

DIFFICULTY BREATHING, RAPID BREATHING, PANTING

BASICS

OVERVIEW

- Difficulty breathing (known as “dyspnea”)—a subjective term that in human medicine means “an uncomfortable sensation in breathing” or a sensation of air hunger; in veterinary medicine, it means difficulty breathing or respiratory distress
- Rapid breathing (known as “tachypnea”) is an increased respiratory rate
- Panting is rapid, shallow, open-mouth breathing

SIGNALMENT/DESCRIPTION of ANIMAL

- Dogs and cats; no breed, age, or sex predilection

SIGNS/OBSERVED CHANGES in the ANIMAL

- Patients with primary respiratory disease—coughing, rapid breathing (tachypnea), exercise intolerance
- Nonrespiratory causes—signs associated with the primary disease
- General signs of dyspnea—increased abdominal effort when breathing; nasal flaring (esp. cats); open-mouth breathing; neck extension; moving the elbows out, away from the body to an attempt to increase lung capacity (elbow abduction)
- Nasal disease—noisy breathing when inhaling (known as “stertor”); lack of airflow through nostrils; difficulty breathing improves with open-mouth breathing
- Upper airway disease (involving nose, throat and/or windpipe, so called “upper airway”)—high-pitched, noisy breathing (known as “stridor”); increased body temperature (known as “hyperthermia”)
- Dynamic obstruction, such as paralysis of the larynx—difficulty breathing on inhalation or inspiration
- Fixed obstruction, such as a mass or foreign body—difficulty breathing on inhalation or inspiration and exhalation or expiration
- Collapse of the windpipe (trachea)—honking cough
- Lower airway disease (involving the windpipe within the chest, bronchi and lungs, so called “lower airway”)—cough; wheezes heard on listening to the lungs (auscultation) on exhalation or expiration; increased abdominal effort when breathing
- Lung disease—may have crackles heard on listening to the lungs (auscultation); may have normal lung sounds
- Pneumonia—fever
- Heart-related build-up of fluid in the lungs (known as “pulmonary edema”)—heart murmur; low body temperature (known as “hypothermia”); pale gums and moist tissues of the body (mucous membranes); the pink color of the gums is slow to return when the gums are blanched by finger pressure (known as “poor capillary refill time”)
- Diseases involving the space between the chest wall and the lungs (known as “pleural-space disease”)—diminished breath sounds
- Chest-wall disease—visible trauma
- Nonrespiratory diseases—findings will depend on the other diseases, such as pale gums if the animal has a low red-blood cell count (anemia)
- Blood clots to the lungs (known as “pulmonary thromboembolism”)—may have clinical signs of the underlying disease leading to the formation of the blood clots
- Other signs will pertain to the underlying disease, such as shock, trauma

CAUSES & RISK FACTORS

Difficulty Breathing (Dyspnea)

- **Upper Airway Disease** (involving nose, throat and/or windpipe in the neck region, so called “upper airway”)
 - Disorders of the nasal passages leading to blockage of the airways (nasal obstruction)—narrowed nostrils (known as “stenotic nares”); infection; inflammation; cancer; trauma; blood-clotting disorders (known as “coagulopathy”) or bleeding disorders
 - Disorders of the throat (pharynx)—overly long soft palate; polyp in the throat or pharynx (known as “pharyngeal polyp,” seen in cats); turning inside-out of a portion of the voice box or larynx (known as “everted laryngeal sacculles”), such that the space for air to pass through the larynx is decreased; foreign body; cancer
 - Disorders of the voice box (larynx)—paralysis of the larynx; fluid build-up of the laryngeal tissues (edema); collapse of the voice box or larynx (known as “laryngeal collapse”); foreign body; cancer; trauma
 - Disorders of the windpipe (trachea)—windpipe collapse (known as “tracheal collapse”) within the neck; narrowing of the windpipe (known as “tracheal stenosis”); trauma; foreign body; cancer; parasites
- **Lower Airway Disease** (involving the windpipe within the chest, bronchi and lungs, so called “lower airway”)
 - Windpipe (trachea) collapse within the chest
 - Squeezing or compression of lung tissue secondary to enlarged lymph nodes, enlarged left atrium (one of the chambers of the heart), or heart-based tumors

