Behavior Problems Associated with Pain and Paresthesia

Citation for published version:
Mills, DS, Coutts, FM & McPeake, KJ 2024, 'Behavior Problems Associated with Pain and Paresthesia', *Veterinary Clinics of North America: Small Animal Practice*, vol. 54, no. 1, pp. 55-69.
https://doi.org/10.1016/j.cvsm.2023.08.007

Digital Object Identifier (DOI):
10.1016/j.cvsm.2023.08.007

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Peer reviewed version

Published In:
Veterinary Clinics of North America: Small Animal Practice

13. Behavior problems associated with pain and paresthesia

Daniel S. Mills[1]*, Fergus M. Coutts[2], Kevin J. McPeake [3]

1 Animal Behaviour Cognition and Welfare Group, Dept of Life Sciences, University of Lincoln, Lincoln, UK; dmills@lincoln.ac.uk (DSM)
2 Pain Management and Rehabilitation Centre, Broadleys Veterinary Hospital, Craigleith Road, Stirling, FK7 7LE, UK; info@ferguscoutts.co.uk (FMC)
3 The Royal (Dick) School of Veterinary Studies, Easter Bush Campus, Midlothian, EH25 9RG, UK; kevin.mcpeake@ed.ac.uk (KJM)

*Correspondence: dmills@lincoln.ac.uk

Disclosure Statement: DSM and FMC have both received funding from Boehringer Ingelheim for veterinary education activities related to pain in dogs.

Key Words: adjunctive behavior, discomfort, dysesthesia, pain, paresthesia, problem behavior

Key Points

- Many forms of discomfort are implicated in problem behavior
- Discomfort is commonly implicated in problem behavior
- There are many non-traditionally recognized behaviors that can aid assessment of pain
- Failure to make expected progress with a rational treatment plan is often indicative of discomfort
- Behavioral comorbidities are a common feature of pain-related problem behaviors

Synopsis

Pain is a subjective, aversive sensory and emotional experience, and can cause or exacerbate problem behaviors. In this review, the biobehavioral model of pain is introduced and used to improve understanding by veterinarians of pain mechanisms and their relationship with problem behaviors. A range of potential indicators of discomfort are presented, illustrated by selected cases from the authors' behavior and pain referral clinics. Various myths exist around pain resulting in barriers to reporting, assessment and treatment. Veterinarians should always consider discomfort in any case presenting with a problem behavior.

Introduction: Pain, paresthesia and dysesthesia in veterinary practice

The International Association for the Study of Pain (IASP) defines pain, as "*An aversive sensory and emotional experience typically caused by, or resembling that caused by, actual or potential tissue injury*"[1]. Importantly this definition and the accompanying notes highlight the following:

- pain is usually an adaptive response even though it may impact on the functioning of an individual;
- pain and nociception are not the same;

- pain is always a subjective experience influenced by biological, psychological, and social factors;
- an individual's expression of pain (which does not need to be verbal) should be accepted and respected (and while the IASP refer to people in this regard, we would suggest the same standard should be applied to non-human animals).

By contrast paresthesia is considered as an abnormal prickling, tingling or burning sensation typically felt in the skin of the limbs[2]; the term 'dysesthesia' may also be used to refer to abnormal painful sensations arising from innocuous cutaneous stimulation which are also often felt as a burning sensation that outlasts the stimulus[3]. Paresthesia may occur when the nerve supply to a region is compromised, e.g. by compression or entrapment (such as from local inflammation) or as a result of direct damage (such as from herpes viral infection); it can also be seen in humans as a consequence of the hyperventilation associated with panic attacks or when the circulation to a region is compromised in a way that results in poor local nerve functioning, e.g. when animals have been out in the snow for a while[4]. While paresthesia can be chronic, the transient nature of many poses a diagnostic challenge when dealing with non-verbal individuals. Nonetheless, given their general biological basis it is fair to say that paresthesia is probably far more common than is widely recognized in veterinary medicine, especially when there are signs of vertebral compression without signs of overt pain. The same probably applies to dysesthesia. Both phenomena can be expected to cause fear/anxiety as patients may experience spontaneous abnormal sensations during movement. For the purposes of this article, we will refer to pain and/or paresthesia and/or dysesthesia as sources of discomfort.

