Evolution of Critical Care in Private Equine Practice

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1. Introduction

The advances in equine medicine over the past couple of decades have brought about a more rapid information gathering process and an increased rate of accurate clinical diagnosis—primarily through the more common use of ultrasonography. Advanced training for veterinarians and veterinary technicians along with continued experience gained in frequent management of critically ill animals have made critical care for the equine patient a much more recognized service in equine practice.

The private practitioner is often on the front line in assessment and management of the critically ill equine patient. Over the past 20 yr, equine medicine has seen the advent of a variety of diagnostic tools and advances in therapy that have improved the medical and surgical management of the critically ill equine patient. Part of this improvement has been a transition in the delivery of advanced care to the private hospital and referral practice setting. This discussion focuses on how these advances have influenced the delivery of care to the critically ill equine patient in the private practice setting.

The skills of expeditious clinical assessment of the critically ill patient along with rapid selection of the most appropriate diagnostic tests or imaging allow for the best decision making in choosing a most effective treatment pathway. Development of an efficient decision-making process is critically important in choosing the most expedient initial treatment course so that time is not wasted. Experienced practitioners often have observed many patients with a similar pattern of injury or illness and have developed an intuitive manner in their clinical approach. The success for each patient relies on the completeness and accuracy of the clinical and ancillary diagnostic evaluation. Failure to detect an important disease process or underestimation of the potential of something, such as sepsis, to progress can result in the continued deterioration of the clinical state. As a result, the animal may die or require more extensive medical treatment later on in life.

Veterinary technicians have aided in the advances of critical care over the years with increased levels of training and skills, and they often provide the majority of patient monitoring within the critical care facility. Keen observational skills and attentiveness to details of a particular patient by the skilled veterinary technician often make a significant difference in early detection of developing clinical problems and more rapid delivery of appropriate care. An example of this is the scenario where an obser-
Placement of a tracheostomy should strongly be considered if the patient seems to have an impending or continual monitoring and if the disease process is that has the potential to worsen to the point of hemodynamic compromise (Table 1).

The initial assessment of a traumatized or critically ill equine patient should involve as complete a physical examination as possible, depending on the stability of the patient and the ability to safely examine them without injury to the handler or veterinarian. The classic ABCs (A, airway; B, breathing; C, circulation) remain a good manner of vital assessment.

Airway disorders resulting in obstruction of airflow and dyspnea should be assessed to determine if the cause is located in the upper or lower airway. Endoscopy used judiciously can allow for a rapid determination of the specific location of obstruction. Placement of a tracheostomy should strongly be considered if the patient seems to have an impending or progressive obstruction of the upper airway. This is a classic example where the clinical decision-making process comes into play. Placement of a tracheostomy tube is much easier when done before the animal reaches a critical point of respiratory obstruction such that the animal is distressed and potentially struggling violently to the point of being dangerous to the clinician and handlers. Lower airway disorders resulting in dyspnea may be rapidly assessed with ultrasonography.

Assessment of circulation and perfusion is the standard in shock management for the equine patient. A rapid assessment of circulation would include determination of heart rate and rhythm. The basic information required to determine if perfusion is adequate include assessment of mucous membrane color, arterial pulse pressure, and peripheral skin temperature (ears and distal limbs). The goal is to correct perfusion deficits as early as possible to improve outcome regardless of if the animal is treated at the owner’s facility, treated at the local practice facility, or referred to a specialty hospital.

Decision trees are sometimes useful in developing an intuitive thought process for clinical problem solving. Here are two examples—one of respiratory difficulty and another for colic (Figs. 1 and 2). Although these are not complete to the point of therapeutic maneuvers, they provide a graphical demonstration of the linear and branching thought process in the approach to two common clinical disorders.

