FELINE OA COMPENDIUM:

A Practical Resource for Managing Feline Osteoarthritis Cases

THE NEW SCIENCE OF
FELINE OA PAIN

ZOETIS PETCARE

OVERVIEW OF OSTEOARTHRITIS

Osteoarthritis (OA) is an incurable, painful, and progressive disease of the joints that reduces quality of life.[1,2] OA is a common condition in cats, with almost 40% of all cats showing clinical signs,[3] and >90% of cats over 12 years having radiographic evidence of OA.[4] While the risk for suffering from OA increases with age, this is not just a disease of old cats. Clinical studies have shown that cats as young as 6 months can suffer from this degenerative condition.[5]

Given the progressive nature of the disease, screening all cats for OA in general practice is essential. This process can not only help to establish a baseline of what's "normal" for individual cats but also to identify signs early in the disease. Broad screening, early identification, and active monitoring can help to increase the number of cats who are treated, relieving pain and increasing mobility—and ultimately improving their quality of life.

Characteristics of OA Pain

The multidimensionality of pain (its ability to affect mood, cognition, sleep, etc.) makes it even more important to address OA and associated pain. OA involves a sensory component (nociception) in which joint damage from OA sends signals to the brain through the central and peripheral nervous systems that alert the cat to the painful stimuli. The autonomic pathways and other areas of the brain also play a role in how the cat experiences the pain of OA, adding an unpleasant emotional aspect to the condition (an affective component).

In addition to nociceptive pain (physical damage to the body causing pain), OA causes:

- **Inflammatory pain**—Low-grade inflammation characteristic of OA stimulates the immune system to react, releasing inflammatory mediators (e.g., cytokines).
- **Maladaptive (pathological) pain**—OA pain is then amplified as various changes occur at the molecular, cellular and microanatomic levels, with pain becoming chronic and causing peripheral and central sensitization. This has been referred to as "wind-up" pain.

The peripheral and central sensitization that results from maladaptive pain leads to exaggerated responses to painful stimuli, as well as responses to stimuli that don't normally cause pain, like touch or pressure. Maladaptive pain produces pain that is longer lasting (duration) and wider reaching (further from the original site).

Nerve Growth Factor

Recently, a new key player has been identified in the transmission of OA-associated pain in people, dogs, and cats: nerve growth factor (NGF). As an integral component of central sensitization, plasticity of the spinal cord, and maladaptive pain signaling, NGF plays a significant role in pain.[6] The resulting "wind-up" of the nervous system that occurs with central sensitization causes a persistent state of pain hypersensitivity. This process starts quickly, within days or even hours of joint changes.

Studies investigating the interaction between NGF and its receptor, tropomyosin receptor kinase A (TrkA), have found that this novel OA pain pathway shows promise for new therapies for cats.[7] Of several anti-NGF/TrkA signaling strategies that have been examined, monoclonal antibodies (mAbs) that bind to NGF are at the forefront of this new field.[7] With treatment, previously sensitized nerves return to a more normal function, helping pain regulation in the peripheral and central nervous systems. Additionally, anti-NGF indirectly stops inflammatory cells from releasing proinflammatory mediators and more NGF. This may play an important role in interrupting pain signaling, and provide targeted and sustained relief from OA pain.

Anti-NGF mAbs may offer an exciting new therapeutic option for cats suffering from the pain of OA.

PART 1:
FELINE FRIENDLY HANDLING FOR OA PATIENTS

Feline Friendly Visits for OA Cats

Cats may outnumber dogs as pets in the United States, but cats receive significantly less veterinary care than dogs.[8] Generally, if cats appear to be healthy and happy, most cat owners see no reason to go through the stress of visiting the veterinarian. However, when cats display behaviors outside of their normal behavior, cat owners *will* make an appointment. In fact, in a survey of 200 US cat owners, 55% of cat owners reported they intended to make an appointment with their veterinarian after reading a description of feline osteoarthritis.[9]

The veterinary visit can start with client education and at-home observations before the cat enters the clinic.

