



Claws & Paws

VETERINARY HOSPITAL®

HEART MURMURS & HEART DISEASE

HEART SOUNDS

When veterinarians listen to the heart we are assessing the heart sounds, rate, and rhythm. Normally we should only hear two heart sounds, “lub-dub”, when auscultating the heart. These sounds should be of the same intensity (uniform loudness) and have a regular rhythm. Each heart beat should also be accompanied by a pulse in the blood vessels. A common vein used to feel for synchronization of the heart beat with pulse is the femoral artery in the rear leg.

When listening for the heart sounds, these should be easily heard without strain. Difficulty hearing the heart may be due to heart disease or pulmonary (lung) disease and chest radiographs are always recommended.

Different species will have different ranges of “normal” heart rates. A rapid heart rate (tachycardia) can be due to stress, fear, illness, or heart disease. Bradycardia (slow heart rate) is common when the animal is very athletic and in very good condition, or it can be related to specific heart problems. If heart disease is a concern, an ECG (electrocardiogram) is an excellent tool to use to diagnose atrial or ventricular fibrillation and other arrhythmias.

HEART MURMURS

A murmur is a vibration caused by disturbance of blood flow. The “lub dub” sounds are the sounds of the heart valves closing. If these valves do not meet correctly, then some blood will flow back into the heart chamber instead of all of it exiting the heart. The noise caused by the blood flowing back into the heart is called a murmur.

Heart murmurs are graded based upon intensity or loudness.

Grade I - barely audible

Grade II - soft, but easily ausculted (clearly audible)

Grade III - intermediate loudness

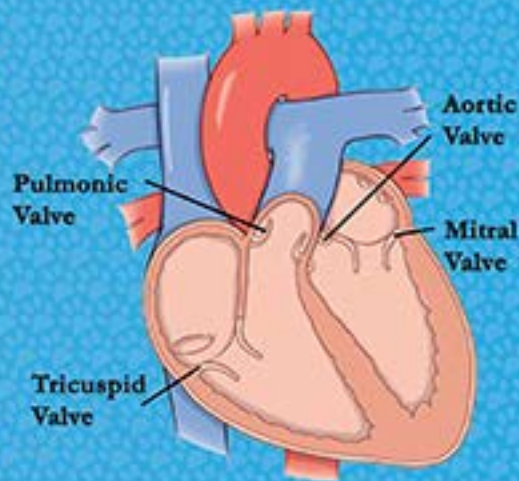
Grade IV - very loud, audible with stethoscope barely touching the chest; palpable thrill (meaning you can feel the murmur by placing your hand over the heart)

Grade V - very loud, audible without the stethoscope; palpable thrill

Lack of an auscultable (audible) heart murmur does not mean that the heart is healthy. The heart can have arrhythmias or be diseased (such as Dilatative or Hypertrophic Cardiomyopathy) and still auscult normally.

When the heart starts to weaken, it will not push out the same amount of blood with the same amount of force with each heartbeat as it does when it is healthy. This decreased cardiac output results in lowered blood pressure. There are certain Baroreceptors in the body whose job is to monitor cardiac output and blood pressure. When the heart is not doing its job properly, these baroreceptors alert the brain to the heart’s problem. The brain then does two things. It sends signals down the nervous system causing the arteries and veins to constrict and increase systemic blood pressure. The brain also sends a hormone to the kidneys causing the kidneys to conserve sodium and therefore water. This is because certain organs like the brain and the kidneys need a minimum blood pressure for them to work properly. They take precedence over the heart.

At first this helps the body and gets the blood pressure back up to normal. Except that now, the heart is having to push against an increased force and therefore has to work harder. This causes the heart to weaken further.



HOURS

MON
7:30AM – 6:00PM

TUE
7:30AM – 7:00PM

WED
7:30AM – 6:00PM

THU
7:30AM – 6:00PM

FRI
7:30AM – 6:00PM

SAT
8:00AM – 1:00PM

In order to compensate for its decreased cardiac output, the heart will dilate (increase in chamber size) so that it can push out increased blood volume with each beat. Sometimes this dilation will pull the heart valves apart and cause a murmur. It cannot be determined whether valvular disease or dilation occurred first. When increased chamber size is no longer enough, the heart will start to beat more quickly in order to get the correct amount of blood volume moving through the body.

