



# Metatarsalgia (Ball of foot pain)

Information for patients  
Podiatry



Metatarsalgia or ball of the foot pain is very common and will affect around 80% of the population at some point in their life. It is made up of a group of conditions that can cause pain and inflammation around the bones and joints in the ball of the foot. Finding comfortable footwear can be difficult.

Treatment protocols for ball-of-the-foot pain almost always start with basic principles and we would encourage you to consider trying some self-help treatment before making a referral to your local Podiatry department.

## **WHAT ARE THE COMMON CONDITIONS THAT CAUSE BALL-OF-THE-FOOT PAIN?**

The most common conditions affecting the ball of the foot are Fat pad atrophy, Capsulitis, Inter metatarsal bursitis and Plantar plate injury.

### **FAT PAD ATROPHY**

Fat pad atrophy is a term used to describe thinning and degeneration of the fat pad that sits under the ball of your foot. The fat pad is the soft tissue layer in between the skin and the bones. It has a honeycombed structure with fibro-elastic chambers containing fat globules which helps with shock absorption and the spreading of pressure across the ball of your foot during activity. Thinning of the fat pad can lead to reduced shock absorption, making the foot more vulnerable to repetitive micro-trauma and developing inflammation, bruising, swelling and pain.

Thinning of the fat pad is a natural process and begins around the age of 30. It can take several years before the fat pad becomes thin enough to cause pain to develop. Fat pad atrophy is more common in people with Diabetes.

## **CAPSULITIS**

Capsulitis is a term used to describe inflammation of a joint capsule. A joint capsule is a covering that surrounds a joint and consists of a thick outer layer which gives it its strength and a thinner synovial layer which produces the fluid to lubricate the joint. Micro trauma or damage to the joint capsule can result in excess fluid being produced which causes the joint to swell and become painful when weight bearing. In your foot it most commonly affects the joint next to the big toe but can affect any joint within the body.

## **INTERMETATARSAL BURSITIS**

Intermetatarsal bursitis is an inflammation of one of the bursa that sits between the joints in the ball of the foot. A bursa is a small sac of fluid that can help to increase shock absorption and reduce friction, its position within the ball of the foot is important as it helps prevent the bones from rubbing together. When the bursa becomes inflamed it can swell and become painful when weight bearing. Tight fitting shoes can increase the compression of the bursa resulting in pain.

## **PLANTAR PLATE INJURY**

The plantar plates are deep ligaments that form the bottom part of the joint capsule within each of the joints in the ball of the foot. The plantar plates help to stabilize the foot and toes when weight bearing and also provide the attachment of the plantar fascia into the base of the toes. Repeated micro trauma can lead to tearing or partial tearing of the plantar plate. If left untreated this can cause deformity of the affected toe.

## Classic signs and symptoms of metatarsalgia

- ❖ A sharp, stabbing, burning or tingling sensation affecting the ball of the foot and into the toes
- ❖ Pain that increases with weight bearing activity and improves with rest
- ❖ Sensation of walking on a 'pebble' or 'lump'
- ❖ Increased pain when walking barefoot, especially on a hard surface. The most common cause of pain in the ball of the foot is from a sudden increase in pressure or activity resulting in micro trauma and inflammation.

## Other contributing factors

- ❖ Being over-weight
- ❖ Age - the fat pad under the ball of the foot becomes thinner and this can increase pressure at the front of the foot.
- ❖ Increased swelling in feet
- ❖ High arched feet
- ❖ Tightness in the muscles in the back of the leg
- ❖ Weakness within the muscles in your foot/leg
- ❖ Unsuitable footwear that is too narrow or has a thin sole i.e. High heeled shoe
- ❖ Foot deformities such as hallux valgus (bunion), hallux limitus and hammer toe deformities
- ❖ Inflammatory conditions i.e. rheumatoid arthritis, psoriatic arthritis etc.
- ❖ Previous foot trauma i.e. metatarsal fracture, nerve injury
- ❖ Spending long periods standing, walking or running, especially with a sudden increase in these activities

## WHAT CAN I DO TO HELP?

Unfortunately there is no quick or easy fix and your symptoms won't improve overnight. It is important though that if you have any of the contributing factors you make the necessary changes to help with your recovery. The advice below is aimed at reducing the pressure and inflammation from around the affected joints with a main focus on footwear and decreasing any tightness in the calf muscles. Tight calf muscles can increase the pressures through your forefoot (the front part of your foot). Your pain should improve but may take time to get better.

