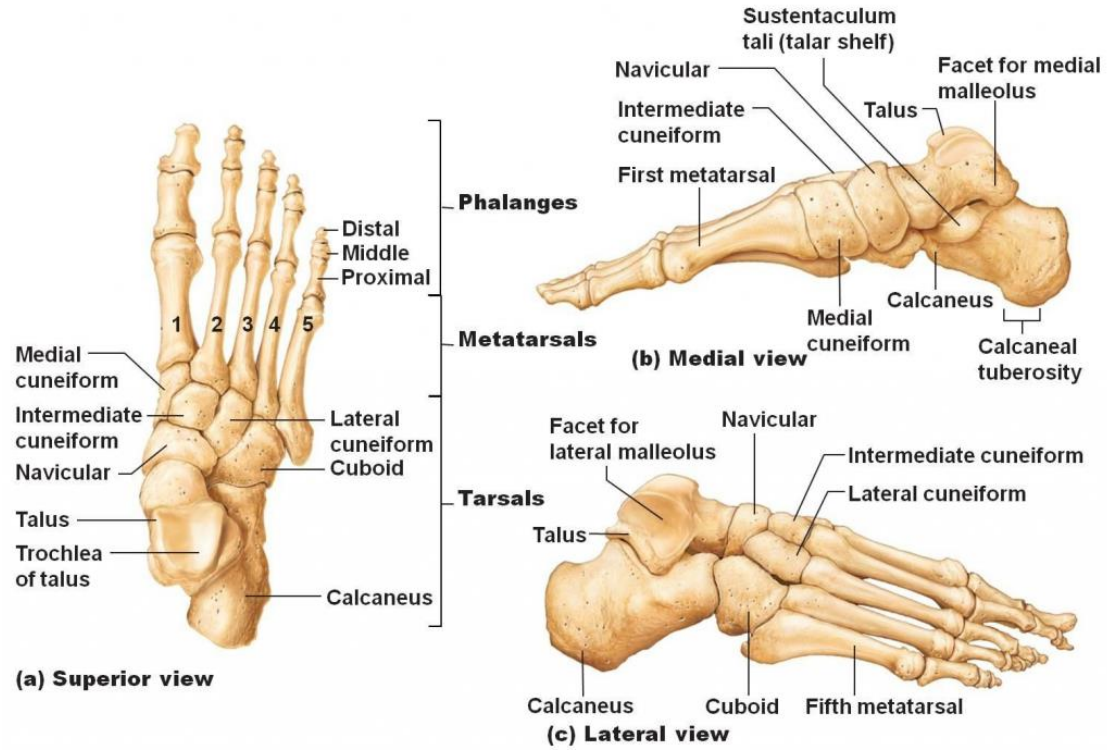
CHARTERED PHYSIOTHERAPY

CATALYST

Rolled your ankle? What to do? Hospital or not?

As physiotherapists, we see a wide array of injuries, but the one that pops up regularly is the rolled ankle, otherwise known as an inversion injury. An inversion injury is an umbrella term that we use, due to the variety of structures that can be involved during the injury. First, we will discuss the anatomy, and that will lead us on nicely to different pathologies and different management pathways.

The foot is comprised of 26 bones, 33 joints and more than 100 muscles, tendons and ligaments, making a rather complex area of the human body! Luckily enough, for an inversion injury, there are only a few structures that we need to worry about, these are shown below



w:

Website: www.catalystphysio.com
Phone: 01256 212260
Email: dfox@catalystphysio.com

There are 3 main ligaments that are involved in this type of injury, and depending on the severity of the injury determines how many of the ligaments may be involved.

1) **Anterior Talofibular Ligament**

The anterior talofibular ligament tends to be the first ligament to tear during an inversion injury. This ligament is labelled above, and it originates from the talus, and its fibres run posteriorly to the fibula.

2) **Calcaneofibular Ligament**

The calcaneofibular ligament will normally tear after the twisting motion has gone past the available movement normally restricted by the anterior talofibular ligament. This ligament is also labelled above, and it originates from the calcaneus bone, and its fibres run proximally to attach on to fibula.

