RECOGNITION OF PAIN IN WILDLIFE

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Introduction

As wildlife carers, we deal with a variety of species that present to care for a diverse range of causes – everything from predation and trauma to starvation. Our challenge is to recognize how pain is expressed in this diverse group of animals, and to understand what conditions could result in pain.

But first, some definitions so that we begin from the same point in this discussion.

What is pain? In humans, it is an unpleasant sensory or emotional experience which we primarily associate with tissue damage or describe in terms of tissue damage, or both. If pain is so bad, why do we feel it? Well, pain is the body's tool to prevent further damage to itself. It is a warning system.

Suffering is not pain. It is defined as a state of emotional distress associated with events that threaten the biological and/or psychosocial integrity of the individual. Suffering often accompanies severe pain but can occur in its absence; hence pain and suffering are distinct.

Pain can come from different parts of the body – and the body acts differently with each of these locations.

- "Somatic pain" comes from the skin, bone, muscles and tendons.
- "Visceral pain" comes from the internal organs: heart, gut, reproductive organs.
- "Nerve pain" comes from nerves, spinal cord and brain.

Pain may also be short or long-term in its nature.

Acute pain follows injury and has gone when the injury has healed – such as a skin wound or broken bone.

Chronic pain occurs when the injury is taking longer to heal, or may never heal completely, such as arthritis.

Understanding the pain pathway

Pain begins in the skin, muscle and bone where many tiny nerve endings are found. Stimulation of the nerves causes an electrical impulse to move along the nerve and finally ending up in particular regions of the brain and spinal cord. The response from the brain then stimulates a reaction to the pain – such as moving away or crying out. The 'pinch test' – where you pinch a toe, and the leg withdraws is an example of this pathway at work. How many nerves are stimulated governs the intensity of the pain – a pin prick on your finger is a different sensation to having your hand crushed.

All of these parts of the body must be intact to feel pain: an animal with a broken leg or spine may not be able to withdraw the leg if it is given a painful stimulus.

The great pretenders

There is one important thing to remember with many of the species that we deal with – and that is, they are prey species. As they evolved over time, part of their defense against predation was to 'pretend' that they were OK. These species do not have the luxury of having a 'sick day' off work. Sick animals are eaten by predators. Birds have perfected this 'Preservation reflex' and are well-known for coming into care in their terminal stages at the point where their defensive mechanism has been overwhelmed by the disease or trauma and they can no longer cope. Think also to those animal documentaries – the lion always catches the lame or the sick. There are certainly other animals in that group that might have a cut leg, mild gut pain, mastitis – but they are all running for their lives – until they cannot run any more.

So our wildlife is 'conditioned' to hide the pain that they are feeling because they are prey species.

How do we humans approach pain in other species?

Ghandi said it best when he said that 'the measure of a culture is how they treat their animals'.

How you, as a human, respond to another's pain depends on many things. There are age-related issues, cultural issues, whether you yourself have experienced a great degree of pain, your understanding of the species and also your level of empathy for others. Studies have been done to say that even 'consistent' groups, such as veterinary students can have different appreciations of levels of pain based on education and experiences.

For us, in this country, up until ten years or so ago, many pain-relieving medications were associated with serious side-effects and the belief was current that it was better to feel pain (particularly in our pet species) rather than have them be affected by the side-effects of the medication. Many veterinarians and doctors, particularly in country areas, still remember those days which can influence their perceptions and approach to pain today.

So how might we understand whether an animal is in pain?

Well, there are several approaches.

1. **Structural**. Animals from fish, amphibians, reptiles, birds to mammals all have a brain, spinal cord and nerves. It is reasonable to believe that if an animal has these structures, then it is has the structural framework to feel pain. What we need to understand though, is that due to differences in shape and environment, how the animal expresses that pain may be different: a fish cannot vocalize, a snake cannot withdraw a limb. Take a look at Melissa Kaplan's website in the references to see the depth of research done to understand these differences. This tells us that if a kangaroo feels pain from a skin wound, then the blue tongue lizard, with the same structure will also feel pain from a similar wound.
2. **Anthropomorphism**. We can go from scientifically understanding structural similarities to then pose the question: if this hurts when I feel it, then it must hurt when another being feels it. This has a more technical name: critical, justifiable anthropomorphism. It

is a good practical basis from which to start recognizing pain in animals. After all, you and I are simply thinking, talking animals and we can project our ability to empathise and imagine another being's pain by 'placing' ourself in that situation.

