PERIOPERATIVE PAIN MANAGEMENT: THE NURSES’ ROLE

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A survey of veterinarians and veterinary nurses asked the question “How do you know when your patient is in pain?” Not surprisingly, nearly all the veterinarians responded “Because my technician [nurse] tells me.” (Shaffran, 2008) Veterinary nurses frequently find themselves in the role of patient advocate, giving voice to their patients’ perceived needs. This advocacy directly benefits patients, as a study in Canada reported that the quality of pain management practice increased proportionately with the number of licensed veterinary nurses on staff and the amount of continuing education the nurses received. (Dohoo & Dohoo, 1998)

Of course we can all appreciate the humane, “feel-good” aspects of good pain management in our patients; we would not be doing the jobs we’re doing, if we didn’t want to relieve suffering in animals. But there are also very practical reasons to practice good management. Pain – especially unrelieved pain - has many negative effects on overall well-being: increased stress (increased cortisol) that affects many body systems, reduces immune responses, and interferes with wound healing; and increased catecholamines (epinephrine/adrenalin and norepinephrine/noradrenalin) that cause tachycardia, hypertension, cardiac arrhythmias, increased catabolism, anorexia, ileus, and weight loss. Preventing and treating pain should mitigate these negative influences, and promote recovery from injury or surgery.

EVERY patient presented, no matter the primary complaint, should have at least a brief pain evaluation (it’s the “4th vital sign” after temperature, pulse, and respiration). Postoperative or hospitalized patients should have regular re-evaluations at intervals based on the underlying disease or injury. Some signs of pain are obvious, although none are specific. Vocalization, agitation, tachycardia, hypertension, and tachypnea all can indicate pain, but also may be associated with other causes. Other signs of pain include subtle behavioral changes such as restlessness, decreased appetite, insomnia, resistance to handling, guarding, and abnormal postures. Even dogs undergoing “routine” ovariohysterectomies or castrations, performed quickly and efficiently by experienced veterinarians, do experience pain, as evidenced by abnormal behaviors that can be detected, and these pain-related behaviors can be modified by administration of analgesics. (Wagner et al, 2008)

Ideally, every practice should have a pain scale for each species, to promote awareness of pain assessment and increase consistency between individual evaluators. For example, the Colorado State University Acute Pain Scales for dogs, cats, and horses are included with these notes (and can be downloaded as pdf files from www.IVAPM.org). However, it is important to realise that there is NO “gold standard” or “perfect” pain scale!!! Even a simple Visual Analog Scale (VAS) or Numeric Rating Scale (NRS) can be helpful in directing attention toward patients’ analgesic needs and improving veterinary personnel’s skills in pain assessment. In general, a higher pain score indicates a greater need for additional (and likely, multimodal) pain therapies than a lower score; however, it
is important that the pain scale NOT be used to put the animal in the position of having to “prove” that it is painful in order to receive treatment.

**PAIN VS ANXIETY VS DYSPHORIA**

Perioperatively, it is often difficult to differentiate between pain and other causes of stress (fear, anxiety, isolation), and between pain and dysphoria caused by certain drugs. Many animals recovering from anaesthesia exhibit abnormal behaviors upon initial awakening (“emergence delirium”) – vocalisation, thrashing, rolling, paddling – but these behaviors should resolve in a few minutes. If the behaviors continue for more than a few minutes (during which time the patient should be protected from harm and comforted as best possible), they should be further investigated.

Patients who stop their abnormal behaviors when calmed or petted often are those who are experiencing mild to moderate pain, or anxiety. If painful, these patients generally respond by guarding or flinching when the painful area is palpated. Usually, additional opioids should be administered to such cases. However, extremely painful or fearful animals may not respond well to soothing or petting. If you cannot determine whether an animal's behavior is caused by pain or by some other cause, the safest approach to treatment is to try a small dose of an opioid to see if the abnormal behavior improves with this additional analgesia. A short-acting opioid such as fentanyl (2 mcg/kg IV) is ideal for this purpose, as its effects are not too long-lasting in case the animal responds poorly (e.g., becomes more dysphoric), and it can be antagonised relatively soon after administration. If the animal does seem to respond favorably to the fentanyl, a longer-acting opioid such as morphine or methadone can be used to prolong analgesia, or a fentanyl CRI can be set up.