Many cat owners don't understand the need for regular veterinary care for a healthy cat. When asked why pet owners don't bring their cats in for veterinary care, the primary reason was the stress of the clinic visit; which includes all of the smells, sounds, strange people, and other pets at the clinic. Together, these can increase the cat's negative experience and stress associated with the visit.

Veterinary teams can change client and cat clinic experiences by:

- Providing tips for getting cats into the clinic in a less stressful way
- Creating calm and comfort in the waiting area and exam room
- Clearly explaining what they are doing with the cat and why
- Establishing feline friendly handling techniques that minimize restraint and are responsive to cues from the cats

By altering the clinic visit experience, veterinary teams can relieve stress for cats, owners, and themselves while creating a trusting relationship and optimizing visit outcomes.

These considerations will go a long way in relieving stress and anxiety for cats, which are already elevated if they are suffering from OA pain. Additionally, they can optimize visit outcomes, creating a trusting relationship with patients and clients.

The American Association of Feline Practitioners (AAFP) and the International Society of Feline Medicine (ISFM), created the Feline-Friendly Handling Guidelines.[10] These guidelines were developed to address the importance of providing the best possible care for cats and can be found at this link:
https://catvets.com/guidelines/practice-guidelines/handling-guidelines

Feline Friendly Handling Tips

- Foster calm by using low voices in both the waiting and exam rooms
- Read the cat's behavioral cues
- Use gentle handling
- Apply minimal restraint
- Do not scruff
- Take it slow
- Strive to complete exam in the room
- For cats with OA, increased stress will make it more difficult to assess pain

Keys to a Successful OA Exam in Cats

A successful OA exam in cats can be accomplished by following a 3-stage approach that includes owner assessment, in-clinic observations, and an orthopedic evaluation/exam. This approach is detailed below.

1. Owner Assessment

Cat owners are less motivated to take their cats to the veterinary clinic because they anticipate a negative veterinary experience, not because they'd rather "do it themselves."[11] Owners are highly attuned to their cat's routine and quickly notice when things are different, but don't always know what changes in behavior mean. It's important to educate and involve them in the process. Owners can aid in OA pain assessment in 2 ways:

- **Completing questionnaires**—Owners answer questions about their cat's ability to perform activities of daily living (ADL), as well as the cat's general mobility and well-being, using a clinical metrology instrument. Pages 9 to 12 detail a newly validated screening tool specifically designed for cat owners.
- **Taking video**—Owners record video of their cat moving around in their home environment and performing specific ADL. The veterinarian then reviews the video, gaining insight into the cat's movements.

2. In-Clinic Observations

The exam room provides a useful setting for practitioners to observe cats:

- Open the cat's carrier, and allow the cat to come out at its own pace, and walk around the exam room.
- While taking the history from the owner, watch the cat move around the room and observe the cat's mobility.
- Consider encouraging the cat to jump up onto chairs or down from the exam table to get a broader picture of the cat's mobility.

This observation can provide great clues about how impaired a cat is, as well as where the impairment is centered.

3. Orthopedic Evaluation/Exam

The orthopedic examination is where you'll put the final pieces of the puzzle together. During this evaluation, you'll focus on:

- Identifying any hypersensitivities
- Evaluating muscle mass, looking for muscle atrophy that may indicate individual joint issues
- Performing a joint examination. This requires manipulating major joints with the cat in different positions, both with an assistant and without (this part of the evaluation is covered later in this resource in the diagnosis section; see page 15)

PART 2:
SCREENING FOR FELINE OA PAIN

Owners play a critical role in helping veterinarians diagnose feline OA pain. To that end, using a simple checklist that is easy and quick to complete can help owners understand signs of OA pain in their cats and relay that information to the veterinarian.