3. **Test and measure**. You observe an animal, and by whatever measures, decide the animal is in pain. Then you provide pain relief and those measures alter toward normal, you have then tested and determined that the animal was feeling pain before providing relief.
4. **Experiential.** We accumulate knowledge from our experiences: thus we learn that a broken leg is painful in a joey. We can extrapolate from the joey to say that the bird with the broken leg must also feel pain. We collect, over time, a mental list of conditions that are painful from what we observe, feel or share with others.

What situations are likely to be painful?

From the definition, any situation that results in damage to the tissue is likely to be painful. This includes (and is not exclusive) predation injuries, vehicle trauma, breaks in the skin, damage to muscles, amputation of limbs, concussion, burns,
Funnily enough, these are the very situations for which wildlife is brought into care!

What are the adverse effects of pain?

Pain can have an adverse effect on healing of wounds.
Acute pain is unlikely to have an adverse effect. However, chronic pain or pain that cannot be relieved become welfare issues for our wildlife where we are unable to relief the pain. Fortunately, we have the ability to euthanase animals in severe and intractable pain.

Metabolic effect	Clinical result
Increased metabolic rate	Increases energy requirement – when likely to be not eating
Increases catabolic hormones	Breaks down muscle tissue for energy
Dehydration	Affects renal function and electrolytes
Releases inflammatory mediators	May lead to inappropriate inflammation that damages tissues
Adrenal gland is stimulated	Stress hormones slow healing
Ileus – intestinal immobility	Gut does not move forward so animal does not want to eat, gas builds up

How might we understand whether an animal is feeling pain?

We can start to recognise pain by looking at different areas and making observations. It can help to document these observations daily – looking for a response to medication or other supportive measures.

1. **Objective measures**
   We could, in the laboratory, measure cortisol in the blood or faeces, for example. We could measure a fast heart rate, respiratory rate before and after a painful event. None of which sounds very helpful!

2. Behavioural

We look for behaviours that are different from normal. This is where hand-rearing orphans teaches us valuable lessons about the adults of the species. From orphans, field observations we learn what normal behaviour is for that species.

Some examples of behavioural changes that have been documented in animals:

a. Lying on the side and trembling
b. Lying in a flat out on the side
c. Not curling tightly
d. Lying on side with hind legs extended and rigid
e. Sitting or lying to keep the affected area from touching the ground
f. Standing or walking with swaying, leaning, falling over, stretching, or walking sideways/backwards
g. Foot flicking in reptiles
h. Feather or body picking in birds
i. Obsessive grooming of one place in mammals.
j. Tucking up the abdomen – hunched posture

3. Gait

Changes in gait will differ with the species.

We are looking for careful placement of gait, stilted movements, shuffling.

The animal may not using a limb, or protects a limb when moving.

4. Activity

Level of activity – may see either complete inactivity – staying in one spot – which is more common in our prey species (playing dead). Or possibly manically moving around exploring the area

Anorexia – not eating is another common expression of pain – in all species. I see this in birds and herbivores post-surgery. Reptiles are another great example.

5. Facial expression

It is easy for us as humans to 'make a face' to communicate pain – we have had millions of years to evolve this way..

We deal with different 'faces' in our different species – often less expressive.

Ears - A common denominator, for those with ears, is 'ears back' rather than pointing forward and erect.

Eyes – may appear dull, dry, half-closed or not focused on us (and don't forget, we are predators, they should be watching us!).

Head and neck may appear hunched up.

6. Vocalization

On 'pain scoring tests' vocalization is only reserved for severe pain. It is even less likely to be seen in prey species (why tell the predator where you are, and that you are hurt?). Do not wait for vocalization to say the animal is in pain – did you scream every minute your arm was broken?

Vocalization may be voluntary or not. The sound will vary with the species: whimpering, growling, grunting, and screeching.

