



INSIDE THE CLINIC

WITH
DR. BILL STONE
of

KATY EQUINE CLINIC

UPDATE ON JOINT CARE

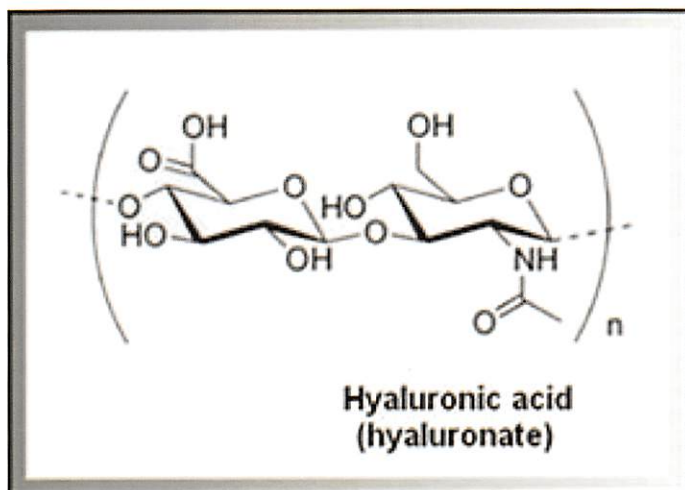
What joint supplement is the right one for your horse? Do we feed it, or do we inject it? Where do we inject it? We have drugs manufactured by pharmaceutical companies, we have compounded drugs made by pharmacies, we have supplements made from legitimate nutritional companies, and then there's the stuff made by Uncle Johnny's grandmother's cousin in a bathtub in the desert. It reminds me of the Aggie that thought the Thermos bottle was best invention ever. If you put something hot inside, it stays hot, and if you put something cold inside, it stays cold the aggie asks, "how do it know?" So, in the face of our question, "How do we know?"

I am your Aggie, and I am going to be your Thermos bottle. Besides structural integrity and conformational correctness, joints need proper lubrication to function properly. At the end of the day, all the products that we choose to use should support or provide essential lubrication for the joint. There are three basic categories for joint support: fluid support, cartilage support, and inflammation control. They are all different and all necessary.

FLUID SUPPORT

Joint fluid, or synovial fluid, is a bit like motor oil. As you add energy, its viscosity (thickness) decreases. As you remove energy, it gets thicker. When your horse is working the fluid is thinner, and when your horse stops working the fluid thickens again. Joint fluid covers all the surfaces of the joint — the boundaries that make them slide. Boundary lubrication can be the primary form of lubrication that functions at low speeds and low loads. Think of boundary lubrication as a film on the surface of the joint cartilage that allows it to move smoothly.

Sodium hyaluronate or the sodium salt of hyaluronic acid is the compound in joint fluid that makes this happen. It is very large molecule made up of many subunits of a compound called glucosamine. The larger the hyaluronate molecule, the better its ability to lubricate. It also acts much like a spring that coils up at rest and unwinds when your horse is working. The longer and tighter the spring, the better the joint can rest. Hyaluronate allows the joints to operate smoothly at work and to rest comfortably at the end of work.



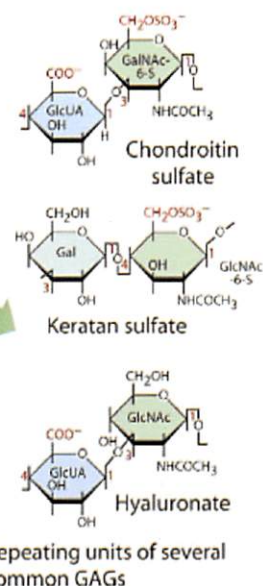
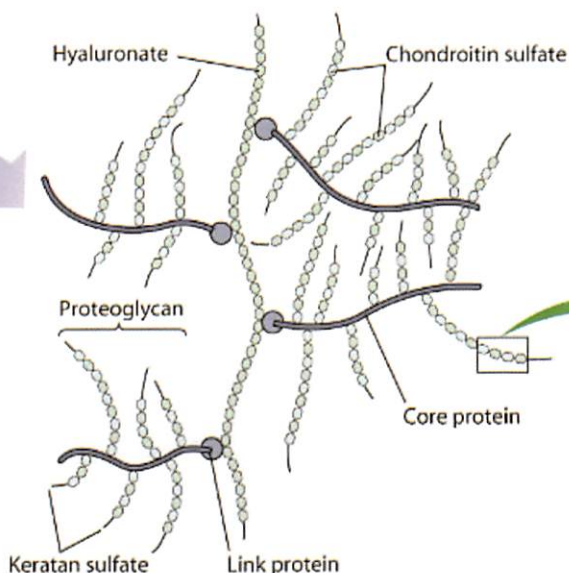
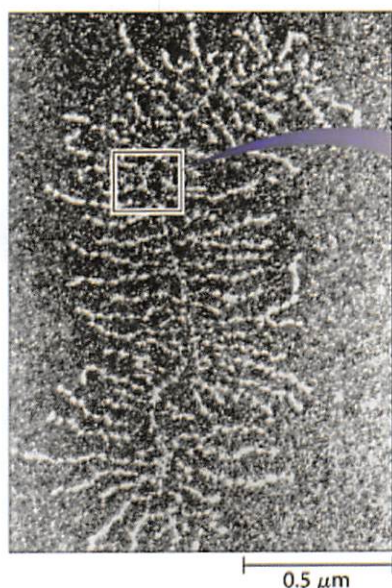
CARTILAGE SUPPORT

