Hertfordshire Sports Clinics

BRITISH ATHLETICS

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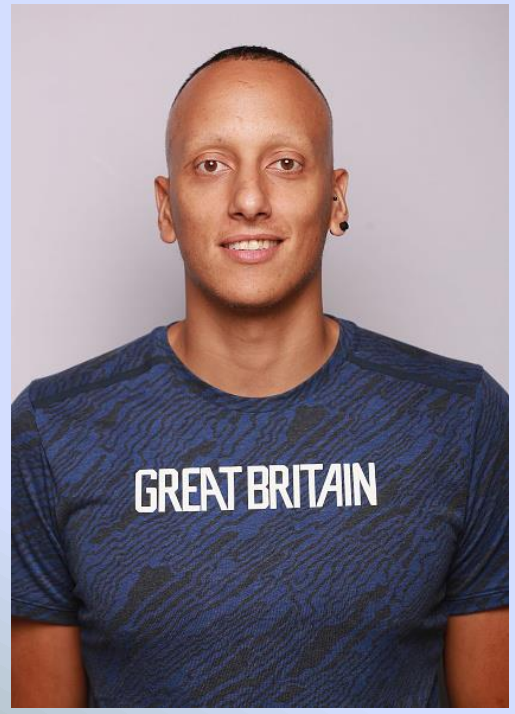


- Clinical Director at Hertfordshire Sports Clinics (Multidisciplinary)
- Osteopath/Performance Therapist – British Athletics (WCPP athletes)
- Qualified from BCOM 2005
- PGCert at Herts Uni 2012 ,completed modules:
  * Applied Strength and Conditioning
  * Advanced Injury Prevention Management
  * Functional Rehabilitation
- Osteopath with post grad physio training

CONTENT OF PRESENTATION

- ❑ What is an osteopath??
- ❑ Important training principles
- ❑ Tendons
- ❑ Importance of strength training in runners
- ❑ What exercises to do?!
- ❑ Questions?

S.A.I.D PRINCIPLE

Specific Adaptations to Imposed Demands

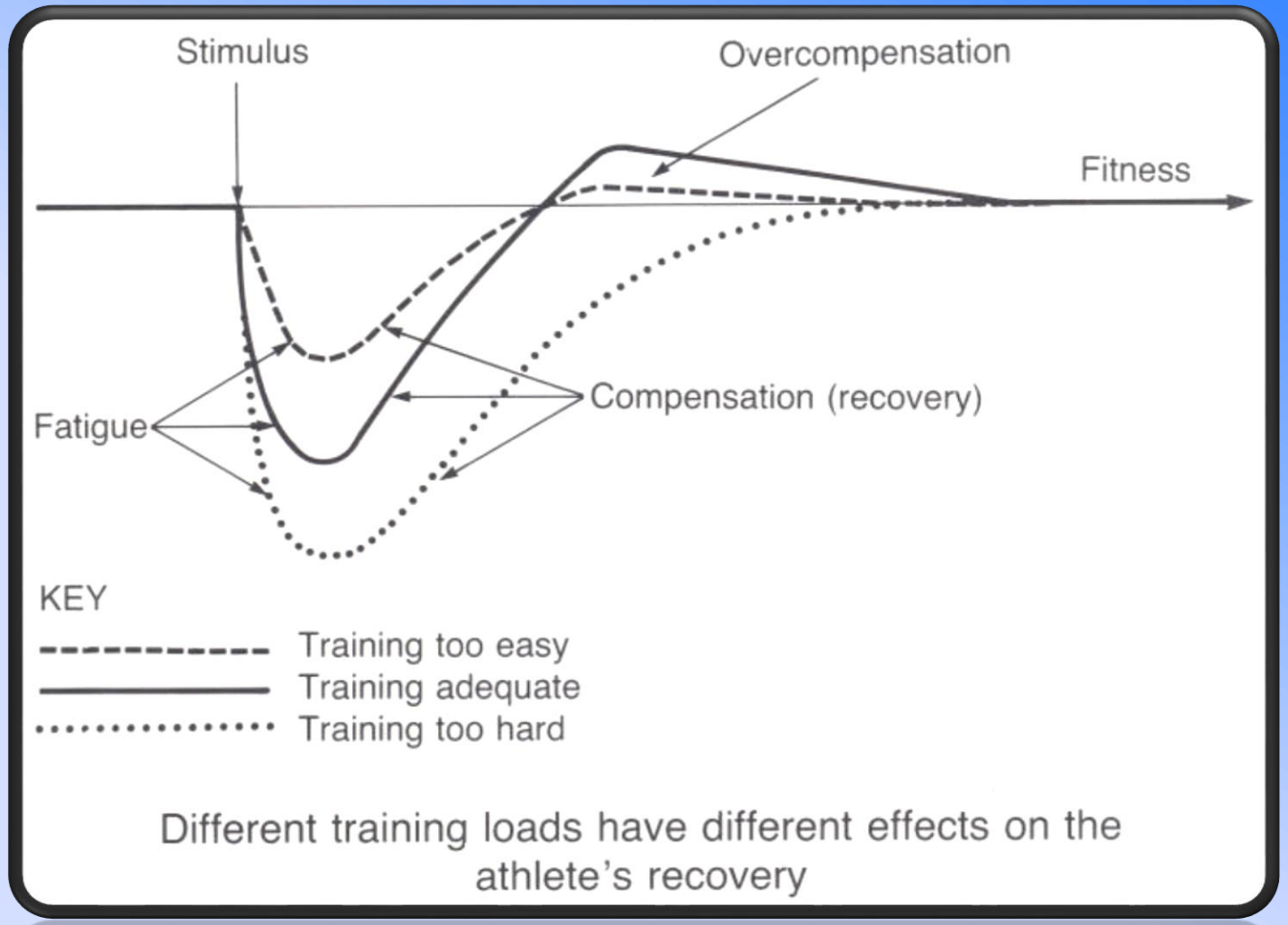
- ✓ This is the case for all biological systems i.e.
- ✓ Think muscle, tendon, ligament, fascia, nervous system, cardiovascular system, joints, bone
- ✓ Think plasticity in both +ive and –ive directions … don't use it you lose it!

