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Introduction:

Osteoarthritis associated with degenerative joint disease (DJD) is a common problem in all dogs, but particularly in large dogs who are susceptible to hip dysplasia (a genetic disorder of dogs controlled by 5 gene pairs). Even without a genetic predisposition in patients to arthritis, many dogs will develop joint disease for the same reasons that we as human beings do so. Often patients are overweight and the micro-traumas associated from carrying this extra weight takes its toll as the patient ages. One important aspect of the treatment of patients with arthritis is to reduce or maintain an ideal body weight. Most dogs in the United States are overweight due to dietary habits or from lack of exercise. It is clear from longevity studies in animals that lean body weight is associated with improved overall health and increased resistance to disease, including arthritis and cancer.

Dogs do develop immune-mediated joint diseases (Systemic Lupus Erythematosus, non-SLE immune joint disease and Rheumatoid arthritis), infectious joint diseases (Lyme disease, Rocky Mountain Stopped Fever, and septic joint disease), and traumatic joint diseases (ruptured anterior cruciate ligament and traumatic hip dislocation). The diagnosis of these diseases requires laboratory tests (CBC, Chemistry profiles, urinalysis, and immune tests), radiographs of the affected joints and joint fluid analysis. In some cases, special diagnostic procedures like bone scans, computer axial tomography (CAT scans) or magnetic resonance images (MRI scans) are necessary to make the correct diagnosis. In acute disease, traditional medical and/or surgical treatments can be extremely effective in providing relief and assisting in repair of the damaged joint. This is particularly true with traumatic disease. On the other hand, traditional therapy may fall short in the long-term control of immune-mediated joint disease and in the control of chronic degenerative joint disease. Even following surgical repair of acute lesions, the patient must still heal and will benefit from the principles of integrative medical therapy.

In dogs with a breed or familial predisposition for developing DID, regular exercise, good nutrition and supplemental support may moderate or forestall the development of joint disease. Once DJD does surface, the same principles can be use to treat and control the process of joint deterioration. This involves the use of anti-oxidants, anti-inflammatory compounds and chondroprotective agents. Western medicine powerful steroid medications which can reduce

inflammation, but these drugs do possess many detrimental effects during long-term usage. In addition, steroids may reduce collagen synthesis, which delays healing. Non-steroidal anti-inflammatory drugs (NSAIDs) reduce inflammation by controlling prostaglandin production and reduce discomfort through their analgesic properties. On the other hand, NSAIDs increase stomach acid secretion and diminish the mucosal protective barriers, leading to gastrointestinal (gi) irritation and upset. Although many new medications have developed which have less gi side-effects, little data is available to show that NSAIDs actually delay the onset or progression of DJD. NSAIDs appear to be most useful in reduction of discomfort from joint pain. Many herbal products have anti-inflammatory properties similar to NSAIDs, yet do not appear to cause the same gi irritation, making herbal products ideal in treating DJD. While veterinary pharmaceutical preparation of chondroprotective drugs are available, there is no data to suggest that they are more effective than less expensive products available from health food stores. In fact, no chondroprotective drug may be more effective than supplementation with dietary cartilage (which contains the chondroprotective compounds and additional useful materials).

Treatment of Acute and Chronic Joint Disease:

Treatment of Acute Joint Injury:

All dogs may from time to time suffer from acute joint injuries (stretching of ligaments, partial tears of ligaments or sprains). These conditions are different from chronic DJD. Although the healthy dog diet and supplements may help these patients from developing injuries and speed their recovery from the injuries, nothing can specifically prevent accidental injury to joints. In acute lameness secondary to joint disease, rest is very important to minimize further injury in the acute phase. Rest should continue until significant healing has taken place, usually for a minimum of 14 days up to 6 weeks. To accomplish this may require kenneling the dog to enforce the rest. Walks should be limited to leash-controlled potty duties. Cold compresses may help minimize swelling and reduce pain and inflammation (this is the opposite of chronic DJD). One way to apply cold is to use bags of frozen peas which can be held in place with a loose "Ace" bandage. This should be applied for 15 minutes 2-3 times a day. Sometimes, application of moist heat following the initial and subsequent "cold" treatments (5-15 minutes after each "cold" treatment) will improve circulation and help rid the area of toxic metabolites. This can be done by placing a slightly moistened towel into the microwave (or oven) for a short period. The towel should be warm, but not so hot as to burn the patient. (Cautiously, test it on yourself. If you feel it is too hot, it is too hot for your dog. *Don't burn yourself !!!*)

