

Pacific Tide

An informational newsletter

Pacific Veterinary Specialists & Emergency Service

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About our Author

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Originally from New York City, Dr. Kristine Chan received her BS in animal science and DVM from Cornell University in Ithaca, New York. She then completed an internship at Angell Animal Medical Center in Boston and a cardiology residency at California Animal Hospital in Los Angeles. She achieved board certification in 2009. She subsequently entered a postdoctoral fellowship at an interventional cardiology lab at Cedars-Sinai Medical Center's Heart Institute, where she trained in catheterization and ablation techniques. Dr. Chan joined Pacific in 2014.

Dr. Chan recently married and will hopefully be in the Bay area for many years to come. In her free time, she enjoys reading, walking, hiking, yoga, going to the beach, and playing fetch with Butters, their rescue cat who has an atrial septal defect.



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Heart Murmurs in Puppies and Kittens

By: Kristine Chan, DVM, DACVIM—Cardiology



Hearing a murmur in a new member of the family may be heavy news to bring to an owner. Also, puppies and kittens can be hard to auscult! Besides squirminess, their breath sounds can mimic murmurs and purrs can mask them. It can help to gently press on the nasal planum while ausculting, or place an alcohol pad in front of the kitten's nose to stop the purring. Below is a review of puppy and kitty heart murmurs.

Puppies

Puppies are generally considered pediatric when they are < 6mo old for toy breeds, and < 1y old for giant breeds¹. The prevalence of congenital heart disease in puppies has been estimated to be 0.46 to 0.85%, with PDA (patent ductus arteriosus), aortic stenosis (AS), and pulmonic stenosis (PS) being the most common diagnoses². As my mentor repeatedly drilled into me: Always auscult deep into the animal's left armpit! You never want to miss a basilar continuous murmur, because there are very few things in veterinary cardiology that we can fix 100% ... and a PDA is one of them.

Puppies can have nonpathologic murmurs for various reasons: physiologic murmurs that resolve in adulthood, secondary murmurs from systemic disturbances (e.g. anemia, fever), or due to excitement/stress. These murmurs are generally soft (I/VI or II/VI), left-sided, basilar, systolic, short in duration, and never associated with clinical signs. Auscultation is never a substitute for a definitive diagnosis, and these murmurs can sound identical to murmurs caused by congenital diseases.

The puppy should be further evaluated if:

- The murmur is continuous
- The murmur is heard in diastole
- The murmur obscures the underlying heart sound(s)
- The murmur radiates to the carotid region/neck
- There are any other heart sounds ausculted (split heart sound, gallop, etc.,)
- The murmur is apical
- The murmur is right-sided
- The murmur is grade III/VI or louder
- The puppy is directly related to a dog with known congenital heart disease
- There are jugular pulses or jugular distension
- The pulses are abnormal (bounding, poor)
- There is evidence of abnormal perfusion
- There is abnormal mucous membrane color
- There is an abnormal arrhythmia

Kittens

Kittens are considered pediatric when they are < 6mo old¹. The prevalence of congenital heart disease in kittens has been estimated to be 1.6% and 5% in adoption centers and referral centers, respectively,¹ with AV valve malformations, VSD (ventricular septal defect), endocardial fibroelastosis, and PDA being the



most common diagnoses². Like puppies, kittens can have physiologic murmurs that are soft and clinically insignificant; they can also have murmurs that are loud and still clinically insignificant (i.e. a small VSD). However, there is no way to distinguish a clinically insignificant murmur from a significant murmur by auscultation alone. Also, it should be noted that very young cats can develop acquired cardiac diseases like HCM (hypertrophic cardiomyopathy), which can also present with a murmur (or lack thereof, unfortunately!). HCM has been reported in cats as young as 2 months³ and 3 months old.⁴ Therefore, all kittens with a murmur should be evaluated by Doppler echocardiography so as to not mistake a physiologic murmur for possible progressive hypertrophic cardiomyopathy. Take care, though – sometimes you can create a murmur by pressing too hard against a cat’s chest.

Further Cardiac Evaluation

1. Thoracic radiography is recommended to evaluate heart size and lung fields. In some cases, radiographs alone can be misleading without the partnership of an echocardiographic diagnosis, for instance in cases where the disease causes concentric hypertrophy with no enlargement of the cardiac silhouette on radiographs.
2. Electrocardiography can augment cardiac imaging, giving information such as amplitude or duration abnormalities that can suggest, but not diagnose, cardiac chamber enlargement. More importantly, they give information on cardiac conduction abnormalities and arrhythmias
3. Doppler echocardiography is required for definitive diagnosis of underlying heart disease, screens for concurrent cardiac lesions, and evaluates the structure of the myocardium, valves, and any abnormal areas of blood flow in the heart.
4. Lastly, NT-proBNP is useful for owners who have financial concerns and may not be able to be referred for Doppler echocardiography. While the test can give both false positives and false negatives, it can still provide guidance, with the understanding that the test is not always definitive. If the test is negative, owners may choose to hold on performing echocardiography unless the test becomes positive at a future re-check date, or unless clinical signs point to heart disease.

The hope is that we can guide owners in assessing the health of their pet when a murmur is heard in a new puppy or kitten.

References

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Our Doctors

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Behavior

Jan Brennan, DVM (practice limited to behavior)

About Our Hospital

Pacific Veterinary Specialists 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 video 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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