

Stay and Play vs. Scoop and Run: Emergency Scenarios and Areas for Stabilization



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Flail chest

Rib fractures and flail chest most commonly occur after blunt or penetrating trauma. Blunt trauma can be from motor vehicle or high rise trauma. Penetrating trauma causing rib fractures is from bite wounds or gunshot wounds. There is a spectrum of clinical signs that can be associated with thoracic trauma that can range from superficial wounds to respiratory failure. Flail chest is a condition when proximal and distal fracture in two or more adjacent ribs create a free-floating segment of chest wall. Patients can present with severe dyspnea due to concurrent conditions of pulmonary contusions, pneumothorax, and hemothorax that can be exacerbated by flail chest. Stabilization of the affected chest wall should be delayed until the patient's shock is stabilized, but may need attention if it is causing impairment of ventilator function. Medical or surgical stabilization of rib fractures is controversial in human medicine and less information is available in veterinary medicine.

Autologous blood transfusion

Auto-transfusion is the administration of autologous blood from the patient and re-administration back to the patient. Trauma is a common reason for blood transfusion and the clinical signs that trigger that decision are usually treatment of shock, clinically relevant worsening anemia, peri-operative hemodynamic optimization (for penetrating wounds), and coagulopathy. Fluid resuscitation with crystalloids is a standard practice in veterinary emergency medicine for the treatment of



hypoperfusion, but in the context of severe acute hemorrhage, the administration of large volume crystalloids may worsen hemostatic dysfunction and induce further hemorrhage. Blood product resuscitation is appealing due to the positive effects of colloidal support, replacement of clotting factors and hemostatic proteins and increasing oxygen carrying capacity. In a pinch, autologous blood transfusion is a reasonable resuscitative measure in scenarios where there is ongoing hemorrhage secondary to trauma. It is readily accessible, cost efficient and avoids compatibility issues of using allogenic red cells or risks associated with storage of red blood cells. A sterile technique should be for thoracocentesis or abdominocentesis and typically collected blood does not need to be anti-coagulated. It should be re-infused through an appropriate blood administration filter. Blood can be transfused as a bolus if needed.

Heatstroke

Heatstroke is a form of hyperthermia associated with a systemic inflammatory response leading to a syndrome of dysfunction in which encephalopathy predominates. It is a disease process that is progressive and life-threatening. There is a spectrum of heat-related illness that spans from heat cramps (muscle spasms) to heat exhaustion, heat prostration and then lastly heat stroke, the most severe. Dogs confined to automobiles, tied outdoors without access to shade or water, or on walks/runs on the first few days of warm weather are commonly susceptible to heat stroke. Early aggressive treatment of heat-related signs and pro-active treatment protocols directed at the complications of heatstroke may reduce patient morbidity and mortality. The most important part of initial treatment is lowering the core temperature quickly. Secondly, resuscitation to optimize cardiovascular support and management of secondary complications (shock, hypoglycemia, AKI, DIC, ARDS, etc.).

Gastric Dilatation-Volvulus

Gastric dilatation-volvulus (GDV) is a life threatening condition that requires aggressive emergency medical stabilization and surgical intervention. It is typically a syndrome of large breed dogs (i.e. Great Dane, Weimaraner, Saint Bernard, Gordon Setter, Irish Setter, Standard Poodles) and likely has a genetic influence, however small dogs, cats and other mammals can develop GDV as well. Once GDV occurs, there is cardiovascular compromise secondary to obstructive shock. The gastric distention compresses abdominal veins so that venous return to the heart is impeded. Respiratory compromise can also be appreciated due to increased abdominal pressure preventing normal diaphragmatic movement. Gastric necrosis is a potential complication of GDV and can be secondary to a complication of shock, thrombosis or avulsion of the splenic and short gastric arteries, and reduced cardiac output. Gastric necrosis is unfortunately associated with increased morbidity and mortality. Diagnosis of gastric necrosis is performed during abdominal surgery, but lactate and lactate clearance may raise suspicion. Lidocaine has been evaluated and may decrease the incidence of AKI, post-op arrhythmias, and length of hospital stay. Treatment goals are aimed at treatment of shock and stabilizing the patient prior to surgery.