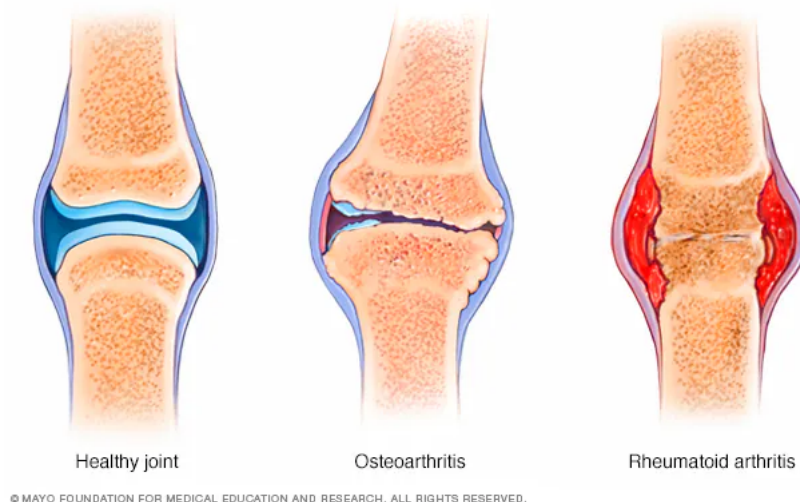


ARTHRITIS WHITE PAPER

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Arthritis can be divided into degenerative osteoarthritis and inflammatory arthritis. You can see the differences in this image from the Mayo Clinic.



Degenerative joint disease (DJD) or Osteoarthritis is the condition we are addressing with this management outline.

Osteoarthritis is usually slowly progressive, secondary to a trauma or just normal “wear and tear” activity and normal aging. Congenital or developmental conditions can influence the progression of arthritis.

Conditions such as Hip dysplasia and Legg Calve Perthes will lead to osteoarthritis of the hips; elbow dysplasia to arthritis of the elbows, cruciate ligament injuries and patellar luxations to degrees of arthritis of the stifles, spinal trauma to spinal arthritis and discospondylosis.

Degenerative arthritis is characterized by deterioration of articular cartilage; the smooth surface covering the joint surfaces is eroded and the underlying subchondral bone becomes exposed. Roughened surfaces develop within the joint and the joint capsule become thickened; the amount of synovial fluid increases slightly and the viscosity decreases lessening its lubrication abilities.

Signs of osteoarthritis include:

- “Cold lameness”: stiff in the morning or after having been sedentary for some time.
- The pet is worse in cold or damp weather.

- Your pet is now having trouble with stairs, trouble or hesitancy jumping on or off the couch or bed, trouble getting in and out of the car, getting up or down slowly,
- And, while usually a lameness that improves as movement progresses, but an arthritic lameness may also be worse after strenuous activity.

Osteoarthritis is an “old-age” arthritis but also an arthritis following trauma to joints.

While osteoarthritis can be inflammatory from the sense that an arthritic joint can be traumatized and benefit from anti-inflammatory medication, osteoarthritis or degenerative arthritis is not an active inflammatory process. (“Inflammatory arthritis” involves swollen joints, fevers, and systemic illness that necessitate an immediate visit to your veterinarian to rule out immune mediated diseases (lupus, rheumatoid), septic arthritis, Lyme disease, etc. These active, inflammatory conditions are treated with antibiotics, steroids, and sometimes chemotherapeutic agents.)

Management of osteoarthritis includes:

- Nutritional supplements
- Weight management to decrease weight bearing stress to joints.
- Environmental adjustments.
- And anti-inflammatory/pain medications as needed.

The frequency and amount of pain medication can be greatly reduced in many cases when long-term supplements are utilized, and obesity prevented.

Natural nutritional supplements for arthritis are considered OTC items and do not require a prescription.

Anti-inflammatory and pain medications (NSAID’s and stronger pain medications) require a prescription and a current doctor-patient relationship with a veterinarian.

