Emergency respiratory patients can be a challenge for any seasoned technician. Not only must technicians minimize further distress to the patient, but we must obtain the required diagnostic tests in order to help determine the problem. Sometimes there are subtle signs of respiratory compromise, which often progress quickly to profound respiratory distress. Technicians of every level must be able to recognize mild, moderate, or severe dyspnea and respiratory failure, and know various techniques that will give the best chance of a positive outcome.

**Patient Presentation**

Normal respiration is passive: Our respiratory cycle often goes completely unnoticed, and we only tend to pay attention to our breathing with a respiratory ailment or heavy exertion. Dyspnea has been described as an abnormal breathing effort characterized by changes in respiratory rate, rhythm, and character as well as altered behavior.

Common respiratory emergencies include pulmonary edema, pleural effusion, pneumonia, airway obstruction, trauma, and respiratory paralysis. Although each of these presentations requires a different treatment, there are commonalities among them. On a typical triage scale of I to IV, respiratory emergencies must be classified as high (class I or II) and intervention be instituted very quickly, as respiratory compromise can quickly evolve into respiratory failure.

When a patient arrives in respiratory distress, it often appears that the animal is completely focused on the act of breathing. These patients are often oblivious to their surroundings, will focus their gaze on a fixed point, and seem not to notice your presence. Other common presenting signs include tachypnea, increased or paradoxical abdominal movement, open-mouth breathing, reluctance to lie down (dogs) or sternal recumbency (cats), and an abnormal posture characterized by extension of the head and neck and abduction of the elbows. Signs of dyspnea and lateral recumbency in a dog or cat usually indicate serious respiratory compromise.

When a patient presents in respiratory distress, the ultimate goal is to improve the quality of its respirations and relieve the cause of dyspnea. Because dyspnea can be a sign of many different problems requiring many different treatments, an accurate, rapid, primary survey should be performed in order to determine why the patient is dyspneic. In most cases, palliative treatment is performed before a complete physical examination (secondary survey) and many diagnostic tests.

Respiratory patients, arguably more than any other type of emergent patient, are susceptible to the stress of handling, examination, and diagnostics, including obtaining vascular access. The goal in caring for these patients must be to minimize stress. Staff should work in a calm, quiet, and efficient manner, with minimal persons handling the patient. Often these patients have been removed from their owner for emergency treatment, likely compounding anxiety. Light sedation is often required to manage them more easily. Our hospital will often use butorphanol, which rarely causes vomiting or panting. This low-dose sedation may relieve some of the anxiety related to dyspnea, and the patient may be better able to deal with handling and diagnostics.

**Be Prepared**

It is very important that every veterinary practice be prepared to provide emergency oxygen supplementation. This includes having readily available all equipment required for rapid intubation, tracheostomy, and thoracentesis in the emergency area.

In the emergent phase, oxygen supplementation is very important. Oxygen should be provided to respiratory patients in as simple and stress-free a manner as possible. Placing nasal cannulae in this high-anxiety, dyspneic state is often too stressful, even though this is considered one of the most efficient methods of oxygen supplementation. Typically, flow-by oxygen is used upon presentation, occasionally with a mask, although this too can be stressful. Flow-by oxygen provides the most oxygen enrichment at flow rates of 100 to 150 ml/kg. Many patients will resent this high a rate being “blasted” into their faces, and the rate must be reduced. Human nasal prongs can be a very effective, low-stress method in larger dogs and are often very well accepted and quickly placed.

A common strategy for dyspneic cats is to administer intramuscular or subcutaneous sedation and then place the patient in an oxygen cage or oxygen hood for 10 to 15 minutes to allow the sedation to take effect before handling.
the patient. This also provides a good opportunity to perform some “distance evaluations,” including respiratory rate, effort, and pattern, while the cat is settling down in an oxygen-rich environment. Cats are particularly susceptible to sudden death when they are dyspneic and must be handled very carefully. Once the sedative has taken effect, the patient and oxygen hood can be removed from the cage onto a table and a catheter can be placed in a hind limb while the front end of the cat remains in the hood. Oxygen hoods also work very well for small dogs. One major disadvantage, however, is panting. If the patient is panting, the oxygen hood can rapidly become very hot, contributing to hyperthermia. Ensuring adequate ventilation for CO₂ to escape is crucial when using oxygen hoods or other closed methods of oxygenation.

Patients that are at risk of respiratory failure often require emergency interventions beyond oxygen supplementation. These patients may require rapid intubation (or tracheostomy) with or without ventilation. In general, endotracheal intubation is preferred in the emergent phase, unless it is physically impossible, in which case a tracheostomy or transtracheal oxygen catheter is necessary. A patient that presents severely hyperthermic due to its respiratory effort may also benefit from anesthesia and intubation.

**Obtaining Vascular Access**
As previously discussed, dyspneic patients do not deal well with additional stressors. Ideally, vascular access should be obtained quickly and on the first attempt. Therefore, placement of an IV catheter should be performed only by an experienced technician. Technicians who work in teaching institutions must make it clear that dyspneic animals are not suitable teaching cases.

