

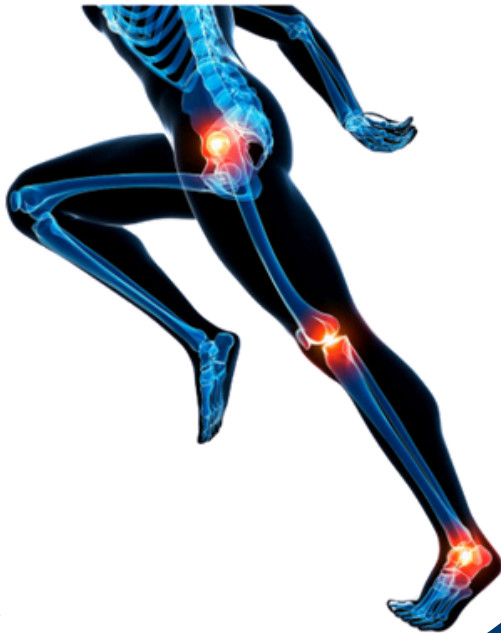
THE FOOT  
& GAIT CLINIC

YOUR COMPLETE GUIDE

# MUSCULOSKELETAL BIOMECHANICS

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FOR THE TREATMENT OF LOWER LIMB  
MUSCULOSKELETAL PROBLEMS



*What is*

# BIOMECHANICS?



Biomechanics is the science of the movement of your body, including how bones, tendons, muscles and ligaments work together to move. In podiatry we focus on the lower half of the body, starting at the tips of your toes all the way up to your lower back.

As we stand, walk or run our body will compensate for any anomalies caused by asymmetry. These compensations will put muscles, joints, ligaments and tendons under strain as they function in an abnormal way. Over time the joints and soft tissues become inflamed and injured.

## **Typical Conditions:**

- Plantar fasciopathies
- Achilles tendonopathy
- Bunions
- Ankle and leg pain
- Knee, hip and lower back pain
- Tibialis posterior dysfunction/ Adult-acquired flat foot deformity
- Walking and running pathologies
- Bursitis
- Osteo arthritis
- Ligament damage
- Neuromas
- Bone and soft tissue pathologies



Depending on your concern we offer two different types of appointments, both available with our specialist MSK podiatrists.

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### MSK (Musculoskeletal) Consultation:

This is a short appointment during which a podiatrist would be able to discuss your problem in more detail, take a look at your feet/legs with the help of ultrasound imaging if required, to diagnose your condition and explain their recommendations going forward. The appointment would concentrate more on interim help reducing any current pain rather than treating the cause of the problem.

### Biomechanical Assessment and Gait Analysis

This is a full examination of the lower limbs, looking for underlying causes of the foot, ankle, knee, hip and back concern, which may be contributing to the way you are moving or the pain you may be experiencing. The appointment can take up to 60 minutes.

Due to the wide range of tests known to our clinicians not every MSK assessment will be the same and they will use their clinical judgement to perform the most appropriate test individually tailored to you based on your history.

See next page for detailed explanation.

# BIOMECHANICAL *Assessment* *and* GAIT ANALYSIS

What happens during a biomechanical assessment and gait analysis?

**Step 1:** At the start of your biomechanical assessment we will spend some time to go through the history of your presenting problem and detail about your medical history, lifestyle, sports, and occupation etc. This gives us a good foundation to start assessing you biologically and mechanically.

**Step 2:** With the relevant history we can then move onto a POCUS Ultrasound imaging scan if appropriate. Ultrasound is extremely useful to visualise inside the body looking for possible bone, ligaments, tendon, muscle, fat pad and bursae defects. Ultrasound can pick up defects such as tendinopathies, bone fractures, ligament ruptures and osteo-arthritis etc. This type of imaging allows us to get an accurate diagnosis immediately.

**Step 3:** At this stage we tend to have a diagnosis. Diagnosis is useful but we also want to know why? Why the condition has happened? And why is it not getting better? Etc.

We start by doing a 'Static' and 'Dynamic Testing' examination. Static testing looks at general body alignment when standing, sitting, or lying down and not moving. We start collecting valuable data about joint range of motion, muscle, tendon, ligament strength and elasticity. This builds us an accurate picture about your mechanics and any limitations that might be contributing to your condition or injury. We do this with all structures from the toes to the lower back and everything in-between.

**Step 4:** Gait analysis... This is vital to know how your mechanics we assessed in the previous step, function together so you can walk, run or any movement that you perform. We capture this data in our gait lab with slow motion video and on request, 3D capturing cameras. We analyse your gait together and explain if there is anything that may be causing or contributing to your condition or injury.

**Step 5:** This final stage, we should have an accurate diagnosis and an understanding of how and why. We use this data to formulate a unique and bespoke treatment plan tailored to you.