A patient that is dysphoric or “delirious” from opioids often does not respond to soothing or petting; dogs may whine incessantly and have a glassy-eyed, non-focused stare. Dysphoric animals usually pay no attention to palpation of their surgical site or injured body part. These animals may benefit from partial opioid reversal and/or sedation; however, there is some risk that partial reversal will increase pain perception. Partial opioid reversal can be achieved in several ways:

- Administer a very small dose of an opioid antagonist, such as naloxone (2 mcg/kg IV); wait a few minutes to assess the effect; the animal should become more aware of its surroundings, its eyes should appear more focused, and whining should be reduced. If there is no response, repeat the same dose, incrementally, until a response is achieved.
- Administer an opioid mu-antagonist / kappa-agonist, such as butorphanol (0.05-0.1 mg/kg IV) or nalbuphine (0.05-0.1 mg/kg IV); these drugs can reverse some of the dysphoric effects of mu-agonists, but maintain some analgesia through their kappa effects.

If you believe that a patient is not currently painful but is dysphoric, and you are reluctant to antagonise opioids (for instance, because the patient has undergone a particularly painful procedure), consider administering a tranquilizer such as acepromazine (0.01 mg/kg IV) to calm the animal. Alpha-2 agonists such as xylazine or dexmedetomidine are excellent sedatives as well as excellent analgesics, so they can be very useful in animals who may be both dysphoric and painful. However, caution should be exercised in patient selection, as all the alpha-2 agonists have significant, potentially detrimental effects on cardiovascular function.
Many hospitalized patients are not accustomed to being in a cage, and some dogs will continually whine or remain restless despite appropriate pain therapy. If logistics permit, providing a non-cage option – a pad on the floor in an area where people are nearby – may be preferable. If cage confinement is necessary, these animals may require long-term tranquilization.

If a dog is panting, its body temperature should be checked to determine if it is hyperthermic. If not hyperthermic, other causes should be considered. Opioid administration may be associated with panting in dogs, as opioids “re-set” the thermoregulatory center in the brain to a lower temperature, causing the dog to “think” it is hot, even when its core temperature may be in the normal range. Reversing or partially reversing the opioid may reduce panting.

Before an animal recovers from anesthesia and surgery, don’t forget to express its bladder, especially if a large amount of IV fluid has been administered during anesthesia. Likewise, make sure that dogs have opportunities to urinate and defecate outside (if possible), as most will not do so in a cage, and this can be a source of significant restlessness and anxiety than may be confused with pain.

CLASSES OF DRUGS USED IN PERIOPERATIVE PAIN MANAGEMENT

Opioids
Almost every dog or cat that is anaesthetised should be given an opioid (morphine, methadone, oxymorphone, hydromorphone, buprenorphine, butorphanol) for premedication. (In many animals – particularly the younger, healthy, active ones – a sedative should also be given.) Preanaesthetic opioids have several benefits:

- Most dogs and cats will be somewhat sedated and will more readily tolerate painful procedures such as venipuncture or catheterization.
- The use of opioid premedication will decrease the required dose for the induction drug and decrease the requirement for inhalant anaesthetic, usually resulting in improved cardiovascular function. Opioids generally have minimal depressant effects on cardiovascular function, other than decreasing heart rate, which can be managed by administering an anticholinergic such as atropine or glycopyrrolate.
- Recovery from a painful procedure will generally be improved if opioid premedication has been given.
- Postoperative pain management may be enhanced if preoperative (“preemptive”) pain medication was given; fewer drugs or lower doses may be needed to provide comfort.
- If nothing painful is done – for instance, a patient is anaesthetised for dental cleaning only – the opioid can be antagonised to hasten recovery and return to normal behavior.

