

Don't Be a Pain: Analgesia for the Emergency and Critical Care Patient

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Pain control is an important and integral part of treating patients that come in through the emergency room and it continues on to the intensive care unit. Patients can sometimes present in severe shock, which inhibits oxygen delivery to the tissues. One step towards clearing up and mitigating shock is by treating pain. As emergency and critical care providers, we need to be ready to assess and classify pain in our ill and injured patients, as well as understand how to treat it, and then decide if the current pain management plan has worked, or if it needs to be reevaluated. The goals of pain control should be to initiate and continue patient comfort, to decrease the possibility of negative physiologic consequences of pain, and to ease owner concerns. There are challenges to pain control; some of these include balancing analgesia with the side effects of medications, learning to not withhold pain control in emergent patients due to the misconception that analgesics will mask signs that the patient is deteriorating, differentiating between pain and behaviour issues, as well as between pain and dysphoria. Also, you need to understand that pain assessment is subjective, and there is an art and science to managing pain.

There are some definitions you should be familiar with in order to fully understand pain and pain control.

Pain: physical suffering or distress, as due to injury or illness; a distressing sensation in a particular part of the body

Nociception: the neurologic process involved in the detection of a noxious stimulus

Wind-up: the increase in pain intensity over time when a given stimulus is delivered repeatedly above a critical rate

Central sensitization: a clinical syndrome where pain has modified the CNS so that it becomes more sensitive and perceives more pain with less intense stimuli.

Hyperalgesia: abnormally increased sensitivity to pain

Allodynia: an exaggerated reaction to a stimulus that is not normally painful

Another thing you should be aware of is that there are many diverse types of pain: acute, chronic, adaptive, maladaptive, physiologic, pathologic, somatic, visceral, and neuropathic. Chronic pain may not seem important when you are thinking of an emergency patient, but some patients can show up with a complicated underlying condition or disease where chronic pain is a component. Chronic pain syndromes can happen due to acute conditions that go untreated, and this type of pain can significantly affect the quality of life of the patient, it is debilitating, and does not always respond well to conventional analgesic protocols. Somatic pain arises from the skin and muscles and is typically easy to localize. Visceral pain arises from internal organs, it is often dull, aching or burning, can be difficult to localize, and can be referred to other structures. Visceral organs are sensitive to distention and inflammation. Physiologic pain is usually a result of inflammation or injury; it has an adaptive and biologically useful function. It is acute in nature, but its protective function is to help healing happen without further injury. Pathologic pain can come from massive tissue damage and inflammation, it may be diffuse, and not in proportion to the extent of the injury. Pathologic pain has been known to continue even after the inflammation has resolved. The type we have the most understanding of and experience in assessing and treating is acute post trauma and post-surgical pain.

There are many consequences of untreated pain: high circulating catecholamine levels, tachycardia, arrhythmias, vasoconstriction, hypertension, increased metabolic rate, increased oxygen requirements. Untreated pain can also lead to stress hormone release, altered metabolic activity, protein catabolism, immobility, inappetence, and ileus. Decreased respiratory movements can result in hypoventilation, which can then lead to atelectasis and hypoxemia. Untreated acute pain can lead to long term neurologic changes, chronic pain syndromes, reduced immune function, impaired wound healing. Patients that do not have their pain addressed can experience longer hospital stays, as well as increased morbidity and mortality. Pain can cause a sympathetic response which can aggravate or even instigate shock states which then leads to decreased wound healing and decreased organ perfusion. Untreated acute pain can also contribute to increased anesthetic risk as higher doses of anesthetic drugs will be needed in order to maintain a stable plane of anesthesia. Recognizing pain and managing it as soon as possible can actually help with assessing the patient and stabilizing them. Pain relief can be part of stabilizing a patient, it can stabilize respirations and perfusion. If pain relief does not stabilize the patient, this can lead to the realization that more diagnostics may be necessary.

