Abstract

Feline osteoarthritis is significantly more common than previously believed. Making the diagnosis can be difficult owing to the often vague clinical signs noted by cat owners and veterinarians. Rethinking perceived behavioral changes, coupled with performing a complete orthopedic and neurologic examination and obtaining high-quality radiographs, is helpful in coming to an accurate diagnosis. Initial management of osteoarthritis in cats involves multimodal therapies and strategies for chronic pain management. Surgical options for osteoarthritis in cats should be viewed as salvage procedures once medical management is no longer effective. New forms of chronic pain management are also discussed in this article.
Osteoarthritis, also known as degenerative joint disease or DJD, has long been underappreciated as a clinical entity affecting cats. Because the clinical signs of osteoarthritis in cats are different from those in dogs, veterinarians have historically been less proactive in diagnosing and treating this disorder in cats. One of the biggest challenges in diagnosis is the paucity of signs noticed by cat owners. Greater awareness and recognition of the clinical signs of feline osteoarthritis can help veterinarians more readily identify affected patients, perform appropriate diagnostic tests, and treat the pain caused by this condition.

INCIDENCE OF FELINE OSTEOARTHRITIS

The true incidence of feline osteoarthritis is unknown. However, a few studies suggest that it is greatly underrecognized. One retrospective study of 100 cats demonstrated that 82% of cats older than 14 years had radiographic signs of osteoarthritis. Of cats older than 6 years, 61% had radiographic evidence of osteoarthritis in one joint, and 48% had changes in multiple joints. However, only 13 of the 100 cat owners in this study reported noting any lameness. A second study reported that 90% of cats older than 12 years of age have radiographic signs of osteoarthritis in 1 or more joints. Most of these cats did not have clinical signs recognized by owners or veterinarians.

Clinical signs of osteoarthritis in cats are commonly behavioral changes such as decreased activity or inability to run or jump. More typical signs such as limping or stiffness and weight gain or loss are also noted.

Crepitus and pain on manipulation of joints with decreased range of motion are the most common physical examination findings in these patients.

Multimodal management of osteoarthritis in cats includes nonsteroidal anti-inflammatory drugs, chondroprotective agents, weight management, controlled exercise, essential fatty acids, and adjunctive therapies such as rehabilitation therapy and polysulfated glycosaminoglycans.

Monoclonal antibody therapy that targets nerve growth factor to reduce joint pain is a new form of therapy for arthritic cats.

Feline hip dysplasia is uncommon; however, Maine Coons are more prone than other breeds. Secondary osteoarthritis associated with hip dysplasia is common.

Take-Home Points

- One study showed that 90% of cats older than 12 years of age have radiographic signs of osteoarthritis in 1 or more joints. Most of these cats did not have clinical signs recognized by owners or veterinarians.
- Crepitus and pain on manipulation of joints with decreased range of motion are the most common physical examination findings in these patients.
- Multimodal management of osteoarthritis in cats includes nonsteroidal anti-inflammatory drugs, chondroprotective agents, weight management, controlled exercise, essential fatty acids, and adjunctive therapies such as rehabilitation therapy and polysulfated glycosaminoglycans.
- Monoclonal antibody therapy that targets nerve growth factor to reduce joint pain is a new form of therapy for arthritic cats.
- Feline hip dysplasia is uncommon; however, Maine Coons are more prone than other breeds. Secondary osteoarthritis associated with hip dysplasia is common.
than 12 years of age had radiographic evidence of osteoarthritis, even though only 4% of these had any mention of arthritis by either owner or veterinarian. In both studies, osteoarthritis was most prevalent in the shoulders, elbows, spine, coxofemoral joints, and tarsi. A third study evaluated 491 cats older than 1 year radiographically for osteoarthritis. It found that 22% of cats had radiographic signs of osteoarthritis, although only one-third of these cats showed clinical evidence of the disease.

These studies emphasize that despite underlying pathology, recognition of arthritis in cats by both owners and veterinarians remains a challenge. Whether there truly is a poor correlation between radiographic evidence of osteoarthritis and overt clinical signs, or whether the clinical signs are more poorly understood than previously believed, is a question yet to be answered.

