

Current insights into feline osteoarthritis

Osteoarthritis is a painful condition which affects the majority of older cats but is often not recognised because of differences in the ways that affected cats exhibit the signs of chronic joint pain compared to dogs. There are also inherent challenges to the physical examination of cats which add to the difficulty of reaching a diagnosis, including the small size of their appendicular joints and a reluctance to allow manipulation and palpation of painful joints. Furthermore, even when osteoarthritis is identified, it is frequently not treated or is not treated effectively, in part as a result of concerns regarding adverse effects and costs of treatment as well as the practical difficulties of daily dosing with medication. Understanding the gait and behaviour changes that are characteristic of osteoarthritis is a key part of the diagnostic process and is more sensitive than radiography in identifying the presence of the disease. Once the condition has been diagnosed, a wide range of well-tolerated treatment options exist, allowing a multi-modal treatment approach to be adopted and tailored to the needs of the cat and the owner, which will deliver effective pain management in an affordable way and will not become a daily stressor to either party.

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Osteoarthritis is a very common problem in older people and older dogs, but until recently it was considered an uncommon problem in cats, in the author's experience. However, it is now recognised as a significant cause of pain for many elderly cats (Hardie et al, 2002; Slingerland et al, 2011) that shows itself differently in cats compared to dogs, and so can easily be missed unless a feline-specific approach is adopted. The most commonly affected joints are the hips, stifles, tarsus and elbows, and spondylosis of the thoracic and lumbar spine is also very common (Lascelles et al, 2010a).

How common is osteoarthritis in cats?

While there is no doubt that osteoarthritis is a very common problem in older cats, it is difficult to put an accurate figure on its prevalence. This difficulty arises in part because of the lack of any widely accepted and practically applicable diagnostic test for the condition, so published studies have used different approaches to identify affected cats as well as focussing on different target populations.

Most studies have looked at the prevalence of radiographic evidence of degenerative joint disease, either retrospectively or prospectively. These studies highlight how common the problem is, identifying radiographic changes in:

- 34% of cats of all ages (Clarke et al, 2005)

- 61% of cats of 6 years of age and older (Slingerland et al, 2011)
- 90% of cats over 12 years old (Hardie et al, 2002).

Furthermore, a significant proportion of painful joints have not yet developed any radiographic changes, which develop later in the course of disease. A post-mortem study of 30 adult cats indicated that 71% of the stifle joints examined had cartilage damage but were radiographically normal; this was also the case in 57% of coxofemoral joints, 57% of elbows and 46% of tarsal joints (Freire et al, 2011). All studies consistently identified a strong correlation between increasing age and increasing prevalence of osteoarthritis but also a significant level of degenerative disease in at least one joint in younger cats (Clarke et al, 2005; Lascelles et al, 2010a; Slingerland et al, 2011).

How does osteoarthritis present in cats?

While osteoarthritis can cause lameness in cats, this is usually only evident in severely affected cats or where there has been an acute injury to a joint already affected by osteoarthritis. Most cats with arthritis will not exhibit lameness; more commonly, they will show changes in behaviour (Clarke and Bennett, 2006; Bennett et al, 2012) as they adapt their lifestyle to cope with the chronic pain affecting multiple joints. Affected cats are more reluctant to extend themselves; they will find ways to reduce the height of a jump into more manageable distances (*Figures 1 and 2*) and use