- **Small Airway Disease** (involving the bronchi, bronchioles, and alveoli of the lungs)
 - Allergy; inflammation (such as bronchitis); infection (for example, *Mycoplasma*); parasites; cancer (bronchogenic carcinoma)
 - **Lung Tissue (Pulmonary Parenchymal) Disease** (involving the lung tissue or cells)
 - Fluid build-up (edema)—heart-related (cardiogenic) or non-heart related (non-cardiogenic)
 - Pneumonia—infectious; parasitic; aspiration; cancer (primary or metastatic)
 - Inflammatory disease—allergic; infiltrative eosinophilia (characterized by the presence of a large number of eosinophils [a type of white blood cell] in the lung tissue); acute respiratory distress syndrome; uremic pneumonitis (inflammation of the lung tissue secondary to the presence of urea and other nitrogenous waste products in the blood)
 - Bleeding (hemorrhage)—trauma; blood-clotting disorders (coagulopathy)
 - Blood clots in the lungs (known as “pulmonary thromboembolism”): immune-mediated breakdown of red blood cells (known as “hemolytic anemia”); heartworm disease; excessive production of steroids by the adrenal glands (known as “hyperadrenocorticism” or “Cushing’s disease”); abnormal blood clotting (known as “disseminated intravascular coagulopathy” or “DIC”)
 - **Pleural Space Disease** (involving the space between the chest wall and the lungs)
 - Air in the pleural space (known as “pneumothorax”)—trauma; secondary to lung tissue (pulmonary parenchymal) disease; ruptured bubble-like areas (known as “bullae”) in the lungs; migrating foreign body; spontaneous
 - Fluid in the pleural space (known as “pleural effusion”)—pus; secondary to congestive heart failure; cancer; twisting of a lung lobe (known as “lung-lobe torsion”)
 - Blood in the pleural space (known as “hemothorax”)—trauma; clotting disorder (coagulopathy); twisting of a lung lobe (lung-lobe torsion); spontaneous bleeding of the thymus
 - Milky fluid in the pleural space (known as “chylothorax”)—unknown reasons (known as “idiopathic”); congestive heart failure; trauma
 - Presence of masses or abdominal organs in the pleural space—cancer; secondary to a tear or abnormal opening in the diaphragm (diaphragmatic hernia) through which abdominal contents enter the chest
 - **Chest Wall Disease**
 - Trauma; cancer; paralysis due to botulism; nervous system disease
 - **Abdominal Distention** (putting pressure on the chest and lungs)
 - Enlarged organs—enlargement of an organ due to an increase in the number of normal cells (known as “hyperplasia”); cancer; pregnancy; obesity; fluid build-up in the abdomen (known as “ascites”); accumulation of air in the stomach with or without twisting of the stomach (known as “bloat” or “gastric dilatation” or “gastric dilatation/torsion” or “gastric dilatation/volvulus”)
- Rapid Breathing (Tachypnea)**
- Low levels of oxygen in the blood (known as “hypoxemia”); high levels of carbon dioxide in the blood (known as “hypercapnia”); low blood pressure (hypotension); fever; low levels of red-blood cells (anemia); acidosis (a condition in which levels of acid are increased in the blood); inflammation
 - Airway disorders—inhaled irritants; allergic disease; narrowing of the bronchi (known as “bronchoconstriction”); airway squeezing or compression; airway infection
 - Interstitial disorders—the interstitium is defined as the small spaces between tissues or organs, interstitial disorders refers to medical conditions located in these spaces—fluid build-up (edema); bleeding (hemorrhage); inflammation; cancer
- Panting**
- Pain; anxiety; drug therapy (such as with opioids); normal body-heat regulation (that is, panting to cool off body temperature); can be a normal behavioral pattern in some dogs

