

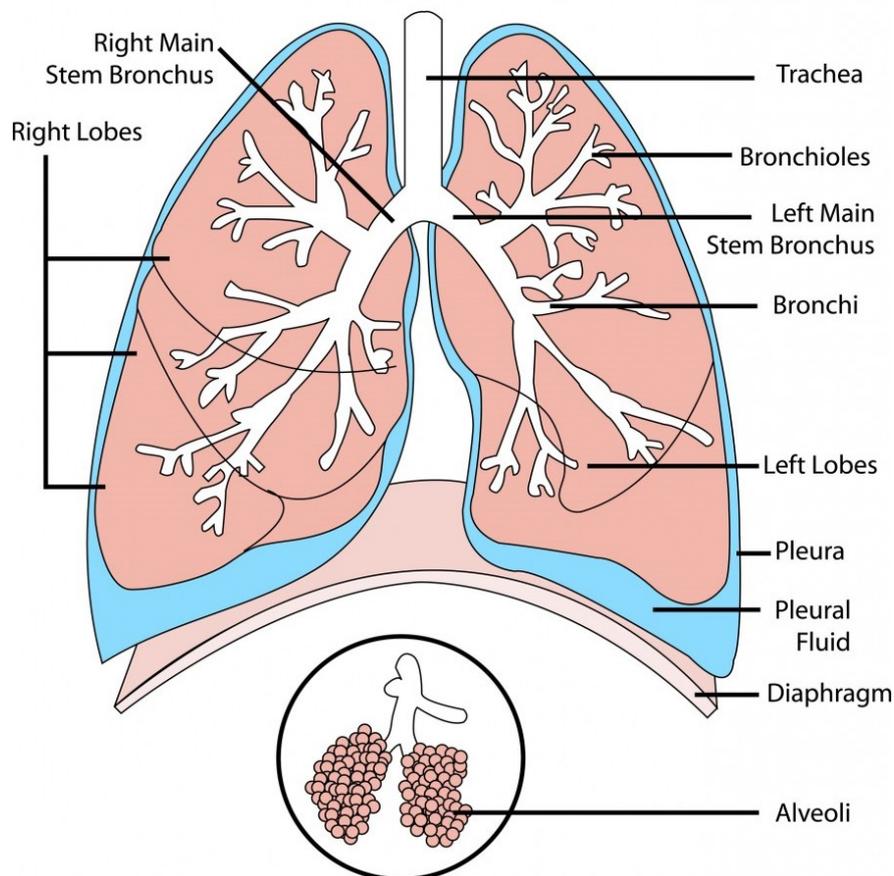


VETERINARY CARDIAC SERVICES AUSTRALIA

Chronic Bronchitis

What is the structure and function of the normal lungs?

The primary function of the respiratory system is gas exchange (delivering oxygen to and removing carbon dioxide from the body). The easiest way to explain respiratory anatomy is to detail the normal pathway of a 'breath of air.' With each inhalation, air first enters the body via the nose (or mouth if your pet is panting). It travels through the nasal passages to a region at the back of the mouth called the pharynx. From here, air passes into the trachea (commonly called the windpipe). This is a large rigid tube predominantly made up of cartilage rings. The trachea runs down into the chest cavity and branches into two smaller (but still rigid) tubes called bronchi. There are two bronchi, each supplying one of the lungs. The bronchi branch multiple times before becoming bronchioles (smaller, less rigid airways that can change diameter due to contraction or relaxation of muscle in their walls). The bronchioles continue to branch, progressively getting smaller and smaller until eventually they reach the alveoli. The alveoli are the sacs within the heart where gas exchange occurs (there are millions of them).





VETERINARY CARDIAC SERVICES AUSTRALIA

Within the walls of the airways are tiny glands that produce a small amount of mucous and other secretions. The mucous keeps the airways moist and lubricated preventing them from drying out. In addition, inhaled dust, pollen and other debris are trapped by the mucous layer, which prevents passage of such particles deep into the lungs. The lining of the airways has thousands of microscopic 'hair-like' structures called cilia which beat in a rhythmic fashion and direct mucous (and any trapped particles) toward the mouth so it can be coughed up (or swallowed) and expelled from the lungs.

What is Chronic Bronchitis?

Bronchitis simply means inflammation of the bronchi. This inflammation causes swelling of the lining of the airways as well as increased production of mucous and other secretions. If severe enough, these secretions can block the airways (so-called mucous plugs). Chronic bronchitis leads to permanent damage to the airways, which can be severe if treatment is not instituted early (see the short discussion on 'bronchiectasis' in the prognosis section below). These changes within the airways are a very strong stimulus for the cough reflex (coughing is a protective mechanism designed to help expel unwanted substances from the lungs).

Bronchitis has many different causes (e.g. infections, inhaled irritants) however chronic bronchitis is a term that is generally reserved for non-infectious inflammation of the airways (which has been present for at least 2 months). In fact, the cause of chronic bronchitis is unknown. It is worth mentioning that bronchitis is not synonymous with asthma. Asthma refers to reversible constriction of the bronchi and smaller airways (bronchitis is not associated with constriction of the airways and is not reversible).

Dogs with chronic bronchitis are prone to secondary bacterial infections (because the lining of the airways is damaged and compromised, which allows opportunistic bacteria to invade). Secondary bacterial infections often cause an acute worsening of the inflammation (and hence the sudden development or exacerbation of coughing).