OVERLOAD PRINCIPLE

This overload can be manipulated by weight, reps, sets, length of contraction with resistance training.

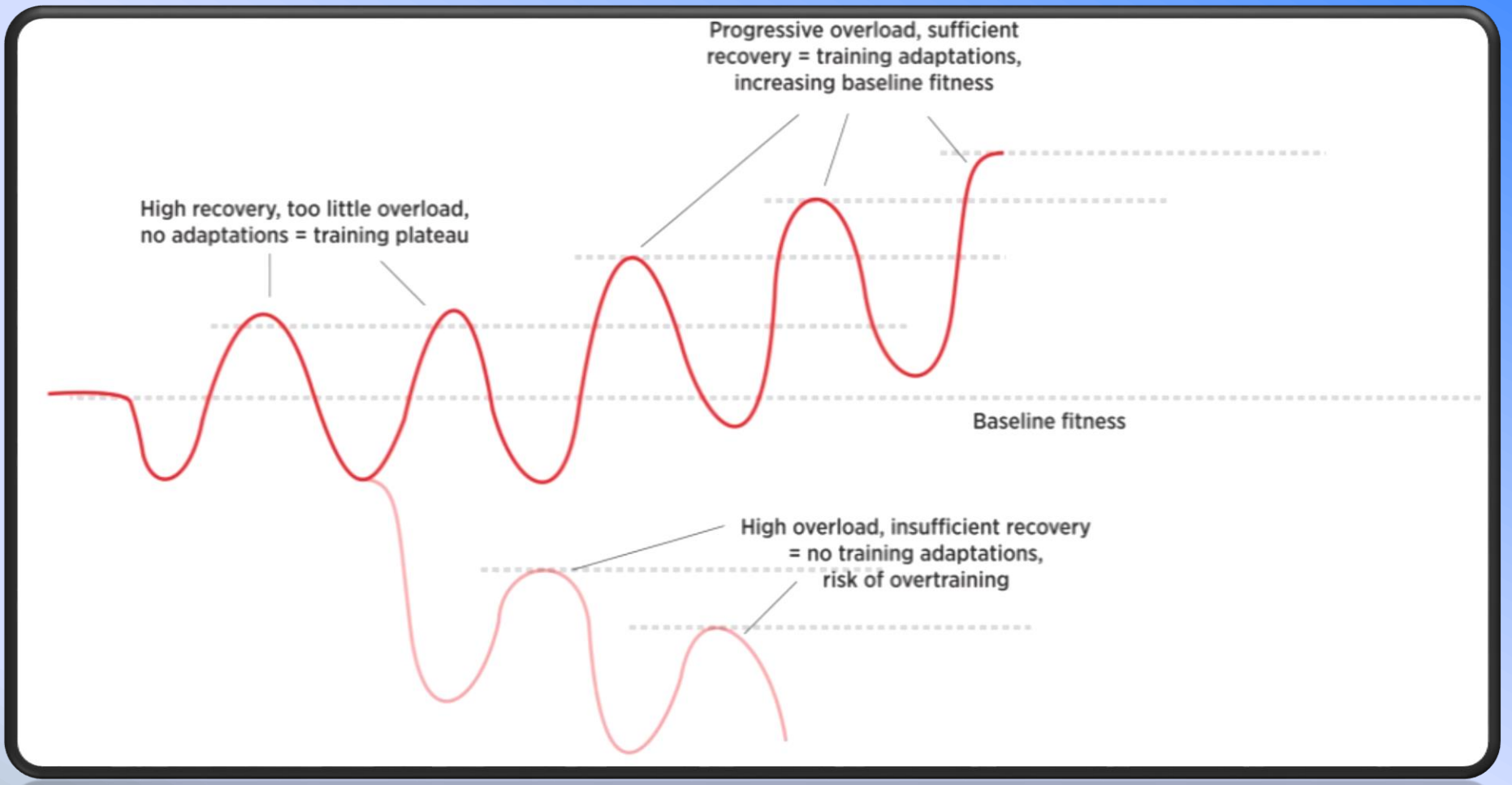
With CV this load can be altered by distance, time and training at specific heart rate zones

