Practical clinical pain assessment (acute and chronic) in dogs and cats

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Acute Pain

Recently, various pain rating scales (see below) have been advocated as valid instruments with which to evaluate postoperative pain in dogs or cats, and these scales are rapidly gaining acceptance as useful measures of acute pain for both research and clinical patient care. However, authors of these veterinary scales did not follow the development techniques recommended by the original authors of the prototype human scales, and the scales were not developed using principles of ethological study as outlined by Lehner.¹ In fact, these scales were simply patterned on the human models and used behaviors gleaned from anecdotal descriptions whose correlation with injury has never been validated. Thus, these scales may simply be measures of how well the postoperative behavior of dogs or cats fit the authors’ preconceived expectations for what constitutes pain-induced behavior.

The subject of pain assessment in veterinary species has been investigated along 3 principle lines, namely a) objective measures of physiologic responses to experimental pain, b) subjective or semi-objective assessment of behavior postoperatively, and c) quantitative measure of postoperative behavior and physiology. Much of the work involving measures of physiologic and endocrine responses has been performed by anesthesiologists working to document the analgesic or anesthetic properties of specific drugs against experimental pain or to describe the effects of these agents on minimum alveolar concentration of anesthetic or on cardiopulmonary function. Although this research is critical to our understanding of drug efficacy and side effects, it is sometimes difficult to translate those results into specific recommendations for management of awake clinical patients. The results tell us more about how to use analgesics rather than when, as these physiological changes have not been validated as clinical pain measures, and physiological parameters do not seem to correlate with measures of clinical pain.² The scales used in the reported veterinary studies have been either verbal ordinal (e.g., 3 point scales with descriptors such as "mild", "moderate", and "severe"), numerical ordinal
(e.g., a 4 to 10-point scale), ordinal with numerical ranking of individual behavior "categories" (e.g., multifactorial NRS [mNRS] with 0-2 points assigned for various behaviors within each of several behavior categories such as vocalization, movement, respiratory pattern and posture), or visual analogue scale (VAS). Numerical ordinal, verbal ordinal, ordinal with categories, VAS, or a combination of one or more of these scales has been used to evaluate behavior in dogs or cats following various types of surgery including OHE or castration \(^3\) orthopedic surgery \(^2,10,11\), auricular surgery, \(^12\) and canine thoracotomies \(^13,14\). All of these are characterized by reliance on subjective evaluation of behaviors whose correlation with other behavioral or physiologic indicators of pain and / or distress have not been confirmed. Some included evaluation of behaviors with no known correlation with pain, for example howling, which is a form of communication between canids triggered by many stimuli unrelated to pain. The subjective nature of these instruments is revealed by the presence of significant variability of pain scores between observers. \(^15\)

Recently, a mNRS named the Melbourne Pain Scale (MPS), with 6 categories of physiological measures or behaviors, was proposed as a method to evaluate pain in dogs following surgery. \(^16\) The authors suggested that “Behavioral and physiologic measurements can be used reliably to evaluate [the] degree of pain in dogs during the postoperative period and their response to analgesics.” This scale was modeled on the human CHEOPS scale, but in contrast to that instrument, no effort was made to validate the behaviors and physiologic measures chosen for inclusion, and the scale was not employed at the 30 second intervals as intended by its original developers.

Recently, a comprehensive approach to developing a practical scale for assessment of postoperative pain in dogs has been undertaken, and shows promise as a reliable scale. \(^17\) These authors developed a composite scale (which they are now testing) based on veterinarians’ observations of behavior. These descriptions (279) were reduced to 47 words or phrases that were allocated into seven behaviour categories: demeanour and response to people, posture, mobility, activity, response to touch, attention to painful area and vocalization. Using hierarchical agglomerative cluster analysis, Cronbach’s alpha coefficient, and analysis of variance with multiple comparisons and empirical cumulative distributions, the process was validated. The scale proposed is now being evaluated.

However, one could argue that the proposed scale relies upon veterinarians preconceptions of indicators of pain, and simply validates what is agreed upon by most veterinarians as indicators of pain. Despite this argument, the scale holds promise as a reliable scale, and is the best attempt so far to produce a scale for evaluation of acute pain in veterinary medicine. \(^17\)

The author, together with Dr. Bernie Hansen is evaluating the above-mentioned scales against a detailed objective behavioral analysis. This work in ongoing, and will allow the scales, and components of the scales to be evaluated.

The one factor that seems to bear most relationship to pain in all these studies is the response to palpation. At the moment, this author recommends that this should form the central part of assessment of patients postoperatively.
Recommended Scale for Assessment of Peri-operative Pain in the Clinic:

0  Does not notice palpation
1  Orient to site on palpation, does not resist
2  Orient to site, may lick, slight objection to palpation
3  Withdraws from palpation, may vocalize, may lick at site or pay attention to site
4  Tries to escape palpation or prevent palpation, may bite, guards the area, may chew, bite or rub area

The response to palpation needs to be assessed in the context of the species being evaluated, the normal behaviour of that individual animal prior to surgery, and the procedure that has been performed, and the other drugs that have been administered.

