



Tendonology®
Specialist Tendon Treatment for Racehorses

Document One The Treatment Process

In summary

- ☑ The treatment protocol is based upon work that has been conducted on human tendons both in the laboratory and in living subjects presenting with tendon pathology. This work has been conducted by a variety of clinicians and scientists and been published in reputable peer reviewed journals. This research, generated by Synapse Ltd the producers of the technology is on-going with an exciting programme at the Tendon Research Centre at Manchester University. The aim of the project are to determine the effects of the patented Synapse microcurrent on the alignment, proliferation, gene profile, and migration of tendon cells and to evaluate the effects on the biomechanics, assembly and turnover of the tendon extracellular matrix.
- ☑ To date over a hundred horses have been through the treatment process. These horses have not been part of a controlled scientific study; therefore, the results have an element of subjective interpretation. Certainly in human patients/subjects the treatment has been remarkably effective and the application is currently being considered for N.I.C.E (National Institute for [Health and] Clinical Excellence) approval as the treatment of choice for tendon pathology and is included on the NHS Supply Chain listing for approved tendon treatments.
- ☑ The equine cases accepted for treatment have in many circumstances been very severe and as such this treatment was viewed as a last chance option. Given this, the number of horses that have been returned to racing following the treatment regime in my opinion and the referring trainers who have acknowledged that they have sent some real 'horrors and no hoppers', it is quite remarkable. For the first thirty horses treated twenty-two returned to racing and remained sound.
- ☑ Tendonology operates as an 'in-patient' treatment centre and the horses stay for the treatment and rehabilitation for a minimum of twelve weeks. Tendonology aims to employ well qualified staff in an environment of good and modern facilities. The care and horse husbandry afforded to the patients is excellent. We have full-time veterinarian cover provided by the vets with Newnham Court Equine Hospital (Maidstone, Kent) and other specialist practitioners whom we use when appropriate, for example a state registered equine physiotherapist.

☑ The Treatment is based upon the hypothesis that whilst tendon tissue is constantly in a state of biological regeneration and degeneration this process occurs slowly and should be in a state of equilibrium (balance). However, in many cases, particularly in older horses, this is not the situation and the degenerative phase runs ahead (at times significantly) of the regenerative phase. This leaves the tissue structure potentially vulnerable to stress induced overload and ultimate breakdown. One reason for the sluggish regenerative cycle has been identified as a slowing or blocking of the cell to cell communication process. This process is, to a degree, controlled by electro-chemical signaling.

☑ Put simplistically the treatment aims to re-ignite this signaling process by applying, little and often, a cell specific electric charge to the affected area with the aim to reengage the cell communication process and the cascade of physiological events that follow this. The result of this being that greater amounts of new tendon tissue is produced and an improved tissue architecture.

[A paper published in Nature Journal (July 26th 2006), one of the most distinguished scientific publications outlined the role of electrical fields/charges in tissue healing and how an externally applied electric charge can augment the healing phase of tissue repair. This paper examined the process at a genetic level and supports the general hypothesis applied to tendon tissue]

☑ Throughout the treatment and rehabilitation process regular diagnostic ultrasound examinations are conducted in order to assess the progress of healing as the new tissue is formed into a new tendon structure. This enables us to accurately gauge the intensity, duration and frequency of the exercise programme.

☑ **What actually does the treatment involve?**

We often get asked two questions about the treatment process:

1. 'What actually is the treatment' or/and

2. 'What exactly are the treatment parameters/sequences of electricity you use?'

1. The treatment is a series of a very cell specific electric current introduced into the tendon area which causes the tendon cells (tenocytes) to reproduce at a greatly increased rate and to produce more tendon tissue (type I collagen). In addition, the electrical stimulation is designed to facilitate a more coherent post-treatment tissue architecture. The frequency and duration of individual treatment session and how long a treatment series lasts for depends upon the severity of the condition and also how the individual tendon responds. Because the superficial digital flexor tendon (SDFT) is a superficial structure we can generally apply the treatment through the skin.

2. The answer to the second question regarding the treatment parameters is not so easy to answer because that is our intellectual property. All cells respond to different intensities of amplitude, frequency and polarity and this is where the time in research and development has been spent aiming for the optimum treatment parameters.

Treatment Rationale

I believe that Tendonology offers a responsible, rational and proper treatment. It will not be successful in all cases but I believe that for many tendon conditions, particularly in the older horse it is the best option available. This statement is based upon the fact that the complete regime offers a well thought out programme of treatment and rehabilitation set out for the individual condition and requirements of the equine patient. The horses are inpatients at the centre for a relatively long period, the process is labour intensive and therefore not an inexpensive option. This principle has adopted because we believe that it will give the horse the opportunity to arrive at the best long-term outcome.

We have conducted treatments on many top racehorses from the Flat and from National Hunt referred by leading trainers and owners. From several sources we have a steady flow of repeat business. Many of these horses have gone on to race at the highest level. Whether this proves that it was the treatment regime responsible for the outcome is impossible to comment on because for the equine application it has not been exposed to a carefully controlled scientific study. However, to be honest this has to be set in the context that neither have any other treatment available for equine tendon problems.

Other Treatment Options

To voice a personal opinion, I have concerns about 'treatment only' options commonly offered to treat tendon conditions and believe that data produced generally by the veterinary profession claiming to provide an accurate comparison evaluating the efficacy of one treatment over another is unreliable and misleading. Correlating treatment outcomes of one treatment over another by measuring the outcome by the return to racing or re-injury rate when often these horses undergo the same treatments let alone different ones when they are exposed to a variety of structured, unstructured or ad-hoc exercise rehabilitation programmes makes such data practically and scientifically worthless.

The difficulty in creating and monitoring clearly defined and controlled in-vivo (life) studies have allowed many treatments to be promoted and used sold off the back of personal reputations rather than robust clinical verification. There is a paucity of good quality, verifiable and reliable data in this area of study. Treatment regimes appear to be frequently based upon personal preference and prejudice rather than rational clinical decision-making.

I would cite the injecting various blood products such as platelet rich plasma and stem cells into tendons as examples based upon little good research data that could actually be doing more harm than good.

I believe that a poorly structured or no effective rehabilitation programme can ruin a good and potentially effective treatment and a less effective treatment can be greatly enhanced by a good rehabilitation regime implemented by an experienced and knowledgeable professional. Such is the difference and influence that this aspect can bring.

In a recent article entitled 'Treatment for Tendons'. (Pilsworth R Part Two Tendon Special Owner & Breeder November 2006, Issue 27, 102 - 105) the author, a Newmarket vet concluded his offering by questioning 'what treatment should an owner chose for a strained tendon?' My answer would be none if it is not accompanied by a properly structured rehabilitation programme.

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