# TREATMENT *Plan*

Based on the diagnosis and data collected the podiatrist will put together a treatment plan especially for you.

Your individual treatment plan will outline some examples of possible treatments:

For example:

- Trial Prescription Orthotics
- An exercise programme may be prescribed to you as part of your rehab plan.
- Manipulation/mobilisation
- Strapping and taping can be included.
- Footwear advice
- Shoe/sandal adaptation
- Gait retraining
- Curacorn® treatment
- Casting for bespoke orthotics or ankle orthotics
- Focused shockwave therapy
- Class 4 laser therapy
- Injection therapy (either steroid or ostenil)\*  
\*all injections are ultrasound guided

MSK Treatment Plan

Date of birth:	Practitioner:
	Appointment:
	Created:
	Last updated:

**Presenting Problem**

Presenting Problem: Findings:

**Treatment Plan**

Treatment Options: In assessment

- Footwear
- Temporary Orthoses
- Supplementary Exercises

Footwear: Continue with new style purchased

Redemptive exercises: Emulated via 'Rehab My Patient'

Treatment Options: Non Invasive:

- Focus Shockwave Therapy - 4 sessions @ £450 or £225 per session
- Laser Therapy - 6 sessions @ £800 or £200 per session
- Physiotherapy: 60 minute appointment @ £85, 30 minute appointment @ £44
- Massage Therapy: 60 minute appointment @ £55, 30 minute appointment @ £40
- Manipulatory: 60 minute appointment @ £85, 30 minute appointment @ £44
- Angular manipulation: £35

Treatment Options: Orthoses:

- Insoles: £80 (typically last 6 months)
- Ankle-foot: £200 (typically last 12 months)
- Semi Rigidsole - £300 (typically last 2-3 years)
- Rigidsole Control FFDSoles: shoe FFDS - £280 (Includes casting and fittings). (Shoe typically lasts 6-8 months, top covers and bottom covers may need to be replaced every few years)

These are all examples of possible treatment methods that may be appropriate to you. We are also part of a multi-disciplinary team, we can refer to our physiotherapy and sports and remedial massage team where necessary.

If further diagnostic imaging is required we have the ability to privately refer for X-ray and MRI imaging. The usual waiting time for referral appointments is approximately 1 week.

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## What are your options?

Sometimes, as part of an initial assessment, if clinically appropriate, clinicians will make you a pair of trial prescription orthotics in order to assess the efficacy of orthotic-based treatment. Progression onto permanent orthotics is not always required.

These orthotics are removable and can be used in most footwear, allowing you to change your footwear when necessary.

Trial Prescription orthotics are made in the clinic during your appointment.



## **CUSTOM MADE SCANNED/ CASTED FOOT ORTHOSES**

If the treatment plan calls for a custom made orthoses then an impression or scan of the foot is taken. This impression is taken with the foot held in a particular position and



requires a further appointment to fit. Some custom made devices

are made in our in-house lab while others are sent to an outside lab which takes 4 to 6 weeks to make.

## **ADAPTED SANDALS**

We have a lot of patients asking about what about summer footwear. There are options:

- We can make prescription sandals, however these may come with a high price tag and may not align with your personal style, or
- We can take the sandals you already have and if they are suitable we can slice them open and add the prescription inside the sandal. That



way we can have the best of both worlds - Your orthotic prescription in your preferred sandals.

# FOCUSED SHOCKWAVE

*Therapy*

Shockwave Therapy is a popular, non-invasive alternative to many surgical or steroid-related procedures.

"Shockwave Therapy (ESWT) offers two main advantages over traditional surgical methods: fewer potential complications and a faster return to normal activity." FDA

Shockwave therapy treatment uses an acoustic wave that is pulsed at a high-energy frequency, directly to the painful or affected area.

Most treatments are applied by a therapist using a hand-held device, which turns compressed air into low-energy sound waves. Light pressure is applied and the device is moved across the damaged areas that require treatment.

Shockwave therapy has two main 'modes of action' that can help with persistent pain.

Firstly, the shockwaves work to 'desensitise' nerve endings which can immediately reduce pain in the local area. Secondly, the waves stimulate blood flow in the area, causing a small amount of localised inflammation. In the days immediately following the treatment, the body naturally tries to heal the inflammation and in doing so, encourages the regeneration of cells, repairing damaged tissue and reducing pain.

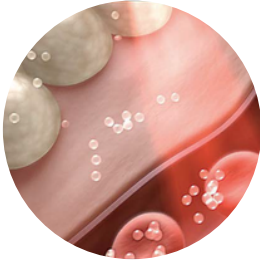
Some of the conditions Shockwave Therapy treats:

- Tendinopathies
- Plantar fasciitis
- Arthritis
- Bursitis
- Capsulitis
- Scar Tissue, etc



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# CLASS IV LASER *Therapy*



K-Laser delivers energy from superficial to deep tissues activating a cascade of photochemical reactions that promotes cell function, enabling treated tissues to accelerate the stages of the healing process and reduce pain sensation.