TREATMENT

HEALTH CARE

- Inpatient care until the cause is identified and treated or determined not to be life-threatening; therapy based on underlying cause
- Oxygen should be administered until patient’s ability to oxygenate is determined
- Keep patient lying on chest (that is, not on its side) until stabilized; and turn hips every 3 to 4 hours
- Upper airway disease—moderately affected animals may benefit from sedation to reduce effort upon inhaling; actively cool patients as necessary since elevated body temperature (hyperthermia) will increase breathing effort; severe upper airway disease may require passing of a tube through the mouth and into the windpipe (intubation) to stabilize the patient; if the problem cannot be resolved immediately, placement of a temporary surgical opening into the windpipe (tracheostomy) may be necessary; remove foreign bodies; perform surgical removal/biopsy of masses, surgical correction for paralysis of the voice box or larynx (laryngeal paralysis) and for the partial upper airway obstruction in short-nosed, flat-faced (brachycephalic) breeds of dogs and cats (known as “brachycephalic airway syndrome”); anti-inflammatory medications for fluid build-up in the voice box or larynx (laryngeal edema)

- Lower airway disease—drugs to enlarge or dilate the bronchii (known as “bronchodilators,” such as terbutaline, theophylline); oxygen therapy until stable; systemic steroids may be necessary to stabilize cats with acute narrowing or decrease in size of the opening of the bronchi (known as “bronchoconstriction”)
- Lung tissue (pulmonary parenchymal) disease—oxygen therapy; antibiotics, if pneumonia; treat blood-clotting disorders; heart-related fluid build-up (known as “cardiogenic edema”) requires diuretics with or without drugs to cause the blood vessels to dilate (known as “vasodilators”); fluid build-up related to non-heart causes (known as “noncardiogenic edema”) requires oxygen therapy; diuretics may be beneficial; use of a hand-controlled bag attached to the airway to push air into the airway or a ventilator (known as “positive-pressure ventilation”) may be necessary if oxygen therapy alone is not adequate to stabilize the patient
- Pleural-space disease—chest tap (known as a “thoracocentesis”) to remove air and/or fluid from the space between the lungs and chest wall—remove as much as possible; chest tube, if repeated chest taps are needed to keep patient stable
- Chest-wall paralysis—positive-pressure ventilation may be necessary, if patient has high levels of carbon dioxide in the blood (known as “hypercapnia”)
- Abdominal distention—drain fluid (ascites) as needed to keep the patient comfortable; relieve stomach distention (as in “bloat”)
- Nonrespiratory diseases—treat primary problem
- Oxygen therapy may be provided via an oxygen cage; a delivery device into the nose (nasal cannula); by making an oxygen “tent” with an Elizabethan collar covered in plastic wrap; an oxygen mask; or allowing oxygen to flow-by the animal’s face—oxygen should be humidified, if administered for more than a few hours

ACTIVITY

- Strict cage confinement until difficulty breathing is resolved

DIET

- Weight-reducing diet, if obesity is contributing to the difficulty in breathing

SURGERY

- Carefully tailor anesthesia to the patient; securing an airway is essential and the ability to use positive-pressure ventilation often is necessary
- Surgery for diaphragmatic hernias or spontaneous pneumothorax (free air in the space between the lungs and chest wall)
- Chest-wall disease—surgery as indicated, particularly if open-chest wound is present

MEDICATIONS

- Varies with underlying cause

FOLLOW-UP CARE

PATIENT MONITORING

- Patients receiving oxygen therapy can be monitored by assessing the degree of breathing difficulty; measure arterial-blood gases
- Pulse oximetry is effective for monitoring patients breathing room air; allowing the patient to try breathing room air (room-air trial) can be useful in evaluating the animal’s response to treatment, degree of breathing difficulty and ability to oxygenate blood (by measuring blood gases)
- Repeat X-rays often are indicated in assessing pulmonary parenchymal disease and pleural-space disease
- Monitor body temperature regularly, as animals with difficult breathing often develop high body temperatures (that is, become hyperthermic), and the increased body temperature (hyperthermia), in turn, will worsen the breathing difficulty (dyspnea)

PREVENTIONS AND AVOIDANCE

- Depends on underlying cause
- Weight reduction, if obesity is contributing to the difficulty in breathing

POSSIBLE COMPLICATIONS

- Breathing difficulties and resulting low oxygen levels in the blood (known as “hypoxia”) can be life threatening; animals with signs of difficult breathing should be evaluated by a veterinarian as soon as possible; animals with severe breathing difficulties should be considered an emergency

EXPECTED COURSE AND PROGNOSIS

- Depends on underlying cause

KEY POINTS

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