

## **PAIN RELIEF IN NATIVE ANIMALS**

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### **A HISTORICAL PERSPECTIVE**

The veterinary use of pain relief in animals has only had a short history. Even as late as 10 years ago, we were not using pain relief routinely prior to surgery, and for arthritic pets, the hazards of long term medication outweighed the benefits. Since then, newer, safer drugs have been released, and the value of pain relief in animals in terms of shorter recovery times and being happy to visit the vet clinic is gaining favour in the eyes of many vets. However, there are still a large proportion of vets out there that are not proactive in the use of pain relief. There are also many vets that believe that marsupials will respond to pain relief as cats do (cats are extremely sensitive to a range of drugs) and use of these drugs will result in problems. However, zoos worldwide have now used these drugs safely in a range of species.

### **OFF LABEL USE OF PAIN RELIEF IN NATIVE ANIMALS**

There are no drugs licensed for use in native animals. There is no research into dose rates, drug metabolism to dictate frequency and no knowledge of what side effects might be at a particular dose rate. There will never be the market for a drug company to sink \$10 million (per species) into R&D to get any of these products licensed for use. So, what happens is that doses arise from anecdotal use – someone tries it, they perceive it works, and they tell a few others about it. As you can imagine, this does not replace tested research! Perhaps from this you can see that vets may be reluctant to prescribe these drugs – the dose rates are hard to find, variable according to source, and if something goes wrong the vet and the drug get the blame (even if they had nothing to do with it), as the vet is responsible by law for what they dispense.

### **SOME DEFINITIONS FIRST**

**PAIN:** series of protective mechanisms put in place when a stimulus causes tissue damage to help the animal to avoid repeating the damage. An example is the animal that holds its broken leg off the ground. Each time it puts the leg down, the sharp end of bone cuts muscle, nerve and vessels, this causes pain and so the animal continues to hold the leg off the ground.

**ANALGESIC** – agent to improve comfort by making pain more tolerable. Pain is not eliminated. For example, drugs given at the time of surgery do not remove the pain, but reduce its severity and duration.

**SEDATIVE:** drug that relieves anxiety. This helps with wild animals when the normal fear/flight mechanism causes anxiety because the animal can not get away due to its injury. It does not provide relief from pain.

**ANTI-INFLAMMATORY** – drug that reduces the mediators that are released with damage to tissues by infection or trauma.

## **HOW DO YOU GRADE THE SEVERITY OF PAIN?**

Pain is not just a yes/no response. It is important to remember that pain occurs along a gradient:

- mild – such as aching seen in arthritis,
- moderate – broken bone,
- severe – internal organ failure.

Many people think that a broken bone is the worst – but you will know of people that have continued to work, with broken digits. Talk to people who have had gall stones, kidney stones, severe pancreatitis or liver infection to appreciate the severity of pain that occurs with damaged internal organs.

## **WHAT BEHAVIOUR DOES A PAINFUL ANIMAL SHOW?**

The behaviour is dependent on the species – know what is normal first!

You may see anything from:

- Hunched up, fluffed up
- Avoiding normal movement – lame, sitting quietly
- Type of behaviour that protects the sore area
- Licking, picking at the sore area
- Not wanting to eat or drink
- Panting, grinding teeth
- Less response to your presence – appears to sleep, eyes are glazed, slow to respond to sound
- Vocalization is an end stage point in pain, despite what people think. But think back to your own broken limb – did you scream at the top of your lungs ALL of the time?

## **WHAT CONDITIONS ARE CONSIDERED PAINFUL?**

If you think it would hurt you, then it will hurt an animal. Even fish have a spinal cord and nerves – and that is where pain is registered.

Some examples of painful conditions:

- Fractures of bones
- Skin and muscle wounds
- Burns – especially partial skin thickness.
- Infection

## **WHAT IS THE DIFFERENCE BETWEEN PAIN AND SHOCK?**

I think there is confusion between shock and pain. An animal in shock is not necessarily painful and vice versa.