This is a safe and non-invasive technique that uses the body's own reparative processes.

## **Benefits Include:**

- Accelerated tissue repair and cell growth.
- Reduced fibrous tissue formation.
- Reduction in pain and inflammation
- Decreased swelling
- Improved vascular activity.
- Increased metabolic activity.
- Improved nerve function.
- Immunoregulation.
- Trigger points and acupressure points.  
Laser therapy reduces muscle trigger points and stimulates acupuncture points on a non-invasive basis providing musculoskeletal pain relief.
- Increased circulation.
- Decreased spasm and stiffness.
- Increased range of motion.
- Quicker recovery – faster regeneration of muscles, ligaments, skin, tendons and nerves.





# Diagnostic IMAGING

## Musculoskeletal Diagnostic Imaging

### Ultrasound imaging



Ultrasound imaging utilises sound waves to offer clinicians a visual representation of internal structures.

Ultrasound imaging can be used in the diagnostics of sporting injuries, arthritis, or soft tissue.

This service is available during your MSK appointments or as a diagnostic ultrasound appointment with one of our certified clinicians.

Diagnostic Ultrasound Imaging helps us get an accurate diagnosis immediately. This gives us the best idea which treatment will work best.

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### MRI scans & X-rays



MRI scans are helpful in the diagnosis of soft tissue injuries such as ligament, tendon, muscle, connective tissue and cartilage. There is also limited use assessing bone related conditions.

Xray scans use high-energy electromagnetic radiation. This produces images of bones and joints. However, Xray isn't useful in the assessment of any soft tissue structures as these aren't visible on Xray.

We are able to assist with onwards referral to our partner providers for MRI and Xray imaging.

Referral appointments are usually offered within 7 days.

# INJECTION *Therapies*

## Ultrasound Guided Injection Therapies

### **Ostenil Injections**

OSTENIL is used for treating osteoarthritis in joints. It is used to treat joints that are classed as synovial.



OSTENIL is a synthetic hyaluronic acid that is injected into the joint space to try and restore the balance that has been upset between the breakdown and and production of hyaluronic acid in synovial fluid and in doing so can decrease the pain and stiffness within the affected joint.

OSTENIL is a synthetic hyaluronic acid that is injected into the joint space to try and restore the balance that has been upset between the breakdown and production of hyaluronic acid in synovial fluid and in doing so can decrease the pain and stiffness within the affected joint. Whilst this can decrease pain and help with movement, it does not reverse the damage to the cartilage. Relief is temporary although can last for several months.

There is a very low risk of reaction as it does not contain animal proteins and post injection soreness is also rare. The more sever the arthritis the less chance of it being effective. These injections carry less risk than steroid injections. Depending on the joint affected, it usually requires a course of injections on a weekly basis for 3 weeks, the effects can take a few days to be noticed or after a second injection.

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# INJECTION *Therapies*

## Ultrasound Guided Injection Therapies Continued

### **Steroid Injections**

Steroid injections are used to treat several musculoskeletal conditions in both joints and soft tissue and are used to reduce inflammation and pain. They are also used to give short term pain relief whilst rehab is being undertaken.

#### HOW IT WORKS

The steroid injection itself is not a pain medication but rather an anti-inflammatory that works by preventing collagen production. The injection shuts down collagen-producing cells in the tendon or joint; this action suppresses inflammation, which is the redness and swelling caused by your body's healing response to damage or injury, and calms nerves, which indirectly reduces pain.

#### POSSIBLE SIDE EFFECTS

Side effects are rare but important to be aware of.

- Post injection flare-up of pain. This may last up to 48 hours.
- Infection is rare but if you develop any of the following symptoms: swelling, redness, warmth around the injection site or are generally unwell then seek medical attention.
- Anaphylactic shock is an extreme but very rare allergic reaction.
- Facial flushing can be present for 24 hours following injection and premenopausal females may experience breakthrough menstrual bleeding.
- Fainting.
- Reduced immunity may occur.
- Central serous chorioretinopathy is a rare side effect causing blurred vision.
- If you are breastfeeding it may cause milk production to stop for a short period of time.
- Can increase osteo-arthritic changes.
- Can cause soft tissue to rupture.



# THE FOOT AND GAIT CLINIC

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*Let's get in touch*

31 Bridge Street, Taunton, TA1 1TQ

01823 256440

[www.footandgaitclinic.co.uk](http://www.footandgaitclinic.co.uk)

[reception@footandgait.co.uk](mailto:reception@footandgait.co.uk)