CAUSES OF AND RISK FACTORS FOR OSTEOARTHRITIS IN CATS

Most of the cats in the studies mentioned likely had primary osteoarthritis. In most cases, little history is provided that describes prior trauma or metabolic diseases that might have resulted in secondary arthritic changes within and around joints. Primary osteoarthritis is typically caused by factors such as age, systemic factors (such as obesity), and genetic predisposition. Secondary osteoarthritis is more likely due to biomechanical factors affecting the joint, such as trauma, developmental abnormalities, instability, and mechanical overload.

Because the life expectancy of cats has dramatically increased over the years, age as a causative factor of primary osteoarthritis has become the most important risk factor for cats. Obesity is also an important risk factor, but it has been reported that only 14% of arthritic cats were obese. This must be interpreted in light of the fact that one clinical finding in some chronically arthritic cats is weight loss, which may be due to muscle atrophy or inappetence.

Clinical Signs of Feline Osteoarthritis

It is common for veterinarians to expect clinical signs of disease seen in one species to be similar to those exhibited in another. Because of the high prevalence of osteoarthritis in dogs, the signs of canine osteoarthritis are familiar, and it is tempting to look for the same signs in cats. However, the clinical signs of feline osteoarthritis are vastly different due to cats' ability to mask injury, and many are difficult to recognize because they are not acute. For example, while limping or stiffness are the typical clinical signs recognized by owners that provide clues to the presence of arthritis in dogs, these signs seem to be considerably less common in cats unless arthritic changes are more advanced or an acute flare-up of pain occurs.

In cats, the clinical signs of osteoarthritis are more typically behavioral changes. Behaviors that have historically been thought of by owners as “normal aging” changes in cats are now acknowledged as potential signs of underlying osteoarthritis. Decreased activity and reluctance to jump up (on household furniture or when outdoors) are signs that are now well recognized as sequelae of arthritic changes. Reluctance to play or to chase toys and other pets is also considered a change possibly associated with chronic arthritis.

Clinical signs of osteoarthritis are shown to be well observed by cat owners who are educated about what to look for. Therefore, the key to identifying cats with osteoarthritis is educating owners to recognize behavioral changes associated with osteoarthritis that have developed over time. Checklists have been developed and validated to assist practitioners in diagnosing osteoarthritis in cats. These

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**BOX 1 Owner-Reported Behavioral Changes in Cats With Osteoarthritis**

- Changes in mobility
  - Gait
  - Jumping
  - Stair use
- Changes in activity level
- Increased time spent resting
- Less time spent grooming
- Changes in social behavior
- Increased vocalization
- Objection to being handled while resting
- Changes in play and hunting behavior
- Changes in overall posture
checklists are most useful in increasing awareness in practitioners and owners regarding interpretation of clinical signs noted in cats and aiding in guiding treatment outcome assessment.  

**PHYSICAL AND ORTHOPEDIC EXAMINATION**

Physical examination findings help in ruling out metabolic illnesses and other injuries in cats with suspected osteoarthritis. A complete neurologic examination should also be performed in these patients, as neurologic abnormalities may be misinterpreted as orthopedic injuries. Physical examination findings may also alert the clinician to concurrent problems. A complete baseline examination is necessary to facilitate treatment regimens as well as continued monitoring and adjusting therapy when indicated.

A complete orthopedic examination is vital to diagnosis of osteoarthritis. However, performing an orthopedic examination in cats is, at best, a challenge. Cats are not always willing to cooperate with having their limbs palpated, flexed, and extended and may offer the veterinarian only a brief opportunity to perform the exam. Having a good, organized approach to enhance this short window of opportunity will facilitate successful completion of the exam.

**How to Perform the Feline Orthopedic Examination**

When performing an orthopedic examination, it is best to try to adhere to the Fear Free principles as much as possible. Taking one’s time; using slow, deliberate actions; and using as little restraint as possible is ideal for most cats. However, use of sedation may be necessary to relieve the cat’s pain and anxiety enough to complete the exam.