**Pain** is the result when a noxious (bad) stimulus is recognized by the cell and passes that message up along the nerves to the spinal cord and brain.

**Shock** is a last ditch effort by the body to save itself. It is bringing a large number of different chemicals in the body into play – only one of which is to do with recognizing pain.

Some of the things that happen with shock include a narrowing of blood vessels in the extremities with blood being directed to heart and lungs. Chemical changes happen in the blood so the defence cells (pus cells) are poured into the blood, ready to treat infections. The heart does not pump well so the organs starve of oxygen. Toxins are released from dying tissues. The muscles become weak. The kidneys try to conserve water by concentrating urine. A lack of urine is then seen. These events do not occur in the pain pathway.

### **HOW DO WE TREAT SHOCK?**

Anti-inflammatory drugs do not work to reverse shock as you can see from the pathways shown above. A drug that acts on the end of a nerve is not the same drug that will direct blood to the heart instead of the gut.

The only time cortisone has been documented to assist in spine damage and concussion is when it is given 6 hours BEFORE the damage occurs. Now all you have to do is to catch that kangaroo, 6 hours before it is hit by a car; or that bird, 6 hours before it flies into a window...

Considering how much damage that cortisone can do to an animal – especially birds (they can die of overwhelming bacterial, fungal or viral infections after just one dose), cortisone is not a drug that DOES NO HARM. There will be times when it needs to be used, granted – but not for shock or pain.

Shock is treated by the very things that carers have at home and are under-utilised:

1. Warmth – by warming the body, you encourage the blood to return to the extremities. Every carer should have a heat pad to achieve this. Aim to get all animal species between 25 - 30°C for the first hour and change the temperature based on their response.
2. Fluids given to correct 10% dehydration– this will result in expanding the blood volume, so the heart beats better, the kidneys return to diluting urine, and the toxins are flushed. Fluids with electrolytes will help muscles to regain strength.

### **WHAT TYPES OF DRUGS ARE AVAILABLE?**

These drugs are available from veterinarians. They are scheduled so that the vet BY LAW needs to dispense them for a particular animal with a particular problem. Vets do not make the rules – but they must follow them! Please respect this when consulting with your veterinarian.

There are two types of pain-relieving drugs:

#### **Non-steroidal anti-inflammatory drugs (NSAIDS)**

Actions: NSAIDS make the pain receptors less sensitive.

The recent drugs are more selective and work further down the pain pathway.

Side effects: stop blood clotting, damage the lining of the stomach and result in ulcers. If given to dehydrated or shocky animals, the kidneys can be damaged when they try to excrete the drug. Potentially, herbivorous animals (kangaroos) are more susceptible to ulcerated stomachs as they do not have the same thick stomach lining as carnivores.

These drugs should be given for a minimum time when possible. For minor injuries, one dose (time of surgery/assessment) may be enough. For fractures 3-5 days would be plenty. Burns cases will need longer courses.

Again, let me mention, the doses in the table are anecdotal. Their use is off label/unlicensed. If you want to use these drugs, be guided by your veterinarian. The last drug on the table, meloxicam (Metacam) has potentially a lot to offer. It has been used as daily medication for arthritic birds for up to two years with apparent safety (kidney enzymes in normal range, no detectable blood loss). All of these drugs are formulated for the 20kg dog and 5kg cat. The species that we deal with are much smaller. **Accurate dosing which can be achieved by accurate dilution is required.** For example, 1 drop of Metacam in its original dispensing bottle, delivers enough Metacam for 1kg. If you gave this to a 100g bird, you are giving a 10 times overdose. For critters under 1kg, dilute the Metacam 1:9. This means getting 0.1ml of Metacam and adding 0.9ml of boiled water to it. Thus each 0.1ml will treat 100g of animal.