Dyspneic patients are often reluctant to lie down (especially without sedation), as this may further impair their breathing. Therefore, being able to place the IV catheter with the patient standing is a useful skill that will minimize further stress. Minimal restraint is best for these patients, as they often do not like having their heads restrained, and muzzling is highly contraindicated. Chemical restraint is preferable to physical restraint for difficult patients.

**Primary Survey and Minimum Database**
The primary survey should include assessment of temperature, pulse, respiratory rate, mentation, mucous membrane color, capillary refill time, and pulse strength. A thorough auscultation of heart and lung fields and the trachea, as well as assessment of the respiratory pattern, are necessary to localize the cause of the dyspnea. It is important for technicians to auscultate their patients in order to identify worsening or improvement of the patient’s condition. Assessing respiration in the emergent patient provides valuable clues to the cause of breathing difficulty. Assessment of the respiratory system involves paying close attention to inspiratory and/or expiratory effort, audible noise during respiration (inspiratory, expiratory, or biphasic), and the character and quality of chest excursion.

The minimum database for a respiratory patient will usually include packed cell volume/total solids, blood gas (usually a venous blood gas is obtained first), electrolytes, glucose, blood urea nitrogen, electrocardiogram, a bedside clotting profile (activated clotting time [ACT] or prothrombin time [PT]/partial thromboplastin time [PTT]), blood pressure, and pulse oximetry, as long as these measurements can easily be obtained. Blood collection in most cases will have to wait until the patient is calm and somewhat stabilized; this is often done at the time of IV catheter placement. The ACT or PT/PTT is important for rapidly identifying any potential clotting issues, which may contraindicate thoracentesis. If possible, pulling the blood to run a complete blood count/biochemical profile from the catheter at the time of placement will again reduce the stress of multiple blood draws.

**Secondary Survey**
Attempting the secondary survey when the patient is suffering from severe dyspnea may cause undue stress. Instead, treating the patient on the basis of the primary survey and history to relieve the dyspnea is often the more prudent course of action. For example, a patient with suspected pleural space disease may benefit more from immediate thoracentesis than from a radiograph. In this case, thoracentesis is both diagnostic and palliative. Unless it is absolutely necessary, it is generally better to wait until the patient is more stable before attempting to obtain a radiograph.

Arterial blood gas (ABG) measurement is the gold standard for assessing oxygenation and ventilation of respiratory patients. I have included ABG in the “secondary survey” because in most cases it is not necessary to have the absolute ABG numbers while the patient is dyspneic. Remember that a pulse oximeter can be used to obtain an oxygen saturation, and a venous blood gas can be used to obtain a CO₂ level. While technically demanding to learn,
obtaining an ABG is relatively easy for a skilled technician to complete on a cooperative patient. Obtaining an ABG measurement can be uncomfortable for the patient; if you have the luxury of time, this pain may be reduced by placing a topical anesthetic cream or patch on the arteriopuncture site approximately a half-hour before the procedure. If the sample is required immediately, some suggest using a bleb of lidocaine over the artery. This may have the added benefit of reducing the reactivity of the artery to arteriopuncture.

For patients that require repeated ABG measurements, placement of an arterial catheter is ideal. Arterial catheters are relatively contraindicated in patients that are active, as the injection port can easily be dislodged, resulting in significant hemorrhage in a very short time. It is imperative that the cages of patients with arterial lines be clearly marked and housed in a central area within the ICU for observation.

**Continued Management**

Once the emergent phase of respiratory distress is successfully addressed, the patient requires continued management. This can range from simply observing the patient for several hours to mechanically ventilating the patient for several days.

Respiratory patients that are sleeping and have a normal respiratory rate would most benefit from cage-side observation of respiratory rate, effort, and pattern. Formerly dyspneic patients can be exhausted from the work of breathing, and waking them unnecessarily can be detrimental to their recovery. Each time the patient is handled, the technician should take the opportunity to auscultate and assess changes in lung sounds. Pulse oximetry can be a valuable, relatively noninvasive tool to assess oxygenation, but it doesn’t need to be performed on a frequent basis unless there are patient concerns such as changes in respiratory rate or effort. End tidal CO₂ monitoring using a snug-fitting mask can also be a noninvasive assessment of ventilation (although this method can be stressful).

Long-term oxygen supplementation may need to be provided, and can have some deleterious effects.

In cases of continued dyspnea after the emergent phase, it is important to note that these patients easily become hyperthermic due to the effort of breathing. Providing housing in roomy cages or runs with good airflow or placing mats on the cage floor may reduce overheating. Many patients may enjoy a fan to further improve air flow and heat elimination. If using an oxygen hood or cage, temperature and ventilation must be controlled to minimize overheating. Of course pyrexia can also occur, especially in cases of pneumonia, so it is important to differentiate hyperthermia from pyrexia.

Other nursing considerations associated with the ongoing care of many respiratory patients include patient positioning, nebulization and coupage, dealing with secretions, and management of chest drains and tracheostomy sites.

When patients are in respiratory distress, the slightest additional stress can be overwhelming. Do they require immediate treatment or intubation, or will they benefit from sedation and oxygen therapy before interventions? Understanding the needs of patients with primary respiratory emergencies, including the minimum information needed to successfully treat the respiratory distress, is crucial and a valuable skill for any emergency technician.

References available upon request.