

Recognizing and Scoring Pain-Multimodal Therapy and Treatment Strategies

Gwendolyn L. Carroll, MS, DVM, DACVA, CVA, RTO
Texas A&M University, College Station, TX

The objective of this discussion is to review

- the cost of unrelieved pain,
- recognition of the painful patient,
- pain scoring systems
- treatment strategies for the painful patient

Clients expect that their pets will be provided with optimal care in a veterinary facility. It is common for clients to inquire about analgesics that will be provided. Veterinarians are sworn to decrease pain and suffering. Historically, analgesics were withheld because veterinarians perceived that it was in the best interest of the patient. There are excellent and safe analgesics available today, and there is sufficient evidence documenting that analgesics are advantageous. Additionally, it is now clear that experiencing pain is not beneficial to patients. Since excellent methods are available for physiologic monitoring of patients receiving analgesics, there is little reason to withhold therapy. Lastly, veterinary organizations are beginning to provide standards for analgesics. The American College of Veterinary Anesthesiologists drafted Pain Standards which were published in the JAVMA and are available on their website. AAHA has provided “Pain Standards” that are required for certification as an AAHA hospital. The International Veterinary Academy of Pain Management (IVAPM), which is an all inclusive group of like-minded individuals interested in improving pain management in veterinary species (ivapm@colostate.edu).

The Cost of Unrelieved Pain

Pain is now considered the 4th or 5th vital sign. The physiologic costs associated with unrelieved pain are real. The stress response can be activated as a result of pain, fear, hypovolemia, temperature changes, dehydration, infection, hypoxia, down time (i.e., recumbency) and perhaps the release of hormones from tissue trauma. Although most activators of the stress response are addressed by caregivers, fear and pain often remain untreated. During the first 48 hours of a stress response, changes in cardiac output, increases in oxygen consumption, vasoconstriction, hypothermia, decreased urine output, and changes in insulin concentration, and immunologic impairment may occur. During days 2 to 5 days, patients may become hypermetabolic, developing a negative nitrogen balance. This results in increases in cardiac output, oxygen consumption, and regional blood flow, and hyperthermia, proteolysis, gluconeogenesis, ureagenesis, and glucose intolerance may develop. The endocrine response to trauma or surgery is catabolic (catecholamines, cortisol, adrenocorticotropic hormone [ACTH], antidiuretic hormone [ADH], glucagon, and aldosterone increase). There is a decrease in anabolically active hormones (insulin, testosterone). There is a resulting increase in blood glucose, plasma cyclic AMP, free fatty acids, ketone bodies, and blood lactate; there are increases in metabolism and oxygen consumption.

There are several specific complications resulting from untreated perioperative pain and anxiety. Postoperative complications resulting from pulmonary dysfunction as a result of pain include muscle splinting, panting, ineffective coughing, retention of secretions, atelectasis, and infection. There are pain-induced complications associated with surgery of major joints (e.g., the hip and knee). Persistent postoperative pain and limitation of movement impairs normal muscle metabolism, causing muscle atrophy and prolonging return to function. Pain alters the immune system and may be

immunosuppressive. Although there may be reasons other than morphine's analgesic activity, it is intriguing that recent evidence indicates that pre- and postoperative morphine analgesia attenuates a surgically induced increase in metastasis in rats. Since immunosuppression resulting from pain promotes pathology that would usually be resisted by the immune system, provision of adequate analgesia should be a minimum standard. Pain-induced anxiety causes cortically mediated increases in blood viscosity and promotes clotting, fibrinolysis, and platelet aggregation, possibly potentiating thromboembolic disease. The physiologic responses can be improved by providing analgesia and a stress-free environment. Indeed, in people, a stress-free perioperative period is known to be beneficial.

