

## **Tracheal Collapse**

### **By Dr. Karen Becker**

Hi, I'm Dr. Karen Becker. Today I want to discuss a potentially very serious disorder that primarily affects small dogs. It's called tracheal collapse. It's a chronic, progressive disease involving the trachea. The trachea is the scientific name for the windpipe, which is the tube that connects the nose, mouth and throat to the lungs. When your dog inhales, the diaphragm, which is the flat muscle that separates the abdomen from the chest cavity, flattens and the muscles between the ribs move to pull air into the lungs. When he exhales, the muscles move in the opposite direction to push air out of the lungs. The trachea enables the passage of air in and out of the lungs.

Part of the trachea is in the throat, and a portion also extends down into the chest. It looks a little bit like a vacuum cleaner hose. It's made of muscle connected by small rings of cartilage that keep the tube open. These rings are actually C-shaped, with the open part facing upward toward your dog's back. Running along the top part of the C-ring is a band of tissue called the dorsal tracheal ligament. It's also referred to as the tracheal membrane or the dorsal membrane. The C-rings that give the windpipe its round shape can weaken over time. As they weaken and become flatter, this is this condition of tracheal collapse.

When the condition is congenital, which means present at birth or genetically predisposed, it's typically the result of an inherited deficiency in certain components of the cartilage rings, like calcium, chondroitin, glycoproteins and glycosaminoglycans, which is the fancy word for glucosamine.

If you are considering buying a puppy with a breed predisposition to this disorder, sadly there isn't a test to check for this condition yet. But it's worth calling your breeders references to see if it's in their lines. Fortunately, more and more great breeders are breeding for reparative conformation. They're choosing not to breed dogs with this syndrome. It's very important that dogs that have this condition are not bred. Don't buy puppies from pet stores or aka puppy mills, because they don't really care what predispositions they're passing along to the next generation.

It's quite important that if you're going to invest money in a puppy that is on the list of dogs that have this, that you're doing your due diligence in partnering with a breeder who you know is not intentionally breeding dogs that have this condition.

A collapsing trachea can also develop over time. It's often caused by chronic respiratory disease, Cushing's disease or heart disease. Whether this is a congenital, which means a genetic predisposition, or an acquired tracheal collapse, where the weakened C-rings cause the ligaments along the top of the windpipe to loosen, the end result is the same. Instead of a tight canopy-like structure, this ligament running across the top of the trachea, the membrane becomes lax and floppy. The trachea begins collapsing along its entire length, or it can also just be a portion of the length of the trachea that resides in the chest or only the portion that resides in the throat.

Most often, the collapse is worse in the area where the trachea enters the chest. As the cartilage rings get progressively flatter, eventually the trachea collapses, leaving the dog trying to pull air through what is essentially like a flattened straw.

### **Risk Factors and Symptoms of Tracheal Collapse**

Panting or rapid breathing, which makes the condition worse, is a very common symptom. Of course, that leads to more rapid breathing as the dog's anxiety increases. The condition also creates inflammation in the trachea, which, over time, can cause tissues to change and lose their normal characteristics, which further exacerbates the condition.

Tracheal collapse is most often seen in toy breeds, especially the toy poodles, Yorkshire terriers, and the Pomeranian. This condition typically becomes a problem when a dog reaches middle age, but it can occur at any age.

Many dogs with tracheal collapse have no obvious symptoms until a secondary problem arises. Factors that can trigger collapsing trachea include environmental respiratory irritants and toxins, such as cigarette smoke, dust and airborne toxins in the environment. Things like air fresheners, plug-ins, room sprays or scented candles can exacerbate or precipitate episodes. Delivery of anesthesia that involves inserting an endotracheal tube can spur on this, as well as a kennel cough infection or another type of upper respiratory infection, as well as an enlarged heart or an obese animal.

One of the first signs of tracheal collapse can be a sudden attack of a dry cough that sounds a little bit like a goose honk cough. Typically this goose honk sound progresses to more of a consistent cough. It often occurs when there's pressure placed on the dog's trachea for a myriad of different reasons. It can happen when the dog is picked up or if the collar is being pulled. As the disease progresses, the dog can develop exercise intolerance, obvious respiratory distress and gagging while they're eating or drinking.

Some dogs with tracheal collapse can actually turn blue when they get really excited or stressed. Secondary heart disease can actually result from their constantly straining to catch enough oxygen. Some dogs have both laryngeal paralysis and tracheal collapse. These dogs usually have a consistent wheezing sound when they're breathing.

### **Diagnosis and Treatment of Tracheal Collapse**

Tracheal collapse can sometimes be seen on an X-ray as the narrowing of an opening to the tracheal lumen. Fluoroscopy, which is a moving X-ray, can allow your veterinarian to watch your dog's trachea as he breathes in and out. An endoscopy, which is passing a camera down your dog's trachea can also help identify if this condition is going on. Your vet can also take samples to make sure that there's not a secondary infection there.

Any disease of the upper airway can be mistaken for tracheal collapse, including a foreign object in the respiratory tract, an elongated soft palate, infection of the trachea or lungs, heart failure, tumors or polyps in the respiratory system. It's quite important that your veterinarian rule out these other diseases before arriving at the diagnosis of tracheal collapse.

Conventional medical treatment of mild to moderate cases of tracheal collapse usually involves the prescribing of cough suppressants, antispasmodics, bronchodilators and calming agents to help reduce coughing spasms and the associated anxiety that most dogs get. Cannabidiol (CBD) oil can actually be very beneficial for a lot of these symptoms.

