

How to case manage the osteoarthritic dog



Hannah Capon and David Dycus of Canine Arthritis Management, help us understand this complex presentation.

Osteoarthritis (OA) is the most common musculoskeletal disease a small animal practitioner is likely to see and is the biggest source of chronic pain in dogs. Current estimates suggest 20% of all dogs are affected with OA, increasing to 80% of dogs over 8 years of age.

Osteoarthritis primarily affects diarthrodial joints and is not an isolated disease entity, but rather should be thought of as a global disease process. The joint should be thought of as any organ with significant cross-talk among the tissues, with the final pathway being failure of the joint. While the articular cartilage is damaged and loses function, in fact in OA all tissues of the joint are affected. It is not a focal disease process, but rather results in a progressive downward spiral of the entire joint ultimately leading to loss of function, increased pain, periarticular fibrosis, loss of range of motion, muscle atrophy, and eventually complete failure. It is a common cause of compensatory pain and is believed to be the leading cause of chronic pain.

Considering pain is the major clinical sign associated with OA, it is imperative that identification, diagnostic and management practice protocols are in place to ensure the welfare of dogs in our care. If pain is not controlled in patients suffering from OA other management strategies will not be effective at slowing down and minimizing the progression of OA.

Little is known about the flow of clinical signs of OA in animals, but it is thought to parallel that of humans. Therefore, the progression of the clinical signs associated with OA are likely to include periods of relative calmness followed by periods of exacerbation of clinical signs called flare-ups. It is logical to assume that most animals that present to the veterinarian for a so called 'OA workup' are in the middle of a flare-up.

Identification

The owner and veterinary team are instrumental in identifying potential cases of OA. Public misconceptions of pain expression in animals will often lead to clinical signs being overlooked as the expected ageing process. It is important to understand that OA in the dog is commonly a secondary event and as such the simple process of aging should not be thought of as a major contributor to OA in the dog. Through a multifaceted approach including team training/ education, client education, questionnaires, and more

frequent general health screening, more cases are likely to be identified earlier in the disease process. This ultimately has not only the potential to improve clinical results, but also allow for the management strategies to be implemented to slow down and minimize the progression of OA.

Animals will respond to pain in various ways. It may remain localized to the problematic joint and be expressed through varying degrees of lameness or joint discomfort on manipulation. Or OA may present with additional compensatory musculoskeletal pain elsewhere in the body due to weight shifting away from the affected limb. In addition, the concept of central sensitization ('wind-up') is involved with the pathophysiology of OA that can lead to the development of hyperalgesia and allodynia, which are conditions known to be harder to manage in the longer term.

Through understanding that:

1. Pain is a complex multidimensional experience with affective and emotional components 'pain is not just about how you feel, but how it makes you feel';
2. Pain can be divided into acute pain, considered 'useful pain', present to encourage action to prevent further harm to the bearer, and chronic pain, considered 'bad pain' caused by central sensitization which not only results in ongoing pain beyond tissue healing but also in referred pain from the source;

we can understand that an osteoarthritic dog may present their pain in a variety of ways not just through simple lameness. Changes in food intake, behaviour, exercise, panting, excessive licking, and social engagement can all be seen in dogs suffering in pain from OA (Figure 1).

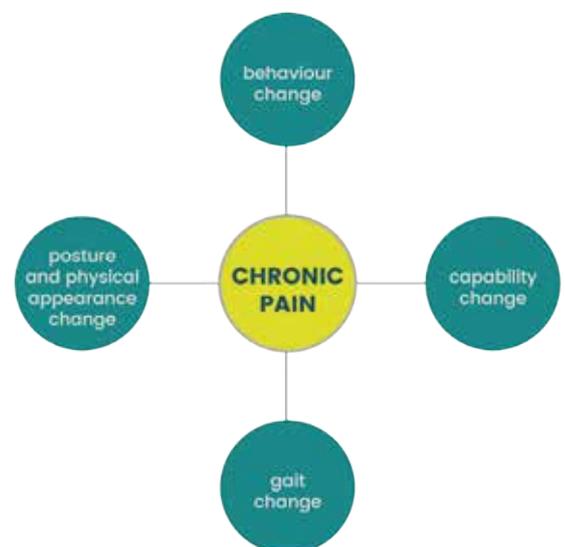


FIGURE 1: Chronic pain causes change in four main areas.

On observation of changes within these four categories a clinician should approach the case considering that pain may be underlying the presentation (Figure 2). The whole practice team may play a role in identification from a receptionist taking the call from the owner, to the nurse watching the dog get up from lying in the waiting room.