Neurologically performing more complex movements, fine motor control, quicker



Different training loads have different effects on the athlete's recovery

PROGRESSIVE OVERLOAD PRINICPLE



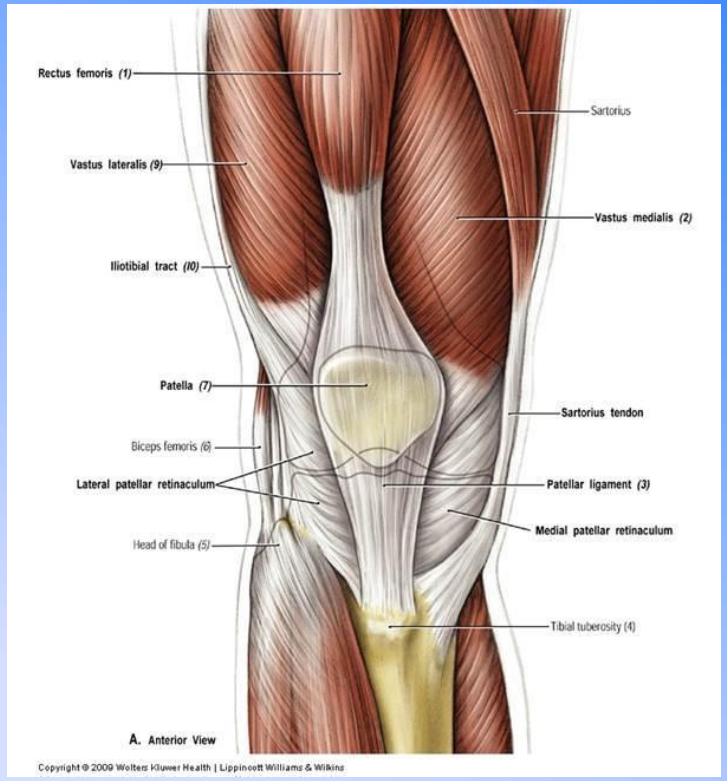
PRINCIPLES RECAP

- Specific training produces specific adaptations in multiple body systems.
- This change can be +ive or -ive
- When we create a training stimulus we want to create the perfect storm of stress to allow the body to come back stronger.
- Too much or too little is bad for different reasons
- Aim is to progressively overload over a prolonged period of time

TENDONS

➢ STRUCTURE

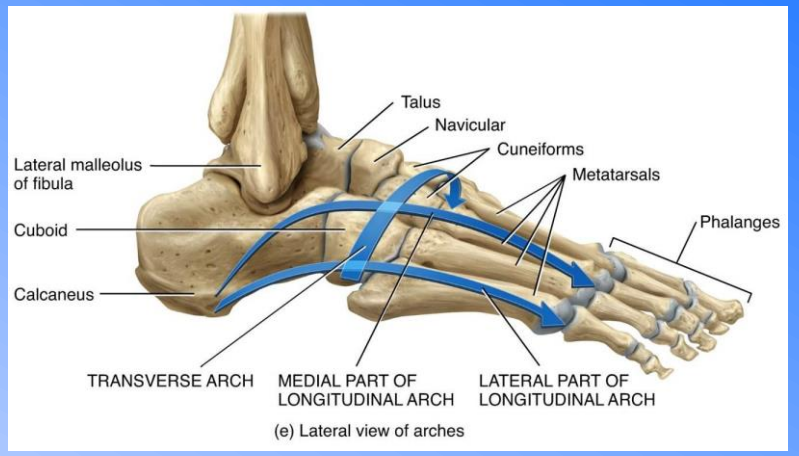
- Tendons are tough thickened bands of connective tissue that primarily attach muscle tissue to bone.
- There are many types of shape from cord like to flat variations depending on role.
- Despite what you see in this image the tendons are not just found at the ends of the muscle, portions of tendon actually run throughout the length of the muscles.
- The tendons themselves don’t end at bone they infiltrate the bone.

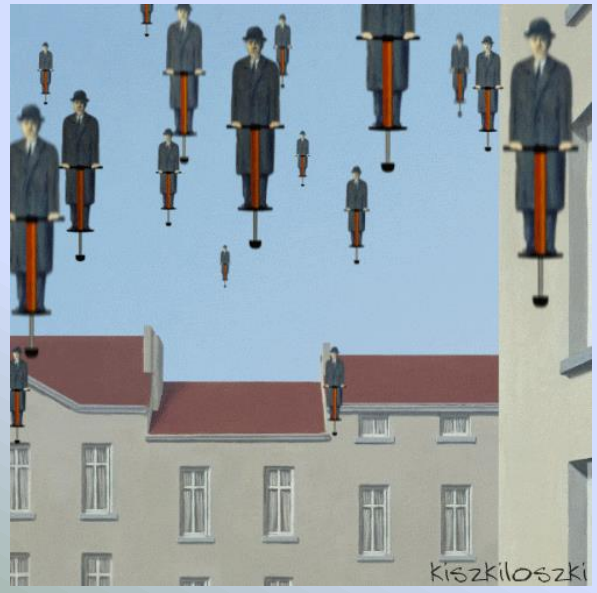


TENDONS

➢ FUNCTION

- To transmit forces to different body tissues/structures efficiently and in the right direction (that's why they go inside bone).
- They provide stiffness that supports joint stability (especially in the foots arches)
- Different tendons have different functions but for runners its their elastic energy storing properties which are key…. Think of them as elastic bands!!





