Arthritis in Companion Animals:
What is it?
Cutting Edge Treatments!

Introduction

It is estimated that 20% of all dogs have arthritis. Studies involving cats age of twelve and over showed 20-90% to have arthritis. The veterinary profession has come a long way in methods to manage this debilitating disease process. Our pets are family, and deserve the modalities being offered to humans. It is our goal, at the South Memorial Animal Hospital Physical Rehabilitation Center, to restore functionality and decrease pain for those pets already affected by arthritis, and to put in place preventative measures for all the rest. Multimodal management of arthritis addresses the whole animal and is not just prescribing medications or supplements for pain. It also involves physical rehabilitation, diet, weight management, and adjunctive therapies such as acupuncture and therapeutic massage.

Arthritis: The Disease Process

In order to understand the most effective ways to manage arthritis, it is necessary to have an understanding of what occurs within the joint and how it affects the whole animal. Arthritis is a vicious cycle. Arthritis is thought to begin with degeneration of cartilage within the joint; this can be due to both injury and normal wear and tear. As degeneration occurs, cartilage becomes soft and pieces can flake off into the joint. Eventually, there can be so much cartilage loss that bone is exposed. The body tries to replace the worn and damaged cartilage, but is not efficient. The new cartilage that is laid down may be inferior or even bone. This uneven surface no longer glides well. This rubbing leads to reactive bone formation: osteophytes are the sharp bony formations that protrude into the joint, form in the joint capsule, or are associated with the ligamentous attachments to the joint margins, while enthesiophytes are the bone spurs that form outside the joint capsule at tendon attachments. The joint space narrows and the shape of the joint changes. These changes account for the crepitus, or grinding sounds that are heard when an arthritic joint is moved. The synovium is the lining of the joint capsule, and it normally produces a viscous fluid. With all the changes occurring in an arthritic joint, the synovium becomes inflamed, and the synovial fluid it produces is greater in volume and thickened, negatively affecting the glide of the joint. Pain is due to more than one factor. During osteophyte formation, the periosteum, or covering of the bone, is elevated and irritated. Bone that is exposed due to cartilage loss is sensitive because the nerve supply is exposed. Microfractures occur in the bony proliferations. There is pinching and abrasion of the synovium, and also inflammation of the synovium and the joint capsule. Sometimes osteophytes can poke the joint capsule, causing irritation with movement. To further complicate matters, the arthritic individual becomes less active because of the pain and the joint capsule tightens, over the sharp osteophytes, because it is not being stretched. Surrounding muscle becomes atrophied from disuse, the animal becomes weak, and can become overweight. With so many processes going on in and around the joint, it is clear that multiple things need to be done to help the situation.

NSAIDs

Over the years, the standard approach to treating arthritis in dogs has been administration of non-steroidal anti-inflammatory drugs (NSAIDS). Unfortunately, cats do not tolerate NSAIDS and can have fatal complications if given NSAIDs. More recently, an NSAID named Metacam was labeled for use in cats and many are doing well with this drug, but it is still not safe for every cat. NSAIDs commonly used in dogs include Deramaxx, Etogesic, Metacam, Previcox, Rimadyl, and Zubrin. The downside to the NSAID-only approach is that arthritis is a progressive disease, and

many pets reach a point where NSAIDS are not enough. Furthermore, NSAIDS are not a safe option for those whose liver, kidneys, and/or gastrointestinal tract cannot handle them, and frequent monitoring of blood work is necessary to monitor the liver and kidneys while on NSAIDS. NSAIDS do hold a place in the treatment of arthritis, but using them as a stand-alone treatment does not adequately address the disease process.

Other Prescription Medications for Pain

More recently, veterinarians are expanding the pharmacy and prescribing different drugs for pain. These drugs have different mechanisms of action than the NSAIDS and work at different locations in the pain pathway. For these reasons, they are all safe to use in combination. Amantadine, gabapentin, and tramadol are some of the medications that can be prescribed. They can be used long-term if needed, and do not require monitoring of blood work. One approach is to use medication to relieve pain initially, start physical rehab, build up muscle and endurance, and then wean off medications while continuing pain relieving-modalities associated with rehab, acupuncture, and/or massage.