Laboratory workup with blood test and urinalysis are usually recommended prior to beginning these medications and at routine follow-up intervals.

ARTHRITIS MANAGEMENT

Maximal Relief of Pain and Inflammation with Minimal Pharmaceutical Use

- **NUTRICEUTICALS/NUTRACEUTICALS**

(Nutraceuticals are nutritional or food supplements used to modulate physiologic wellbeing. Food supplements are not government regulated the same as pharmaceuticals. We recommend products that are manufactured by companies using “pharmaceutical standards” to ensure the safety and accuracy of the supplements. For the best results use at least one product from each of the nutraceutical categories at the beginning dose levels for 6 weeks, then at maintenance levels thereafter. After several weeks with collagen Type II, glucosamine may be discontinued.). However, if only one or two supplements are to be used, then Omega 3 (Welacin) and Microlactin/MSM (Duralactin Canine Joint Plus Soft Chews) would be our top recommendations.

- **OMEGA 3 FATTY ACIDS** specifically eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (natural anti-inflammatory with beneficial effects for the joints, skin, coat, heart, kidneys, retina, brain: learning and memory, glucose metabolism and the immune system). Omega 3 fatty acid formulations are free form, triglycerides or esters.

- *3VFreeForm Liquid or 3VHPCapsules* : free form fatty acids are the most bioavailable form of omega 3 fatty acids, sometimes 60-90% usable (but some find the strong fishy odor objectionable)
- *Welactin Liquid and Welactin or OmegaMintSoftgels* (mint flavored)
my preferred supplement has been Welactin liquid which contains 1440mg EPA and DHA/6cc
- *Missing Link* : a powdered form of Omega 3 and Omega 6 fatty acids

- **GLUCOSAMINE, CHONDROITIN, MSM**

- *Dasuquin or Dasuquin w/MSM* : Glucosamine HCl an low molecular weight Chondroitin Sulfate (to support cartilage production and inhibit cartilage breakdown), ASU (avocado/soybean unsaponifiables to aid in joint protection), MSM (methylsulfonylmethane, a natural sulfur nutrient with analgesic and anti-inflammatory properties to support connective tissue, joints, circulation and reduce muscle spasms)
- *Cosequin or Cosequin DS or CosaminDS* : Glucosamine HCl with low molecular weight Chondroitin Sulfate (for better absorption)

- *PhyCox-JS Soft Chews*: Glucosamine HCl, MSM, Creatine, Turmeric, Phycocyanin
- *Synovi G3 Soft Chews* :Glucosamine HCl, MSM, Creatine, and Perna Canaliculus
- *SeaFlex Sea Cucumber Treats for Cats*

- **MICROLACTIN**
 - *Duralactin*: Microlactin (dried milk protein) an anti-inflammatory with a unique mechanism of action different from any known drug.
 - *Duralactin* capsules for cats,
 - *Duralactin* tablets for Dogs (Vanilla flavored), or
 - *Duralactin Canine Joint Plus Soft Chews* (Microlactin, glucosamine, MSM)

- **COLLAGEN TYPE II, TUMERIC-CURCUMIN, GREEN-LIPPED MUSSELS, HYALURONIC ACID, PCSO-524**
 - *Flexadin Advanced Chews* contain undenatured chicken collagen Type II as an immune modulator against inflammation
 - *Antinol for Cats, Antinol for Dogs* contains PCSO-524 a marine sourced fatty acid compound
 - *Nutramax Cosequin DS Plus MSM & Hyaluronic Acid Joint Health Supplement*
 - *VetriScience Glycoflex3* with Perna canaliculus (green lipped mussels), glucosamine and MSM

PHARMACEUTICALS

(Prescription medications)

- **INJECTABLE GLUCOSAMINOGLYCANS (GAG's)**
 - *Adequan Canine*: Polysulfated Glycosaminoglycan (PSGAG), an injectable form of chondroitin sulfate which inhibits certain prostaglandins that damage cartilage as well as improving production of joint tissues and fluid. Injections are given twice weekly for 4 weeks.
- **NSAID (NON-STEROIDAL ANTI-INFLAMMATORY DRUGS)**