Case vignette: Change in cutaneous sensation and self-mutilation in a dog

A 6.5 year old Labrador was presented with a history of having been hit by a car 8 months earlier. Advanced imaging showed multiple fractures of vertebral transverse processes, cervical cord contusion and damage to the left brachial plexus. He was presented to a pain management clinic with marked left forelimb lameness and a 'lick granuloma' over the medial aspect of the left carpus (see image 1). There was an absence of pin-prick sensation in and around this lesion and, consistent with neuropathy, there was presumed to be dysesthesia/pain in an area of hypoesthesia. He was also found to be hypothyroid. Treatment of neuropathic pain and thyroid supplementation decreased the licking without further behavior modification and the lesion healed (see image 2).

Image 1 – Lick granuloma on left carpus before treatment

Image 2 – Left carpus following treatment

Classification of discomfort and its implications

There are several systems used to describe and classify discomfort:

Temporal - Acute or chronic. Although this involves an arbitrary time-based distinction, it has some clinical utility, contrasting acute pain e.g. from a surgical setting, with chronic pain which is associated with conditions where pain lasts more than 3 months[5]. Nonetheless, there are challenges to the biological validity of this distinction[6]. This classification poorly describes the transition from the mechanisms behind inflammatory pain, which is mostly acute, to the changes in processing associated with neuropathic pain, often characterized by longer term tissue damage with central and peripheral sensitization.

Adaptive or maladaptive. As defined by Woolf (2004) "adaptive pain contributes to survival by protecting the organism from injury or promoting healing when injury has occurred. Maladaptive pain, in contrast, is an expression of the pathologic operation of the nervous system; it is pain as disease"[7]. However this assumption about malfunction giving rise to maladaptiveness may not be sound[8].

Organ system affected. Whilst this description can help communicate the localization of discomfort, it can also lead to a belief that there is a specific 'recipe' based on the locality of the pain. Conditions affecting certain organs may frequently recruit specific pain mechanisms, but effective management relies on understanding and recognition of the more fundamental pain mechanisms involved, regardless of the organ or tissue system affected.

Pathogenesis. Understanding the neurobiology involved in the discomfort being presented allows treatment with drugs to target specific mechanisms, (peripheral sensitization, neuropathic pain, central sensitization, nociplastic pain). This provides the most valid basis for management.

Successful management of discomfort is optimized when using a multimodal approach, where pain mechanisms become therapeutic targets and approached with pharmacological and non-pharmacological treatment. Discussion of multimodal treatment is beyond the scope of this paper, and the principles are well described in the WSAVA Global Pain Council Guidelines[9] and related texts[10,11].

