

# THE SENIOR OVERWEIGHT OSTEOARTHRITIS PATIENT: WHAT DO I DO NOW?

Juliette Hart, DVM, MS, CCRT, CVA  
*Cornell University Veterinary Specialists. Stamford, CT*

Just as in humans, our canine and feline patients can get varying degrees and clinically impactful levels of osteoarthritic changes in their joints. Their owners may notice that their pet “has been slowing down overall as the years go by,” or “he just can’t walk as far as he used to,” or “he really gets a limp if we walk more than a few miles,” or even “I’ve really noticed that he’s slowing down. He was diagnosed with hip osteoarthritis as a puppy.” Regardless of when the diagnosis was made, osteoarthritis is a disease process that we as clinicians likely will see every day in practice.

Arthritis can be classified as “inflammatory” and “non inflammatory,” and typically covers the disease process within the synovial joint. Osteoarthritis has been defined as the “aberrant repair and eventual degradation of articular cartilage in association with alterations in subchondral bone metabolism, periarticular osteophytosis, and a variable degree of synovial inflammation.”<sup>1</sup> This lecture will focus on osteoarthritis in our senior patients, and potential therapies and treatments available.

## **Osteoarthritis**

Osteoarthritis is life-long, often impacts multiple joints, and is very dependent upon the dog’s weight, comorbidities, the age of the dog, and its environment/working goals. Weight management, pain control, and nutrition are critical in lifelong management of osteoarthritis, and the appropriate diagnostic plan (including pain control) is dependent on the patient’s age, specific physical exam and clinical signs, and goals for function in their normal environment.

## **Weight/Nutrition Management**

Counseling owners on proper diet and nutrition for their dog is an on-going conversation. As weight increases, stress on the joint increases, which can result in pain, stiffness, and decreased range of motion in that joint – which may result in decreased activity overall for the dog. It has been reported that overweight dogs with diagnosed hip osteoarthritis, when dropping >10% of body weight, showed an overall decrease in body weight, body condition score, and severity of hind limb lameness.<sup>2</sup>

## **Pain Assessment/Management**

A recent JAAHA article<sup>3</sup> published pain management guidelines for both cats and dogs. The article reviews the behaviors of pain, how to recognize these signs in both our feline and canine patients, and evaluates treatments in both acute and chronic pain scenarios.

- 1.) Recognition of pain: What is the animal’s ability to maintain normal behavior, has there been a loss of normal behavior, and have there been any developments of new behaviors that appear either as an adaption to pain or a response to pain relief?<sup>3</sup>

2.) Pain scores: Both Colorado State University Veterinary Teaching Hospital and the University of Glasgow have published Pain Scales. Please see references for the web addresses.

In each patient evaluation, a clinician has a large availability of multiple pharmacologic and non-pharmacologic options. One should consider careful review of the literature and levels of evidence, perform constant evaluation of the patient, and effectively communicate with all members of the patient's team, including other clinicians and the owner. By way of modalities, LASER (light amplification by stimulated emission of radiation) therapy has been used in rehabilitation therapy to help modulate cellular function. It generates a photochemical response in damaged or dysfunctional tissue, with the goals of alleviating pain, and reducing inflammation. <sup>4</sup> E-Stim (Electrical stimulation) has also been utilized, and theorized that the effects are possibly due to stimulation of alpha-beta fibers that activate inhibitory neurons and block pain to the brain, and by potentially increasing aminobutyric acid in the spinal cord, which may reduce central sensation. <sup>4</sup>

### **Muscle Strengthening/ROM (Range of Motion)**

Concentric muscle contraction: Direction of motion is the same as the contraction. <sup>4</sup> For example, the biceps contracts, shortens, and extends the shoulder and flexes the elbow.

Eccentric muscle contraction: Direction of the muscle shortening is opposite to the direction of motion of the bone it attaches to<sup>4</sup>, so the muscle lengthens when under a load. As an example, during a biceps curl, lowering the weight to the ground.

Isometric muscle contraction: Contraction that is not associated with any movement. <sup>4</sup> As an example, standing on an uneven surface and maintaining that stance.