In addition to "cold" and "heat" therapy, NSAID compounds may help reduce pain and inflammation. NSAID compounds should only be used for the first few days (3-5) when the

inflammation is most acute. Aspirin (particularly enteric-coated, buffered aspirin) is usually well tolerated by dogs at doses of 1-5 mg/kg up to 3 times a day. This can cause gi upset and gastric bleeding in some sensitive dogs or dogs with inherited bleeding tendencies. Carprofen (Rimadyl) may also be a good NSAID product which dose not appear to have the same level of side-effects as other NSAID drugs. Acetaminophen (Tylenol) does not have an anti-inflammatory action and, therefore, does not help in acute joint injury (other than providing analgesia (never exceed 20 mg/kg/day since it can cause liver damage in dogs) Ibuprofen seems to cause (sometimes severe) gi upset much more frequently than aspirin and I do not recommend it for dogs. An alternative to the NSAID drugs with fewer side-effects is to use a cocktail of garlic powder, dry ginger and dry mustard (1/4-1 teaspoon each, depending on your dog's size) 2-3 times a day with food. These can also be dissolved in a small amount of vinegar (1 teaspoon, mixed with 1 tablespoon of honey and diluted with an ounce of warm water) and given orally. Another natural NSAID compound which can be given is feverfew (see below).

If your dog's lameness does not improve rapidly in a few days or worsens, see your veterinarian for proper diagnosis and additional therapy. Some acute joint injuries require surgical correction. Others may need specific therapy. On the other hand, if the resolve quickly, the injury was likely to be self limiting. Recurrent symptoms could indicate a chronic disease process.

Prevention of DJD:

The methods of prevention of arthritis are based upon the principles of exercise and dietary measures useful in maintaining health in all dogs. Of these components, antioxidants and membrane stabilizers are most important. Vitamin C is necessary for normal bone development and may stabilize the vascular supply to healthy bones and joints. Tofu has phytoestrogens which improve bone development and calcium incorporation into the bone matrix. Garlic, ginger and mustard provide anti-inflammatory actions to minimize micro-traumas during the life of the patient. In those dogs who have a genetic predisposition to DJD, the addition of dietary cartilage and Perna mussel (see below) as dietary supplements may provide additional chondroprotection to minimize genetic influences. While it is not always possible to prevent genetic diseases, reducing their impact may allow the patient to lead a longer, disease-free life.

Therapy for Active DJD:

Feverfew:

Feverfew is a natural NSAID compound without the side-effects of prescription drugs. It can be used in dogs with pain or arthritis to help reduce inflammation and discomfort. I do not recommend it for routine use; but, if your dog has pain from arthritis, give 1 capsule every 8-12 hours as needed. You can use this for 5 days out of the week, safely.

Dietary Cartilage:

In many cases of DJD with arthritis, recent studies have suggested that glycosaminoglycans and chondroitin sulfate may help reduce pain and inflammation from osteoarthritis, assisting in the healing process. While these products are available through health-food stores or a pharmaceutical medication through your veterinarian, you can give these to your dog directly by giving cooked cartilage. Sources of dietary cartilage would include cooked and "de-bone" chicken wings or using cooked spare ribs as the meat source in the diet. Why pay for cartilage products if it can be gotten for free in the dietary source. Some people taught the benefits of shark cartilage, but there are no scientific studies to support these claims. (It is also ecologically unsound to kill sharks to harvest their cartilage.) On the other hand, increase dietary cartilage can do no harm, particularly in the face of arthritis. In patients with arthritis, I recommend 1-2 grams of dietary cartilage with each meal. Another alternative is bovine gelatin (Knox gelatin or Knox Nutrajoint) which can be added to the food (1-2 packages per feeding). In some dogs, using glucosamine/chondroitin sulfate complex will be beneficial in controlling joint pain and stimulating healing; however, dietary cartilage has these compounds along with other important ingredients. Forms of glucosamine/chondroitin sulfate complex are available at health food store. (These are cheaper than products available from your veterinarian and may work as well) I recommend around 1200 mg of glucosamine and 1500 mg of chondroitin sulfate daily, if other forms of cartilage are not available.

