

NON-INVASIVE

TREATMENT OF JOINT PROBLEMS

(PART 2)

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GOOD NUTRITION IS ALSO AN IMPORTANT AND OFTEN OVERLOOKED FACTOR. ADEQUATE QUANTITY AND QUALITY OF PROTEIN, CALCIUM: PHOSPHORUS RATIO OF AT LEAST 2:1, MICRONUTRIENTS INCLUDING 20 PARTS PER MILLION OF COPPER, ZINC, ETC. ARE ALL PARTS OF A GOOD DIET. PROPER HOOF GROWTH REQUIRES SULPHUR CONTAINING AMINO ACIDS AND BIOTIN ALONG WITH GOOD CIRCULATION TO THE FEET. EVEN THINGS LIKE DEHYDRATION CAN AFFECT THE INJURY RATE. WHEN TISSUES, FOR INSTANCE, LIKE CARTILAGE GET DEHYDRATED THEY ARE MUCH LESS SUPPLE AND ARE MUCH MORE SUBJECT TO DAMAGE. THE SAME GOES FOR TENDONS AND LIGAMENTS. DEHYDRATION CAN ALSO DECREASE SYNOVIAL FLUID IN THE JOINT. THAT FLUID IS NECESSARY FOR PROPER LUBRICATION AND JOINT FUNCTION.



Distal end of the third metacarpal (cannon) bone showing cartilage erosion & score lines from abnormal wear due to corticosteroid injections

So what does one do other than submit to the “needle man”? There are actually quite a few options available today. We will discuss a few of them.

The best treatment of all is also the easiest and the cheapest. It is simply rest. Yes, that’s right, rest. It really needs to be part of almost all other joint treatments, invasive or not. Rest will often stop the damage and create an environment where the natural healing abilities of the body can repair damaged tissues. Here again, as with prevention, good nutrition is essential. The body must be supplied with the necessary macro and micro nutrients to repair and rebuild tissues. Rest can also be combined with other therapies such as physiotherapy, massage, swimming, passive flexion, and controlled hand walking and stretching.

This brings us to the next group of treatment modalities which are collectively known as nutraceuticals. These are substances such as glucosamine, chondroitin sulfate, oral hyaluronic acid, aloe, avocado, soy, omega-3 fatty acids, collagen, etc. available in various combinations. They are not really considered nutrients nor are they pharmaceuticals but have properties of both, thus the name. Their use in osteoarthritis is controversial. Even experts are by no means in agreement on their efficacy. Most clinicians feel that they are probably more useful as preventatives than treatments. However, this author prefers to use them as adjuncts to other therapies in a multiple modality approach to osteoarthritis in the horse.

Non-steroid anti-inflammatory drugs (NSAIDs) have their place in the treatment of joint problems in horses. These are things like aspirin (salicylic acid), phenylbutazone (Bute), Flunixin Meglumine (Banamine®), etc. These drugs reduce the inflammation of joint disease as well as relieve pain. They can be useful for short and long term treatment. Phenylbutazone has been used successfully for many years in the long term treatment of joint problems in horses. Only the



▲ An arthritic right hip joint caused by an injury

oral form should be used as the intravenous form causes phlebitis and destruction of the veins that is often permanent. This destructive effect seems to be magnified when phenylbutazone is combined with salicylates (aspirin) as in one certain well know combination.

All of the NSAIDs have some potential side effects. Most notably are gastric (stomach) and colon ulcers. These can be potentially serious but only occur in a minority of individuals on NSAIDs. A new NSAID for horses called firocoxib, under the trade name Equioxx® is available that is very potent but with minimal side effects. Equioxx inhibits cyclooxygenase-2 (COX-2),

an enzyme that causes inflammation and pain. Most other NSAIDs only inhibit COX-1.