The one person who can help you get better is you!



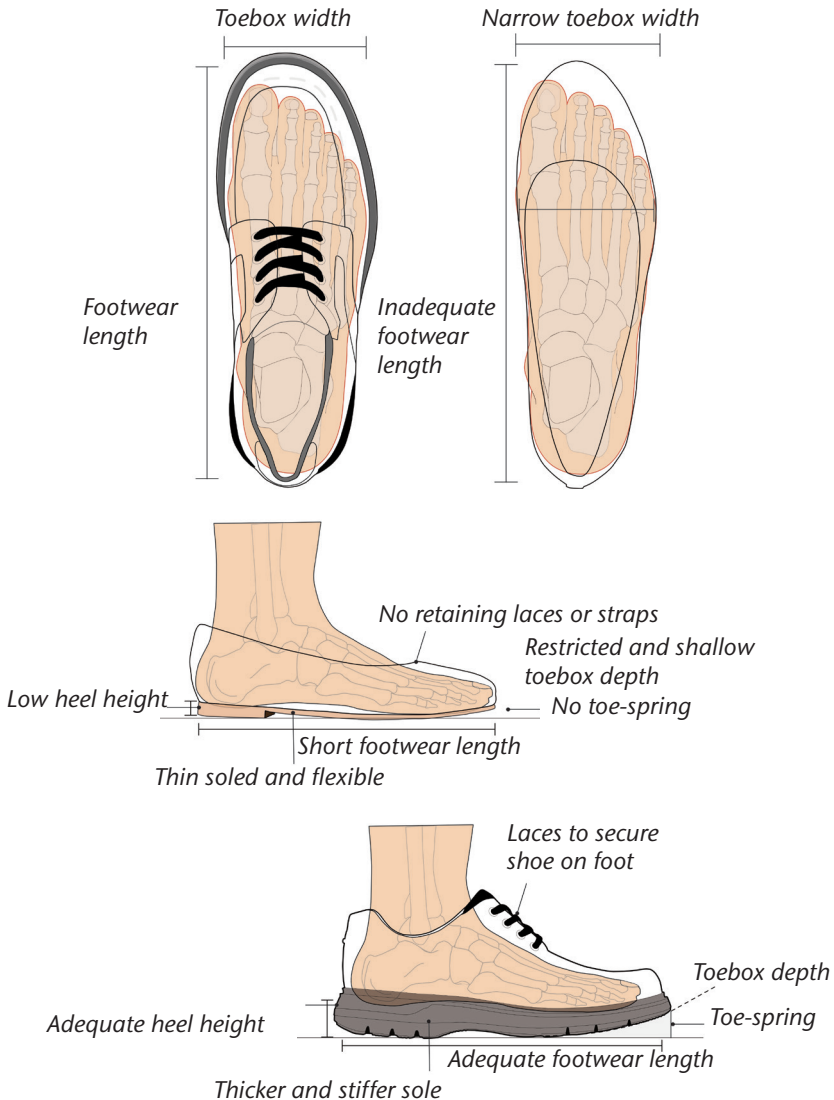
### WEIGHT MANAGEMENT

Increased weight will place extra stress on your joints and soft tissues in your feet. Losing even a small amount of weight will make a big difference to this especially when walking, running, or going up and downstairs.

If you need help with weight-control, you can find information, advice and groups you can join to help you manage your weight better. To access the NHS BMI Calculator go to: **[www.nhs.uk/live-well/healthy-weight/bmi-calculator/](http://www.nhs.uk/live-well/healthy-weight/bmi-calculator/)** or otherwise open your camera on your smartphone or tablet and hold it up to the code and the link should appear on your screen, press this link and you'll be taken to this web address. This guide will help you decide whether you should consider weight management.

# FOOTWEAR

With ball of the foot pain it is important to make sure that your footwear fits well and are not too tight across the fore foot. Narrow footwear will increase compression through the joints and increase your pain. Shoes with a deep and wide toe box are preferable.



Avoid high-heeled, narrow or pointed-toe shoes as these could further increase the pressure on the joints. Footwear that have thin, hard soles should also be avoided as these will not provide enough cushioning or shock absorption that can also increase the pressure on your joints. Shoes with laces or adjustable straps are best.

