

Chronic Bronchitis

Chronic bronchitis (CB) is inflammation in the airways of the lungs, which goes on for a long period of time, and is associated with a persistent cough. In association with "collapsing trachea," CB is probably the most common chronic lung disorder in dogs. Inflammation within airways causes chronic cough and excessive mucus production. Because dogs can't spit, it is not always easy to know if the dog is making increased airway mucus. Therefore, the diagnosis of CB is usually based on chronic cough alone.

Because we diagnose CB on the basis of a daily cough, we need to be sure that other causes of chronic cough such as heart failure, heartworm infestation, pneumonia, lung tumor, high blood pressure in the lungs (pulmonary hypertension), etc., have been ruled out. This can be complicated, in part, because CB is a disease of older dogs, and these animals may have any of these other, co-existing disorders, which can by themselves, cause cough. Additionally, certain drugs used to treat CB in dogs may be inappropriate and even cause problems for disorders other than CB. For example, many medications that dilate the airways can make high blood pressure worse. Importantly then, the diagnosis of CB must be made with some degree of certainty to avoid potential complications related to therapy.

HOW DO WE KNOW IF A DOG HAS CHRONIC BRONCHITIS?

Dogs diagnosed with CB are generally older than 6 years of age. CB seems to be more common in smaller dogs, but can occur in any breed or size of dog.

By definition, dogs with CB have a chronic cough. This cough is generally deeper and "throatier" than the high pitched "honking" cough caused by tracheal collapse, and yet harsher than the "soft moist" cough caused by pneumonia. If the cough ends in gagging, swallowing or choking, then the dog is probably coughing up and then swallowing the mucus.

Some dogs with CB may be otherwise absolutely normal while others will be severely exercise-limited by their disease. The difference is probably due to the amount of cartilage weakening that is present, and the resulting airway collapse that occurs when the easily fatigued dog begins to exercise. These animals are otherwise bright, alert, and in all other respects, systemically well. Chronic bronchitis in dogs does not cause depression, lethargy, anorexia, etc. If these signs are present, you should consider other disorders that cause cough.

It is likely that the only abnormality that your vet will find when examining your pet is crackles in the lung fields. Heart rate is generally normal for the breed and age, and may be a bit slower than anticipated. A pronounced "sinus arrhythmia" is very common and can be appreciated by feeling the pulse on the inside of the back leg while listening to the heart. A sinus arrhythmia occurs in normal dogs, and can be pronounced in dogs with respiratory disease. As the dog breathes in, the heart speeds up a little, and as the dog breathes out, the heart slows a little. It is not possible for a dog in heart failure to have a sinus arrhythmia, because it's working harder to move blood through the heart prevents the heart from being able to slow down as the dog breathes out.

Because the diagnosis of CB is based on a history of chronic cough, it is necessary to perform the tests below to rule out other causes of chronic cough.

Bloodwork. Complete Blood Count (CBC) can give us evidence of bacterial infection. General health profile can look for a disease called Cushing's Disease which can produce lung disease resembling CB. Dogs with Cushing's Disease drink a great deal of water, urinate a great deal, pant excessively, have chronic skin problems and hair loss, have a pot bellied appearance, gain weight, and have an increased appetite. Cushing's Disease is a syndrome where the adrenal glands are over-active and can cause many chronic problems. Cushing's Disease is diagnosed by blood tests and sometimes ultrasound. Of course, if there has been no recent heartworm test, we must also do a test for heartworms, which can also cause lung disease which can resemble CB.

Chest X-rays. Chest X-rays of dogs with CB may appear normal. This finding does not rule out CB! More commonly however, thoracic radiographs reveal the presence of "doughnuts" and/or "tram lines" which are prominent and thickened bronchial walls seen on end or in parallel, respectively. Chest x-rays are especially important in a coughing dog, to rule out heart failure. If Chest x-rays show evidence of heart failure, we may recommend an ultrasound of the heart which can help determine need for drugs which can treat the heart failure.

Trans-tracheal Wash. "Trans" is the medical term for "Across," and "trachea" is the medical term for the "windpipe" that carries air from the mouth and nose into the lungs. This is a procedure where your pet will be lightly sedated, and a catheter placed into the trachea. A small amount of fluid (1-2 teaspoons) is injected into the trachea, and then quickly aspirated back out, to collect the cells and mucus in the airway so that they can be examined and cultured for bacteria. When a normal dog undergoes a trans-

tracheal wash, the fluid collected is clear, just like water. When a dog with CB undergoes a trans-tracheal wash, the material is usually very cloudy with mucus floating in it. Rarely, parasites can be found by performing this procedure. The kind of cells found in the wash can give us information as to the cause of the cough – parasites, bacteria, fungal organisms, allergies, etc. If bacteria can be grown in culture, it can be tested for susceptibility to antibiotics, so we know what drugs to use to treat the problem. Low numbers of bacteria can be found in the airways of normal dogs. If high numbers are found, we suspect bacterial infection.

Bronchoscopy. Bronchoscopy is a procedure where a pet is put under general anesthesia so that a “scope” can be passed into the airways to inspect them. The airways of dogs with CB are usually red and often have a roughened or granular appearance. The surface (mucosa) is often thickened, irregular and may bleed easily. Excessive and thick mucus may span the opening of an airway or gather as a mucus plug, which can block smaller airways and cause difficulty breathing. When this occurs, it is called Chronic Obstructive Pulmonary Disease (COPD), which is the most severe kind of CB.