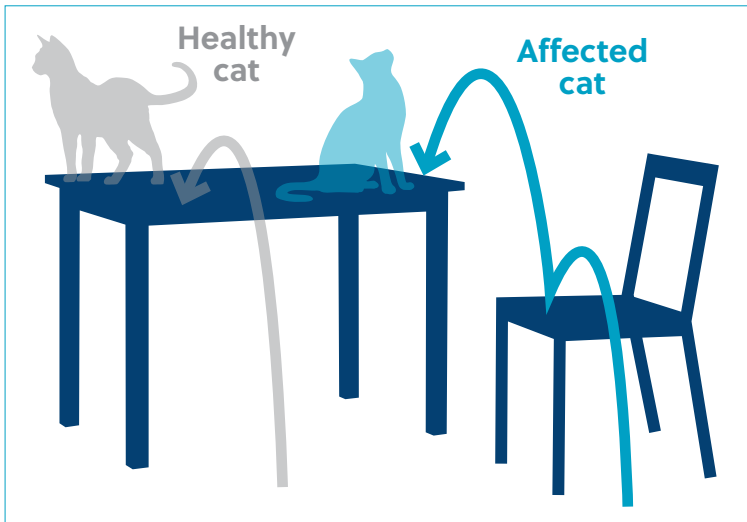


Figure 1. Reducing the height of a jump by going via an intermediate step, in this case, a chair.



Figure 2. Reducing the height of a jump down by extending the forelimbs down a vertical surface before launching into the jump.



Figure 3. An unkempt coat as a result of reduced grooming, especially around the more difficult to reach hind end.

their forelimbs to help pull themselves up when jumping onto a low surface such as a sofa or lap. They will take stairs one at a time rather than moving in a fluid continuous motion. The elbows are very commonly affected (Slingerland et al, 2011), so reluctance to jump down and going downstairs one step at a time is as significant as difficulty in jumping up or climbing stairs one at a time. Most commonly, affected cats spend more time resting and less time grooming, so their coat may become unkempt, especially at the hind end where it is harder to reach (Figure 3). When they do move around, they do so at a walk rather than a trot and they pause to rest frequently, sometimes favouring an affected forelimb (Figure 4). Affected cats often become 'grumpy' and withdraw themselves from family life and interactions with other pets (Slingerland et al, 2011).

Physical findings on examination are also very subtle, and easily overlooked. Mild to moderately affected joints usually feel normal, with no obvious bony or fluid swelling and a good range of joint movement (Klinck et al, 2012). The cat may show few, if any, signs of joint pain; it may become tense or 'wiggly' when its joints are handled as the only sign of discomfort. Take care to avoid over-manipulation of the joints – while the cat may not show clear signs of discomfort during the examination it may be in significantly more pain afterwards.

How can osteoarthritis in cats be diagnosed?

Identifying characteristic behavioural and gait changes (such as going up and downstairs one step at a time, or with a 'bunny-hopping' action) and achieving a positive response to analgesia have been shown to be a reliable means of identifying osteoarthritis in cats (Lascelles et al, 2007; Klinck et al, 2012) without the need for costly and stressful procedures such as anaesthesia and radiography.

Asking the right questions

If veterinarians are to rely heavily on the owner's observations and reporting of behavioural and gait changes in their cats in order to diagnose osteoarthritis, it is important that they ask the right questions and educate owners as to the significance of the changes they are seeing.

The behavioural and gait changes associated with osteoarthritis are very often recognised by owners of older cats but are interpreted as indicators of old age rather than as signs of pain. In many cases, the owner will not perceive them as significant enough to be mentioned at visits to the veterinary practice despite being aware that changes have occurred. Even when owners are aware that the signs they are seeing relate to osteoarthritis, they may assume that this is both inevitable and untreatable and so do not bring their cat into the practice to discuss this issue. It is therefore essential to raise owner awareness of the problem, and the available treatment options, by appropriate history-taking and discussion during routine health checks or when the cat is presented for other problems.

A mobility questionnaire, sent to the owners of older cats along with their booster vaccination reminder, or given to them to fill in while in the waiting room, can help to highlight problem areas and focus the mind. A simple checklist (Figure 5) of gait and behav-

our changes that have been shown to be reliable indicators of osteoarthritis has been developed and validated (Enomoto et al, 2020). It identifies changes that are readily identifiable by owners and provides a clinically expedient screening tool to improve veterinary ability to identify affected cats and to help increase owner's awareness of the problem. Asking owners to record video clips of their cat walking across a room, going up and downstairs and climbing up or down onto chairs or work surfaces is also very helpful.

How many cats with osteoarthritis receive effective treatment?