Figure 1. Palpation of the surgical site is the best way to determine if pain is present in a busy clinic environment. Any adversive reaction to such palpation is taken as an indication that further analgesia is required (further doses of a particular drug, or another drug from a different analgesic class).
Chronic Pain

Due to the nature of chronic pain, such as that associated with osteoarthritis in dogs and cats, the accompanying behavioural changes can be subtle and easily missed. There is an increasing, and justified, movement to provide therapeutic interventions to alleviate the presumed pain associated with diseases such as osteoarthritis and cancer. However, objective assessment of clinical outcome is a significant challenge in chronic conditions such as osteoarthritis. 18 Although acute pain is not a prominent clinical feature of osteoarthritis, pain and stiffness associated with osteoarthritis is manifested as behavioral changes, disabilities, and loss of function. In animals these changes can be measured by force plate analysis of limb use, with the presumption that pain is correlated with decreased limb use. 19-32 In people, questionnaire-based outcome measures have been developed, validated, and reasonably well accepted. In veterinary medicine, however, subjective outcome measures are less well developed and validation studies are largely lacking. However, recent forceplate studies where a subjective owner assessment was included, demonstrated that owner assessments correlated better with forceplate evaluations than veterinarian assessments did. This information probably holds the key to chronic pain assessment in the clinic: owner assessment.

Preliminary data based on owner interviews showed changes in 32 types of behaviour in dogs with chronic pain. 33 Although still in the development phase, the Glasgow University Health-Related Dog Behavior Questionnaire has identified some key indicators of chronic pain, including, but not limited to, decreases in mobility, activity, sociability, and curiosity and increases in aggression, anxiety, daytime sleeping, and vocalizing. 33

Another study 34 evaluated questions about behavior of dogs with and without osteoarthritis, and identified 11 ‘question topics’ that seemed useful in evaluating dogs with OA:

- mood, play and games, vocalization, walking, trotting, galloping, jumping, laying down, getting up, difficulty moving after rest, difficulty moving after vigorous exercise

This study suggested that chronic pain could be assessed in dogs with osteoarthritis by completion of a questionnaire by a person familiar with the pet, after receiving appropriate education in its use. This study again indicated that the owners are the best evaluators of their pet’s pain (compared to veterinarians).

A more recent study took this information further, using client-specific outcome measures to evaluate pain in dogs. 35 This study used similar questions and topics as the Finnish study, 34 but for each pet, five very specific problems related to osteoarthritis were identified, which were recorded, and the intensity of the problem was monitored as treatment progressed. For example, if an owner suggested that one problem was the ability of their dog to walk on the slippery wooden kitchen floor, this very client-specific measure was followed over time by asking whether ‘walking on the kitchen floor’ was ‘not a problem, a little problematic, somewhat problematic, very problematic, or impossible’. Because the questions were very specific to the individual animal in its environment, the measurement system appeared to be very sensitive. Further work is
required to confirm these findings, but such an approach may hold the key to a sensitive and practical means of evaluating chronic pain in the clinic. The study by Gingerich 35 concentrated on client specific outcome measures of activity, but recently the Glasgow group, in a continuation of previous work, 36 developed a health related quality of life questionnaire designed to measure other aspects of the effects of chronic pain. This approach shows promise, especially for chronic pain conditions that may not result in readily observable changes in activity.

**Recommended Scale for Assessment of Chronic Pain in the Clinic:**
EXAMPLE: Assessment of Chronic Pain due to Osteoarthritis in Dogs. Similar ones can be created for cats with osteoarthritis, and cats and dogs with other painful conditions.

The assessment is performed in 4 stages. Such assessments take time, however they not only result in determining factors that can be followed to evaluate treatment effects, but also result in the veterinarian understanding the pet’s problem better.

1. Activities that seem to be difficult for the dog, or activities that have changed, as a result of the osteoarthritis, are discussed. The owner is asked to indicate which of these activities have become altered. They are given examples to help them think about this:

<table>
<thead>
<tr>
<th>Play and games</th>
<th>Difficulty moving after rest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>Difficulty moving after major activity</td>
</tr>
<tr>
<td>Trotting</td>
<td>Marking</td>
</tr>
<tr>
<td>Galloping</td>
<td>Moving on slippery floors</td>
</tr>
<tr>
<td>Jumping</td>
<td>Getting in and out of the car</td>
</tr>
<tr>
<td>Laying down</td>
<td>Defaecation</td>
</tr>
<tr>
<td>Getting up</td>
<td>Jumping onto furniture</td>
</tr>
<tr>
<td>Ascending stairs</td>
<td>Playing with other animals</td>
</tr>
</tbody>
</table>

2. The owner is then asked to be very specific and indicate both places and times when they see these activities impaired, e.g they might say “climbing stairs last thing at night”, or “getting in and out of the boot of the Ford Escort estate in the morning”

3. The owner is then asked to **rate the degree of impairment** associated with these very specific activities, **compared to when the dog was considered normal** (e.g a specific age)
4. These ratings are then recorded:

*Indicate how problematic these activities are compared to when your dog was normal, or did not have osteoarthritis. Comparison is to when he/she was ________ years old.*

<table>
<thead>
<tr>
<th>Problems in mobility related to osteoarthritis in your dog</th>
<th>No problem</th>
<th>A little problematic</th>
<th>Quite problematic</th>
<th>Severely problematic</th>
<th>Impossible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climbing stairs at girlfriend’s house</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descending stairs at girlfriend’s house</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting into car (VW)</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Jumping off his own sofa</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking on hardwood floor</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. At each re-visit, the same questions are asked, and the degree of impairment recorded. This allows a monitoring of progress with treatment.
References