## **PAIN MANAGEMENT**

Pain medication can help reduce your symptoms, allowing you to move more comfortably which will aid your recovery. Your community Pharmacist can provide painful area guidance on specific medication or other methods of pain relief (always read the label and manufacturer's guidelines).

## **STRETCHING AND STRENGTHENING EXERCISES**

Stretching exercises for the muscles in the back of your leg can help reduced the loading pressures through your forefoot and increase the flexibility of the foot and ankle.

Strengthening the small muscles in the foot is important as this will improve the strength and stability of your foot and help reduce your pain.

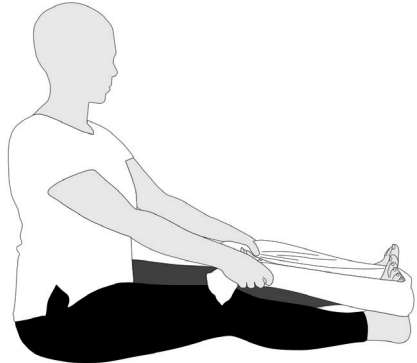
## STRENGTHENING AND STRETCHING EXERCISES

Exercises can help to reduce the tightness in the muscles in the back of your leg and improve the flexibility in the foot and ankle.

### 1. Calf towel stretch

This exercise is designed to stretch the muscles in the back of your leg.

Start by placing a towel around the ball of the painful foot keeping your heel in contact with the ground and avoid bending your knee.



Pull the towel towards you until you feel a stretch along the bottom of your foot and the calf muscles in the back of your leg.

Hold the stretch for 30 seconds and repeat three times with a small period of rest in between stretches.

It is particularly useful to perform this stretch first thing in the morning and after periods of rest.

**If you feel this stretching exercise is making your pain worse then focus on the strengthening exercises.**



## 2. Standing Calf stretch

This exercise is done in two parts.

First support yourself by placing both hands shoulder height and width apart against the wall. Once supported take a step back with your painful foot. Make sure your heels are in contact with the ground and remain like this throughout this exercise with both feet also pointing forwards towards the wall.

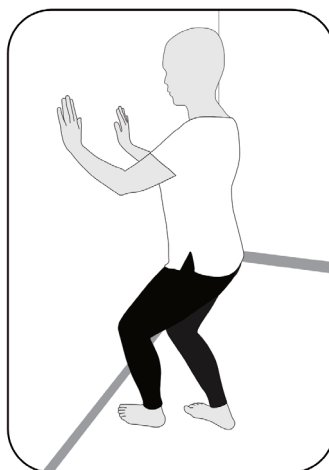
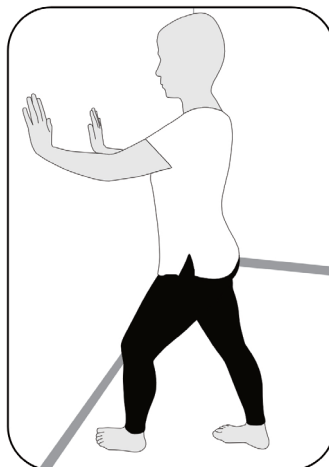
Now slowly begin to bend your front knee whilst moving your upper body towards the wall until you feel a stretch in the calf muscles in the back of your leg.

Hold the stretch for 20 seconds and repeat three times with a small period of rest in between stretches.

The second part of this exercise is designed to stretch the soleus muscle which is one of your calf muscles. Starting in the same position as before slide your painful foot towards the front foot as being demonstrated. Now when bending the front knee also bend the knee of the back leg until you feel a deeper stretch in the calf muscle. Like the other stretches make sure your heel is in contact with the ground throughout the exercise.

Hold this stretch for 20 seconds and repeat three times.