While boundary lubrication allows the cartilage surfaces to work together; we need a second system to cushion the load. That backup system is quite simply water held in the cartilage. We call this hydrostatic lubrication at rest and hydrodynamic lubrication at work. Every time the horse loads a joint, water cushions that load, and as the work increases, that water will squeeze out, which aids and supports lubrication on

the surface. This is especially important at high speeds or during prolonged activity; the effectiveness of the lubrication on the boundary decreases as energy increases in the joint.

Glycosaminoglycan is the compound in the cartilage that holds the water there. At the end of each branch of the glycosaminoglycan is a sulfate group. This combination is often called chondroitin

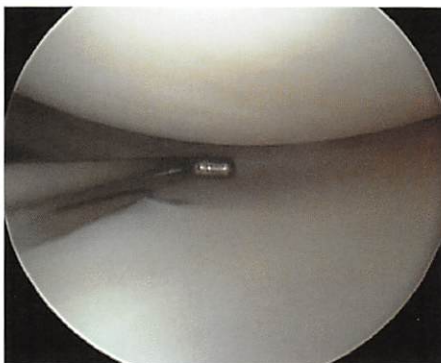
sulfate, and that sulfate group holds a water molecule that it will give up to provide lubrication. The greater the glycosaminoglycan content, the greater the joint's ability to hold and release water. As the cartilage is loaded, small bits of water are released on the surface of the cartilage, protecting it from damage by the opposing joint surface. This system functions at high speeds or high loads, — while you are riding.



INFLAMMATION SUPPORT

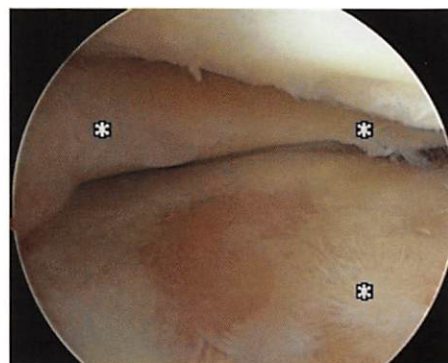
Inflammation is the gremlin that destroys the system. When you place your hand on an inflamed joint, you feel heat. Heat is energy. As such, it prevents the hyaluronate molecule from regaining its viscosity. An inflamed joint is always under stress, similar to that of constant work. Further, when the molecule is “uncoiled,” it’s subject to damage, and it becomes shorter, further reducing viscosity and its ability to provide needed boundary lubrication. Therefore, in the face of inflammation, because of the damaged hyaluronate molecule, the joint is essentially always working and never resting.

The first stages of inflammation attack hyaluronate, restricting boundary lubrication. If the joint remains in an inflammatory state, the glycosaminoglycan content begins to diminish as well, reducing the cartilage’s ability to hold water. Without water, hydrostatic/hydrodynamic lubrication decreases causing damage to the cartilage.



We see this as lines and fissures in the cartilage. In extreme cases, the cartilage can be totally destroyed.

If inflammation goes uncontrolled for a long time, both lubricating systems fail. Without lubrication, the cartilage cannot support the



GRADE IV - Chondral defects

joint’s activity, which results in mechanical damage. Unfortunately, mechanical damage is often permanent — cartilage does not grow back in its same form.

OUR TOOLS

Hyaluronate products provide boundary lubrication and stimulate production of large molecular weight hyaluronate molecules. Recent research is leading to use of synthetic molecules — polyacrylamide hydrogel — that imbeds in the lining of the joint stimulating the production of high quality hyaluronate. (Aziz Tnibar1*, Oct. 2017) European studies are promising; however, these products are only available in the United States in clinical trials.

Poly-sulfated glycosaminoglycan products are designed to preserve and support hydrostatic — cartilage lubrication. We use a variety of protocols and products, often with personal preferences. (Frisbie, 2009)

We use two groups of anti-inflammatory drugs, steroids and non-steroids. Steroids are used most often in the joint itself (intraarticularly). They provide direct and potent inflammation control. As with any medication, there are

upsides — controlling inflammation — and downsides, proteoglycan depletion. They can provide a great help to the joint environment but should be used thoughtfully.

We usually give the non-steroidal drugs systemically, orally or by injection. The provide relief to the whole horse, which sounds good, but they have a downside as well. Over use can result in stomach and liver problems.

OUR GOAL

Our goal is pretty simple, really. Support lubrication and control inflammation. Then why are there so many joint products out there? What makes them all different? In short, if we give something to our horses, then it should do one of two

things: support lubrication or control inflammation. To determine the best way to provide for good joint function, consult your veterinarian or equine professional to help you navigate your choices.

William C. Stone
DVM MS MBA
Diplomate ACVS

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