Emergency Handling of, Stabilization of, and Diagnosing the Dyspneic Patient

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Triage

Dyspneic patients should be identified immediately upon presentation. Front office staff and triage nurses are on the front lines to identify this type of emergency. It is essential to minimize additional stress on these animals to prevent worsening the clinical condition. Diagnosis and therapy may need to be performed stepwise to allow the patient breaks in between stressful events.

Signalment and presenting complaints are some of the first clues to diagnosing a dyspneic patient. For example, an older chihuahua might place congestive heart failure higher on the differential list, while a young dog presenting for trauma might put pneumothorax or pulmonary contusions higher on the list. Increased respiratory rate in a young cat who presented with an unrelated problem may place stress higher on the list. In this case the veterinarian should confirm with the owner if the cat was breathing normally at home.

Physical Exam

On the initial physical exam, the emergency veterinarian should evaluate for any external wounds and note the patient's breathing pattern. Stertor and stridor are associated with brachycephalic airway syndrome, laryngeal paralysis, or other upper airway disease such as an obstructive mass. On auscultation, the veterinarian should evaluate for crackles, wheezes, decreased lung sounds, or muffled heart sounds. Crackles are associated with congestive heart failure, pneumonia, or other pulmonary parenchymal

disease. Wheezes are associated with lower airway disease, including feline asthma or chronic lower airway disease. Decreased lung sounds may clue the veterinarian into pleural effusion, while muffled heart sounds may help diagnose pericardial effusion.

Initial Diagnostics

Initial diagnostics performed on triage may include a FAST scan (focused assessment with sonography for trauma) of the chest and abdomen. B-lines are artifacts on ultrasound caused by pulmonary edema, which help diagnose congestive heart failure or pneumonia. A thoracic glide sign, commonly visualized as "ants marching in a line," is caused by lung visceral pleura sliding along the parietal pleura during respiration. The absence of a glide sign helps diagnose pleural disease such as a pneumothorax, pleural effusion, or other space-occupying pleural lesions. The veterinarian may view the right parasternal short axis of the heart base during FAST scan to evaluate the left atrial-to-aortic (La:Ao) ratio. Generally speaking, a normal La:Ao ratio is considered less than 1.6. An increased La:Ao ratio in combination with b-lines suggests congestive heart failure.

Minimum database bloodwork that includes electrolytes and acid-base status is useful to diagnose causes of dyspnea. In emergency scenarios, a venous blood gas is often most easily obtained, allowing the veterinarian to distinguish between primary or secondary respiratory acidosis or alkalosis. Hypoxemia can be identified if an arterial blood gas can be obtained. Causes of hypoxemia include hypoventilation, alveolar disease, blood shunting, V/Q (ventilation-perfusion) mismatch, or decreased amount of inspired oxygen.

Initial Treatments

Cages that are used to provide oxygen support.

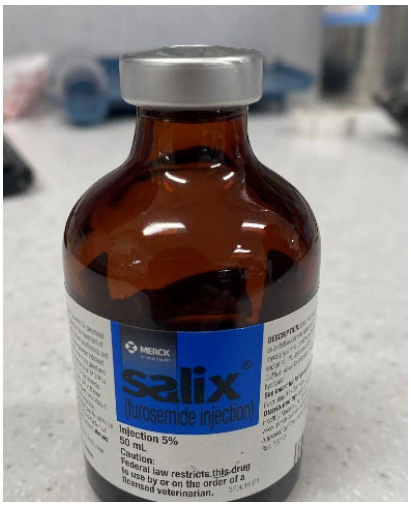
While not all dyspneic animals benefit from oxygen therapy, it is often one of the first and relatively benign therapies that may be administered on triage. Oxygen therapy may be delivered via flow by or an oxygen cage with FiO2 40 to 60%. Anxiolytics and mild sedatives are also mainstay initial therapies, especially in patients whose cause of dyspnea is unknown. More specifically, they are particularly useful for treating upper respiratory disease, lower airway disease, or stress. Butorphanol 0.1 to 0.3 mg/kg IM, SQ, or IV is frequently used. This agonist-antagonist opioid has sedative, antitussive, and mild analgesic properties and minimal respiratory depressive effects. Butorphanol can be partially reversed if needed. Acepromazine, a phenothiazine, is also commonly used for sedation at 0.01 to 0.02 mg/kg IM, SQ, or IV, and it has minimal respiratory depressive effects. However, acepromazine should be used cautiously as it causes hypotension, decreases seizure threshold, and is irreversible.

Moreover, pain should always be considered a possible contributing factor to dyspnea. At Angell Animal Medical Center, if a patient's presenting complaint or apparent clinical condition may be painful, methadone 0.1 to 0.3 mg/kg IM, SQ, or IV is commonly administered on triage. This is a full mu opiate receptor agonist that has minimal respiratory depressive effects, less emetic effects than hydromorphone, and it is reversible.

Further therapies to stabilize the dyspneic patient are more specific. For example, inhalant albuterol in conjunction with butorphanol may be successful if feline asthma is suspected. If additional therapy is needed, dexamethasone sodium phosphate may be administered IM or IV on triage. Additional injectable bronchodilators may be administered, such as terbutaline or theophyllines. However, the use of steroids should be cautioned before obtaining a more definitive diagnosis.

If congestive heart failure is suspected, then furosemide, a diuretic, should be administered at a starting dose of 2 mg/kg in dogs and 1 to 2 mg/kg in cats IM or IV. If a patient already takes oral furosemide, it should be administered at a starting dose that is 25 to 50% greater than a patient's current dose at home. Another common cause of dyspnea is pneumonia, and IV antibiotic therapy should be initiated as soon as possible if this disease is suspected. Moreover, if upper airway swelling is suspected, then dexamethasone sodium phosphate 0.1 to 0.2 mg/kg IV may help decrease inflammation. If pleural space disease is identified, an emergent thoracocentesis may be indicated for diagnostic and therapeutic purposes. If pericardial tamponade is identified, then an emergent pericardiocentesis is indicated.

Intubation may be required if the dyspneic patient cannot be stabilized with initial therapy. If there is an upper airway obstruction and intubation is unsuccessful or not an option, an emergent temporary tracheostomy may be required.



Injectable furosemide which is used to treat congestive heart failure.

Workup

Additional treatment of the dyspneic animal may require further workup. Thoracic radiographs are often the first diagnostic test; others may include an echocardiogram, computerized tomography, infectious disease panels, or bronchoalveolar lavage.

The dyspneic patient is one of the most stressful presentations to any veterinary clinic. With the right tools and practice, veterinary staff can successfully handle, stabilize, and diagnose the dyspneic patient.

References

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