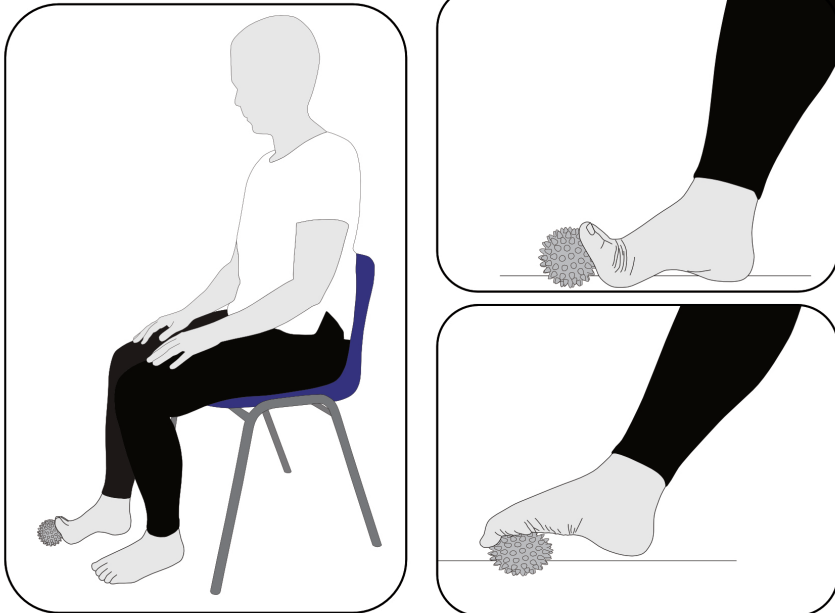
**If you feel this stretching exercise is making your pain worse then please focus on the strengthening exercises.**



### 3. Foot arch exercise

This exercise is designed to strengthen the muscles in the arch of the foot.

Sitting comfortably in a chair, flex your toes against the friction ball with your heel and ball of the foot placed on the ground.



Slowly lift your heel and start to roll the ball under your toes. Your toes must continue to stay in contact with the ball at all times. Hold this position for three seconds and then slowly roll the ball backwards to bring the foot back to its starting position. When rolling the ball back make sure your heel touches the ground first before the ball of the foot.

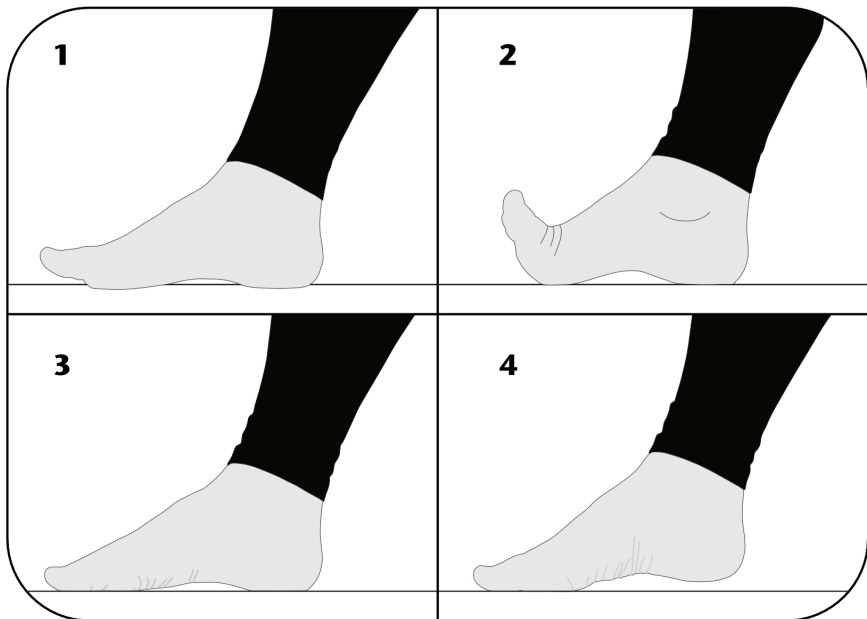
You should be able to feel the effects of this exercise in the arch of your foot and the muscles in the back of your leg.

#### 4. Toe motion exercise

This exercise is designed to strengthen the small muscles in your foot and can be done with or without footwear.

In a seated position place your heel and ball of the foot on the ground and lift your toes towards you holding this for five seconds. Slowly bring your toes back down to the ground. Now with the tips of your toes grip the ground and slowly lift your heel up very slightly. Hold this position for five seconds. Relax and bring the toes back towards holding again for five seconds. Continue to work between these two positions for 10 repetitions.

If you experience some cramping in your foot when doing this exercise you should reduce the number of repetitions.

