The recognition and relief of pain in birds

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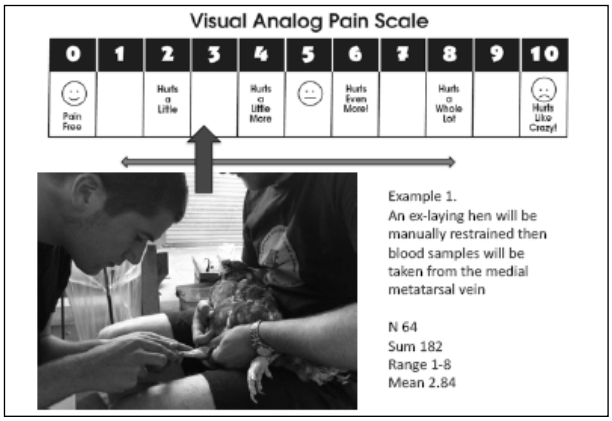
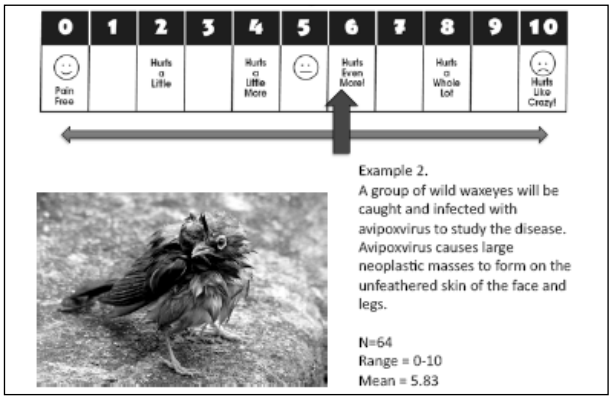
Our knowledge of the perception and expression of pain in birds is based on a small number of studies in a small number of species of birds. However, it is beyond doubt that birds are able to perceive pain. There are many challenges in recognising and quantifying pain in birds. There are marked differences in pain perception between birds and mammals, and also in the behavioural expressions of pain. Further, there is considerable variation between bird species and even between individual birds in their tolerance and expression of pain. In many species of birds, especially prey species, behavioural expression of pain can be very cryptic and subtle.

Veterinarians subjectively assess the degree of pain in the birds they treat based on the birds' behaviour and an anthropomorphic extrapolation of what pain is expected with a particular injury or surgery. Some veterinarians recommend a simple 1 to 10 scale for recording pain and have found it to be well correlated to more complicated pain scoring systems that include indirect measures of pain such as heart and respiratory rates, food intake and activity. In some cases, recognition of the degree of pain is only able to be characterised by the bird's response to analgesia.

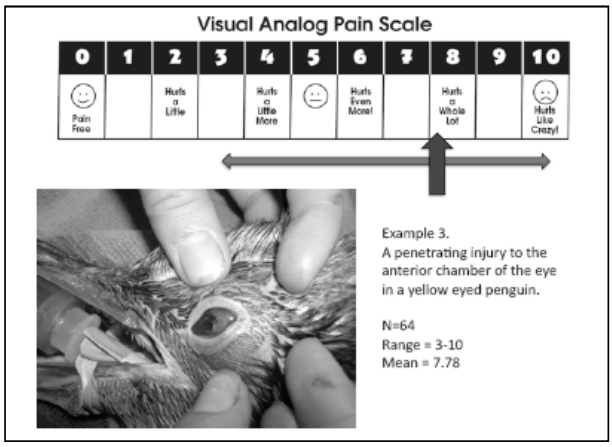
In the presentation to the ANZCCART conference, 10 examples taken from clinical avian medicine and surgery, research and teaching scenarios were presented and the audience asked to score out of 10. Each of the scenarios and the mean score and range of responses is given below and briefly discussed from my own perspective and experiences. The mean of the group's responses is represented by the vertical arrow and the range by the horizontal arrow.



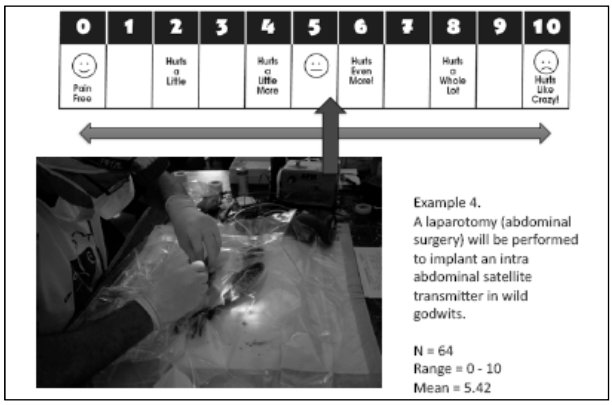
The sharp pain of a needlestick injury is a common baseline pain that most people have experienced and can relate to. I would suggest a score of 3/10 for this but the group range was quite large.