Clinically, patients that are kept comfortable and minimally stressed recover sooner than patients that are not treated perioperatively for pain and stress. There are few outcome studies in veterinary medicine, but in people one of the best predictors of return to function is the amount of postoperative pain the patients have. A study in dogs after ovariohysterectomy, indicated a more rapid return to normal behavior in oxymorphone-treated dogs. A study in rats indicated that the detrimental effects of abdominal surgery on food and water consumption could be reduced by the administration of buprenorphine, an opioid analgesic. In cats following onychectomy, about 28% more of the cats receiving postoperative butorphanol ate during hospitalization, compared to the cats receiving a placebo; 22% more of the cats receiving butorphanol ate during the first day at home, compared to cats receiving a placebo. Even without much published information regarding improved outcome, the attitude in veterinary teaching hospitals surrounding the use of analgesics has gradually changed. Clinicians of many disciplines request analgesic therapy or consultations regarding the use of analgesics in their patients. In addition to a heightened awareness of the physiologic cost of unrelieved pain, clinicians recognize that patients do in fact regain normal functions (e.g., eating, drinking, and grooming) sooner if pain is controlled during the perioperative period or during the acute phase of a painful medical disease.

Identifying the Painful Patient

Scary survey: In a study at Colorado, faculty, house officers, and students were asked about pain management. The 3rd year students were better than the 4th students at recognizing and treating painful patients. It is unclear what happens to the students.

Identification of the painful patient is based on physiologic responses, expectations, behavioral responses, and response to therapy. Physiologic responses have been discussed. There are certainly situations in which an aberrant physiologic finding may be related to a condition rather than pain. For example, a tachycardia may result from acepromazine administration. In that situation, the appropriate therapy would be volume replacement. With respect to expectations regarding surgical procedures or individual responses, everyone brings with them some bias. For example, most people perceive that the response to pain in a working dog might be different to that of a miniature companion dog. Similarly, most people have some expectation that a minor procedure will not be very painful. Therefore, expectations may be used to guide treatment decisions, but should never be used to deny therapy. There are several procedures that we anticipate will be extremely painful (eg, thoracotomies, amputations, ear ablations). Other procedures can be categorized as moderately to severely painful (eg, thoracic or lumbar disk surgery, mandibulectomy), mildly to moderately painful (eg, dental extraction, aural hematoma, castration, and irritating or mildly painful (eg, clipper burns, superficial lacerations).

Behavior is relied on primarily by clinicians to determine if a patient is painful. As difficult as it may be to determine behavioral changes in patient that we do not know, we still rely on behavior. There are very few evolutionary advantages to displaying pain behaviors. It appears that the more socialized an animal and the more comfortable the animal in its surroundings, the more likely it is to demonstrate pain behaviors. Vocalization is the one behavior that guarantees treatment in our practice. Even though not a very sensitive indicator of pain (many painful patients suffer in silence) vocalization is not well-

tolerated by care-givers. More subtle indicators relate to facial expression, body posture, activity, attitude, grooming, self-awareness, appetite, response to palpation, and urinary and bowel habits.

The last parameter that is used to identify the painful patient is response to therapy. A comfortable patient should be resting, but arousable. As sedation from general anesthesia wears off, normal behavior (e.g., eating, drinking, urinating [using the box], grooming) should return. There should be normal attention to the environment. The patient should be continually monitored for successful therapy.

Scoring Systems

Any scoring system will require training of staff and veterinarians. The visual analogue scale (VAS) and the interactive (iVAS) or Dynamic (DiVAS) are probably the most reliable scoring systems to use once everyone is trained. In the numerical rating scores (NRS), numbers are assigned to a level of activity within a behavior category. The NRS lacks specificity, Verbal rating scales (VRS) and Simple descriptive scales (SDS) rate pain as none, mild, moderate, severe. They seem easy but are not very sensitive. In people 10 to 20 descriptors are needed to discriminate pain. There are cumulative pain scores (CPS) that evaluate the plane of response in many different categories. The CPS may include physiologic scores for changes from heart rate and respiratory rate. The CPS may also include changes in behavior, so lying quietly might receive 0 points and a thrashing patient might receive 5 points. At the conclusion of the observation, the observer will calculate the final CPS and determine if treatment is required.

