COUGHING IN DOGS AND CATS
Anjop J. Venker-van Haagen, DVM, PhD, ECVS
aj.venkervanhaagen@wanadoo.nl

Coughing is a reflex activity following stimulation of “cough receptors” which are located in the mucosa of the larynx, trachea, carina, and bronchi. The reflex is principally a defense mechanism that protects the lower respiratory tract and the alveoli. Inhaled irritants, mucus, and mechanical and positional changes in the lung stimulate the cough receptors.

A single cough consists of a rapid, deep inspiration followed by a forced expiration against a closed glottis, and then sudden opening of the glottis with continued expiratory effort to expel air and whatever substance has stimulated the cough. This basic pattern can have many variants in both man and animals. It may be repeated to produce a sudden outburst of coughing. Afferent nerves from the receptors pass via the vagus nerve to the medulla oblongata, from which efferents are distributed to the respiratory and laryngeal muscles. Repeated coughing and paroxysmal coughing are signs of continuous irritation of the receptors, whether by repeated or continuous mechanical or chemical irritants. This continuous irritation may damage the mucosa, which can be alarming. Many of the stimuli that cause coughing also activate other receptors, and the resulting breathing response will be an interaction of reflexes. In this way the coughing reflex may be suppressed. Continuous coughing is the sign that indicates a threat to the upper airways.

Acute laryngitis is characterized by edema and hypervascularization of the laryngeal mucosa. The clinical signs are characterized by repeated bouts of hard, dry coughing. When the irritation is severe, paroxysmal coughing often leads to gagging. The dog’s attempt to bark, or the cat’s to purr, may also elicit the characteristic dry cough. The cause of the disease determines the progression of the clinical signs. The most common cause of acute laryngitis in dogs is infectious tracheobronchitis (kennel cough). There is usually no fever or other sign of systemic illness. Coughing can persist for three weeks or longer. Therapy consists of rest and avoidance of excitement. Pediatric cough syrups are usually very effective. A moist environment and additional oral administration of water diminish the irritation of the mucosa and hence the coughing. There is no indication for corticosteroids. If there is no fever, there is no indication for antibiotics.

In cats, both herpesvirus and calicivirus may affect the laryngeal mucosa. This seldom results in a dry cough, but rather in stridorous breathing due to edema of the laryngeal mucosa. The dominant symptoms in cats are fever, salivation, conjunctivitis, and general distress. The treatment consists of antibiotics and parenteral fluids, together with symptomatic care. The laryngeal edema seldom leads to life-threatening obstruction that necessitates tracheotomy. Chronic laryngitis is rather common in dogs. It may be mild or severe. Mild laryngitis can persist for years, causing coughing during exertion or straining on the leash, and gagging provoked by severe coughing. There is no laryngeal dysfunction other than mild hoarseness. The laryngeal mucosa is red and thickened. Therapy consists of advice to avoid the habits resulting in coughing, when possible. In other laryngeal diseases, stridorous breathing, and not coughing, is the predominant sign.

Tracheitis can occur in dogs and cats, often in the infectious diseases “kennel cough” in dogs and in “feline influenza” in cats (see laryngitis). Tracheitis causes a hard but nonproductive cough. The diagnosis is based on the hard, dry cough and the sensitivity of the trachea to palpation, by which the dry cough is also provoked. As long as the animal has no fever and has no general signs of illness, the tracheitis can be treated with extra water intake, cough syrups, and rest. The prognosis for uncomplicated tracheitis is favorable. In tracheobronchitis with a hard, productive cough, treatment with antibiotics can be important.

Tumors of the trachea do occur in dogs and cats but in both they are infrequent. The symptoms vary from coughing alone to coughing combined with dyspnea. The diagnosis can be suggested by radiographic findings and can be confirmed by bronchoscopy.
Foreign bodies of plant origin can enter the trachea in the dog and cat and in the dog also marbles and stones are sometimes seen. The most notable acute signs are sudden heavy coughing, gagging, and if the foreign body is large, dyspnea. The diagnosis is based on the history, radiographs (marbles, stones), and bronchoscopy. Plant material is not visible on radiographs.