### **Examples of Non-steroidal Antiinflammatory Drugs**

Generic name	Trade name	Bird dose rate	Mammal dose rate	Reptile dose rate
carprofen	Rimadyl, Zenecarp	2mg/kg twice daily	2mg/kg once daily	2-4mg/kg every 1-3d
ketoprofen	Ketofen	3mg/kg once daily	1mg/kg once daily for 1-3d	
meloxicam	Metacam	0.2mg/kg once daily	0.2mg/kg once daily	0.1mg/kg every 1-2d

Dose rates from Melbourne Zoo's formulary, and discussion email lists for exotic animals and birds.

### **Opiate drugs**

Examples include: pethidine, butorphanol

Action: lower the brain's recognition of pain.

Side effects: depresses the body's ability to breathe and the heart to pump, stops the gut from moving food forward.

These drugs fall in the addictive schedule. Their use is restricted to veterinarians. Each dose of drug must be documented by law and the drugs are kept in a locked safe. A slight overdose may result in the death of the animal from depression of the breathing centre in the brain.

## **WHAT DRUGS SHOULD NOT BE USED?**

Human medication should not be used. Humans respond very differently to some of these drugs compared to other animals.

**Aspirin** is an analgesic that is used in humans to stop blood from clotting. It is not safe to use in wildlife.

**Panadol** is an antipyretic (reduces fever). It is not a good anti-inflammatory. It can cause liver failure and stops blood clotting. The tablets are for 70kg humans and overdose for small animals is unfortunately (might need 1/70<sup>th</sup> of a tablet) all too likely.

## **CAN SEDATIVES BE USED TO KEEP ANIMALS CALMER DURING PAIN?**

Certainly sedative may relieve anxiety and some are muscle relaxants. They certainly have a role to play. However, remember that in the instance of a broken leg, the animal's body is using the tense muscle as a splint to help reduce further movement. Relax the muscle and you cause more damage. This must be weighed up against the benefit of reducing anxiety.

## **HOW DO YOU TREAT FRACTURES?**

The basic first aid premise for fractures is to immobilize the fracture. The act of bandaging reduces the pain of the fracture by 50%. Let me say it again – bandaging reduces the pain of the fracture by 50%!!! No magic drugs - just bandaging material from the chemist/vet! Every carer needs to feel comfortable in the application of a figure-of-8 bandage on a bird and a leg bandage to a bird/mammal/reptile. Bandage the leg so that the fracture is immobilized as far as the joint above and joint below. The animal needs to be assessed on humane grounds by a veterinarian within 24 hours (bird bones set in 48 hours).

## **HOW DO YOU TREAT GASTROINTESTINAL PAIN?**

This is a difficult one to treat as there is no easy answer. The drugs that are good for muscle and bone pain are not good for gut pain as the muscles are a different type. These animals need fluids and lots of them. A correct diagnosis and prompt, correct treatment will reduce the time spent in pain. For these animals, I feel that the opiates are superior to non-steroidal antiinflammatories. However, one side effect of opiates is to stop the gut moving and this may not be in the best interest of the patient.

You really need to learn to recognize signs of gut pain early: bruxism (teeth grinding), not off food but at the 'drinking less' stage, less mentally reactive to stimulus, the 'just not right' feel.

We also need to respect that, in regards Coccidiosis and twisted guts, these are natural processes that we are not always likely to win – even with timely intervention. While humans which have at their disposal hospitals, casualty wards, infrastructure (things that go bing), staff, many drugs – and yet they still

die after being hit by car, or due to organ damage – our wildlife does not. But it has our best care that we can give. And sometimes nature will win out.

## **CONCLUSION**

Establish a good working relationship with your veterinarian. The 'stand-out' carers are the ones that learn what is normal in the animals they care for, and seek assistance when they have a problem. Pain relief is something that we can offer injured wildlife. Ensure that the dose rates that you give are accurate. However, it must never take the place of basic first aid care: warmth, fluids and fracture immobilization.