

Why UTC?

Envision Medical Imaging, is pleased to announce our world-leading Ultrasound Tissue Characterisation (UTC) service for the management of Achilles and patellar tendinopathy. Envision's UTC scanner is the only one in Western Australia and only one of three in use for tendon imaging in Australia.

In addition to producing standard (2-dimensional "B mode") ultrasound images, UTC is the only modality capable of providing 3-dimensional semi-quantitative analysis of structure in the Achilles and patellar tendon. When Achilles or patellar tendinopathy is suspected or present, UTC allows Envision to replace standard imaging with a more accurate picture of tendon pathology to facilitate enhanced management for patients with tendinopathy. UTC's other major advantages over standard ultrasound is its reproducibility and elimination of artefact related diagnostic error that is frequently seen in standard musculoskeletal ultrasound.

Imaging of both of the patients Achilles or patellar tendons is performed at the same appointment (not typically performed at standard ultrasound assessments elsewhere), which allows for comparison of the symptomatic side with the contralateral tendon, and may also assist in detection of early tendon disease of the contralateral side. Processing and analysis of the complex tendon data obtained is performed by world-leading experts in

tendon disease in Melbourne, with an expected turn-around time of 2 days.

In addition to confirmation of the diagnosis of Achilles and patellar tendinopathy UTC allows:

- Staging of tendinopathy – to facilitate improved management of reactive or degenerative tendons
- Accurate identification and quantification of focal areas of tendon degeneration and tears
- Accurate differential diagnosis of Plantaris tendinopathy from Achilles tendinopathy
- Monitoring of response to load in problematic tendons in the elite athlete and high-level 'weekend warrior' (e.g. training for marathon or triathlon)
- Monitoring of Achilles tendon repair or rupture during rehabilitation

As with standard ultrasound imaging, UTC imaging of the Achilles and patellar tendons at Envision attracts a Medicare rebate and is performed for the same cost as a standard musculoskeletal ultrasound.

		Doctor referred		Podiatrist referred		Physio referred	
UTC Imaging	Fee	Medicare rebate	Patient pays	Medicare rebate	Patient pays	Medicare rebate	Patient pays
Ankle	\$285	\$ 93	\$192	\$ 93	\$192	\$ 32	\$253
Knee	\$285	\$ 93	\$192	\$ 32	\$253	\$ 32	\$253

much more
than a picture



More on UTC

To date, imaging of superficial tendons, such as the Achilles and patellar tendons, has been limited to conventional ultrasound (US) or magnetic resonance imaging (MRI). Ultrasound has been generally preferred in tendon imaging because of its exquisite spatial resolution, due to new high-frequency linear probes and proximity of the probe to the tendon, which allows resolution of collagen fibrils and internal tendon architecture. (Unlike US, standard MRI is not capable of resolving the internal architecture of tendons.) However, tendon US has a number of limitations that affect diagnostic accuracy. These limitations include high operator dependency (e.g. due to artefacts), poor contrast resolution for tendon tears, poor reproducibility and lack of an imaging based staging system for tendinopathy. Ultrasound Tissue Characterisation (UTC) is a form of ultrasound examination that couples a standard high-frequency linear US probe to a motorised tracking device that allows for a completely reproducible and comparable study of tendons such as the Achilles and patellar tendon. A 3-dimensional image of the tendon is rendered by collecting 600 contiguous transverse ultrasound images over a distance of 12cm. This allows UTC to eliminate many of the technical limitations of standard US, including operator dependency and poor reproducibility. UTC assesses and quantifies the degree of collagen fibril

alignment of tendons with complex software, to create a powerful tool for diagnosis and quantification of tendinopathy. The integrity of tendon structure is quantified into four distinct echo-types that have been validated against histopathological samples. Green pixels indicate normally aligned tendon collagen fibrils. Blue pixels indicate increased separation or waviness of fibrils, due to ground substance deposition between fibrils. Red pixels indicate decreased fibril integrity due to collagen disruption. Black pixels indicate absence of fibril organisation, seen in areas of mucoid degeneration or tendon tears. When combined with an established Clinicopathological model for tendinopathy [1], UTC is able to stage tendon disease and assist in formulating a tendon management programme for patients with Achilles or patellar tendinopathy. Complete reproducibility of the study and quantification allows clinicians and patients to accurately monitor their tendons and their response to loading, during episodes of tendinopathy, as well as during rehabilitation. UTC may be used as an injury prevention tool in elite and high-level athletes, particularly those at risk of tendinopathy, during pre-season and competition. UTC has an important role in the differential diagnosis of Achilles tendinopathy, particularly in evaluating for Plantaris tendinopathy, which is frequently overlooked or difficult to assess on standard US and MRI.

[1] Cook and Purdam, *BJSM*, 2009

UTC Key Points

- Provides an objective diagnosis and assessment of Achilles and patellar tendinopathy
- Eliminates artefact and operator dependency that limit the accuracy of standard US
- Stages tendinopathy to assist in providing an accurate management programme
- Monitoring of tendon response to load and tendinopathy management during episodes of tendinopathy, post rupture or repair and for athletes in training or competition

much more
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