It's important to interrupt the coughing cycle, because coughing irritates the airway and, of course, leads to more coughing. The earlier we can intervene with natural cough remedies – I oftentimes use several different things, but a cool tincture of slippery elm tea is excellent. Licorice, root, mullein, wild cherry

bark teas and organic honey: all of these things can help suppress the cough. The sooner we institute natural cough suppressants, the better.

If a secondary factor is triggering or exacerbating a collapsed trachea, then obviously resolving that issue, which treating for a respiratory infection or getting your dog's weight under control will also help to reduce the symptoms of collapsing trachea.

I also recommend that you evaluate your dog's environment. Obviously, your dog needs to live in a smoke-free environment and a pollution-free environment. Getting rid of flame-retardant sprayed dog beds, if you have them, is a really good idea. Investing in an all-new dog bed is a great idea. If the dog bed doesn't say that it's made with all-natural fibers, you need to assume that beautiful dog beds that are not listed as being organic or chemical-free have been sprayed with flame retardants.

Switching to organic household cleaners is another great way to help reduce your dog's environmental chemical load, which can exacerbate tracheal irritation. Throw out your plug-ins. Throw out your room sprays. Throw out those amazing vanilla-scented candles, because they're all very bad for your dog's respiratory tract. Consider getting a new air purifier.

Any dog with a collapsing trachea should not be walked on a traditional collar. I recommend only using a harness. There shouldn't be anything around your dog's neck. If you have a turtleneck coat or you typically wear a bandana, or even a sweater that rides higher up on your dog's neck, I recommend replacing all of those with other things that rest lower below the level of your dog's throat, as reducing all of the pressure around your dog's neck is really important. I believe traditional collars can actually dramatically exacerbate this condition by applying consistent pressure to the trachea, so nothing around the neck for any of these dogs.

Medical management or eliminating triggers works for about 70 percent of these dogs with mild tracheal collapse. Holistic and integrative veterinarians usually recommend cartilage builders to help maintain the integrity of the tracheal cartilage. I recommend these as well. They can include glucosamine, Perna mussel, which is also called green-lipped clam, chondroitin, methylsulfonylmethane (MSM) – MSM is actually a really important source of organic sulfur, which is a main constituent in healthy cartilage resiliency – egg shell membrane, which is different than eggshell – eggshell membrane is a cartilage builder – and cetyl myristoleate, or CMO.

Many dogs also benefit from organic trace mineral supplementation or whole-food sources of silica, manganese and magnesium, as well as supplemental vitamin C. Natural anti-inflammatories, such as proteolytic enzymes and turmeric can also be incredibly beneficial for these dogs in terms of reducing tracheal inflammation.

In some dogs, chiropractic treatments and acupuncture have proven to be great at reducing the intensity and the duration of coughing episodes. Both homeopathy in Chinese medicine actually have had some improvement with many of these conditions as well.

### **Surgery for Tracheal Collapse**

Surgery for tracheal collapse, in my opinion, should be avoided, except in life-threatening situations. I believe surgery should be reserved for only the most severe cases of collapsing trachea, for dogs that actually just don't respond to any medical management.

If the collapse is happening at the neck or at the thoracic inlet, plastic rings are placed surgically around the inside of the trachea. If the collapse is deeper in the chest, then a stent is placed in the trachea. A stent is like a tiny spring that holds the trachea open. Stent placement achieves improvement in clinical signs in the majority of dogs, but unfortunately, complications are common. Oftentimes, within a few years, many of these animals require a second stent.

Surgical repair of a collapsing trachea is a very specialized procedure with significant potential for complications. These procedures should only be performed by a veterinary surgeon with extensive knowledge and a well-equipped hospital with a staff that's capable of helping your dog recover in an appropriate manner.

I do recommend avoiding this surgery unless you have exhausted all forms of therapy and your dog's ability to move oxygen is obviously affected, which means your dog is moving into a potentially life-threatening situation. Thankfully, most of these situations are fairly rare.

Interestingly, a study published in 2006 suggests that liver disease may go hand-in-hand with a collapsing trachea. The researchers looked at 26 dogs with tracheal collapse and compared their liver function results with 42 dogs with normal tracheas. The vast majority of dogs with tracheal collapse – in fact, 92 percent – had abnormal liver function test results.

When some of these dogs received tracheal stents to alleviate their symptoms, their liver values improved, which made the researchers conclude that oxygen deprivation from a collapsing trachea may, in fact, impact liver health, and that liver function should be routinely assessed in dogs with collapsing trachea syndrome. I do recommend that you do that.

Tracheal collapse can be a very frightening and frustrating disease for pet parents to manage. Dogs whose condition can be successfully medically managed have a good prognosis for normal quality of life. The outlook for dogs with severe disease or who undergo stent placement is less optimistic.

If your dog has a collapsing trachea, her distress can become so severe that her normally pink, healthy-looking mouth and mucous membranes can turn a bluish color, and she can collapse. Obviously, if your dog is in extreme distress or collapses, this is a medical emergency. She should be taken immediately to your local emergency room (ER) clinic.

The best option, in my opinion, is to slow down the progression of the disease by being proactive, which means beginning a cartilage support protocol in high-risk breeds as early as possible. If you have a dog that, let's say, you know is predisposed, starting a cartilage support protocol at 3 years of age is one way to help prevent tracheal cartilage deterioration. Or, second best, addressing the problem immediately when you very first notice symptoms before progression of the disease occurs, that's a great way to avoid the severe degeneration in the first place.

*[END]*