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Recognition and Assessment of Pain in Animals

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Pain is a complex, multidimensional experience with sensory and affective elements. All mammals process the neuroanatomic and neuropharmacologic components involved in transduction, transmission, and perception of noxious stimuli; therefore, it is expected that animals experience pain even if they cannot exactly perceive or communicate it in the same way people do. Recognizing pain in animals is not intuitive, particularly for those unfamiliar with normal species-specific or individual behaviors. In recent years, there has been an increased focus on determining and measuring such specific pain behaviors. These efforts should improve recognition and treatment of pain in animals as validated pain assessment tools are developed. Nevertheless, the accurate assessment of pain in animals remains a subjective and challenging undertaking. Numerous factors complicate evaluation of pain in animals. Veterinary pain scales should consider the following characteristics: species, breed, environment and rearing conditions, age, gender, origin of pain (eg, trauma, surgery, pathology), body region affected (eg, abdominal pain, musculoskeletal pain), type of pain (eg, acute, chronic), and pain intensity. Any pain scale or methodology used for pain assessment must be able to distinguish individual sensitivities. Differences in pain tolerance have been demonstrated experimentally in people and animals and play an important role in the clinical management of pain. For example, the existence of a lower threshold for pain in an individual does not obviate the necessity of treatment, nor does a particularly stoic nature.

There is no "gold standard" to assess pain in animals. Many scoring methods that include physiologic and behavioral variables have been published, but few have been validated. Most veterinary pain scales rely on the recognition and/or interpretation of some behavior and are subject to some degree of variability among observers. Pain scales based on the presence or absence of species-specific behaviors, and that minimize the interpretation of those behaviors, are likely to be more accurate than generic scales that rely heavily on subjective assessment and interpretation. All current methods used to measure pain in animals are prone to errors of under- or overestimation. Even if the amount of pain is correctly estimated, determining how well the individual animal is coping with pain may be difficult. This is particularly true if the animal is removed from its normal environment. Assessment systems must also consider the different types and sources of pain, such as acute versus chronic or neuropathic pain and visceral pain versus somatic pain. Finally, all current methods assess the effects of physical pain; none has been designed to evaluate mental or psychological dimensions of pain in animals.

Physiologic parameters (eg, changes in heart rate, respiratory rate, arterial blood pressure, pupil dilation) may be used to assess responses to an acute noxious (painful) stimulus, particularly during anesthesia, and to assess pain in some clinical situations (eg, horses with acute colic pain). However, physiologic measurements often do not differentiate between animals that have undergone surgery and are experiencing pain and those that did not undergo surgery. Likewise, animals experiencing chronic pain may have normal physiologic parameters. Lack of change in physiologic responses should not be construed to mean there is no pain if other clinical signs suggest otherwise. Physiologic parameters are not specific enough to differentiate pain from other stressors such as anxiety, fear, or physiologic responses to metabolic conditions (eg, anemia).

Lack of familiarity with normal behaviors typical of a particular species or breed makes recognition of pain-induced behaviors difficult or impossible. **Behavioral changes** indicative of pain may be too subtle or take too long to recognize under routine clinical situations in both large and small animals. Sporadic observation of animal behavior may not reveal signs of pain. Except in the most severe circumstances, signs of pain may be “masked” by behavior that is stereotypical of the species being observed. For instance, dogs may wag their tails and greet observers despite being in pain. Flock animals, such as sheep, may be startled when an observer approaches and attempt to conceal signs of pain by staying bunched up with the rest of the flock. Behavioral changes indicating pain may not be what we expect. A cat sitting quietly in the back of the cage after surgery may be in pain; however, pain would not be recognized if the caregiver expects to see more active signs of pain such as pacing, agitation, or vocalization. Because it is difficult to detect sudden behavior changes, recent research has focused more on sudden changes in facial expressions. The mouse and rodent grimace scale

appears to offer a means to assess postoperative pain in mice and rats as effectively as manual behavioral-based scoring, without the limitation of such schemes in the latter.

In general, responses to acute surgical and traumatic pain are likely to be more marked and readily recognizable than clinical signs associated with chronic pain. Often, clinical criteria used to assess chronic pain (eg, lack of activity, lack of grooming, decreased appetite, weight loss) are not specific signs of pain and point only to an underlying problem in need of further diagnosis. A significant time commitment is required in the diagnosis and formulation of a treatment plan for animals in chronic pain. Observations by owners are essential to detect more subtle signs of chronic pain in animals, such as changes in attitude or interaction with family members or members of the herd or flock. The Helsinki Chronic Pain Index and the Canine Brief Pain Inventory are owner-completed questionnaires designed to quantify the severity and impact of chronic pain in companion dogs. They have been validated for canine osteoarthritis. The Canine Brief Pain Inventory, which is based on the human Brief Pain Inventory, also has been validated for canine bone cancer. A thorough history and physical examination are integral to the evaluation. Evaluating the degree of lameness and sensitivity to manipulation are also critically important when assessing chronic orthopedic pain and pain of spinal origin. A comprehensive neurologic examination must be included for complete assessment and accurate diagnosis of any chronic pain syndrome. Lastly, response to therapy, such as increased activity after administering an NSAID, may provide important diagnostic information regarding the role of pain in behavioral changes.

Cancer pain may have components of acute pain (eg, expansion of a tumor or secondary responses to surgical, radiation, or chemotherapy treatment), chronic pain, and neuropathic pain (eg, nerve entrapment). Thus, assessment of cancer pain requires methods capable of detecting behavioral changes associated with both acute and chronic pain.