions and should take advice from a heart specialist.

Further help & information

British Heart Foundation

Greater London House, 180 Hampstead Road, London, NW1 7AW

Tel: (Heart Helpline) 0300 330 3311, (Admin) 020 7554 0000

Web: www.bhf.org.uk

Children's Heart Federation

Level One, 2-4 Great Eastern Street, London, EC2A 3NW

Tel: (Helpline) 0808 808 5000, (Office) 020 7422 0630

Web: www.chfed.org.uk

Children's Heartbeat Trust

c/o Clark Clinic, The Royal Belfast Hospital for Sick Children, 180 Falls Road, Belfast, BT12 6BE

Tel: 07584 164 815

Web: www.childrensheartbeattrust.org

The Scottish Association for Children with Heart Disorders

Web: www.youngheart.info

Tiny Ticklers

Web: www.tinyticklers.org

Further reading & references

- [Transcatheter endovascular closure of perimembranous ventricular septal defect](#); NICE Interventional Procedures Guidance, March 2010
- [Cardiac Disease and Pregnancy](#), Royal College of Obstetricians and Gynaecologists (June 2011)

Disclaimer: This article is for information only and should not be used for the diagnosis or treatment of medical conditions. EMIS has used all reasonable care in compiling the information but make no warranty as to its accuracy. Consult a doctor or other health care professional for diagnosis and treatment of medical conditions. For details see our [conditions](#).

Original Author: Dr Hayley Willacy	Current Version: Dr Anjum Gandhi	Peer Reviewer: Dr Hayley Willacy
Document ID: 13795 (v2)	Last Checked: 20/01/2015	Next Review: 19/01/2018

View this article online at: patient.info/health/ventricular-septal-defect-leaflet

Discuss Ventricular Septal Defect and find more trusted resources at [Patient](#).

Ask your doctor about Patient Access

- 🔍 Book appointments
- 🔍 Order repeat prescriptions
- 🔍 View your medical record
- 🔍 Create a personal health record (iOS only)



Simple, quick and convenient.
Visit patient.info/patient-access
or search 'Patient Access'

Like us.
it's good for you!



Like us on **facebook**
fb.com/patient