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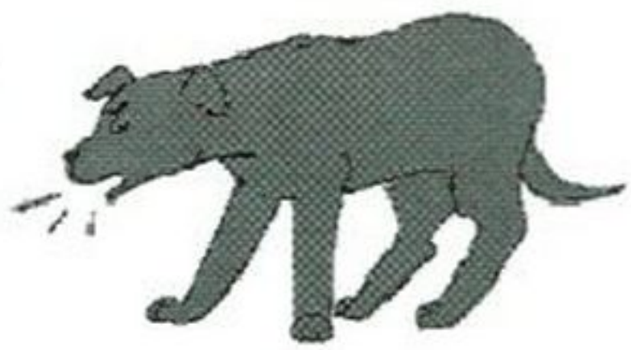
Kennel Cough

(Infectious Tracheobronchitis)

What is it?

Kennel cough is an infectious bronchitis characterized by a harsh, hacking cough that most people describe as sounding like "something stuck in my dog's throat." It is analogous to a chest cold for humans and is only a serious condition in special circumstances (see below); in general, it resolves on its own. A dog with kennel cough generally feels active and maintains a normal appetite despite frequent fits of coughing. There is usually no fever or listlessness, just lots of coughing.



Not sure what a Coughing Dog sounds like?

Dogs can make an assortment of respiratory sounds. Usually a cough is recognizable but it is important to be aware of another sound called a reverse sneeze. The reverse sneeze is often mistaken for a cough, a choking fit, sneezing, retching, or even gasping for breath. In fact, the reverse sneeze represents a post-nasal drip or tickle in the throat. It is considered normal especially for small dogs or dogs and only requires attention if it is felt to be excessive. The point here is to know a cough when you see one. A cough can be dry or productive, meaning it is followed by a gag, swallowing motion, production of foamy mucus (not to be confused with vomiting). Here are some videos that might help.

Coughing Dog (with Productive Cough):

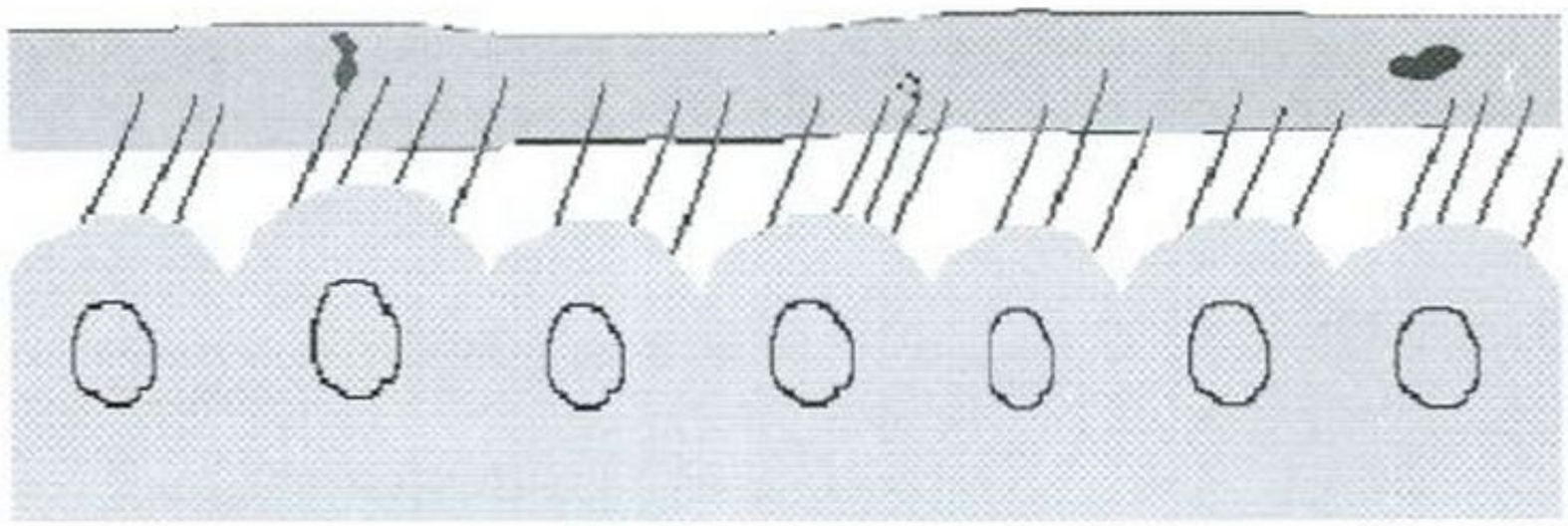
Note: we have received a great deal of email from people who have viewed this video, compared it to what their own dog is doing and concluded their dog has kennel cough. This video is meant to demonstrate coughing in general. It is important to note that there are many causes of coughing and the nature of the cough does not generally reflect on its cause.

