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Elisa M. Mazzaferro

Update on Cardiopulmonary Resuscitation in Small Animals 1183
Manuel Boller and Daniel J. Fletcher

Cardiopulmonary arrest (CPA), the acute cessation of ventilation and systemic perfusion, leads to discontinuation of tissue oxygen delivery and death if not quickly reversed. Reported resuscitation rates suggest that the heart can be restarted in 40% to 50% of dogs and cats treated with cardiopulmonary resuscitation (CPR). However, approximately 80% of these animals do not survive to hospital discharge. To minimize mortality due to CPA a broad strategy is required including preparedness and prevention measures, basic and advanced life support as well as post-cardiac arrest care. This article summarizes the current guidelines on the treatment of small animals with CPA.

Small Animal Transfusion Medicine 1203
Kendon W. Kuo and Maureen McMichael

Transfusion medicine can be a lifesaving intervention. Component therapy has expanded the availability and blood products available. Patient safety and minimizing risk is important and can be accomplished through proper donor screening, collection, storage, compatibility testing, administration, and monitoring. The pros and cons of available products must be considered and tailored to each individual patient. Recent discoveries include new antigens and blood types, microbial effects on blood type, and the association between blood type and disease prevalence.

Extracorporeal Therapies in the Emergency Room and Intensive Care Unit 1215
J.D. Foster

Extracorporeal treatments create opportunity for removing disease causing solutes within blood. Intoxications, renal failure, and immune-mediated diseases may be managed with these treatments, often providing new hope for patients with severe or refractory disease. Understanding solute pharmacokinetics and the limitations of each type of extracorporeal technique can allow for the selection of the optimal treatment modality.

Respiratory Emergencies 1237
Carissa W. Tong and Anthony L. Gonzalez

Respiratory distress is commonly seen in dogs and cats presenting to the emergency room. Rapid identification of respiratory difficulty with strategic stabilization and diagnostic efforts are warranted to maximize patient outcome. This article focuses on the relevant anatomy and physiology of
the respiratory system and the clinical recognition, stabilization, and initial diagnostic planning for small animal patients that present for respiratory emergencies.

Ocular Emergencies in Small Animal Patients

Rachel Matusow Wynne

Small animal ocular emergencies vary from relatively benign to potentially vision or life threatening, with significant overlap in clinical signs. Careful ophthalmic examination in dim light conditions with a bright light source and competent patient head restraint are crucial to properly diagnosing ocular disease. Adjunctive ophthalmic diagnostic testing should be performed to rule out corneal ulceration, glaucoma, and dry eye before empiric topical antibiotic or steroid medications are prescribed. Most emergency cases present because of ocular redness, cloudiness, discomfort, apparent bulging, or vision loss; categorizing differential diagnoses on this basis can be helpful to the emergency clinician.

Biosecurity Measures in Clinical Practice

Christopher G. Byers

Hospitalized companion animals have increased susceptibility for hospital-acquired/nosocomial infections. Veterinarians have a responsibility to ensure adequate infection control, biosecurity, and biosafety within veterinary hospitals. Through elimination of pathogens and substitution of hazards, as well as implementation of engineering and administrative controls and the use of personal protective equipment, veterinary teams can dramatically reduce unintentional disease transmission.

Update on Albumin Therapy in Critical Illness

Elisa M. Mazzaferro and Thomas Edwards

Albumin is among the most important proteins and plays a significant role in maintenance of colloid osmotic pressure, wound healing, decreasing oxidative damage, carrying drugs and endogenous substances, and coagulation. Hypoalbuminemia is common in acute and chronic illnesses. Replenishment of albumin can be in the form of fresh frozen, frozen or cryopoor plasma, or in the form of human or canine albumin concentrates. Infusion of human albumin concentrate to healthy and critically ill dogs can induce acute and delayed hypersensitivity reactions. Death has been reported. Therefore, allogenic transfusion in the form of plasma products or canine albumin concentrate is recommended.

Update on Canine Parvoviral Enteritis

Elisa M. Mazzaferro

Canine parvoviral enteritis is one of the most common causes of morbidity and mortality in dogs worldwide. Tests can detect viral antigen in feces, and characteristic decreases in total leukocyte, neutrophil, and lymphocyte counts can increase the index of suspicion in affected cases and can be used to prognosticate morbidity and mortality. The standard of care for infected animals includes IV crystalloid and sometimes colloid
fluids, antiemetics, broad-spectrum antibiotics, and early enteral nutrition. Vaccination induces protective immunity in most dogs. Vaccination, along with limiting exposure in young puppies, is the most effective means of preventing parvoviral enteritis in dogs.

Therapeutic Strategies for Treatment of Immune-Mediated Hemolytic Anemia

Robert Goggs

Immune-mediated hemolytic anemia is a common hematologic disorder in dogs. Disease management involves immunosuppression using glucocorticoids, potentially in combination with other medications such as azathioprine, cyclosporine, or mycophenolate mofetil. Therapeutic drug monitoring may enhance the utility and maximize the safety of cyclosporine and mycophenolate mofetil. The disease is proinflammatory and prothrombotic. Antithrombotic drug administration is therefore essential, and anticoagulant therapy should be initiated at the time of diagnosis. Additional therapies include red blood cell transfusion to support blood oxygen content. Future therapies may include therapeutic plasma exchange, anti-CD20 monoclonal antibodies, and complement inhibitors.