Pain and discomfort: a biobehavioral perspective

The 'biobehavioral model' of pain[12] recognizes, as noted above, that neurobiological mechanisms and behavioral contributors interact. Discomfort is not just a sensory phenomenon, but has a bidirectional relationship with both the emotional (affective) state and cognition of the patient, which will impact on their behavior. Protective strategies can be expected lead to an increased risk of anxiety and aggressive behavior[4], but in other cases the changes in behavior may be much more subtle. For example, joint hypermobility is a chronically uncomfortable condition for people[13] and in dogs is a risk factor for canine hip dysplasia[14], which has recently been found to be associated with potentially problematic emotional arousal in dogs[15]. Some changes may also occur as a result of the increased cognitive load associated with discomfort, which can lower pain thresholds and the overall capacity of the sufferer to cope with environmental stressors[16]. The individual may then exhibit not only increased sensitivity to mildly noxious stimuli (e.g., noise)[17], but also ordinarily innocuous stimuli, such as handling and touch, may also be perceived as potentially painful (a form of allodynia)[17] and thus threatening. This may manifest as an alteration in the way in which an individual animal interacts with others[18] and their environment[19] as they seek to avoid or change the nature of their responses to avoid discomfort. Indeed, in the case of animals under human care, the bidirectional relationship may extend to include the behavior of the carer, since the carer's behavior may affect both the perception of discomfort by the animal and their concerns about discomfort clearly affect their own mental well-being and behavior[19]. Accordingly, we must recognize that the relationships that exist between discomfort and behavior can be highly complex. It must also be acknowledged that while many potential relationships between discomfort and behavior are suggested, it is difficult to present definitive evidence of these. However, given the guidance of IASP[1] to accept and respect expressions of pain, which can be non-verbal, we should be open to at least provisionally accepting these relationships with discomfort, until it can be shown otherwise. Accordingly, veterinarians should be open to the implementation of management strategies for discomfort in cases of problem behavior; accepting that the relationship may not be an obvious one, and that there is enormous variability between individuals.

This biobehavioral model also establishes a basis for identifying discomfort and assessing the pain burden an animal is experiencing:

- Nociceptors in the peripheral nervous system transduce injury to generate electrical activity in afferent sensory nerves.
- The release of inflammatory mediators in injured tissue lowers the threshold of nociceptors, causing a 'nociceptive barrage'.
- This barrage leads to central sensitization in the dorsal horn, where sensory signals are amplified and distorted before projection to the brain.
- The brain's perception of pain is altered by psychological influences. For example, reduced by distraction[21], or enhanced by anticipation[22].

Further discussion of pain mechanisms is beyond the scope of this article, but further details can be found elsewhere, e.g. Bell (2018)[23].

Relationship between discomfort and problem behavior

There are several ways in which discomfort can contribute significantly to the presentation of problem behavior:

1. **Discomfort can be the overt or covert cause of the problem**: All veterinarians will be familiar with the painful animal who protects itself through aggressive behavior. However, the relationship between pain and aggressive behavior is often much more subtle than this, especially when the discomfort has had an insidious onset, as is often the case with chronic osteoarthritis or enteritis.

2. **Discomfort can exacerbate the signs or create a particular profile for a given problem behavior**: Associations between aggressive behavior and chronic musculoskeletal pain have been described in several case series[18,24], which indicate certain features of the aggressive behavior that might be suggestive of pain involvement. These include greater impulsivity, greater generalization (extension of contexts in which the behaviour occurs), bites to the extremities more than other regions, and "attacks" that are more easily broken up. In general, discomfort can be expected to produce some or all of the following general changes that might moderate the problem in various ways depending on its primary cause:
    a. Animals can be expected to be more anxious and/or avoidant as they seek to avoid exacerbating their discomfort. This anxieties may be more severe, i.e. intense or extreme in their response, or triggered more readily (in response to otherwise innocuous stimuli that might be predictive of something leading to increased discomfort) than expected[18,24]. In non-anxiety/fear related conditions, the individual may appear more withdrawn or less willing to engage in certain activities, such as going out for a walk or walking down steps to go into the garden.
    b. The increased and prolonged psychological and potentially physiological load caused by an ongoing medical issue leading to discomfort will reduce the individual's resilience[25]. This might make the individual more irritable but also prone to other minor ailments. For example, in the case of atopy, a potential bidirectional relationship between the condition and the ability of the individual to cope has been shown[26].
    c. Individuals may appear clingier/ attention seeking as social support can reduce the perception of pain or threat of pain[27]. This higher level of interaction can lead to the conditioning and reinforcement of a range of problem behaviors, as seems to have occurred during the COVID pandemic, during the lockdown period[28]. Pre-existing signs of separation related problems may be a particular risk factor for the development of a range of other problems in this regard. Perhaps somewhat paradoxically, despite these changes, the individual might avoid physical contact, and perhaps become more aggressive, as they seek to avoid handling which presumably exacerbates their discomfort.
    d. The problem behavior might be accompanied by other changes in behavior (see text box). These include an increase in behaviors such as yawning, sniffing, body-shaking, stretching, and many bizarre behaviors like air-snapping, surface licking and sudden postural freezing which may all be signs of mild discomfort[4]. Animals may also become more destructive, perhaps as a form of displaced/redirected aggressive behavior associated with the discomfort[29]. There may also be a decrease in potentially uncomfortable behaviors like going upstairs (in the case of cats this might be manifest in reduced use of an upstairs litter box with or without a concomitant housesoiling issue developing as a result) or going for a walk. In some cases animal's will adapt by adopting strange postures or ways of doing routine behaviors, such as frequently appearing to be about to lie down and then

