TRACHEAL COLLAPSE
(ABNORMALITY OF THE WINDPIPE)

BASICS

OVERVIEW
- The windpipe or trachea is the large airway that carries air from the nose and throat to the airways (bronchi) that go to the lungs
- "Tracheal collapse" is a reduction in the diameter of the lumen of the windpipe (trachea) during breathing; it is considered to be a "dynamic" process as the lumen's diameter changes with the movements of breathing (inspiration and expiration)
- May involve the windpipe (trachea) in the neck (known as the "cervical trachea"), the windpipe (trachea) within the chest (known as the "intrathoracic trachea"), or both segments
- Compression of the windpipe (trachea) or bronchi as a result of enlarged lymph nodes or the presence of tumors are not considered part of this condition

GENETICS
- Unknown

SIGNALMENT/DESCRIPTION of ANIMAL

Species
- Primarily dogs, rarely cats

Breed Predilection
- Miniature poodles, Yorkshire terriers, Chihuahuas, Pomeranians, and other small- and toy-breed dogs
- Occasionally seen in young, large-breed dogs

Mean Age and Range
- Middle-aged to elderly—onset of signs at 4 to 14 years of age
- Severely affected animals may be less than 1 year of age

SIGNS/OBSERVED CHANGES in the ANIMAL
- Usually worsened by excitement, heat, humidity, exercise, or obesity
- Dry, honking cough
- May have long-term (chronic) intermittent coughing or difficulty breathing
- Retching (attempting to vomit)—often observed; occurs from an attempt to clear respiratory secretions from the voice box (larynx)
- Rapid breathing (known as "tachypnea"), exercise intolerance, and/or severe breathing difficulty (known as "respiratory distress")—common
- Severe breathing difficulty (respiratory distress)—seen during inspiration (breathing in) with collapse of the windpipe in the neck (cervical tracheal collapse); seen during expiration (breathing out) with collapse of the windpipe within the chest (intrathoracic tracheal collapse)
- Bluish discoloration of the skin and moist tissues (mucous membranes) of the body caused by inadequate oxygen levels in the red-blood cells (known as "cyanosis") or fainting (known as "syncope")—may see in severely affected individuals
- Increased tracheal sensitivity
- Whistling sounds (wheezing) or musical sounds over the narrowed area of the windpipe may be heard while listening with a stethoscope (known as "auscultation")
- A "snap" sound may be heard (when listening with a stethoscope) at the end of expiration, when large segments of the windpipe (trachea) collapses within the chest (intrathoracic tracheal collapse) during forceful expiration
- Abnormal breath sounds on listening to the lungs with a stethoscope (auscultation)—increased intensity or breath sounds over the bronchi; short, rough snapping sounds (known as "crackles"); and squeaking or whistling sounds (known as "wheezes")—indicate coexistent small airway disease
- Heart murmurs (mitral valve insufficiency murmurs)—often are found in small-breed dogs with tracheal collapse
- Normal to low heart rate—common in dogs with tracheal collapse, unless severe breathing difficulty (respiratory distress) occurs
- Loud second heart sound detected when listening to the heart with a stethoscope (auscultation)—suggests increased blood pressure within the lungs (known as "pulmonary hypertension")
- Enlarged liver (known as "hepatomegaly")—cause unknown

CAUSES
- Defects in the development of cartilage in the windpipe (trachea)
- Long-term (chronic) small-airway disease

RISK FACTORS
- Obesity

- Infection or inflammation of the lungs
- Upper airway blockage or obstruction

TREATMENT

HEALTH CARE

- Outpatient—stable patients
- Inpatient—oxygen therapy and heavy sedation for severe breathing difficulty (respiratory distress) or for severely anxious patients

ACTIVITY

- Severely limited, until patient is stable
- During management of disease—gentle exercise recommended to encourage weight loss

DIET

- Most affected dogs improve after losing weight
- Institute weight-loss program with a high-fiber reducing diet
- Feed 60% of total daily requirement of calories; use a slow weight-loss program

SURGERY

- Surgery—may benefit some patients, primarily those with collapse of the windpipe (trachea) in the neck (cervical tracheal collapse)
- Signs due to upper airway obstructive disorder (such as paralysis of the voice box or larynx [known as "laryngeal paralysis"], turning inside-out of a portion of the voice box or larynx [known as "everted laryngeal saccules"])—may improve after corrective surgery
- Placement of stents to keep the lumen of the windpipe open, in selected patients (primarily with collapse of the windpipe [trachea] in the neck [cervical tracheal collapse]) by a skilled surgeon—shown to improve quality of life and reduce clinical signs when adequate stabilization of the airway can be achieved and when long-term (chronic) lung changes do not limit resolution of disease
- Consider likelihood of complications after surgery (such as persistent cough, severe breathing difficultly [respiratory distress], or paralysis of the voice box (larynx; laryngeal paralysis]); some patients may require a permanent surgical opening into the windpipe or trachea (known as a "permanent tracheostomy")

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.

- Sedation and cough suppression—butorphanol; addition of a tranquilizer (acepromazine) may enhance sedative effects and further reduce the cough reflex; narcotic cough suppressants (butorphanol or hydrocodone) effective for long-term (chronic) treatment
- Drugs to dilate the bronchi and bronchioles (known as "bronchodilators"); dilation of small airways and lowering pressure gradients with lower airway disease—sustained-release theophylline or terbutaline; bronchodilators have no effect on the diameter of the windpipe (trachea)
- Reduction of inflammation of the windpipe (trachea)—prednisone; consider inhaled steroids given via face mask and spacer chamber
- Robitussin® DM—may provide relief to animal, reduce the severity of the cough, but is not a cure (known as "palliation")

FOLLOW-UP CARE

PATIENT MONITORING

- Body weight
- Exercise tolerance
- Pattern of breathing
- Incidence of cough

PREVENTIONS AND AVOIDANCE

- Avoid obesity in breeds commonly afflicted with tracheal collapse
- Avoid heat and humidity
- Use a harness rather than a collar (a collar puts pressure on the windpipe, and may aggravate the problem)

POSSIBLE COMPLICATIONS

• Severe breathing difficulties that do not respond to medical treatment (known as “intractable respiratory distress”) leading to respiratory failure or euthanasia

EXPECTED COURSE AND PROGNOSIS

• Combinations of medications, along with weight control, may reduce clinical signs
• Surgery—may benefit some patients, primarily those with collapse of the windpipe (trachea) in the neck (cervical tracheal collapse)
• Patient will cough throughout life
• Prognosis—based on evidence and degree of airway blockage

KEY POINTS

• “Tracheal collapse” is a reduction in the diameter of the lumen of the windpipe (trachea) during breathing; it is considered to be a “dynamic” process as the lumen’s diameter changes with the movements of breathing (inspiration and expiration)
• Obesity, over excitement, and humid conditions may precipitate a breathing crisis
• Use a harness instead of a collar
• Combinations of medications, along with weight control, may reduce clinical signs