Pain management is individualized for each patient.

Clinical Pain:
1. Acute Pain
   Operative and Trauma Care
2. Chronic Pain
   Arthritic Pain
   Cancer Pain
3. Critical Care Analgesia

Pain is an unpleasant sensory and emotional experience with actual or potential tissue damage. (Merskey 1979)

This definition of pain is also applied to the animal patient.

1. Acute Pain and Perioperative Pain Management:
   - Perioperative and Trauma Care
   - The first area of marked improvement

2. Chronic Pain, Arthritic Pain, and Cancer Pain
   - For our clients, the most obvious improvements in veterinary pain management.
   - For example, have you heard of “Rimadyl”? (>8M dogs in US alone)
3. Critical Care Analgesia:

- Advantages are well defined.
- Mechanisms are documented.
- Tools are available.
- Application of these too often lags. Same is unfortunately true in human medicine.

Benefits of Pain/Stress Management

- Reduced sympathetic stimulation
- Better control of cardiovascular function
- Reduced neurologic stimulation
- (maladaptive neuro-endocrine response)
- Improved eating & drinking
- Improved general well being
- Reduced morbidity and mortality

Pain as a Vital Sign

Patient evaluation based on:
- Temperature
- Pulse (heart rate)
- Respiratory rate
- Blood pressure (in humans primarily)
- Pain

AAHA PM Standards:
"Pain assessment using a standardized scale or scoring system is recorded in the medical record for every patient evaluation"
- Pain scales...
Options for Evaluation

1. Simple Descriptive Scale
2. Numerical Rating Scale
3. Composite Scale
4. Interactive Visual Analog Scale

Measurement of stress:  
- neuroendocrine catecholamines  
- electrical impedance/conductance

Measurement of pain:  
- Intraspinal c-fos

Behavioral signs...

Many Factors Influence Pain Scores

- Temperament
- Vocalization
- Posture
- Locomotion
- Other behavioral changes

Behavioral Indicators of Stress and Pain

- Appetite
- Activity
- Facial expression
- Appearance
- Attitude
- Vocalization
- Activity
- Posture
- Aggression
- Response to handling

There are species-specific variations in the reliability of the behaviors or indicators of pain

- Behavioral differences may be observed when the patient is removed from its normal environment
- Client / owner input should be considered
- Reassessment after treatment should be made by the same individual

Species-specific responses to chronic pain:

- Dogs - eating behavior is rarely affected
- Cats - isolation from others in the household, decreased grooming, and cessation of eating
- Horses - inappetance, severe weight loss, dull expression, glazed eyes, and basewide stance
- Ruminants - weight loss and isolation from the herd
- Pigs - reluctance to rise, reduced social interaction, and little appetite change
Behaviors as potential indicators of pain in the dog:

- Hunched or prayer position
- Glazed facial expression
- Attention-seeking and whining
- Licking the painful area
- Not hiding the painful body part

Behaviors as potential indicators of pain in the cat:

- Poor or lack of grooming
- Hissing or aggression if the painful part is manipulated
- Tendency to hide the painful part and look normal
- Dissociation from the environment
- Vocalization is rare

Common behaviors associated with chronic pain:

- Temperament - dull, grouchy, and grumpy.
- Posture and locomotion - limited ambulation, altered gait, overt lameness, reluctance to move, difficulty rising, and reduced play behavior.
- Grooming - alteration in or lack of grooming, grooming of specific parts, and licking of painful parts.
- Reduction of activity level.
- Reduction of food and water consumption.
- Inappropriate urination and defecation.

Documented Observation Biases:

- Human sensitivity to vocalization and extreme behaviors.
- Lameness evaluation:
  - Affected by joint
  - Severely subject to observer bias
  - Owner evaluation subject to placebo effect
- Caretaker expectation of perceived pain

Sudden Changes in Behavior:

- Non-responsive:
  - Hiding, motionless, silent
- Vocalization:
  - Crying, barking, hissing
- Aggression:
  - Biting, kicking, pawing, scratching, ...Caution!

CAUTION

- Pain induces neurological activity, which will increase arterial blood pressure & heart rate
- It also creates stress & its related impact on function
- It causes changes in temperament
Pain Posture and Attitude

Pain Behavior

Scales for Evaluation of Pain:

1. Simple Descriptive Scale
2. Composite Scale
3. Interactive Visual Analog Scale
4. Numerical Rating Scale (Interactive, 0-10)
   (Repeated evaluations by owners, veterinarians & staff)
   Our choice for evaluation of clinical pain.

Other pain scales have been developed and should be considered.