With all these systems, it is impossible to determine if you are actually catching painful patients that need treatment. The veterinary systems have not been validated, but largely mimic the scoring in human patients. The most difficult dilemma is that our patients are non-verbal. Many investigators are trying to develop the perfect system. For example, in cats, blood pressure and cortisol are most reflective of pain determined with behavioral scores. However, the cortisol takes some time to recover. Glucose is also helpful, but again not very practical.

In order to ensure compliance, scoring systems that are not very complicated will be the most successful. Scoring systems that are designed for postoperative analgesia requirements will not address the needs of chronic or medically painful patients. The VAS, iVAS, and DiVAS, will likely have the most compliance and will be the most reproducible with training.

For a complete description of the scoring methods, see: Hellyer, P. 2002. Objective, categoric methods for assessing pain and analgesia. In: *Veterinary Pain Management*, Gaynor, J, Muir, W, (eds.) St. Louis: Mosby, pp. 82-111.

Treatment Strategies

There are several treatment modalities that may be used to provide comfort. Patients wake up the way they go to sleep. A stress free anesthetic induction and recovery in a warm quiet safe room will benefit all patients. Good nursing care cannot be over-emphasized. After surgery, the eyes should be re-lubricated, the bladder emptied, any dried blood or soap should be removed, and bandages should be evaluated for tightness. The head and limbs may be supported with pillows or rolled towels. The patient should-be positioned with the operated side up unless there is a surgical reason to do otherwise. After surgery, the patient should be turned regularly if the patient cannot turn without assistance. Use plastic sheets with absorbent liners to keep patients dry. Generally, patients ventilate best in sternal recumbency; if ventilation has been compromised, the patient may be propped in sternal recumbency and oxygen may be insufflated if necessary. The environment may be enhanced by the addition of items familiar to the patient. If possible, cats should be recovered in a ward separate from dogs. There are several physical medicine therapies that may assist recovery and these are covered in another session.

Other treatment strategies involve drugs. Tranquilizers (e.g., acepromazine, diazepam, midazolam) or sedatives (e.g., α_2 -agonists, sometimes μ -agonists) may be administered to calm the anxious patient. It is imperative to understand that tranquilizers do not provide analgesia. A patient may appear sedate but still be painful. Analgesics (e.g., α_2 -agonists, opioids [μ -agonists, partial μ -agonists, κ -agonists], nonsteroidal anti-inflammatory drugs [NSAIDs], local anesthetics, N-methyl-D-aspartic acid [NMDA] receptor antagonists) may be administered by several different routes. There is little doubt that the analgesics should be administered preemptively. Preemptive administration of analgesics obtunds “wind-up” or the afferent volley of nociceptive impulses that travel the spinal cord during surgery. In fact, opioids appear to obtund wind up while local anesthetic blocks tend to prevent windup. Typically, analgesics are administered on a schedule based on their pharmacokinetics profile. Pharmacokinetics speak against “as needed” treatment. For example, oxymorphone may be administered every 4 hours (SQ, IM, IV). Many people favor transdermal administration of the analgesic for prolonged treatment (e.g., fentanyl patch). For patients that have unremitting pain, a constant rate infusion may be administered (eg, morphine, fentanyl, lidocaine, ketamine). Patients undergoing moderate to severely painful procedures may have epidural administration of the analgesic or anesthetic (e.g., preservative free morphine, oxymorphone, bupivacaine, lidocaine). Other local techniques may be employed such as intraarticular injection for stifle surgery (eg, bupivacaine, morphine), brachial plexus block, interpleural or intercostal block, incisional injection, nerve stump injection, isolated nerve blocks, and splash block (eg, bupivacaine). Oral administration of analgesics (e.g., NSAIDS, opioids) may begin as soon as the patient is eating and drinking.