- The Achilles tendon and associated elastic spring mechanisms in the plantar fascia contribute approx. 60% of the next stride with stored energy in the tendon – super efficient!
- They allow our muscles to remain at an optimal length for the strongest most efficient contraction whilst the tendon lengthens and shortens.
- So basically think of a pogo!
- Different genetic factors dictate length and properties….. But we should look to maximise what we have

TENDON INJURY

- **TENDINOPATHY**

→ **Reactive Tendinopathy**

Response to overload (large increase in mileage, reduction of rest days, change in training type i.e. Introducing hill or speed work).

It can also be from direct trauma to a tendon.

NO CHANGE TO STRUTURE OF TENDON

Symptoms include:

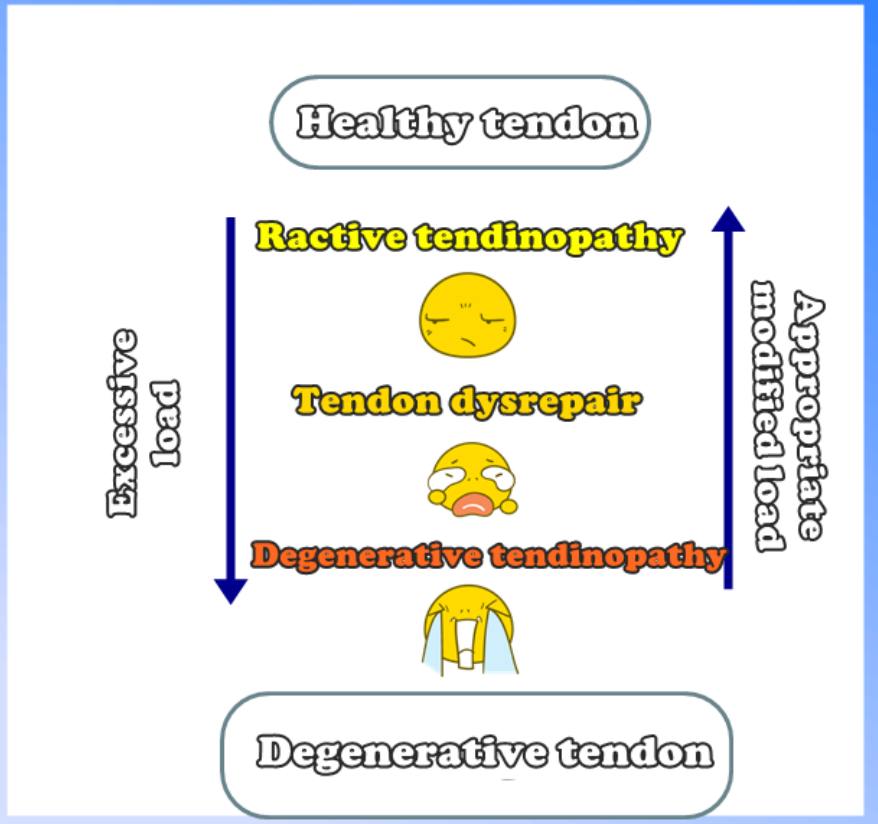
- Pain and stiffness on the tendon
- Morning pain and stiffness
- First few steps after prolonged sitting
- 1st part of a walk or run

Treatment:

- Reduce overload - running :[but not always :]
- Do off loaded work (cycling)
- Seek advice and guidance from an experienced therapist.
- Heel raises

Prognosis:

- Good as it is easily reversible with load management and some treatment.
- Can take a few days to a couple of weeks to settle.
- Graded reintroduction to appropriate training load with strength training, tendon loading



TENDON INJURY

- **TENDINOPATHY**

→ **Tendon Dysrepair**

Usually the stage that would follow reactive tendinopathy if the tendon continues to be excessively loaded. It is similar to the reactive stage BUT …….

…..THE TENDON STRUCTURE STARTS TO BREAKDOWN

It's like continually picking a scab to stop it fully healing!

Symptoms include:

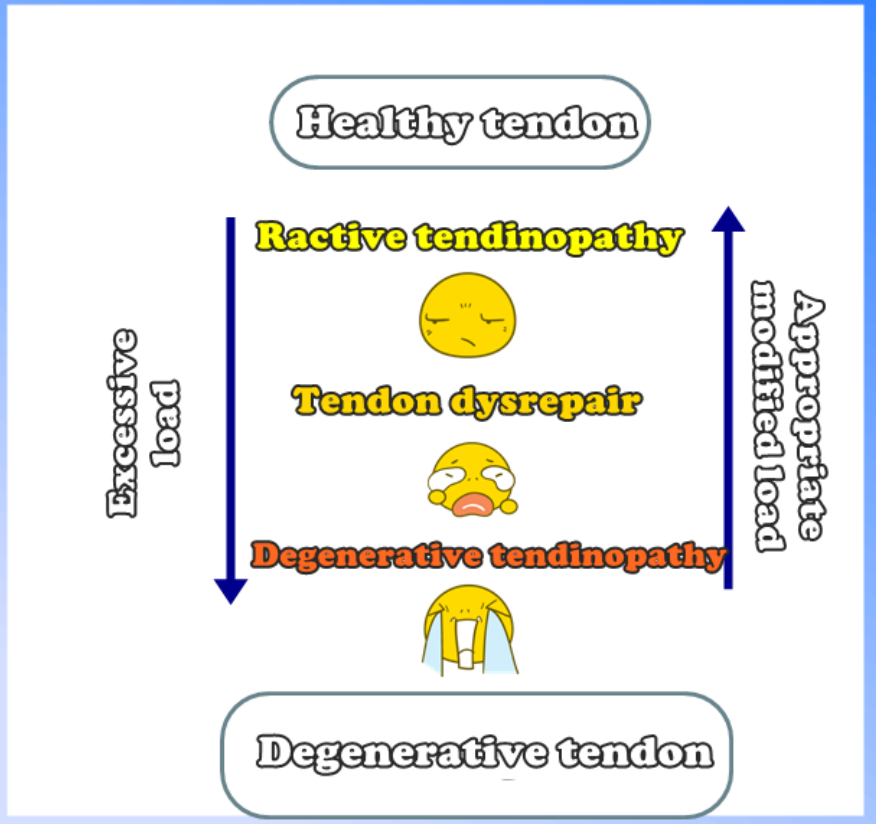
- More pain and stiffness on the tendon
- More Morning pain and stiffness
- More steps after prolonged sitting
- Longer part of a walk or run