Such a checklist helps bridge the gap between how owners perceive pain in their cats and how veterinarians assess pain. The Zoetis Petcare Cat Osteoarthritis Pain Checklist provides this clinically expedient communication tool, both educating and empowering owners about OA and increasing the ability of veterinarians to screen for OA pain in cats.

What Is the Zoetis Petcare Cat Osteoarthritis Pain Checklist?[12]

The Zoetis Petcare Cat Osteoarthritis Pain Checklist was developed to assess chronic OA pain in cats using validated methodologies to accurately and reliably capture owner observations that might indicate OA pain in cats.

Brief and easy to understand, the Zoetis Petcare Cat Osteoarthritis Pain Checklist can be quickly completed by owners, making it a valuable in-clinic asset.

An Important Educational and Communication Tool

The checklist works as an important educational tool by helping owners recognize the behaviors that can signal OA pain in cats, as these can differ from those in dogs. It also serves as a collaborative communication method between owners and veterinarians, providing an effective way to start this discussion with the owner. In addition, it gives veterinarians a clinically useful tool to identify cats likely to be suffering from OA pain, prompting further evaluation. The first checklist an owner completes becomes the cat's baseline before treatment.

What Is Included in the Zoetis Petcare Cat Osteoarthritis Pain Checklist?

As previously noted, OA pain is multidimensional, affecting cats in various ways, so different screening parameters are useful in helping to identify pain associated with the condition. The checklist consolidates 3 aspects that together create a well-rounded profile of feline OA pain:

1. Functional loss from OA pain (MiPSC)
2. Physical and emotional well-being (quality of life)
3. Relevant medical history

Functional Loss

The first part of the checklist describes specific behavioral signs that may indicate OA pain and functional loss and asks owners to identify whether they have noticed their cat having difficulty performing any of these behaviors:

Climbing up stairs	
Climbing down stairs	
Chasing moving objects	
Jumping up	

The functional loss section of the checklist (the Musculoskeletal Pain Screening Checklist or MiPSC) used data from previous studies of OA in owned cats to design and test the questions ultimately included in the checklist.

A higher percentage of cats with OA pain were rated as "impaired" for many of the activities, a stark contrast to cats who did not have OA. The 6 questions ultimately included in the checklist would identify 99% of cats that came in whose owners were aware of OA and associated pain behaviors.

Positive responses to any or all of these show a strong correlation to a clinical diagnosis of OA. In fact, the specificity of this checklist was found to be >97%.[12] The high specificity means that if an owner indicates that a cat performs any of these behaviors abnormally, the cat is likely to have OA pain.

Health-Related Quality of Life (HRQL)

Measuring *how* the cat feels, not just *what* the cat is feeling, is important as well.[13,14] This is the affective component of the pain experience. Research has shown that owners are the best people to assess their pets' HRQL related to chronic pain because some changes in behavior can be quite subtle; owners are the ones most familiar with their cats and thus the most likely to notice gradual changes.[15]

The checklist includes questions about the impact of chronic pain on quality of life by asking about changes in behavior that may indicate a negative effect on the cat's emotional or social well-being.

A 7-point rating scale is used to help assess the cat's:

1. Energy and enthusiasm (vitality)
2. Activity and comfort
3. Happiness and contentedness (emotional well-being)

The scale ranges from 0, where the cat "couldn't be less" (energetic and enthusiastic, for instance) to 6, where the cat "couldn't be more" (active and comfortable, for instance).

Having a more comprehensive understanding of a cat's pain that includes the affective component may be fundamental to diagnosis and management.[14] Not only does this section of the checklist provide an accurate baseline of the cat's physical and emotional well-being, but it also helps guide the treatment approach by giving the practitioner an indication of how well chronic pain management is working.

