

Progressive Therapies for Musculoskeletal Injuries in the Equine Athlete

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Joint or tendon/ligament injuries comprise the majority of performance limiting conditions in the equine athlete. Most competitive riders have experienced one or both of these problems at some point during their horse's athletic career. Any rider who has dealt with either of these conditions has also experienced the frustration of trying to get their horse through the recovery process and back into competition.

Until recently, the primary treatment for joint injuries or arthritis consisted of a combination of rest, systemic anti-inflammatories, and joint injections with hyaluronic acid (HA, which is one of the primary constituents of joint fluid) combined with a steroid (potent anti-inflammatory). In more severe injuries, arthroscopic surgery may have been required to remove bone fragments or evaluate cartilage damage. Although new conservative therapies have been developed they are best used in cases where significant bone or cartilage damage has not occurred.

The treatment for a tendon/ligament injury has also been fairly standard until recently, and usually included rest, ice, and anti-inflammatory medications (such as phenylbutazone) followed by a controlled exercise program. The injured horse's return to work was usually dictated by serial ultrasound evaluations that monitored the healing of the injury.

The above treatments are often very effective and are still used in the majority of joint conditions or tendon/ligament injuries. However, in the quest for more rapid and higher quality healing, several new therapies have been investigated and introduced into the equine veterinary market. These therapies include extracorporeal shockwave therapy, IRAP (Interleukin-1 Receptor Antagonist Protein) harvesting and injections, PRP (Platelet Rich Plasma) harvesting and injections, and stem cell harvesting and injections. IRAP and shockwave therapy will be discussed in this

article, and the regenerative medicine therapies (PRP and stem cells) will be discussed in a future article by Surgi-Care staff surgeon, Dr. Ruth-Anne Richter.

Extracorporeal Shockwave Therapy: This therapy involves the use of a shockwave machine that converts electrical energy into a pressure wave within a fluid media. There are three mechanisms used to generate a focused shock wave; piezoelectric, electromagnetic, or electrohydraulic. Once these pressure waves are generated, they can be focused at a specific site within the body. These waves will pass through fluid and soft tissue and their effects occur at sites where there is a change in impedance or tissue quality such as at a bone-soft tissue junction. Shockwave therapy was originally used in Europe to break down kidney stones so that they could be passed into the urinary bladder. Other uses have been developed and shockwave therapy is now approved by the FDA to be used in the United States in humans for the treatment of plantar fasciitis or heel spurs.

The most common uses of this therapy in the horse are to stimulate bone formation or remodeling (non-healing fractures or bucked shins in the racehorse) and also to treat insertional desmitis and tendinitis such as proximal suspensory disease or other soft tissue injuries where the soft tissue structure is attaching to bone. It has also been used successfully in bone spavin, navicular syndrome, stress fractures etc. At this time, solid data about the effectiveness of this treatment is unavailable and the exact mechanism with which it works is also undetermined. It is known that an "anesthetic" effect is achieved with the use of shockwave therapy so it must be used with some caution if the horse could be in a situation to catastrophically injure itself due to loss of recognition of pain. Your veterinarian will be able to guide you in the injuries which will be amenable to treatment with shockwave therapy.

IRAP (Interleukin-1 Receptor Antagonist Protein) Injections: This therapy involves drawing blood from the horse into a special syringe containing glass beads. The syringe is incubated for 24 hours and then processed to produce sterile aliquots of serum containing high quantities of interleukin-1 receptor antagonist protein for injection into a diseased joint. In simplistic terms, interleukin-1 (IL-1) is the "bad guy"

of the joint because it is an inflammatory mediator which accelerates tissue destruction. In a healthy joint interleukin-1 and interleukin receptor antagonist protein are in balanced concentrations such that the IRAP blocks the negative effects of IL-1. In cases of arthritis, there is not enough IRAP to block the destructive effects of IL-1 which results in inflammation, joint pain, and cartilage destruction. So the goal of IRAP injections is to increase the levels of IRAP within a diseased joint and thus neutralize the negative effects of IL-1. Horses with arthritis, synovitis, or capsulitis (sprained joint) that are not responsive to conventional steroid/HA treatment generally respond favorably to IRAP injections. Horses with more severe arthritis are thought to respond less favorably although this author has seen significant improvement in horses with severe/chronic arthritic changes with prolonged use of the product. The treatment protocol typically involves three injections into the affected joint about two weeks apart. This therapy has also been used in horses following arthroscopic surgery with promising results. Your veterinarian will be able to help you determine if your horse is a good candidate for IRAP treatment or whether more conventional methods should be used.

In summary, these new treatment modalities are promising and are becoming more commonly used in equine veterinary medicine. It is important to note that there is limited research or clinical trials that have been conducted at this time on any of the therapies. Empirically, it seems that these therapies are all efficacious and worth pursuing, but we may find in 10 years that all or none of these therapies have withstood the test of time. You are advised to discuss these therapies carefully with your treating veterinarian prior to use. For more information about shockwave therapy or IRAP injections for the treatment of joint or soft tissue injuries in your horse, please contact Brandon Equine Medical Center at 813-643-7177 or email info@brandonequine.com with any questions regarding this topic.

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