It is unclear how long a patient should be treated with analgesics. In people, 3 to 5 days appear to be optimal. In cats undergoing onychectomy, 2 days of treatment was superior to one or two injections of analgesics perioperatively. Interestingly, many owners could tell if their cat received an analgesic or a placebo. Even without outcome studies, it is apparent that one injection of an analgesic preoperatively is insufficient. Often, injectable analgesics are used in the acute perioperative period (i.e., the first day) and patients are switched to oral analgesics for the next 2 to 5 days.

Assessing Cases

Pictures of patients with brief history provided to determine agreement in Harris Co.

PAIN MANAGEMENT STANDARDS

	Rarely	Occasionally	Usually	Always	Point Value
Mandatory Standards					
<p>MA23. Pain assessment is considered part of every patient evaluation regardless of the presenting complaint.</p> <p><i>Rationale: Patient comfort should be a primary objective of the practice team. Continual pain is detrimental to the overall healing process as well as general well-being. Unrelieved pain leads to suffering, stress, anxiety, and diminished quality of life.</i></p>					
<p>MA24. Appropriate pain management is provided for the anticipated level and duration of pain.</p> <p><i>Rationale: The practice team should think in terms of the similarities of pain perception in human beings and animals and treat with the analgesic appropriate for the level of pain likely to be present, regardless of whether one is convinced that the patient is in pain.</i></p>					
General					
<p>PM1. Pain assessment using a standardized scale or scoring system is recorded in the medical record for every patient evaluation.</p>	10	20	30	40	
<p>PM2. Pain management is individualized for each patient.</p> <p><i>Rationale: Many variables have the potential to influence the response to pain management in an individual patient. Examples of these variables include:</i></p> <ul style="list-style-type: none"> • <i>Species, breed, age, demeanor, and relative size of the patient</i> • <i>Physical status and specific disease processes of the patient</i> • <i>Concurrent medications including anesthetics and sedatives</i> • <i>Severity and anticipated duration of pain</i> • <i>Knowledge and skills of the individuals providing the patient care</i> 					100
<p>PM3. The practice utilizes preemptive pain management.</p> <p><i>Rationale: It is better to prevent pain than to treat it. Pain is more difficult to control once the patient has become conscious of it.</i></p>					60

PM4. Pain management accompanies all surgical procedures. <i>Rationale: When patients are under anesthesia, many parameters that are routinely used for pain assessment, such as vocalization, heart rate, respiratory rate, etc., are altered. However, it should be remembered that general anesthesia and analgesia are not synonymous, so appropriate pain management should accompany all potentially painful procedures, such as surgery, that occur under anesthesia.</i>					80
PM5. The patient is reassessed for evidence of pain throughout any procedure that has the potential to cause patient discomfort.					40
PM6. Patients with persistent or recurring conditions, such as periodontal disease, pancreatitis, neoplasia, osteoarthritis, and otitis, are evaluated to determine their pain management needs.					60
PM7. Analgesic therapy is used as a tool to confirm the existence of a painful condition when pain is suspected but cannot be confirmed by objective methods.					60
PM8. A written pain management protocol is utilized and addresses:					40
PM8a. Methods for preemptive control of pain					40
PM8b. Events or circumstances known to be associated with pain					40
PM8c. Means by which pain and the degree of pain can be recognized in patients					40
PM8d. Names and actions of medications dispensed, prescribed, or administered for pain management					40
PM8e. Side effects, complications, concurrent drug interactions, and contraindications associated with specific analgesics and general pain management					40
PM8f. Ancillary methods for treating pain, such as massage and warm or cold compresses					40
PM8g. How practice team members are trained to identify causes, level of pain, and medications and methods to control pain					60
PM8h. How clients are taught to recognize signs of pain in their pets					40
PM9. In cases where pain management is part of the therapeutic plan, the client is effectively educated, in writing and verbally, regarding medical issues such as potentially beneficial and adverse effects of the therapy.	10	20	30	40	
Total					820

Copyright © 2005, American Animal Hospital Association

DEFINITIONS

- **Analgesic** – A drug that relieves pain.
- **Preemptive** – To prevent something from happening.