TENDON
PERFORMANCE

Tendon Performance is a clinical consultancy specialising in musculoskeletal services for recreational sportsmen and woman, and elite level human and equine athletes. We are a team of passionate sports medicine professionals dedicated to the diagnosis, treatment and management of tendinopathy to enable athletes to perform at their best for longer.

Our team of specialists includes a sports doctor, sports physiotherapists, and a specialist biomechanist. All our specialists are involved in ongoing research and are considered experts in their respective fields of practice.

Analysis

Optimal management of tendons begins with a comprehensive diagnosis using UTC™ (Ultrasound Tissue Characterisation) 3D imaging, which our specialists use to analyse the tendon health of individual athletes. The Tendon Performance team diagnoses current pathology and can detect early signs of matrix degradation in the achilles and patella tendons. This enables athletes, their clinicians, coaches and sports physicians to make informed and effective decisions about athletes' capacity for performance before tendon degradation or damage occurs.

Diagnosis

Using thorough clinical history recording and UTC scanning, our specialists assess the integrity of the athletes' tendons. We classify the tendon into four discreet echo types and provide comparitive graphs for clarity and ease of comprehension to provide objective feedback on the current state of the tendon matrix. Combined with performance measures taken from drop jump data, our team is able to determine the current load tolerance and biomechanical anomalies that predispose an athlete to poor function.

Rehabilitation

With a detailed medical and strength diagnostics profile, we then design a comprehensive loading program, thereby addressing all elements of the kinetic chain. This enables athletes to return to peak performance faster and with less risk of recurring tendinopathy. The Tendon Performance team provides ongoing monitoring service, comparing initial data with prospective values to assess and maintain full function for longer.

Diagnose

The 3-D tomographic visualisation of the tendon and the ability to characterise the tissue offers far greater diagnostic capabilities than regular ultrasound imaging.

subclinical, reactive stage | partial rupture
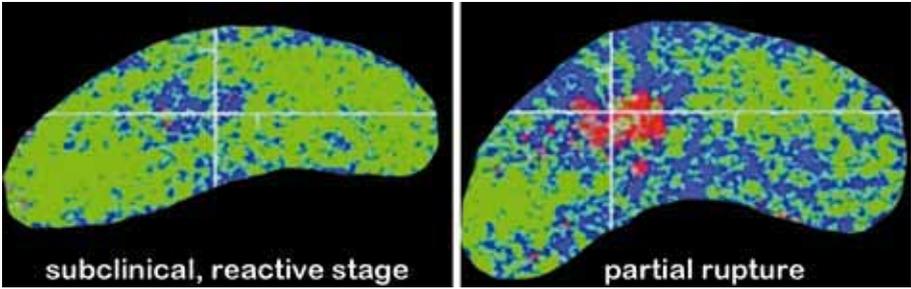
Treat

Insight in the architecture and integrity of the collagenous matrix offered through UTC tissue characterization facilitates staging of lesions which is essential for fine-tuned treatment options.

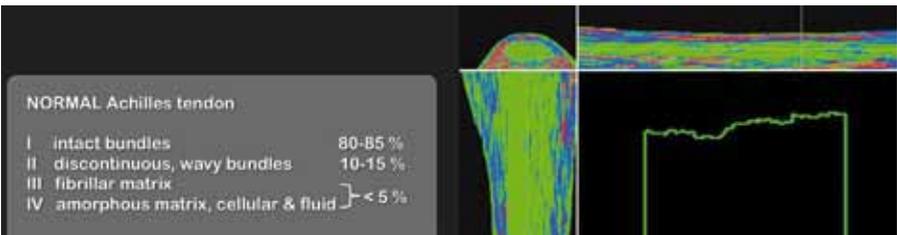PRE-Treatment | POST-Treatment
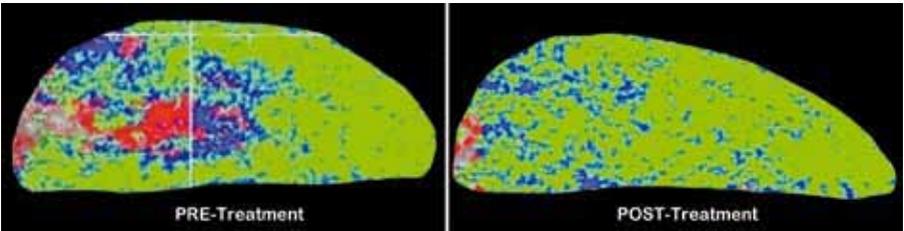
Monitor

Being very sensitive, UTC will already detect minimal effects of exercise or interventions, even within days after changing exercise-level or interventions like regenerative medicines and surgery.