Animals coming in through the emergency room are usually stressed and anxious, even if they are not in pain. And if they are injured or sick, this additional stress can heighten their perception of pain. Differentiating stress from pain can be challenging, and in a lot of cases, both pain and stress will be present. We really need to manage both in order to properly control their pain. There are a lot of different elements that can impact physiologic parameters – such as heart rate, respiratory rate, and blood pressure; changes in these parameters do not always equal pain. A sizable number of patients in the ER are not cardiovascularly stable and may have other reasons for these parameters to be disrupted. One of the best ways to assess pain is likely going to be behaviour. Getting a very thorough history from the owner can be extremely helpful in assessing a patient's pain. When a patient is obtunded or sedated this can make using behaviour as a guide difficult. If a patient has obvious tissue injury, or a disease process that is known to be painful, they should not have to prove they are painful before receiving analgesics. Vitals alone are not particularly good predictors of pain. You will also need to observe the patient in their cage, see how they interact with another staff member, attempt to elicit a painful response by palpating an affected limb, organ, or incision, note if they are eating or drinking normally, and observe how they are ambulating.

One particularly important thing to be aware of is that not every patient exhibits pain in the same way. Cats in particular can be quite difficult to assess. Cats can exhibit what we refer to as “pain face” – and there is a grimace scale that can be used for pain scoring in cats. It is important to use a pain scoring scale – it can be subjective or objective, or a combination of these. But you should pick one and have all staff involved with patient care get accustomed to using it consistently. There are several available – there is the Glasgow Composite Pain Scale, the one that may be a little more familiar to most of you, as this one seems more widely used, is from Colorado State University – the Canine and Feline Acute Pain Scale. There are also chronic pain scoring systems out there – and a big part of those include acquiring quality of life, activity level, mobility input from owners. Pain assessments should be performed every 4-6 hours on stable patients, but much more often in critical care patients where things can change so much more quickly. In the immediate post op period, pain assessments should be done every 30 minutes. Having pain assessments done on each shift by the same person, if possible, will help with consistency. Repeated assessments allow us to evaluate how well the analgesic protocol is working and if any changes need to be made.

It can be difficult sometimes to differentiate between pain and dysphoria or behavioural issues. And especially with dogs, sometimes this is due to breed differences – for example, a northern breed like a Siberian Husky, opposed to a more stoic breed, like a lab, can make things challenging! Sometimes you will need to reverse some of the drugs the patient received or reduce CRI rates to know for sure. BUT you will need to give something else!! You cannot leave them with no pain control at all! Signs if patient is dysphoric: the patient does not usually respond to stimulation – they likely will not react to your voice or stop crying when you pet them; they may be panting; sometimes they will be struggling to stand or move around. Dysphoric patients may also be agitated or disoriented. Signs the patient is actually painful can include them having trouble getting comfortable, they may frequently vocalize (dogs in particular). Painful patients are usually aware of their surroundings and will respond to stimulation, even if only briefly. You also need to be aware that sometimes it can be emergence delirium as they recover from anesthesia as opposed to true dysphoria, and you will just have to wait it out. It can take a lot of investigation, experience, critical thinking to get to the bottom of things.

Opioids are generally the best choice of pain medication for emergency and/or critical care patients. There are quite a few reasons for this: opioids have a rapid onset of action, they are highly effective analgesics, they can be reversed, which is an added safety feature. The side effects of opioids tend to be dose dependent and these drugs are well tolerated in most animals. Opioids have minimal cardiovascular effects and should always be considered in patients with moderate to severe pain. Administering opioids as a constant rate infusion is a great option, as this can help avoid the drug peaking and then decreasing in effectiveness; as well, CRIs also make it much easier to titrate these drugs to effect. Commonly used opioids include mu agonists: morphine, hydromorphone, oxymorphone, methadone, fentanyl, and remifentanyl. Buprenorphine, a partial mu agonist is also frequently used.

NMDA receptor antagonists provide anesthesia, analgesia, and psychomimetic effects. The one most commonly used in veterinary medicine is ketamine, as it potentiates opioid analgesia. Methadone, in addition to being a mu receptor agonist, also has some action on the NMDA receptors. Amantadine is an oral medication that is often used in conjunction with an NSAID. NSAIDs are not always suitable for emergency patients, although they may sometimes be used after a patient has been worked up and stabilized.