Perna Mussel:

The marine bivalve mussel, *Perna canaliculus*, has been used to treat DJD for many years. This mussel contains many bioactive compounds, including glycosaminoglycans, an anti-inflammatory component and an antihistamine compound. In a number of scientific studies, Perna mussel has been shown to reduce the inflammation of rheumatoid arthritis and DJD of the stifle. While the exact mechanism for this beneficial effect in arthritis is not known, it may be due to the unique combination of complex proteins, glycosaminoglycans, amino and nucleic acids and chelated minerals which it contains. It seems to enhance the regenerative capacities of joint chondrocytes, regulating the chondroitin sulfates and hyaluronic acid production needed

to maintain healthy chondrocytes. Perna mussel is available at most health food stores (Sea Mussel by FoodScience or green lipped mussel). I recommend that this be given based upon the recommendations for human beings. In small dogs, reduce the amount by one-third. Perna mussel is also available as a veterinary pharmaceutical (Glyco-Flex) which can be obtained from your veterinarian. The dosage of Glyco-Flex is 1 capsule (contains 300 mg of Perna mussel) for every 15 lbs of body weight per day, divided into 2 or 3 doses.

Bromelain/Curcumin:

Bromelain is an extract of pineapple stems which has the property of decreasing circulating immune-complexes. As such, there is no Western medicine which is its equal. Since many of the complications and the direct initiation of the immune damage may be caused by the elevated immune-complexes in some forms of DJD, bromelain may be an important key in helping to control the progression of DJD. Curcumin (the yellow pigment of turmeric plants) is a potent anti-inflammatory agent. Bromelain and curcumin have a synergistic effect whereby they assist the absorption of each other from the gastrointestinal tract, increasing their potency. As such, they should be given together. Many health food stores carry combinations of bromelain and curcumin. For dogs with DJD, give 400-500 mg of bromelain with 500-400 mg of curcumin twice a day. (Curcumin is found in low concentrations in the spices turmeric and yellow mustard. As such, it is possible to replace the "capsule" form by adding 1-2 Tbs of turmeric and 1-2 tsp of dry yellow mustard to the diet.)

Additional Measures for Treatment of DJD:

Acupuncture:

While acupuncture cannot prevent DJD but can be very effective in relieving pain caused by any form of arthritis or following surgical correction during the healing process. Acupuncture is widely accepted as a method to provide analgesia without the side-effects of drugs. It stabilizes the adrenal gland function and may increase endogenous corticosteroid secretion without the side-effects of exogenous steroid medication. Electrical acupuncture will stimulate reflex activity, improving muscle strength and allowing more rapid return of function. Post-operatively, needle acupuncture is useful to reduce muscle spasms without drug intervention. Generally, acupuncture is given over several treatments. If it does not provide benefits within 3-5 treatments, then further therapy may not be warranted. Acupuncture should be performed only by a veterinarian who is trained and certified in its use; your veterinarian should be able to refer

you to a qualified veterinary acupuncturist in your area.

Physical & Massage Therapy:

While physical therapy and massage therapy probably will not prevent DJD, they are very useful in help patients feel relief from discomfort and in maintaining maximal joint flexibility. Using the methods, as part of play while the dog is healthy, may help make them more acceptable to the patient when they are needed. Massage therapy improves muscle and joint flexibility, increases blood supply (improving nutrient delivery and waste removal), and help prevent or breakdown scar tissue formation. It also helps relax muscle spasms and aids in patient comfort levels. Massage therapy for animals should be performed by massage therapist trained in animal behavior and anatomy, under the supervision of your veterinarian. Many of the basic principles can be learned by the owner under proper instruction.

