

Understanding Murmurs

Your pet has been diagnosed with a cardiac murmur by your vet. The significance of the murmur will vary from case to case. Not all murmurs need to be treated. Further investigations may be required to determine if treatment is required and to stage the disease.

What is a murmur?

A murmur is a “whooshing sound” heard with each heartbeat, heard by stethoscope across the chest wall. This sound is an indication of turbulence in blood flow as it is moving through the heart. This turbulence in blood flow can be because of various structural heart defects:

- 1. Leaking valves:** There are 4 valves in the heart. The valves ensure one-way direction of blood flow through the heart. Most commonly the valves become thickened causing a small gap to form between the tips, resulting in blood leaking backwards through the gap. Small breeds are particularly prone to development of thickened, distorted valves (Endocardiosis or more commonly known as myxomatous mitral valve disease (MMVD)). The loudness of the murmurs will vary depending on the stage of disease and is usually slow to progress with no clinical signs in early stages as the heart adapts to the changes.
- 2. Heart enlargement:** In large breeds disease affecting the heart muscle causes the heart to enlarge/dilate (Dilated Cardiomyopathy, DCM for short). This stretches the opening of the valves creating a small leak between the tips. These murmurs are usually soft. In some breeds, the heart disease may progress rapidly, so it is vital to have these murmurs investigated as soon as possible. This disease can also cause irregular heartbeats (arrhythmia).
- 3. Narrowed heart valves:** Some heart valves may develop abnormally from birth causing narrowing (stenosis) in the flow across the valve. The narrowing causes blood to speed up as it moves across the narrowing. The increased speed of flow creates turbulence, which causes a high pitched “squirting” murmur like when you put your finger across the end of a hosepipe. The narrower the defect is, the more significant the problem.
- 4. “Hole in heart”:** Ventral septal defect (VSD) is a hole between the left and right ventricle (bottom chambers). Atrial septal defects (ASD) is a hole between the left and right atrium (top chambers). Patent ductus arteriosus (PDA) is a hole between the large blood vessels leaving heart (aorta on left and pulmonic artery on right). In all 3 of these congenital heart diseases, blood will flow abnormally through the hole. If the hole is small, the blood will speed up to move through the gap and this will cause increased turbulence and a high-grade murmur. Larger holes are more significant as more blood moves across the defect.
- 5. Innocent/ physiological murmurs** are low-grade murmurs which occur without heart disease and is usually found in animal less than 6 months of age. It is caused by fast blood flow through a small heart. The murmur will usually disappear by the age of 6 months. If the murmur is very loud or does not disappear by 6 months of age, it would be wise to assess for congenital heart disease (birth defect). In older animals, physiological murmurs can occur with anaemias, fevers or athletically fit dogs without the presence of heart disease.

What is the significance of a murmur?

Whilst some murmurs are associated with minor heart disease, others are more significant as the heart tries to compensate by changing its size and shape by process of remodelling. Over time these compensatory mechanisms will fail, and heart failure will ensue. Mild defects may not have any effect on the heart and your pet can live a normal and full life, whereas more severe defects, require treatment and ongoing monitoring to manage the problem. Sadly, severe heart disease may shorten your pet's life expectancy regardless of treatment, but treatment may improve quality of life and extend the life expectancy.

Grading heart murmurs

Murmurs are graded 1- 6, with 1 been very soft and grade 6 being very loud. The type of the murmur will depend on the heart defect. In dogs generally, the loudness of the murmur correlates with severity of disease apart from with "holes in the heart"

Where loud murmurs indicate the hole is small, often with no consequences. In valve defects the murmurs start off soft with small leaks but as the leaks worsen, the murmur intensity increases. In dilated cardiomyopathy soft murmurs but can still be significant.

In cats, the grade of the murmur does not correlate with severity of disease and it can be very difficult to determine which cats have significant heart disease and which don't, by listening to the heart alone. Due to their fast heart rates, some cats will have murmurs without heart disease whilst others with have significant heart disease without having a murmur. Furthermore, cat murmurs can vary in intensity and even disappear from day to day and this can be very confusing. It is therefore recommended to investigate all cat murmurs.

What is the best way to diagnose a murmur?

The best way to diagnoses a murmur is by performing an ultrasound scan (echocardiography). This is a non-invasive way to assess where the murmur is originating from, whether the heart is adapting. In most cases we prefer to scan your pet without sedation but when the pet is aggressive or very stressed, a light sedation may be required. Vets will have different skills and training and different practices will have different levels of equipment, so your vet may prefer to refer you to a referral centre for a cardiologist to examine and diagnose your pets heart condition. Cardiologists, in general, have a lot more training and experience with advanced equipment to diagnose more complex heart conditions.

What other tests can be used to assess heart disease?

Sometimes additional tests are required to assess the heart and blood vessels further. These includes:

- Blood tests to assess general health status and for other concurrent diseases and to monitor effects of medication
- Blood pressure to assess heart function and adaptive mechanisms
- X-rays of the chest to assess for heart failure, concurrent lung disease and size of the heart
- ECG to assess the electrical activity of the heart and to diagnose abnormal heart rhythms
- 24-hr Holter monitor will assess an arrhythmia or effects of medication on heart rate over a 24-hr period.

When should I investigate a murmur?

This will depend on the age, breed and type of murmur. The cardiologist will obtain a full history and discuss any clinical signs before examining your pet. After all the information is obtained, they will decide on when it is the best time to proceed with diagnostic tests. As a rule, we recommend investigating the following cases:

- All persistently loud-grade puppy or kitten murmurs over the age of 6 months

- All cats with murmurs
- Large breed dogs with low grade murmurs

- All small breeds with grade 3 or louder murmurs. Monitor lower grade murmurs every year at boosters
- All symptomatic animals (coughing, distended belly, collapsing, exercise intolerance, fevers of unknown origin)
- All animals with an arrhythmia (abnormal heart rhythm or rate)
- All animals intended for breeding purposes as many heart defects are hereditary

Why should I investigate a murmur when my pet is not showing clinical signs?

It is important to assess if the murmur is due to significant heart disease and to assess the risks for heart failure. Many diseases start off in the occult phase (occult= hidden or asymptomatic phase) as the heart learns to adapt to the defect. If left undiagnosed and untreated however, your pet may develop heart failure sooner as the heart has to work harder to adapt to an ever-progressing disease. More severe clinical signs cost more money to stabilize and require longer stay in hospital.

Not all animals require treatment but monitoring the disease may allow us to be 1 step ahead of the problem. Recent studies in small dogs and large breeds without clinical signs showed that starting medication when the heart becomes enlarged, could push back the onset of heart failure and allow them to live longer with better quality of life than those left untreated. In certain breeds heart disease can progress rapidly to heart failure or even cause them to die suddenly without warning.

Starting medication earlier, may help to reduce the onset of heart failure or risks of sudden death. Many cats do not require heart medication but for the few cats that do, it may help to slow progression of the disease and prevent blood clots from developing. Some congenital heart diseases can be cured by surgery or procedures using catheters to close the holes or stretch open narrowed valves. With some birth defects, if left untreated, can cause your pet die before the age of 2 years or go on to having significant clinical signs such as collapsing or heart failure.