



# Broadmead Orthopaedic Physiotherapy Clinic\*

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## OVERUSE TENDON INJURIES

Overuse tendon injuries, or tendinopathies, are commonly found in the work place and account for up to 50% of all sports injuries. These injuries are, however, poorly understood and often mistreated. A common misconception is that if something hurts then it must be inflamed. From this comes the catch-all term of tendinitis. The “itis” suffix implies inflammation. This is simply not always the case. Recent research on the nature of tendinopathies supports the understanding that **overuse tendon injuries do not involve inflammation**. Clinically this is important as it changes both the treatment methods and timelines.

### ANATOMY

To understand tendinopathies, we need to look at the anatomy of a tendon. Tendons are the structures that attach muscle to bone. Within the body there are obviously tendons of different shapes and lengths. However, they all serve the same function. Tendons transmit forces, generated in the muscle, to bones, thus imparting stability and movement to a joint.

Tendons, like all connective tissue are primarily composed of two tissue types: collagen and elastin. Collagen gives the tendon its strength while elastin, as the name implies, gives elasticity or flexibility to the connective tissue. The quantity of collagen and the arrangement of its fibers will determine the strength of the tendon. Under a microscope a healthy tendon will have closely packed collagen fibers arranged in a parallel pattern.

When healthy tendon tissue is compared to tissue from patients with chronic tendinopathies there are marked differences. The abnormal tissue is characterized by: a loss of organization in the collagen fibers; an increase in vascularity and cellularity of the tissue with a resulting decrease in density of collagen; and an **absence** of inflammatory cells. The term **tendinosis** is used to describe this type of chronic tendinopathy.



Normal Patella Tendon



Tendinosis

### CAUSE

The main problem for someone with tendinosis is failed healing, not inflammation. Tendinosis is an accumulation over time of microscopic injuries that don't heal properly. Although inflammation can be involved in the initial stages of the injury, it is the inability of the tendon to heal that perpetuates the pain and disability.

### MANAGEMENT

A common misconception is that tendinopathies are self-limiting conditions that resolve within a few weeks. Available evidence does not support this assumption. Tendinopathies may take months to resolve and are often resistant to treatment. This is obviously dependent on the pathology.



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The table below describes the differences between tendinosis and tendinitis.

	Overuse Tendinosis	Overuse Tendinitis
Prevalence	Common	Rare
Time for recovery (with <b>early presentation</b> )	6-10 wk	Several days to 2 wk
Time for full recovery (with <b>chronic presentation</b> )	3-6 mo	4-6 wk
Likelihood of full recovery to sport from chronic symptoms	~80%	99%
Focus of conservative therapy	Encouragement of collagen- synthesis maturation and strength	Anti-inflammatory modalities and drugs

Adapted from Khan et al.

## Patient education

Appropriate treatment may require that the athlete / worker cease or modify aggravating factors. Particularly important is educating those patients whose symptoms are of short duration. That is, symptoms come on with onset of activity but subside as that area “warms up”. These patients are less likely to seek appropriate treatment and by continuing with activity they will worsen the tendinosis. Tendon injuries often require patience and careful rehabilitation because tendons heal more slowly than muscles do.

## Need for assessment of training errors and biomechanical faults

Muscles and tendons will make specific adaptations to demands placed upon them. Athletes use this principle in training to make gains in strength and endurance. Overtraining occurs when the body is not able to adapt to the imposed demands and cellular damage is not allowed the appropriate healing time and / or conditions. Training errors, such as an inappropriate increase in intensity or duration, are an obvious source of tissue injury. Equally common, but often overlooked, are biomechanical faults. Repetitive movements in an abnormal pattern will effect the way in which force is transmitted through the skeletal system. Correction of biomechanical faults is essential in order to provide the necessary structural environment for healing to occur.

## Load-Decreasing Devices

Tendinosis is caused by the application of excessive load through a tendon. With the use of an appropriate load-decreasing device ( braces, heel lift, etc) there will be less force exerted through the tendon. This will assist in preventing further collagen breakdown and allow the tissue an opportunity to recover.

## Stretching and proprioceptive exercises

Appropriate stretches will begin to address biomechanical faults and decrease the load on tendons. While stretches are important, perhaps more important are proprioceptive exercises. These exercises are designed to restore both balance and joint stability by challenging the use of interdependent muscle groups. Specific exercises are based on a thorough physical assessment.

## Treatment aimed at increasing collagen production – including strengthening

The cornerstone of all treatment for tendinosis is appropriate eccentric exercises. An exercise is performed eccentrically when a muscle is made to contract while **lengthening**. There is an overwhelming body of evidence to support the use of eccentric strength training to increase collagen production. The exercises performed are specific to the area involved.

## Surgery

In some circumstances surgery is an option but surgery must be thought of as a last resort. Recovery from surgery will require 6 to 12 months and the success is generally 60-80%.