

## **Tufts Veterinary School Clinical Case Study of the Month**

### ***Clinical Overview of Acute Pain Treatment: Reasons, And Options***

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When advocating pain control in animals, one often hears things like, “we never treated pain after surgery before and animals did OK”. Or “animals need pain to stay still after surgery so that they do not hurt themselves”. So, as we embark on a discussion of methods to treat pain, it is first important to consider WHY treating pain is advisable and why having pain may be bad for animals.

First of all, veterinarians were formerly not trained to treat pain in animals, and long ago, even the techniques of providing anesthesia were not particularly well taught. At this time, most clinics have anesthesia machines for providing gas anesthesia, and anesthesia techniques and drugs have been developed for many species. Veterinary students are taught to treat pain in vet schools now. Treatment of pain after surgery is now being recognized as a refinement of care that makes patients feel better with little risk.

Pain makes “metabolic demands”. Sometimes the debilitated patient, or the one with cardiovascular or respiratory compromise, or who has faced major trauma, has to use energy to heal, and they are not eating and drinking to restore energy supplies. Pain may thus complicate the healing process because the patient's caloric intake may be insufficient to supply protein for tissue repair AND to sustain the behaviors associated with pain, like panting, abdominal splinting, etc. Patients with severe pain who can't stand or walk may not be able to defecate – leading to constipation and this makes them unwilling to eat. Although pain medications may also reduce appetite, if the patient can at least relax and sleep, they can save their energy stores for healing.

Acute pain during the postoperative period, or following burns *serves no useful function* for the most part. In certain situations, such as immediately following trauma, or initially in situations of abdominal severe pain the resulting immobility and anorexia are protective to the patient. A patient with a fractured back may be immobilized because of excruciating pain, which acts as a “splint”. Or, a patient with severe abdominal pain may refuse to eat, which helps to avoid further damage. But once the condition is recognized and treatment has begun, pain relief should be a part of patient care. The idea that pain is a form of endogenous “chemical restraint” is one that needs to be re-examined, especially since it is possible to judiciously employ sedatives to limit activity if needed. Many analgesic medications also have sedative properties.

Unrelieved pain in humans has actually been found to cause problems. This occurs in cases of upper abdominal or thoracic surgery or trauma. People are found to have reduced pulmonary function (can't take a deep breath), decreased diaphragmatic function (it hurts to cough) and so pneumonia, lung collapse, hypoxemia and hypercarbia might result. Ileus, nausea and vomiting are also associated with severe visceral or somatic pain, and increase the time until normal oral intake of fluids and food can occur. Unrelieved pain leads to poor sleeping patterns, and sleep is crucial to healing.

Chronically painful patients may adapt to their pain, but often pain causes sleep disturbances, lack of appetite and other behavioral changes (self-mutilation, aggressiveness). Cancer pain is a type of chronic pain that may be complicated by side effects from chemotherapeutic drugs. Treatment of chronic pain is still inadequate and poorly understood, even in human medicine. Pain that is inadequately treated may cause owners to elect to euthanize pets, whereas if pain control was available, the animal's life would be longer.

The pain from surgical procedures varies depending on the type of surgery, the skill of the surgeon, the amount of tissue handling, and factors such as infection and inflammation. We now

generally try to predict the degree of anticipated pain, and to “pre-treat” with analgesics pre or intra-operatively. This leads to quiet recoveries and some astonishing differences from our former protocols, particularly with the incorporation of the morphine epidural into some of the more painful surgeries. A WORD OF CAUTION: Whenever you institute a change in your peri-anesthesia use of analgesics, be alert to the likelihood that you will need to decrease your other doses of anesthetics. Pain medications often decrease the amount of injectable and inhalational anesthetics needed by patients and if you don't take this into account, animals may be harmed because the anesthetics are overdosed, causing low blood pressure or respiratory depression. Your patients will also look differently after surgery and this will take some time to get used to. You must educate the other staff who do patient care as well. Patients may be a bit groggier than usual, and this is not necessarily bad – sleeping after major surgery is surely better than sitting up because it hurts to lie down!

So, what interventions are possible for acute pain?

1. We can treat pain at a **central** level, by giving opioids, ketamine, tranquilizers, alpha 2 agonists or NSAIDS.
  - Opioids modify and depress the transmission of pain responses within the central nervous system, and so do alpha 2 agonists.
  - We can try to avoid the emotional component of pain, by giving tranquilizers to decrease anxiety – this involves a **central** action.
  - Epidural or spinal analgesics work by altering or inhibiting **central** pathways as well.
  - We can use NSAIDS to inhibit inflammation and reduce pain transmission by the spinal cord, but NSAIDS also work centrally (on the brain) to decrease pain.
  - Other drugs such as ketamine, muscle relaxants, etc may have central actions as well
2. We can target a **peripheral** aspect, removing the stimulus (injured tissue, foreign body) or use local anesthetics like lidocaine to block painful stimuli from even entering the spinal cord, and use anti-inflammatory agents such as NSAIDS and corticosteroids to reduce swelling.
3. Lastly, we can use **non-pharmacologic methods** to influence the perception of pain. Cold therapy inhibits inflammation, warmth helps muscle spasm and swelling, acupuncture can give analgesia, even simple patient care such as syringing a bit of water onto dry tongues, grooming, attention to noises, drafts, and social contact can affect the patient's level of distress. We sometimes expect our patients to tolerate great amounts of environmental stress when hospitalized, and nursing care can help reduce this stress.

When treating the pain of surgery, the best approach is to use “preemptive analgesia”. This means that analgesics are used before the pain is caused (before incision) and continued without interruption until pain would be expected to have subsided. At first, more powerful analgesics are used, and then the frequency and type of drug may be downgraded appropriately. If the patient is already painful (as in treating a fracture), it may be more difficult to get pain under control – more drug will be needed. We call this “chasing pain” and chasing pain is more difficult than preemptively treating it. But, in some cases, the pain is already there, and we have to cope with it. Also, some surgical procedures actually reduce pain (lancing abscess, pulling infected tooth, removing herniated disk) and although pain relief at surgery is needed, the patient will improve rapidly.