**Gait Assessment**

Before using any restraint, the patient’s gait and neurologic status should be assessed. This is sometimes difficult in cats, as they may not wish to cooperate, but using a cat-friendly exam room, if available, may help. Allowing the cat to move around the room on its own may afford the examiner their best opportunity to see how the cat walks, jumps up on a chair, or jumps down. Owner-provided home videos are also often very helpful in this regard to see the cat in its usual environment.

To facilitate movement in the veterinary setting, the examiner can place the cat in the center of the room and allow it to walk to a place where it may feel safe or hide. The cat may tolerate only 1 or 2 attempts to do this; therefore, keen observation is necessary. Cats may
also elect to just lie down where they are placed or slink low to the ground when they move. In both cases, gait assessment may not be accurate and complete.

**Joint Assessment**

Individual palpation of all 4 limbs is the ideal approach to performing a complete orthopedic examination. Since many cats with osteoarthritis do not show signs recognized by owners, it is vital to assess all joints. By palpating each of the long bones individually and flexing/extending each joint individually (isolating each joint through its full range of motion when doing so), it is possible to fully assess each leg. Other injuries, such as muscle or tendon injuries, must also be considered and ruled out. Palpating the most clinically affected leg last (when possible) lessens the degree of central sensitization, or wind-up, which can limit or cloud the results of further assessment.

During these manipulations/palpations, each bone is assessed for pain and each joint for effusion, crepitus, pain, range of motion asymmetry, and periarticular thickening/muscle atrophy. When a unilateral injury is suspected, comparison to the contralateral limb helps serve as a control.

When manipulating joints, it is important to take each joint through its full range of motion slowly, feeling for crepitus and assessing full range of motion. The author recommends using a goniometer to measure joint angles at full extension and flexion. This practice helps better assess the initial range of motion present and enables better evaluation of the patient’s response to treatment during subsequent exams. Measuring muscle circumference at predefined points with a tape measure is also helpful to evaluate whether muscles are rebuilding or atrophying further over time.

Orthopedic examination findings in cats with arthritis are somewhat different than those noted in dogs. As mentioned, cats exhibit more behavioral changes than clinical ones. However, pain on flexion and extension of joints may still be noted, and if so, the level of flexion/extension at which the pain is elicited should be recorded. Crepitus upon manipulation of joints may also be noted, although these changes are considerably more common in dogs. Many affected cats have some degree of muscle atrophy surrounding these joints, and many are either overweight from decreased activity or underweight from decreased food intake caused by chronic pain. Thickened joints due to either effusion or periarticular fibrosis are often noted. Joint thickening must be distinguished from the presence of surrounding muscle atrophy.

**Sedation**

Cats with orthopedic pain may not allow much handling and manipulation. In cases where the patient is especially fractious or painful, sedation can be used to provide more comfort during the examination. “Kitty Magic” (dexmedetomidine/ketamine/butorphanol) can be given either intravenously or intramuscularly. The author’s preferred dosage is 0.1 mL of dexmedetomidine, 0.1 mL of ketamine, and 0.1 mL of butorphanol per 4.5 kg (10 lb) cat. This dosage may be adjusted empirically based on need for further sedation as well as the size and age of the cat. The goal is to lightly sedate the cat to a point where comfortable manipulation of the legs is possible, as well as to minimize pain and stress. While sedation does make it more difficult to interpret some exam results, providing pain relief and reducing anxiety is important for painful, scared cats.

