

## What ya puttin' in there doc?



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# ***A closer look at joint medications*** **By Emma Read, DVM, MVSc, DACVS**

Many of our western performance horses receive joint injections as treatment for chronic lameness issues. How much do you know about what your veterinarian is injecting in those joints? All of the different kinds of medications that can be injected into the joints are basically trying to achieve the same effect by working as some type of anti-inflammatory. The reduction in inflammation means that the joint is less painful and in most cases that also means that there is a slowing of the degenerative process affecting the cartilage. Arthritis, also called degenerative joint disease, is the primary indication for joint injections in the horse. The cartilage of the joint is the primary tissue affected but more recent evidence shows that there is also involvement of the joint capsule, the synovial (joint) lining and the underlying bone.

There are a few basic categories of medications ...

... Hyaluronic acid (HA) is a large sugar-like molecule made by the cells of the synovial membrane (joint lining). It is a normal component of healthy joint fluid and is used for lubrication of the soft tissues of the joint as well as being an anti-inflammatory. It actually inhibits the action of some of the inflammatory products found in the joint during arthritis such as metalloproteinases and cytokines. HA is also thought to limit the ability for white blood cells to migrate into the joint and in this manner may limit the inflammatory response in the joint. HA is also made by the cartilage cells in the joint and contributes to the health of the cartilage matrix. The compressive stiffness of the cartilage is dependent on the matrix and the stiffness is what contributes to the shock absorption characteristic of the cartilage. The exact mechanism of injected (external) HA is unknown. It is theorized that the injected HA leads to an increased production of (internal) HA by the synovial cells. Studies have documented that HA leads to reduced lameness, and less thinning of the articular cartilage. On a scale of 1-10, with 1 being least anti-inflammatory and 10 being most anti-inflammatory, HA is likely about a 3-4. While it has some anti-inflammatory properties it is not likely to treat anything more than a mild synovitis (or joint inflammation) when given on it's own. HA is also available as an intravenous injection (Legendâ) and in this manner may be useful in treating multiple joints at the same time. The only scientific study to date on intravenous injection of HA suggests that it is effective when given in this manner and acts similarly to the intra-articular route. HA is often combined with other joint medications to take advantage of the lubrication effects it has while combining it with more potent anti-inflammatory medications.

Polysulfated glycosaminoglycans (PSGAG's) (Adequanâ) are a naturally occurring sugar that has anti-clotting properties. It has its effect in preventing cartilage degeneration. Specifically it inhibits the enzymes that degrade the cartilage matrix. The PSGAG's are extracted from cow tracheal cartilage and are purified before creating a solution that is injected into the joints. Again, the exact mechanism of action is unknown but it is most likely that the PSGAG's inhibit the production of or action of the degradative enzymes within the joint. PSGAG's are potent anti-inflammatories and can actually limit the ability of the joint to raise a white blood cell response or activate complement activity. In this regard, PSGAG's are almost always injected along with antibiotics to try to prevent joint infection. Infections following injection are rare but a low-grade level of bacteria that the horse would normally be able to fight off usually causes it. When a potent anti-inflammatory such as Adequan is injected then an insignificant amount of bacteria can become a big problem because the horse is limited in the response it can raise with it's white blood cells. In order to avoid this the joint is sterilely prepared prior to injection and sterile gloves are often worn. Medications are drawn out of new single use vials with sterile syringes and needles. On a scale of 1-10 for anti-inflammatory then PSGAG's would be more like a 5-6.

Adequanâ is also approved for intramuscular injection as well as intra-articular injection. Many practitioners

prefer to use Adequanâ in this manner to avoid injecting it directly into the joints. There is controversy about whether the intramuscular version is as potent as when it is placed directly into the joint but no studies have been reported on this point. Many veterinarians advocate the intramuscular route as a method to avoid the devastating consequences of a potential joint infection while still providing this drug to the joints that need it. Anecdotal reports from owners abound as to the effectiveness of Adequanâ in the muscle.

When most people think of joint injections they assume that the horse is being given corticosteroids. Steroids would be the most commonly used intra-articular medication even despite the availability of HA and PSGAG's. Steroids are potent anti-inflammatories that strongly inhibit the inflammatory cascade within the joint. They work at the cellular level in the white blood cells of the joint. In the earlier days of steroid use in horse joints much higher doses were used than are used today. Earlier reports were that steroids worked well to reduce the signs of inflammation in the joint but that the articular cartilage quickly degenerated. Concerns were raised that the horse could keep performing on a joint that was pain free while the actual joint problem continued to worsen thus making the horse's problem worse. With recent studies in steroid use in horses we know much more about using appropriate doses. Steroids are potent drugs and rank about a 9 on a scale of 1-10 for anti-inflammatory effectiveness. We now know that we should use the lowest dose of steroids that will have an effect and should dose them only as often as needed. There are multiple different steroid preparations for injection in the horse. We know that different steroid preparations work better in different joints and some are even known to have minimal effect on the normal function of the cartilage matrix. Your veterinarian should take into account which joint you are treating and what the state of the joint is prior to choosing an appropriate steroid for your horse.

As mentioned previously, these potent anti-inflammatories can contribute to joint infection and have been associated with post-injection flare. A flare is a self-limiting event characterized by a sudden onset of joint swelling and severe lameness. Your horse looks like it has a septic joint but it is just severely inflamed. The incidence of this happening is approximately 1 in every 100 horses injected. The treatment is usually symptomatic until the joint reaction subsides. By contrast, a joint infection is a serious complication of intra-articular therapy. This often necessitates flushing the horse's joint and putting in antibiotics. For this reason if your horse becomes suddenly severely lame after receiving a joint injection then please seek veterinary advice immediately. The earlier we see the horse the greater the chances of resolving the problem with minimal lasting effects.

Finally, more recently there is a new kid on the intra-articular injection block called I.R.A.P. (interleukin receptor antagonist protein). This is a medication that is produced by drawing a sample of the horse's blood into a special syringe with glass beads in it. The blood is then incubated at body temperature overnight in the syringe and the beads basically mimic a wound in the body. This causes the blood to release potent anti-inflammatory compounds from the white blood cells. The serum portion of the blood is then collected and divided into multiple doses to be re-injected into the horse's joints. IRAP is a relatively new therapy and as such, the research work to critically evaluate its use is currently limited. Initial impressions are that it is a useful anti-inflammatory and that it appears to work best in mild to moderate arthritis cases. We are still learning more about how this medication works and when best to use it. The next time you have your horse at the veterinarian's for treating a lameness problem make sure you ask "hey doc, what are you putting in there?"

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