Incidentally-detected heart murmurs in dogs and cats: executive summary 2015

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An incidentally-detected heart murmur is a heart murmur that is first detected in the course of an examination not initially aimed at the cardiovascular system (e.g., routine annual examination, pre-anesthetic examination). A layperson's term would be "asymptomatic murmur".

The need to evaluate a patient with an incidentally-detected heart murmur depends on the client (e.g., cost, pre-existing notions of importance, concern/anxiety), the patient (features of the heart murmur, concurrent diseases or signs, lineage), and the veterinarian (confidence in the likely underlying cause based on examination alone, perception of severity of the cause). The specific approach can change from case to case.

Dogs

*General:* Echocardiography is recommended in any dog of any age if the heart murmur is 1) diastolic, 2) continuous, 3) accompanied by other heart sound abnormalities (e.g., a gallop sound or arrhythmia other than sinus arrhythmia), 4) associated with historical or physical signs of cardiovascular disease, 5) radiating to the carotid region, 6) louder over the right hemithorax, and/or 7) louder over the left cardiac base and grade 3/6 or louder.

*For the Working Group of the American College of Veterinary Internal Medicine Specialty of Cardiology on Incidentally-Detected Heart Murmurs
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Puppies with soft murmurs: Puppies with grade 1-2/6 systolic murmurs loudest over the left cranial thorax may have one of two classes of underlying cause: functional/innocent murmurs that are of no consequence and most often resolve with growth, or minor congenital heart defects that are generally of no importance to the individual dog but may be of substantial importance in specific situations (e.g., breeding stock). In these cases, two-dimensional and Doppler echocardiography should be discussed with the puppy's owner and recommended if justified based on the factors listed above.

Adult dogs: Adult dogs with systolic, left apical murmurs commonly have mitral regurgitation. In small-breed dogs (<20 kg), the most common cause is degenerative mitral valve disease (DMVD), and thoracic radiographs can be used as an initial diagnostic test. Normal cardiac silhouette size and absence of clinical signs make clinically significant mitral regurgitation unlikely, and treatment is not indicated. Cardiomegaly warrants serial thoracic radiography, echocardiography, or both. In larger dogs (≥20 kg), a specific diagnosis is much less certain from auscultation alone. Dilated cardiomyopathy, infective endocarditis, mitral valve dysplasia, and DMVD are well-recognized and not easily distinguished radiographically or on auscultation. Therefore, echocardiography is the first-line test in larger dogs with systolic, left apical murmurs.

Cats

Echocardiography is recommended in any cat if the heart murmur is 1) of grade 4/6 or louder, 2) diastolic, 3) continuous, 4) accompanied by an arrhythmia and/or a gallop

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sound, or 5) associated with possible clinical signs of heart disease. In cats with soft (grade 1-3/6) systolic murmurs, the underlying cause of the murmur and the clinical severity of the causative disorder cannot be predicted from such murmur characteristics as the point of maximal intensity, murmur grade, or variability of murmur intensity with heart rate. Such cats should be evaluated further when imminent cardiovascular stress (e.g., general anesthesia), owner concerns, and availability and cost of tests justify doing so. This determination is different for every patient and client. Reasonable approaches can include: 1) ancillary tests based on risk (e.g., measurement of arterial blood pressure and serum thyroxine concentration in geriatric adult cats); 2) measurement of circulating NT-proBNP concentration, with a low value making clinically-significant cardiomyopathy very unlikely; 3) thoracic radiographs, with certain changes in the cardiac silhouette suggestive of heart disease but with limited sensitivity and specificity; and/or 4) two-dimensional and Doppler echocardiography to definitively identify the murmur’s cause and establish risk of deleterious cardiac sequelae, if any.

Frequently Asked Questions

1. A cat has an incidentally-detected heart murmur and the owner can afford very little. Is it wiser to invest available funds into starting treatment (e.g., an antiplatelet drug like clopidogrel, or an antitachycardia drug like a beta-blocker) rather than diagnostic tests?

No, treatment is not indicated in this context for at least 2 reasons: 1) the cause of the murmur in many of these cats is benign and considered nonpathological (e.g., dynamic

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right ventricular outflow tract obstruction); and 2) without a specific therapeutic target (e.g., atrial enlargement which might warrant antiplatelet therapy), treatment is speculative, may not be necessary, and could possibly do more harm than good.

2. A 12 year-old miniature poodle dog with a left apical systolic murmur that was grade 2/6 last year has been presented today for an annual exam and the murmur intensity is now grade 4/6. What is the best way to proceed?

The dog’s signalment and the murmur features suggest degenerative mitral valve disease (DMVD). The greater murmur intensity may be related to disease progression (i.e., more mitral regurgitation) or may be unrelated (e.g., greater sympathetic activation from excitement). The presence or absence of historical signs of heart failure, the rest of the physical exam, and the client's concerns and wishes should be used for deciding whether to proceed with diagnostic testing: thoracic radiographs, echocardiography, or both.

3. A cat with an intermittent heart murmur is leaving for long-distance travel by car (or by plane) with its owner. What would be the safest approach?

In cats, cardiac risk assessment requires echocardiography. Results identify the extent of cardiac disease, if any. Other tests may be indicated (e.g., electrocardiography if an arrhythmia is noted) to properly determine risk, or to guide anxiolytic drug selection if

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needed, for example If echocardiography is not feasible, thoracic radiography and circulating NT-proBNP measurement would be appropriate. In general, cardiac risk assessment justifies evaluation by a cardiologist.

4. A small-breed, obese, elderly dog has a left apical systolic murmur detected during an examination for evaluation of otitis externa. There is an occasional cough. Thoracic radiographs show equivocal pulmonary abnormalities, and possibly, cardiomegaly. Should cardiac therapy be initiated?

A presumptive diagnosis of DMVD can be made based on signalment and murmur characteristics. Whether to begin medications (ACE inhibitors) in DMVD prior to heart failure is controversial, especially when left atrial enlargement has not been confirmed. If cardiac medications are being considered and clinical and radiographic findings are ambiguous, echocardiography with a cardiologist is justified, to avoid unnecessary treatment.

5. A puppy has an abnormal-sounding heart but it is unclear whether the abnormality is a murmur or something else. How is this patient best managed?

Three options exist: recheck auscultation in 3-4 weeks, second-opinion auscultation by a cardiologist, and diagnostic testing (radiographs/echo). Particularly when a pup's
vocalization or movement makes auscultation incomplete, a second opinion is appropriate, with diagnostic testing if indicated.

[Formatting note: the length of this copy is intended to fill one sheet of paper, double-sided: Executive Summary on one side, and FAQs on the other. Therefore, the many opportunities for making this document longer by adding more information or language that is more verbose have been avoided deliberately in favor of compact size.]