**DIAGNOSTICS**

Radiographs are an important diagnostic tool in identifying physical changes caused by arthritis, especially in older cats exhibiting behaviors associated with feline osteoarthritis. For cats with obvious

![FIGURE 1. Ventrodorsal radiograph of a cat with chronic right coxofemoral osteoarthritis. Note the enthesophyte formation, sclerosis of bone, and secondary changes to the femoral head and neck.](image-url)
joint-related discomfort, radiographs should be taken of joints found to be painful on examination in order to rule out other injuries, assess the level of arthritis (when present), and serve as a baseline for future radiographs. The radiographic signs of osteoarthritis most frequently noted are joint effusion, periarticular new bone formation, soft tissue thickening, narrowed joint space, subchondral bone sclerosis, and capsular or extra-articular mineralization (FIGURE 1). More advanced imaging techniques such as computed tomography may be indicated in some cases, but good-quality orthogonal radiographs often suffice. Because radiographs alone have not proven to correlate well with clinical signs, orthopedic examination results and radiographic findings should be interpreted in light of their mutual conclusions.

A complete systemic assessment should also be performed to rule out other metabolic abnormalities as well as provide a baseline prior to nonsteroidal anti-inflammatory drug (NSAID) therapy. A complete blood count, serum biochemical profile, and urinalysis are indicated as part of the whole-health assessment. More advanced sampling, such as arthrocentesis for synovial fluid cytology and cultures, may be indicated but is not part of a routine work-up for osteoarthritis. Serology may be indicated when infectious disease is suspected.

MANAGEMENT OF FELINE OSTEOARTHRITIS

A multimodal management approach to treating osteoarthritis is the mainstay of therapy in cats. Because arthritis is not diagnosed in many cats until it is advanced, treatment is often aimed at alleviating chronic pain. However, lessening the progression of arthritis has long-term benefits in minimizing chronic pain as well.

Management of feline osteoarthritis should be seen as a mutual endeavor with the owner rather than following a predetermined checklist. Comprehensive therapeutic plans should include multimodal treatment options to provide both pain relief as well as prophylactic arthritis treatments. Such options include NSAIDs, weight management, chondroprotective agents, controlled exercise, essential fatty acids, and adjunctive therapies such as rehabilitation therapy and polysulfated glycosaminoglycans (PSGAGs). These therapies, as well as environmental modifications, should be discussed with owners of arthritic cats to decide which combination is the best course of treatment.

Pain Medications

**NSAIDs**

Use of an NSAID in patients with chronic pain and osteoarthritis may be indicated to reduce pain and inflammation of joints and muscles; however, there are some limitations to the use of NSAIDs in cats. In the United States, robenacoxib (Onsior; Elanco, onsior.com) is an NSAID approved by the U.S. Food and Drug Administration (FDA) and labeled for “control of postoperative pain and inflammation associated with orthopedic surgery, ovariohysterectomy and castration in cats […] for up to a maximum of 3 days.”

Robenacoxib is approved in Europe for treating chronic pain in cats at 1 mg/kg (dose range, 1 to 2.4 mg/kg) with the recommendation that if no improvement is noted it should be discontinued after 6 weeks (not recommended for cats <2.5 kg or under 4 months of age). Long-term clinical use of robenacoxib in cats has shown that cats do tolerate daily administration over a 4-week period with no clinical damage to the liver, kidneys, or gastrointestinal tract.

Meloxicam is another NSAID used in cats with chronic arthritis to reduce inflammation and decrease pain. One protocol recommends dosing cats at 0.1 mg/kg for a first dose, followed by 0.05 mg/kg q24h thereafter.

With any chronic use of NSAIDs, it is important to monitor patients for gastric ulceration and renal toxicosis. As with any extralabel use of medications, owners must be informed of this use, potential complications discussed, and owner consent given.

**Other Drugs**

Other drugs that have been described for the treatment of cats with chronic pain due to osteoarthritis include tramadol and gabapentin. Tramadol is a weak µ-opioid receptor agonist that has been used for the treatment of pain in dogs with osteoarthritis, although a blinded, placebo-controlled crossover study in dogs showed no clinical benefit of tramadol in managing chronic pain. However, one randomized crossover study in cats with osteoarthritis suggested a possible beneficial effect of tramadol when given twice daily at 2 mg/kg. It also suggested caution with tramadol use in cats receiving other medications or with comorbidities. A second
study demonstrated a possible beneficial effect of tramadol as measured by kinetics (peak vertical force) in cats with osteoarthritis. Based on these studies, more investigation into the efficacy of tramadol in cats with chronic pain is warranted. Owners of cats receiving tramadol should monitor for dose-dependent gastrointestinal side effects as well as effects such as mydriasis, euphoria, and sedation.

