Infectious Canine Tracheobronchitis (Kennel Cough)

**Basics**

**OVERVIEW**
- Any contagious respiratory disease of dogs that is manifested by coughing

**SIGNALMENT/DESCRIPTION OF PET**

**Species**
- Dogs

**Breed Predilections**
- None

**Mean Age and Range**
- Most severe in puppies 6 weeks–6 months old
- May develop in dogs of all ages and often with preexisting subclinical airway disease (such as abnormal development of the respiratory tract or long-term inflammation of the bronchi [known as “chronic bronchitis”])

**SIGNS/OBSERVED CHANGES IN THE PET**
- Related to the degree of respiratory tract damage and age of the affected dog
- May be nonexistent, mild, or severe with pneumonia
- Most viral, bacterial, and *Mycoplasma* agents spread rapidly from seemingly healthy dogs to other dogs in the same environment; signs usually begin about 4 days after exposure to the infecting agent(s)
- Uncomplicated—cough in an otherwise healthy dog is characteristic; may be dry and hacking, soft and dry, moist and hacking, or sudden and sharp, followed by gagging or spitting up of mucus; excitement, exercise, changes in temperature or humidity of the inspired air, and gentle pressure (such as from collar) on the windpipe (trachea) induce a sudden onset of coughing
- Uncomplicated—cough readily induced with pressure on the windpipe (trachea) during physical examination; lung sounds often normal; otherwise appears healthy
- Severe—decreased appetite (known as “inappetence”) to loss of appetite (known as “anorexia”); cough (when
noted) is moist and productive; may see sluggishness (lethargy), difficulty breathing (known as “dyspnea”), and exercise intolerance

- Severe—may have constant, low-grade, or fluctuating fever (39.4–40.6°C; 103–104°F); may have increased intensity of normal lung sounds; short, rough lung sounds (known as “crackles”) heard with a stethoscope; or (less frequently) whistling or squeaking sounds (known as “wheezes”)

**CAUSES**

- Viral—canine distemper virus; canine adenovirus-2; canine parainfluenza virus; canine adenovirus-1; canine respiratory coronavirus; canine reovirus type 1, 2, or 3; canine herpesvirus-1; canine influenza virus
- Canine adenovirus-2 and canine parainfluenza virus may damage the lining cells of the respiratory tract to such an extent that invasion by various bacteria and *Mycoplasma* cause severe airway disease
- Bacterial—*Bordetella bronchiseptica*, (with no other respiratory disease-causing agents) produces clinical signs indistinguishable from those of other bacterial causes; *Pseudomonas, Escherichia coli, Klebsiella, Pasteurella, Streptococcus, Mycoplasma*, and other species equally likely

**RISK FACTORS**

- Dogs housed with multiple other dogs, such as pet shops, humane society shelters, research facilities, and boarding and training kennels
- Housing with less than ideal hygienic conditions; overcrowding conditions
- Preexisting subclinical airway disease, such as abnormal development of the respiratory tract or long-term inflammation of the bronchi (chronic bronchitis)

**Treatment**

**HEALTH CARE**

- Outpatient—strongly recommended for uncomplicated disease
- Inpatient—strongly recommended for complicated disease and/or pneumonia
- Fluid administration—indicated for complicated disease and/or pneumonia

**ACTIVITY**

- Enforce rest—for at least 14–21 days with uncomplicated disease; for at least the duration of x-ray evidence of pneumonia in severely affected dogs

**DIET**

- Good-quality canned or dry commercial food

**Medications**

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Antibiotic therapy—amoxicillin/clavulanic acid or doxycycline—initial treatment of uncomplicated disease
- Antibiotic therapy—cephalosporin (such as cefazolin) with gentamicin or amikacin or enrofloxacin—usually effective for severe pneumonia; continue antibiotic therapy for at least 10 days beyond resolution of pneumonia as seen on x-rays (radiographs)
- *Bordetella bronchiseptica* or other resistant bacteria—some antibiotics may not reach adequate levels in the lower respiratory tract to be effective, so administration of these antibiotics by mouth or injection may have limited effectiveness; treating with a fine medicated spray (known as “nebulization”) containing kanamycin, gentamicin, or polymyxin B maybe effective, when administered daily for 3–5 days; also administer systemic antibiotics in dogs with lung disease
- Cough suppressants (such as butorphanol or hydrocodone)—effective in decreasing the dry, nonproductive cough, not associated with bacterial infection
- Drugs to increase the openings in the bronchi and bronchioles (known as “bronchodilators,” such as extended-release theophylline)—may be used to control narrowing of the bronchi and bronchioles due to contraction of smooth muscles in the walls of these airways (known as “bronchospasm”); bronchospasm is detected clinically by whistling or squeaking sounds (wheezes)
Follow-Up Care

PATIENT MONITORING
• Uncomplicated disease—should respond to treatment in 10–14 days; if the pet continues to cough 14 days or more after adequate treatment, dog should be evaluated again by your pet’s veterinarian
• Severe disease—repeat chest x-rays (radiographs) until at least 14 days beyond resolution of all clinical signs

PREVENTIONS AND AVOIDANCE
• Shedding of the causative virus and/or bacteria of infectious canine tracheobronchitis (kennel cough) in respiratory secretions of dogs undoubtedly accounts for the persistence of this problem in kennels, animal shelters, boarding facilities, and veterinary hospitals; thorough cleaning and disinfecting of kennels is necessary to control spread of disease-causing organisms

Viral and Bacterial Vaccines
• Available to control disease caused by the principal infectious agents involved
• *Bordetella bronchiseptica* and canine parainfluenza virus vaccine—may vaccinate puppies using a vaccine applied into the nose (intranasal vaccine) as early as 2–4 weeks of age, without interference from maternal antibody; follow-up vaccinations should be administered as directed by your pet’s veterinarian; may vaccinate mature dogs with a one-dose intranasal vaccination (at the same time as their puppies or when they receive other vaccinations, as directed by your pet’s veterinarian)
• Inactivated injectable *Bordetella bronchiseptica* vaccine—administered as two doses, 2–4 weeks apart; initial vaccination of puppies is recommended at or about 6–8 weeks of age; administer second vaccine at 4 months of age
• Inactivated canine influenza virus vaccine is available

EXPECTED COURSE AND PROGNOSIS
• Natural course of uncomplicated disease, if untreated—10–14 days; simple restriction of exercise and prevention of excitement shortens the course
• Typical course of severe disease—2–6 weeks; may be fatal in pets that develop severe pneumonia, affecting multiple lung lobes

Key Points
• Isolate the dog from other pets; infected dogs can transmit the disease-causing virus and/or bacteria before onset of clinical signs and afterward until immunity develops
• Dogs with uncomplicated disease should respond to treatment in 10–14 days
• Once infection spreads in a kennel, it can be controlled by removing all dogs from the premises for 1–2 weeks and disinfecting with commonly used chemicals, such as sodium hypochlorite (bleach; 1:30 dilution), chlorhexidine, or benzalkonium (NOTE: never mix disinfectants; follow directions for use carefully)