WHAT ARE THEY HIDING? PAIN ASSESSMENT IN DOGS AND CATS

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The main barrier to treating pain in animals: We can scientifically prove that animals feel pain since the pain pathway is very similar across mammalian species – thus, if a stimulus is painful to a human, it is painful to a dog or cat. But due to an evolutionary need for survival, **animals hide pain from humans** (and other animals). This instinct may be even stronger in cats and this, along with their more sedentary lifestyle when compared to dogs, results in pain being diagnosed less frequently in cats than in dogs. Difficulty in diagnosing/recognizing pain in both species is true for both acute and chronic pain and for in-hospital and at-home pain. Untreated pain causes a myriad of adverse effects that impact health, behavior, quality of life and welfare. Thus, it is imperative that the veterinary team and animal caregivers learn to identify pain in our patients and pets so that pain can be effectively treated. For an in-depth discussion of both acute and chronic pain and a list of validated pain scoring systems, see the 2022 WSAVA Global Pain Council Guidelines (https://wsava.org/Global-Guidelines/Global-Pain-Council-Guidelines/). In addition to the Global Pain Council Guidelines, an excellent review of assessment of acute pain in cats is available: Steagall PV, Monteiro BP. Acute pain in cats: Recent advances in clinical assessment. J Feline Med Surg. 2019;21(1):25-34.

ACUTE PAIN

Instead of relying on the patient to exhibit pain signs, pain should be **anticipated** and analgesic plans made based on the presumed level of pain from the surgical procedure, traumatic injury or disease/condition that the patient is experiencing. This can be accomplished using knowledge of the pain level in humans for that stimulus and by understanding that the degree of pain in an animal would be very similar in an animal (for examples of expected pain levels see: Mathews KA, Vet Clinics of North America, Small Animal Practice 2000;30:729-755.). However, pain is a very **individual sensation** and the analgesic protocol, even one that is very robust, may not be adequate for all individual patients. Thus, the pain level should be assessed in all patients.

Assessment

A brief pain exam should be a routine part of the postoperative physical exam. A few quick pain assessments can be added to the post-operative physical exam that can provide a normal/abnormal 'diagnosis'. The patient should be examined more in-depth if abnormalities are identified during the pain exam, just as the patient would be examined more in-depth if any abnormalities were identified during any other part of the physical exam.

What is assessed in a pain exam?

For a 'quick look' (these can all be assessed from outside the cage):

1. CATS: Facial expressions or 'grimace': One physical change that was not attributed to animals until recently is change in **facial 'expressions**. However, with the publication of the 'rat grimace scales' (Sotocinal SG, et al. Molecular Pain 2011, 7:55), the ability to identify pain-related changes in facial expressions has been described and validated in a number of species. The Feline Facial Grimace Scale is a validated, easy to use scale (Evangelista et al. 2018) that can be used first as a screening tool as part of a 'quick' look and second as the actual pain scoring tool to assign a pain level to the cat. The scale and a training manual for the scale are available as open access (see links in list of scoring systems). **You need this!** The same facial pain indicators can be used in dogs but have not yet been validated by research. In part, this is because there is more variability in dog skull/facial anatomy, thus potentially more variability in exhibition of facial expressions. The grimace scale is difficult to use in both dog and cat brachycephalic breeds.
2. **Body posture**: Changes in posture like 'tucked' abdomen or 'hunched' back, head down, neck stretched, ears rotated outward (cat) or flat (dog) and tail down/tucked are all signs that could indicate pain. Body posture while lying down is also important. For instance, cats generally sleep 'curled up' in cold environments, like most veterinary hospitals, and cats that are laying stretched

out in this environment may be experiencing pain. Dogs laying in awkward or not normal positions may also be experiencing pain.

