Tendons and Tendon Pathology

What is a tendon?

- Tendons are a complex,extracellular matrix tissue. Tenocytes are lined up in series and produce the matrix they live in (collagen, proteoglycans, glycoproteins) and can communicate via mechanotransduction. It has minimal nerve and vascular supply

Tendons are surrounded by paratenon, a fibrofatty tissue which supports the tendon with neuro-vascular supply

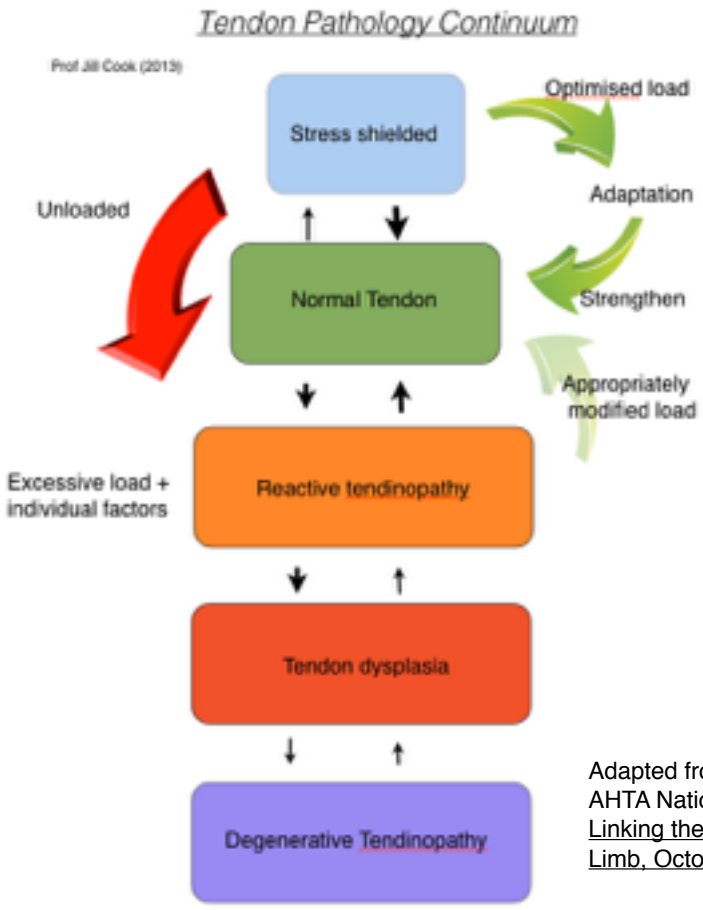
Tendons function like springs -they absorb and then release energy

Tendon loading
Tenocytes respond to load by up-regulation (they get busy communicating along/across the chain). Load causes the tendon to stiffen, if we unload tendon for too long, we get too little stiffness. BOTH too much and too little load can lead to tendinopathy

- Recent research indicates that excessive load can cause overuse tendiopathy (Cook & Purdam, 2012)
- Overuse tendinopathy results in changes to the cell and extracellular matrix, with activated cells, increase in large proteoglycans and a breakdown of the collagen structure (Cook & Purdam, 2012)
- The tenocytes respond to the load by changing and becoming protective (produce more matrix to protect cells. This creates space in the usually tight bundles of collagen fibres and weakens tendon structure

(Cook & Purdam, 2012)

At this point - the process is reversible. If process of tendon overloading continues, creates more spaces and weakens the tendon further.



Adapted from Prof Jill Cook's presentation at the AHTA National Conference 2013, Lorne,Victoria, Linking the Chain : Biomechanics of the Upper Limb, October 18-20 2013