Osteoarthritis

Edited by Patricia Long, Melissa Zebley DVM, Judy Benoit
Contributors: Liz Bradbury, Binay Cahn, Ros Catt, Laurie Crocker, Steve Dudley, Ann Ghiorso, Gael Goldsack, Sherry Hartung, Ina Olsen, Sue Sanvido, Martha Millas Senécal, Chuck & Dorothy Turley, Teresa Vigil, Nell Ward, Susan Williams, Kathryn Yost

This article is about osteoarthritis, OA, rather than immune mediated forms of arthritis such as inflammatory or rheumatoid arthritis. OA is not a disease in and of itself, but is a degenerative condition caused by other joint problems. The two type of problems that are commonly associated with OA are trauma (abnormal force on a normal joint) or congenital (normal force on an abnormal joint, such as from OCD, ED, CHD, HOD, or canine patella luxation).

Normal cartilage is smooth and wear resistant, allowing nearly frictionless movement. It is composed of collagen, water, proteoglycans (chondroitin sulfate, keratan sulfate, and dermatan sulfate), and hyaluronan. The cartilage covers the end of the bone, called the subchondral bone. The synovial fluid cushions the bones of a joint, while ligaments enclose the joint capsule and provide stability. Muscles provide additional support to the joint.

If a joint is damaged or is improperly constructed, changes will occur to the cartilage. The surface will become rough, stress to the underlying layers causes fissures, collagen breaks down, cartilage thins, proteoglycan is depleted or lost into the synovial fluid. All of this causes pain when the joint moves (articulates). The increase of pain causes the dog to exercise less, causing the surrounding muscle to atrophy which increases stress on an already painful joint. The dog limps, or bunny hops, shows reluctance to jump into the car or go up or down stairs, prefers to lie down rather than sit or stand, or any number of other behavioral or temperament changes.

In order to minimize the chances of a dog's developing OA, the first and most important thing is the selection of a breeder. All the good breeders will try to reduce the possibility of congenital problems by the use of hip and elbow x-rays, and by not breeding a dog that had OCD. (Note: these are just a few of the many things a breeder will do in the selection and evaluation of potential sires and dams). The next most important thing an owner can do is to provide the proper nutrition to the growing pup while ensuring that the large breed pup does not eat too much or grow too fast. It is recommended that the amount of food be limited, rather than free-feeding or time-limited feeding. High-energy foods (from high fat content) should be avoided, and the amount of calcium and phosphorus should be carefully balanced. Copper, zinc, vitamins A and D are all necessary in the proper amounts. The addition of vitamin C has not been shown to be necessary by clinical tests. (However, anecdotal reports seem to indicate that it may be beneficial. How's that for dithering?)

The recommendation for a large breed puppy for a dry kibble food:
Protein 25 - 30%

Fat 8 - 12 %

Calcium 0.9 - 1.5%

ME (kcal/g) 3.2 - 3.8

Phosphorus 0.7 - 1.45%

For the dog with arthritis, the most promising dietary additive is fish oil or EPA/DHA. Use of this by humans has allowed a reduction in the use of NSAIDs for the pain and inflammation. And of course, weight control, since obesity is a major risk factor for OA.

Exercise for a young dog / growing pup should allow for good muscle tone while minimizing the risk of injury. In other words, stairs are an excellent exercise provided a pup is taught to go down "easy" to prevent injury. Rough play with a bigger dog should be limited or controlled to prevent injury.

Exercise for an arthritic dog will probably help strengthen the muscles and increase the range of motion of the affected joint. Studies have been done in humans, but not in dogs, and it is not known if increasing exercise will accelerate the progression of OA. Exercise should be increased gradually and needs to be moderate and low impact. Leash walking and swimming are the best options. Exercise should be done only after any joint instability has been corrected (repair of cruciate ligament rupture), and any excess weight has been reduced. Several short periods of exercise are better than one prolonged session. Icing an arthritic joint after exercise can help reduce the inflammation.

There are many different drugs, which can be used for arthritis prevention and management. Some of these are still experimental; not all of them are approved for use in all countries. This list is also not complete. Please remember that not all medications will work the same way for all dogs, and too much of most anything can be dangerous.