3. **Behavior**: Has the patient's behavior changed? There may be some residual effects of drugs in the immediate postoperative period (especially for the first 30 minutes in most patients) but a major behavior change should be obvious and subsequent assessments will be less impacted by anesthetic drugs. Common behaviors to watch for: defensive/aggressive (growling/hissing in a previously non-vocal cat; growling, excessive barking in a previously quiet dog, etc.), hiding or not interacting in a previously friendly cat or dog, etc. Although this is first assessed from **outside the cage**, the cage door should be opened so that the person assessing pain can **interac**t with the patient.
4. Vital signs are **not pain specific** and not included in many pain scoring systems but abnormalities detected in a routine physical exam should be investigated and may be attributed to pain. Since pain is a stressor, physiologic signs of stress can occur and include tachycardia, tachypnea, hypertension, arrhythmias, etc… However, a change in physiologic parameters without any other change may not indicate pain and pain can be present without changes in physiologic parameters. Also, physiologic parameters can be altered by any stress, including hospitalization, loud environment (eg, barking dogs!), etc… so they must be assessed in conjunction with other signs of pain.

A little deeper look:

1. If abnormalities are detected on any parameter above, do a more focused pain exam. GENTLY **palpate the areas around the wound or incision** to assess for both localized and expanding pain areas. Watch the patient **move** around the room and/or use other manipulations specific for the source of pain (eg, flex/extend joints).
2. Obviously the patient will receive analgesia if pain is detected. If unsure, assume pain is present, **administer analgesics and evaluate the response**. We call it 'asking' the animal if it is in pain and this is often the most useful way to determine the presence or absence of pain. For acute pain, an opioid is often the best option because of the rapid onset and potency of the drug class. If the patient's behavior returns to normal after treatment, then the diagnosis has been made – PAIN, and now a treatment plan that will address the patient's analgesic needs can be made. If the patient's behavior does not return to normal but pain is still a likely diagnosis, try another dose of the analgesic drug and/or add a drug from another drug class (eg, use opioids and NSAIDs together). Relief of severe pain often requires multimodal therapy and may require higher than expected drug dosages. Lack of response to aggressive analgesic therapy can be used as a diagnostic tool since continued abnormal behavior would unlikely be due to pain if analgesic therapy is adequate but the patient doesn't improve. Pain is ruled out and further diagnostics to determine the cause of the behavior change are begun.

Scoring Systems: Acute Pain

All of the information from the pain assessment should be put into a pain score in the patient's record (and on the cage card if your practice uses them). No pain scoring system is perfect, especially since we rely on a human's perception of what the animal is feeling – or what the animal is trying to hide. There are many scoring systems that range from simple numeric scales with no descriptors to more complex scales with physiologic, postural and/or behavioral indices to evaluate. Thus, each clinic can choose the one that works best for them. Ideally, the same person will score the animal before and after a painful procedure (like surgery) AND before and after pain relieving treatment. Using the same person to score the patient improves the consistency of results from the scoring system. Systems are available for both acute and chronic pain. The previously mentioned Feline Grimace is the most commonly used scale in cats. The Colorado State University pain scale, an easy-to-use descriptive scale, is available for both dogs and cats but has not yet been validated by research. The Glasgow Composite Short Form has been at least partially validated to identify pain in both dogs and cats. Another validated pain scale for cats is the UNESP-Botucatu scale from Brazil. The website includes a series of videos of painful cats for scoring practice. Whether you use this scale or not, the practice section is very useful for the entire veterinary team.

The Feline Grimace, CSU, Glasgow and Botucatu scales can be downloaded at the following sites:

Feline Grimace: https://www.felinegrimacescale.com/
CSU Canine: https://vetmedbiosci.colostate.edu/vth/wp-content/uploads/sites/7/2020/12/canine-pain-scale.pdf
CSU Feline: https://vetmedbiosci.colostate.edu/vth/wp-content/uploads/sites/7/2020/12/feline-pain-scale.pdf
Glasgow Canine: http://www.isvra.org/PDF/SF-GCPS%20eng%20owner.pdf
Glasgow Feline: https://novacatclinic.com/wp-content/uploads/2016/06/CMP_feline_eng.pdf
UNESP-Botucatu: https://animalpain.org/en/home-en/