Pain Scales: Simple Descriptive Scale

- Modified Verbal Rating Scale
- Adapted from Jensen & Karoly, 1992
- Subjective based on simple observations & conclusions

(Pain Scales: Numerical Rating Scale (NRS)

- Scale of 0-10 based on 0 is no pain and 10 is worst possible pain

The use of pain scores in animals is more complex than in humans. The use of single signs of pain such as facial expressions may lead to erroneous conclusions.

(Pain Scales: Numerical Rating Scale (NRS))

Additional behavioral information is required for complete assessment.

(Same Scale as Used in Animal Pain Scoring?)
Pain Scales: Visual Analog Scale (VAS)

- Use of the VAS to evaluate pain management
- Scale of no pain to worst pain ever, 0-100 mm

Animal with pain requiring treatment

Evaluation after treatment

Post-treatment. Pain is returning, TIME TO REDOSE.

Pain Scales: Numerical Rating Scale (NRS)

- Interactive Scale of 0-10
- Based on 0 as no pain and 10 as the worst possible pain for that condition
- Behavioral signs
- Interactive
- Approach, engage, physically contact, elicit responses
- Repeated evaluations by owners, veterinarians & staff
- Evaluations before and after analgesic interventions
- Individualize interactions and evaluations to patient needs
- Pain score recorded for every patient evaluation

Numerical Rating Scale
Application of Pain Scales in our Patient Care:

- Tramadol
- Buprenorphine
- Butorphanol
- Remifentanil (Ultiva)
- Fentanyl (Duragesic)
- Morphine

Dose to effect

Interactive Numerical Rating Scale

Evaluations are conducted by owners, veterinarians & staff. All evaluations should be interactive with the patient.

Principles in Pain Management

1. Preemptive analgesia
2. Balanced analgesia
3. Dose to effect

Balanced or Multi-modal Analgesia:

- Thorough Nursing Care
- Alter the Environment
- Distraction / Relaxation
- Opioids
- Loco-Regional Anesthesia
- Alpha-2 Agonists
- Adjunctive Analgesics
  - tramadol, gabapentin, amantadine, ketamine, acupuncture, etc.

Make best use of Opioids:

- Morphine
- Oxymorphine
- Hydromorphone
- Fentanyl (Duragesic)
- Remifentanil (Ultiva)
- Butorphanol
  - (Torbutrol, Torbugesic, Stadol)
- Buprenorphine
  - (Buprenex, Temgesic)
- Tramadol (Mu agonist plus inhibits reuptake of NE & 5-HT)

Epidural Opioids +/- Locals

- Powerful and sustained analgesia
- Effective throughout the body
- Technically easy
- Cost effective
- Numerous benefits
Neuroaxial Analgesia:
- 12-24 hours of substantial analgesia
- Decreased “Stress response”
- Epidural Morphine (Duramorph, preservative free)
- Morphine USP
- Bupivacaine or Lidocaine (with volume expansion)

Success with Local Anesthetics:
- Drugs used:
  - Lidocaine
  - Bupivacaine, Ropivacaine
  - Articaine
- Applications:
  - Regional, Specific Nerve Blocks, Infiltration
  - Neuroaxial Epidural, Spinal
  - Intravenous (Lidocaine C.R.I.)
- Locals are very cheap and very effective!

Make best use of NSAID’s:
- Ketoprofen
- Carprofen
- Etodolac
- Deracoxib
- Meloxicam
- Firocoxib
- Other NSAID’s
- (Acetaminophen)

Which NSAID?
- Recognize tremendous individual patient variability in efficacy and safety of various NSAID’s, and it changes!
- Skill in application and management
- Management of toxicities
  - Cox-2 selectivity/specificity
  - Constitutive Cox-1 and Cox-2
  - Cytoprotective measures
  - Dual pathway Cox/Lox
- Several paradigm shifts regarding NSAID toxicities

Principles in Pain Management
1. Preemptive analgesia
2. Balanced analgesia
3. Dose to effect
   - plan a “wet lab”...
Case Studies - How to Manage that “PAIN IN THE YAK”

Case Studies
- Fan-belt Trauma

Case Studies
- Thermal Burns - dog or cat

Case Studies
- Thoracotomy

Case Studies
- Evisceration – Gored by a "Pet" Boar!
- Massive trauma, sepsis, shock

Case Studies
- Total Ear Canal Ablation
Case Studies

- Polytrauma
- Multiple Fractures, etc.

How to Manage Clinical Pain

Dr. Ralph Harvey

Thank you for participating in these sessions!