Cats don't make it easy - helpful tools to assess, manage, and treat feline OA

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Disclosures

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Discussion Points

- OA/DJD as a multidisciplinary condition
- Behaviors affected by OA pain
- Why it matters: Quality of life
- What’s in the future for treatment
PAIN IS MULTIDIMENSIONAL AND IS A UNIQUELY INDIVIDUAL EXPERIENCE

PHYSIOLOGIC
- Location
- Onset
- Duration
- Etiology

SENSORY
- Intensity
- Quality
- Pattern

BEHAVIORAL
- Physical activity
- Medications
- Pain behaviors
- Sleep

SOCIOCULTURAL
- Environment
- Family

EMOTIONAL
- Mood
- Anxiety
- Well-Being

COGNITIVE
- Coping

Chronic pain has downstream consequences

Leads to changes reflective of:
• Defensive behavior
• Learned avoidance
• Peripheral and central sensitization
This complicates our management of patients

https://www.physiopedia.com/Considering the Stress Pain Cycle in Assessment
Decreased coping $\Rightarrow$ Increased fear/avoidance

- Tightened muscles
- Tense
- Nervous
- Vigilant
- More inhibited behavior
OA is a multidisciplinary condition
With a multidisciplinary patient

CKD, chronic kidney disease; DM, diabetes mellitus; HCM, hypertrophic cardiomyopathy; OA, osteoarthritis.
High overlap of DJD and CKD

Prevalence and classification of chronic kidney disease in cats randomly selected from four age groups and in cats recruited for degenerative joint disease studies

Marino et al 2014

Figure 1 Prevalence of cats with chronic kidney disease (CKDpos), small kidneys, and without CKD (CKDneg) in the randomly selected (RS) and degenerative joint disease (DJD) groups. Total prevalence (percentage) is shown above each bar. The prevalence was calculated as the number of cats in each category out of the total number of cats in the RS and DJD groups.
Prevalence of painful OA is high

- Middle-aged and older cats
  - 61%-92% of cats show radiographic evidence of DJD
  - ~40% of all cats will have DJD and associated pain

- More cats than are being treated

DJD, degenerative joint disease.

Why do we miss feline OA signs?

• Most cats do not exhibit lameness\textsuperscript{1}
  • Frequently bilateral\textsuperscript{2,3}
  • Tendency to be less demonstrative about pain as a protective mechanism\textsuperscript{4}

• Cats compensate for severe disease because they are small and agile

• Radiographic changes are variable\textsuperscript{1}
  • Cats with early disease may be very painful yet show no radiographic changes

1. Bennett D, et al. Osteoarthritis in the Cat: How common is it and how easy to recognize JFMS 2012, (14) 65-75
Behavior is the single best way to assess for the presence and progression of pain.
Painful OA affects cat behavior

- Changes in mobility
  - Gait or activity
  - Ability to maneuver and perform daily routines
  - Loss of smoothness/fluidity

- Changes in behavior
  - Decreased sociability
    - Hiding, changes in mood/demeanor/tolerance of handling
How do we identify this cat?

How do we quantify the behavior?

How do we monitor treatment?
How do we identify this cat?

How do we quantify the behavior?

How do we monitor treatment?
Six activities can help identify cats with OA

Percentage of cats scored as ‘abnormal’

Unlike dogs, these behaviors are best observed in the home.

Without owner engagement, many of these behaviors are attributed to aging.
Why it matters: Quality of life

With OA:

- Coping ability decreases
- Modifications needed to ensure access

Because quality of life is more than just absence of pain...
Many impacts on quality of life

- Pain
- Anxiety
- Fear
- Aggression
- Mobility impairment
- Sickness
- Chronic diseases
- Cognitive decline
- Environment
To understand what to provide, we need to understand cat needs
CAT TIME BUDGET

- Sleeping: 44%
- Eating: 2%
- Grooming: 8%
- Travel: 3%
- Hunting: 17%
- Resting: 25%
- Other: 1%

How is this altered by chronic pain?

To understand *cat needs*, we need to understand their history

- Solitary hunters
- Social structure is both solitary and community
- “Time-share” resources
- People are a part of cats’ social structure
- Use scent for communication
Solitary hunters — Midlevel predators
Cats have a flexible social structure.
| Time-sharing of resources | System of communication designed to avoid conflict |
Social interactions with people are important.
Cats use scent for communication
Cats depend on us to meet their needs

- Lack of activity and enrichment could lead to a variety of health and behavioral issues
  - Obesity
  - Inappropriate play
  - Boredom/frustration
  - Potential for behavior problems
The importance of 3-D space

- Increased 3-D space
  - Increased use of space and
  - Decreased agonistic encounters

- Cats treated with effective analgesic will resume use of vertical space

- What accommodations must be made to preserve access?
Safe places – Ability to ‘get away’ may be compromised
Cats with OA pain need consistent access to safe, comfortable spaces.
How do we identify this cat?

Owner engagement is crucial – they know their own cats’ behavior and notice changes earlier

BUT, they often dismiss the changes as “slowing down” or normal aging
Learning about OA and associated pain motivates action among owners

Owners:
• Can detect behavioral changes in their cats
• Do not want their cats to be in pain
• Must understand that these behavioral changes may indicate disease
When we ask about pain...