NSAIDs: non-steroidal anti-inflammatory drugs

acetylsalicylic acid, aspirin decreases inflammation and pain, can cause gastric bleeding, loss of kidney function


etodalac: effective in improving rear limb function with CHD

acetaminophen, Tylenol may be OK for dogs (it's toxic for cats)
Phenylbutazone: similar action to aspirin may be effective for dogs that can't tolerate buffered aspirin, but can depress bone marrow.

meclofenamic acid, Arque: very effective in treatment of OA, may cause diarrhea

corticosteroids, prednisone, prednisolone: severe side effects with prolonged use

SADOAs: slow acting drugs of OA

PSGAG: polysulfated glycosaminoglycan, Adequan - best when administered as a shot in the joint (intra-articularly); young dogs predisposed to CHD had significantly better radiographed hip conformation than untreated dogs the earlier it's administered, the more likely it is to decrease synovitis and protect against cartilage degradation

PPS: pentosan polysulfate, Cartrophen - Vet given subcutaneously for 4 weeks, showed a favorable response to lameness given intra-muscularly for FCP, there was a more rapid return to function

nutritional supplements: glucosamine, chondroitin sulfate - (Glycoflex contains both, and is an extract of the Perna molusc exoskeleton) (Cosequin contains both and also manganese ascorbate)

glucosamine: stimulates the production of glycosaminoglycan, proteoglycan, and collagen. It may also have anti-inflammatory properties.

chondroitin: sulfate inhibits histamine induced inflammation, cartilage degredative enzymes, and stimulates collagen and glycosaminoglycan production.

HA: hyluronan, polyanionic, nonsulfated glycosaminoglycan - studies on humans and horses report a decrease of pain, improved joint mobility and performance.

Tetracyclines: doxycycline, minocycline - when used in dogs with cranial cruciate ligament rupture repair, there was a decrease in cartilage ulceration on the weight bearing areas of the medial femoral condyle.

When conservative therapy is not an option or is no longer an option, surgical treatment may be advisable. Total hip replacement, femoral head and neck excision (Note: both of these will be discussed in the Canine Hip Dysplasia article), locking a joint in place (arthrodesis), rinsing and cutting away damaged cartilage (arthroscopy, used in OCD), ligament repair are all viable options. Each should be carefully researched before proceeding.

Case histories from the Berner-L mailing list:
Steve Dudley's excellent post in Digest 131 is poorly summarized here. His horribly dysplastic Labrador pup was immediately put on Ester-C and never showed any signs of problems. He was a fine hunting dog right up to the very end. Steve also used Ester-C on his Berner when Baron had cruciate ligament surgery, and was extremely impressed with the speed of Baron's recovery. Baron never showed much sign of restricted motion. Steve went on to post a letter which summarized the many benefits of Vitamin C.

Nell Ward's Merlin was treated with Glyco-Flex and Arquel, but the Arquel seemed to cause him a great deal of gastro-intestinal distress. He was switched to Feldene which is given only once every 3 days. This combination seemed to help him.

Ros Catt's 10 year old Trista was quite arthritic from hip dysplasia. She used McFarlane S.F. 4 Mussel Extract tablets and apple cider vinegar which seemed to help. She had tried the Cartrophen injections, but didn't notice much difference.

Laurie Crocker's Kodi was diagnosed with FCP in his left elbow. She used Rimadyl and tried the Glyc-Flex for awhile. She discontinued the Glyco-Flex because she didn't notice any benefit. The Rimadyl works like magic, but she uses it very cautiously because of concerns about liver/kidney problems. Kodi gets one before any heavy exercise (running on the beach or in the woods) and shows no sign of any lameness afterward. Kodi also gets Foster & Smith JointCare daily, which contains both glucosamine and chondroitin sulfate, as well as Ester C, and lots of celery in his raw diet.

Gael Goldsack's Kiri gets periodic injections of Cartrophen, and her limping stops after the first week of the 4 weekly injections. Gael now administers an injection once a month instead of 4 injections every 6 months. Kiri has been helped tremendously.

Sue Sanvido has an 8 year old dysplastic bitch who has been helped a great deal by chiropractic adjustments. After the first adjustment, the dog was tearing around the back yard playing chase with a younger dog!

Binay Cahn's Bandit was diagnosed with mild hip dysplasia, and had been starting to limp noticeably. After Binay and Bandit moved from Chicago to San Francisco, the limping substantially decreased. The only change was the weather, from cold and wet to warm and dry. The hills of San Francisco don't even seem to bother Bandit now.

Liz Bradbury's Annie is the Arthritis Poster Dog. The treatment that has helped best is Cod Liver oil, shark cartilage (2 x 740mg/day), Vitamin E (500 mg), tsp. safflower oil, 2 tsp apple cider vinegar. Even though the joints remain swollen, there is no sign of a limp, and she runs with the rest of the gang. Annie will limit the amount of play, and will lag behind when tired. Losing 20 pounds also helped a great deal!

