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Dr. Kelli Paschal was born in Murfreesboro, Tennessee. She earned her Bachelor's degree in biology at Middle Tennessee State University and has been a member of the United States Army National Guard since 2006. In 2014 she graduated with her Doctoral degree in Veterinary Medicine from the University of Tennessee in Knoxville. She moved east to North Carolina where she currently works at Southwoods

Animal Hospital. She has a strong interest in internal medicine and surgery. In her spare time, she loves to play guitar and mandolin, participate in outdoor activities, and spend time with friends and family, including her furry family members, Moose and Oliver.

The Coughing Dog

Most dogs, at some point in their lives, develop a cough; but some are more significant than others. The list of causes for coughing is a very long one. Many factors contribute including age, breed, clinical signs, and other problems that your vet finds during the physical exam.

THE RESPIRATORY TRACT

KENNEL COUGH One of the more common causes for coughing in an otherwise healthy pet is infectious tracheobronchitis, or "kennel cough." This is caused by an opportunistic bacterium, *Bordetella bronchiseptica*, which often times will invade when a viral infection makes the airway susceptible. These respiratory pathogens are easily transmitted between dogs and are also commonly transmitted in areas where many dogs are housed close together (i.e., vet hospitals, boarding facilities, and dog parks). The vaccine, while very protective, does not prevent infection so if your dog has been boarded or has come into contact with unvaccinated dogs, consult your vet right away.

COLLAPSING TRACHEA Some dogs with more of a 'honking' cough may have a collapsing trachea. The trachea is made up of c-shaped cartilage rings that are usually rigid and hold the airway open. These rings can weaken, and, over time, the airway narrows (collapses) making it difficult for air to pass through. While the exact cause of tracheal collapse is unknown, certain breeds are more likely to have this problem (primarily Yorkies and other toy breeds) indicating a possible genetic link. The cough, as well as blue-tinged gums, labored breathing, and exercise intolerance may be observed or worsened by excitement, eating, drinking, tracheal irritants (smoke or dust), obesity, exercise, and hot and humid weather. In many cases, radiographs (x-rays) of the chest can confirm a collapsing trachea as well as rule out other issues. Most cases of tracheal collapse are treated with cough suppressants, bronchodilators, and most importantly WEIGHT LOSS to help decrease respiratory effort.

PNEUMONIA Sometimes a cough can be more significant. A deep, productive cough in combination with lethargy, anorexia, and fever can mean your dog has pneumonia. Along with these initial signs, your vet may hear abnormal or absent lung sounds in certain areas which

may mean that portions of the lung are filled with fluid, inflammatory cells, or organisms. Pneumonia can be caused by many different things including viruses, bacteria, fungus, parasites, or from aspirating fluid after vomiting. Bloodwork and radiographs can help determine how severely your pet is affected. Depending on the severity, your vet may recommend hospitalization and supportive care, or antibiotics and bronchodilators with monitoring at home.

THE HEART

In addition to your dog's respiratory tract, your dog's heart can also be the cause of a cough. For many reasons the heart can lose effective pumping ability, or it can grow larger, creating physical pressure on the airway. Two common causes of heart disease and failure are heartworm infection and degenerative heart disease.

HEARTWORMS One cause of heart disease is infection with heartworms. Heartworms are transmitted by mosquitoes that inject immature larval stages of heartworms in the body. Over time these larval stages will migrate into the bloodstream where they eventually grow into adult worms in the vessels of the heart. There they can reproduce until many adult worms are present and obstruct the flow of blood, making the heart work much harder to circulate blood. Eventually the heart will not be able to keep up. Initially you may notice a decrease in exercise, increase in respiratory effort or rate, or the cough. Because early stages of heartworms are susceptible to preventatives, giving your pet heartworm prevention year-round is a very easy way to ensure he or she does not succumb to this terrible disease.

DEGENERATIVE HEART DISEASE Has your veterinarian heard a murmur in your dog? A murmur occurs when blood flows in an abnormal direction. Younger dogs may have innocent murmurs that resolve as they age. If the murmur is heard after 16 weeks of age, this could mean a congenital problem is present. In older dogs, murmurs are more commonly caused by degenerative valvular disease, in which the valves wear out, become "leaky" and allow some blood to flow backward. This does not always mean that your dog will develop heart failure. However, the heart will have to work harder to push blood forward causing it to get larger. Also, over time, the heart may not be able to pump effectively, causing fluid to build up in the body or lungs. You may notice coughing, exercise intolerance, increased respiratory rate, or pale gums. Sometimes these can be emergency situations requiring oxygen and hospitalization. Ideally, radiographs of the chest should be performed to see if the heart, vessels, and lungs appear normal. When heart disease or failure is diagnosed in your dog, medications can help reduce fluid accumulation, reduce blood pressure, and reduce work-load of the heart muscle. Unfortunately, there is no cure for heart disease in pets but with proper management and monitoring, your dog can enjoy good quality time doing all the normal things he or she enjoys.

Though coughing is a normal defense mechanism, it can be the first symptom of a more important disease process in your dog. In addition to some of the diseases mentioned above, there are many other causes. It's important to check with your veterinarian when you notice coughing to prevent something simple from becoming more serious.



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