Ensure a correct diagnosis

Osteoarthritis is commonly diagnosed on history and observation alone, which leads to a large risk of misdiagnosis and inappropriate or lack of treatment.

Diagnosis of OA requires a thorough work-up divided into six substages.

1. Gait analysis should be performed looking for central neurological signs, single or multi-limb lameness, ataxia and paresis. While subjective gait analysis is commonly used in daily practice, objective gait analysis

would be the gold standard in terms of identifying a lameness.

2. Allodynia or hyperaesthesia identification through behavioural changes, avoidance, tensing or reactivity on approach or gentle manual handling.
3. Full clinical examination looking for supportive clinical signs or suggestions of a differential diagnosis. It also ensures co-morbidity is identified and included in the diagnostic and treatment plan.
4. A neurological examination looking for other potential causes of pain, gait abnormalities, ataxia and paresis commonly seen in osteoarthritis.
5. An orthopaedic assessment looking at the whole dog not just the limb or limbs in question. It is common for a dog to have multifocal osteoarthritis, as well as secondary sources of musculoskeletal pain that will need addressing in the treatment

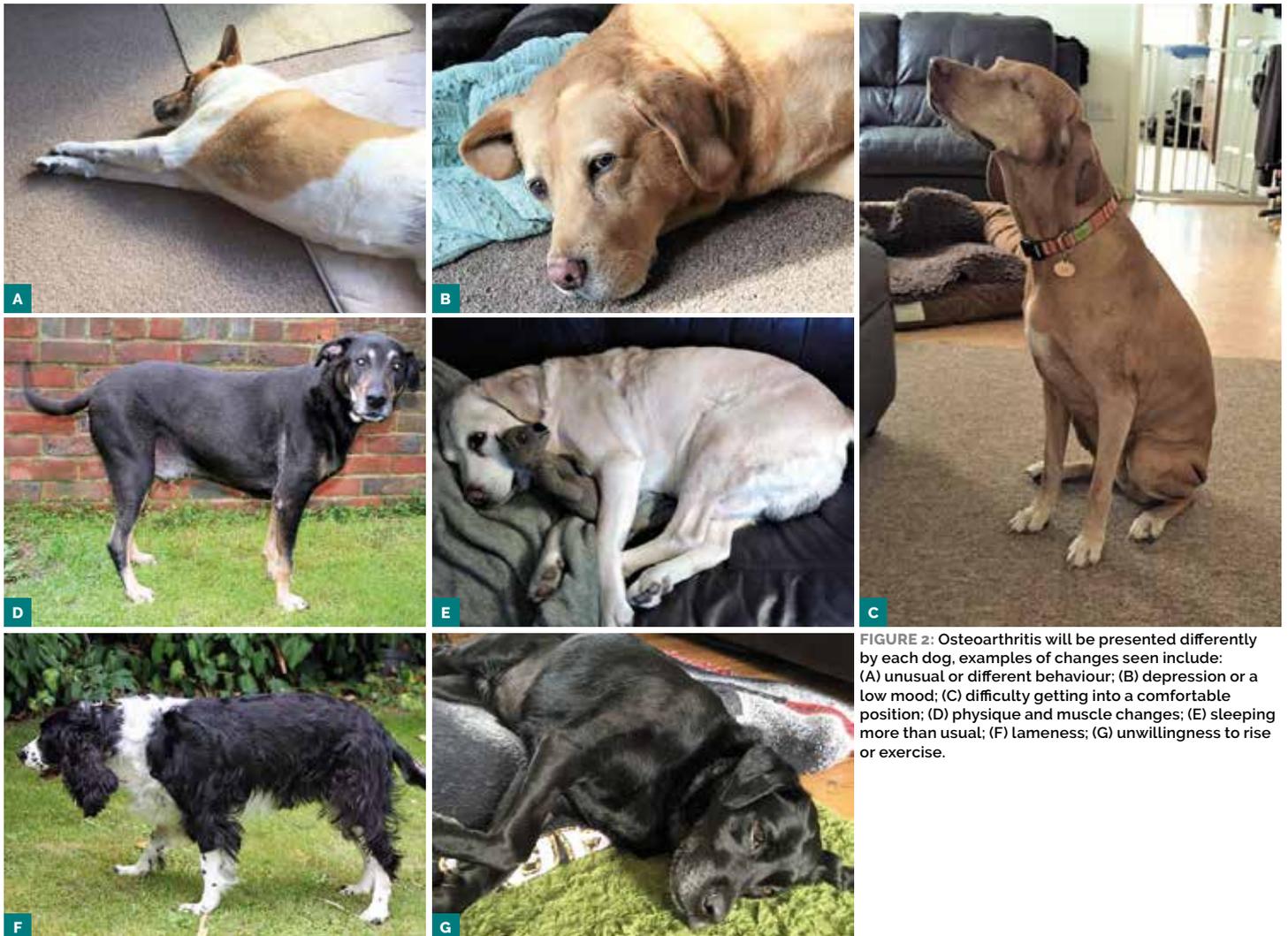


FIGURE 2: Osteoarthritis will be presented differently by each dog, examples of changes seen include: (A) unusual or different behaviour; (B) depression or a low mood; (C) difficulty getting into a comfortable position; (D) physique and muscle changes; (E) sleeping more than usual; (F) lameness; (G) unwillingness to rise or exercise.



plan. To aid in the objective assessment in orthopaedic patients, muscle mass and goniometry should be used.

6. Appropriately positioned and orthogonal diagnostic imaging is required to confirm the presence of osteoarthritic related changes. This can be through radiography, or CT. A clinician can only have a high index of suspicion of osteoarthritis without diagnostic images; therefore, the diagnosis of OA should never be made without diagnostic imaging – joint fluid assessment may also be required at this stage.

Through the thorough investigative process described above, an understanding of the primary and secondary sources of pain in a dog can be identified and the associated pathology diagnosed.

Remember the radiographic signs of OA do not correlate with clinical signs. That is mild OA changes on radiographs may be associated with high pain scores, whereas severe signs of OA can also be associated with low pain scores. It is important to treat the patient and not the diagnostic imaging signs.

Grade the osteoarthritic disease

Osteoarthritis is challenging to not only grade but also when monitoring progression. The reasoning is because radiographic signs of OA don't correlate with clinical signs and continued radiographic changes don't always correlate with worsening disease progression. Studies are available that allow for radiographic scoring to grade OA changes, but the gold standard to fully evaluate and monitor for progression would be through arthroscopy.

