



# Canine Diseases

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## Canine Infectious Tracheobronchitis (Kennel Cough)

Canine infectious tracheobronchitis (CITB), also colloquially known as kennel cough, is a highly contagious multifactorial disease characterized by acute or chronic inflammation of the trachea and bronchial airways. It is usually a mild, self-limiting disease but may progress to fatal bronchopneumonia in puppies or to chronic bronchitis in debilitated adult or aged dogs. It is commonly seen where dogs are in close contact with each other, e.g. boarding kennels or rescue centres, although CITB can also occur in dogs with no history of having been in such a situation. The disease can spread rapidly among susceptible dogs housed in close confinement and signs can persist for some weeks.

### Etiology and Pathogenesis

Canine parainfluenza virus, canine adenovirus 2 (CAV-2), or canine distemper virus can be the primary or sole pathogen involved. Canine reoviruses (types 1, 2, and 3), canine herpesvirus, and canine adenovirus 1 (CAV-1) are of questionable significance in this syndrome. *Bordetella bronchiseptica* may act as a primary pathogen, especially in dogs <6 mo old; however, it and other bacteria (usually gram-negative organisms such as *Pseudomonas* sp, *Escherichia coli*, and *Klebsiella pneumoniae*) may cause secondary infections after viral injury to the respiratory tract. Concurrent infections with several of these agents are common. The role of *Mycoplasma* sp has not been clearly established. Stress and extremes of ventilation, temperature, and humidity apparently increase susceptibility to, and severity of, the disease.

### Clinical and Pathological Findings

The prominent clinical sign is paroxysms of harsh, dry coughing, which may be followed by retching and gagging. The cough is easily induced by gentle palpation of the larynx or trachea. Affected dogs demonstrate few if any additional clinical signs except for partial anorexia. On auscultation, respiratory sounds may be essentially normal. In advanced cases, inspiratory crackles and expiratory wheezes are heard. Body temperature may be only slightly increased and WBC counts usually remain normal. Development of more severe signs, including fever, purulent nasal discharge, depression, anorexia, and a productive cough, especially in puppies, indicates a complicating systemic infection such as distemper or bronchopneumonia. Stress, particularly due to adverse environmental conditions and improper nutrition, may contribute to a relapse during convalescence.

During the acute and subacute inflammatory stages, the air passages are filled with frothy, serous, or mucopurulent exudate. In chronic bronchitis, they contain excessive viscid mucus. The epithelial linings are roughened and opaque, a result of diffuse fibrosis, edema, and mononuclear cell infiltration. There is hypertrophy and hyperplasia of the tracheobronchial mucous glands and goblet cells. The act of coughing is an attempt to remove the accumulations of mucus and exudate from the respiratory passages.

## Diagnosis

CITB should be suspected whenever the characteristic cough suddenly develops 5–10 days after exposure to other susceptible or affected dogs. Severity usually diminishes during the first 5 days, but the disease can persist for some weeks. The diagnosis is usually made from the history and clinical signs and by elimination of other causes of coughing. In chronic bronchitis, chest radiographs may show an increase in linear and peribronchial markings. Bronchoscopy reveals inflamed epithelium and often mucopurulent mucus in the bronchi. In addition, the procedure allows collection of biopsy and swab samples for in vitro assay. Bronchial washing is an additional diagnostic aid that may demonstrate causative agents or significant cellular responses (eg, eosinophils).