TP 1 | TP 2 | TP 3
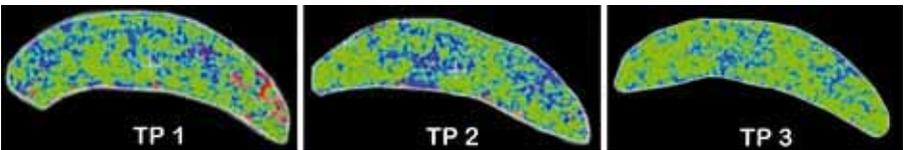
Perform

Using UTC for the detection of exercise effects and early diagnosis of developing tendon pathology, it is extremely helpful for injury-prevention and guided rehabilitation.

NORMAL Achilles tendon

I   intact bundles   80-85 %
II discontinuous, wavy bundles   10-15 %
III fibrillar matrix   ⎤ < 5 %
IV amorphous matrix, cellular & fluid   ⎦

Computerized "Ultrasound Tissue Characterization" (UTC) consists of both hard and software. A pivotal role in the configuration plays the UTC-Tracker, a precision instrument that moves the ultrasound probe automatically across the region of interest, e.g. along a tendon's long axis, collecting transverse images at even distances of 0.2 mm over a length of 12 cm. These images are stored real-time in a high-capacity laptop computer and a 3-D ultrasound data-block is created that can be used for tomographic visualization and tissue characterization.

Tomographic visualization.
The 3-D ultrasound data-block can be scrolled through and regions of interest can be visualized instantaneously in 3 planes of view, transverse, sagittal and coronal plus a 3-D rendered view over a length of 12 cm.
In this way, scrolling through the ultrasound data facilitates a real-time "surgeon's view" in which skin, paratenon and tendon's interior can be visualized. This inward view allows a reliable evaluation of integrity or extent of disintegration. As such, this tomographic visualization can be used for targeted and minimally invasive interventions.

Tissue characterization.
Dedicated UTC algorithms are meticulously validated with histo-morphology of tissue specimen as reference test. In tendon tissue 4 different echo-types can be discriminated and related to the architecture and integrity of the collagenous matrix.
This ultra-structural information is visualized tomographically in 3 planes of view and quantified by means of the calculation of respective percentages of echo-types. The ratios of these 4 echo-types are highly correlated with histo-morphological characteristics of tendon tissue, showing the discriminative power of UTC for tissue characterization.

UTC-imaging is an innovative technique that adds new dimensions to diagnostic ultrasound, namely unique 3-D imaging capabilities next to the novel Tissue Characterization properties. As such it can be used for lesion-prone tendons, like Achilles, patellar, quadriceps and hamstring.

Features of UTC Imaging

- Portable
- Standardized & highly reproducible
- Easy to perform: scan plus analysis takes only minutes
- 3-D visualization & tissue characterization
- Monitoring exercise effects, aiming at injury-prevention
- Early detection overstrain & degeneration

- Precise diagnosis & prognostication
- Targeted & minimally invasive treatment
- Objective evaluation & monitoring of therapy
- Guided rehabilitation

UTC Echotypes

Intact and aligned bundles and fasciculi - Ø ≥0.38 mm
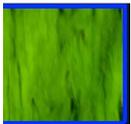
Discontinuous wavy bundle and fasciculi - Ø ≥0.38 m

Mainly smaller fibres - "fibrillar" - Ø << 0.38 mm

Mainly amorphous tissue containing cells and/or fluid Ø <<< 0.38 mm

Our services can be track or pitch side and clinic based to provide comprehensive and integrated tendon health services.

For more information visit:
tendonperformance.com

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