What dogs are most commonly affected by Chronic Bronchitis?

The dogs most commonly affected by chronic bronchitis are older smaller-breed dogs (e.g. Poodles, Terrier breeds, Chihuahuas, Pomeranians). These dogs also commonly develop a heart condition called degenerative valve disease and sometimes it can be challenging to determine whether clinical signs are due to chronic bronchitis or degenerative valve disease.

What clinical signs are seen in pets with Chronic Bronchitis?

By far the most common clinical signs are coughing and wheezy respiration (often ending with a terminal retch). The nature/character of the cough is highly variable between and even in an individual dog with chronic bronchitis. It may be dry, loud and hacking or soft and wet. A 'wet' cough does not necessarily imply there is a secondary infection present (it may simply mean there is excess mucous within the airways).

Other clinical signs may include: exercise intolerance, lethargy and reduced appetite (albeit these would be seen in the more severe cases). Most dogs however, tend to just have a cough and are otherwise bright and well (provided they do not have any concurrent disorders).



VETERINARY CARDIAC SERVICES AUSTRALIA

How is Chronic Bronchitis diagnosed?

An important initial test to increase or decrease the suspicion of bronchitis is thoracic radiography (i.e. chest x-rays). Chronic bronchitis may increase the bronchial markings within the lung (bronchial markings refer to specific radiographic features produced by the bronchi and small airways of the lungs), which in an older dog with compatible clinical signs (i.e. coughing), strongly supports a diagnosis of chronic bronchitis. Furthermore, radiographs allow the veterinarian to exclude other causes of coughing (e.g. cancer, pneumonia, foreign bodies etc.).

More advanced tests are sometimes performed in dogs with chronic bronchitis (particularly if they are not responding well to medical treatment) including bronchoscopy (passing a camera down into the lungs using an endoscope which allows visualisation of the airways) and bronchoalveolar lavage (BAL). BAL involves flushing small volumes of sterile saline into the trachea and bronchi and then collecting this back into a syringe. This allows the veterinarian to obtain a sample of the cells (and possibly infectious agents) within the airways. This is then submitted to a lab and analysed. Changes consistent with inflammation are normally present. Furthermore, if a specific infectious agent is identified this may allow the vet to better tailor treatment.

Often a diagnosis of chronic bronchitis is presumptive: a small-breed dog with a chronic cough that is otherwise doing well (and x-rays do not show any evidence of other causes of coughing) are often assumed to have chronic bronchitis until proven otherwise.

What treatments are available?

Although chronic bronchitis is incurable, the inflammation and associated clinical signs can often be well controlled with medical management.

The mainstay of therapy is directly suppressing the inflammation. This is most often achieved using corticosteroids, which have potent anti-inflammatory properties. A common approach is to dispense a 1-month tapering course of steroid medication. A few days after starting steroids, many owners report their pet's cough has significantly reduced. After completion of the steroid course the dog is closely monitored for relapse of the cough. If relapse occurs soon after stopping steroids, these dogs may need to be managed long-term on steroid medication (either with low-dose oral steroids or alternatively using special inhalers designed for dogs). Other dogs may not relapse immediately and are treated with another steroid course when the time arises.

Other medical treatments are sometimes used including:

- Antibiotics (short courses of antibiotics are often used when a secondary bacterial infection is suspected).
- Bronchodilators (drugs designed to dilate the airways).
- Anti-tussive agents (drugs such as codeine that directly suppress the cough reflex).

Other recommendations include:

- Only use a harness and never a neck collar (neck collars can push on the trachea and trigger the cough reflex).
- Weight loss is important. Overweight and obese dogs tend to cough more than lean dogs.



VETERINARY CARDIAC SERVICES AUSTRALIA

- Nebulisation and gentle coupage. The easiest way to do this is to place your pet in the bathroom next to a hot running shower. The steam that is generated is inhaled by your pet which can help break down the mucous plugs within the airways. This should be followed by gently thumping both sides of the chest which further helps to break down secretions and promotes expulsion via coughing.
- Dogs should avoid environments where they may inhale noxious substances (which could exacerbate coughing) e.g. they should not be allowed near cigarette smoke. Other airborne irritants such as perfumes should be avoided.
- Improving dental hygiene to decrease the risk of opportunistic bacteria entering the airways.

What is the prognosis?

Although incurable, chronic bronchitis rarely causes anything more than a 'nuisance' cough i.e. it is almost never life-threatening. Furthermore, this cough can often be well-controlled on medical management.

Complete resolution of the cough is not a realistic goal. A more realistic goal is to achieve an 80% reduction in the frequency of the cough. A dog that is occasionally coughing but is otherwise bright and well, generally does not have a compromised quality of life.

Only in severe cases in which the dog is coughing all the time (and medical treatment is not working), will owners consider euthanasia (this is an uncommon scenario).

One uncommon consequence of severe, long-standing bronchitis is a condition called bronchiectasis. In this situation the inflammation leads to severe, permanent, irreversible damage including dilation of the airways as well as a loss of the protective cilia layer. These dogs are very prone to the development of recurrent infections/pneumonia and can be quite difficult to treat. A specialist veterinarian is best consulted in this situation.