Collapse of the upper wall of the trachea, causing the normally round trachea to become flattened, is common in dogs with CB. This finding does not rule out CB, but instead reflects concurrent tracheal collapse in association with CB. A striking finding in some dogs with CB is the collapse of small airways in the chest as the dog exhales. This may not be apparent on chest x-rays as collapse of the trachea usually is. In my experience, dogs with airway collapse deep in the lungs respond only marginally to therapy, and in general, have a less fortunate prognosis. We do not have a bronchoscope at our clinic. If your dog has CB which does not respond well to medications, we may refer you to a specialist for bronchoscopy. Bronchoscopy helps with diagnosis and prognosis – not with treatment.

Allergy Testing. Though there are no studies to show that allergy shots will help CB, it is possible that if your dog's CB is due to severe allergies, allergy shots may help a great deal. A blood test is first done to test for antibodies to a number of allergies. If the results show that your dog may be helped by allergy shots, formulas can be specially prepared to give to your dog, to help reduce symptoms of allergy, including chronic cough. After the initial series of allergy shots, then we wean allergy shots down to the lowest effective dose. If the allergy shots seem to help, sometimes once things are under control, they need only be given once a week to once a month. Occasionally, they can be stopped altogether.

TREATMENT OF CHRONIC BRONCHITIS

The primary treatment of CB is based entirely on controlling airway inflammation, and the occasional secondary infection

Corticosteroids (cortisone)

Glucocorticoids (another word for corticosteroids or cortisone) have been used to treat humans with bronchial disease for over 50 years. They are clearly the most effective treatment for this disorder, although potentially debilitating side effects sometimes limit their use long term. Some pets tolerate cortisone well, and others don't. Even though steroids do not act directly to suppress a cough, they do act by decreasing inflammation that can lead to cough, and they may decrease stimulation of airway sensory nerves that are responsible for initiating cough in canine CB. Additionally, corticosteroids decrease the volume of mucus produced by the inflamed airways. In my experience, steroids are the most effective drugs available to treat dogs with CB, and should be considered the mainstay of chronic therapy. I generally begin treatment with prednisone 1 mg/kg every 12 hours one week, then half that dose for an additional week. The first week or two of treatment will cause the most dramatic decrease in clinical signs and this is usually as good as the dog will ever get on prednisone. Tapering continues to the lowest effective dose that controls > 75% of the cough. If the cough returns using a dose of prednisone that causes significant side effects (as determined by you and the owner), we can introduce inhaled steroids (Flovent, 220 mcg every 12 hours).

Bronchodilators

As indicated by their name, bronchodilators make the airways bigger, in hopes of easing breathing in dogs with CB. It would make sense to use bronchodilators to treat dogs with CB if some degree of constriction of the airways existed which led to clinical signs. Based on the current studies, there is very little reason to believe that this is true for most dogs with CB, even though these drugs are commonly prescribed for CB. Only one study has collected objective data to determine the effect of bronchodilator therapy in dogs with CB. In that report, and in our later experience, only about one in seven dogs had a positive response. On the other hand, bronchodilator therapy by inhalation is safe and easy to administer. Because it is not clear which dogs with CB will benefit from bronchodilator therapy, it can be attempted in any dog with CB that does not have a great response to steroids.

Some of the more common bronchodilators given by mouth include aminophylline, theophylline (TheoDur, theophylline anhydrous), and terbutaline (Brethine). The most common bronchodilator inhaler is

albuterol, though there are others. If inhalers are to be used for your dog, you will have to purchase a special mask to administer the drugs.

Antibiotics

Bacterial infection probably doesn't play a significant role in most cases of canine CB. But dogs with CB can have the occasional bacterial infection that needs to be treated. Some dogs with CB can have recurring bacterial bronchitis, which if untreated can lead to bronchopneumonia. Because of the chronic disease, the immunity of their airways is not as strong as it should be.

Cough Suppressants

Chronic airway inflammation causes production of lots of thick mucus, probably as a protective mechanism to trap the offending irritant from reaching the lung. Coughing is very important to clear this mucus and should be thought of as a protective physiologic reflex. However, there are many cases in which the cough is dry and non-productive (no gagging and swallowing at the end of the cough). In these situations, the cough is not protective and serves to further irritate the airway, leading to a vicious cycle of cough-irritation-cough. In order to get things under control, we have to break the cycle with cough suppressants. In addition, some dogs with chronic cough are unable to sleep and may awaken their owners at night. Occasionally, some dogs with chronic cough may faint due to severe coughing. In each of these clinical settings, cough suppression may be indicated. We often use hydrocodone, 0.22 mg/kg every 6-12 hours as needed for cough. This is a starting dose, and it can be increased until the cough is greatly reduced or the dog is asleep. Literally!

In practice, the most common side effects of high doses of hydrocodone in dogs are drowsiness and constipation. I use 1 teaspoon of Metamucil on the food if constipation develops, and I reduce the dose of hydrocodone during the day to decrease the sleepiness.

If hydrocodone does not work well, sometime we will try Torbutrol (butorphanol), another similar drug might work better in some dogs.

Other Drugs

Mucolytics (to thin the mucus) have been suggested as a form of therapy for dogs with airway disease associated with excessive secretion of mucus. If there is severe mucus production, mucolytics can be used together with expectorants (which help the mucus to be coughed up and eliminated) in the short term, to get mucus production under control.

Very rarely, parasites are found in the airways that are treated with anti-parasitic drugs such as Panacur (fenbendazole).

PROGNOSIS AND CONCLUSIONS

Canine CB is a common, progressive, and chronic airway disorder. Signs can be greatly improved but the disease is not totally curable. Establishment of excellent client communications is critical so that client expectations are realistic and so that the therapeutic regime established by the veterinarian is adhered to.