Physical therapy is often initiated by your veterinarian, who will instruct the owner in how to continue the therapy at home. There are several physical techniques which are beneficial in returning patients to function. Initially, passive movement of all joints of legs which are affected needs to be performed. Each joint should be gently brought through its full range of motion for at least 5 minutes per day, gradually striving to regain normal range of motion. This will stimulate blood circulation and help maintain muscle and joint flexibility. The importance of passive movements continues until muscle strength and usage of the leg returns; at which point, they are no longer necessary. One way to accomplish these passive movements is to bring the entire leg through circular extension and flexion movements, similar to "riding a bicycle" exercise. Shortly after the start of passive movement therapy, standing exercises are important to build muscle strength. The affected limbs should be positioned naturally and the weight of the animal used against muscle resistance. Initially, this resistance will be minimal; but, with increasing time and exercise, the resistance will allow the animal to stand for brief periods. The standing should be continued, increasing resistance by pressing down upon the animal's back, until the muscles tire. Muscles must fatigue to gain strength. Standing exercises should be continued until the use of the limb is strong. Within 3 days of surgical correction, hydrotherapy can be begun. Using warm water, hydrotherapy helps loosen muscles and increase circulation. Hydrotherapy also can be combined with passive movements during the early stages increasing the benefits of each. By removing gravity, pain-free movements may be easier for the patient to initiate. Hydrotherapy is beneficial until normal walking movements have begun and standing exercises have increased muscle strength significantly.

Healing Touch:

Healing touch is based upon the capacity of human beings to pass "life-force" from themselves into others willing to accept this gift. Although many forms of healing touch are taught in the West, they represent teachings of the same physical process. Many studies have indicated that human contact can help lower blood pressure, reduce stress and improve the state of well-being of the recipient. Human contact has also been shown to increase the immune resistance of others. These principles can be used to help animal patients heal, as well. While it is not easy to demonstrate measurable results in all cases, certainly healing touch does no harm. When done as taught by practitioners of healing touch, it does not cost the "giver" personal energy, since the "giver" acts as a conduit of "universal" life-force which is freely available from a limitless supply of life-force within the cosmos. The "recipient" is free to accept and use this life-force energy. Most Eastern philosophies of healing are based upon the concept that living beings are based upon energy which flows in the body. When the energy level is low or there is a blockage of energy flow, disease develops. Healing touch, by providing life-force energy above or below this blockage, can re-establish the natural flow of energy, allowing healing to take place.

While healing touch has a spiritual aspect, it is not a religious practice nor does it require any particular belief by the giver or recipient. What is required is a recognition by the giver that this process can occur and for the giver to practice the technique to establish pathways for energy flow from them to the recipient. Distant healing touch can also be beneficial to patients. In this form of healing touch, the giver establishes a "psychic" connection with the recipient and mentally visualizes offering the life-force to the patient. Many double blind studies have shown that prayers directed at patients in human intensive care units reduce the complication rates of those patients and their ultimate length of stay in the intensive care unit. Distant healing touch and prayer seem to work through similar mechanisms, in their benefits to patients. On the other hand, belief in any specific religion is unnecessary to practice healing touch. Any person can learn and practice healing touch. In fact, most people perform healing touch without knowledge of doing so. For information about the practice of healing touch see [Dr. Weil's web pages](#) and search for "healing touch". For a discussion of healing touch, see <http://neuro.vetmed.ufl.edu/neuro/courses/vem5208/centering.html>

Healing touch may be helpful to maintain normal health in dogs who might develop DJD. It also will assist in slowing progression and maximizing recovery once DJD has developed. Since this can be done without risk of injury, it will do no harm; yet healing touch may increase the chances of full recovery. It also helps develop the human-animal bond. The outcome of healing touch is non-judgmental. It is a gift which is shared between the patient and healer.