These are non-narcotic, non-steroidal, cyclooxygenase inhibiting anti-inflammatory drugs for the control of pain and inflammation both post-operative and osteoarthritic. Selective Cox-2 inhibition is desired for maximum anti-inflammatory activity. Potential side effects for all NSAID's include gastrointestinal, renal and hepatic toxicity, bleeding (secondary to

decrease in platelet aggregation) and gastrointestinal bleeding; side effects are in part due to Cox-1 and Cox-3 inhibition. Interactions between steroids (cortisone, prednisone, dexamethasone, or triamcinolone), other NSAIDs (including aspirin, endolac or phenylbutazone), and protein bound drugs (cardiac, anticonvulsant, and behavioral) may occur; "wash-out" periods between drugs should be considered as well as the addition of intestinal protectorants. Laboratory testing to establish hemodynamic and serum baseline data is recommended prior to and periodically during administration of any NSAID.

- *Galliprant (grapiprant)* specifically blocks EP4 pain and inflammation receptor
- *Previcox (firocoxib)*-delayed absorption if given with food
- *Metacam (meloxicam)*-liquid, limited use in cats
- *Deramxx (deracoxib)*-bioavailability greatest with food
- *Rimadyl (carprofen)*

VERY IMPORTANT ABOUT NSAIDs: do NOT use with steroids or other NSAIDs

- *Premedication blood profile recommended when starting NSAIDs*

OTHER PAIN MANAGEMENT OPTIONS:

- Gabapentin (Neurontin), Tramadol, and opiates/narcotics may also be used for control of arthritic pain. Edible preparations of CBD formulations of marijuana have also been advocated for pain management.
 - *Gabapentin* is a neurologic anti-convulsant pain medication that targets peripheral neural pain and is useful in managing arthritic pain.
- *CBD (Cannabidiol)* is the non-psychoactive ingredient of marijuana as well as hemp. The formulations of 20:1 ratio CBD:THC appear to be more effective in controlling anxiety, inflammation and arthritic pain than the hemp derived "pure" CBD products. Since FDA does not regulate the safety and purity of dietary supplements, it is recommended that a certificate of analysis be obtained when purchasing CBD products to assure a 20:1 ratio. CBD drops applied to the gums or under the tongue are absorbed better and faster than orally given drops although both are effective.

THERAPEUTIC LASER: Low level light energy can behave as an anti-inflammatory modality for controlling pain and inflammation with chronic arthritis. The photochemical changes can increase blood supply, decrease swelling and edema and decrease inflammation. A series of laser treatments are usually scheduled. In most cases of arthritis, the spine (cervical, thoracic and lumbar) as well as the hips and any other affected joints are usually included. The newer Class IV lasers are our choice for depth of tissue penetration and reduced treatment times for arthritis management as well as other inflammatory conditions. Laser treatments are non-invasive and often decrease the amounts of medication needed to control pain. Laser treatments can stimulate acupuncture sites.

PREVENT OBESITY: Weight reduction can often be as beneficial as medication

EXERCISE: Regular, moderate exercise is beneficial, but avoid over exertion

- *(warm water) Swimming or water treadmill exercises*

MASSAGE THERAPY and ACCUPRESSURE

ACCUPUNTURE

ENVIRONMENTAL MANAGEMENT

- *Bedding: firm but soft, egg crate foam or gel beds (FlexGel), raised bedding*
- *Raised feed and water bowls*
- *Nonslip flooring or neoprene footpads (PupPads from PupGear)*
- *Avoid stairs, use ramps*
- *Warmth*

REHABILITATION EXERCISES: Exercises to improve core strength and mobility may be helpful

WATER TREADMILL: The buoyancy of water combined with a treadmill allows low impact exercise on joints & muscles