

Claws and Effect: The Connection Between Pain and Aggression in Companion Animals

Hagar Hauser, DVM, DACVB, CDBC

Metropolitan Veterinary Associates

hhauser@metro-vet.com

What is Pain?

Definitions

International Association for the study of Pain (IASP) definition for **pain**:

“An unpleasant sensory and emotional experience associated with, or resembling that associated with, acute or potential tissue damage” and 6 key notes:

1. Pain is always a personal experience that is influenced to varying degrees by biological, psychological, and social factors.
2. Pain and nociception are different phenomena. Pain cannot be inferred solely from activity in sensory neurons.
3. Through their life experiences, individuals learn the concept of pain.
4. A person’s report of an experience as pain should be respected.
5. Although pain usually serves an adaptive role, it may have adverse effects on function and social and psychological well-being.

Verbal description is only one of several behaviors to express pain; inability to communicate does not negate the possibility that a human or a nonhuman animal experiences pain.”

According to the IASP, **acute pain** “...happens suddenly, starts out sharp or intense, and serves as a warning sign of disease or threat to the body. It is caused by injury, surgery, illness, trauma, or painful medical procedures and generally lasts from a few minutes to less than six months. Acute pain usually disappears whenever the underlying cause is treated or healed.”

According to the IASP, **chronic pain** is “...pain that persists or recurs for longer than 3 months. Such pain often becomes the sole or predominant clinical problem in some patients. As such it may warrant specific diagnostic evaluation, therapy and rehabilitation... It is multifactorial: biological, psychological and social factors contribute to the pain syndrome.”

Psychological Disorders in Humans

In humans, there are numerous physical conditions that have psychological clinical signs. There is an organization called the Psychophysiological Disorders Association that educates about this topic. Some conditions in humans include back pain, irritable bowel syndrome, interstitial cystitis, eczema and psoriasis, and Cushing’s.

Pain and Behavior in Animals

Acute Pain and Aggression

When a patient is presented for a sudden behavior change, especially guarding of their body (e.g., growling when touched or approached while resting), acute pain should be considered. In addition, acute changes in a chronic condition (e.g., allergy flare-up) should be considered when a patient’s behavior was stable and there has been a sudden change in behavior. Diagnosing acute pain can be difficult on physical examination when the patient is stressed because of noradrenaline’s effect. During an examination, discomfort or pain may be induced to diagnose pain, such as during spinal or abdominal palpation, which further exacerbates the pain and increases veterinary visit anxiety. While the acute pain may resolve, the patient may create an association with a stimulus while in pain that persists after the pain has resolved. Acute pain may also be caused by aversive tools, such as electric collars and prong collars, which further increase anxiety.

In a paper by Michaelides and Zis 2019, the links between depression, anxiety, and acute pain are discussed. An important quote from this study is included: “Depression and anxiety are associated with increased perception of pain severity whereas prolonged duration of acute pain leads to increased mood dysregulation.”

Chronic Pain and Aggression

Chronic pain can present as both acute and gradual changes in behavior. For example, a patient with ongoing osteoarthritis may not display aggression until the condition has progressed or after exercise. More often, gradual changes are noted with chronic pain as sensitization occurs. Chronic pain is more

difficult to rule out as the behavior changes are often subtle. In addition, pain from one source, such as hip dysplasia, may present as pain elsewhere (e.g., reacting to a vaccine). Chronic pain is underdiagnosed due to its gradual onset and subtle signs that are difficult for guardians to identify.

Diagnosing Pain Based on Behavior (from a Veterinary Behaviorist's perspective)

Detailed History Collection

To receive the necessary information for a diagnosis of pain, the clients should be asked directed questions about their pet's behavior at home. For example, asking "Is your pet in pain?" will often result in a quick "no," since many clients only perceive pain as a pet who is limping or vocalizing. However, by asking more specific questions, the clients may notice other changes, mainly behavior changes. Here are examples of specific questions to ask clients to inquire about pain:

- Does your pet have any difficulty jumping on or off furniture? For example, hesitating or first jumping to a lower surface before jumping onto the one they were aiming for.
- Does your pet take longer to get up from laying down, especially in the morning?
- Does your pet stretch after getting up longer than before?
- Does your pet resist jumping into the car?
- Does your pet resist or use the stairs more slowly?
- Does your pet look back or move away when you pet certain parts of their body?
- Is your dog resisting or slowing down on walks?
- When your pet sits, is one leg typically sticking out to the side or out front?

In addition to asking questions directly about pain in the pet, inquire about non-specific signs, especially in feline patients. Here are examples of questions to ask about non-specific signs that may indicate pain:

- Has your pet's appetite decreased?
- Has your pet appeared lethargic or less playful?
- Has your pet been hiding or resting in spots that are unusual for them?
- Has your pet spent less time in the same room as you?

Sudden Behavior Change

When a patient is presented for behavior changes years after social maturity, especially at a senior age, pain must first be ruled out. The behavior change may be a new behavior, such as growling towards the housemate who was lived there for 5 years, or loss of a previous behavior, such as following the guardians.