stopping, before finally dropping very suddenly; lying or sitting in an unusual way; an unusual gait or way of defecating (perhaps squatting for a short while and then moving or walking on before trying again). In the case of cats with sore hips they might adopt a standing posture to eliminate, which might be mistaken for spray marking. In some cases the cat will continue to use the litter box, but in others an association between eliminating and location may develop, so the animal develops a wandering pattern of housesoiling (this might then be a primary behavioral complaint). Another general change might be restlessness as the animal may not be comfortable to lie still for a prolonged period. This can be manifested as the primary problem being accompanied by a separation related problem; in other instances the separation related problem might be the primary complaint and other problems secondary. Thus superficially unrelated behavioral co-morbidities featuring separation related problems or attention seeking should be given particular clinical attention.

e. Increased possessiveness, which may manifest as a shift in resting area to a more comfortable area (e.g. sleeping on the sofa rather than their pet bed) and protectiveness of resources such as food, may also arise when an individual is in a state of discomfort. Resources in fact may become more valuable, due to an increased need for certain resources such as comfortable resting places as well as a perceived increased personal cost (due to the pain involved) in reacquiring them if lost. Aggressive displays may be directed towards the human family or other animals in the home. Once again, owner reinforcement may play a substantial role in how this issue is finally manifested by the time the primary problem is presented, and it might not escalate to a primary problem but be considered an annoying feature of the pet's character. Accordingly, the potential for this change should be enquired about in all types of behavioral problem and, when such changes are noted as a behavioral comorbidity (as with apparent attachment related issues described above), then careful clinical examination for a source of discomfort is warranted.

There are many potential adaptive mechanisms underpinning these types of observation, even if there is not definitive evidence. As already mentioned, animals in pain will feel more at risk and so will express higher levels of anxiety. Individuals in pain are also at greater risk of frustration as they are unable to access the resources they want, or perceive certain resources as more valuable as the cost of access increases with the degree of pain associated with gaining it. Increased frustration will also increase the likelihood of displacement behaviors occurring if there is not an acceptable solution, and these might be the origin of the collection of signs commonly described as "calming signals"[30] (see text box on "Some common signals and cues to pain"). The occurrence of such behaviors may serve to increase endorphin release and thus alleviate some of the discomfort. Engaging in a social interaction with an owner, and as such attention seeking behaviors[31] might have a similar effect (see case vignette below).

Enquiring about these changes can be illuminating and will certainly increase a clinician's awareness of the potential importance of discomfort in a range of behavioral complaints. This highlights the importance of close veterinary oversight of these cases. This oversight should extend to the treatment period as well, as the significance of discomfort and its effective management might only become apparent at this time in some incidences as discussed in the next section.