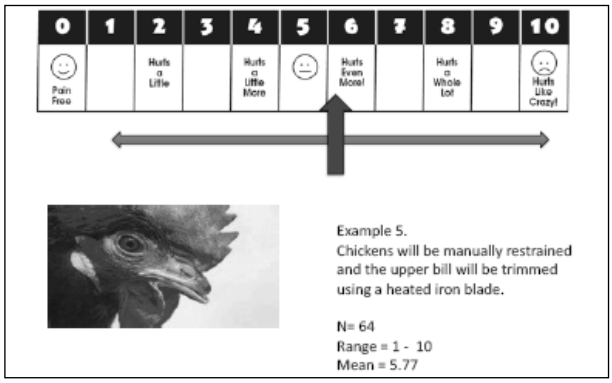
The avipox lesion looks painful but the neoplastic mass contains no nerves as it is composed of neoplastic epithelial cells. There may be some pain from the pressure on normal tissues. This example was used to demonstrate that visual appearance is not always the best guide to pain



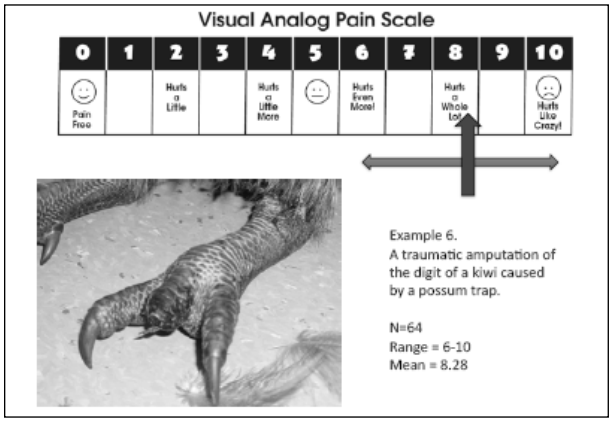
In human pain scoring a perforation of the eye rates as one of the most painful experiences. Most human pain scores place this injury in the range of 8 to 10.



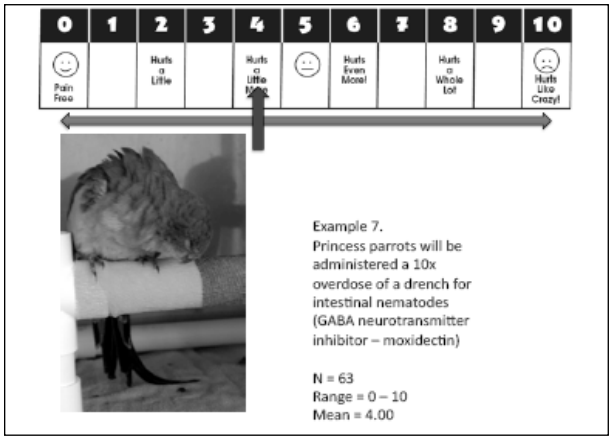
This example is used to illustrate that many general anaesthetics supply no analgesia. The different pathways of pain that will be activated in this example include those of skin and muscle and the pressure receptors in the abdomen.



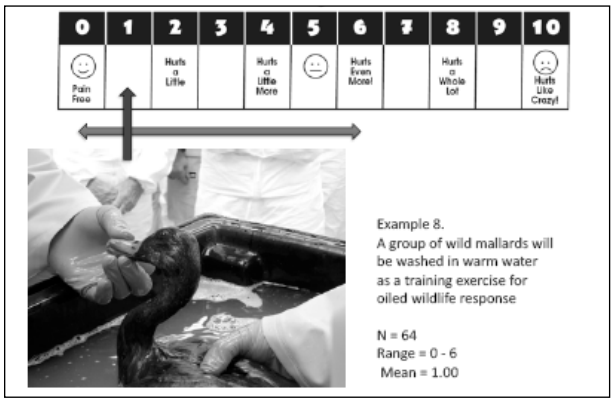
This common husbandry procedure in poultry sheds is used to demonstrate the need to know the nervous anatomy of the area affected. The beak is rich in neural supply and contains many mechanoreceptors as well as a deep bed of soft tissue below the keratinised surface.