Bruxism, or teeth grinding is a recognised sign of pain in herbivorous species.

7. Mental State

We might describe this as: dull, depressed or unresponsive.
The animal may be more timid than usual; conversely, it may be aggressive when approached and handled.
The animal may not interact as expected with others of the same species.

Treatment of Pain

For our wildlife, we need to be very aware that we also need to take measures to reduce stress and provide comfort to the animal. There is no magic injection that will make a cold, hungry, scared animal feel better – we need to care for the patient, as well as its pain.

Supportive care

Supportive care includes providing a place for the animal that is warm, dark and quiet – if you had a car crash, would you really want to go to a football match, or does a lie down in hospital sound like a better idea!

Provide an enclosure that is away from and safe from predators. All of these animals are prey species! You will find it harder to assess pain if the animal thinks it needs to defend itself from not only you (a predator) but your pets as well.

Provide food that the animal can recognize.

Handle quietly and gently – keep voices down and movements calm.

First Aid Measures

Treatment of dehydration is recommended.

Immobilization of fractures will reduce 50% of the pain from the fracture by preventing the sharp ends of bone from further damaging muscle tissue.

Clean and cover wounds – nerve endings in the skin are irritated if they dry out.

Provide antibiotic cover if appropriate – uncontrolled infections result in painful inflammation and release of chemical mediators into the bloodstream.

Drug Therapy

Non-steroidal Anti-inflammatory drugs
E.g.: commonly used drugs include *Meloxicam (Metacam®), Carprofen (Rimadyl®, Prolet®.)*

These drugs have come a long way from the days of Aspirin. Newer drugs are safer and target parts of the inflammatory cycle specific to pain. The drugs are scheduled as "prescription animal remedy" – requiring a veterinarian to prescribe the medication for the animal.

Provide antiinflammatories for acute mild to moderate pain (trauma, skin wound) for 1- 2 days. For more serious tissue trauma, such as a broken limb, for 3 days.

One dose of most drugs in this category will last for 24 hours.

The side effects can be gastric ulceration – which has not been seen in birds, marsupials or reptiles at recommended doses for these periods.

Many of our wildlife are dehydrated upon arrival, and rehydration for 4-6 hours at least prior to administration of pain relief is recommended.

Opioids
E.g.: *Morphine, Fentanyl, Pethidine*

This category of drugs is scheduled as addictive. The duration of action of some of these drugs is variable in different species – the same dose of morphine in a dog, which lasts for 12 hours, lasts 1 hour in a rat. Other species such as birds require many times the dose rate as mammals and may have receptors that work well for some drugs, and not well for others.

The most significant side effect of this group of drugs is depression of the heart and lungs, with resultant death. However, these drugs are used as a component in premedication for surgery in wildlife species.

References:

- Bradley T. *Recognition of Pain in Exotic Animals*. Exotic DVM 31 (3) 21-26. July 2001
- www.anapsid.org/herppain2.html. Melissa Kaplan's reptile site. Article on "*Perception of Pain in Reptiles*" by Roger Klingberg, in The Vivarium, 10(4) 45 – 49, 1999. Lots of other references to work done on recognition of pain in reptiles on this website.
- www.vet.ed.ac.uk/animalpain *Guidelines for the Recognition and Assessment of Animal Pain.*
- Fowler A. *Pain Relief in Native Animals*. In Wildlife Matters, newsletter of Wildlife Victoria, 2004.
- Barnett JL. *Measuring Pain in Animals.* Aust Vet J. Vol 75, no 12, p 878-879,Dec 1997
- Simpson M. *Pain Management in Avian and Exotic Pets*. Conference Proceedings of UEP SIG of AVA from AVA National Conference, 2004.

Recognition of Pain in Animals.

Below are some examples of animals with a variety of injuries showing how they might express their pain.

Photo: Lizzie Corke

Joey protecting right front leg after muscle injury from predation. Right arm is dropped, left arm is guarding the injured side.

Ringtail possum after cat attack. Notice curled, defensive position. But eyes are vacant and staring. The animal is not attempting to hide in the toweling.

This barn owl with a broken wing is hunched up, eyes shut – rather than watching the predator (me).