With osteoarthritic changes in joints, the dog may not use the limb as well or as frequently, so range of motion in the joint decreases, and pain may increase. If the dog is not using the joint normally, associated muscle atrophy may result, contributing to pain, and increasing weakness.

ROM (Range of Motion): Muscles have a range of motion, which can be defined as "the distance a muscle is able to shorten after it has been maximally elongated." <sup>4</sup>

AROM (Active): Motion of the joint with active muscle contraction.

PROM (Passive): Motion of the joint without any active muscle contraction.

When considering therapeutic exercises and overall treatment plans, it is important to consider the function of muscles associated with the joint (or joints) in question to develop the best overall plan.

### **Intra-Articular Injections/Conservative Therapies**

Intra-articular injections have been reviewed on the human and equine side for the management of some joint pathology, and more recent literature has produced several canine joint studies. A recent equine paper described the joint as an organ and as a result, "OA involves all its tissues including articular cartilage, subchondral bone, synovium, fibrous capsule and joint fluid." <sup>5</sup> Hyaluronic acid, corticosteroids (triamcinolone), and regenerative medicine therapies have all been marketed for the treatment of

osteoarthritis. Hyaluronic acid's anti-inflammatory effect is thought to be caused by the decreased migration of inflammatory cells, and lowered levels of inflammatory mediators (prostaglandin E2 and bradykinin). Phospholipase A2 inhibitory proteins inhibit arachidonic acid, which then controls the biosynthesis on prostaglandins and leukotrienes.

Platelet rich plasma (PRP) has been studied in humans for the treatment of symptomatic knee osteoarthritis, and is increasing in visibility for the treatment of many different musculoskeletal disorders. In a recent paper looking at the meniscal release model for stifle osteoarthritis in dogs, dogs were split into groups (PRP versus a saline control) based on the type of intra-articular treatment. Injections were given at weeks 1, 2, 3, 6 and 8. While all subjects progressed radiographically in the appearance of osteoarthritis, dogs in the saline group had more severe lameness at weeks 5, 12, 18 and the PRP dogs had higher function, and higher %TPI at weeks 5, 12, 18. <sup>6</sup>

Current evidence from the literature should be discussed with clients prior to instituting a treatment protocol. A patient's prognosis is entirely dependent upon their diagnosis (and other preexisting conditions).

## References

1. Tobias KM, Johnston SA. Veterinary Surgery Small Animal. 2012 Saunders Elsevier.
2. Impellizeri JA, Tetrickand MA, Muir p. Effect of weight Reduction on clinical signs of lameness in dogs with hip osteoarthritis. JAVMA 7(1): 1089-1091, 2000.
3. Epstein M, Rodan I, Griffenhagen G, et al. 2015 AAHA/AAFP Pain Management Guidelines for Dogs and Cats. 2015 JAAHA 51:67–84.  
[csuanimalcancercenter.org/assets/files/csu\\_acute\\_pain\\_scale\\_canine.pdf](http://csuanimalcancercenter.org/assets/files/csu_acute_pain_scale_canine.pdf)  
[csuanimalcancercenter.org/assets/files/csu\\_acute\\_pain\\_scale\\_feline.pdf](http://csuanimalcancercenter.org/assets/files/csu_acute_pain_scale_feline.pdf)
4. Millis DL, Levine D. Canine Rehabilitation and Physical Therapy. 2<sup>nd</sup> Edition. 2014 Saunders Elsevier.
5. McIlwraith CW, Frisbie DD, Kawcak CE, et al. The OARSI histopathology initiative -- recommendations for histological assessments of osteoarthritis in the horse Osteoarthritis and Cartilage 18 (2010) S93-S105.
6. Cook JL, Smith PA, Bozynski CC et al. Multiple Injections of Leukoreduced Platelet Rich Plasma Reduce Pain and Functional Impairment in a Canine Model of ACL and Meniscal Deficiency Journal of Orthopedic Research 2015.

*Additional references are available from the author upon request.*