3. **Discomfort might reduce or completely block successful treatment of a behavior problem:** While it is probably true to say that it is possible to train an animal not showing overt signs of pain, it is probably not true to say that this means that the animal ceases to feel pain. In some instances training may mask the signs of discomfort, and its involvement or significance may only become apparent after behavior modification has begun. If the treatment plan is appropriate and well implemented then the animal should respond. A slower than expected or plateauing response to behavior modification exercises is, in our experience, much less often associated with poor owner compliance than it might be widely believed. More often the issue relates to pain limiting the animal's ability to proceed. Consider, for example, a plan that involves an animal lying for a prolonged period, but the animal cannot lie comfortably.In this case, as the plan proceeds to increase the time required for the animal to remain lying, the chance of failure due to discomfort increases. Likewise, techniques depending on desensitization may be limited if the animal is already struggling to cope with discomfort. Accordingly, such limitation in progress not only call for a reassessment of the case behaviorally but also medically.

Case vignette: sleep disturbance and attention seeking associated with hip dysplasia

A 9 month old, intact, male Labrador was referred to a pain management clinic with hip dysplasia. A murmur was discovered and the cardiologist reported an atrial septal defect, tricuspid valve dysplasia and pulmonic valve stenosis. He had become clingy and did not sleep well at night, moving around and when awake seeks out the owner for comfort. After treatment for the dysplasia he was found to sleep through the night without specific behavioral intervention; it was noted that he did have some unusual sleep postures (see Image 3), which might reflect his medical issues.

Image 3 – Unusual sleep posture of dog with hip dysplasia

Identification of discomfort

Inferences about whether an animal is in discomfort are drawn by owners and clinicians from their observations of the animal's behavior and, in the case of problem behavior, this often involves the assessment of low grade persistent or intermittent discomfort. Individuals may inhibit or suppress signs of discomfort in certain contexts[32], and so signs might not be obvious within the context and time of a standard veterinary consultation Thus careful observation of the patient over a sustained period is essential. In a simple case this may involve observing lameness to identify pain in a limb or identifying obvious effects on an animal's ability to move through its environment, e.g. climbing stairs, enjoying walks, and rising with ease from a lying position. However, in more complex cases the effect of pain on an animal's behavior may be less obvious, especially where there are subtle changes in gait rather than lameness. In some of these cases owners are aware something is wrong, but may be unable to describe what. Video footage that can be viewed in slow motion is often helpful in these instances, with advice on how to capture this freely available online[34]. In this instance a range of parameters should be assessed. For example, animals with bilateral elbow osteoarthritis may have a short stride and elbow abduction, but not show the weight transference associated with a limp. In these cases the animal may be presented with the owners reporting less obvious changes in behavior, such as those described in the text box below "Some common signals and cues to discomfort". Of course, none of these are pathognomonic for pain, but may signify 'yellow flags' for clinicians, and should prompt closer examination such as the use of the "Dog pain screen" provided at the end of this article. All of the available evidence should then be carefully triangulated to make an assessment of the likelihood of the occurrence of discomfort and an on-the-spot risk assessment made, that includes the consequences of a failure to recognise discomfort before the next steps are decided.

<u>Text box:</u> Some common signals and cues to discomfort

The following are signs of discomfort that might be noticed in association with a behavior problem

Increased blinking, lip-licking, nose-licking, yawning, air-sniffing and hesitant paw-lifting are widely used when individuals feel uncomfortable. These signals, except for slow blinking, are less common in cats.

A **change in the look** of a dog. Owners may struggle to identify what has changed in their dog's face, but both a softening of the eyes when approached (appeasement gesture) and a harder stare (expression of pain) with exposure of the white of the eye (whale eye) may occur with discomfort.

A tendency to **turn the head or body away** from a familiar individual when they approach, ultimately leading to the individual walking away (perhaps unexpectedly from the owner' perspective) can be a gentle way for an animal to signal that they do not want to engage or be touched. In many case the animal may walk away very slowly, not because it is physically uncomfortable but in order not to increase the excitement of the situation. Sudden changes in social exchanges can result in rapid escalation of threat.

Animals may **freeze** out of discomfort or as a sign of tolerance to the proximity of another. This often occurs as a normal behavioural response when a smaller dog meets a larger one, but if this there is a change in the frequency with which this response occurs, or a larger dog starts to do this type of response to a smaller dog when it previously did not, then this might indicate the animal is uncomfortable.