Treatment:

- Reduce overload - definitely running now:[
- Do off loaded work (cycling)
- Seek advice and guidance from an experienced therapist.
- Shockwave Therapy
- Heel raises

Prognosis:

- It is reversible with load management and treatment.
- Can take a few days to a couple of weeks to settle.
- Graded reintroduction to appropriate training load with strength training, tendon loading



TENDON INJURY

- **TENDINOPATHY**

→ **Degenerative Tendinopathy**

More common in the older athlete.

It is the response of the tendon to chronic overloading. There are multiple tendon structure changes making it less efficient at dealing with load.

THE TENDON STRUCTURE HAS IRREVERSAIBLY ALTERED 😔

Symptoms include:

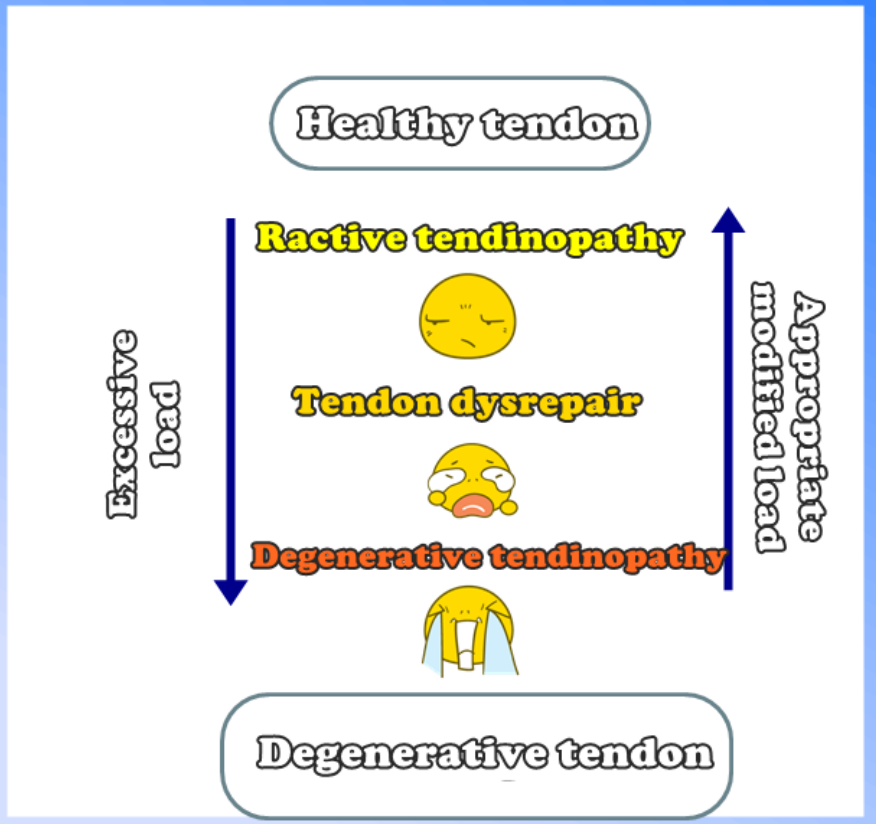
- More pain and stiffness on the tendon
- More Morning pain and stiffness
- Complete rest does not work
- Thickened nodular tendon

Treatment:

- Stop overload completely
- Essential to seek advice and guidance from an experienced therapist.
- Shockwave Therapy
- Extensive rehab and tendon loading program

Prognosis:

- Irreversible damage, full recovery impossible.
- Months of treatment, rehab and tendon loading.
- High risk of tendon tears and ruptures



IMPORTANCE OF STRENGTH TRAINING FOR RUNNERS

MSK

Increase muscle strength/endurance → more efficient contractions.
Stiffer tendons → more competent ENERGY storing tendons
↑ bone density and strength → protection against stress responses/fractures
↑ Core '*functional*' stability → able to hold good running posture for longer
↑plyometric strength → better 'kick' at end of race
Allow you to work on imbalances
Make you ↑ ↑ physically robust reducing niggles (loading with more than just body weight)
Reduce body fat and increase lean muscle mass (you trade in dead weight for muscle)

A strength training program alongside a running program (concurrent training) actually inhibits mass muscle gain

PHYSIOLOGICAL

↑ mitochondria in muscles - energy producing parts of the cells (basically strapping more battery packs to your muscles)
↑ capacity of you muscles, tendons, ligaments, connective tissues, joints to deal with load.
↑ insulin sensitivity allowing for better blood sugar control.