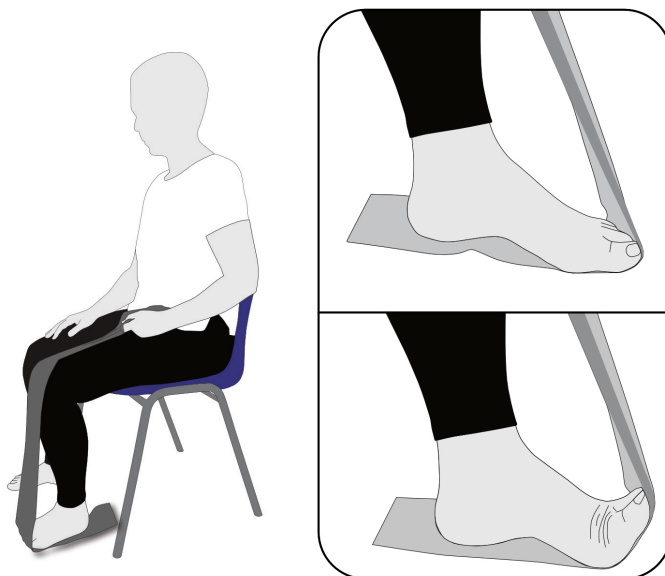


## 5. Intrinsic foot exercises (Theraband)

This exercise is designed to strengthen the small muscles in the foot. This exercise is performed in a seated position making sure your back is straight and leg bent comfortably at 90 degrees with your painful foot placed on a strip of Theraband.

Pull the end of the Theraband over your knee towards you which in turn will pull your toes up into a flexed position. Anchor the band on your thigh maintaining a good level of tension throughout the exercise. Hold the band tight and begin to slowly push your toes down towards the ground against the resistance of the band. When your toes reach the ground allow them to slowly raise back to their starting position.

You are aiming to do three sets of around 10-15 repetitions. You can adjust the difficulty of the exercise by creating more or less tension on the Theraband. Make sure your heel stays in contact with the ground throughout the exercise.



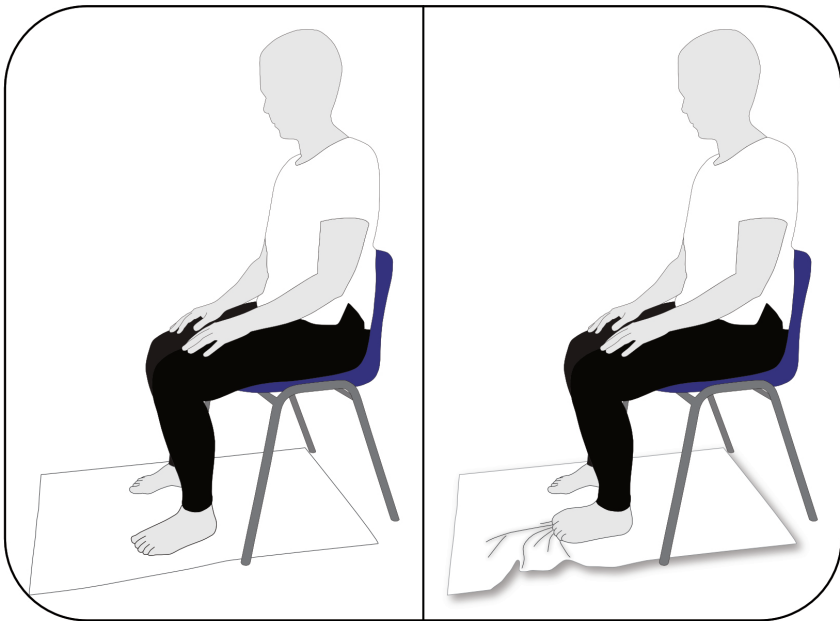
## 6. Intrinsic towel strengthening

This exercise is designed to strengthen the small muscles in your foot.

Start by placing a small towel flat on the ground. This exercise is performed in a seated position making sure your back is straight and legs bent comfortably at 90 degrees.