Objective measures that consider joint functionality, readily available for the general veterinarian include the canine orthopaedic index (www.canineorthopedicindex.com), muscle-mass measurements, goniometry, validated pain scales, and owner questionnaires (Figure 3).

OA grade	5 steps to understand and tailor treatment of canine arthritis
1	Suspicion based on history. Recognized incongruity. No OA changes on radiographs
2	Mild clinical signs. Discomfort on examination of joint. Early OA changes on radiographs.
3	Moderate clinical signs. Reduced range of motion of joint and crepitus. Moderate OA changes on radiographs.
4	Overt clinical signs. Crepitus, thickening of the joint and pain. Obvious OA changes on radiographs.
5	Pronounced clinical signs. Severe joint changes on palpation. End stage joint disease on radiographs.

FIGURE 3: Grade the osteoarthritis present.

Score and assess the dog's pain state

As previously stated the main clinical sign of OA is pain, whether acute localized pain, compensatory pain, or central sensitization pain. The pain a dog experiences due to OA is individual and must be a priority consideration when formulating a management plan. Through quantifying the pain the animal is experiencing, treatment strategies can be assimilated and, through reassessments using the same scale, a treatment can be considered successful, adequate, unsuccessful or inadequate.

“ The main clinical sign of osteoarthritis is pain, whether acute localized pain, compensatory pain, or central sensitization pain. ”

Current pain-scoring systems that have been validated for use in dogs are the Chronic Brief Pain Inventory (CBPI) from the University of Pennsylvania, the Liverpool Osteoarthritis in Dogs owner questionnaire, and the Helsinki Chronic Pain Index. These are comprehensive and user-friendly but can be time-consuming initially. The use of these scales is gold standard; however, given the time limitations in general practice the author feels a step towards 'quantifying' the pain state is better than none and uses a variation of the Colorado Pain-Scoring system (Figure 4). In the author's opinion, a priority when designing a treatment plan is owner education and team communication, and in these situations a simplistic approach may be all that is possible.

Pain score	5 steps to prioritize treatment of canine arthritis
1	Mild behavioural changes/not themselves. Mild discomfort. Possible lameness/gait change.
2	Behavioural changes noted. Less capable and enthusiastic. Mild lameness/gait change. Pain response on joint manipulation.
3	Overt behavioural changes noted. Reluctance to move. Obviously lame/gait change. Moderate pain on joint manipulation.
4	Quiet/aversive/significant behavioural changes. Significantly lame/gait change. Guarding or reactive to handling. Overt pain on joint manipulation.
5	Depressed. Significantly lame. Reactive to handling/touch. Severe pain within joint and region. Distressing to see.