Gabapentin, a structural analog of γ-aminobutyric acid, is commonly used to diminish neuropathic pain in humans through suppression of central nociceptive neurons. It is frequently used for chronic pain management in cats despite little evidence of its effectiveness. Although sedation is a side effect, owners in one study noted some mild improvement in impaired activities in cats with osteoarthritis. Unfortunately, cats find gabapentin and tramadol to be bitter, and owners have difficulty administering doses.

**Feline Hip Dysplasia**

Feline hip dysplasia is relatively uncommon compared with its canine counterpart. One study found an estimated radiographic frequency of 6.6% of evaluated cats, with no sex predilection. However, Maine Coons have a higher prevalence of hip dysplasia than do other breeds, with an estimated frequency of 24.9% (27.3% of males and 23.3% of females). Compared with the general feline population, domestic shorthairs have a lower radiographic frequency (5.8% of evaluated cats). However, agreement among radiologists in diagnosing feline hip dysplasia can be variable. Only 75% of radiologists were able to reach a majority consensus when evaluating pelvic radiographs in cats with suspected hip dysplasia, underscoring the difficulty in diagnosing feline hip dysplasia solely by radiographs.

Cats with osteoarthritis secondary to hip dysplasia present similarly to cats with osteoarthritis from other causes. Owners report decreased activity, lameness that is exacerbated by exercise, reluctance to navigate stairs, vocalization, and abnormal positioning in the litter box. Physical examination findings most noted in cats with hip dysplasia include muscle atrophy and pain with crepitus upon extension of the hips.

Radiographic signs are generally different than those seen in dogs. Whereas the hip joints of dogs on ventrodorsal radiographs are judged based on the coverage of the femoral head by the acetabulum, cats typically have a shallower acetabulum and do not necessarily develop osteoarthritis based solely on this finding. Subluxation and joint laxity of the hip is not a consistent finding in cats with hip dysplasia. Femoral neck remodeling is frequent in dogs with hip dysplasia but less so in cats. In cats, remodeling of bone is more commonly noted along the cranial dorsal acetabular rim. Changes to the shape of the femoral head are also more frequently observed.

Treatment of hip dysplasia in cats uses the same multimodal therapies as for primary osteoarthritis. Surgical management of hip dysplasia should be considered when medical management no longer keeps the cat comfortable. Femoral head and neck ostectomy and total hip replacement are both salvage procedures that may be considered.

**Supplements**

Joint supplements are used in cats with osteoarthritis to assist with rebuilding damaged cartilage and providing pain relief. Essential fatty acids, especially docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), contain high levels of omega-3 fatty acids, which have been shown to slow down cartilage destruction in dogs by reducing degradative enzymes present in arthritic joints. Studies have shown, however, that owners note a placebo effect when giving joint supplements to cats. Glucosamine and chondroitin sulfate are building blocks of the extracellular matrix of cartilage, and it is believed that supplementing these molecules helps to maintain the integrity of the cartilage; however, these agents are largely unproven to have a primary direct effect on cartilage metabolism in cats. Because other studies have demonstrated a partially positive effect on comfort in cats administered joint supplements, the use of joint

**References**

supplements continues to be recommended as adjunctive therapy for cats with osteoarthritis.

**Diet**

Weight management continues to be the most important component of osteoarthritis management in cats. Overweight animals inherently place more pressure on joints whose cartilage has been compromised by changes secondary to osteoarthritis. Additionally, adipokines in fat (leptin and adiponectin) are proinflammatory mediators that play a role in cartilage pathology in overweight cats. These changes can further stress the joint capsule and subchondral bone, resulting in pain and limited mobility. Weight reduction diets can help improve mobility and decrease joint pain in overweight cats. Diets supplemented with essential fatty acids and other joint supplements can be very effective for weight management and improved mobility as long as caloric density is monitored and is appropriate. Client compliance is vital for dietary approaches to be effective.