Physical Examination

A visual exam is vital for patients presenting for behavior changes and for those with suspected pain. This should be performed prior to any interactions with patients to avoid stress affecting the examination. The professional should be observing gait, sitting posture, ability to lay down or get up smoothly, and other subtle changes. Once this has been assessed, a hands-on examination can begin if their temperament permits. If they resist manipulations due to anxiety and/or aggression, a sedated examination should be performed. During palpations and manipulations in an awake patient, note any subtle signs of stress such as lip licking, yawning, whale eye, and pinned ears during each body part. In some cases, the patient will not exhibit reactions to examination because of the "freeze response" which can make diagnosis more difficult.

Client Videos

Since patients often hide signs of discomfort in the veterinary setting, video assessment of mobility and behavior can be a key diagnostic tool. Request that clients record video of their pets walking, running, using stairs, laying down, getting up, etc. This will allow the professional to view the videos of their patient in a relaxed state and the video can be slowed down for more accurate assessment.

Validated Pain Scoring Systems

There are a variety of pain scoring systems that can also be used to diagnose pain in pets. Please refer to Dr. Sheila Robertson's lectures for more information.

Pain, Fear, and Anxiety

The Connection

The same brain areas process both physical and social pain. If the areas receive intense activation, fear and analgesia are induced. However, if there is moderate activation, anxiety and hyperalgesia are induced. This can explain why patients presenting for pain may not exhibit signs of pain when they are fearful. On the other hand, some patients exhibit an exaggerated response to a stimulus (e.g., vaccine)

due to anxiety. "Stress-induced analgesia" is linked to the release of endogenous opioids and can be attenuated by opioid antagonists.

Anticipation and anxiety about future pain lowers the pain threshold. Therefore, reducing fear and anxiety in the veterinary clinic is crucial for accurate diagnosis and treatment of pain in patients. Cooperative care training in patients is the best way to facilitate low stress handling via providing agency to patients.

Neurotransmitters Involved

Dopamine: As part of the Combined Reward Deficiency Antireward Model, failure to relieve pain inhibits the brain's motivational centers which causes a reward-deficiency state. In response, there is release of stress-related chemicals leading to diminished dopamine neurotransmission and the antireward state. The maladaptive state in chronic pain patients enhances pain perception and comorbid changes (e.g., depression, anxiety).

Opioids: Chronic pain induces kappa opioid receptor activation which in turn inhibits dopamine and results in a state of anxiety.

Serotonin: A pain-induced stress response may reduce serotonin activity in the brain and by decreasing physical activity, this can further reduce serotonin activity in the CNS.

Substance P: It is co-released with glutamate from sensitized dorsal horn presynaptic neurons.

Pain and Anxiety in the Clinical Setting

Trigger stacking occurs when a dog or cat experiences a stressful or arousing situation that results in the release of cortisol and lowers the threshold for them to react to future triggers. Pain can lower the threshold for irritability and therefore, the patient reacts differently to an unrelated trigger. For example, if a dog is typically tolerant of their housemate jumping on them but they tear their cruciate ligament, they will then snap at the housemate for a previously tolerated interaction.

Even once a painful stimulus has resolved, anxiety that developed as a result of the pain may persist. For example, a dog that slipped down the stairs previously may not use them in the future even though it is not painful to use the stairs afterwards. Another common example is a cat who had a episode of feline interstitial cystitis and will no longer use the litter box despite the pain resolving.

There are many physical and mental conditions that affect one another and therefore, there is a cyclic nature to them. Examples include animals that lick due to anxiety and are atopic, animals that have chronic gastrointestinal disease with flare-ups triggered by anxiety, and dogs with motion sickness and car anxiety.

Literature on Pain and Aggression in Companion Animals

Campos et al. 2012: 12 dogs presented for aggression. The most common cause of pain was hip dysplasia (66.7%). There was no correlation between characteristics of aggression and source of pain (e.g., petting on head triggered aggression in a dog with hip dysplasia). The authors investigated if the dogs exhibited aggression before the onset of the painful condition and they found that if they were not aggressive prior then the aggression was more impulsive and more likely when manipulated.

Affenzler et al. 2017: Two dogs were diagnosed with chronic discospondylitis but did not exhibit typical clinical signs of the condition. The first dog exhibited unpredictable episodes of growling and biting when handled or approached. The second dog exhibited vocalization and occasional growling when handled or lifted. The aggression resolved in both cases with treatment of the discospondylitis.

Fagundes et al. 2018: Dogs with noise sensitivity and musculoskeletal pain were presented on average 4 years later than those with noise sensitivity and no pain (2.5-years-old vs. 6.5-years-old). Musculoskeletal pain should be screened for in dogs presenting with noise sensitivity at an older age.

Mills et al. 2020: 6 specialty veterinary behavior clinics reported on a total of 100 cases. 28-82% of cases presenting to the clinicians had a suspected underlying medical problem. The source of pain varied and included orthopedic, metabolic, gastrointestinal, dermatologic, and endocrine.

McAuffie et al. 2022: 141 dogs with a clinical diagnosis of atopic dermatitis and 3-month history of pruritus were included. The guardians completed a CBARQ and pruritus scale. Pruritic, atopic dogs showed a significant increase in aggression (stranger-directed, owner-directed, familiar dog, dog-

directed), fear- and anxiety-related behaviors (nonsocial fear, touch sensitivity), excitability, and attention-seeking behaviors.

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