FIGURE 4: A simple pain-scoring system for canine patients.

Educate the owner, stage the disease and manage expectations

Osteoarthritis is a non-curable, long-term, progressive condition requiring a committed motivated and compliant owner. The emotionally, physically and financially draining nature of the disease for the owner must be considered by the veterinarian from the outset. A combination of appropriate veterinary intervention and thorough owner management is essential to achieve a good quality of life for the dog. This is achieved through education regarding the disease, discussing realistic owner expectations, and tackling the lifestyle changes that are required alongside veterinary intervention. The author likes to 'stage' the disease to aid communication between veterinarian and client as well as within the veterinary team. Through a numerical staging system, the owner understands where they are within the 'management process' (Figure 5). It also allows preparation with regards to the latter stages of the disease.

OA stage	5 simple steps to communicate canine arthritis
1	Identification of suspect OA by owner/vet/veterinary team.
2	Confirmation of OA.
3	Initial treatment plan.
4	Adjusting maintenance plan.
5	End of life care/acceptance.

FIGURE 5: The five stages of osteoarthritis management.

Determining if a patient with OA is in a flare-up is an important part of any assessment because treatment goals as well as the 'management process' will differ. It is also important to understand that irreversible decisions such as surgery or euthanasia should not be made when a patient is in a flare-up.

Multimodal management planning

As previously stated OA is a chronic, progressive disease that not only involves all the structures of the joint but can lead to 'whole animal pain'; therefore, management must be not only multimodal but also patient specific.

Initial decision-making requires determining if the patient is in the middle of a flare-up or not. In a patient experiencing a flare-up the first priority should be to get the pain under control. This is commonly achieved through pharmaceuticals such as non-steroidal anti-inflammatories (NSAIDs); however, other management strategies such as intra-articular injections, formal rehabilitation therapy, and complementary medicine can be considered. Activity should also be significantly reduced.

The process of getting the acute pain under control should take approximately 7–14 days and reassessment should be planned for 2 weeks from presentation, then again at 4, 8 and 12 weeks.

If a patient has OA and is not in the middle of a flare-up, then baseline management can be implemented. This consists of nutraceuticals, but most importantly weight control, daily exercise, and lifestyle changes including complementary therapies. The owner should be warned if there is ever a deviation from the baseline management such as the inability to exercise as expected this could indicate a flare-up. If a flare-up is noted then activity should be restricted and pain controlled with the ultimate goal of getting the flare-up under control quickly so the patient can resume their baseline management. It should be noted that management of a flare-up may vary between and within patients. As the disease process advances the baseline management may need to include intermittent use of pharmaceuticals (eventually progressing to daily usage) as needed (Figures 6 and 7).

It is important that we consider moving away from putting patients on NSAIDs early in the course of disease and keeping them on them for life, but rather using them in a tailored fashion determined by requirement.

Effective management of pain is essential in order to be able to address/correct factors such as compensatory gait and postural changes and muscle loss/weakness effectively (through modalities such as physio and hydro) and achieve acceptable function. Conducting physiotherapy and hydrotherapy in the absence of effective pain management is likely to be less effective, and in some cases runs the risk of being counterproductive.

In line with the baseline management of lifestyle changes the author's priority is to prevent further harm in patients with OA, from self-sustained injuries in the home and on exercise, and to reactions to medications prescribed. This must be achieved

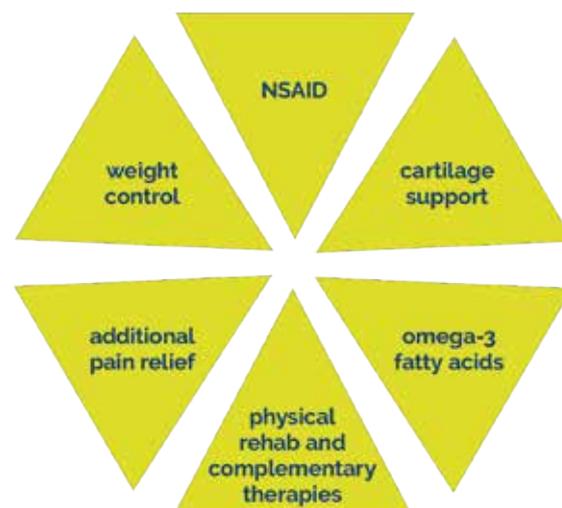


FIGURE 6: All areas that need to be tackled in designing a management plan for canine osteoarthritis.



