Abnormal respiratory noises that can be heard without a stethoscope include stertor and stridor. Stridor is a high pitched inspiratory noise associated with obstruction of a large and rigid airway such as the larynx, trachea, or nasopharynx. With severe obstruction, expiratory stridor can also be detected. Stertor is an inspiratory or expiratory snoring noise caused by vibration of soft tissues such as the soft palate and laryngeal saccules. These findings help localize the type of disease and determine appropriate diagnostics and prognosis.

**Nasopharyngeal stenosis**

The opening to the caudal nasopharynx is normally ~1 cm across in cats, and variably sized in dogs. It can be reduced to less than 1mm or obliterated by a web of scar tissue spanning within the nasopharynx. In cats, this is typically a thin web of tissue however in dogs, thick fibrous tissue can span a long portion of the nasal cavity and nasopharynx. This tissue might occur due to a congenital malformation or could be a response to chronic inflammation associated with chronic upper respiratory disease or regurgitation into the nasopharynx. In dogs, it is particularly a problem when post-anaesthetic regurgitation occurs and material ends up in the nasopharynx.

Signs associated with nasopharyngeal stenosis can be classic for upper respiratory infection, with sneezing and mucopurulent nasal discharge. However, signs due to nasal obstruction usually predominate, and most cases lack nasal discharge. Stertorous respiration or snoring sounds are commonly reported. Respiratory distress occurs in animals when nasal breathing is required. Signs that can be alleviated by open mouth breathing localize the abnormality to bilateral nasal passages or the nasopharynx.

A lateral radiograph is unlikely to reveal a stenotic lesion but it can be beneficial in ruling out a mass lesion. Nasopharyngeal stenosis can typically be visualized on CT and sagittal reconstruction of the image provides information on the length and extent of the stenosis. Nasopharyngeal stenosis is most easily diagnosed using a flexible endoscope to obtain a view of the nasopharynx. The investigator must have an appreciation of the normal anatomy of the caudal nasopharynx to recognize this syndrome. Therefore, it is worthwhile to include a view of the caudal nasopharynx in the work-up of any cat with upper respiratory disease. If a flexible endoscope is not available, the nasopharyngeal region can be indirectly evaluated by passing a 3 - 5 French catheter caudally through the ventral meatus into the nasopharynx and oropharynx. In the normal cat, the catheter should pass easily into the pharynx, however a stenosed region will block passage of the catheter in affected cats.

Treatment of this obstructive breathing disorder can be achieved through balloon dilation in the cat, and most cats respond well to a single dilation, although some can require multiple episodes. In dogs, the fibrous nature of the tissue and the extent of narrowing make balloon dilation less likely to be successful. Some resolution of signs has been achieved with temporary implantation of removable stents, although these require careful monitoring and management for 6-8 weeks.

**Nasal neoplasia**
Animals with nasal neoplasia present with clinical signs similar to those seen with other nasal disorders. Epistaxis or nasal discharge (unilateral or bilateral) is commonly seen along with sneezing or pawing at the face. Owners can note either stertorous or stridorous respiration depending on the level of obstruction in the upper respiratory tract. On physical examination, loss of nasal airflow is a finding more consistent with neoplasia or fungal infection (in the cat) in comparison to rhinitis. Facial deformity or a mass protruding from the nostrils is reported in 70% of cats with nasal tumors, and epiphora is also commonly seen. Neurologic signs such as seizures, behavioral changes, or cerebral dysfunction can be seen alone or in conjunction with respiratory signs. The presence of these signs is highly suggestive of tumor invasion into the central nervous system and warrants a guarded prognosis. Although the biologic behavior of most nasal tumors is characterized by local extension, metastasis to regional lymph nodes or to the lungs can occur and worsens prognosis.

The diagnostic work-up for nasal neoplasia includes testing for baseline laboratory testing, CT, and rhinoscopy. Nasopharyngeal examination and biopsy of mass lesions is critical since some neoplasms affect only the caudal nasopharynx. Obtaining histopathologic samples with visualization is the best means for obtaining a definitive diagnosis.

The most commonly employed treatment of nasal tumors is radiation therapy, and median survival times are 9 - 23 months. Side effects of radiation therapy are predictable and expected. If no early side effects are seen in normal tissue, it is unlikely that the dose administered was high enough to palliate the tumor. Early side effects of radiation therapy include mucositis, conjunctivitis, and moist desquamation of skin. Artificial tears are employed to lubricate the eye, but specific treatment of the skin is not recommended. If mucositis causes anorexia, cold tea mouth rinses may make the animal more comfortable. Late effects of radiation therapy are generally irreversible. Radiation treatment plans are designed to reduce the incidence of delayed side effects such as bone necrosis, cataracts, and keratoconjunctivitis sicca. For nasal lymphoma, chemotherapy can be used in addition to radiation therapy or it may be employed as a single therapeutic modality.

