

What Are They Hiding? Pain Assessment in Dogs and Cats

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Introduction: the 5th vital sign

Pain is called the 5th vital sign in human medicine (vital signs: heart rate, respiratory rate, arterial blood pressure, body temperature, pain) and is often called the 4th vital sign in veterinary medicine (because we don't often measure blood pressure in a routine physical exam). Why is pain the '5th vital sign'? Because pain is the main reason that humans seek medical care. And because of the importance of unrecognized pain:

- Pain is a stressor and impacts the entire body through physiologic responses to stress;

- Healing is faster when pain is adequately treated;

- Unrelieved pain can delay healing and turn acute pain into a chronic problem;

- Chronic pain is 'pathologic pain' with no protective value.

What does that have to do with veterinarians?

Why do we care in veterinary medicine? Because our patients feel pain too. The pain pathway is the equivalent in all mammals so if a stimulus would cause pain in a human, it would also cause pain in an animal. And perhaps pain is not the main reason that animals 'seek' veterinary care, but the importance of unrecognized pain is the same in our patients as it is in human patients. However, animals are very likely to try and hide pain since pain could be considered a 'weakness' and, no matter how long animals have been domesticated, the instinct for survival still exists and that instinct dictates that animals hide weaknesses – or they may be killed by stronger animals. So we must anticipate pain, look for signs of pain and 'ask' our patients if they are in pain.

Anticipating Pain

The best way to control pain in our patients is to anticipate the level of pain that might occur from the surgery, diagnostic test, traumatic event, etc... that will be/has been experienced by the patient. Since all mammals have a similar pain pathway, we can scientifically say that an experience that would cause pain in a human will indeed cause pain in an animal. Although true that animals may not cerebrally process pain like humans do, it is a certainty that they do indeed feel pain and pain intensity in humans is most likely parallel to pain intensity in animals. Thus, we can use charts like those provided by Dr. Karol Mathews (Mathews KA, Vet Clinics of North America, Small Animal Practice 2000;30:729-755.) to anticipate the degree of pain that our patients will feel based on the degree of pain expected from with the procedure, surgery, injury, disease, etc...

Looking for Pain

However, sometimes we don't anticipate well and we need to look for pain. And even if we have utilized excellent analgesia, we should still assess our patients for pain since pain is a very individual experience and the analgesic protocol may not be adequate for all individual patients. Let's go back to the vital signs. We don't 'ask' the patient to 'tell' us the other vital signs, so why would we 'ask' them to 'tell' us their pain level? We must LOOK for pain. We can use the other vital signs to aid in pain assessment. Since pain is a stressor, we can look for physiologic signs of stress: tachycardia, tachypnea, hypertension, arrhythmias, etc... However, a change in physiologic parameters without any other change may not indicate pain. Conversely, changes in behavior or signs of pain like limping may indicate pain even if physiologic changes have not occurred. A partial list of signs that might indicate pain are listed in Table 1. Of course, these signs can be altered by any stress, including hospitalization, doctors with white coats, barking dogs, etc... so they must be assessed in conjunction with other signs of pain.

Vocalization is often used to determine the presence of pain, and this can be useful, but vocalization is often breed specific (eg, Huskie dogs and Siamese cats) and, especially in the postoperative setting, can be due to dysphoria. Vocalization can include growling or hissing and, of course, are more specific for pain if they occur following a painful event – especially if the patient didn't growl or hiss before the painful event.

We can also look for changes in posture and gait, which can often be quite specific for pain. Changes in posture like ‘tucked’ abdomen or ‘hunched’ back usually indicate pain. Head down, neck stretched, ears back or flat and tail down are also all signs that could indicate pain. Body posture while lying down is also important. For instance, cats generally sleep ‘curled’ and cats that are laying stretched out may be experiencing pain, but again this should be linked to a potential painful condition or event, not just a happy cat stretched out in the sun. Of course, lameness is usually indicative of pain, although mechanical lameness can occur if healed fractures or articular injuries cause abnormal anatomical changes to the limb. But lameness should always be investigated.

Lameness may become worse with exercise (pain of unstable joints) or worse with sedentary activity (like old dogs with musculoskeletal pain that are more painful after a night’s sleep) so it is important to get a history from the owner regarding the timing of the animal’s lameness. Walking with a very stiff or abnormal gait may also occur with pain.

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 changes in facial expressions in animals has been validated and expressions related to pain have been described in other species. These should be used as part of the overall pain assessment and are included in some pain scales, like the Colorado State scales discussed below.