Relative Behavior History

Each cat is different, so knowing an individual cat's "normal" is important. In addition to answers about behaviors performed abnormally (as in the first section), any *changes* to an individual cat's normal behavior are useful for providing further information on the cat's condition. That's why the checklist includes 3 brief questions on changes in the cat's behavior regarding:

1. Personality and sociability
2. Urination and defecation habits
3. Hiding or "slowing down"

These "yes"/"no" questions are intended to help practitioners ascertain any changes to an individual cat's behavior in these specific areas based on the owner's assessment of the cat. Although changes in these areas can be related to a condition other than OA, a "yes" for any of the questions can point the veterinarian toward a diagnosis.

Get the Checklist

- For a downloadable, printable version of the checklist, visit: catoachecklistprint.com
- An interactive version of the checklist can be found at: catoachecklist.com

How to Use the Checklist?

Having an effective strategy to gain insight into a cat's behavior and activity at home is invaluable to help the veterinarian diagnose feline OA. Ideally, the checklist will be incorporated into the clinic routine and used for every feline patient.

Convey the Value of the Checklist

Before implementing the use of the Zoetis Petcare Cat Osteoarthritis Pain Checklist, the entire team needs to be onboard. This first means understanding the value of the checklist.

- **For the cat:** When OA is caught early and appropriate management is started promptly, it can help improve the cat's quality of life.
- **For the owner:** Increased awareness and understanding of OA and potential signs of pain can empower the owner.
- **For the veterinary technician:** The easy-to-use tool provides a bridge for communication between the technician and the owner, making history taking more efficient.
- **For the veterinarian:** The checklist provides an accurate method to proactively screen feline patients for OA, potentially facilitating an earlier diagnosis and intervention.
- **For the practice:** Not only can the checklist make owner education easier, but when OA is identified early and managed appropriately, this can provide the cat with better mobility and comfort, supporting good quality of care and strengthening client trust in the veterinarian and the practice.

The first time the checklist is introduced to the owner to fill out is an opportunity to initiate an OA monitoring partnership with the owner. Take advantage of this moment to explain what the cat will gain through early diagnosis and management.

Make It a Team Effort

From the moment a cat owner walks in the clinic door, all team members who the owner encounters play a crucial role in helping to gather information and relay it to the rest of the team. To make the best use of the Zoetis Petcare Cat Osteoarthritis Pain Checklist, team members can initiate owner conversations. Here is an example:

Receptionist: "Hi, Ms. Donovan. It's great to see you and Bella! We have a new initiative at the clinic to screen every cat to make sure they stay happy and active. Would you mind filling out this short checklist? It's easy and quick to complete; our veterinary technician will then go over your answers with you."

Veterinary technician: "Thank you, Ms. Donovan, for taking the time to complete the Zoetis Petcare Cat Osteoarthritis Pain Checklist. Because OA may cause pain and discomfort as it progresses, we're checking in regularly with every cat to make sure we're catching any potential issue related to OA as early as possible. You indicated that Bella is having trouble climbing down stairs—can you tell me a bit more about what you've noticed?"

Veterinarian: "Hi, Ms. Donovan. Our veterinary technician has filled me in on a few items we'd like to take a closer look at based on your answers on the checklist. We'll be doing some assessments today during the exam to determine whether Bella has any pain related to OA. If she does, we will work together to find ways that can help her feel better and stay active."

More Details to Provide Owners About the Checklist

If an owner requests more details regarding the Zoetis Petcare Cat Osteoarthritis Pain Checklist, here are some additional talking points:

- "For the first section, we're looking for behaviors that may be signs of osteoarthritis, or OA. Read the brief descriptions that go along with the illustrations, and check every sign that you've noticed in your cat. We'll discuss them afterward."
- "OA can cause both physical and emotional issues in cats and have a tremendous negative impact on a cat's quality of life. So for the second section, we want you to be honest and indicate where you think your cat fits for each of the 3 questions. The goal isn't to achieve a high score, but rather an accurate assessment of your cat's physical and emotional well-being right now."
- "As we've discussed, having an accurate picture of your cat's behavior at home is important to help us recognize whether your cat may be in pain. For the third section, just let us know whether you've noticed those changes in your cat's behavior."