Dorsoventral flattening of the trachea occurs in the Yorkshire terrier and in other miniature and toy breeds. The tracheal rings are flattened in the dorsoventral direction, resulting in a wide gap between the two ends, which are joined by a very wide dorsal ligament. Eventually there is irritation and thickening of the ligament and the lumen of the trachea can be closed by forced respiration, which draws the ligament inward. Stridorous respiration, dyspnea, and honking coughing sounds are characteristic signs. The severity of the abnormality determines the severity of the signs. The honking sounds usually develop at the age of 2-4 years. The diagnosis cannot always be made on the basis of radiographs; fluoroscopy is better. The severity of the abnormality can be determined by bronchoscopy. The irritation of the trachea can be lessened by the use of light sedation (e.g., phenobarbital) and a cough syrup. In severe cases the dog’s life is so hindered by this abnormality that euthanasia is requested. The progression caused by thickening of the ligament means that the prognosis is always somber. Hypoplasia of the trachea occurs in the English bulldog and some other breeds, resulting in a narrow lumen and overlapping of the ends of the very small and thick cartilaginous rings. The dorsal ligament thus lies in the tracheal lumen. Because the stiff tube is too narrow to permit passage of adequate amounts of air, dyspnea is the most important clinical sign. Only in severe cases is cough the dominant clinical sign.

In both dogs and cats, bronchitis is usually an infectious disease; “kennel cough” and “feline influenza” play important roles. In chronic bronchitis there is a hard, nonproductive cough that, in dogs, builds up to a great deal of commotion, ending in gagging. The dog or cat remains lively and has no fever, and the reparatory rate is normal. The diagnosis is made on the basis of clinical signs. In addition, the cough can be elicited by palpation of the trachea near the thoracic inlet. Accentuated respiratory sounds may be heard over some parts of the thorax. The radiograph reveals no abnormalities. The therapy is that for tracheitis, the emphasis being on enforced rest and the use of an antitussive. The prognosis is good if the therapy is carried out carefully. In the severe form of acute catarrhal bronchitis there can be fever, painful coughing, and tachypnea. This form can be the first symptom of canine distemper. Acute mucopurulent bronchitis is a frequently occurring form that usually follows an infection but can also occur because of unfavorable circumstances when resistance is lowered. The dog or cat remains listless and usually has a fever. There is a moist, productive cough that in the dog sometimes ends in gagging. Sometimes the cough is held back slightly, giving the impression that coughing causes pain. The respiratory frequency is often increased. During auscultation, accentuated respiratory sounds are heard with moist, peeping rhonchi here and there. The radiograph reveals an increased bronchial pattern because of edema of the mucosa and infiltration of the peribronchial tissue. The first step in treatment is to prescribe rest. Broad-spectrum antibiotics are given for at least two weeks. If the fever does not decrease within a few days, bacteriological examination must be carried out (bronchial or tracheal washing). If there is a mucopurulent bronchitis, antitussives are contraindicated because coughing serves to expel the mucopurulent exudate. Especially in the cat, parenteral administration of fluid is often necessary (subcutaneous or intravenous 0.9% NaCl solution). The prognosis is usually good if the therapy is carried out conscientiously and there are no complicating factors, such as reduced resistance caused by other abnormalities.

Chronic bronchitis can develop insidiously as a primary disorder, but it can also develop secondary to an acute bronchitis. It occurs most frequently in the cat. Usually the animal is not ill and has a hard, wet cough. The dog or cat continues coughing during the night, and in the morning a large amount of mucopurulent material is coughed up and sometimes spit out. The animal’s endurance is reduced and weight loss can occur. Auscultation reveals increased and accentuated respiratory sounds, best described as rattling and squeaking. The diagnosis is based on bronchial and peribronchial changes on radiographs. Further examinations such as
bronchoscopy, cytological and bacteriological examination of bronchial washings, and blood examinations are necessary. The therapy is determined by the results of the examinations. Rest, broad-spectrum antibiotics, and improvement of the general condition of the animal are the essential components of therapy. The prognosis depends on the severity of the bronchial changes and varies from good to poor, and in the latter cases there will be recurrences.

**Foreign bodies** cause immediate coughing and gagging. After some days the coughing decreases and mucopurulent bronchitis develops. If the history is suggestive, bronchoscopy is necessary. Usually the foreign body can be removed through the bronchoscope.

**Tumors** in the bronchial tree or in lung tissue do not always cause coughing, but when coughing produces blood, tumor is likely. With tumors in the trachea, dyspnea is the predominant sign. Therapy is not always possible. Bronchoscopy can provide an estimate of the extent of the tumor and facilitate biopsy. A wide carina indicates enlargement of the bronchial lymph nodes and thus probable metastasis to these nodes.

**References:**