NEUROLOGICAL

↑ the number of connections between nerves (collateralisation) leading to stronger, quicker more efficient nerve signals/muscle contractions.
Training running transferrable movements (triple extension) speeds up nerve signals allowing smoother running action.
↑ coordination and proprioception (body's GPS system)

IMPORTANCE OF STRENGTH TRAINING FOR RUNNERS

TO SUMMISE:

- Run faster
- Better running economy
- Add more kick at the end of a race
- Improve tendon compliance and spring loading ability
- Get out of a plateau of not making significant gains

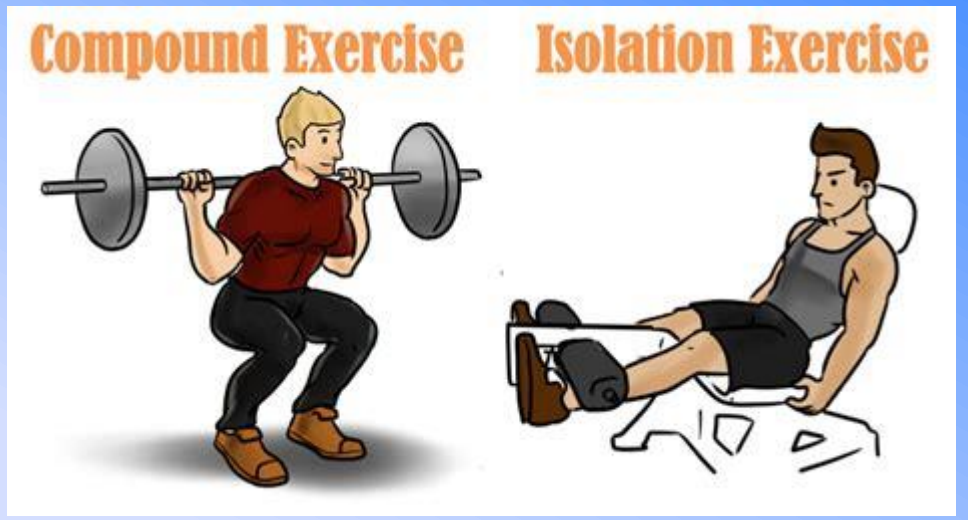
- **REDUCE RISK OF INJURIES**

- Have fun?

So what exercises should I do?!?!

Compound Exercises

- Any movements that involve the use of two or more joints and work multiple muscle groups at the same time.
- More functional strength based exercise
- Good for improving overall body strength



Accessory/Isolation

- Isolation exercises in weight training are those involving only one joint and a limited number of muscle groups.
- Unlikely to be functional as running doesn't involve 1 joint working in isolation.
- Used for improving strength of specific muscle (to address imbalance or rehab)

So what exercises should I do?!?!

Compound Exercises

- Deadlift/Romanian Deadlift/Stiff Leg Deadlift
- Squat (back/front/sumo)
- Lunges
- Pull ups
- Pull downs
- Bent over rows
- Shoulder press
- Overhead press
- Landmines
- Hanging Leg Raises
- Cable Crunches

So what exercises should I do?!?!

Accessory/Isolation

- Hamstring Curls
- Knee extensions
- Calf raises
- Clams
- Bicep curls
- Triceps kickbacks
- Machine assisted dips
- Rehab exercises!!

So what exercises should I do?!?!

Words of Advice

- Introduce strength training gradually to existing running regime.
- Aim for minimum of 2 sessions per week.
- Mix combination of compound and isolation exercises.
- Start the session……. Single leg exercises → Heavy challenging compound exercises → isolation exercises.
- Don’t do double session days…. yet (cardio am weights pm)
- Plan enough rest between running and strength sessions.
- DO NOT OVERTRAIN!!!!

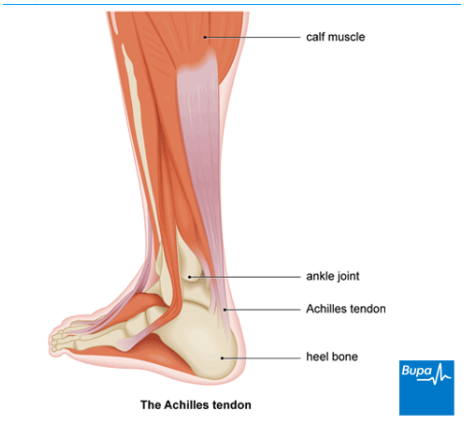
Tel: 0845 30 111 89 – email: reception@osteopathyfirst.co.uk

Achilles Tendinopathy explained

What is Achilles Tendinopathy?

Achilles tendinopathy historically was called Achilles tendinitis, but we now know more about the condition which can be acute (reactive) or chronic (degenerative) or somewhere in between. There is little or no inflammation that occurs within the tendon as previously thought. It is a degenerative condition, caused most probably by poor biomechanics and therefore over-loading.