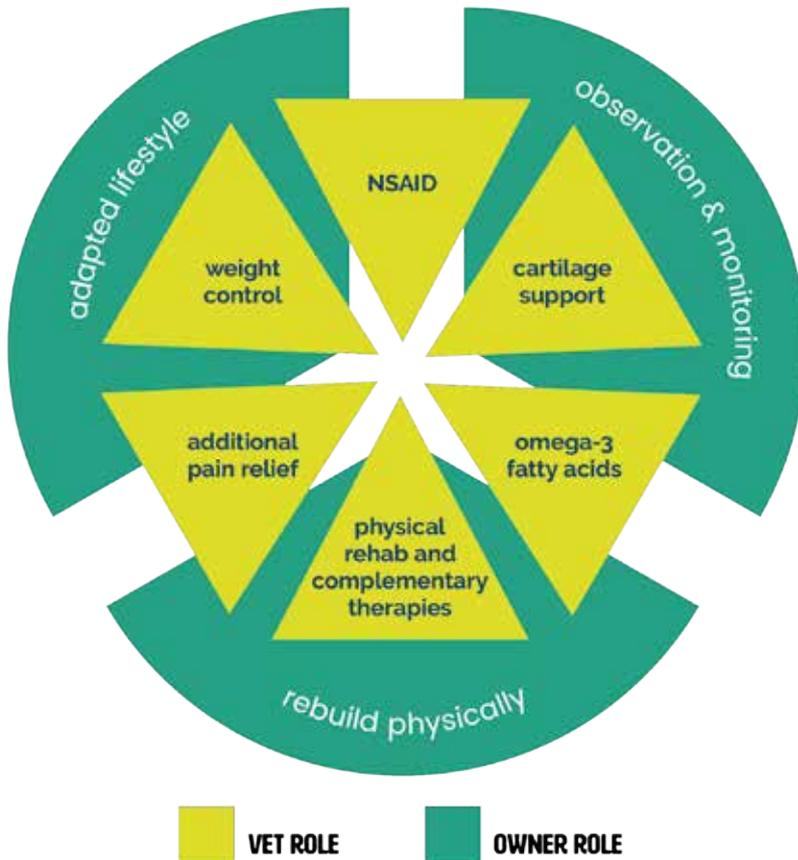


FIGURE 7: Involvement of the owner working as part of the team is key to success.



through owner education which may be via veterinary/veterinary nurse clinics, practice literature or reference to www.caninearthritis.co.uk.

Weight control

Controlling weight is probably the most important strategy in the baseline management of OA as excessive body fat is known to negatively impact the dog's pain state, and disease progression. Weight loss strategies are not overnight successes, so initiating a dietary plan early in the management plan is sensible. It is currently unknown how much body weight a dog should lose to have a positive impact on clinical signs; however, in humans losing 10% of body weight can have profound effects in improving joint pain. Therefore, it is sensible in animals to aim for 10% body weight loss with the goal to be 1–2 % weight loss per week. This can be accomplished through diet and exercise. A simple piece of initial advice is to simply feed 60% of the recommended food intake, with regular assessments to keep up with the nutritional requirements of the dog. Again, a patient must be comfortable to be able to exercise effectively.

The target for the majority of dogs is to be able to walk at least twice daily on level flat ground for 20 minutes. Once a dog can achieve this with no clinical

signs then additional time along with changes in elevation and terrain can take place. Daily exercise is vital for improving range of motion, promoting joint health, maintenance of muscular strength and endurance. Unfortunately, this is not accomplished through self-driven activities such as playing in the back garden. Hence, successful OA management requires commitment from the owner.

Disease modifying agents such as nutraceuticals are known to require time to achieve effect. Adding these early in the treatment protocol is logically appropriate. While more than 30 compounds have shown some relief in human OA in prospective randomized trials, in animals most attention is currently directed at polyunsaturated (omega-3) fatty acids.

Invasive options

Newer novel minimally invasive options now exist for helping get pain and inflammation under control. Such an option is intra-articular therapies such as a steroid, hyaluronic acid, platelet-rich plasma and stem cell therapy. It should be noted that such intra-articular therapies such as platelet-rich plasma and stem cell therapy have minimal clinical evidence at this time.

