The Conservative Approach

Time required with tendon and ligament injuries

BY MAUREEN BLANEY FLIETNER / ANNE M. EBERHARDT PHOTOS

Despite the numerous treatments available, time and R&R remain essential for helping a horse recover from tendon or ligament injury. That can be good or bad news, depending on an owner's expectations for the horse's performance.

Both tendons and ligaments are soft tissues. They sustain injury via similar forces, respond to damage in a similar fashion, and heal at almost the same rates. That typically amounts to eight months.

Tendons and ligaments sustain injury from similar forces and respond to damage in similar fashion

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Treating Tendons and Ligaments

The one thing that has served me well throughout a career and has taken me around the globe as an equine veterinarian is practicing preventative medicine. Treating injuries involving tendons and ligaments is probably the best example I can think of this application. These dense but flexible structures are quite incredible when we look at their function and resilience over varying conditions during the lifespan of a racing equine athlete. They adapt readily to different surfaces as the equine athlete first moves through pastures as a foal, and they continue to remodel, stretch, and respond to the increasing loads and demands up to and including carrying weight over a variety of surfaces at high speeds in competitive events, all the while showing their resiliency and a miraculous ability to recover after tremendously stressful efforts. In a perfect world on a well-conformed, evenly balanced, well-shod hooves and legs, these structures hold up well and practically without incidence and sometimes are taken for granted and only given consideration as an afterthought or as an expectation of normalcy during routine inspections. The reality is that very few, if any, horses are perfectly conformed and many times no two feet are exactly alike. Knees are offset, or "back" at the knee. Feet are too low in the heel, or possibly "clubby," legs turn in or out, are too upright or too lax in the pasterns, all contribute to asymmetry, and this creates an overload or overstretching of tendons and ligaments.

A lot of the overstretching is tolerated well for a while, but continuous, repetitive pounding can create damage and tearing by loading these structures too many times and not allowing enough recovery time after exertion. Eventually, the damaged areas become inflamed and sore. Now the repairing process must occur or a career could be ended.

During this time, systemic treatment should be used to decrease inflammation and swelling as rapidly as possible. Topical application of ice or cold water therapy works well to help massage the area and help remove edema and hemorrhage from the damaged area. All of these can pay dividends for the future of the equine athlete by decreasing the chances of scarring in the damaged area. Scarring helps heal the defect but can be the reason the equine athlete never returns to competition. Adhesions and the lack of elasticity of the scarred area can constantly cause continuous tearing of tendon or ligament fibers from the scarred area, eventually leaving a perpetually growing scar that no longer has the ability to function in a normal way in the racehorse.

In the final analysis, horses and their tendinous and ligamentous structures are unlike motorized vehicles. There are no replacement parts. They must effectively perform throughout their careers with "original equipment." Therefore, preventative maintenance is of the utmost importance. Having a comprehensive program to insure that this occurs is the key to protecting the integrity of these structures.—*Dr. Steven C. Allday, DVM, developer of LubriSyn*

For more information, visit LubriSyn at its website www.LubriSyn.com or phone 800-901-8498.

But why so long? The body's healing system is complex, explains Dr. Duncan F. Peters, director of the Sport Horse Division at Hagyard Equine Medical Institute, in Lexington. While newer treatments might provide functional improvement in the healing process, they do not speed up the process itself.

"The time factor is still necessary, and R&R is part of the process," he noted.

Root Causes

Tendon and ligament injuries arise from a variety of sources, such as conformational faults, fatigue, and lameness, that can lead to overload. Exercise-related tendon and ligament injuries might occur:

- When a rider works a horse lightly for most of the week, then works him strenuously on the weekend.
- When trainers work a group of horses on the same training schedule even though the animals vary in their responses and need individual programs based on physical condition, maturity, and temperament.
- When a horse guards a painful area, resulting in overuse of other parts of an affected limb or other limbs.
- When an awkward step or odd positional stress overloads tissue, undermining its strength and damaging fibers.
- Because such injuries are an inherent risk of high-level performance, says ultrasound consultant Dr. Johanna Reimer, of Georgetown, Ky.

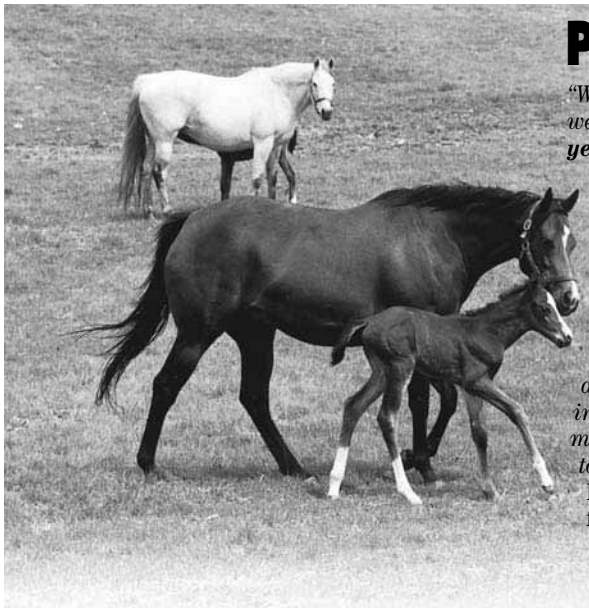
Unfortunately, there are no accurate methods to assess musculoskeletal fatigue while it's occurring, says Dr. Carol Gillis, of Equine Ultrasound and Sports Medicine, in Aiken, S.C. As muscles tire, tendons, ligaments, and joints experience imprecise loading. As tendons and ligaments approach their breaking strength during activities, the imprecise loading can lead to fiber tearing.