Clinical signs of heart disease depend upon which side (sometimes both sides) of the heart is affected. Dogs with heart disease may exhibit the following clinical signs (based upon which side of the heart is affected): Weakness, depression, lethargy, coughing, weight loss, difficulty breathing, anorexia (not eating), fainting spells, abdominal distention (fluid), possible cyanosis (blue tinge to tongue and mucous membranes), exercise intolerance, vomiting, collapse, sudden death. Some pets may be asymptomatic (without clinical signs).

DIAGNOSTIC TESTING

Once a heart problem is detected or suspected, your veterinarian will recommend certain diagnostic tests to further diagnose the problem so that effective treatment can be recommended.

Chest X-rays Chest radiographs give valuable information concerning both the heart and the lungs. The heart can be evaluated for increased size (right, left, or general cardiomegaly), abnormal shape (tumor), and position. Blood vessels are evaluated for increased size, tortuosity, and blunting. Variable lung patterns will help to differentiate between asthma, fluid, effusion, and tumors. This test does not show how the heart functions.

Blood Tests - CBC (complete blood cell count) and Serum Chemistries help to detect potential problems with other organs in the body—liver, kidney, pancreas, etc. It is important to make sure that the liver and kidneys are healthy because they metabolize most of the medications used to treat heart disease.

ECG (electrocardiogram) - This test shows an electrical picture of the heart functioning. It helps detect changes in rate and rhythm (arrhythmias), heart chamber size, and electrical axis.

Cardiac Ultrasound - With this test we can observe strength of contractions, measure chamber size and thickness of the heart muscle walls, valvular function, detect heartworms and also detect tumors. This test is the most sensitive in determining how well the heart is functioning.

Blood Pressure Monitoring - This is a non-invasive means of measuring blood pressure very similar to the procedure done in human Doctors' offices. Many cardiac (heart) diseases and heart medications can cause increases or decreases in blood pressure.

The Doctor will discuss with you which of these diagnostic tests is needed for your pet. At the very least, an x-ray and CBC/Chemistry panel are needed. Some of these diagnostic tests may need to be performed periodically as a means of monitoring efficacy of treatment.

Many heart medications can have adverse drug interactions with other medications. It is very important that you let your veterinarian know all medications that your pet may be on. Should side effects occur, *it is very important that you talk to your veterinarian as soon as possible and do not simply discontinue the drug unless instructed by your Doctor.*



HEART MEDICATIONS

Your pet may need to be on one or more of these drugs, or even one not listed here, based upon the type of heart problem that is present.

Enalapril maleate (Enacard) - This is an angiotensin-converting-enzyme (ACE) inhibitor. It functions in two different ways. It stops angiotensin (a hormone made by the brain) from reaching the kidneys, therefore decreasing sodium reabsorption and lowering blood pressure. It also has been shown to strengthen the heart muscle itself. Dogs have been shown to live longer on this medication. It is also used some in cats. Monitor your pet for nausea, vomiting, or diarrhea and call the hospital should any of these symptoms occur.

Pimobendan (Vetmedin) - This is a veterinary inodilator that dilates both veins and arteries, easing the workload of the heart. It also directly increases cardiac output and tissue perfusion. It is indicated for use in the management of mild to severe congestive heart failure (CHF) in dogs. Acting directly on the heart, Vetmedin improves signs of CHF, often within eight days. In one clinical study, dogs on vetmedin survived three times longer than dogs on standard heart medications alone. This medication is not intended to replace other heart medications such as furosemide (Lasix) and enalapril (enacard). Because it has a different mode of action, Vetmedin is designed to be used concurrently with many heart medications. Monitor your pet for lack of appetite, vomiting, diarrhea, lethargy and dizziness.