Reverse Sneezing Dog:

A coughing dog that has a poor appetite, fever, and/or listlessness should be evaluated for pneumonia.

How Infection Occurs

An infected dog sheds infectious bacteria and/or viruses in respiratory secretions. These secretions become aerosolized and float in the air and can then be inhaled by a healthy dog.



Depiction of mucociliary escalator

The normal respiratory tract has substantial safeguards against invading infectious agents. The most important of these is probably what is called the mucociliary escalator. This safeguard consists of tiny hair-like structures called cilia that protrude from the cells lining the respiratory tract and extend into a coat of mucus over them. The cilia beat in a coordinated fashion through the lower and more watery mucus layer called the sol. A thicker mucus layer called the gel floats on top of the sol. Debris, including infectious agents, get trapped in the sticky gel and the cilia move them upward towards the throat where the collection of debris and mucus may be coughed up and/or swallowed.

The mucociliary escalator is damaged by the following:

- shipping stress
- crowding stress
- heavy dust exposure
- cigarette smoke exposure
- infectious agents (viruses such as reovirus, adenovirus, parainfluenza virus, and even the distemper virus can be initiating infections).
- cold temperature
- poor ventilation

Without this protective mechanism, invading bacteria, especially *Bordetella bronchiseptica*, the chief agent of kennel cough, may simply march down the airways unimpeded.

Bordetella bronchiseptica organisms have some tricks of their own as well:

- They are able to bind directly to cilia, rendering them unable to move within 3 hours of contact.
- They secrete substances that disable the immune cells normally responsible for consuming and destroying bacteria.

Because it is common for *Bordetella* to be accompanied by at least one other infectious agent (such as one of the viruses listed below), kennel cough is actually a complex of infections rather than infection by one agent.

Members of the kennel cough complex:

- Parainfluenza virus
- Canine adenovirus type 2
- Canine distemper virus
- Canine herpes virus
- Canine reovirus (type 1, 2, or 3)

Any of these viruses can produce a minor sore throat and cough ultimately allowing a way in for the more toxic *Bordetella bronchiseptica* bacteria.

Classically, dogs get infected when they are kept in a crowded situation with poor air circulation and lots of warm air (i.e., a boarding kennel, vaccination clinic, obedience class, local park, animal shelter, animal hospital waiting room, or grooming parlor). In reality, most causes of coughing that begin acutely in a dog are due to infectious causes and usually represent some form of kennel cough.

THE INCUBATION PERIOD IS 2 TO 14 DAYS

How is Diagnosis Made?

Usually the history of exposure to a crowd of dogs within the proper time frame plus typical examination findings (a coughing dog that otherwise feels well) is adequate to make the diagnosis. Radiographs show bronchitis, although severe cases can progress to pneumonia, especially if the canine distemper virus is involved.

How Contagious is it?

Bordetella infection can be picked up by rabbits, guinea pigs, pigs, cats (if they are very young and housed in groups), and other dogs. *Bordetella* is generally not considered contagious to humans although it is closely related to *Bordetella pertussis*, the agent of whooping cough. Immune-suppressed humans potentially could be infected.