PART 3:
DIAGNOSING FELINE OA

The In-Clinic Orthopedic Examination: Diagnostic Techniques

Because of the high prevalence of feline OA, orthopedic examinations are warranted for all cats suspected of having chronic pain. The following notes provide practitioners with key information on the hands-on part of the orthopedic examination for an assessment of pain associated with degenerative joint disease (DJD) in cats. Remember, owner history, review of video, and careful in-clinic observation are crucial to a successful orthopedic evaluation of the domestic cat.

The components of the examination are:

- Assessment of sensitivity. See scoring systems at: https://cvm.ncsu.edu/research/labs/clinical-sciences/comparative-pain-research/clinical-metrology-instruments/
- Assessment of muscle mass. See scoring systems at: https://cvm.ncsu.edu/research/labs/clinical-sciences/comparative-pain-research/clinical-metrology-instruments/
- Assessment of each joint for pain, crepitus, effusion, and thickening

In a prevalence study of 100 cats, the most affected joints were[5]:

Joint	Joints Affected, No. (%)
Hip	131 (65%)
Stifle	102 (50%)
Tarsus	85 (40%)
Elbow	69 (35%)
Carpus	32 (15%)
Shoulder	28 (14%)

Spinal Segment	Cats Affected (%)
Thoracic	43
L-S	29
Lumbar	26
Cervical	20

Assessment of the Cat Before the Joint Examination

The hands-on part of the feline evaluation begins with assessing excessive sensitivities and muscle mass.

1. Assess Sensitivity

Assessment of somatosensory sensitivity is best done using Quantitative Sensory Testing. However, in the clinic, the presence of excessive sensitivity, possibly indicative of a hypersensitive state, can be assessed by assessing the reaction of the skin to light to moderate touch, and assessing the response of underlying muscles to the gentle pressure of fingers.

At the skin, excessive sensitivity may be demonstrated by a twitching response of the skin to light touch.

At the muscles, excessive sensitivity may be demonstrated by 'fasiculation' of the muscles either spontaneously (spontaneous contraction of muscle fibers, often causing a flicker of movement under the skin), or in response to mild to moderate point pressure on the muscles (using fingers).

Light touch of the skin is used to assess the forequarter area and the area of skin over the lumbar/gluteal region.

For muscle fasiculation, major muscle groups (especially the triceps, quadriceps and hamstrings) are assessed by applying mild to moderate pressure with the tips of the fingers.

2. Assess Hypersensitivity

Using feline friendly handling techniques, stroke the cat:

A. Run your hands down the cat's neck and back.

B. Note whether you see or feel skin twitching.

C. Note whether you see or feel fasciculation of the muscles (muscle contractions).

These hypersensitivities can be associated with flea allergy and other dermatologic skin conditions, but they can also be indicative of maladaptive pain. Excessive sensitivities may develop much more readily in association with long-standing joint pain in cats than in dogs.[16]

3. Assess Muscle Mass

Assessing the cat's muscle mass in major muscle groups can help you determine which specific limbs or joints to focus on further during the joint examination. Again, using feline friendly handling techniques, begin observing and palpating the cat's muscles:

A. Start with the upper forelimbs, and move down the limbs.

B. Place your fingers perpendicular to the spine of the scapula, and feel the supraspinatus and infraspinatus muscles, assessing (1) whether the muscle mass is appropriate bilaterally and (2) whether either side is showing signs of muscle atrophy.

C. Move your hands caudally and assess the gluteal muscle mass over the pelvis (ideally performed with the cat lying down).

To assess the other major muscle masses, the cat should be in a standing position (you may need to extend the limbs to feel the muscle masses):

A. If the cat is lying down, gently lift the cat with one hand, and use the thumb and forefinger of your other hand to feel the mass of the triceps muscle on one side.

