Introduction

- What is pain?
- What happens in the body.
- How we assess pain.
- Acupuncture.

What is pain?

- Pain is…..
  - Unpleasant?
  - Due to physical harm?
  - Emotional?
  - Subjective?
  - Individual!

- “… an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.” IASP, 2006.
Different ‘types’ of pain

- Nociceptive pain:
  - Can be described as ‘normal’ pain, protective, physiological and protective.
  - First and second pain.
  - Visceral or somatic.
  - Can lead to the development of chronic pain if managed inappropriately.

Different types of pain

- Inflammatory pain:
  - In response to actual tissue damage.

- Neuropathic pain:
  - Due to damage to the nervous system.
  - Nociceptors aren’t involved.
  - Serves no useful purpose.
  - Difficult to diagnose and confirm in veterinary species.

- Functional pain:
  - A type of neuropathic pain where there is no physical cause.
  - Not documented in animals yet.

Transmission of pain

- Complex sensory pathway starting from stimulus and ending with cognitive perception.
- Can be simplified into four stages:
  - Transduction
  - Transmission
  - Modulation
  - Perception

Where do analgesic drugs fit in?

- Local anaesthetic blocks e.g. epidural or peripheral blocks.
- Non-steroidal anti-inflammatory drugs (NSAIDs), e.g. metacam, rimadyl, meloxicam, etc.
- Opioids e.g. morphine and buprenorphine.
- Other analgesic drugs, e.g. ketamine, melatromine and paracetamol.
- General anaesthesia.

Example

- Undergoing TPLO surgery due to a ruptured cranial cruciate ligament.
- What type of pain is involved?
  - Acute nociceptive pain.
  - Inflammatory pain.

How can we block pain?
Daisy, 8y FN Airedale

- Chronic bilateral cruciate disease and OA.
- Lumbar spinal pain.
- IBD and colitis controlled with steroids.
- Insulin-dependent diabetic with bilateral cataracts.
- GRUMPY!

Daisy, 8y FN Airedale

- What type of pain?
  - Inflammatory?
  - Acute vs. chronic?
  - Neuropathic?
- How do we assess her pain?

Daisy, 8y FN Airedale

- Pain management:
  - Prednisolone (steroid).
  - Paracetamol.
  - Hydrotherapy and physiotherapy.
  - Acupuncture.

Assessing pain

- Fundamental part of pain management.
- Human pain 'experience' is split into three parts;
  - Sensory-discriminative,
  - Affective-motivational,
  - Cognitive-evaluative.
- Can be difficult to accurately assess pain in animals.

Assessing acute pain

<table>
<thead>
<tr>
<th>Objective</th>
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<tbody>
<tr>
<td>Physiological indicators of pain?</td>
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<tr>
<td>Heart rate, respiration rate, blood pressure, pupil size, plasma cortisol, beta-endorphin levels</td>
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<tr>
<td>Measurement of thermal, mechanical pain thresholds</td>
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<td>Objective behavioural assessment</td>
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<table>
<thead>
<tr>
<th>Subjective</th>
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<tr>
<td>One dimensional:</td>
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<tr>
<td>Simple descriptive scales (SDS)</td>
</tr>
<tr>
<td>Verbal rating or ordinal scales (VRS)</td>
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<tr>
<td>Numerical rating scales (NRS)</td>
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<tr>
<td>Visual analogue scales (VAS)</td>
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<tr>
<td>Multidimensional pain scales:</td>
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<tr>
<td>University of Melbourne Pain Scale</td>
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<tr>
<td>Glasgow Composite Pain Score</td>
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Assessing chronic pain

- Very difficult in humans and animals.
- Relies heavily on input from owners!
- Questionnaire-based assessment:
  - GUV-Quest (www.vetmetrica.com).
  - Helsinki Chronic Pain Index.
  - Canine Brief Pain Inventory.
Veterinary Acupuncture

• What is acupuncture?
• How does acupuncture work?
• When and how can we use acupuncture?

What is acupuncture?

"Insertion of a solid needle into the body for the purpose of therapy, disease prevention and/or the maintenance of health."

• Acupuncture is not:
  – Moxibustion
  – Gold bead implantation
  – Laser acupuncture
  – Acupressure
• An Act of Veterinary Surgery.

What is acupuncture?

• Adjunctive therapy for pain management.

• Western Approach:
  – Adapted Traditional approach using current knowledge of anatomy, physiology, pathology and evidence-based medicine.
  – Based on neurophysiological principles.
  – Incorporates traditional acupuncture points.

What is acupuncture?

• Adjunctive therapy traditionally used in people in the management of multiple conditions, including pain.
• Growing popularity in veterinary species.
• Originated in China?
• Otzi (3300 BC) – Alpine Iceman

What is acupuncture?

• Adjunctive therapy for pain management.

• Traditional Chinese/Eastern Approach:
  – Alterations in the flow of ‘Qi’ (pronounced chi) along body meridians.
  – Traditional acupuncture points
### How does acupuncture work?

- **Specific effects** are mediated through the stimulation of the peripheral nervous system and subsequent neuromodulation within the CNS.

- **Effects can be:**
  - Local
    - Segmental
    - Heterosegmental
    - Generalized.
  - Analgesic
  - Non-analgesic

### Can I use acupuncture?

**YES:**
- Osteoarthritis
- Chronic pain states
- Neuropathic pain
- Disc-related pain
- Wound healing?
- Alopy?

**NO:**
- Immunocompromised patients.
- Bleeding disorders.
- Overlying skin infections.
- Pregnant animals.
- Risk of entering the thorax/abdomen.

### Where do I put my needle?

**Western approach:**
- Myofascial trigger points
- In muscles near tender points
- In muscles innervated by the same neurological segment.
- Traditional acupuncture points – local and generalized effect.

### Treatment

- Dry needling or electroacupuncture (EAP)
- 20-30 minutes per session.
  - CCK-8 release after >45 minutes.
- Weekly sessions for 4-6 weeks, then increase the interval depending on the individual.
- Not all animals respond positively to acupuncture.

### Side effects and complications

- **Mild adverse effects** in 10% patients.
  - e.g. tiredness, local pain, temporary exacerbation of symptoms
- **Moderate adverse effects** in 0.13% patients
  - e.g. fainting, severe exacerbation of symptoms
- **Serious adverse events** in 0.024% patients.
  - E.g. pneumothorax, bacterial endocarditis (auricular AP), cardiac tamponade
- **No reports in animals.....**
Evidence?

- Post-operative pain in hemilaminectomy patients;
  - Reduced post-operative opioid requirement (Lair et al, 2009).
  - Improved function compared to control groups (Hayashi et al, 2007).
- Elbow OA;
  - No effect of EAP on ground reaction forces and pain scoring (VAS) in elbow OA in dogs but 8/9 blinded Owners able to identify period of AP (Kapatin 2006).
- Humans – OA, neck pain, chronic lower back pain and nausea.

In summary.

- Acupuncture is an adjunctive therapy that can be used in patients with chronic pain.
- The risk of side effects are low.
- Not all patients respond to acupuncture.

Any questions?