Susan Williams had two geriatric dogs with very stiff joints. She used a daily regimen: in the morning a tablespoon of malt extract with cod liver oil, and in the evening a capful of aloe vera juice, a dribble of cod liver oil, some brewers yeast tablets, an aspirin, and a ladleful of celery concoction. The celery concoction was chopped celery boiled with
some liver. It all seemed to help, and the coats were lovely. Eight year old Berner Billy had a series of 4 cartrophen injections a year ago, and has been pain and limp-free since. He loves to swim, and won't go in when it is really cold, but seems to benefit a lot from the swims.

Kathryn Yost found ArthriSoothe - Joint Formula, by NaturVet. The ingredients are: montmorillinite, chondroitin sulfate, green lipped mussel (perna), whey, beef liver, Vitamins E and C, boswellia serrata, yucca schidigera, magnesium stearate, stearic acid, and silica gel. She started using it on dysplastic 7.5 year old Raven to try to prevent future problems, he shows no signs of arthritis yet now that he's 8.5! Kathryn used electro-acupuncture on Sarah, before the cancer took over, and highly recommends the procedure.

Martha Millas Senécal has been very pleased with the results of Cartrophen Vet and daily shark cartilage that she gives Mishka. Mishka had a hip replacement on one side, and an FMO on the other. The additional stress placed on the front legs because of this would be debilitating without the treatments.

Ina Olsen told us that gold bead implants are commonly used in Denmark to help relieve pain from HD, ED, Spondylosis, and others. She knows of a young female with very painful ED that had gold beads implanted. Within a few days the dog was without any symptoms. Several years later, the dog is still just fine. A second female with bad HD had the gold beads implanted, and got about 80% better. So they won't help every case, but they shouldn't do any harm.

Teresa Vigil's Sheltie Willie injured his hip from a bad fall when he was 8 months old, and by the time he was 2 years he was already avoiding activity and limping. She changed his diet to a more natural product (Solid Gold), and used two additives, Ambrotose and Sport, made by Mannatech. Within three days the Sport made a difference, and she no longer sees Willie avoid play, and there is no evidence of a limp!

Ann Ghiorso's Bella had a limp at 1 year, and was diagnosed with either ED or FCP, the x-rays were not conclusive. No surgery was done, and as Bella aged, the limping was only noticeable after hard running. She later tore a cruciate ligament in her right rear leg, had surgery to repair it, then a second surgery to repair the meniscus that was shredded! Bella had swimming therapy, and a therapist also massaged Bella in a heated pool, which seemed to aid the recovery process. In addition, she takes 3 Glyco-flex and 1 shark cartilage pill daily. The joint begins to click if the Glyco-flex is stopped. Bella also takes Rimadyl only when needed - if she does any heavy exercise. Bella is over 7 years old now, and gets plenty of exercise to help keep her moving well.

Pat Long's Samoyed Sam was starting to stiffen considerably, so she began giving him Fresh Factors - ingredients: yeast culture, liver, bee pollen, chondroitin sulfate, kelp, biotin. Since he seemed to do so well on it, she put 7 year old Vesta on it as well, and at 8.5 years she is still bouncing like a puppy most of the time, so the Fresh Factors hasn't hurt.
Chuck Turley provided information to the list about Cetyl Myristoleate, which is purported to actually cure osteoarthritis. (No claims were made about helping the blind see, however!) See digest 970 for a more complete write-up. See also http://www.healingself.com/cmnomore.htm

Dorothy reports that they tried the treatment on Gambit, as well as reducing the protein level in his food and giving him glycoflex. Now that he has completed the treatment, his limp is significantly reduced, but not eliminated. They will be x-raying later to check on the results.

Sherry Hartung found an article indicating that a study of borage-seed oil, rich in gamma linolenic acid, showed a reduction of arthritic pain and inflammation.

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**Bibliography:**

This article is a distillation of the following book. Rather than footnoting just about every sentence, I have included the list of articles used from the book. For those of you who wish to have the most thorough understanding of Osteoarthritis in canines, I highly recommend you buy this book!


Osteoarthritis: Joint Anatomy, Physiology, and Pathobiology by Spencer A. Johnston

Congenital Conditions that Lead to Osteoarthritis in the Dog by Steven A. Martinez

Acquired Conditions that Lead to Osteoarthritis in the Dog by Steven A. Martinez, George S. Coronado

Nonsteroidal Anti-inflammatory Drugs and Corticosteroids for the Management of Canine Osteoarthritis by Spencer A. Johnston, Steven C. Budsberg

Slow-Acting, Disease-Modifying Osteoarthritis Agents by Spencer A. Johnston, Rory J. Todhunter

Nutritional Management of Osteoarthritis by Daniel C. Richardson, William D. Schoenhen, Steven C. Zicker

The Role of Exercise and Physical Modalities in the Treatment of Osteoarthritis by Daryl L. Millis, David Levine
Surgical Treatment of Osteoarthritis by John T. Payne


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