

Laser Therapy in Equine Practice

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For the Education Series

I have witnessed therapeutic lasers being used on the equine athlete since the 1970s. The lasers that were used throughout the '70s, '80s and '90s were all Class III lasers and I always found them to be long on promises but very short on clinical results.

There was some anecdotal evidence of benefit to wound healing, but almost no scientific studies supporting any other clinical applications.

I believe that failure of these early therapeutic lasers was primarily due to a lack of power (wattage), improper wavelengths and the insufficient application of a therapeutic dosage (joules/cm²). The lack of successful treatment using photobiomodulation changed with the innovative technology developing within the industry. Class IV therapeutic lasers have now become an essential tool in modern equine practice.

What does the application of a deep-penetrating therapeutic laser actually accomplish?

Through a stimulated photobiochemical cascade of events at the cellular level, we achieve relief of pain, a reduction in inflammation and an increase in microcirculation. These result in an accelerated restoration of function or healing within the tissues.

A localized and systemic analgesic effect is accomplished through simultaneous biochemical pathways. These are:

- * Increased nitric oxide production
- * Increase in the release of beta endorphins
- * Decreased bradykinin levels within the surrounding tissues
- * Ion channel normalization within the individual cells
- * Stabilization of the action potentials within the individual nerve cells
- * An increase in the localized and systemic serotonin levels
- * Increased release of acetylcholine
- * Blocked depolarization of C-fiber afferent nerves

Reduction in the inflammatory process is accomplished by a similar cascade of events. These are:

- * An inhibition in the synthesis and secretion of inflammatory prostaglandins yet a stimulation of those prostaglandins that have a vasodilatory and anti-inflammatory action
- * Stabilization of the cellular membrane in regard to Ca⁺⁺, Na⁺ and K⁺ concentrations
- * Enhancement of ATP production and synthesis stimulating the metabolic activity and the production of fibroblasts
- * Reduction in interleukin 1 production

Microcirculation is primarily stimulated by the release of nitric oxide and increased levels of serotonin. This increase in circulation and subsequent vasodilatation allows for an increase in leukocytic and macrophage activities.

What are the top clinical applications for deep penetrating laser therapy?

There are four broad areas where photobiomodulation is of great benefit to the equine athlete. These are:

1. To accelerate the rehabilitation and healing of many common lameness disorders.
2. To maintain the peak performance within any equine athletic discipline.
3. To prevent the occurrence or recurrence of athletic injuries.
4. As an essential component of stem cell and PRP treatment protocols.

Combining deep-penetrating laser therapy with tra-



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ditional therapeutic regimens accelerates the recovery time of many common lameness disorders in horses. Pharmacological approaches and rehabilitative physical therapy techniques, such as hyperbaric oxygen therapy and underwater treadmills, complement each other to reach the unique therapeutic goal for each patient.

Several of the most common applications of laser therapy for the treatment of lameness disorders include:

- * Tendon and suspensory injuries such as tears, tendinitis and desmitis
- * Synovitis and tenosynovitis
- * Osteoarthritis
- * Back disorders
- * Wound healing

One of the most important aspects of equine sports medicine is the maintenance of these athletes at their highest level of performance. Deep-tissue laser therapy is an invaluable tool for this endeavor.

All athletes have to endure the rigors of training. This training results in pain and soreness. Periodic therapeutic laser applications allow these equine athletes to recover faster and therefore train more efficiently.

The ability to use laser therapy to prevent injuries is often overlooked or even considered non-efficacious. How important would it be to establish blood flow and elasticity within the tissues of the suspensory tendon in an equine athlete predisposed to stress in this area before a competitive event? Deep-penetrating laser therapy accomplishes this therapeutic goal.

How often do you have to apply laser therapy for it to be effective?

Laser therapy is cumulative in effect. Each treatment is complementary to the last on a cellular level. Each case is unique and a therapeutic goal should be established, setting realistic expectations for the owner or trainer.

If the condition is acute, i.e., a soft tissue injury or wound, or chronic, i.e., a high suspensory desmitis, treatment is accomplished in three phases. Initially, the therapy should be administered aggressively (every day or every other day for several treatments). This is analogous to the loading dose

of a pharmacological agent.

A high level of stimulation within the tissue is the first goal. Secondly, there is a transition phase that consists of once- or twice-per-week treatments as dictated on a case-by-case basis. Lastly, especially in chronic disorders, a maintenance phase should be in place.

In these tough economic times, how do I get a return on my investment?

One of the Golden Rules of practice is: Don't buy anything that can't pay for itself in one year. Learning to use laser therapy requires a very short learning curve, and within a very short period of time it will be utilized in numerous areas of your practice.

Charges vary with respect to geographic region. The following charges represent a nationwide average:

Anatomical Area	Average Treatment Time in Minutes	Average Charge In Dollars
Carpus	6 - 8	30 - 40
Fetlock	5 - 6	25 - 30
Foot	6 - 8	30 - 40
Back	25 - 30	125 - 175
Stifle	8 - 10	40 - 50
Hock	6 - 8	30 - 40

An example:

- * Dx: Carpalis in both knees. Traditional standard of care therapy plus
- * Rx: Each will receive six laser treatments: Six treatments multiplied by two anatomical areas x \$30 per treatment = \$360
- * Total time spent doing each treatment: 2 to 15 minutes

Summary

Laser therapy provides pain relief, a reduction in inflammation and accelerated healing. It is a scientifically proven healing modality. Laser therapy brings another tool to your practice for disorders for which we currently don't have a solution, like chronic sore backs. Laser therapy brings another income source to the practice without cannibalizing any other aspect of the practice. ●

Dr. Riegel has lectured at numerous veterinary schools and conferences nationwide and is the author of "Laser Therapy in the Companion Animal Practice" and co-author of "Laser Therapy for the Equine Athlete." Dr. Riegel is one of the founders and directors of the American Institute for Medical Laser Applications.

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