Incorporating invasive approaches into a treatment plan such as surgery is individual to each case, but always requires comprehensive discussion with the owner ensuring owner expectations, physical requirement, financial implications, and post intervention rehabilitation are covered. In veterinary medicine the opportunity for surgery to help in the management of OA is limited to joint replacement techniques.

Rehabilitation

Complementary therapies and rehabilitation is a rapidly developing field in veterinary medicine and is a source of confusion for many. The author encourages the incorporation of formal rehabilitation programmes to help maintain range of motion in addition to active muscle engagement. The overall idea is to preserve function while minimizing joint discomfort such that once the flare-up is under control the patient can move back into their baseline management with an emphasis on daily activity and exercise.

The author has chosen to simplify this complicated component of the multimodal approach for comprehensive purposes.

- All osteoarthritis sufferers benefit from rehabilitation, which means using a variety of therapies and interventions to return to function.
- Return to function means directing an animal's progression towards a minimal pain state, with maximum achievable mobility and a good quality of life such that their baseline management is successful.
- Minimizing pain is achieved through using different therapies often concurrently, or in

succession. Currently, we have no ability to predict which permutation of therapies will be effective for each dog, and we do know that specific combinations will necessarily be appropriate in the long term as osteoarthritis is a progressive disease with a fluctuating clinical picture. Thus, to achieve a continuous minimal pain state the owner must be educated to monitor for signs of discomfort and approach those in charge of the case to action a treatment plan modification as required. This means there is no 'cook-book' approach to OA management, but rather it has to be a patient-specific approach that is always evolving. Combining a pharmaceutical based approach with other therapies such as acupuncture, laser therapy, hydrotherapy, and massage therapy is appropriate.

- *Reliance on the unimodal strategy of NSAIDs alone is no longer considered an acceptable approach.*
- Maximum achievable mobility is not gained through reducing pain alone. An understanding of musculoskeletal structure and function is required to encourage appropriate use to rebuild the soft tissue structural support to stabilize the underlying joints. This may require physiotherapy, and rehabilitation approaches such as therapeutic exercises, hydrotherapy, acupuncture and massage.
- Good quality of life is still a subjective area, but progress is being made with regards to measuring quality of life such as through the validated tool Vetmetrica (www.vetmetrica.com). Simplistically, quality of life can be interpreted as the patient's ability to enjoy normal life activities. Thus, consideration of the dog's requirements and whether their clinical state allows them to achieve these, must be incorporated into a management plan. This is a dynamic consideration unique to that dog and owner. For example, reduced mobility may compromise the length of walks, but through reducing the distance, choosing a more appropriate terrain, using a mobility support like a dog trolley, offering regular breaks and changing the timescale to reach the destination, the quality of life of that dog and owner is maintained.

This multimodal approach is a successful way of managing OA, but it does require excellent communication skills, owner education, considered implementation and monitoring, and regular reassessments. The author conveys this to owners through the changing pie chart diagrams in Figures 6 and 7.

Formalize reassessments with a team strategy

Osteoarthritis is a progressive condition influenced by many variables such as comorbidity, the environment and the management strategies chosen. Accurately predicting its course is impossible. Through a formalized reassessment structure, the veterinarian responsible for the case can track improvement and deterioration and act accordingly. Concurrent conditions and side effects of treatments being employed can also be identified early.

The authors recommend that patients with OA during periods of calmness should be evaluated initially every 3 months for the first year that OA is diagnosed then every 3–6 months thereafter (unless a flare-up occurs).

The reassessments themselves require structure to ensure all components of the multimodal approach are covered, no comorbidities are missed, and the owner receives value which will increase compliance and improve overall patient care. This is best achieved through a combination of verbal and written instruction.

Have an end-of-life care practice strategy

Even with early identification, diagnosis and a complete multimodal approach, osteoarthritis can be the cause of premature euthanasia. In the author's opinion anticipatory grief and bereavement must be considered when supporting the owner through the final stages of care for their dog. Ensuring the owner has access to resources within and external to the practice, as well as the ability to plan their dog's euthanasia, is essential to managing this difficult time. 🐾



ABOUT CANINE ARTHRITIS MANAGEMENT

Canine Arthritis Management (CAM) was initiated by small animal vet Hannah Capon in 2015 with the aim of raising public awareness of chronic pain and helping vets and nurses in general practice provide the best support they can for their patients and their owners. CAM is now supported by a large number of other highly qualified members of the veterinary community and is already widely used by members of the public to help them provide better care for their pets suffering with arthritis.