**Exercise**

Controlled, light-intensity exercise facilitates muscle maintenance and strengthening while helping cats to maintain or lose weight. It is challenging to get cats to exercise, but they may engage in interactive play with owners. Daily use of toys that encourage chasing or hunting behavior can assist cats in moving in a low-intensity, controlled manner.

**Emerging Therapies**

Monoclonal antibodies (mAbs) that target the pain pathway of nerve growth factor (NGF) are a novel form of therapy for cats with chronic pain due to osteoarthritis. NGF triggers nociceptor sensitization following injury and is produced in response to painful stimulation. It serves as a mediator of the pain pathway and reduces pain sensation when blocked. Frunvetmab (Solensia; Zoetis, solensiavetteam.com) is an anti-NGF mAb that has been approved in the United States and is shown to improve comfort in cats with osteoarthritis. Treatment of cats with chronic pain due to osteoarthritis using anti-NGF mAbs offers potential for improving overall comfort in these patients.

Injections of PSGAGs are used in clinical practice to decrease the activity of catabolic enzymes in arthritic joints. No PSGAG product is currently approved for cats in the United States; however, extralabel use of an approved product for dogs (Adequan; American Regent Animal Health, adequancanine.com) is common despite no reported safety and efficacy data. In vitro studies of PSGAGs have indicated that activity of anabolic enzymes is increased in arthritic joints, making this an attractive treatment option early in the course of osteoarthritis. A common clinical protocol (extrapolated from labeled guidelines in dogs) involves twice-weekly injections for 4 weeks followed by monthly administration at dosages similar to those recommended for dogs.

**Adjunctive Therapies**

Rehabilitation therapy involves exercises intended to rebuild strength, improve joint range of motion and mobility, and allow fibrozed muscles to stretch. Several techniques are beneficial in reducing chronic pain. Deep muscle massage is beneficial in breaking down scar tissue, improving blood flow to promote healing, and facilitating lymphatic drainage of edema. Passive range-of-motion exercises assist in the breakdown of fibrotic periarticular tissue and improve joint range of motion (FIGURE 2). Acupuncture can also be helpful. Modalities such as photobiomodulation therapy (low-level light therapy) and therapeutic ultrasound provide relief and healing of sore muscles, although ultrasound may require shaving the area, which some cat owners may object to. Most cats tolerate these therapies if performed slowly and deliberately. However, joints that are sore and have limited range of motion may be more painful and decrease a cat’s

**FIGURE 2.** Physical therapy in the form of passive range-of-motion exercises can often be done with minimal restraint in cats if performed slowly.
tolerance for manipulation. In these cases, preemptive analgesia or light sedation can allow treatments to be performed with less pain and stress to the patient.

Environmental Modifications
Environmental modifications are helpful to facilitate ease of movement for cats with osteoarthritis. Simple modifications include moving food and water bowls to an easily accessible location and providing steps to favored perches (e.g., furniture) to allow cats access without having to jump. Litter boxes with 1 or more low sides to allow easier entrance and exit also help encourage continued litter box use for these cats.54

Surgical Options
Surgical management of osteoarthritis is generally regarded as salvage for patients when medical management does not provide positive results. Only when a comprehensive attempt at multimodal management fails should surgery be considered. Surgical options include osteotomies (such as femoral head and neck ostectomy), joint replacement, arthrodesis, or, in extreme cases, amputation. When a comprehensive attempt at multimodal management does not provide positive results. Only regarded as salvage for patients when medical management fails should surgery be considered. Surgical options include osteotomies (such as femoral head and neck ostectomy), joint replacement, arthrodesis, or, in extreme cases, amputation. Depending on the surgical procedure performed, prognosis for recovery is often favorable.