- This requires a shift in our language
Current emphasis for ‘pain’ is weighted on extreme behaviors

- Change in form of feeding behavior
- Avoiding bright areas
- Growling
- Groaning
- Eyes closed
Need to shift to awareness

Less extreme behavioral changes are still indicative of painful disease
Osteoarthritis has physical and emotional effects

Just as in humans, chronic pain negatively impacts your cat's quality of life, not just physically, but also emotionally. The good news is that by identifying your cat's condition, you and your veterinarian can develop a treatment plan for your cat.

A recent peer-reviewed published study demonstrated the initial validity and reliability of a quality of life assessment for chronic diseases, such as osteoarthritis, in cats. Using these questions, you can help your veterinarian assess and monitor how well your cat's chronic pain management treatment is working.

Think about your cat's behavior in the past week and help us determine a starting point by completing the following table.

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energetic &amp; Enthusiastic</td>
<td></td>
<td></td>
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<tr>
<td>Active &amp; Comfortable</td>
<td></td>
<td></td>
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<tr>
<td>Happy &amp; Content</td>
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</tbody>
</table>

Your cat's general behavior history can be helpful

Additional information that can be helpful to your veterinary team is your cat's behavior:

1. Has your cat's personality and sociability changed?
   - [ ] Yes
   - [ ] No

2. Has your cat's urination or defecation habits changed?
   - [ ] Yes
   - [ ] No

3. Is your cat hiding more or does your cat seem to be "slowing down"?
   - [ ] Yes
   - [ ] No

OA pain can affect cats of any age, and it has been seen in more than 60% of cats that are 6 years or older or if left untreated, the pain can become worse over time. This checklist is designed to help with the recognition of OA pain to help keep your cat happy and active. Your veterinary team will review the results of this checklist with you to identify if your cat might be suffering from OA. This checklist is not a medical diagnostic tool and is not intended to replace discussion with an animal healthcare professional. Discuss medical concerns with your veterinarian.

References:
Climbing up stairs: uses ‘bunny-hop’, with both back legs hopping at same time, and/or stops for a break.

Climbing down stairs: angles body to the side, descends one stair at a time, and/or stops for a break.

Chasing moving objects: slows down or takes breaks during play and/or may have thinner frame near the tail.

Jumping up: hesitates before jumping up, doesn't clear jumps in one leap, and/or uses arms to pull the legs up.

Jumping down: hesitates before jumping down, makes smaller jumps vs. one big one and/or reaches down towards the ground instead of leaping.

Running: moves at a slower speed and alternates between jogging & walking, and/or back feet angle together.
Comparisons are powerful (especially for slowly progressing conditions)
What we have:

- Appreciation for the effects of OA pain on QoL for cats
- Behaviors we can use to identify and monitor OA pain
- Owners motivated to provide pain control for their cats

What are we missing?
Treatment and management

PRIMARY GOAL: RESTORE QUALITY OF LIFE

1. Lifestyle changes
2. Pharmacological intervention
3. Nonpharmacological intervention

Lifestyle changes: Environmental


Lifestyle changes:
Supportive

• Weight loss
• Controlled exercise
• Grooming
Current OA intervention toolbox

- NSAIDS
- Platelet-Rich Plasma
- Opioids
- Stem cells
- Alpha-2 Agonists
- Nutraceuticals
- Tricyclic antidepressants
- Joint diets
- Ketamine
- Rehabilitation
- Gabapentinoids
- Acupuncture
Pharmacologic interventions:

- # None approved in the US
- * Proven efficacy based on evidence-based veterinary medical literature

<table>
<thead>
<tr>
<th>#Approved therapies</th>
<th>NSAIDs (meloxicam; robenacoxib)</th>
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<tr>
<td></td>
<td>Frunevetmab</td>
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<th>*Proven therapies</th>
<th>NSAIDs</th>
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<td>Diet optimization</td>
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Remember our multidisciplinary patient...
Balancing treatments and cat-human bond is critical
Many target opportunities in the periphery
Nerve Growth Factor (NGF)

• During development: aids the normal development of the nervous system

• In the adult: primary role is pro-nociceptive
NGF plays an important role in OA pain

Anti-nerve growth factor monoclonal antibodies for the control of pain in dogs and cats

Masataka Enomoto,1 Patrick W Mantyh,2 Joanna Murrell,3 John F Innes,4 B Duncan X Lascelles1,5,6,7

Anti-NGF Strategies

- Removing free NGF (Anti-NGF mAb)
- Preventing NGF from binding to TrkA
- Prevent TrkA activation
Benefits of Monoclonal Antibodies (mAb)

• Long duration of action (long half-life)
• Injectable
• Low risk of toxicity
• Highly specific; not cross BBB
Feline anti-NGF mAb

Proof-of-concept study\(^1\)

- 34 cats (single site)
  - 23 frunevetmab; 11 placebo
- 1 injection (SQ)
  - 7 weeks additional follow-up
- Activity monitors and owner questionnaires

Pilot field study\(^2\)

- 126 cats (multi-site)
  - 85 frunevetmab; 41 placebo
- 2 injections (SQ or IV)
  - 4 weeks apart
- Activity monitors and owner questionnaires

Both studies showed a positive effect of frunevetmab for treatment of chronic pain in cats

Key takeaways

• Behaviors impacted by chronic pain are important components of quality of life for cats

• Behavior remains the best way to assess pain in cats
  – These are best assessed in the home

• Owners who know what to watch for are able to identify abnormal behavior
  – And are motivated to treat their cats

• New treatment options offer promise for relief of OA pain in cats
Questions?