Air-licking and licking of surfaces have been associated with gastro-intestinal discomfort, e.g. due to Giardia or inflammatory bowel disease.

Play is typically reduced when animals are uncomfortable; but play bows in dogs and lateral lying in front of an individual in cats are often used to defuse a tense situation. So potentially this behavior might be seen to increase in conspecifics with whom the uncomfortable individual shares a home, as they respond to the increased irritability of the uncomfortable housemate.

Coat changes, including increased dandruff and premature greying, may be signs of chronic stress. This may relate to chronic discomfort and so should be noted as part of the clinical exam. Changes to the nature of the coat, e.g. curling of the hair over a muscle group, might also occur if there has been damage to the underlying tissue with consequent disruption to the blood supply and nutrition of hair follicles.

Increased scratching and grooming of a specific area may occur as a result of sensory disturbance related to paresthesia; ear scratching in the absence of overt ear disease may reflect head pain or discomfort in in the upper neck.

A **general change in personality or fluctuating mood**. Many animals in discomfort are described as having a "Jekyll and Hyde" personality, moody or unpredictable. Other more consistent changes are increased irritability/ grumpiness and a reduction in play. Any of these changes, especially if they have developed over time, are highly suggestive of discomfort.

End of text box

Persistent myths about pain

Major barriers to clinicians identifying a source of discomfort for a problem behavior are:

- a failure to acknowledge or recognize that a range of conditions are actually painful or cause discomfort;
- a belief that the problem is just "behavioral", and thus a failure to undertake a systematic clinical examination with a view to thoroughly testing the idea "how might these signs be related to discomfort?".

However, there are also a number of myths that persist around pain in animals, which can affect both an owner's ability to seek help for a potentially painful problem in a timely way and a veterinarian's decision to intervene. These myths include:

- Behavior is distinct from disease and so behavior problems do not require veterinary assessment. Not only is this counter to the biobehavioral model of pain, but such a belief appears to deny the self-evident truth that the reason why most medical cases are presented to a veterinarian is because of a change in behavior, ranging from the lameness of the dog to the development of diarrhea (which is behavior of the gut). At a practical level, this can lead to a partial (e.g. performing a cursory physical assessment) or complete failure to undertake a medical examination of a case presented for problem behavior.
- The absence of specific behavioral signs means pain cannot be present. Examples include the lack of yelping when a painful area is palpated or used. In other instances, signs of pain like lameness might be mild and so their significance as a potential source of discomfort could be dismissed. This is especially common when the relationship with other behavioral signs is not recognized.
- The absence of obvious or any physical evidence from diagnostic imaging. Many painful conditions e.g. muscular pain will not be revealed using traditional imaging techniques, but even when mild lesions are identified, these are sometimes deemed to be insignificant.
- The belief that certain conditions are not painful, unless they require surgical intervention. Common examples include a range of orthopedic problems like luxating patellae (see case vignette below) or angular limb deformities; eye problems such as keratoconjunctivitis sicca; skin problems like otitis externa and atopic dermatitis; and gastrointestinal problems such as acute and chronic inflammatory bowel disease. Indeed, in some instances, certain conditions are so common in a particular breed that they are simply accepted as being "normal" for that breed, without any consideration given to the discomfort they cause.
- Willingness to engage in certain activities like play or extended walks means the animal can't be in pain. This is most evident in dogs who are highly motivated to engage in particular activities, for example chasing squirrels in the park or playing fetch with their