Furosemide (Lasix) - This is a diuretic. It is used to help reduce the amount of water in the pet's body by increasing urination. It also helps with increased blood pressure by decreasing the work load of the heart and arteries. It is most commonly used when fluid starts to accumulate in the lungs because of heart disease. It is important that fresh water always be available. Any water restriction could potentially hurt the kidneys. Pets on this medication will have increased drinking and urination.

Theophylline (Theo-Dur) - This is a multi-purpose drug which is also used to treat asthma patients. It works by increasing the size of the bronchioles and airways in the lungs making it easier for the pet to breathe. It also has mild anti-tussive (cough) effects and is a mild diuretic. This medication usually starts to work within an hour of oral administration and can be given every 4-6 hours if needed. Some pets will experience increased excitement and stomach discomfort. This usually resolves with time, but let your Doctor know if your pet exhibits these symptoms as she may want to temporarily decrease the dosage. Other side effects may include increased thirst, vomiting, and diarrhea.

Prednisone - This is a corticosteroid medication used for its anti-inflammatory properties. It does not directly affect the heart. It is used to help decrease inflammation with the lungs and also acts as a mild diuretic. Pets on this medication will have increased drinking, urination, and appetite. Long-term usage at elevated doses can suppress the immune system and may cause pets to be more prone to infections.

Digitalis (Digoxin) - This medication is used only in specific types of heart disease. It is used to help decrease the frequency of the heart beat and also to increase the strength of contractions. It improves cardiac efficiency overall. It is very important that this drug be given at the correct dosage. Potential side effects are vomiting, diarrhea, lack of appetite, and depression. It is important that liver enzymes and drug dosage be monitored periodically. It is also important that an ECG be performed both prior to beginning this medication and also periodically during treatment. Digoxin can potentially cause fatal arrhythmias.

Diltiazem (Cardizem CD) - This is a calcium channel blocker used to decrease high blood pressure and to decrease the heart rate. It is primarily used in cats for Hypertrophic Cardiomyopathy. It can be given once a day. Side effects seen may be depression, upset stomach, rash and low blood pressure.

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DIET AND EXERCISE

Severe sodium restriction is not necessary, but we do want to reduce the amount of sodium in the pet's diet. The best commercial diets are those specifically engineered for heart patients—these have a low yet adequate amount of sodium present. Two examples of acceptable diets are IVD Vet's Choice Modified Diet and Hills Science Diet h/d. If a pet will not eat either of these two diets, discuss an alternative with your Doctor. Many of today's pet treats have too much salt in them. Stay away from jerky type treats and canned food. Most human food also has too much salt in it. Just one half slice of bacon could cause a poodle to go into heart failure.

The amount of exercise that your pet should have is based upon each individual's situation. For most pets, mild exercise is well tolerated. Most pets can choose their own level of activity. Heart patients are also less tolerant of extremes of heat and cold, and all forms of stress should be avoided.

PHYSICAL EXAMINATIONS

Once your pet has been diagnosed with a heart problem, it is highly recommended that your pet be examined once every three months. Besides a comprehensive examination, the Doctor will especially listen to the heart and lungs for any changes in heart rate, murmur, and breathing pattern. Treatment recommendations may be modified based upon physical examination and how the pet is doing at home. Periodic blood tests and other diagnostics will also need to be performed.

SIGNS THAT MY PET IS HAVING PROBLEMS

Even on proper medication and diet, your pet's heart condition may worsen over time. Call your veterinarian any time that you observe the following:

- Difficulty breathing, panting at rest, labored breathing
- Increased breathing at home. Count the number of breaths for 15 seconds and multiply by 4 to obtain the respirations per minute (RPM). RPM should be less than 30.
- Pale mucous membranes (white or bluish)
- Collapse
- Not eating, vomiting, or diarrhea



Anytime you are not sure whether or not it is an emergency, assume that it is and bring your pet in right away. This hand-out is designed to help you understand heart disease and answer most of your questions. Please do not hesitate to call should you have any concerns or questions.

Links to Social Media Sites
Can Be Found On Our Website
www.CPVH.com