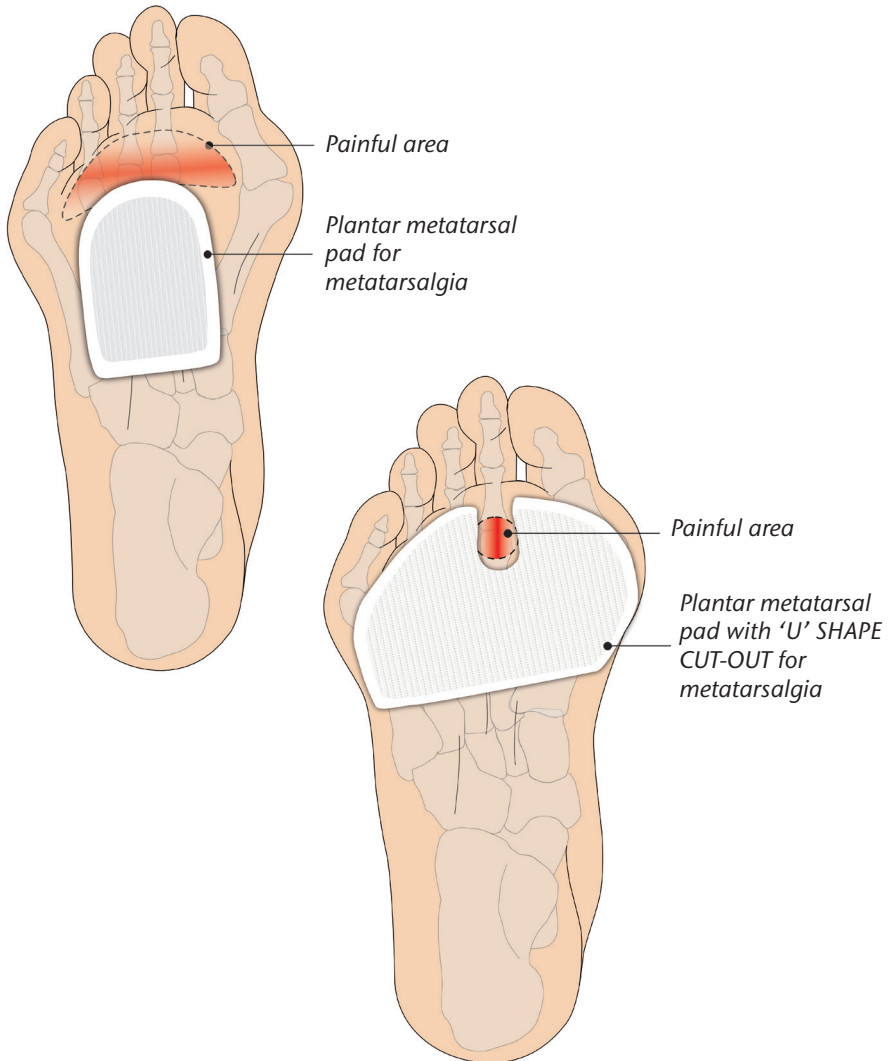
Place your painful foot on top of the towel and using your toes start scrunching the towel so that it is being pulled towards you. Do this in a slow controlled manner, making sure your heel remains in contact with the ground throughout this exercise.

When you have pulled the towel in as far as possible, flatten it back out and repeat the process between three and five times.



## PADDING AND STRAPPING

bottom of their foot or on an insole to help cushion and reduce the pressure on the joints. Padding comes in a variety of materials and can be bought from your local pharmacy or online.



## **STRAPPING**

Strapping/Taping can be used to help support the toes to help reduce movement which can reduce the strain through the soft tissues. This can be a useful short term treatment that can help reduce your symptoms.

## **INJURY MANAGEMENT**

If you have severe sudden foot pain or have had an episode of trauma we would advise that you seek medical treatment straight away. If you have developed a new lump or bump or there has been a change in a preexisting one contact your GP as soon as possible. If your symptoms are not related to any of the above and has been present for less than 48 hours please contact your GP. After 48 hours it is normal to still be experiencing symptoms. It is important to slowly begin weightbearing through your painful foot as prolonged rest could lengthen your recovery period and may impact on your health and wellbeing.

If you are in pain do not try and do all your normal daily activities such as housework, at once. Break the harder jobs down into smaller jobs and do something gentler in between.

Extensive walking or standing should be avoided if it aggravates your pain. It is recommended you modify activities rather than to fully stop all forms of movement or exercise. Swimming or cycling are an alternative to walking or running as these activities are non-weight bearing.

After periods of activity you may experience an increase in pain.

Applying some ice can be useful in reducing some of the inflammation in and around the ball of the foot. This can be achieved by:

- ❖ Wrapping crushed ice in a damp towel. A damp towel between the ice and the skin will help to avoid an ice burn.
- ❖ Hold it for 20 minutes against the painful area. Alternatively, you could try sports sprays and gel/cool packs, which will do a similar job.