Ultrasound imaging, perhaps more than any other tool, has revolutionized the management of the critically ill equine patient—adult and neonate. The graphical demonstration of its role in decision making for the colic patient is presented above where the role of the abdominal ultrasound examination has become more central in the total examination process. The ability to immediately assess the contents of the thoracic and abdominal cavities provides vital real-time information for rapid, accurate diagnostic assessment and selection of therapeutic plan. With the advent of high-quality portable ultrasound equipment, this is now technology that is readily available for the practitioner in the field. The learning curve for ultrasound imaging is not that steep, and an individual can learn to examine the chest and abdomen using ultrasound with minimal investment in time through commonly available continuing education programs in lecture and wet lab format.

The combination of the clinical problem-solving skills of physical assessment and diagnostic imaging have moved the point of diagnosis from the referral center to the front lines of private practice in many regions. The next part of the decision-making process is to determine if the patient will need ongoing or continual monitoring and if the disease process is one that has the potential to worsen to the point of requiring surgical or more intensive intervention. In many situations, the clinical status is an evolving situation and requires continuous or at a minimum,
periodic evaluation of the patient. This is often the real issue in deciding if the animal should be referred or if it can be handled on site or at a local facility. The skills and clinical monitoring abilities of the personnel at the facility may also be a determining factor in this decision. In some regions, the on-the-farm management may be of the level that some seriously ill patients can be managed on site. Veterinary technicians are now trained to monitor and perform diagnostics on critically ill equine patients, and they have become a very important part of the team in caring for these patients. The team approach to critical care, which includes a trained veterinary technician, will pay off in improved care and outcomes for the patient.

Over the past two decades, significant advances have been made in the management of shock in the equine patient. Endotoxemia research has helped us understand the importance of blockade of various inflammatory mediators as well as improve perfusion and hemodynamics for fluid therapy. The use of large-volume crystalloid fluids has become a standard of care in equine practice. Other treatments to improve IV fluid volume and perfusion include the use of hypertonic saline and the colloids, such as hetastarch. The use of colloids has become more common, often for improving colloid oncotic pressure in animals with potentially leaky capillaries or those with decreased plasma oncotic pressure because of hypoproteinemia and hypalbuminemia.

Along with the delivery of IV fluids, we have seen improvement in the quality of IV catheterization. Newer, less thrombogenic IV catheter products are now available and are more easily placed in the hypotensive patient. Over-the-wire IV catheters are composed of much less thrombogenic material and can be placed in larger diameter veins, even in hemodynamically compromised animals with less than normal venous filling. Some of these products also have an antiseptic or antimicrobial agent incorporated into the catheter material in an effort to reduce catheter site infection.

Often, the differentiating factor between a referral center and the frontline private practice is the experience level of the veterinarian and technical staff and perhaps some monitoring equipment. Those individuals who routinely manage complicated critical care patients may have developed a set of clinical skills and thought processes such that they become more efficient and are able to more expediently handle certain complex critical patients.

After the initial assessment of the patient and accurate determination of the clinical problem, the decision process turns to initial management followed by the best location for the care of a critical patient. In some circumstances, the illness or injury may not allow for transportation, and on-site care may be necessary. If the clinical condition seems to require surgical care or more prolonged management with frequent skilled monitoring and assessment at the specialist level or go beyond the skills, experience, or comfort level of the first responder, then transportation to a facility or referral center for critical care should be considered. Initial contact should be established with direct communication to the critical care professional if at all possible so that good exchange of information about presenting clinical signs and initial clinical management can occur. Time is often a factor in the progression of the clinical appearance, and the early history can sometimes be key in the decisions for the diagnostic course.

An important component of the communication between the primary responder and the critical care center is an estimate of costs. If the owner is not prepared financially to pursue the level of critical care,
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Care needed for a particular problem, a frank discussion may be needed during the first clinical assessment to determine if euthanasia is appropriate. On occasion, the situation may require more advanced diagnostics before this decision can be made and that also should be communicated with the owner. The goal is for the primary responder and the critical care personnel to function as a team in providing the horse owner with the very best information possible for them to make the best decisions in selecting the course of care for their animal.

References