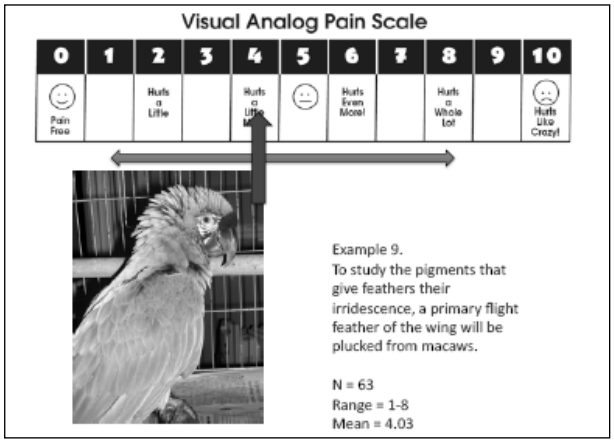
A traumatic amputation with bone ends exposed is something most participants recognised as intensely painful.



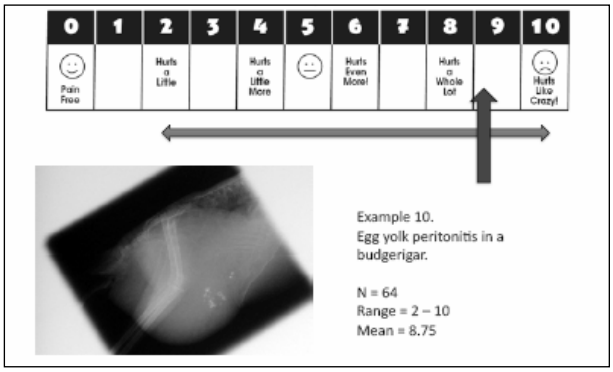
I don't know what pain these birds experienced as the behavioural signs seen here were possibly just the disruption of motor function caused by the overdose of this neurotransmitter blocker. Sometimes extrapolation from human experience will only take you so far. These birds may have been pain-free or in excruciating pain.



Despite emphasising at this point that the examples should be pain scores not stress scores, many participants rated this as a painful procedure. I included it as what I thought would be a pain-free example of a warm bath.



The primary feathers of the wing insert on the periosteum of the ulna. Plucking these feathers is a matter of tearing the attachments from the bone and, judging by the response of birds is an extremely painful procedure. This emphasises again the need to know your species anatomy and peculiarities.



An egg yolk peritonitis involves inflammation and pressure distension of the peritoneum. Birds do have a peritoneal membrane enclosing the intestines that is separate from the air sac. Extrapolating from human experience this is an intensely painful experience.

The relief of pain in birds is also problematic. Most of our understanding of the physiology of analgesia in birds comes from a small number of studies on pigeons and domestic poultry. From this work it appears that birds differ from mammals in that the forebrain nociceptors are dominated by kappa rather than mu receptors. This means that common opioid analgesics used in mammals (e.g., morphine, fentanyl, buprenorphine) are unlikely to provide effective analgesia in birds and this is supported by the limited analgesia studies available. Further, the hazards of inter-species extrapolation has been shown repeatedly in the few pharmacokinetic and pharmacodynamic studies we have of analgesic drugs in birds. Birds show much faster rates of metabolism and drug clearance and there is considerable species variation in these parameters. This suggests that if we extrapolate the dose rates of analgesics from mammals to birds we will not provide effective analgesia.

The current best practice recommendations we have for reducing pain through pharmacotherapy is to use mixed receptor opioid analgesics such as butorphanol (2-4 mg/kg intramuscularly every 4-6 hrs) for severe pain. Non-steroidal anti-inflammatory drug such as carprofen (3 mg/kg po sid-bid) or meloxicam (0.2 mg/kg po sid) are very effective for chronic and lower grade pain but care needs to be taken to avoid renal or gastrointestinal side effects. Regional or local anaesthesia using lignocaine and/or bupivicaine can also be useful but care is needed to avoid systemic toxic effects at doses greater than 2 mg/kg. A combination of these agents, known as multimodal or balanced analgesia is the most effective.

It is vital not to rely solely on drugs for analgesia. Good attention to husbandry and nursing care can dramatically reduce pain and stress. Thermal, nutritional and fluid support of animals in pain will all be beneficial. For domesticated birds human contact can be soothing, but for wild birds minimising human interactions can be an important way to reduce stress and pain.

Acknowledgments

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Further reading

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