B. Switch hands gently to check the other side, and compare the two.

C. Next, move to the hind limbs.

D. Shift the cat gently with one hand, and again with the forefinger and thumb of the opposite hand, assess the quadriceps on one side. You can use the stifle and patella to help locate the quadriceps.

E. Then move your thumb caudally around the back of the hind limb, and make an assessment of the hamstrings.

F. Switch hands, and assess the quadriceps and hamstrings on the other side.

G. Switch hands gently back and forth between the sides, feeling both sides a few times and comparing the two to determine (1) whether the muscle mass overall is normal and (2) whether there is any difference between the right and left sides.

Diagnostic Screening Tool: Feline Musculoskeletal Pain Index (FMPI)

What Is the FMPI?

This validated clinical metrology instrument was developed at the North Carolina State University Translational Research in Pain program. Veterinary team members can ask owners to fill out the screening questionnaire to assess the severity of pain associated with OA in their individual cat.

Using a 5-point scale (scored as 0-4), the FMPI measures clinical aspects of an individual cat's mobility, agility, and social interaction that can be correlated with chronic OA pain. Each question also includes a box stating "Don't know or not applicable." If the owner selects this box, that question receives no score and the total possible score is reduced by 4.

The FMPI is intended for use in both diagnosis and monitoring of cats with OA pain; another helpful tool for long-term monitoring of feline OA pain is described later in this guide (see page 27).

Tip: Limiting your touch to two fingers—your thumb and forefinger—as you perform these assessments tends to increase the sensitivity (how well you can feel the muscles).

How Do You Use the FMPI?

After reading the instructions to the owner, encourage the owner to answer every question. This is important for getting an accurate picture of the cat's current chronic pain level. Next are the questions included in the FMPI regarding the cat's ability to perform certain activities:

	0 Normal	1 Not quite normal	2 Somewhat worse than normal	3 Barely, or with great effort	4 Not at all	Don't know or not applicable
1. Walk and/or move easily?	○	○	○	○	○	○
2. Run?	○	○	○	○	○	○
3. Jump up (how well and how easily)?	○	○	○	○	○	○
4. Jump up to kitchen-counter height in one try?	○	○	○	○	○	○
5. Jump down (how well and how easily)?	○	○	○	○	○	○
6. Climb up stairs or steps?	○	○	○	○	○	○
7. Go down stairs or steps?	○	○	○	○	○	○
8. Play with toys and/or chase objects?	○	○	○	○	○	○
9. Play and interact with other pets?	○	○	○	○	○	○
10. Get up from a resting position?	○	○	○	○	○	○
11. Lie and/or sit down?	○	○	○	○	○	○
12. Stretch?	○	○	○	○	○	○
13. Groom himself or herself?	○	○	○	○	○	○
14. Interact with you and family members?	○	○	○	○	○	○
15. Tolerate being touched and/or held?	○	○	○	○	○	○
16. Use the litter box (get in and out, squat, cover waste)?	○	○	○	○	○	○
TOTAL						

When the owner returns the completed FMPI, then the team member calculates the total FMPI score by **assigning whole integer scores from 0 to 4 for each question from 1 to 16:**

- **0** = least affected (normal)
- **1** = not quite normal
- **2** = somewhat worse than normal
- **3** = barely, or with great effort
- **4** = most affected (not at all capable of performing the activity)

To calculate the total FMPI score, add all scores for all questions. The lowest possible score for an individual cat is 0, and the highest is the number of questions the owner answered times 4. If an owner did not have stairs, for example, their cat's score could range from 0 to 64. The higher the total, the greater the impairment.

Approach to Starting the Joint Examination

1. Decide Where to Begin

The joint manipulation portion of the orthopedic evaluation does not always need to be done in the same order or set sequence. You'll want to choose an area to focus on first, starting with either the front or hind end. This decision should be based on your assessment of hypersensitivities and muscle mass as well as owner-provided video and your own observation.

Focus on the areas you want to assess most, and evaluate those areas first.

