

Arthritis

What is arthritis?

Arthritis is inflammation of a joint. To understand it we need to look at the structure and function of a joint. There are different types of arthritis, osteoarthritis (OA), degenerative joint disease, (DJD), septic or infected and rheumatoid or auto-immune mediated joint disease. Only OA and DJD will be discussed here.

What is a joint?

A joint is a movable separation between two bones.

Types of joints: There are many different types of joints, synovial (fluid filled) and non-synovial (fixed) and variations of both. Some joints are virtually immovable such as those between the bones of the skull. These are called sutures. Craniosacral therapy depends on the mobilization of these sutures. The sacroiliac joints are slightly mobile. Others are highly mobile and have many different movements; extension, flexion and rotation. In the spine the intervertebral discs are modified synovial joints while the facet joints are small true synovial joints.

Joint function: Joints allow movement of the body or limbs at various angles. This is done by muscles which span one or more joints.

Joint structure: A synovial joint consists of bone covered by articular cartilage, ligaments to stabilize the joint and the joint capsule with synovial membrane lining. The space is filled with joint fluid.

Joint fluid: Joint fluid is formed by the synovial membrane or lining of the joint capsule. It flows between the cartilage surfaces supplying oxygen and nutrients to the cartilage. Cartilage has no inherent blood or nerve supply.

The ends of bones are covered in a body of cartilage. Cartilage is composed of chondrocytes or cartilage producing cells and an extracellular matrix, a dense network of collagen and elastic fibres. The matrix consists of water, collagen and proteoglycans, which are made of chains of carbohydrates known as glycosaminoglycans, (GAGs), attached to a linear protein. The main GAGs are Chondroitin Sulphate and Hyaluronic acid. The cartilage is a bluish colour and acts as a shock absorber and cushion to absorb concussive forces and allow a smooth glide between the bones. It can also become calcified to form new bone in growth or inflammation.

How do Joints Change in Arthritis?

DJD can occur as a result of wear and tear, intense athletic work, a lack of usage or simply poor conformation and ageing. All these factors cause less chondroitin to be produced. This results in less binding with collagen within the matrix and more water is absorbed. The matrix becomes softer with less tensile strength. This can lead to chondrocyte death and water leaking through the cartilage and into the underlying bone, causing bone damage and pain.

Inflammation of the joint capsule and synovial membrane (synovitis) is the initial stage. The inflammation is the body's response to damage of any tissue. Chemicals (histamine, kinins and prostaglandins) are released in response to inflammation. They cause a dilation and increased permeability of the blood vessels. This allows white blood cells to invade the tissue. In DJD the white blood cells enter the joint space and engulf dead cells and other debris.

The joint becomes hot, swollen and red. The prostaglandins and kinins stimulate synovial nerve endings leading to pain and loss of function. Acute pain is protective. Chronic pain is a nuisance.

The result of inflammation is a thin watery joint fluid with less hyaluronic acid but with a build up of lactic acid, which causes the fluid to become more acidic.

The chondrocytes which depend on healthy synovial fluid for nutrients lose their ability to produce matrix. The cartilage turns yellowish, fragments and frays. The bone becomes exposed and new bone is laid down as osteophytes, which give the knobby feel to affected joints.

The results are;

Ongoing synovial inflammation

The inability of cartilage to repair itself

Bone being laid down in the wrong places

Chronic loss of Range of Motion,(ROM).

How can it be treated?

There are many different approaches to treating arthritis. Generally, a combination of methods are used, but really none are fully curative, just palliative.

(A) Weight control is vitally important. Inflamed joints are painful and any excess stress from being overweight makes it worse. Weight control or loss is only possible by combining

lower calorie intake and exercise. In truth dogs only need to eat once a day at the most. Fasting stimulates the burning of fat far more than exercise. So use a smaller bowl and feed less often with no treats!

(B) Exercise doesn't really reduce weight, our taking the dog for a walk is good exercise for us, but minimal for the dog. But exercise is essential to keep joints moving and supplying nutrients to the cartilage. In arthritic dogs any joint movement will also provide better circulation around the joints and help reduce the inflammation. Be sensible and increase exercise in line with their ability

(C) Warm bedding; warmth reduces pain and promotes more movement, even when sleeping.

(D) Massage frees up the muscles and stimulates blood flow around the joints. Massage can be manual or ultrasound. Again this should be gentle.

(E) Anti-inflammatory drugs are commonly used. They work by reducing the pain and inflammation but at the same time they raise the animal's pain threshold. This means the animals feel better but the condition is getting worse. However, they do have a significant role to play especially in getting the animal mobile again.

(F) Disease Modifying Drugs: (more details later)

Pentosan: is a drug which re-lubricates joints and reduces inflammation.

Glucosamine and Chondroitin Sulphate: aid cartilage repair and rebuilding.

(G) Disease Altering Techniques:

Surgical intervention helps in some cases with joint instability, such as slipping patella, denervation of hip joints for hip dysplasia.