ball on walks, which will induce the caregivers to think that "it can't be pain as he still runs around like a puppy at times". Whilst we may see a reduction in engagement exercise and play in some animals with pain[33], many continue to engage in these activities in spite of being in pain.
- Related to the previous point, there is sometimes a perceptual blind spot to accepting that abnormalities in young animals can be painful. Some seem unwilling to accept that a young animal can be afflicted with a chronically painful condition such as osteoarthritis.
- The belief that pain is inevitable and just needs to be accepted. This is not uncommon when the state of older animals is considered. In these cases, the lack of intervention may sometimes be justified on the basis of an erroneous calculation of the benefits versus risks of analgesic intervention. Whilst painful conditions, especially arising from degenerative conditions such as osteoarthritis are common, awareness must be raised on the early identification of pain and appropriate management to maintain the welfare of these patients.
- A short or single course of analgesia didn't make an obvious differences, so the condition cannot be painful or no amount of analgesia will work. In this case, there is often a failure to appreciate the heterogeneity of the mechanisms involved or the need for a multimodal approach[9,10,11].

Case vignette: luxating patella and aggression in a dog

A 2 year old, male neutered, Chihuahua-cross was referred to a veterinary behaviorist for problems involving vocalizing when separated, barking and lunging at dogs on walks, and sudden and unpredictable episodes of growling, snarling, snapping and biting towards his owners, usually when resting on their lap. He would still regularly jump on their lap, appeared to seek out physical contact and attention regularly, and weeks could pass without any aggressive behaviors occurring in this context. There were no other environmental triggers identified for these episodes, and physical causes were suspected and explored. The dog was identified as having a pelvic limb lameness where his owners had also seen him "skipping" (pulling one hind leg up abruptly) regularly when walking and running. A grade 2 unilateral luxating patella was identified. A behavior modification program was developed, and this included an analgesia trial in the short term. This led to an improvement in the severity of the signs, but not a resolution likely due to continued patellar luxation. Corrective surgery was performed and after recovery, the lameness was resolved, and no further episodes of aggressive behavior occurred even once pain relief was withdrawn.

Reflections

In preparation of this article the authors each reviewed the last 100 dog cases seen in their referral clinics. DSM and KJM each run a behavior referral clinic; FMC runs a pain management referral clinic. We offer the following additional insights for reflection on the relationship between pain and behavior:

1. Of those 100 cases referred to each of the authors' behavior clinics, DSM found 76% had suspected physical problems (75% causing pain/discomfort); KJM found 58% had suspected physical problems (53% causing pain/discomfort); for FMC, running a pain management clinic, 100% had painful conditions as expected.

2. The perception of the case as behavioral or painful, appears to strongly influence the level of clinical attention given to the assessment of the case before referral. If the problem is thought by the referring veterinarian to be behavioral rather than pain-related, there is high probability that relevant physical (usually relating to discomfort) issues will not be identified by them. Relevant physical problems (even if their significance was not identified) were missed by the referring veterinarian in more than half of the behavior cases referred. This most often included gait abnormalities, signs of chronic enteropathy and bizarre oral behaviors. Amongst the behavioral cases it was also noted that, even when a veterinarian had identified a physical issue, other physical problems often went unrecognized.
3. Whether or not the animal is perceived to be in pain, is strongly associated with the emphasis given in the presenting complaint. For example, the emotional sensitivity of the patient was emphasized in around three quarters or more of behavior cases presented, but in less than half of those referred for pain management. By contrast functional issues, such as the ability to undertake normal activities like going for a walk or groom the dog was emphasized in more than 90% of pain referrals but less than 50% of behavior referrals.
4. Clinical comorbidities (i.e. conditions not contributing to the primary cause of pain), and multiple comorbidities, are common in the cases seen, and often have a direct bearing on treatment plans, for example affecting drug choices (NSAID precluded in dogs with gastrointestinal disease, or impaired renal function), treating hypothyroidism, or seeking additional advice from cardiology or neurology services. Amongst the most common comorbidities seen are, being overweight (which obviously exacerbates musculoskeletal discomfort), dermatological issues, gastro-intestinal issues, heart disease, and endocrine disorders.
5. In both types of referral, owners are generally very quick to recognize and accept the relevance and relationship between discomfort and the behavioral issues they face.
6. Chronic osteoarthritis is commonly implicated in both types of referral and this often affects more than one site. Spinal tenderness as not uncommon, even when there was no pathological finding on radiography or advanced imaging. Longstanding postural and gait change can lead to myofascial discomfort, evident from sensitivity around the shoulder and lumbar musculature.
7. Successful management of pain is optimized when using a multimodal approach, where pain mechanisms become therapeutic targets and approached with pharmacological and non-pharmacological treatment. Behavioral intervention may be required to address established avoidance responses.

