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6 Takeaways from the Carolina Equine Sports Medicine Symposium

Cutting-edge professionals present practical and innovative ideas for the equine athlete

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Thanks to ground-breaking technologies and shifting equine rehabilitation protocols, there are now innumerable ways to treat sport horse injuries. Even injuries that were previously thought to be career-ending or at least prevented the horse from competing for a substantial amount of time now have concrete treatment options. Experts discussed a wide range of innovative therapies and their applications, as well as ideas and trends from the field of human sports medicine during the **Equine Sports Medicine Symposium** held just outside of Raleigh, in Pittsboro, North Carolina, June 29–30.

"We're all dedicated to the horse. And we're also extremely interested in education and teaching and bringing out new ideas and forward-thinking concepts," said Richard A. Mansmann, VMD, PhD. hon. DACVIM-LA, a fourth-generation horseman, equine practitioner and clinical professor emeritus of the North Carolina State University College of Veterinary Medicine. One of the leading organizers of the Equine Sports Medicine Symposium, Dr. Mansmann says he envisions the conference as a jumping-off point for futuristic ideas.

Co-hosted by the Equine Podiatry Education Foundation, the two-day conference featured a wide variety of lectures, beginning with several talks from Dr. Antonio Luciani, who practices mainly orthopedics and sports medicine in high-level sport horses. "In the last two decades, the use of physical therapies in equine veterinary medicine has been continuously increasing," explained Dr. Luciani, whose talks focused on laser therapies, post-injury "re-atheization" of the sport horse (the last phase of the horse's path from injury to functional recovery) and case-study discussions.

But equine sports medicine wasn't the only focus of the symposium. Dr. Peter Friesen, a dual board-certified physical therapist in sports and orthopedics who is currently the head strength and conditioning coach for the U.S. Women's National Hockey Team and served as the head strength and conditioning coach North Carolina's NHL team, the Hurricanes, gave several talks focused on hot topics in physical therapy and trends in strength and conditioning for elite human athletes. "We like innovative ideas, and we like comparative ideas—that's why we asked Dr. Friesen to speak, to get a human athletic perspective," Dr. Mansmann explained. Many of the therapies Dr. Friesen presented in his talks are available in the horse world though not to the same degree, but there were also several advancements that the equine world can learn from. While new methods of treatment have come a long way in both fields, it was clear there is a need for more research to confirm effectiveness of many of the advancements, but certainly more so in the equine field.

The symposium was chock-full of valuable information, thought-provoking lectures and interesting discussions. Here are six takeaways from the weekend:

1. The Importance of a Holistic Approach

One of the symposium's main themes was the need for veterinarians and farriers to work together when coming up with a treatment plan for a horse. "We believe in the idea of the medical team to help the horse is a better than only the veterinarian or only the farrier or only the massage therapist [working on a horse]," said Dr. Mansmann. Dr. Friesen noted that in the human world it's commonplace for specialists and general practitioners—the coaching staff, medical staff, strength and conditioning coaches, psychologists, etc.—to all work together on the performance and injury reduction programs of elite athletes.

The veterinarian–farrier relationship is especially important because a major factor of incidence in lameness comes from unhealthy hooves. “Veterinarians have become increasingly more distant from farriery, yet abnormalities of the foot are responsible for or contribute to the largest percentage of pathologies that specialists are diagnosing and treating,” explained David Jensen, DVM, an equine practitioner who developed the Equine Podiatry Education Foundation with farrier Pete Healey. “These treatments are increasingly carried out in isolation without proper attention to the underlying reason that these injuries have occurred in the first place.” Dr. Jensen stressed the importance on maintaining healthy, mechanically correct feet. Without addressing the feet first, the influence of other therapies will be diluted, temporary, and even ineffective, he explained.

When evaluating a horse for lameness, veterinarians should focus on basic trot-ups and palpations instead of going straight to X-rays or ultrasounds to diagnose an issue, said Dr. Luciani. The whole horse needs to be examined. First, looking at the horse’s hoof conformation and shoeing, to assessing the horse in-hand, on the lunge line and under saddle. Dr. Luciani also likes to look at competition videos to see if he can pick up on something that isn’t appearing in a lameness evaluation. It’s essential that each horse be assessed as an individual with treatments adapted for his unique case as opposed to applying a blanket solution.

In one of Dr. Friesen’s talks, he emphasized looking at regional interdependence—how and why parts of the body are interconnected and how this affects injuries and the treatment of injuries. The athlete—whether horse or human—could be compensating for pain elsewhere.

2. New Rehab Protocols for Tendons/Ligaments

Rehabilitation guidelines for tendon and ligament injuries are beginning to change with an emphasis on getting the horse back into work sooner. Now, depending on the injury and its severity, sport horses can be back to their previous level of competition between four and six months instead of nine to 12 months. In the first four to seven days of a tendon or ligament injury, there is acute inflammation. Then the injury goes through a regeneration phase (restoration of the injured body part) which lasts three to six weeks, followed by remodeling (living tissue undergoes structural reorganization and renewal), which lasts two to four months. Remodeling actually occurs mostly in the regeneration phase and continues (to a lesser extent) for the next two to four months.