The Achilles tendon is a strong structure and is a continuation of your calf muscles - joining directly into the back of your heel bone. Achilles tendinopathy is common in runners and can occur on just one or on both sides simultaneously. Diagnosis is important to ensure that you have not sustained a more significant injury such as a partial or total rupture to the structure. These tendons can take a long time to repair due to their poor local blood supply so be patient as you are looking at up to six months for resolution.



What are the symptoms of Achilles Tendinopathy?

The most common signs are local dull or sharp pain, tenderness, swelling around or thickening of the tendon itself. Weakness can also be associated. The pain is usually worse first thing in the morning, after activity and as the condition progresses, it can become painful during activity as well.

What are the causes of Achilles Tendinopathy?

This is another condition that is now thought to be due to repetitive microtrauma, and is common in runners. As with many injuries, these cases are multi-factoral and require a multi-faceted approach to treatment and rehabilitation. What you need to do is address the underlying factors and not just try and make the pain go away – that is how you will get long term resolution from this and any other biomechanical issue.

The structure of the Achilles tendon should be strong and linear. Chronic tendinopathy occurs over time when the arrangement of the collagen fibres that make up the tendon becomes more haphazard. Because the tendon has a poor blood supply, it doesn't heal well on its own and this is why you have to try and identify and remove all the

aggravating factors and causes. We most commonly see this in runners 40+ and more in men than women. We also see it in jumping sports such as tennis, squash or netball so bear this in mind if you do these sports or anything similar in addition to your running.

Inadequate shock absorption, excessive rear foot pronation and a heavy heel strike can be risk factors for Achilles tendinopathy. Check your running shoes haven't done more miles than they should! If you suddenly start hill training, this can also increase the load on your Achilles and also be associated with the onset of symptoms.

How is Achilles Tendinopathy diagnosed?

Our diagnosis is made from the signs and symptoms your present with as well as your case history and our own assessment including palpation of the tendon itself and tests such as getting you to stand on your tip toes.

An x-ray won't show any soft tissue damage or degeneration. We would choose to refer for diagnostic ultrasound but this is not usually necessary unless your symptoms are not settling with conservative treatment and management.

How is Achilles Tendinopathy Treated?

Historically patients with Achilles tendinopathy were given anti-inflammatory medication but we know now that this is of very little use.

It can take a while for AT to settle even if you are religious about your treatment and management approach to it. This is because our bodies have a cyclical regeneration/repair process which takes around 12 weeks and so you should start to see some real improvement after this time. If running is what makes your pain worse, whilst you many not want to hear this, it may be that rest is what is needed. However we will likely give you lots of things to be doing in the meantime to keep you busy as complete rest is not usually advised. I will often recommend using a cross trainer as a non-impact alternative together with swimming and cycling and we will normally get you back running as soon as you can do so within certain limits.

There is some evidence to show that stretching a reactive Achilles tendon will irritate it so don't think that stretching madly all day every day is what you need to be doing and listen to the advice that is given.

A typical treatment program here at our clinic after initial consultation would be soft tissue massage to the calf and hamstrings in the first instance all aimed at de-loading the tendon. We will look at your strength, flexibility and function all the way from your feet up to your hips and pelvis. We may use kinesiotape to the Achilles and calf. We will provide a stretching and strengthening program which is unique to you but will usually include the proven 12 week progressive eccentric loading protocol described by Prof Hasan Alfredson. Some therapists use acupuncture to try and increase local blood supply and healing.

We will also look at what you spend your days doing, and what your wear on your feet during this time. We might recommend a basic over the counter orthotic to support your rear foot motion and provide some support for your foot arches. Sometimes we will also use heel lifts for a short time to once again de-load the tendon itself and provide it with some rest to recover.

Should conservative treatment fail, there are a number of options now for the treatment of Achilles tendinopathy. Cortisone injections are no longer recommended. Shockwave therapy is a more recent option and is showing some promising positive research. PRP injections have limited research driven results. Surgical intervention is a last resort.

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Patellar Tendinopathy explained

What is Patellar Tendinopathy?

Patellar tendinopathy historically was called Patellar tendinitis, but we now know more about the condition which is degenerative, caused most probably by poor biomechanics and therefore repetitive over-loading.

The Patellar tendon is a strong structure and is found underneath your patella (kneecap) itself and joins into the top of the tibia bone. It is a continuation of the quadriceps and works to control your knee in varying degrees of bend. Patellar tendinopathy is common in running and jumping sports and can occur on just one or on both sides simultaneously, but you do not need to be an athlete to suffer with this condition. Diagnosis is important to ensure that you have not sustained a more significant injury such as a partial or total rupture to the structure. These tendons can take a long time to repair due to their poor local blood supply so be patient as you are looking at several months for resolution.

What are the symptoms of Patellar Tendinopathy?

The most common signs are local dull or sharp pain, tenderness, swelling around or thickening of the tendon itself. Weakness can also be associated. The pain is usually worse first thing in the morning, after activity and as the condition progresses, it can become painful during activity as well.

What are the causes of Patellar Tendinopathy?