SUMMARY
Osteoarthritis is common in cats, especially older cats. Because the clinical signs of arthritis in cats are very different from those seen in dogs, this condition is often not recognized until it is advanced. Physical examination findings, radiographs, and historical information provided by owners are used to establish the diagnosis. Chronic pain management of cats with arthritis should be multimodal, with surgical options viewed as salvage procedures. Hip dysplasia is an uncommon condition in most cat breeds and is a cause of secondary arthritis in cats. TVP

References


**Michael Jaffe**

Dr. Jaffe is a 1991 graduate of the University of Missouri College of Veterinary Medicine. Upon graduation, he practiced as a primary care veterinarian for 5 years. Dr. Jaffe then completed a 1-year companion animal medicine and surgery internship and a 3-year small animal surgery residency at Louisiana State University where he also received his master’s degree. Dr. Jaffe then practiced for 17 years in specialty surgical practice. He became a diplomat of the American College of Veterinary Surgeons in 2002 and a Certified Canine Rehabilitation Practitioner in 2017. Dr. Jaffe entered academia as part of the founding faculty at Midwestern University College of Veterinary Medicine. Dr. Jaffe is currently an associate professor and service chief of small animal surgery at Mississippi State University College of Veterinary Medicine. Dr. Jaffe’s research has included work in clinical stem cell therapy trials and laser tissue welding. His current research involves biomechanical studies of bone implants in canines and equines, spectroscopic analysis of collagen in osteoporotic bone, and physical therapy/rehabilitation of patients following orthopedic surgical procedures.
Diagnosis and Management of Feline Osteoarthritis

TOPIC OVERVIEW
Osteoarthritis, or degenerative joint disease, is a common cause of pain in cats that is often overlooked. Behavioral changes once believed to be a part of normal aging are now recognized as symptoms of osteoarthritis. By performing a thorough physical examination, coupled with high-quality radiographs and the use of checklists, practitioners are able to better diagnose feline osteoarthritis. Through a multimodal approach to pain management, cats can live a more comfortable life in the presence of these arthritic changes.

LEARNING OBJECTIVES
After reading this article, practitioners should be able to list the clinical signs and behavioral changes associated with feline osteoarthritis, as well as be able to formulate a diagnostic and treatment plan for cats with osteoarthritis.

1. Radiographic signs of osteoarthritis in cats often do not correlate well with clinical signs noted by owners.
   a. True
   b. False

2. Which clinical sign of arthritis in cats is less commonly observed by owners?
   a. Decreased activity
   b. Reluctance to jump
   c. Lameness
   d. Changes in social behavior

3. An ideal feline orthopedic examination should include:
   a. Sedation
   b. Wrapping the cat in a blanket to restrain it
   c. Examination of only the affected leg(s) before the cat resists
   d. Fear Free handling and examination of all 4 limbs

4. When assessing a cat’s gait, what method is most helpful?
   a. Owner-provided videos from home
   b. Running the cat in a hallway on a leash
   c. Clapping hands behind the cat to make it move
   d. Palpating the cat fully before the gait exam to best elicit the lameness

5. How should a feline orthopedic examination progress?
   a. Always start with the most painful limb first
   b. Just examine the most affected limb
   c. Palpate all 4 limbs individually
   d. Only examine the legs of concern

6. Which diagnostic test is best for assessing arthritis in a cat?
   a. Radiography
   b. Computed tomography
   c. Magnetic resonance imaging
   d. Arthrocentesis

7. What is the preferred method of treatment for cats with arthritis?
   a. Surgery
   b. Multimodal pain management
   c. Crate rest and NSAIDs only
   d. Steroids

8. How do monoclonal antibodies that target nerve growth factor help cats with arthritis?
   a. They stop the progression of arthritis
   b. They block the pain pathway of the arthritic joint
   c. They are NSAIDs
   d. They inhibit catabolic enzymes that destroy cartilage

9. Which of the following is not a benefit of rehabilitation and physical therapy?
   a. Rebuilding muscle strength
   b. Improved joint range of motion
   c. Stretching fibrosed muscle fibers
   d. Allowing damaged cartilage to heal

10. In what breed of cats is hip dysplasia most frequently noted?
    a. Domestic shorthair
    b. Siamese
    c. Maine Coon
    d. Domestic longhair