Local Anaesthetics
- Local anaesthesia is highly recommended for any procedure that is amenable to a local nerve block (dental extractions) or infiltration of local anaesthesia (surgical incision, castration). Benefits of local anaesthesia include:
- Minimal expenditure of time and cost.
- Preemptive analgesic effect, if administered before pain stimulus (surgery) begins.
- Reduced requirement for inhalant anaesthetic, usually resulting in improved cardiovascular and respiratory function.
- Residual postoperative analgesia, with exact duration dependent on the specific local anaesthetic used. Lignocaine has a fast onset (<5 min) and relatively short duration (60-90 min); bupivacaine has a slower onset (~15-20 min) but a longer duration (4-8 hr).

**Non-Steroidal Anti-inflammatory Drugs (NSAIDs)**
NSAIDs are highly recommended for any patient undergoing a potentially painful or inflammatory procedure, unless contraindicated by conditions such as dehydration, preexisting renal disease, GI disease, or hypotension during anaesthesia. Although it would be ideal to have the NSAID "on board" before the surgical insult begins, there is a slight risk that intraoperative hypotension combined with NSAID effects might result in kidney damage. Therefore, a more conservative approach is to administer an NSAID at the end of surgery, before the patient recovers, only IF blood pressure has been well-maintained.

**Alpha-2 Agonists**
Alpha-2 agonists are useful for both sedation and analgesia, but should be used cautiously and only in otherwise healthy patients, because of their cardiovascular effects. Low doses of xylazine (0.1 to 0.3 mg/kg IV), medetomidine (1 to 5 mcg/kg IV), or dexmedetomidine (1 to 3 mcg/kg IV) can be administered to a dog that is agitation or vocalizing, if opioids and other appropriate pain medications have not resolved the abnormal behavior. At these low doses, the effects will not be long-lasting (15-45 min, depending on individual response), so they may need to be repeated, or given as CRIIs (constant rate infusions; medetomidine 1-3 mcg/kg/hr or dexmedetomidine 0.5-2 mcg/kg/hr, IV).

**WHAT NURSES CAN DO TO PROMOTE AND ENSURE APPROPRIATE PAIN MANAGEMENT IN VETERINARY PATIENTS:**
Although veterinary nurses are often in the best position to assess patient comfort, and are responsible for implementing most of the patient care, they rarely have the freedom to prescribe or initiate treatments. Therefore it is of utmost importance that nurses be able to communicate with veterinarians in a clear and knowledgeable manner, and that the veterinarians regard the nurses as an integral part of the patient care team.

How nurses can facilitate good pain management:
- Promote the use of preemptive analgesic medications, including opioids and local anaesthesia, where applicable.
- After anesthesia and surgery, try to place the recovering animal in its cage or other appropriate permanent place, BEFORE it is completely
awake, to avoid causing additional pain from moving and positioning a conscious animal.

- Request that the veterinarian establish guidelines or standing orders for treatment of each patient’s pain, including additional treatment options if initial treatment(s) don’t work.

- Provide appropriate, high-quality husbandry and “nursing care” – food and water, pads or blankets to lie on, temperature management, attention to needs for urination / defecation, bandage comfort, etc.

- Present requests for additional pain treatments in a constructive manner
  - Describe what the patient is doing that is perceived as pain-related.
  - Describe what has already been done that is not working (drugs administered, bandage checked, bladder emptied, etc.).
  - Mention what other options are still available.

- Keep good records that others can interpret (especially at shift changes, including the following (perhaps devise a chart with this information, for patients that require multiple evaluations and treatments over time):
  - Drug name, dosage (mg/kg), dose (total mg), time given, route of administration
  - Time that the effect was assessed
  - Observations, interpretation, pain score

- Join the International Veterinary Academy of Pain Management (IVAPM) to stay updated with developments in pain management, including pharmacologic and non-pharmacologic therapies (www.IVAPM.org)

References