This is another condition that is now thought to be due to repetitive microtrauma. As with many injuries, these cases are multi-factoral and require a multi-faceted approach to treatment and rehabilitation. What you need to do is address the underlying factors and not just try and make the pain go away – that is how you will get long term resolution from this and any other biomechanical issue.

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Inadequate shock absorption, tight Iliotibial (IT) bands, tight quadriceps or hamstrings, excessive rear foot pronation and weak hip/pelvic muscle control can be risk factors for Patellar tendinopathy.

How is Patellar Tendinopathy diagnosed?

Our diagnosis is made from the signs and symptoms your present with as well as your case history and our own assessment including palpation of the tendon itself.

An x-ray won't show any soft tissue damage or degeneration. We would choose to refer for diagnostic ultrasound but this is not usually necessary unless your symptoms are not settling with conservative treatment and management.

How is Patellar Tendinopathy Treated?

Historically patients with Patellar tendinopathy were given anti-inflammatory medication but we know now that this is of very little use.

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We will also look at what you spend your days doing, and what your wear on your feet during this time. We might recommend a basic over the counter orthotic to support your rear foot motion and provide some support for your foot arches.

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Plantar Fasciitis explained

What is Plantar Fasciitis?

Plantar Fasciitis (PF) is all too common, we are seeing more and more of it in our clinics each year. It has a number of causes, but the good news is there's quite a lot you can do to help yourself and the sooner you do something, the better. However, if you ignore it, or its causes, it can trouble you for a very long time.

The plantar fascia is a great big thick shock absorbing tissue that sits on the undersurface of your foot and runs from your heel bone to your toes. Plantar fasciitis is a condition that occurs when any part of this structure becomes irritated or inflamed, usually due to overuse or repeated microtrauma causing damage and degeneration within the tissues and is common in those with poor lower limb biomechanics. We used to think that the pain was down to a bone spur on the heel, but we know now that this is not always the case.

What are the symptoms of Plantar Fasciitis?

The most common sign is undoubtedly heel pain – just at the front of the fleshy part of your heel on the undersurface. The pain can also extend anywhere along the plantar fascia itself under the arch of your foot. The classic report we hear is of pain first thing in the morning, when you take your first steps after being in bed or after periods of rest, for example having been sitting at your desk for a few hours.

The plantar fascia itself is usually very tender to palpate (or touch) when it is in this state, and the pain is often worsened by walking around barefoot.

What are the causes of Plantar Fasciitis?

As with any injury, there is rarely one sole cause. These cases are multi-factoral and by addressing the problem from many angles, you have a better chance of recovery. What you need to do is address the underlying factors and not just try and make the pain go away – that is how you will get long term resolution from this and any other biomechanical issue.

There has been some research to show that poor calf/Achilles flexibility and an associated lack of range of movement within the ankle joint are linked to plantar fasciitis. As with the familiar song from childhood 'the foot bone's connected to the leg bone' we need to remember that everything is connected and the plantar fascia is in fact a direct continuation of the Achilles tendon which is a continuation of the calf muscle and this is why one will affect the other.

Changes in weight, excessive weight, incorrect footwear with inadequate shock absorption, as well as poor arch support can also be linked to plantar fasciitis.

You must also be aware of your footwear. For example, poorly fitting shoes, or those with inadequate support can irritate plantar fasciitis if worn during your working hours for 8-10 hours per day and also the same goes for running shoes worn for comparatively less time. Ladies who wear heels all day and then run during evenings and weekends may suffer more. Sufferers also report that going barefoot increases symptoms so be aware of this.

How is Plantar Fasciitis diagnosed?

Our diagnosis is made from the signs and symptoms your present with as well as your case history.

An x-ray will tell you if you have a bone spur but won't show any soft tissue damage or degeneration. We would choose to refer for diagnostic ultrasound but this is not usually necessary unless your symptoms are not settling with conservative treatment and management.

How is Plantar Fasciitis Treated?

It can take a while for PF to settle even if you are religious about your treatment and management approach to it. This is because our bodies have a cyclical regeneration/repair process which takes around 12 weeks and so you should start to see some real improvement after this time, but it can take longer – up to 9 months so be patient. You may be advised to rest from certain activities that aggravate your symptoms.

You will receive a treatment program and some supporting advice and exercises. It is important that you take this advice and undertake your rehabilitation exercises as these are very much part of your treatment and mean that you not only would be more likely to get better more quickly but also mean that you are helping to reduce the risk of the symptoms coming back in the future.

We will also look at what you spend your days doing, and what your wear on your feet during this time. We might recommend a basic over the counter orthotic to support your rear foot motion and provide some support for your foot arches.

Sometimes we will perform a 'gaitscan', putting you on a computerised forceplate to show us exactly what is going wrong in your gait cycle. This gives us more information about how to treat and rehabilitate you, and in some cases we will make custom, prescription orthotics which you will wear in your running shoes, or work shoes, or both.

For local pain relief, you might try filling a small water bottle with water and freeze, then roll your foot backward and forward over the bottle.

Experience shows that plantar fasciitis should settle with what we term 'conservative management' i.e. the methods detailed above. In rare cases where it may not, then injections of cortisone may be suggested but this can bring a risk of rupture of the plantar fascia. Shockwave therapy is a more recent option and is showing some promising positive research. Surgical intervention is a last resort.