The Use of Antithrombotics in Critical Illness

Alexandra Pfaff, Armelle M. de Laforcade, and Elizabeth A. Rozanski

Hypercoagulable tendencies may develop in critically ill dogs and to a less known extent, cats. Although the use of antithrombotics is well-established in critically ill people, the indications and approach are far less well-known in dogs and cats. The goal of this article was to review the relevant CURATIVE guidelines, as well as other sources, and to provide recommendations for critically ill patients with directions for future investigation.

Use of Human Intravenous Immunoglobulin in Veterinary Clinical Practice

Nicole Spurlock and Jennifer Prittie

Therapy with human intravenous immunoglobulin (hIVIG) as an immunomodulator in veterinary patients results in effective but transient immunosuppression, and may be viable as part of a multidrug strategy against immune-mediated thrombocytopenia and autoimmune cutaneous disease. Efficacy of hIVIG against other veterinary autoimmune diseases is questionable. Veterinary patients tolerate hIVIG therapy well, with few infusion reactions documented. Veterinary clinical trials of hIVIG are limited, and more work is needed to determine the true efficacy and risk of hIVIG administration in companion animals.

Resuscitation Strategies for the Small Animal Trauma Patient

Anusha Balakrishnan

Traumatic injuries in small animals are a common cause for presentation to emergency departments. Severe traumatic injury results in a multitude of systemic responses, which can exacerbate initial tissue damage. Trauma resuscitation should focus on the global goals of controlling hemorrhage, improving tissue hypoperfusion, and minimizing ongoing inflammation and
morbidity through the concept of “damage-control resuscitation.” This approach focuses on the balanced use of blood products, hemorrhage control, and minimizing aggressive crystalloid use. Although these tenets may not be directly applicable to every veterinary patient with trauma, they provide guidance when managing the most severely injured subpopulation of these patients.

Use of Thromboelastography in Clinical Practice 1397
Andrew G. Burton and Karl E. Jandrey
Viscoelastic testing, such as thromboelastography or thromboelastometry, is performed on whole-blood samples, which include both soluble plasma factors as well as blood cells and platelets bearing tissue factor and phospholipid. This methodology allows identification of fibrinolysis and can provide analysis of platelet function. Viscoelastic testing has become increasingly accessible and popular in emergency and critical care settings in recent years and can provide important information for the diagnosis and management of patients with hemostatic disorders. This article discusses the principles and interpretation of viscoelastic testing, application to small animal emergency and critical care medicine, and potential advantages and disadvantages.

Nutritional Support of the Critically Ill Small Animal Patient 1411
Daniel L. Chan
Over the past couple of decades, a component of veterinary critical care was simply to ensure that nutritional support formed some part of the treatment plan. Great emphasis was made on early placement of feeding tubes in critically ill veterinary patients to facilitate enteral feeding. Progress has been made on techniques for nutritional provision, establishing feasibility of nutritional interventions in various patient populations and establishing that nutritional support does have an important role in veterinary critical care. Some refinement of appropriate caloric targets in critically ill animals has decreased complications relating to overfeeding, but further work is required to establish optimal feeding regimes.

Update on Anticonvulsant Therapy in the Emergent Small Animal Patient 1423
Heidi L. Barnes Heller
Seizures are common in veterinary patients and control is critical to the overall patient health. The benzodiazepine class of drugs (diazepam, midazolam, and lorazepam) often are the drug class of choice; however, levetiracetam and propofol also have been gaining favor as anticonvulsant drugs for acute seizure management. After cessation of seizures, practitioners then can discuss long-term seizure control on a case-by-case basis with clients.

Total Intravenous Anesthesia for the Small Animal Critical Patient 1433
Marc R. Raffe
The practice of creating and maintaining general anesthesia using intravenous anesthetic drugs is defined as total intravenous anesthesia. Total
intravenous anesthesia produces general anesthesia by selective drug properties that fulfill the 3 elements of anesthesia. Total intravenous anesthesia has potential application in veterinary emergency and critical care medicine. This article reviews the theory and application of total intravenous anesthesia and identifies possible application in emergency and critical care medicine.

Cageside Ultrasonography in the Emergency Room and Intensive Care Unit 1445

Gregory R. Lisciandro

Global Focused Assessment with Sonography for Trauma (FAST) and point-of-care ultrasonography carry the potential to screen for and monitor conditions rather than traditional means without ultrasonography. Advantages include being point of care, cageside, low impact, rapid, safe, and radiation sparing, and requiring no shaving and/or minimal patient restraint. Moreover, information is real time for free fluid and soft tissue abnormalities of the abdomen, heart, and lung, which are missed or only suspected by physical examination, basic blood and urine testing, and radiography. A standardized approach with recording of patient data is integral to a successful Global FAST program.