



## **OSTEOARTHRITIS (Degenerative Joint Disease or DJD)**

**What is Osteoarthritis?** - Arthritis (osteoarthritis) is a progressive deterioration of articular cartilage found in diarthrodial (moving) joints. Degenerative joint disease (DJD) is a more appropriate term used to describe this condition in veterinary medicine. The two broad classes of DJD are primary and secondary. It is the most common joint disease in dogs.

**What Causes it?** - In the primary form, osteoarthritis is the result of defective articular cartilage structure and generation (the cartilage over the ends of bones). In the secondary forms, it can be caused by joint trauma, inflammatory conditions, congenital and developmental abnormalities, or a number of metabolic, hormonal, neurological, or neoplastic (tumor) causes.

The primary form is rare in dogs and cats, while secondary osteoarthritis is common. Ageing is not a cause of osteoarthritis, but it plays a part in the process, since the changes are cumulative. It occurs in both dogs and cats and any breed is susceptible. Many immature dogs develop DJD due to hereditary or developmental disorders such as osteochondrosis, elbow dysplasia, or hip dysplasia. Trauma-induced DJD can occur at any age.

Animals are at higher risk to develop DJD if they are working dogs, athletic dogs, or obese animals. Dogs with Cushing's disease or diabetes mellitus may also be more prone to DJD due to metabolic processes.

### **What Symptoms Suggest Osteoarthritis?**

Clinical signs become apparent when there is enough joint damage to cause joint pain, limited joint movement, joint crepitus or grating, joint effusion or swelling, and inflammation. Clinical signs vary greatly among affected animals. The severity of signs seen on x-rays often does not correlate with those seen clinically. Dogs suffering from DJD often show intermittent lameness that slowly becomes more severe and frequent with time. Severity of signs may be exacerbated by exercise, long periods of recumbency, and weather changes (cold weather).

Some dogs have a stiff gait, rather than lameness or limping. Pets may have a history of previous joint trauma (fracture, ligament injury, dislocation), osteochondral disease (bone/cartilage) or developmental disorders (patellar luxation, fragmented medial coronoid process, ununited anconeal process, hip dysplasia).

Physical examination findings may include: stiffness of gait, lameness, reduced range of motion, crepitus (grating), and joint swelling and pain. Depending on the duration of disease, joint instability may be present (ligament tear or subluxation).

**How is Osteoarthritis Diagnosed?** - The physical examination is a major part of diagnosing Osteoarthritis. Radiographs (X-rays) of the affected joints may show a number of changes associated with the disease. Blood tests may be indicated to help rule out immunemediated arthritis (autoimmune diseases like lupus, rheumatoid, or autoimmune polyarthritis). Serum titers for *Borrelia*, *Ehrlichia* and *Rickettsia* help evaluate for infectious arthritis.

Synovial fluid (joint lubricant) analysis can be useful, including bacterial culture. Biopsy of the joint tissue is helpful in ruling out other joint pathologies or tumors.

**How is Osteoarthritis Treated?** - Osteoarthritis management focuses on controlling pain, improving joint function, and slowing the degenerative process within the joint. Treatment of DJD may include medical or surgical options. Most patients are initially treated medically. Therapy usually involves weight management, controlled exercise, and anti-inflammatory and analgesic medications.

Medical management of DJD includes a wide variety of pharmaceuticals that inhibit prostaglandins, leukotrienes, serine proteases, metalloproteases, interleukins, and tumor necrosis factor. Other drugs, such as the chondroprotective (cartilage protective) agents not only inhibit inflammatory mediators, but also stimulate metabolic activity of joint cells. If an inadequate response is obtained, surgical options



### **OSTEOARTHRITIS (Cont.)**

may be considered.

**ACTIVITY:** Exercise should be limited to a level that minimizes aggravation of clinical signs. Using the joint in a manner that consistently causes discomfort accelerates cartilage destruction. Most patients are comfortable with light to moderate exercise regimens that don't vary greatly. Exercise peaks and valleys tend to aggravate clinical signs.

**DIET:** Weight reduction in obese pets will reduce the stress placed on affected joints. Reduced caloric intake is recommended as activity diminishes due to DJD and as the patient ages.

**SURGICAL CONSIDERATIONS:** Arthrotomy (joint

surgery) is often used to treat underlying causes of DJD such as fragmented medial coronoid process, osteochondral diseases, or ununited anconeal process. Reconstructive procedures are used to eliminate joint instability or correct anatomic deficiencies.

Arthroplasty procedures are commonly performed to treat DJD of the hip. Total hip replacement (THR) can give excellent results and is recommended in dogs that can accommodate the implants. Femoral head ostectomy is performed in smaller dogs and cats, or select patients that can not afford total hip.

Arthrodesis (making the joint solid and immovable) is used in selective patients with chronic DJD and joint instability. Complete or partial arthrodesis can be performed based on the location of DJD or instability. Arthrodesis of the carpus (wrist) generally yields excellent results, while arthrodesis of the shoulder, elbow, stifle or hock gives less predictable results.

**MEDICATIONS:** Nonsteroidal Antiinflammatory Drugs (NSAIDs) work by inhibiting prostaglandin synthesis. Aspirin and phenylbutazone are the most commonly used agents in dogs. Rimadyl and Etogesic are two new NSAIDs that are less likely to irritate the digestive tract and are quite effective. Use of NSAIDs in cats is limited to aspirin. Chondroprotective agents: a drug, (Adequan®) which is gaining popularity for

use in dogs, is a glycosaminoglycan polysulfate ester (GAGPS).

