

Aortic and Subaortic Stenosis in Dogs

What are aortic stenosis and subaortic stenosis?

Aortic stenosis and subaortic stenosis are two similar forms of congenital heart disease, or heart disease that is present at birth, rather than beginning later in life. **Subaortic stenosis (SAS)** is the more common of the two forms, and both conditions will be considered together as SAS for the remainder of this handout. SAS is a narrowing (also called *stenosis*) in the region of the aortic valve, where blood leaves the heart to enter the aorta and be distributed to the rest of the body. As a result of this narrowing, the chamber of the heart responsible for pumping blood into the aorta (the left ventricle) must become stronger and must generate abnormally high pressure in order to push blood forward.

If the stenosis is severe, it predisposes to any or all of the following potential complications: 1) The obstruction to forward flow may be so great that blood backs up, leading to buildup of fluid in the lungs. This is called *congestive heart failure*. 2) Poor forward flow may result in periods during which the brain does not receive enough oxygen. This may result in transient weakness or fainting episodes. 3) Thickening of the heart muscle in order to pump more strongly may damage the electrical system that runs through the muscle, resulting in arrhythmias (abnormalities in the electrical activity of the heart). This causes the heart to become extremely inefficient and can lead to weakness, fainting, or even sudden death. 4) The structurally abnormal aortic valve may trap bacteria and become infected, a life-threatening condition called “endocarditis.”

How is SAS diagnosed?

A congenital heart condition is often first suspected following detection of a heart *murmur* during routine **physical examination** in a young dog. This is an abnormal “whooshing” sound associated with the normally crisp heart sounds, heard while listening to the heart with a stethoscope. The murmur is described according to its loudness and where it is best heard on the chest. Although many conditions may result in the presence of a heart murmur, the location where the murmur is the loudest and the breed of the dog may raise suspicion for AS in particular. If congestive heart failure is already present at the time of first examination, other findings may include abnormally loud lung sounds (also heard with a stethoscope) as well as rapid or labored breathing.

Diagnosis of SAS is confirmed by performing an **echocardiogram**. This is an ultrasound examination of the heart, during which information is collected about the size, structure, and function of the heart. This information is used to confirm the presence of SAS, determine its severity, and decide whether or not specific therapy is necessary. Specific echocardiographic findings in dogs with SAS may include a visible ridge located below the aortic valve, thickening of the valve cusps, enlargement of the first portion of the aorta located just beyond the valve, and/or enlargement of the left ventricle.

Chest x-rays are used to obtain a “big picture” view of the heart and lungs, and to look for evidence of congestive heart failure. An **electrocardiogram** is performed to identify and characterize arrhythmias that may be present, and to guide antiarrhythmic therapy if necessary. Depending on the specific situation, blood work may be recommended as well. Some of these tests may need to be repeated periodically in order to monitor progression of the condition and its response to therapy.

How is SAS treated?

Dogs with mild forms of SAS, such as those that exhibit no symptoms (discussed further below) and have only mild changes on their echocardiogram, may not require any specific therapy. For dogs with moderate to severe forms of SAS based on symptoms or echocardiographic abnormalities, medical therapy is recommended and typically consists of a “beta blocker.” This is a medication that allows the heart to spend more time relaxing, and decreases the tendency for the heart walls to become abnormally thickened. Beta blockers also have antiarrhythmic properties, which may also be of benefit.

Dogs with severe complications of SAS may need to be hospitalized, and are treated according to the specific problem identified. For example, dogs that develop congestive heart failure receive medications that remove excessive fluid from the body and facilitate forward blood flow through the body’s blood vessels. In cases of endocarditis, antibiotics are used in order to treat the infection of the aortic valve.

What is the prognosis? What should I watch for?

Some dogs with mild forms of SAS remain asymptomatic, with the only evidence of the condition being the heart murmur detected during physical examination. Other dogs may develop symptoms, the nature and severity of which are variable between dogs and depend upon how the condition progresses. **Intolerance to activity or exercise** may be noted. If the heart becomes enlarged, it may push on the nearby bronchi (the major branches of the trachea or “windpipe”) and cause **coughing**. If congestive heart failure develops, **rapid** or **labored breathing** may be seen, and the tongue or gums may take on a **blue** color. If blood flow forward is severely obstructed or if arrhythmias develop, **weakness** or **fainting** may occur. Although uncommon, dogs that develop endocarditis may experience **lethargy** and **loss of appetite**, and **limping** may occur if infection spreads to joints. Finally, potential side effects of the medications used to treat SAS and congestive heart failure may overlap with those already discussed, such as lethargy, loss of appetite, weakness, and less often fainting.

Some of the medications used to treat SAS should not be discontinued suddenly. Therefore, changes in medication administration should always be discussed first with a doctor. If any of the above symptoms are noted, or if you have any questions or concerns, please call your veterinarian or Dr. Marshall at Veterinary Specialty Services immediately to discuss an appropriate plan. Problems that are caught early are more easily corrected and less likely to require a visit to the hospital. If you feel that the problem should not wait and requires immediate attention, then an emergency visit is warranted.