

# ATRIAL SEPTAL DEFECT (ASD)

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## Atrial Septal Defect (ASD)

### What is an ASD?

Atrial septal defect (ASD) is a hole in the wall (the septum) between the heart's two uppermost chambers, the right and left atrium. This hole allows blood to flow in either direction between the left and right atrium.

ASDs may cause several problems. First, the right side of the heart now contains extra blood, and extra blood also now flows to the lungs. These problems with blood flow put strain on the heart because it has to pump this extra blood to the lungs. In addition, the strain put on this right side of the heart causes it to become weak or enlarged. This can lead to heart failure if left untreated.

An enlarged heart may also cause arrhythmias (irregular heart rhythms) to develop. This extra blood flow to the lungs may damage the arteries to the lungs over time, leading to high blood pressure in these vessels. Also, ASDs can sometimes allow blood clots from the body to enter the brain and cause a stroke.

### What are the symptoms of an ASD?

Most patients do not have any symptoms in childhood. However, symptoms that might develop over time, depending on the severity of the ASD and other factors, include:

- Shortness of breath, fatigue, and labored breathing while exercising
- Irregular heartbeats
- Transient ischemic attacks (TIA), which result in stroke-like symptoms
- Stroke
- Pulmonary hypertension, which is high blood pressure in the arteries of the lung, and can lead to heart failure if not treated

- Reduction in lifespan of about 20 years on average if the ASD is not closed

### What causes ASD?

An ASD is congenital, meaning it is a defect that is inborn or exists at birth. Stated another way, the defect is an abnormality, not a disease. The septum between the two atrium of the heart did not develop normally before birth. What is known is that about 20 percent of ASDs that occur in infants close on their own in the first few years of life.

Heart defects in general. In about 95% of the cases, no cause can be identified. Sometimes a viral infection can cause heart defects to develop. Other known causes include genetic factors, certain other medical conditions (Down's syndrome, for example), and some prescription and nonprescription drugs.

### How is an ASD diagnosed?

During a routine examination, your doctor may hear a murmur when listening to the heart. A heart murmur is an additional sound, a swishing sound heard in the heart. If a murmur is identified, your doctor will order other tests that can include:

- **Electrocardiogram**  
(ECG or EKG) - a test that records the electrical changes that occur during a heartbeat; reveals abnormal heart rhythms (arrhythmias) and detects heart muscle stress.
- **Chest x-ray**  
A test to show the size and shape of the heart and lungs.
- **Echocardiogram**  
A test that uses sound waves to create a moving picture of the heart's internal structures.
- **Doppler ultrasound**  
A test that uses sound waves to measure blood flow; often combined with echocardiogram to evaluate both the internal structure of the heart and blood flow across the heart's valves.
- **Cardiac magnetic resonance imaging**  
(MRI) - a test that uses three-dimensional imaging to reveal how blood flows through the heart and how the heart is working.
- **Cardiac catheterization**  
A procedure that involves inserting a thin tube (a catheter) into a vein or artery and passing it into the heart to sample the level of oxygen, measure pressure changes and make x-ray movies of the heart and its internal structures.
- **Angiography**  
A dye-enhanced x-ray of the heart's internal structures.

Additional tests may be ordered as necessary.

### How is an ASD treated?

If you or your child is diagnosed with an ASD, your primary care doctor will recommend that you meet with a congenital heart specialist (a doctor who has the training and equipment to determine the heart problem) who will arrange for the necessary special tests, medical care, heart procedures, and follow-up checkups. The best treatment approach will depend on the patient's symptoms as well as the size of the ASD. The ASD may need to be closed surgically through open-heart surgery or may be repaired through an outpatient catheter-based procedure.

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