Warning Signs

For the rider or owner, decreased performance might be the first sign something is going wrong. The horse might exhibit an attitude change or a gait change while performing certain exercises, according to Peters.

"Horses with tendon and ligament injuries spend little time being lame at a trot on the straight or the longe line and much time underperforming or reluctant to work," said Gillis, because tendon and ligament tissues contain relatively few pain recep-

Mares Bred/Live Foals Less Than 75%?



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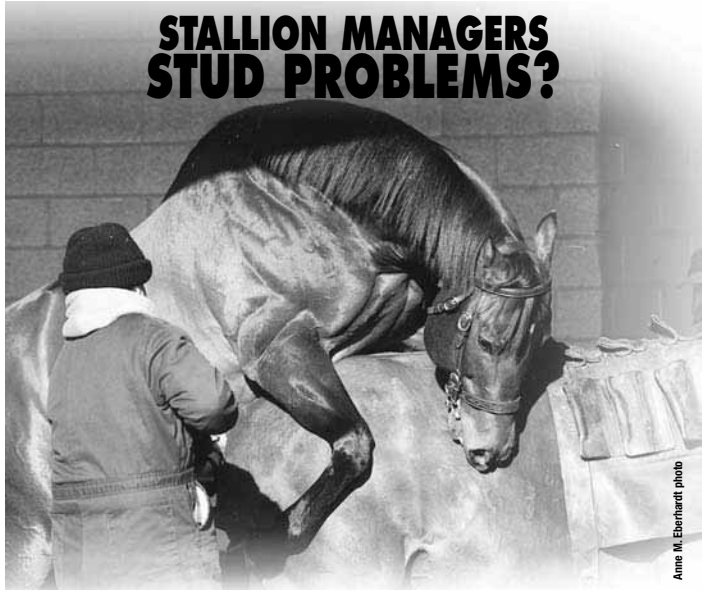
—Nobu Araki / Polo Green Stable
Versailles, KY



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UltrOZ Elite

There is a lot of buzz around the racing world about the UltrOZ Elite, a new drug-free equine therapy device making its way to the track from the sport horse world. The talk is coming from numerous sources including Breeders' Cup-winning trainer Bill Kaplan, veterinary clinics such as Hagyard Equine Medical Institute and Rood and Riddle Equine Hospital, and equine therapists such as Mimi Porter and many others. They're all using this new therapy to increase performance and improve healing in a host of injured tendons, ligaments, and muscle conditions.

Developed by scientists at world-renowned Cornell University, the UltrOZ Elite is the first wearable, long-duration ultrasound system for horses. Its size and portability allow it to deliver ultrasound therapy safely without a trained specialist and without having to tether the horse to a large control system.

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According to Bill Kaplan, trainer of Eclipse Award-winning Musical Romance, "The UltrOZ is fantastic at treating high suspensory injuries. It has quickly become the main treatment I use for that condition. It's remarkable; it's non-invasive, no drugs *and* you get to stay in the game. I now have multiple UltrOZ systems, and they've become an integral part of my training and maintenance regime."

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tors. The owner might initially interpret the action as a training or behavior issue and deal with it accordingly.

Generally, the injury becomes apparent only after tissue sustains significant damage—evidenced by heat, swelling, and pain upon palpation—and is accompanied by an altered gait.

The veterinarian's expertise, experience with these injuries, and access to diagnostic tools can make a difference in the prognosis. Peters said it is important to understand that "tissue damage can look quite different 10-14 days later in the (healing) process, so it may be important to hold off with a prognosis til a bit down the road."

Injuries by Activity

Our sources agree that the tendons and ligaments horses most commonly injure are the superficial digital flexor tendon (the classic "bowed tendon") and the suspensory ligament apparatus.

"These two structures are involved in support and flexion of the fetlock, which is the major load-bearing joint in the horse," Gillis said.

Reimer said she most often finds bowed tendons and torn suspensories in racehorses; suspensory injuries in show hunters and jumpers; forelimb bowed tendons and fore and hind limb suspensory injuries in upper-level event horses; front suspensory injuries in reiners; front and hind suspensory injuries in upper-level dressage horses; and inferior check ligament (which connects the deep flexor tendon with the cannon bone just below the knee) injuries in horses at pasture or that have taken a "bad step."

But the damage might extend beyond these structures. Gillis said veterinarians are realizing more and more that "arthritic" conditions in the foot and in joints often begin as soft tissue injuries of the collateral ligaments or other structures involved in joint stabilization.