The new rehab protocol entails one week of therapies aimed to shut down the inflammatory process, followed by three to six weeks of rehabilitation and finally, two to four months of re-atheization with the horse returning to his previous level of competition at six months. During the regeneration phase, scar tissue forms. Scar tissue can be 95 percent as strong as the original tissue. Stress on the tissue is helpful for rehabilitation because it encourages the new collagen fibers to form in parallel lines, which is a much stronger configuration. Exercises are critical to this process. Re-atheization is a concept introduced in recent years to describe the final stage from injury to functional recovery. In the past, the return to competition coincided with the end of the rehabilitation phase. Re-atheization improves the horse’s sport-specific abilities and overall condition, helping him get back to his previous level. Injury rehabilitation should be an ongoing process and injury-specific exercise should be a permanent component in training and conditioning—without this approach the likelihood of re-injury is high.

Dr. Luciani cautioned that there are, however, several ways in which the re-atheization can fail, and it mostly has to do with owners or riders not quite following instructions. Turning the horse out in a paddock; irregular workload; excessive rider caution in progressing with the rehab plan; or the inability, or lack of skill of the rider to perform the requested exercises can all jeopardize re-atheization.

In the human world, there is a similar approach to rehabilitation, though not necessarily specifically related to tendon or ligament injuries. Athletes shouldn’t stop all exercise during injury because muscle groups can regress, explained Dr. Friesen (more on this in #5).

3. Laser Therapy

Laser therapy can be used for many different ailments, and certain classes of lasers are used to treat different injuries. Lasers can be used to relieve pain and inflammation and can help with healing. They can be used for tendon and ligament injuries, for issues with the back and sacroiliac joint, for muscle tears and strains, and to help heal wounds and proud flesh.

There are many different laser devices on the market, all with different application protocols for power, duration and emitted wavelengths. As the power of the laser increases, so does its healing ability but also the risk of injury to the eyes and skin. Lasers can be classified in two ways. First, based on their power and therefore the correlated risks of burning the skin, known as Class I, II, IIIa, IIIb and IV (Class IV lasers are prohibited from use in FEI competition). Second, they can be classified based on the power density and thermic impact on the skin, which is distinguished by low-, mid- or high-power lasers. Low-power lasers have no thermic effects on the skin. Mid-power lasers could have some thermic effect. High-power lasers have an increased risk of burn on any skin. According to Dr. Luciani, low-power lasers are considered effective for acupuncture applications; mid-power lasers are used for pain management and anti-inflammatory applications but not necessarily for healing; and high-power lasers can be used as a solo therapy for effective regeneration. Dr. Luciani noted that this was his opinion based on his experience with horses and in humans it is different. This is mainly due to the horse's skin thickness and coat.

The Inner X laser is currently the most revolutionary laser therapy. Laser light is applied by an optic fiber, passed through a needle, directly to the target (joints, including facet joints of vertebrae and sacroiliac, tendon and ligament lesions, meniscal tears, navicular bursae, etc. The aim is to provide the exact quantity of energy needed at the right power at the site of the injury. One or two applications are enough efficiency is very high for this therapy.

4. Human Therapy Insights

Although rehabilitation techniques and therapy tactics are far more advanced in the human world, many of the same practices are used on horses. Below are some of the popular therapies utilized by human athletes, highlighted by Dr. Friesen, with a caveat: Many of these human therapies need far more studies because there are conflicting reports on the validity:

• ***Vibration Training***–rapid vibration forces the muscles to contract in reaction. Can be used as treatment for balance, pain, neurologic disorders, fitness.

• ***Wearable sensors***–there are several brands of wearable sensors. **Catapult** helps the athlete prepare for the demands of competition and reduce injuries by using data to inform how hard to train for increased performance without pushing too hard. **I Measure U** is a lower-limb load monitoring device that measures velocity and the placement of the foot while running. It calculates the load and intensity on each limb so medical, rehab or performance teams can make informed decisions on rehabilitation. Dr. Friesen cautions that while analyzing the data, it's important to understand what's normal for the individual and how the data relates to the specific athlete.

I Measure U is a lower-limb monitoring device. Courtesy, Dr. Peter Friesen

• ***Performance neurology***—the practice of improving brain function for better performance. Different physical exercises can bring specific mental gains, from improving memory to dealing with cravings or reducing stress

• ***Compression garments***–pieces of clothing that fit tightly around the skin. Dr. Friesen cited studies that show that compression garments enhance blood flow that may aid in the removal of waste and shorten the recovery period between competitive races or strenuous training periods to allow for more frequent bouts of heavy work. However, some studies have shown there does not necessarily improve performance or recovery

• ***Cupping***–cups are placed on the skin to create suction and are left on for 3 to 5 minutes. The cups cause the skin to rise and redden and blood vessels to expand. Some reports claim they remove toxins, promote healing, boost recovery and repair muscle damage after hard workouts.

