

## 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; 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.

### *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.

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 can be damaged by the following:

- shipping stress
- crowding stress
- heavy dust exposure
- cigarette smoke exposure
- infectious agents (including many viruses)
- cold temperature
- poor ventilation

Without this protective mechanism, invading bacteria may simply march down the airways unimpeded. *Bordetella bronchiseptica*, the chief bacterial cause of kennel cough, has some tricks of its own as well:

- Bacteria 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.**

- 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 but lots of warm air (i.e., a boarding kennel, vaccination clinic, obedience class, local park, animal shelter, 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.

### ***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.

### ***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. Alternatively, 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 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.