Laryngeal disease
Animals with laryngeal disease present with variable degrees of respiratory distress, exercise intolerance, tachypnoea, and cough. Gagging or dysphagia can also be seen. Careful questioning of the owner may reveal a voice change or a reduction in vocalization in the recent history. The aetiology could be a laryngeal mass (due to inflammatory laryngitis or laryngeal neoplasia) or laryngeal paralysis.

There have been a few small case series in the literature describing inflammatory laryngitis in cats that is presumed to be primary in origin. Most cats are middle-aged to older at presentation, and neoplasia is the primary differential diagnosis. Cats can present with chronic, progressive signs of inspiratory respiratory distress and coughing or acute onset of severe signs. Increased inspiratory effort is virtually always observed and stridor can be ausculted in some cats. Laryngeal palpation is generally normal however radiographs of the cervical region can reveal a soft tissue density in the region of the larynx. Careful positioning is required to evaluate neck radiographs in an animal because slight deviations in positioning can result in artifacts. Mass lesions obstructing the rima glottidis are typically visible on laryngoscopy in affected cats. Histopathology generally reveals granulomatous, lymphocytic inflammation, which is the only criterion that distinguishes this condition from neoplasia. Some cats can be successfully managed with aggressive steroid therapy. Surgical excision or debulking may be helpful in some cases, however permanent tracheostomy may be required. Caution is warranted in using this procedure in the cat because excessive mucus production tends to obstruct the tracheostomy site.

Unfortunately, laryngeal neoplasia is encountered more commonly than inflammatory laryngitis in dogs and in cats. The most common neoplasms to affect the larynx are lymphosarcoma and squamous cell carcinoma. While chemotherapy (with or without radiation therapy) can be helpful in reducing airway obstruction associated with lymphoma, some animals require tracheotomy or tracheostomy during anesthetic recovery or while waiting for a clinical response to therapy. Squamous cell carcinoma is poorly responsive to most therapies. Surgical debulking and tracheostomy must be considered.
Laryngeal paralysis is a common cause of stridor that affects certain breeds as a congenital condition (Dalmatian, Rottweiler, Leonberger) and also exists as an acquired disease. The acquired syndrome may be associated with trauma to the recurrent nerve anywhere along its pathway, a mass lesion impinging on the nerve, or in older large breed dogs, a generalized neuromuscular disease. The condition is much less common in cats than in dogs. In either species, paralysis can be unilateral or bilateral.

History, presenting complaints, and physical examination are similar to those found with other laryngeal diseases. Neurologic assessment is important because additional nerve dysfunction can be detected in both congenital disease (of the Rottweiler and Dalmatian) and in the acquired syndrome of large breed dogs. Proprioceptive placing deficits are quite common in these dogs and could be an early indicator of disease. Cervical radiographs can reveal caudal retraction of the larynx associated with increased inspiratory effort. It is common to find air in the laryngeal saccules. Thoracic radiographs sometimes reveal hyperinflation or an air-filled oesophagus, which must be differentiated from megaoesophagus. Aspiration pneumonia in the middle lung fields may be apparent.

Diagnosis of laryngeal paralysis is based on visualization of decreased or absent laryngeal abduction on inspiration while the animal is under a light plane of anaesthesia. Ultrasound of the larynx has also been reported as a means for confirming the diagnosis. With either technique, it is important that an assistant identifies inspiratory motions to the examiner to allow correlation of laryngeal abduction with inspiration. Motion can be slightly asymmetric and still be within normal limits, and complete closure of the laryngeal cartilages may or may not be observed on expiration. In dogs, when a definitive diagnosis of laryngeal paralysis cannot be made based on visual examination, respirations are stimulated using doxapram (1.0 mg/kg IV). This drug has not been assessed for clinical use in cats with laryngeal dysfunction.

Animals that display marked clinical signs associated with laryngeal paralysis require surgical treatment via unilateral arytenoid lateralization. Aspiration pneumonia does not appear to occur post-operatively in cats as often as it is reported in the dog. Less severely affected animals can be managed with weight loss and avoidance of heat, humidity, and over-exertion.