Research has found that around 60% of cats aged 6 years and older (Slingerland et al, 2011) and around 90% of cats over 12 years old are affected by osteoarthritis (Hardie et al, 2002), but the number of cats that receive treatment for this painful problem is significantly lower.

A survey of vets in the UK suggested that, even when osteoarthritis is diagnosed, only around 60% of affected cats are started on treatment (Zoetis Pet Owner Feline Journey Market Research, 2020, unpublished data). This low treatment rate arises both because owners do not take up their vet's treatment recommendation, but also in many cases because vets do not make a recommendation to treat. Factors that contribute to this high level of under-treatment include:

- Under recognition of the problem by both owners and vets
- Owner misconception that their cat is 'stiff' rather than in pain, and that this is an inevitable consequence of ageing
- Owner misconception that there is nothing that can be done to treat the problem
- Concern on the part of both vets and owners about the potential adverse effects of treatment, especially chronic use of non-steroidal anti-inflammatory drugs in older cats
- The inherent difficulty in administering daily medication to cats
- Cost of treatment
- Lack of time in the consulting room to engage the client and discuss all the available treatment options.

Some of these factors also cause problems with continuing treatment in the long term: a survey of cat owners indicated that around 50% owners who start treatment do not continue to administer the treatment in the long term (Zoetis Pet Owner Feline Journey Market Research, 2020, unpublished data).

Common reasons cited for stopping treatment included:

- Limited efficacy: owners did not perceive a significant benefit when using the recommended treatment
- Adverse effects: gastrointestinal adverse effects are common in cats receiving non-steroidal anti-inflammatory drugs, while opioids and gabapentin can induce mild sedation
- Difficulty dosing their cat on a regular basis, and difficulty in remembering to give the treatment
- Lack of conviction that their cat is in pain and in need of treatment rather than 'just slowing down in their old age'.

Treating osteoarthritis in older cats

Managing the pain of arthritis can make a big difference to a cat and can be very rewarding for owners and veterinary staff. Because the signs of arthritis are so subtle, the extent to which a



Figure 4. Favouring a front-limb when stopping to rest.

To determine if your cat is showing signs of degenerative joint disease-associated pain, please complete the following questionnaire.

Please answer all questions.

1. Does your cat jump up normally? Yes No
2. Does your cat jump down normally? Yes No
3. Does your cat climb up stairs or steps normally? Yes No
4. Does your cat climb down stairs or steps normally? Yes No
5. Does your cat run normally? Yes No
6. Does your cat chase moving objects (toys, prey, etc) Yes No

Figure 5. A simple checklist of gait and behaviour changes that have been shown to be reliable indicators of osteoarthritis in cats (Enomoto et al, 2020).

cat has been affected is often only apparent when its joint pain is treated effectively – owners often comment that the cat 'has a new lease of life' or 'is better than it has been for years'.

There are many potential treatment options for the management of chronic arthritis, ranging from prescription drugs through to acupuncture and nutraceuticals, but relatively few prescription drugs are licensed for use in cats. Care must be taken to use appropriate drugs at appropriate doses, and the optimum treatment plan will vary from cat to cat, often using a combination of different treatments to allow individual drug doses to be kept relatively low.

Environmental modification

Simple adaptations of the cat's environment can also make a big difference: an indoor low-sided uncovered litter tray for easier ac-

cess; steps up to the cat flap; boxes, steps (*Figure 6*), ramps or just a pile of magazines (*Figure 7*) to allow easier access to favourite resting sites will all allow the cat to access key resources with less pain.

Medications licensed for long term use

Non-steroidal anti-inflammatory drugs

Meloxicam and robenacoxib (Onsior, Elanco) are licensed for long-term use in cats. They are a good choice for otherwise healthy arthritic cats, as they are usually highly effective and easy for owners to give, so compliance levels are generally good. Since cats have limited ability to metabolise non-steroidal anti-inflammatory drugs, they are potentially more toxic to cats than dogs and must be used with care especially in cats with chronic kidney disease. Both osteoarthritis and chronic kidney disease are common in older cats, and they commonly occur together. One study identified that 70% of cats recruited to studies of degenerative joint disease also had concurrent chronic kidney disease (Marino et al, 2014).