2. Keep the Cat Comfortable

Use these tips to keep the exam feline friendly:

- Perform the joint evaluation in a position the cat is most comfortable in, whether that's sitting on the exam table, lying in the owner's arms, or lying in its carrier.
- Remember that cats don't like "point contact," so keep your hands or body in contact with the cat at all times while manipulating the joints.
- Gently move a hand down to the point you want to manipulate and then start the manipulation, rather than touching the area abruptly and starting the manipulation. This technique helps avoid the cat's immediate withdrawal, which could be interpreted as an aversive reaction rather than simply a dislike of that immediate point contact.

Techniques to use during the joint evaluation can be found under the diagnosis section starting on page 21.

ELBOW JOINT

TECHNIQUE

1. Feel for the lateral epicondyle and the olecranon. Between these bony prominences, there should be a dip that feels like the letter "V." If there is no dip, it suggests the area is full because of thickening, fusion, or a combination of the two.
2. Then use one hand to put gentle counterpressure on the elbow as the other hand gently manipulates the limb while maintaining gentle and slight flexion of the carpus.
3. As the elbow is moving through flexion and extension, pay attention to whether you are seeing normal range of motion.
4. Switch sides, performing the same moves on the opposite side, using the opposite hands.

Elbow extension can be done one-handed:

1. Place one hand gently under the neck of the cat and the thumb of your other hand on the olecranon.
2. From this position, bring the elbow into extension using the fingers of the same hand on the front of the antebrachium.
3. For flexion, move the thumb behind the triceps, just above the olecranon, and move the fingers caudal to the antebrachium.
4. Switch sides, performing the same moves on the opposite side, using the opposite hands.

Tips: It helps to hold the carpus at a slight angle during flexion. Normal elbow extension is 160 to 180 degrees. During flexion of a healthy cat, the antebrachium should touch the brachium.

Performing the manipulation one-handed, it can be difficult to concurrently feel the elbow (for crepitus, effusion, thickening) while moving from flexion to extension. This is where another set of hands can come in handy.

SHOULDER JOINT

TECHNIQUE

Flexion of the shoulder joint is fairly straightforward, but remember to have the rest of the limb in a relaxed position. For shoulder extension, you need to move the limb forward and concurrently pull back on the front of the shoulder.

1. Use the distal limb to move the shoulder into flexion.
2. Use one hand to put gentle pressure on the front of the shoulder and pull the shoulder back.
3. Use the other hand to move the limb into extension using counterpressure on the forearm to move the limb into extension.
4. Extension can be effected using one hand, using the fingers to move the antebrachium forward, while using the thumb to pull back on the shoulder joint.
5. Switch sides, performing the same moves on the opposite side, using the opposite hands.

Tip: When you try moving the shoulder into extension with one hand, the angle between the scapula and the humerus doesn't change much. Two sets of hands are ideal for this manipulation, so if possible, use an assistant.

STIFLE JOINT

TECHNIQUE

Ensure that the cat's limbs are in a relaxed position and normal orientation with respect to the rest of the cat's body before starting.

1. Use one hand to act as counterpressure on the stifle area.
2. Use the other hand to move the stifle by gently holding onto the distal limb.
3. Gently flex and extend the stifle while assessing for pain and feeling for crepitus with fingers placed over the patella.
4. Repeat this action several times, taking the stifle through the full range of motion.
5. Switch sides, performing the same moves on the opposite side, using the opposite hands.

To perform the manipulation with one hand:

1. Place one thumb on the front of the stifle joint to steady the joint and feel for crepitus.
2. Use the fingers of that hand to extend the stifle joint and lift the cat's limb slightly off the table.
3. For flexion, put fingers 2 and 3 over the cranial aspect of the stifle joint, and fingers 4 and 5 on the lateral and cranial aspect of the crus to move the stifle joint into flexion.