Stem Cell treatment and Platelet Rich Plasma (PRP) are showing signs of benefit in many cases. Please ask for more information on this.

Acupuncture and Herbal Medicine based on Traditional Chinese Medicine are of benefit in many cases.

Chiropractic and osteopathic treatments, now, known as Animal Biomechanical Medicine allows tissue and joint mobilization and adjustment to restore homeostasis, strengthen muscles and improve nervous system function. This can include passive flexion – extension to increase range of motion.

(H) Pain relief medication, as distinct from anti-inflammatories, can also be used at any stage of the disease.

Can it be prevented?

Yes, to a degree. Like mother used to say “everything in moderation my dear” is probably the best advice. So, the bottom line is “no excessive exercise, lying about, overeating etc, balanced by a healthy diet and lifestyle.” There are now commercial diets designed to assist in weight control and joint disease available.

Neutraceuticals can also be added to home made diets. Mostly these supplements consist of shark fin, green lip mussel and omega 3 oils. These are available as “Sasha’s Blend”, “Pernaese” powder, “Joint Guard” and “4 Cyte.” Omega 3 is available in fish oil capsules or salmon offcuts.

The use of Pentosan and these supplements begun before signs appear will stimulate regeneration of cartilage and slow the onset of DJD

We can’t, however, avoid old age.

Further Details.

Pentosan

Pentosan polysulphate (PPS) is a semi-synthetic sugar like molecule derived from xylan, a complex hemicellulose extract of plant origin (Beechwood).

It exhibits the following direct actions:

- 1 Stimulates cartilage regeneration by increasing production of proteoglycans and healthy matrix.
- 2 Improves the amount and consistency of joint fluid. PPS stimulates synovial cells to produce high molecular weight hyaluronic acid, the main viscous component of joint fluid. This increases the amount and viscosity of joint fluid, improving lubrication and reducing further damage.
- 3 Enhances production of cartilage by stimulating chondrocyte division.
- 4 Reduces joint capsule pain and inflammation. Inflammation is a “cascade” reaction and PPS has an inhibiting effect on the mediators of this cascade. It binds to white blood cells and alters their ability to
 - a. Migrate into the joints
 - b. Stick to blood vessels
 - c. Release chemicals which contribute to the pain and inflammation cascade.
- 5 Inhibits release of enzymes that destroy joint fluid and cartilage constituents
- 6 Mobilizes blood clots, fibrin, fat and cholesterol deposits in the joint spaces and blood vessels of the joint improving blood flow

- 7 Closes the pores of the blood vessels which, reduces the ability of inflammatory agents to enter the joint.

Use with other drugs

Pentosan has anti-coagulation properties, so care is needed in acute trauma cases, dogs with Von Willebrands Disease, eg Dobermanns, or haemophilia eg German Shepherds. It should not be used in conjunction with some anti-inflammatories, eg Aspirin.

It should not be used in animals with infection or known liver or kidney failure or within two days of surgery.

Neutraceuticals

There are a range of so –called neutraceuticals available for use in arthritis. The words Glucosamine and Chondroitin have become household words. Neutraceuticals have a slow effect so like the ad says “It won’t happen overnight.”

There is a huge range of products available, some well proven others very hearsay basis. Mostly these work best in conjunction with Pentosan and there is a synergistic response.

Glucosamine hydrochloride stimulates the synthesis of synovial fluid and cartilage matrix, including both collagen and proteoglycans.

Chondroitin sulphate is the major GAG in cartilage. It also inhibits the enzymes which degrade cartilage

Manganese is required for proteoglycan synthesis to occur

Omega 3 has an anti-inflammatory role.

Precautions with use: None

Traditional Chinese Medicine

TCM is often described as a very old form of medicine, but like our western medicine it is constantly evolving. TCM is based on experience and attention to detail rather than experimentation and proof. Acupuncture is but one area of TCM. It is based on the body’s relation to the whole universe and depends on the concept of Yin and Yang. Needles are used to stimulate the flow of Qi and Blood around the body. Arthritis is a form of Bi syndrome associated with an interruption of this flow of Blood and Qi. Pain is associated with stagnation. Many cases respond very well to acupuncture.

Chinese Herbal, this is another branch of TCM, there are many different formulas of herbs that can be used. Cases of low back and knee pain often respond very well to Du Huo Ji Sheng Wan.

Animal Biomechanical Medicine

This has evolved from both Chiropractic and Osteopathic techniques. The techniques used are spinal adjustment with a rewiring of the nervous system, and more soft tissue techniques which stimulate the flow of fluids in the body. The primary tenet here is that the body has an innate or natural ability to heal itself. Treatment is not an immediate cure but a continuum of improvement. It has recently been shown that Chiropractic adjustment also increases the strength of muscles, by retuning the whole nervous system.

At Forbes Street Vet Clinic we can use any or all of these modalities to help your animal. Please ask our friendly staff for help with any questions you have.

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