Other signs that might be linked to pain include changes in eating, grooming or defecation/urination habits. For instance, cats that are litter box trained but suddenly stop using the box for defecation/urination may have pain that precludes them from wanting to climb into the box. Of course, all other sources of changes in defecation/urination (eg, urinary bladder infection, gastrointestinal disease, new cats in the house, etc..) must be ruled out. These indices might also be related to behavior and **one of the most useful signs of pain is change in behavior**. Of course, we can’t be sure that a change in behavior necessarily means pain, but a change in behavior that coincides with a painful event (eg, surgery or trauma) should be investigated. Animals that were friendly may become aggressive or defensive and those that were solitary may seek human companionship and comfort. The animal’s behavior may even seem normal until the painful area is approached or touched and then fear or aggression may be exhibited. Animals that don’t exhibit normal sleep behavior, especially those that don’t want to lie down and sleep after a painful surgery, are very likely painful.

Ask the Patient if it feels Pain

Finally, the most useful way to determine whether or not an animal is in pain is to administer an analgesic drug and evaluate the response to the drug. For acute pain, an opioid is often the best option because of the rapid onset and ‘high’ potency of the drug. For chronic pain, an NSAID is often the best choice, but a dose of an opioid can be used to make a rapid decision. 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 provide the patient with pain relief. 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 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 are begun.

Scoring Systems

One of the best ways to detect pain is to use pain scoring systems, especially systems that combine physiologic, physical and behavioral signs. In human medicine, pain scoring systems are used to determine the level of pain as the 5th vital sign, although these systems are generally not as robust as the scoring systems that we are using in veterinary medicine since humans can verbalize their level of pain. No pain scoring system is perfect, especially since we have to 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) or before and after pain relieving treatment. Using the same person to score the patient improves the usefulness of the scoring system. Systems are available for both acute and chronic pain. One easy to use descriptive scale is the Colorado State University pain scale, which is available for both dogs and cats (Figures 1 & 2). Another commonly used scale is the Glasgow Composite Short Form, which is not as intuitive as the CSU scale but has been validated to identify pain in the research setting in both dogs and cats (Figures 3 & 4). Another validated pain scale for cats is the UNESP-Botucatu scale from Brazil. The scale is located at an excellent website (<http://www.animalpain.com.br/en-us/avaliacao-da-dor-em-gatos.php>) that includes a series of videos of painful cats for scoring practice. Other scales, including facial grimace scales, are available.

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 should be asked to participate in an evaluation of their pet's pain – and pain relief. Scoring systems like those in Figures 5 and 6 can easily be used by pet owners.

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

CSU Canine: http://www.csuanimalcancercenter.org/assets/files/csu_acute_pain_scale_canine.pdf

CSU Feline: https://www.csuanimalcancercenter.org/assets/files/csu_acute_pain_scale_feline.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: <http://www.animalpain.com.br/assets/upload/escala-en-us.pdf>






SUMMARY

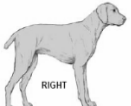
Animals feel pain and pain can add to the patient's morbidity, but animals are masters at hiding pain so we must learn to look for the pain. Using physiologic, physical and behavioral signs of pain, especially when combined in a pain scoring system, can help us to identify patients that need analgesic therapy. An even better way to identify pain is to administer an analgesic drug and monitor the patient's response to treatment.

Table 1: Examples of signs that might indicate pain in dogs and cats.

Physiologic Signs	Behavior Signs	Expression/ Vocalization	Posture/ Body position	Gait/ Locomotion	Other
Tachycardia	Any change in behavior	Howling (dog)	Head down	Lameness	Failure to groom
Tachypnea, Panting	Aggression	Whimpering (dog)	'Hunched' body or 'tucked' abdomen	Reluctant to move	Excessive grooming of painful site
Hypertension	Hiding/avoidance	Excessive barking (dog)	Tail down	Walks with stiff gait	Failure to go outside to urinate or defecate
Arrhythmias	Seeks comfort, won't leave owner	Growling (dog or cat)	Ears 'flat' or out to side (cat)	Walks with more weight on front or back legs	Failure to use litter box
	Guards painful area – may snap if painful area touched	Hissing (cat)	Laying in straight position rather than curled (cat)	Pacing	Change in facial 'expressions'
	Won't lie down, won't sleep	Purring (cat)			Anorexia

