Anesthesia/Analgesia for Abdominal Procedures

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Abdominal procedures collectively include a wide range of potential disease processes and co-morbidities. From elective ovariohysterectomies to exploratory laparotomy, all have some commonalities—pain. Surgical approach to the abdominal cavity is painful and requires appropriate preparation and case management. In this presentation we will explore general concepts as it relates to the wide category 'abdominal procedures' from elective procedures to emergencies. Starting with pre-anesthetic assessment including case preparation, drug selection, anticipation of potential complications and appropriate pain management.

Often veterinary professionals are concerned with anesthetic drug selection. Likely drug selection has little impact on patient outcome. For healthy elective abdominal procedures likely any anesthetic drug combination with appropriate analgesia that the veterinary team is familiar with will be appropriate. For more critical patients, short acting, reversible drugs are ideal but familiarity with the drug should not be dismissed. In place of convincing a team to utilize a drug they are unfamiliar with in an already stressful critical case, I would encourage focusing on diligent patient monitoring. This includes monitoring of all vitals including pain.

Where I would encourage you to consider branching outside your comfort zone surrounds appropriate analgesia—specifically the use of constant rate infusions and local regional techniques where appropriate. Transverse Abdominus Plan (TAP) block is a four point block that has the potential to provide desensitization to the whole abdomen. It does require ultrasound guidance but once mastered, is quick and easy to apply. Alternatively, epidurals can provide abdominal pain relief. This is a easily learned skill that once mastered is quick to perform with a high degree of success. When local regional blocks cannot be utilized, a systemic, multimodal analgesic approach is used. Where appropriate this could include the systemic administration of lidocaine, ketamine, opioids, NSAIDs and other adjunctive.

Constant rate infusions (CRIs) are effective following a loading dose for reducing minimal alveolar concentration and minimizing break through pain frequently experienced when intermittent boluses are used. Utilizing the equation below, CRIs can be delivered safely and effectively.

CRI drug dosage (mg/kg/h) X Fluid bag (mL) = mg drug to add to fluid bag

Fluid rate (mL/kg/h)

This equation is designed to deliver your patient's fluids containing analgesic drug additives.

Lidocaine is a great additive choice for dogs only. Adding 30 mL of 2% lidocaine to a 1000 mL bag of LRS or plasma-lyte at a fluid rate of 5 mL/kg/h will deliver lidocaine at 3 mg/kg/h.

Ketamine is a great additive analgesic for dogs and cats experiencing somatic (skin/bone) pain. Adding 1.2 mL of 100 mg/mL ketamine to a 1000 mL bag of LRS or plasma-lyte at 5 mL/kg/h will deliver ketamine at 0.6 mg/kg/h.

An opioid can also be added in both dogs and cats. Concentrations for opioids vary greatly depending on availability—please pay close attention to the example provide and compare that to your specific opioid on hand.

Morphine, 10 mg/mL at 0.2 mg/kg/h, requires 4 mL to be added to a 1000 mL bag of LRS/plasma-lyte when delivered at 5 mL/kg/h. Hydromorphone, 2 mg/mL, at 0.02 mg/kg/h, requires 2 mL to be added to a 1000 mL bag of LRS/plasma-lyte when delivered at 5 mL/kg/h. Fentanyl, 0.05 mg/mL at 0.005 mg/kg/h, requires 20 mL of fentanyl to be added to a 1000 mL bag of LRS/plasma-lyte when delivered at 5 mL/kg/h.

In critical abdominal procedures the most common complications include hypoventilation, hypotension, hypovolemia, and cardiac arrhythmias. The most common arrhythmias are typically ventricular in nature. Having a dedicated, trained anesthetist comfortable with patient monitoring, recognizing waveform and understanding complications experienced with various disease processes optimizing patient outcomes.