## **Patience**

Have patience. Your symptoms should start to improve within three months of following this advice.

## **What else can be done?**

The good news is that your pain should start to improve once you start following the above advice.

If you have any concerns that you are getting worse or notice any changes in the shape of your foot please contact your local MSK Podiatrist or email [\*\*PodiatryMSK@lanarkshire.scot.nhs.uk\*\*](mailto:PodiatryMSK@lanarkshire.scot.nhs.uk).

## **FREQUENTLY ASKED QUESTIONS**

The information below will answer many of the questions you may have in the early part of your treatment. We aim to ensure your specific needs are considered throughout.

A shared decision making process is used by our teams. This means you will be informed about the treatment options open to you the risks and benefits of each option. You will be supported to make a choice about which treatment best meets your needs.

We hope the following questions that have been developed on the back of MSK focus groups, will provide you with some answers and information around your condition.



### **What is wrong? Why? What is the cause?**

Metatarsalgia is a term for a group of conditions that can cause pain and inflammation around the bones and joints at the ball-of-the-foot and can also cause difficulty in finding comfortable footwear. The most common cause of pain in the ball of the foot is from a sudden increase in pressure or activity resulting in small injuries and inflammation. Tight fitting footwear can play a big role in aggravating your symptoms.

### **What is the possible impact on my health and function?**

It can restrict your day to day activities and limit your ability to walk or exercise, which in turn can lead to strains elsewhere in the body.

### **Will I get better or worse?**

The good news is that your pain should start to improve by following the advice that is aimed at reducing the pressures on the front of your foot. It should be noted that it is normal to have periods of increased pain during activity through the recovery process.

### **Is it curable?**

Unfortunately there is no quick or easy fix and your symptoms will not improve overnight so we would advise on completing the conservative advice in the first instance. The advice above is focused on reducing the pressure and inflammation from around the front of your foot. Your pain should improve but it may take time to get better.

### **How long will it take to get better?**

There is no overnight cure for this condition. However, your symptoms should start to improve within three months of following this advice.

## **What are you (the health professional) able to do about my problem?**

By using our self-help tool, we would like to help you to better understand your condition and provide you with the tools which should help support your recovery.

## **What is the treatment that is most appropriate for me?**

Treatment protocols for Metatarsalgia almost always start with basic principles and we would encourage you to consider trying some self-help treatments in the first instance before making a referral to your local Podiatry department.

## **What can I do to help myself to alleviate it?**

We would encourage you consider trying some self-help treatment in the first instance before making a self referral to your local Podiatry department.

## **How can I reduce or control my pain?**

Footwear and activity adaption along with ice and pain medication can help reduce your symptoms, allowing you to move more comfortably which will aid your recovery. Your community Pharmacist can provide guidance on specific medication or other methods of pain relief (always read the label and manufacturer's guidelines).

## **How can I maintain my function and do the things I want to and need to do?**

If you are in pain do not try and do all your normal daily activities such as housework, at once. Break the harder jobs down into smaller jobs and do something gentler in between. Extensive walking or standing should be avoided if it aggravates your pain. It is recommended that you modify activities rather than to fully stop all forms of movement or exercise. Work out what you can do relatively pain free and use that as a starting

point. Then over time build up your activity. Track and write down your progress to keep you motivated.

### What activities can I do and how should I adapt them

#### (e.g. sports, work)?

Avoid high impact activities like running as this will significantly increase load through the front of your foot. We would encourage you participate in lower impact activities like walking, swimming, cycling etc until your pain is at a manageable level.

The return to sporting activity is guided by your symptoms and the type of sport you like to do. We would advise a gradual return to your sport as you will have lost condition during injury and recovery.

### Have I made an improvement?

Most people's symptoms should start to improve within three months of following the self-help advice. You should note that although you may still have episodes of pain, they will be becoming less frequent and severe.

### Why am I not improving? Where have I gone wrong?

#### Am I doing the right things?

There could be a number of reasons why your symptoms may not be improving. If you have followed the self-help advice for three months and your pain has not started to improve please contact your local MSK Podiatrist or email **[PodiatryMSK@lanarkshire.scot.nhs.uk](mailto:PodiatryMSK@lanarkshire.scot.nhs.uk)**.

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Pub. date:	October 2020
Review date:	October 2022
Issue No:	01
Department:	Podiatry

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