• ***Muscle stimulation***–portable electronic muscle conditioning stimulator that produces impulses that go through electrodes placed on the skin. Muscle stim produces an ultra-low frequency, low tension and non-fatiguing contraction. Can be utilized as a strength building tool for the athlete or as a rehabilitation and preventive tool.

• ***Ischemic Pre-Conditioning for Potentiation***–blood supply is impaired for a short time (a tourniquet is used 3 times for 5 minutes each time) and then the blood flow is released to enhance the strength conditioning of cells and type II muscle fibers for improved power outputs.

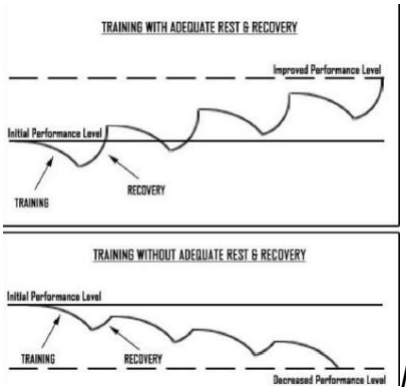
• ***Cryotherapy***–Chambers with large air compressors divide oxygen and nitrogen, and once separated, the nitrogen cools. When the nitrogen cools sufficiently, it is then remixed with oxygen and injected into the chamber, which can be as cold as -250 degrees Fahrenheit. Alleviation of pain and recovery improvements appear to be related to cold induced pain relief, lower levels of oxidative stress and inflammation. However, a small number of studies did not report significant positive effects.

5. Potential Human Performance Topics Related to Horse World

Dr. Friesen's talks not only focused on hot topics in physical therapy but also insights into trends in strength and conditioning for human athletes. Much like the therapy field, Dr. Friesen said there are too few longitudinal studies (studies that involve repeated observations of the same variables, like people, over long periods of time) and too few repetition studies. He also explained that many times, if the results of a study are trivial, or null, they aren't even reported. He advised to "marry intuition and scientific reasoning for success." Here are some performance topics that could have some correlation to sport horse performance:

• ***Training loads and finding balance.*** Training loads should challenge the athlete without overloading. You must monitor internal loads (physiological and psychological stress) and external loads (work performed by athlete, independent of internal characteristics) to understand how the training load is impacting the athlete.

• ***The importance of adequate rest and recovery.*** Without proper rest and recovery, training gains will not be as successful. Dr. Friesen said training for performance can be as simple as train hard, eat well and get plenty of sleep.



Rest and recovery are essential for training gains. Courtesy, Dr. Peter Friesen

• ***Periodization.*** *S*ystematic planning of training to reach the maximum performance capability at the most important competition of the year or figuring out when and how to peak your performance.
• ***Staying active.*** Being consistently active is associated with less pain and injury, but inappropriate preparation or under or overactivity may increase pain or injury. Cross-training is ideal to allow athletes the benefits of both relative rest and activity. Dr. Friesen believes there is too much emphasis placed on pain-relief modalities and immediate treatment effects rather than maintaining physical readiness.
• ***Recovering from injury.*** According to Dr. Friesen, there is evidence that exercising with some pain is at least as effective as pain-free rehabilitation. Research shows that athletes who return to their normal daily activities more quickly following injury recover faster and have fewer long-term problems than athletes who do not. Muscle groups can regress and there can be a psychological impact if an athlete totally stops training during an injury. If the pain is **acute**, identify the injured tissue (bone, muscle, tendon, etc.) and devise a treatment to help promote healing and reduce stress on the injured area. Try to identify positions that hurt and positions that do not hurt and provide treatment and exercises to help the injured tissue move more efficiently. If the pain is **chronic**, it's important to identify factors that may be leading to prolonged pain. This could be things like faulty movement patterns, muscle weakness, areas of stiffness that prevent normal motion, previous injury and past events that may be contributing to the pain, fear, negative emotions and other behaviors that can lead to long-term pain. Design a treatment plan to fit specific needs, which may include hands-on therapy and gentle exercises to relieve pain.

6. The Importance of Podiatry and the Role of Shoeing for Rehab

A key issue in equine podiatry is that in the United States and Canada, farrier schools and certification programs are available—but not legally required. This means there is a lack of uniformity between schools of thought with many opinions on trimming and shoeing approaches in the horse, Dr. Jensen explained. On top of that, few veterinarian programs at universities provide training in podiatry, and therefore there is a huge disconnect to the need for proper care of the feet.

"When rehabilitating a patient with an equine sports injury, we must carefully evaluate the hoof in a detailed manner, both internally and externally, then apply appropriate podiatry principles to establish a foundation on which to build," explained Dr. Jensen. "Not doing so leaves one of our most powerful tools for rehabilitation in the toolbox." Farrier Pete Healey agrees. "Understanding the mechanics of the foot can help to determine why things go wrong and how to fix them," he said. "

There are available technologies that create accurate, consistent, scaled images using photographs and radiographs to properly evaluate a hoof. "New technologies, some now utilizing artificial intelligence software to collect, measure and store detailed measurements of the foot, are becoming increasingly available to both veterinarians and farriers," said Dr. Jensen.