Dexmedetomidine is the most common alpha-2 adrenergic receptor agonist used in small animal veterinary medicine. This drug provides sedation, analgesia, and reversibility. Dexmedetomidine should only be used in patients who are cardiovascularly stable and do not have major organ dysfunction.

Lidocaine can be used as a CRI for painful critical care patients. It provides excellent adjunct analgesia and may also help prevent reperfusion injury. Lidocaine can reduce the risk of developing DIC or SIRS; it has anti-inflammatory properties and may help prevent ileus. Local/Regional anesthesia is another option as adjunct analgesia. This can be in the form of nerve blocks, soaker catheters, local injections, infiltration into a body cavity or joint, or even as a topical application. Local/regional analgesic techniques can provide rapid, short- or long-term effects, depending on the drugs used. Epidurals are another great option for pain control, especially in emergency patients. They can be particularly helpful in patients with hindlimb trauma, patients requiring a c-section or tail amputation. Coccygeal blocks are especially useful for cats with a urinary blockage, or if they need a perineal urethrostomy surgery, tail amputation, or if they have an anal gland abscess. When it comes to benzodiazepines such as diazepam or midazolam, the advantages are that there are minimal to no cardiovascular or respiratory side effects, and they are reversible. However, they do not provide enough sedation if used alone in healthy, aggressive, or excited dogs, and they do not provide any analgesia. Constant Rate Infusions (CRIs) are advantageous in that they are not difficult to set up, they are relatively inexpensive, there are several drugs that can be used as a CRI, and the dose can be easily adjusted. There are not many disadvantages as such a low dose can be used with this method.

Treating acute pain involves a multimodal approach. Firstly, you need to assess the patient's pain, think about where the pain is occurring, what could be causing it, and whether or not wind up is present. You then need to decide on a pain score and figure out which medication(s) will be the most appropriate for this condition or injury and this patient. Pain medication alone is not always enough; frequently the cause of the pain needs to be addressed, and the underlying problem managed. Also, because patients may exhibit a "fight or flight" response when initially presented to the ER, this can be masking their pain. After they have been admitted to the hospital and this response has worn off, their pain levels will need to be reassessed. As well, every patient experiences pain differently, and can react to analgesics unpredictably, so pain management will need to be individualized. A multimodal approach should always be considered.

In most patients that are critically ill or injured, some degree of pain should be assumed. Depending on the patient's condition, their pain could be severe to excruciating, moderate to severe, or mild to moderate. It is usually best to assume a higher level of pain than to undertreat an intensely painful condition. Pain control options are going to depend on the condition/injury/surgery the patient has and will need to be very individualized and constantly reassessed for effectiveness. Some options to consider for critical care patients are intermittent injections of opioids, CRIs, local anesthetic blocks near painful areas, epidurals, soaker catheters, acupuncture, physical therapy, laser therapy.

There are also non-pharmacological approaches to pain management that should be considered. These approaches include excellent nursing care, stress management, environmental considerations, attention to bodily elimination needs, gentle handling, cold compresses/warm compresses, wound dressing, laser therapy, Assisi Loop, and acupuncture. Other things that can be considered are Feliway diffusers in cat wards, spraying privacy towels over cat cages with Feliway, giving cats boxes to hide in if their health issues do not negate this (example: cat has respiratory issues and needs to be closely observed). Spraying bedding in and on cages with Adaptil for your canine patients is another technique you can use. Some stress management techniques will require some pharmacology: medications such as Trazodone and/or Gabapentin for example can go a long way to helping our patients to be much less stressed while they are in our care.

The stress of hospitalization can inhibit normal behaviour in a lot of patients, so anything we can do to help them feel more relaxed and comfortable will help with their pain levels. A little TLC can go a long way!

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Keywords: emergency, critical care, analgesia, multimodal, anxiety, pain scoring