Among dogs, kennel cough is fairly contagious depending on stress level, vaccination status, and exposure to minor viruses. Dogs shed *Bordetella* organisms for up to 3 months after infection.

Some veterinarians recommend keeping all dogs current on* Bordetella *vaccinations because you never know when they will be in an unexpected situation.

How is Kennel Cough Treated?

Although most cases will go away on their own, we like to think we can hasten recovery with antibiotics to directly kill the *Bordetella* organism. Kennel cough may be treated with cough suppressants to provide comfort during natural recovery. Alternatively, antibiotics and cough suppressants can be combined.

When is it a Serious Condition?

Very young puppies, especially those with a recent shipping history (i.e., pet store puppies) are especially prone to severe cases of infectious tracheobronchitis that frequently progress to pneumonia.

In dogs where the distemper virus is involved (usually shelter or pet store puppies), there is tremendous potential for serious consequences.

Vaccination Options

There are basically two options for kennel cough vaccination: injectable and intranasal. It is important to realize that not all members of the kennel cough complex have a vaccine. Also, because kennel cough is a localized infection (meaning it is local to the respiratory tract), it is an infection that does not lend itself to prevention by vaccination. Vaccination must be regularly boosted and often vaccination simply muffles the severity of infection without completely preventing it.

Injectable Vaccine
Injectable vaccination is a good choice for aggressive dogs who may bite if their muzzle is approached. For puppies, injectable vaccination provides good systemic immunity as long as two doses are given (approximately one month apart) after age 4 months. Boosters are generally given annually.

There is some controversy over whether previously vaccinated dogs generate better immunity receiving injectable or nasal boosters for kennel cough.

Parainfluenza, adenovirus type 2, and canine distemper, all members of the kennel cough complex, are all covered by the standard DHLPP vaccine, the basic vaccine for dogs. Adenovirus type 2 serum also immunizes against adenovirus type 1, the agent of infectious canine hepatitis.

Nasal Vaccine
Intranasal vaccination may be given as early as 3 weeks of age and immunity generally lasts 10 to 12 months. (Usually this vaccine is boosted annually but if you are expecting imminent exposure as in boarding, competition, or other event where dogs are together, it is optimal to boost if over 6 months have elapsed.) The advantage here is that the local immunity is stimulated right at the site where the natural infection would be trying to take hold.

It takes four days to generate a solid immune response after intranasal vaccination so it is best if vaccination is given at least four days prior to the exposure. Some dogs will have some sneezing or nasal discharge in the week following intranasal vaccination. As a general rule, nasal vaccination provides faster immunity than injectable vaccination.

There is some evidence that young puppies in a high risk environment may benefit from both injectable and nasal vaccination (rather than simply receiving one or the other).

IF A NASAL VACCINE IS ACCIDENTALLY GIVEN AS AN INJECTION, AN ABSCESS CAN RESULT UNDER THE SKIN.
Nasal vaccines cannot be given as injections.

VACCINATION IS NOT USEFUL IN A DOG ALREADY INCUBATING KENNEL COUGH.

If boarding is planned and more than 6 months have passed since the last booster shot, ideally the vaccine should be boosted 5 days or more before the start of boarding.

What if Kennel Cough doesn't Improve?

As previously noted, this infection is generally self-limiting. It should be at least improved partially after one week of treatment. If no improvement has been observed in this time, a re-check exam (possibly including radiographs of the chest) would be a good idea. Failure of kennel cough to resolve suggests an underlying condition. Kennel cough can activate a previously asymptomatic collapsing trachea or the condition may have progressed to pneumonia. There is also another respiratory infection called canine influenza, which seemed to be a racing greyhound issue exclusively until late 2005. This infection produces fever and pneumonia but starts looking like a routine kennel cough. This particular infection is much more severe, highly contagious, but for now seems to be uncommon.

If you have questions about a coughing dog, do not hesitate to bring them to your veterinarian, or use the Ask A Vet feature on the home page of Veterinary Partner.

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