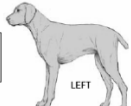
Date _____
Time _____

Pain Score	Example	Psychological & Behavioral	Response to Palpation	Body Tension
0		<input type="checkbox"/> Comfortable when resting <input type="checkbox"/> Happy, content <input type="checkbox"/> Not bothering wound or surgery site <input type="checkbox"/> Interested in or curious about surroundings	<input type="checkbox"/> Nontender to palpation of wound or surgery site, or to palpation elsewhere	Minimal
1		<input type="checkbox"/> Content to slightly unsettled or restless <input type="checkbox"/> Distracted easily by surroundings	<input type="checkbox"/> Reacts to palpation of wound, surgery site, or other body part by looking around, flinching, or whimpering	Mild
2		<input type="checkbox"/> Looks uncomfortable when resting <input type="checkbox"/> May whimper or cry and may lick or rub wound or surgery site when unattended <input type="checkbox"/> Droopy ears, worried facial expression (arched eye brows, staring eyes) <input type="checkbox"/> Reluctant to respond when beckoned <input type="checkbox"/> Not eager to interact with people or surroundings but will look around to see what is going on	<input type="checkbox"/> Finches, whimpers cries, or guards/pulls away	Mild to Moderate Reassess analgesic plan
3		<input type="checkbox"/> Unsettled, crying, growling, biting or chewing wound when unattended <input type="checkbox"/> Guards or protects wound or surgery site by altering weight distribution (i.e., limping, shifting body position) <input type="checkbox"/> May be unwilling to move all or part of body	<input type="checkbox"/> May be subtle (shifting eyes or increased respiratory rate) if dog is too painful to move or is stoic <input type="checkbox"/> May be dramatic, such as a sharp cry, growl, bite or bite threat, and/or pulling away	Moderate Reassess analgesic plan
4		<input type="checkbox"/> Constantly growling or screaming when unattended <input type="checkbox"/> May bite or chew at wound, but unlikely to move <input type="checkbox"/> Potentially unresponsive to surroundings <input type="checkbox"/> Difficult to distract from pain	<input type="checkbox"/> Cries at non-painful palpation (may be experiencing allodynia, wind-up, or fearful that pain could be made worse) <input type="checkbox"/> May react aggressively to palpation	Moderate to Severe May be rigid to avoid painful movement Reassess analgesic plan



RIGHT






☐ Tender to palpation
☒ Warm
☒ Tense

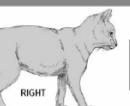


LEFT

Figure 1: Colorado State University canine pain scale


Date _____
Time _____

Pain Score	Example	Psychological & Behavioral	Response to Palpation	Body Tension
0		<input type="checkbox"/> Content and quiet when unattended <input type="checkbox"/> Comfortable when resting <input type="checkbox"/> Interested in or curious about surroundings	<input type="checkbox"/> Not bothered by palpation of wound or surgery site, or to palpation elsewhere	Minimal
1		<input type="checkbox"/> Signs are often subtle and not easily detected in the hospital setting, more likely to be detected by the owner(s) at home <input type="checkbox"/> Earliest signs at home may be withdrawal from surroundings or change in normal routine <input type="checkbox"/> In the hospital, may be content or slightly unsettled <input type="checkbox"/> Less interested in surroundings but will look around to see what is going on	<input type="checkbox"/> May or may not react to palpation of wound or surgery site	Mild
2		<input type="checkbox"/> Decreased responsiveness, seeks solitude <input type="checkbox"/> Quiet, loss of brightness in eyes <input type="checkbox"/> Lays curled up or sits tucked up (all four feet under body, shoulders hunched, head held slightly lower than shoulders, tail curled tightly around body) with eyes partially or mostly closed <input type="checkbox"/> Hair coat appears rough or fluffed up <input type="checkbox"/> May intensively groom an area that is painful or irritating <input type="checkbox"/> Decreased appetite, not interested in food	<input type="checkbox"/> Responds aggressively or tries to escape if painful area is palpated or approached <input type="checkbox"/> Tolerates attention, may even perk up when petted as long as painful area is avoided	Mild to Moderate Reassess analgesic plan
3		<input type="checkbox"/> Constantly yowling, growling, or hissing when unattended <input type="checkbox"/> May bite or chew at wound, but unlikely to move if left alone	<input type="checkbox"/> Growls or hisses at non-painful palpation (may be experiencing allodynia, wind-up, or fearful that pain could be made worse) <input type="checkbox"/> Reacts aggressively to palpation, adamantly pulls away to avoid any contact	Moderate Reassess analgesic plan
4		<input type="checkbox"/> Prostrate <input type="checkbox"/> Potentially unresponsive to or unaware of surroundings, difficult to distract from pain <input type="checkbox"/> Receptive to care (even mean or wild cats will be more tolerant of contact)	<input type="checkbox"/> May not respond to palpation <input type="checkbox"/> May be rigid to avoid painful movement	Moderate to Severe May be rigid to avoid painful movement Reassess analgesic plan



