



Pacific Tide

An informational monthly newsletter

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Author of the month:



Mandi Kleman, DVM, DACVIM (Cardiology)

Dr. Kleman received her DVM from the University of Florida followed by an internship at the University of Pennsylvania and a cardiology residency at the University of Florida. In addition to life-saving interventional procedures, she is interested in complex arrhythmia diagnosis/management and novel approaches to chronic congestive heart failure. Most importantly, Dr. Kleman is passionate about helping to provide happy and fulfilling lives for dogs and cats with heart disease. Her philosophy balances the importance of communication, compassion, and knowledge while working closely with the families and veterinarians of her patients.

Feline Heart Murmurs – “Important” or Not?

Interpreting feline heart murmurs can be frustrating! Murmurs are very common in cats and it goes without saying that the presence of a heart murmur serves as a warning sign that underlying cardiac disease may be present. The problem arises that feline heart murmurs do not always equate to the presence of cardiac disease. Murmurs may be innocent or physiologic or may be pathologic (due to mild, moderate or severe HCM, restrictive or unclassified cardiomyopathy, thyrotoxicosis, arrhythmogenic right ventricular cardiomyopathy, dilated cardiomyopathy, or congenital heart disease).

Additionally, care should be taken to not apply too much pressure over the sternum with your stethoscope. This pressure may deviate blood flow through the small cat heart to cause a non-pathologic heart murmur. Referred airway sounds can also mimic a heart murmur in cats. Cats are notorious for taking short in and out breaths that coincide with the rate of the heart beat thereby mimicking murmurs. Applying gentle pressure to the nares may alter the patient's respiratory pattern to allow respirations to be differentiated from the heart beats.

Innocent or physiologic murmurs account for a large percentage of feline murmurs and are frequently heard in cats with high heart rates due to stress, pain, or excitement. The actual cause of this type of physiologic murmur is often a dynamic right ventricular outflow tract obstruction (DRVOTO). This long name indicates a dynamic compression of the right ventricle during systole at high heart rates or inotropic stimulation. There is no anatomic abnormality and the velocity is

never more than mildly elevated. Physiologic heart murmurs may also be heard in the presence of anemia (PCV typically <18% in cats), fever, and other systemic illnesses due to an increased velocity of normal, laminar blood flow through the heart and a hyperdynamic state.

Hyperthyroidism can cause both physiologic and pathologic heart murmurs in cats. Early in the disease process, both the elevated sympathetic tone and hyperdynamic state contribute to a physiologic murmur. These murmurs frequently resolve following effective treatment of the hyperthyroidism. Longer standing hyperthyroidism induces pathologic changes to the heart, including left ventricular hypertrophy, systolic anterior motion of the mitral valve, and left atrial dilation. Heart murmurs are common in these cats due to the structural and functional cardiac changes and the murmur may or may not resolve following treatment.

Can auscultation really differentiate benign physiologic murmurs from pathologic murmurs associated with cardiac disease? Unfortunately, the answer is no. Our ears are not able to tell the difference between a pathologic murmur and a physiologic murmur in a cat. Both physiologic and pathologic heart murmurs are commonly dynamic in cats and this auscultatory finding is not helpful for differentiation. A dynamic heart murmur means that the murmur disappears or diminishes in intensity when cats are relaxed and increases in intensity when excited or stressed. It is prudent to recommend an echocardiogram whenever a murmur is ausculted

as only echocardiography can determine whether a heart murmur is of pathologic significance. An echocardiogram provides the owner with information on whether cardiac disease is present and if so, what kind and how severe it is. Definitive therapy may be recommended based on the results of echocardiography. Thoracic radiographs may be taken if cardiac disease is verified by echocardiography, but radiographs are not necessary for physiologic murmurs. Bloodwork and further workup may follow (e.g. T4, blood pressure, ECG).

Why not just take chest radiographs? Chest radiographs will indicate whether the cat has moderate to severe cardiac disease (mild disease is very difficult to differentiate from normal) but will not tell you what type of cardiac disease is present. Chest radiographs in asymptomatic cats infrequently provide enough information to differentiate mild cardiac disease from a physiologic murmur. The presence of a heart murmur serves as a warning sign that underlying cardiac disease may be present and an echocardiogram is indicated. If echocardiography is not accessible due to finances or availability, thoracic radiographs and/or NT-proBNP are good intermediate steps. However, both of these tests have interpretation limitations/"grey" zones in cats with mild to moderate cardiac disease. Additionally, both of these tests are not necessary in cats with a normal echocardiogram and a physiologic murmur.

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About Our Organization

PVSES was founded to provide high quality, specialized medical care to companion animal patients. Our practice is dedicated to serving the veterinary community as a partner in total patient

care. We offer comprehensive specialized services including endoscopy, Doppler ultrasound, surgery, 24-hour ICU care, and emergency and critical care. Our

staff is committed to providing compassionate and thorough medical care that meets the needs of the patient, client, and referring veterinarian.

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