CHRONIC PAIN

As is the case in human medicine, osteoarthritis (OA) is the main cause of chronic pain in dogs and cats. Experts estimate that the overall incidence of OA in all ages of cats and dogs is 40% of the total cat or dog population. Based on radiographic evidence, 90% of cats over 12 years old (Hardie EM, et al. J Am Vet Med Assoc. 2002;220(5):628-32) may have OA. This does not mean that all of these cats have pain, but it is likely that more have pain than are being treated. Other causes of chronic pain include orofacial/dental disease, gastrointestinal disease like pancreatitis and inflammatory bowel disease, cystitis, otitis, cancer and nonhealing wounds or surgical sites. As with acute pain, instead of solely relying on the patient to exhibit easily recognizable signs of pain, analgesic plans should be made based on the presumed level of pain from the chronically painful disease/condition that it presents with.

Assessment

Although the expected prevalence of OA is similar between dogs and cats, cat owners are less likely than dog owners to identify pain in their pet (AVMA Sourcebook 2017-2018). Identifying chronic pain can be very difficult for a number of reasons. 1) Owners often mistake signs of pain for 'just getting old'; 2) Evolutionarily, animals hide pain, especially cats – who can be both predators and prey. As prey, their natural instinct is to hide any vulnerability that could increase predation, including pain. However, the impact of pain on the cat's lifestyle and quality of life can be discerned if cat owners are educated on pain manifestation. As with acute pain, change in behavior is the most common sign that the dog or cat might have chronic pain. Examples include: previously friendly, gregarious animals that are now spending all of their time hiding; previously fastidious animals that have stopped grooming; and animals that suddenly start urinating and defecating right outside the litter box (cats) or in the house (dogs). Of course, these can all be signs of other medical issues so a full medical assessment is necessary to rule in (or rule out) pain as the cause. 3) Cats (and some dogs) are largely sedentary, making pain-related mobility changes more challenging to observe, and are often at least semi-nocturnal, so the owner may be sleeping when the cat is exhibiting mobility changes. Mechanistically, feline OA is often idiopathic and bilateral as compared with canine OA, which is primarily secondary and unilateral. Thus, classic limping as exhibited by dogs is unlikely to be exhibited by cats. Finally, cats also spend more time moving vertically (eg, jumping, climbing). Vertical mobility changes, which most owners do not know how to identify, are important indicators of cat OA pain. Owners should be educated that cats with a favorite high-up perch that they no longer jump to might be painful.

The successful identification and treatment of chronic pain lies largely on the pet caregiver. To educate caregivers on signs of both dog and cat pain, we need to reach them. Placing information on chronic pain assessment on clinic websites, Facebook pages, in-clinic media (eg, TV screens), etc… is critical. Some excellent owner (and veterinary professional and staff!) resources are available at: https://www.zoetispetcare.com/checklist/osteoarthritis-checklist-cat and for dogs, https://www.zoetispetcare.com/checklist/osteoarthritis-checklist

As with acute pain, if unsure, assume pain is present, **administer analgesics and evaluate the response**. We call it 'asking' the animal if it is in pain and this is the most useful way to determine whether or not an animal is in pain. For chronic pain, an NSAID is often the best choice, but a dose of an opioid can be used to make a rapid decision. As with acute pain, if the patient's behavior returns to normal after treatment, then the diagnosis has been made – PAIN, and now we can move on to developing a treatment plan that will address the patient's analgesic needs. Again, as with acute pain, relief of severe pain often requires multimodal therapy and may require higher than expected drug dosages so provide more aggressive therapy if pain is suspected but not relieved by one drug alone.