### **ALTERNATE DRUGS:**

- **Nutraceuticals:** these products are classified as nutritional supplements, rather than pharmaceuticals. Little controlled experimental or clinical research substantiate their efficacy in dogs. Manufacturer recommendations should be followed. Glycosaminoglycan products contain varying amounts of chondroitin sulfates. Cosequin® provides raw materials needed for glycosaminoglycan synthesis. Cosequin contains glucosamine, chondroitin sulfate, mixed glycosaminoglycans, and manganese ascorbate. Methyl sulfonyl methane (MSM) is a derivative of dimethyl sulfoxide (DMSO) that is promoted as an agent to reduce pain, inflammation, and free radicals.

The use of fatty acids is helpful in the treatment of arthritis. Omega-3 fatty acids suppress the inflammatory mediators and thereby reduce inflammation. DermCaps is a source of Omega-3 fatty acids and is used at the dose recommended for skin problems. Other sources of Omega-3 fatty acids include flaxseed, soybean, and canola oils from vegetable sources. Much more effective are fatty acids from animal sources such as fish oil. One capsule of fish oil daily is adequate for most dogs.

Antioxidants have been shown to lessen cartilage degradation. Some of the antioxidants that have been studied and are associated with a decrease in the formation of arthritis include vitamins E and C, zinc, and selenium. These are part of a balanced pet food.

- **Free-radical scavengers:** the use of oral superoxide dismutase (SD) is controversial due to lack of controlled clinical studies evaluating its efficacy and questions regarding its bioavailability following ingestion. The efficacy of subcutaneously administered SD is unproven. Topical DMSO may provide short term relief in some dogs.

- **Corticosteroids:** the use of glucocorticoids (GCC) for treatment of DJD would appear to be ideal due to inhibition of inflammatory mediators and cytokines; however, chronic use of these drugs has been found to delay healing and initiate damage to articular cartilage.



**PATIENT MONITORING:** Clinical deterioration indicates the need for a change in drug selection, or dosage or surgical intervention.

**PREVENTION/AVOIDANCE:** Early identification of predisposing causes and prompt treatment will help reduce progression of secondary DJD.

**EXPECTED COURSE AND PROGNOSIS:** Slow progression of disease is likely. Some form of medical or surgical treatment will usually allow a good quality of life.

Special instructions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

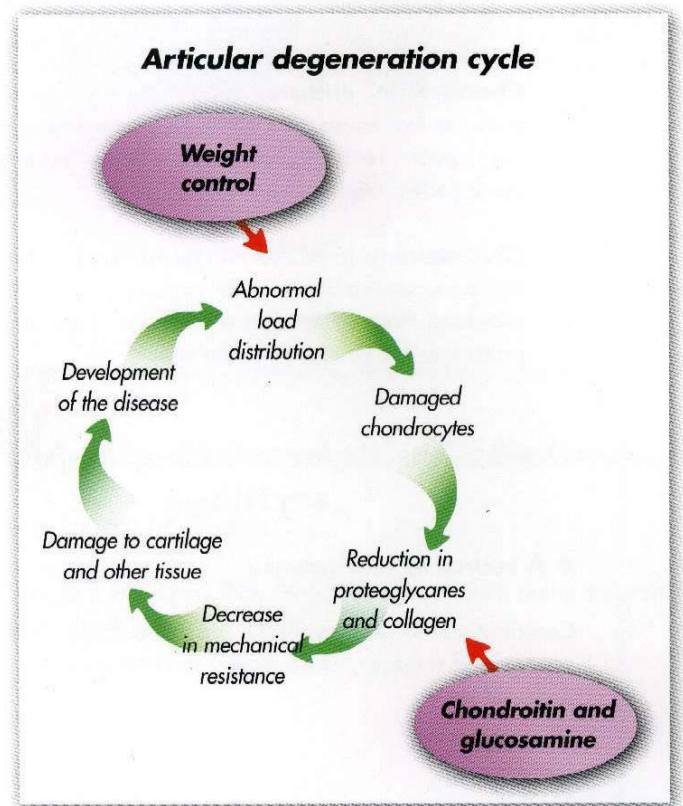
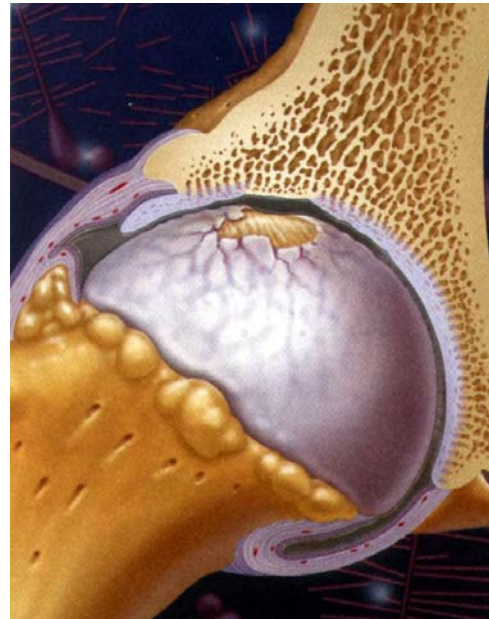
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*Thank you for this opportunity to serve you!*



**Evolution of osteoarthritis**