Glycosaminoglycans (GAGS)

GAGS are present in the matrix that surrounds the cells that make up cartilage. GAGS trap water, which in turn provides cartilage with its shape and enables it to act as a cushion. GAGS also inhibit destructive enzymes and have anti-inflammatory effects. The cells that make up cartilage, called chondrocytes, produce the GAGS, but with increased cartilage destruction caused by arthritis, the chondrocytes cannot keep up.

GAGs can be supplied orally, in the form of chondoitin sulfate. Some products supply chondroitin in the form of Perna canaliculus, also known as Green-lipped mussel. Chondroitin is available in combination with glucosamine-containing supplements, or on its own. One can purchase the products intended for human use and check with the veterinarian for the appropriate dose to give, or buy veterinary products that are flavored and have the dosages for dogs and cats on the label. These are available without prescription. Studies conflict as to whether or not oral chondroitin is helpful with arthritis, and many of the studies were poorly designed. More recently, a large double-blinded multicenter clinical trial was performed in humans, called the Glucosamine/chondroitin Arthritis Intervention Trial, or GAIT study for short. The GAIT study was a $12.5 million project funded by the National Institutes of Health (NIH), the National Center for Complementary and Alternative Medicine (NCCAM), and the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). Participants all suffered from arthritis of the knee. The treatment groups were treated with 1) glucosamine alone, 2) chondroitin sulfate alone, 3) glucosamine and chondroitin in combination, 4) an NSAID, or 5) a placebo. Participants receiving NSAIDS had statistically significant pain relief from arthritis. No other groups had improvement considered to be statistically significant with except for a subgroup that was considered to have moderate-to-severe pain, and the glucosamine chondroitin combination was helpful. This subgroup was so small, that researchers still say more research needs to be done. Whether or not a chondroitin-containing supplement should be given should be discussed with your veterinary health care provider. As previously stated, there is more research to be done and efficacy is debatable, but many owners report significant improvement in their pets' arthritis condition once starting this supplement. Chondroitin sulfate is a nutraceutical, and as such is regulated by the FDA as a food and not a drug. So, these products are not held to the rigors of testing that drugs are, and quality can vary. It is best to get a recommendation from the veterinarian on which products are known to be reputable.

Adequan® Canine is an injectable product containing GAGS. The GAGS are polysulfated, so they are able to attract and hold more water. It may work better than orally administered GAGs because it bypasses the gastrointestinal tract, therefore is not broken down before it reaches the tissues it needs to help. Also, its smaller size may help it better penetrate the joint capsule. It is labeled for use in dogs, but can be used "off-label" in cats and works quite well in the feline patients. This is a prescription medication and therefore is regulated by the FDA as a drug.

Furthermore, there is research to back the efficacy of the product. The treatment protocol calls for a series of injections given twice weekly for 4 weeks, for a total of 8 injections. Then, injections are given as needed, usually monthly, for maintenance. Injections can be given in the hospital or sent home with the owner.

Other Supplements

Glucosamine is a building block for articular cartilage. Glucosamine supplements are widely used in both dogs and cats. These products are administered orally. One can purchase the products intended for human use and check with the veterinarian for the appropriate dose to give, or buy veterinary products that are flavored and have the dosages for dogs and cats on the label. These are available without prescription. It is recommended to go with a product that comes from a reputable source; like chondroitin it is not regulated by the FDA as a drug. As stated above for chondroitin, glucosamine was tested in the GAIT study and results were only significant in a small subgroup receiving glucosamine in combination with chondroitin, and only if arthritis pain was considered to be in the category of moderate-to-severe.

Long chained omega fatty acids, specifically eicosapentaenoic acid (EPA) are beneficial in the treatment of arthritis. Through their cellular interactions, they help to manage inflammation and inhibit cartilage degradation. Many of the joint specific diets on the market today already contain EPA. Another option is to give a fatty acid supplement, such as 3V® Caps. Again, this is a nutraceutical so get a recommendation for reputable brands.

Weight Management

Obesity is strongly linked to the development of arthritis. In humans, heavy people are 3.5 times more likely to develop arthritis than light people, and losing 11 pounds decreases the odds of developing arthritis by over 50%.