RIGHT

☐ Tender to palpation
☒ Warm
☒ Tense



LEFT

Figure 2: Colorado State University feline pain scale

SHORT FORM OF THE GLASGOW COMPOSITE PAIN SCALE

Dog's name _____
 Hospital Number _____ Date / / Time
 Surgery Yes/No (delete as appropriate)
 Procedure or Condition _____

In the sections below please circle the appropriate score in each list and sum these to give the total score.

A. Look at dog in Kennel

Is the dog?

(i)	(ii)
Quiet	0 Ignoring any wound or painful area
Crying or whimpering	1 Looking at wound or painful area
Groaning	2 Licking wound or painful area
Screaming	3 Rubbing wound or painful area
	4 Chewing wound or painful area

In the case of spinal, pelvic or multiple limb fractures, or where assistance is required to aid locomotion do not carry out section B and proceed to C.
 Please tick if this is the case ☐ then proceed to C.

B. Put lead on dog and lead out of the kennel. C. If it has a wound or painful area including abdomen, apply gentle pressure 2 inches round the site.

When the dog rises/walks is it?

(iii)	Does it?
Normal	0 Do nothing
Lame	1 Look round
Slow or reluctant	2 Flinch
Stiff	3 Growl or guard area
It refuses to move	4 Snap
	5 Cry

D. Overall

Is the dog?

(v)	(vi)
Happy and content or happy and bouncy	0 Comfortable
Quiet	1 Unsettled
Indifferent or non-responsive to surroundings	2 Restless
Nervous or anxious or fearful	3 Hunched or tense
Depressed or non-responsive to stimulation	4 Rigid

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Total Score (i+ii+iii+iv+v+vi) = _____

Figure 3: Glasgow canine pain scale. Validated in research studies to identify pain.

Glasgow Feline Composite Measure Pain Scale: CMPS - Feline

Choose the most appropriate expression from each section and total the scores to calculate the pain score for the cat. If more than one expression applies choose the higher score

LOOK AT THE CAT IN ITS CAGE:

Is it?

Question 1

Silent / purring / meowing	0
Crying/growling / groaning	1

Question 2

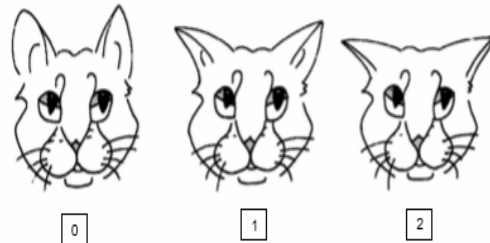
Relaxed	0
Licking lips	1
Restless/cowering at back of cage	2
Tense/crouched	3
Rigid/hunched	4

Question 3

Ignoring any wound or painful area	0
Attention to wound	1

Question 4

a) Look at the following caricatures. Circle the drawing which best depicts the cat's ear position?



b) Look at the shape of the muzzle in the following caricatures. Circle the drawing which appears most like that of the cat?



Figure 4: First page of Glasgow feline pain scale. Validated in research studies to identify pain.

Score	C-SOM Term	Descriptor
1	No Problem	
2	Mildly Problematic	Mild; Owner can detect impairment while others might not
3	Moderately Problematic	Intermediate; Easily detected by Owners; observable to others
4	Severely Problematic	Serious; Very obvious to any observed; requires evaluation or treatment
5	Impossible	

Figure 5: The Client-Specific Outcomes Measurement (C-SOM) is a pain scoring system for owners.

DATE				
PAIN INTENSITY How bad was your pet's pain today?	Severe Moderate Mild None	Severe Moderate Mild None	Severe Moderate Mild None	Severe Moderate Mild None
PAIN RELIEF How much pain relief was achieved by the medication?	Complete Good Moderate Slight None	Complete Good Moderate Slight None	Complete Good Moderate Slight None	Complete Good Moderate Slight None
SIDE EFFECTS Did the medication upset your pet in any way? Please describe.				

Figure 6: Another example of an owner-based pain assessment system (modified from 'Pain Management for the Small Animal Practitioner' by Tranquilli, Lamont and Grimm; published by Teton New Media, Jackson, WY)