While they must be used with care in older cats – especially those with renal compromise – there is good evidence to support their use in cats with stable chronic kidney disease that are not inappetent (Gowan et al, 2011; KuKanich et al, 2021). For long term use the daily dose should be gradually titrated down to the minimum effective dose which is usually around 50% of the licensed dose. Renal function should ideally be assessed before prescribing, 2–4 weeks after starting treatment and at 2–6 month intervals thereafter, with a preferred minimum database to include body weight, urine specific gravity and fasted serum urea, creatinine, alanine aminotransferase and alkaline phosphatase (Sparkes et al, 2010a), but with an understanding and expectation that the level of monitoring will need to be tailored to the needs of the cat and the financial means of the owner.

Anti-nerve growth factor monoclonal antibodies

Frunevetmab (Solensia, Zoetis) is licensed for use in cats, including those with International Renal Interest Society stage 1 and 2 chronic kidney disease. It is administered once a month by subcutaneous injection and offers a promising new option for treatment of osteoarthritis in cats, especially those that are difficult for owners to dose with oral medications and those for whom use of non-steroidal anti-inflammatory drugs is contraindicated because of concurrent disease or the need for other long-term medication (for example, corticosteroids). Frunevetmab has a low incidence of adverse effects and is not metabolised via the kidneys or liver.

Nutritional supplements and dietary management

As in other species, nutraceuticals can be used in the management of feline arthritis, ideally as part of a multi-modal therapeutic plan. Clinical studies assessing their effect in cats are limited, but there is evidence to support a positive effect for omega-3-fatty acids (Corbee et al, 2013) and for diets such as Hills J/D (Sparkes et al, 2010b) and Royal Canin Mobility (Lascelles et al, 2010b), which are supplemented with combinations of omega-3 fatty acids, green lipped mussel powder, glucosamine and chondroitin. The effect is variable from case to case, but many cats enjoy a good response when these diets or nutraceuticals are used as their sole source of nutrition.

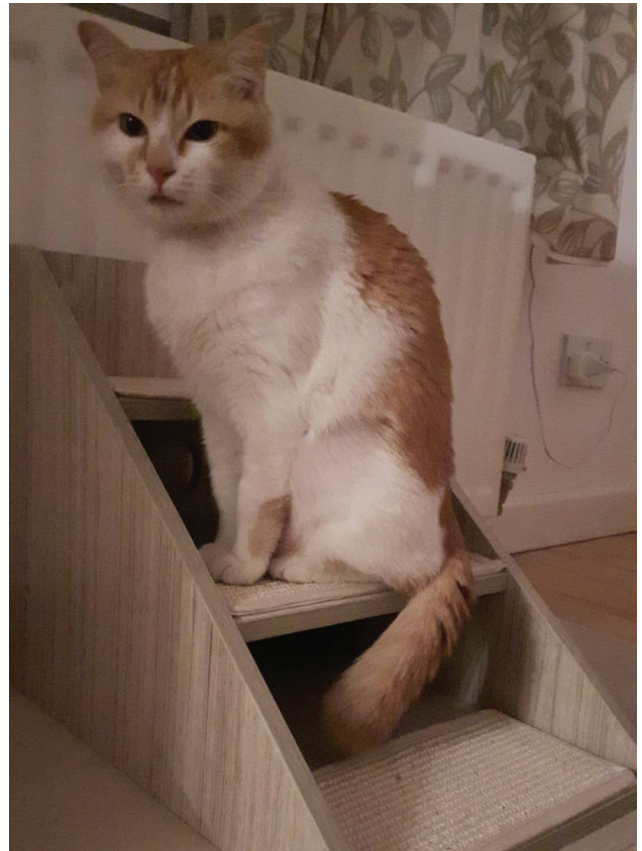


Figure 6. A set of steps to allow easier access to a shelf above a radiator.



Figure 7. A pile of magazine provides easier access to a favourite resting place.

