

Dr. Roughie's Questions and Answers

Heart Murmurs-What are They, Anyway?

Kasmin D. Bittle DVM

Heart murmurs are abnormal heard sounds. Typically, heart sounds are described as being “lub-dub” with each sound pair representing a single beat of the heart. With each beat of the heart, a single pulse is generated and in the normal animal, this pulse may be felt at several external locations on the body. The most accessible location for feeling, or palpating, the pulse in dogs is on the inside of the thigh where the femoral artery courses downward near the center of the leg.

Not all heart murmurs are representative of heart abnormality. Murmurs may be classified as either “innocent” or as “pathologic”. Innocent murmurs are those where no abnormality of the heart is found to account for the abnormal sound. Murmurs also may be pathologic, meaning that a heart abnormality is present and is causing the abnormal heart sound. It is essential to understand that a heart murmur is not a diagnosis, it is a symptom or sign. The actual diagnosis will in most cases require further workup. It is also important to understand that classification of heart murmurs as to innocence or pathology is made only through diagnostic workup. While a very loud heart murmur is likely to represent disease, it is not necessarily true that a very soft heart murmur is innocent. Other parameters may be looked at to evaluate whether a murmur is innocent or pathologic. Small body size, particularly when compared to that of littermates, cyanosis (blue discoloration of gums and conjunctiva), and exercise intolerance strongly suggest the presence of actual heart disease.

Heart murmurs are graded from I to VI, with grade I murmurs being very difficult to hear and grade VI murmurs being audible with a stethoscope placed slightly away from the chest wall. Heart murmurs are also classified as diastolic or systolic. Systolic

sounds are heard between the “lub” and the “dub” and occur during the period of heart contraction. Diastolic murmurs, which are less frequent than systolic, are heard during the period of heart relaxation, between heart beats, and therefore between the “dub” and the ensuing “lub” of the next heart beat. Murmurs may also be described in terms of where on the chest wall they are loudest or most easily heard. Some heart murmurs are audible only on a very confined region of the thoracic wall, and others may be heard in several locations to include locations distant from the heart such as along the carotid arteries. The description of heart murmurs as to diastolic versus systolic, and according to where they are most easily heard may offer some clue as the diagnosis of the problem. But again, further workup will be necessary to confirm these suspicions.

Heart murmurs may also be “acquired” or “congenital”. Acquired murmurs are those that develop with age, but were not present in the animal previously. Good examples of acquired murmurs are those associated with cardiomyopathy, as seen in Doberman Pinschers and Boxers. Again, it is important to understand that the murmur is the “sign” of disease and cardiomyopathy is the diagnosis. Congenital heart murmurs are those that are present at birth, or those suspected to have been present since birth. Congenital heart murmurs, although present since birth, are frequently not detected until the animal’s first complete examination. Heart murmurs that are grades I-III may also be easily missed in uncooperative animals or when extraneous noises drown out the sound during the auscultation procedure. Auscultation is the process of listening to the heart with a stethoscope.

Once a heart murmur is detected, diagnostic procedures must follow to determine whether heart disease is present. The most useful diagnostic procedures for most heart murmurs are radiography, or X-ray of the heart, and ultrasonography.

Radiography provides useful information about overall heart size, with some impression as to heart chamber enlargement or enlargement or prominence of heart or pulmonary (lung) blood vessels. Ultrasound will provide much more specific information regarding actual chamber size, thickness of the heart walls, structure and dynamics of the heart valves, and the presence or absence of abnormal structures within or around the heart. Doppler ultrasound provides even more information as the addition of Doppler technology to ultrasound equipment permits the measurement of flow rates and pressure gradients across the heart valves. Other tools which may be used in the diagnosis of heart disease are electrocardiography and angiocardiology. The electrocardiogram (ECG) measures the electrical activity of the heart and may be used to diagnose heart arrhythmias or major shifts in electrical axis which is usually a reflection of heart chamber enlargement. Angiocardiograms are dye studies of the heart using radiography or fluoroscopy, which is essentially video radiography. Ultrasound, ECGs, and radiographs are considered to be non-invasive procedures and pose little risk to the animal being studied. Angiocardiography is considered invasive, and some risk to the animal may be incurred by this procedure. It therefore follows that angiocardiology is often not pursued unless the diagnosis remains unclear following diagnostic workup using non-invasive procedures.

Many of the heart defects seen in purebred dogs are congenital in nature and are presumed to be hereditary. Examples of congenital heart defects common in purebred dogs are subaortic stenosis, as seen in Newfoundlands, Golden Retrievers and Rottweilers, tricuspid valve dysplasia as seen in Labrador Retrievers and pulmonic stenosis is seen in Beagles, Bulldogs and Fox Terriers. Auscultation by a qualified veterinary internist or cardiologist is the mainstay for screening for congenital heart disease. In breeds where there is a high prevalence of disease, such as in the Newfoundland, litters are screened for the presence of murmurs

before placement into homes. As indicated above, however, it is important to realize that auscultation is used as the screening procedure, while other diagnostic modalities are used to confirm the diagnosis.

Animals with heart murmurs should not be bred unless diagnostic workup to rule out heart disease has been performed. There are many examples of animals with significant and potentially inherited heart disease that may be asymptomatic except for the presence of a heart murmur. It is also beneficial to pursue diagnosis so that trends within a breed may be detected and addressed before a defect has a high prevalence. In most breeds where congenital heart disease has become prevalent, affected animals were bred either because they were never ausculted, even by a nonspecialist, or were ausculted, but soft murmurs were presumed to be innocent without diagnostic workup. This once again points to the importance of the physical examination for the maintenance of health and vigor within a breed population.