"We have traditionally believed that a joint showing inflammation that has clean or normal radiographs (X-rays) does not have a serious problem," said Gillis. "However, damaged soft tissues in and around the joint will result in continued instability, inflammation, and eventually arthritic changes visible on radiographs if the joint is simply treated with injections to alleviate pain and inflammation temporarily without addressing the underlying cause."

Nature's Role

Injury prompts a cascade of distinct processes. The first is inflammation, the body's protective response, lasting three to four weeks. Increased blood flow associated with inflammation prompts the body's first-aid team—cellular and biochemical processes that stimulate tissue regeneration.

The next stage, beginning about a week after the injury, overlapping the inflammatory stage and lasting about three weeks, is marked by angiogenesis. In this process the body builds new capillaries to enable water and chemical exchange between blood and surrounding tissues. Tendons and ligaments typically have a relatively poor blood supply. However, Gillis says, with injury the number and size of vessels triple in tendons and ligaments. Scaffolding also forms for fibroblasts (cells that form connective tissues) to accumulate and build new tissue.

In the third stage, stretching from about weeks 4 to 16, type III collagen—a type of structural protein—fibrils form as part of the healing response. Many fibrils then aggregate and link to form collagen fibers, then fascicles. Several fascicles ultimately form new tendon or ligament.

In the final phase, 16 to 32 weeks into the healing process, type I collagen, the protein found in normal tendon and ligament tissue, replaces the weaker type III collagen and increases structural strength.

Coordinating with Nature

To synchronize with the body's own natural healing response, our sources advise first confining the injured horse to his stall and then gradually increasing duration and intensity of exercise. They agree that any overexercise would lead to a cycle of partial healing and reinjury. However, veterinarians' specific recommendations for return to exercise differ.

In general, cold therapy or cold hydrotherapy and systemic medications help control initial cellular mediators of inflammation that can damage tissue. Bandages hold topical anti-inflammatory medications on the area and reduce edema (fluid swelling) and other swelling, says Reimer.

For the first five weeks or so post-injury, Gillis advises hand walking the horse, walking him on a water treadmill, or walking him on a free exerciser. While owners should generally wait to ride, Reimer says she does allow walking under saddle with a light rider with or without a pony (for control and companionship), if necessary, because some horses might be difficult to control in hand.

From weeks 4 to 16, Gillis suggests the owner or caretaker walk the horse under tack, increase the horse's time walking on a free exerciser, or pony him from another horse at a walk.

In her experience, Reimer says many caretakers rehabilitate Thoroughbred racehorses with bowed tendons successfully with one month of stall rest and hand walking followed by three months of turnout in a small paddock. However, Gillis says she has performed ultrasound on horses after this small paddock rest regimen and found that tendons/ligaments are not healed completely to full strength.

During the first part of the last phase, weeks 16 to 24, Gillis recommends the owner walk or trot the horse under tack (mounted or unmounted) or in a free exerciser. Reimer allows cantering as well as small paddock turnout at this time, provided the horse is sound and ultrasound findings show improvement.

From weeks 24 to 32, Gillis advises increasing canter work. After one week of canter under saddle, the horse can be turned out to canter freely for the first time in rehabilitation, as he should now be conditioned to that level, says Gillis.

Sport-specific training now predominates: speed work for racehorses, cavaletti for jumpers, increased lateral work and collection for dressage horses.

Other useful therapies our experts consider during rehabilitation include ice water, whirlpool boots, therapeutic laser, therapeutic ultrasound, electromagnetic therapy, heat, massage, chiropractic adjustment, acupuncture for pain, and muscle relaxants for spasms associated with back or neck injuries.

Most common injuries are to the superficial digital flexor tendon and the suspensory ligament apparatus

Chances of Recurrence

For horses sent back to work before injuries heal completely or with underlying issues that have not been identified and treated appropriately, the recurrence rate is high. Injury recurrence can also happen because the tissue is not as resilient and elastic as the original and might not respond to loads as well as the parent tissue, says Peters.

"The published success rate (i.e., the horse goes back to the same level of work or better without reinjury) for any soft tissue injury, no matter the medical or surgical treatment, is 50 to 60%," Gillis said. "For a whole horse approach that identifies and treats all problems simultaneously and uses diagnostic ultrasound effectively to guide the rehabilitation process, my success rate since 1999 is 80 to 90%."

In a survey Gillis conducted of 145 horses discharged from the Equine Ultrasound Unit at the University of California, Davis, she determined horses that completed a rehabilitation program successfully and were judged to be 95% healed on the last ultrasound were able to return to work at their previous level of performance with no greater risk of reinjury than a previously uninjured horse.

"This is the reason to follow a controlled exercise program based on regular clinical and ultrasonographic exams until the injured tendon or ligament is completely healed based on strict imaging criteria," she said. "Unfortunately, however, some injuries are career-ending or are of a degree that the horse will be unable to return to the previous level of performance regardless of the time and treatments given."

An experienced veterinarian can design an individualized rehabilitation program suitable for your horse's injury, his temperament, and your resources.

Excerpted from The Horse: Your Guide to Equine Health Care. Free weekly newsletters at *www.TheHorse.com*

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