Though there are not studies yet in pets to give comparable statistics, studies do show that limiting intake as opposed to feeding ad libitum significantly improved arthritis scores in the hip, knee, and elbow over the course of a lifetime. We know obesity is a risk factor for arthritis in pets, and that overweight pets with arthritis can benefit from weight loss. Your veterinary healthcare professionals can assist in designing a weight loss plan, looking at both diet and exercise recommendations. Sometimes we modify the diet already being fed, and sometimes the recommendation is for a prescription weight loss diet. Treats are also taken into consideration. An exercise plan specific to the pet is developed that owners can carry out daily at home. Optionally, you can schedule "gym" sessions at the Rehabilitation Center. We have a variety of exercise equipment, including both a land treadmill and an underwater treadmill, and are sure to come up with an exercise routine that will not only aid in weight loss but be fun for your pet.

Physical Rehabilitation

Arthritis results in decreased muscle mass, weakness, and decreased ability to perform functional activities such as jump in the car, move from a lying-down position to a standing position, or even posture to urinate or defecate. With physical rehabilitation, goals are outlined specific to each pet and a plan is made to achieve these goals. An exercise program is designed to help stretch joint capsules, build muscle mass, and help with balance. Modalities such as laser, pulsed electromagnetic field therapy, and neuromuscular electrical stimulation can be used to alleviate pain and stimulate healing. Owners perform the outlined exercise plan on a daily basis at home, and also bring the pet in for therapy as needed. Pets enjoy the physical activity; they regain lost function while having a good time and getting lots

of attention. One of the state-of-the-art options is exercise in the underwater treadmill. The buoyancy of the water assists limb movement by reducing excessive forces on the joints, making movement more comfortable and affording an opportunity to exercise, condition, strengthen, and also has cardiovascular benefits.

Stem Cells

Adult stem cell therapy is available for the treatment of arthritic conditions in pets. A study published in 2007 in *Veterinary Therapeutics* stated, "The improvement in clinical scores was statistically significant in the stem cell group at all posttreatment evaluation times for lameness at walk and trot, pain on manipulation, and pain-free range of motion." We carried out our first stem cell procedure at South Memorial Animal Hospital in October 2008, are thrilled with the results, and are excited about the implications for the future. The procedure involves a surgery to remove fat under the skin. Fat is an excellent source for stem cells. The tissue is shipped overnight to the Vet-Stem laboratory in San Diego. The processing lab isolates the stem cells, performs cell counts, and does viability assessment. The stem cells are specially packaged and sent back the same day. If the yield is high, some cells can be cryogenically banked for later use. Once we receive the stem cells, the animal is briefly anesthetized and the stem cells are injected directly into the affected joint(s). There is usually enough to treat 2-3 joints initially, with the possibility of some being stored for later use. The stem cells help in multiple ways: giving trophic support, imparting anti-inflammatory properties, differentiating into tissue, homing to the injury site, and modulating the immune system. Most pets show clinical signs of improvement within a few weeks, and some never require another stem cell treatment. Vet-Stem recommends that stem cell therapy be carried out with physical rehabilitation, because the physical rehabilitation can make results occur sooner, and positive benefits last longer. The company's website is: www.vet-stem.com. We are proud to be one of the pioneers offering this service.

Therapeutic Massage

Massage is beneficial for pets with arthritis. It is thought to reduce pain and muscle tension, stimulate joint fluid, help with muscle atrophy, and increase lymph flow. The end result is an increase in range of motion and mobility. We have a canine massage therapist and a massage room at the Physical Rehabilitation Center.

Acupuncture

This alternative therapy has become more and more mainstream as the research continues to mount to support it. Acupuncture is used to treat various maladies, and adjunctive pain relief is just one of its uses. We look to add this to our repertoire of treatments in 2009.

Conclusion

With so many options available, our pets do not have to live a compromised quality of life with arthritis. We are pleased to offer all these services in one location: the Physical Rehabilitation Center at South Memorial Animal Hospital. The Rehabilitation Center is housed in its own building and has a homey atmosphere, to alleviate the anxiety many pets feel when going to the vet. Call 918.664.8690 to schedule an appointment for your pet, find out more, or to tour our facility.