Scoring Systems: Chronic Pain
Owners know the normal behavior of their pets better than anyone and owners see their pets in an environment very different from the stressful environment of the animal hospital. Thus, we should get a good history of the animal's behavior from the owner when investigating pain. **And, especially with chronic pain, the owner is critical in evaluation of their pet's pain and in and pain relief.** However, owners generally have difficulty recognizing pain itself but can recognize the *impact* of pain, or the 'pain affect' on their pets. Thus, quality of life (QOL) scales are much more effective for pain identification by the owner. If the owner is unsure if a certain behavior might be pain related, they should be encouraged to take videos of their pet doing that behavior and have them send or bring the video to the clinic. Videos can be very helpful. Once the pet is at the hospital, the veterinarian can use the information from the video and can utilize specific pain exams (eg, joint palpation) to identify the presence of pain.

In addition to behavior, mobility should be included in the pain assessment. Specific questions (eg, does your cat still jump up to its favorite spot?; does your dog walk beside or ahead of you or does it lag behind? Is this normal for the dog?) should be included in chronic pain scales/questionnaires.

A validated chronic pain scales for cats, along with information for both veterinary professionals and owners is the Feline Musculoskeletal Pain Index (FMPI) at http://painfreecats.org/about-us/
The Client Specific Outcomes Measure (CSOM) is used for both dogs and cats and has become tool used not only by veterinary professionals and owners but also accepted by the US Food & Drug Administration (FDA), along with other regulating agencies, to determine efficacy of chronic pain drugs (example, frunevetmab, etc). https://pubmed.ncbi.nlm.nih.gov/17552444/

For diagnostics, very thorough videos demonstrating a complete cat diagnostic OA exam with joint palpation can be found at: https://www.zoetisus.com/conditions/petcare/oa-pain/feline-oa-pain#feline-exam-videos
The website https://www.galliprantvet.com/us/en/coast-tools outlines the COAST osteoarthritis scoring system for dogs with information for both owners and veterinarians and http://www.newmetrica.com/vetmetrica-hrql/.

Both Canine Arthritis Resources and Education (CARE) https://canineartheritis.org/ and Canine Arthritis Management https://canineartheritis.co.uk/ have information for veterinary professionals but also a very strong focus on client education.

In addition, quality of life (QOL) scales are not specific for pain but pain is one of the many causes of decreased QOL that owners should be aware of. These scales are often quite easy for owners to use and can identify un- or under-treated pain and the resulting negative impact on the pet. Numerous QOL scales are available. Two open-access and easy to use examples are:
1) H5M2 scale https://www.tuftsyourdog.com/dogtrainingandbehavior/quality-of-life-hhhhhmm-scale/ The 5 H's are Hurt, Hunger, Hydration, Hygiene, and Happiness and the 2 M's are Mobility and More Good Days than Bad. The criteria are scored 0 to 10, with lower scores indicating a bigger impact on QOL; and
2) the Lap of Love scale which is similar and a bit streamlined https://www.lapoflove.com/how-will-i-know-it-is-time/lap-of-love-quality-of-life-scale.pdf

Future Technology
Wearable monitors, like accelerometers, could potentially be the most efficient way to monitor the patient's pain status. Some wearables may be simple, like many activity monitors or 'accelerometers'. However, even activity monitors need to be validated for dogs and cats and must be able to identify movement quality rather than simply quantity (eg, a painful patient that is restless and can't find a comfortable way to sleep will show high activity – but it is not 'normal' activity). Specific identifiers for cats will be needed since cats tend to move as much vertically as horizontally. Research in this technology is ongoing at Aniv8 (https://aniv8.com/ [US only for now]) A new monitor that uses biosignals to identify pain is PainTrace® at: https://biotraceit.com/paintrace-vet/ [US only for now]. When used for pain identification/assessment, this technology has far-reaching potential including not only diagnosing acute and chronic pain in patients but also tracking efficacy of analgesic therapy, assessing owner compliance in analgesic administration, promoting animal welfare and enhancing pain/analgesia research.

SUMMARY
Animals DO feel pain but are very adept at hiding pain so we must learn to look for pain. Physiologic, physical and behavioral signs of pain can be used to identify patients that need analgesic therapy. If unsure whether or not the animal is in pain, 'ask' the animal pharmacologically if it is in pain and monitor the patient's response to treatment. Future pain assessment tools are in development.