



MISSISSIPPI STATE
UNIVERSITY™

Chronic Coughing In An Otherwise Well Dog

Important history questions:

- Is patient on heartworm prevention?
- Any other clinical signs (GI, urinary, etc)
- Environment/travel/boarding history?
 - *Is kennel cough possible?
- Cough worse after exercise? Worse after eating/drinking?
- Loud, "goose-honking" or soft cough?
- Is there a seasonality to the cough?
- Exposure to snails or crawfish?
- Any nasal discharge?

Consider age and breed of patient. Tracheal collapse is common in small breed dogs, especially the Pomeranian, Chihuahua, Miniature Poodle, and Yorkshire terrier. Chronic bronchitis is common in these same breeds, as well as other small breeds such as Cocker Spaniels. Young, larger breed dogs (especially Malamutes and Siberian Huskies) are predisposed to eosinophilic bronchopneumopathy. Some small breeds may also be affected by eosinophilic bronchopneumopathy.

Recommended Diagnostics

-Physical exam

*Often a murmur is auscultated in small breed dogs that are also prone to chronic respiratory diseases. Congestive heart failure actually is an uncommon cause of cough, but an enlarged left atrium may compress bronchi and cause a harsh cough. Although for the latter to happen, bronchomalacia usually is present, weakening the bronchi.

*A change in voice or stridor suggests laryngeal paralysis, which may lead to aspiration pneumonia

-Routine thoracic radiographs and repeat radiographs after inducing cough to look for dynamic tracheal collapse (if a small breed dog) if initial views do not confirm tracheal collapse

*Tracheal collapse may only be identified on bronchoscopy. Therefore, airway collapse cannot be ruled out with routine radiographs and should still be strongly considered in small breeds.

-Baermann fecal float to look for evidence of lungworms

-Heartworm testing if in endemic area or if late on heartworm prevention

-Blind Bronchoalveolar Lavage technique (if suspect chronic lower airway disease):

*Anesthetize with short-acting anesthetic such as propofol, pass an endotracheal tube, and do an endotracheal tube wash with sterile saline and a sterile red rubber catheter

*Sterilely cut the end of the catheter

*The catheter is sterilely threaded into the endotracheal tube until resistance is met (presumably in a small airway at this point). Do not force the catheter any further, but ensure it stays at the area of first slight resistance.

*Attach a syringe of sterile saline to the catheter and rapidly infuse aliquots of saline into the catheter, down into the airways (3, 5, and 10 ml for dogs < 5kg, 5-10 kg, and >10 kg, respectively). Immediately apply suction to retrieve as much of the fluid back into the syringe as possible. Ideally at least 30% of the fluid is retrieved. Keep catheter in same spot until negative pressure is felt on the syringe, at which point the catheter is slightly backed out to retrieve more fluid.

*Retrieved fluid should be submitted immediately for culture and cytology

*Remove catheter from endotracheal tube and lift hindquarters of patient to help remove any residual fluid in the airways before recovery with supplemental oxygen.

*Monitor patient for respiratory distress.

*Avoid exceeding 25-30 total ml in small dogs and 75 total ml in large dogs. Total volume may need to be even lower depending on respiratory status of patient.

*Administration of a bronchodilator such as albuterol or terbutaline may be considered to reduce bronchospasm.

*Neutrophilic inflammation supports a diagnosis of infection or chronic inflammation/chronic bronchitis

*Eosinophilic inflammation supports eosinophilic bronchopneumopathy or respiratory parasites, some fungal disease

Treatment

-Antibiotic trial: A 2-4 week trial of doxycycline, azithromycin, or enrofloxacin is recommended before cough suppression or steroids are used and in cases of acute exacerbation of chronic bronchitis.

*If radiographic diagnosis of pneumonia, treat for 2 weeks past radiographic resolution with more broad spectrum antibiotics such as Clavamox®.

*Long-term antibiotics may be considered in cases where bronchiectasis is present.

-Deworming trial: 50 mg/kg fenbendazole for 5-7 days or 1 mg/kg milbemycin weekly for 3 weeks

-Cough suppression (if infection has been treated or ruled out):

- a. HYDROCODONE (0.2-0.5 mg/kg PO q 6-12 hours)
- b. MAROPITANT (2 mg/kg PO q48 hours)
- c. DIPHENOXYLATE/ATROPINE (0.2-0.5 mg/kg PO q 8 hours)
- d. BUTORPHANOL (0.5-1 mg/kg PO q6-12 hours)
- e. GABAPENTIN (10 mg/kg PO q 8-12 hours)

-Bronchodilators:

Airway dilators are indicated for chronic lower airway disease and may help in tracheal collapse by reducing intrathoracic pressure.

- a. THEOPHYLLINE (10 mg/kg PO q12 hours if using extended release): if using concurrently with enrofloxacin, reduce dose by 30%
- b. TERBUTALINE (1.25-5 mg/dog PO q8 hours)
- c. ALBUTEROL (inhaled preferred; 1 puff every 6-12 hours)

-Steroids (if infection has been treated or ruled out):

Steroids are the treatment of choice for chronic bronchitis and eosinophilic bronchopneumopathy. A short course may also be needed for tracheal collapse cases.

- a. PREDNISONE (0.5-1 mg/kg PO q12 hours) tapered to lowest effective dose.
- b. FLUTICASONE (110 or 22µg inhaler; 1 puff q12 hours tapered to lowest effective dose). Note: this product may be cost prohibitive in the US. Canadian pharmacies typically offer significantly better prices.

-Other management

*Weight loss

*Use of a halter, instead of neck lead

*Avoid exposure of pet to airway irritants such as smoke, scented candles/sprays, perfumes, etc.

