

Congenital Heart Diseases of Dogs and Cats

Dogs and cats may occasionally be affected by heart disease that is the result of a congenital heart defect, meaning that there was an abnormality of the heart that arose during early development. These conditions are often diagnosed by an echocardiogram.

The most commonly encountered congenital heart defects in dogs include patent ductus arteriosus, subaortic stenosis, pulmonic stenosis and ventricular septal defects, and valvular dysplasias. The most commonly encountered heart defects in cats include ventricular septal defects, atrioventricular canal defects and valvular dysplasia.

Patent Ductus Arteriosus (PDA):

Before birth, the ductus arteriosus is a blood vessel that is normally present in the fetus and allows blood to bypass the lungs, which are not yet inflated. After an animal is born, the ductus normally closes, however in some dogs/cats it will remain open (“patent ductus arteriosus”). Since blood pressure in the lungs is normally lower than blood pressure in the rest of the body, blood will pass through the PDA to the lungs, and then back to the left side of the heart. The constant overflow of blood through the lungs and the left side of the heart can eventually lead to left-sided congestive heart. To prevent this sequence of events from occurring, surgical closure/ligation of the PDA is necessary, after which the dog or cat can usually live a full life span.

Besides congestive heart failure, a less common consequence of an untreated PDA is significant pulmonary hypertension, which will cause reversal of the direction of blood flow through the PDA (reversed PDA). This can lead to significant symptoms including weakness, collapse, cyanosis (bluish gums/tongue), and eventual death of the patient. An abnormally high number of red blood cells in the body (polycythemia) can develop and contribute to symptoms. A reversed PDA unfortunately cannot be safely corrected via surgery.

Subaortic (SAS) and Valvular Aortic Stenosis:

Subvalvular aortic (or subaortic) stenosis has a ridge of tissue encircling the region beneath the aortic valve on the left side of the heart. Valvular aortic stenosis implies that the aortic valve is malformed. The leaflets are usually too thick and sometimes do not open fully. In both instances, it is more difficult for blood to be ejected from the left ventricle into the aorta. If the obstruction to blood flow is severe enough, it can lead to symptoms of exercise intolerance, weakness, or collapse. Severely affected patients can develop severe heart muscle thickening, cardiac arrhythmias and have increased risk for sudden cardiac death. Mildly affected patients may have no problems and lead normal or near-normal lives.

The wear on the aortic valve can predispose a patient to infective endocarditis, which is a bacterial infection that can be life-threatening. Patients with aortic stenosis may be placed on prophylactic antibiotics for any surgeries, dental procedures, and ear or skin infections.

Pulmonic Stenosis:

Pulmonic stenosis (PS) is a common congenital defect in dogs resulting from a malformation of the pulmonic valve on the right side of the heart. When a patient has pulmonic stenosis it is more difficult for blood to be ejected from the right ventricle into the pulmonary artery. If the obstruction to blood flow is severe enough, it can lead to symptoms of exercise intolerance, weakness, or collapse. Right heart muscle thickening and ascites may be seen via ultrasound. Some patients may not need any therapy, some patients may benefit from medical therapy with a beta-blocker and some patients may benefit from a catheter-based procedure called balloon valvuloplasty.

Ventricular Septal Defect:

Ventricular septal defect (VSD) is a congenital defect seen in dogs and cats where there is a hole/gap in the ventricular septum, which is the wall that separates the left and right ventricular chambers. If the defect is small, the hemodynamic consequences are minimal and the patient may lead a normal life. More severely affected patients may develop heart enlargement, heart failure and pulmonary hypertension.



Valvular Dysplasias:

Malformations of either the atrioventricular valve on the left (mitral valvular dysplasia or MVD) or the right (tricuspid valvular dysplasia or TVD) side of the heart may occur in dogs or cats. Valvular dysplasia may lead to severe leakage of the affected valve and occasionally narrowing (stenosis) of the valve orifice. Depending on how severely the valve is affected, the patient can live a normal lifespan or could develop heart arrhythmias and congestive heart failure. Atrioventricular canal defects or endocardial “cushion” defect are rare defects primarily seen in cats.

Atrial Septal Defect (ASD):

An ASD is a hole/gap in the atrial septum, which is the wall that separates the left and right atrial chambers. Blood is able to pass between these two chambers through the ASD. If the defect is small, the hemodynamic consequences are minimal and the patient may lead a normal life. More severely affected patients may develop heart enlargement, heart failure and pulmonary hypertension.