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Tips: Do not grasp the hind limb firmly—make sure you are holding on gently. Perform the manipulation in a relatively normal position with respect to the long axis (90-degree angle between the hind limb and the long axis) of the cat so as to not stretch the hamstrings into places they wouldn't normally go. When there is abnormal stretching, you may get an adverse response.

HIP JOINT

TECHNIQUE

1. Use one hand to put counterpressure on the back and the other hand to gently hold the stifle.
2. Abduct the leg to full extension with the hand holding the stifle while maintaining gentle pressure with your other hand. The thumb of that hand should, feel the hip joint going through those motions.
3. Switch sides, performing the same moves on the opposite side, using the opposite hands.

To perform the manipulation with one hand:

1. Use your one hand to support the cat underneath while the other hand holds the stifle joint.
2. Perform abduction and then extension to test the hip joint.
3. Switch sides, performing the same moves on the opposite side, using the opposite hands.

Images ©BDXLascelles, TRiP, NC State

Tip: Slight abduction with extension means there is no dorsiflexion and therefore no stress put on the lower back. By pulling the hind limb straight back, you will get dorsiflexion.

LUMBOSACRAL SPACE

TECHNIQUE

1. With one hand, place a finger between the hind limbs and gently hold the distal hind limbs together. With the other hand, find the iliac processes (one on the right and one on the left).
2. Use that other hand to put pressure on the lumbosacral space (in between the iliac processes) as the hand holding the hind limbs sweeps in a gentle arc motion in order to tilt the pelvis back.

From a standing position:

1. Gather the hind limbs gently with one hand.
2. With your other hand, find and put counterpressure on the lumbosacral space (in between the iliac processes).
3. Use the hand holding the hind limbs to gently swing the limbs and therefore the pelvis caudally.
4. Maintain light pressure on the lumbosacral space with your other hand as the pelvis is being tilted.

Image ©BDXLascelles, TRiP, NC State

Tip: You want the pelvis to be tilting underneath your fingers—stressing the lumbosacral space and effecting dorsiflexion. By pressing directly or too hard down on the lumbosacral space, cats will collapse under the pressure, indicating an adverse response when there really isn't one.

PART 4: MONITORING FELINE OA

As with screening and diagnosis, management of feline OA benefits from a partnership between the owner and veterinary team. By using monitoring tools such as the Client Specific Outcome Measures-Feline that is designed for cat owners, veterinarians can keep owners invested in their cat's care and actively involved in monitoring their cat's OA pain. This allows owners to also see their cat's progress on specific activities individualized for their cat.

Client Specific Outcome Measures-Feline (CSOMf)

What Is the CSOMf?

This clinical metrology instrument provides veterinarians and cat owners with a long-term method of monitoring cats' OA pain. The CSOMf was created to help veterinarians monitor progress of treatment and encourage pet owner awareness and compliance.

The CSOMf is a 3-question evaluation personalized to each cat and owner and must be created on a case-by-case basis. Thus, the CSOMf is unique to every cat and owner.

Once the CSOMf activities have been defined, the owner is asked "How much difficulty has your cat had performing the following activities?" The score for each question is generally based on a scale of 1 to 5, with 1 being normal/no problem and 5 being impossible for the cat to perform. The higher the score, the greater the impairment.

How to Use the CSOMf?

The veterinarian and technicians work with the owner to find appropriate activities specific to the individual cat that can be evaluated, starting by reviewing the observations reported in the checklist and verified by the FMPI, including:

- Functional loss behaviors, particularly those associated with affected joints identified by the FMPI
- Changes in emotional and physical well-being
- Relative behavior history

This discussion ultimately leads the veterinary team member to define the 3 specific activities that will be evaluated. These activities are based on specific places and times the owner has noticed the impairment. It is important to keep language in the questions simple and understandable for the owner.

The owner then completes the same questionnaire at assigned times during the cat's management to help monitor OA-related chronic pain as well as treatment success.

A guide to setting up the CSOMf and other tools can be found at: https://cvm.ncsu.edu

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