There is a topical NSAID available to treat arthritis in horses called Surpass®. Surpass contains diclofenac and employs a totally new technology not based on traditional carriers like DMSO and PLO gel. Surpass is manufactured to exacting standards for diclofenac bound within liposomes (microscopic vesicles composed of membrane-like lipid bilayers surrounding aqueous compartments). The cream is applied directly to the affected joint once a day. This leads to the next modality known collectively as topical medications. Many different substances are



▲ The distal end of the first phalanx shows severe cartilage erosion. In one area the erosion is down to the bleeding subchondral bone

used topically to treat joint disease in horses. Most liniments provide a soothing effect and increase circulation to the joint. Topical anti-inflammatory medications are often based on the use of DMSO (dimethyl sulfoxide).

DMSO is in itself a good topical and systemic anti-inflammatory. It also scavenges free radicals, chemicals that breakdown tissues. Other reasons to use DMSO are its great ability to penetrate all tissues of the body and its capability to carry other substances deeper into the joints and peri-articular tissues. It is often combined with locally active steroids and non-steroid anti-inflammatories.

This is an important distinction. For example, the corticosteroid prednisone must go through the body and be metabolized by the liver into its active form to be effective. Prednisolone, a similar drug, is already in the active form and so is a better choice for topical use.

Some of the most exciting new treatments involve biological products. These are substances produced within the animal's own body, such as stem cells, Interleukin 1 receptor antagonist protein (IRAP), and platelet rich plasma.

When a joint is inflamed, it creates an unhealthy environment for healing. The natural response of inflammation is Mother Nature's way to tell us to rest: if it hurts, don't use it. Let it rest. The negative side, however, is that the inflammatory process can create a harmful chemical mix in the joint fluid. In other words, the inflammation itself can contribute to breakdown of the joint.

Pharmaceutical companies have focused a great deal of their research on arthritis on identifying the chemical mediators of inflammation at the molecular level. It seems that the worst of these culprits is a substance called interleukin-1. Interleukin-1 (a deleterious cytokine) is at the head of the inflammatory cascade, leading to a breakdown in the cartilage matrix through signalling factors that alter regulation and effect of inflammatory biochemical mediators. The goals of therapeutic intervention focus on returning a joint to normal as quickly as possible, when possible, and to prevent the occurrence and severity of osteoarthritis in an injured joint. When interleukin 1 attaches to receptors on the synovial membrane of the joint, bad things begin to happen that leads to all of the inflammation and destruction of all the joint tissues (cartilage, synovium,

etc.) that we see as osteoarthritis.

A company called Arthrex, based in Naples, Florida in the USA developed interleukin 1 receptor antagonist protein (IRAP) therapy as an answer to this problem. Basically, IRAP is an incubated "soup" that's produced from the horses' own blood that has been collected and incubated overnight with chromium-coated glass beads, then put in a centrifuge and filtered. The collected serum is then injected into the affected joint (or tendon sheath). This "soup" then locks up inflammatory receptors on the synovial membrane, creating a more normal, healthy joint fluid environment conducive to healing. It undoubtedly contains a variety of other "growth factors" that stimulate joint healing as well. This is a very innovative and, so far, very successful approach to joint therapy that does not involve any drugs but simply the body's own products.

Intra-articular stem cell use has also been an exciting new direction for treatment of joint disease. While research is still under way, it is a promising avenue of therapy. One of our biggest challenges in treating osteoarthritis is replacing damaged, degenerating, or destroyed cartilage. Once the articular cartilage is gone, there are few options for a bone-on-bone situation. Early evidence suggests that stem cells injected into a joint can make new cartilage. It is only a matter of time before researchers will discover how to "program" stem cells to produce the new tissue. Early clinical results of stem cell use in joints have been promising but much work needs to be done.

Intra-articular platelet-rich plasma (PRP) use is also on the table, and there is some interesting new research available, but it is too early to recommend it for regular clinical use. Platelets contain many "growth factors" that signal the body's own mechanism to heal, so there is potential for using it to treat tendon and ligament injuries and possibly joint damage. 🐾