Off-label use of medications

A range of other medical treatments have been used in the management of feline osteoarthritis. While controlled clinical studies are largely lacking, the following examples are generally well-tolerated and anecdotally can be helpful as adjunctive treatments or where the use of licensed products is not possible. The medications mentioned reflect the author's personal experience and do not by any means comprise a comprehensive list. Where studies are available, references have been included.

Pentosan polysulphate injections (cartrophen injection)

This is a disease-modifying drug with no primary analgesic effect. It improves joint fluid viscosity, stimulates cartilage repair and reduces joint inflammation. It is not licensed for use in cats but can be effective when given at the same dosage and frequency as in dogs (0.3 mg/kg weekly for 4 weeks). It is generally well tolerated, but as in dogs, it can cause prolonged bleeding times so should be used with care and it should not be given concurrently with non-steroidal anti-inflammatory drugs.

Gabapentin

An anti-hyperalgesic rather than an analgesic, which can be useful for management of chronic pain in cats that cannot tolerate non-steroidal anti-inflammatory drugs, or for adjunctive use alongside these drugs to reduce the dose required. The suggested dose for management of chronic pain is 5–10 mg/kg twice daily (Allerton, 2023). It is not licensed for use in cats but is well tolerated. The only common side effect is dose-dependent sedation, which is reversible on ceasing treatment or reducing the dose. It is cleared through the kidneys but is well-tolerated in moderate doses in cats with chronic kidney disease.

Opioids and tramadol

Buprenorphine has good analgesic effect in cats for a relatively prolonged period and can be administered directly into the mouth for transmucosal absorption (Robertson et al, 2005). Although not licensed for use by this route, it is available in syrup form in the UK (Summit Veterinary Pharmaceuticals). Dose-dependent sedation and mydriasis may occur. Tramadol has higher bioavailability and longer half-life in cats than dogs (Papich and Bledsoe, 2007) and can be a useful analgesic for management of arthritis (Monteiro et al, 2017). However, its bitter taste limits its practicality for oral use. While not licensed for use in cats, a transdermal formulation (Bova Ltd) is available in the UK which may provide a more practical route for dosing.

Corticosteroids

The anti-inflammatory effects of corticosteroids can be effective in the management of arthritic pain (Lascelles and Robertson, 2010) but adverse effects can occur with long-term use, and they may also contribute to ongoing joint damage, so should be avoided whenever alternative therapies can be used.

Other treatment modalities

Although controlled studies are not available, anecdotally many cats with arthritis show improved mobility and quality of life

KEY POINTS

- Around 90% of cats over 12 years old are affected by osteoarthritis.
- There is a poor correlation between radiographic evidence of osteoarthritis and the presence of cartilage damage as well as between radiographic changes and identifiable joint pain.
- Cats with osteoarthritis can be identified by changes in gait such as going up and downstairs one step at a time, or with a 'bunny-hopping' action, rather than in a smooth fluid movement from one stair to the next.
- When osteoarthritis is diagnosed, only around 60% of affected cats are started on treatment.
- There are a wide range of treatment options for feline osteoarthritis, allowing a treatment plan to be tailored to the individual cat's and owner's needs and with minimal long-term adverse consequences.

when treated with acupuncture. Other treatment modalities that are being explored include, but are not limited to, physiotherapy, hydrotherapy, K-laser, cannabidiol oil, intra-articular injection of stem cells and therapeutic ultrasound. Published data is currently lacking but there is room for optimism that some may prove to be both effective and practical to use in cats.

Conclusions

Osteoarthritis is a very common problem in cats which often goes unrecognised, and even when it is recognised it often goes untreated. A number of factors contribute to the under-diagnosis of this chronic, painful condition and a clinically expedient approach to diagnosis relying more heavily on owner observed changes in mobility and behaviour could have a major impact in uncovering the magnitude of the problem. Once osteoarthritis has been diagnosed there are still barriers to the implementation of an effective treatment program. **CA**

Conflicts of interest

The author declares that there are no conflicts of interest.

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