Concluding comments

Veterinarians should routinely consider and reflect on how discomfort might affect the presentation of a problem behavior, appreciating that this does not require overt manifestation of pain, and that discomfort may be transient or intermittent. In line with the principle of erring in favor of an animal's wellbeing we should not completely discount the potential role that pain/discomfort plays in any problem behavior case, even if the link appears unlikely or is not yet documented in published literature. Trial analgesia may not be sufficient to definitively confirm a focus of discomfort. However, it will safeguard the welfare of the patient, illustrate compassion for the patient, and may negate the need for a behavior modification program that the owner may struggle to undertake. For these reasons, it is our recommendation that it is often better to treat suspected discomfort first rather than consider its significance only after diagnostic assessment reveals clear physical evidence of pathology (which may not be possible) or when the animal does not respond to behavior therapy.

Clinics Care Points

- Pain and paresthesia are commonly implicated in problem behavior through a range of direct and indirect effects
- Veterinarians should always consider discomfort in any case presenting with a problem behavior
- Veterinarians should maintain oversight of problem behavior cases if referred to a non-veterinary behaviorist, as the relevance of discomfort may become apparent at any stage of the diagnostic or treatment process.

Dog pain screen© Mills reproduced with permission

Client questionnaire to be used for cases of problem behavior in conjunction with a clinical examination

Main behavior problem of concern:

Other problem behaviors:

General

- Have you struggled to teach your dog certain actions?
    - If so which ones?
- Would you say your dog is moody, has a changeable temperament or Jekyll and Hyde type personality?
- Would you describe your dog as clingy or occasionally clingy for no apparent reason?
- When your dog is scared does s/he tend to seek you out or take off and be alone?
- Does your dog wake you at night?
- Does your dog seem scared sometimes for no apparent reason?

Adjunctive behaviors

- Does your dog show any of the following behaviors?
    - Arching her/his neck and fixing position while looking up (Stargazing),
    - Snapping jaws for no apparent reason (Fly snapping, jaw snapping),
    - Excessive licking of surfaces or "air licking"
    - Excessive licking or grooming of any region of the body or limbs
    - Frequent licking of others
    - An appetite for non-food related items (e.g. plaster, wood, plastic, but not including plants or faeces) (Pica)
    - A strong appetite for green plants e.g. grass or leaves
    - Any abnormalities of gait or load bearing (including tending to prop itself up)
    - Unusual sitting or lying postures (frog-sitting or lying with the legs sticking straight out behind) or always lying with one hip down
    - Hesitant or unusual elimination behavior, including vocalizing while eliminating (urine of faeces)
    - Sudden skin flinches
    - Yelping for no apparent reason
    - Excessive sniffing behavior or sniffing for no apparent reason
    - Excessive yawning
    - Frequent stretching and body shaking
    - Moaning

Movement and activity

- Is your dog reluctant to move sometimes?
- Does your dog avoid being touched sometimes or in relation to particular body regions?

- Does your dog avoid walking on very warm or cold surfaces?
- Does your dog occasionally refuse to continue on a walk or go into a part of the home?
- If you work or do specific physical activities with your dog, would you say your dog tends to underperform or that its performance has dropped off?
    - Does your dog seem to be “one-sided” in any aspect of behavior or work?
    - Does your dog take time to get going?
    - Does your dog have poor stamina for no apparent reason?
    - Are there certain activities your dog avoids doing or seems to enjoy less without good reason?

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