3) **Posterior Talofibular Ligament**

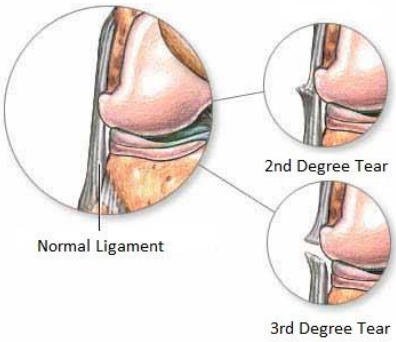
The posterior talofibular ligament will normally be the last to tear. This ligament is also labelled above, and it originates from the posterior aspect of the talus bone, and its fibres run anteriorly to attach on to fibula.

There are other structures that can be involved in severe cases, but we can discuss those towards the end.

<u>What to expect straight after an injury?</u>

Firstly, before I scare you away with some pictures, we need to briefly discuss the different grades of ligament sprains, as these will dictate how the ankle will look post injury.

- **Grade 1** – Mild tear, normally between 0-30% fibres torn. A grade 1 injury would be associated with mild swelling and possibly bruising around the foot.



- **Grade 2** – a moderate tear, normally between 30-55% torn. A grade 2 injury would be associated with severe swelling and bruising, abnormal laxity during certain movements and tenderness around the ankle.

- **Grade 3** – A complete rupture of the ligament. A grade 3 ligament sprain would be associated with severe swelling and bruising, severe instability on passive movements, and severe tenderness around the ankle joint.

So, what does it look like post injury? Well normally immediately after the injury you will have difficulties weight bearing, and the ankle will swell. I have attached an image below. Normally the swelling is very specific to the ligament involved, and normally this is the anterior talofibular ligament, as shown in the image here.

In most instances, when someone has suffered from an inversion injury, weight bearing immediately will be extremely difficult and painful, and swelling will occur very soon from the onset. With these cases, we must follow the RICE principle. This is to rest, apply ice, apply compression, and elevate as best as possible.

Following on from the first 24 hours, the ankle will

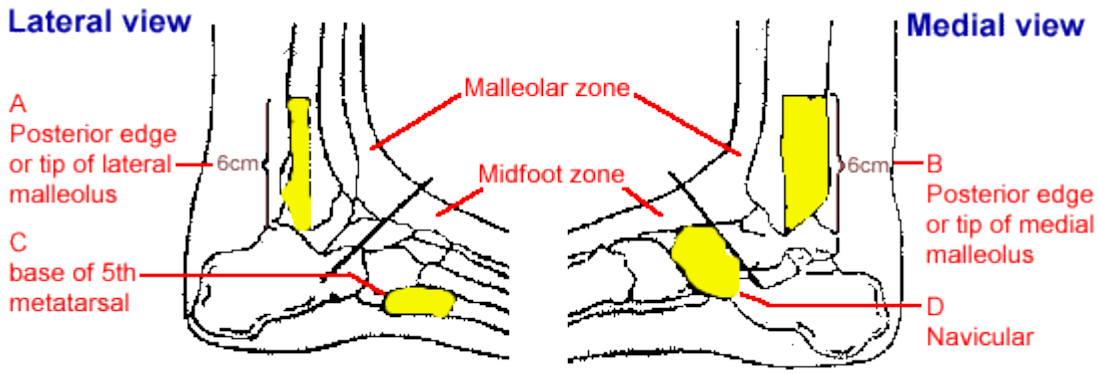
Website: www.catalystphysio.com
Phone: 01256 212260
Email: dfox@catalystphysio.com

probably progress to something like this…

Straight after the injury, you will experience pain on walking, you will experience pain in the ankle, so this is to be expected, but the question we hear a lot is, should I go to hospital?

Should I go to hospital?

Luckily, some criteria and rules have been created to answer this question with greater accuracy. These are called the Ottawa rules, and are based on recent research, to allow physicians to make informed decisions on whether someone requires an X-ray. The instrument has a sensitivity of almost 100% and a modest specificity, and its use should reduce the number of unnecessary radiographs by 30-40%.



Ottawa Rules with Respect to Ankle X-rays

An ankle x-ray is required only if there is any pain in malleolar zone and any of these findings:

- boney tenderness at the lateral malleolar zone A (from the tip of the lateral malleolus to include the lower 6 cm of posterior border of the fibular)
- boney tenderness at the medial malleolar zone B (from the tip of the medial malleolus to the lower 6 cm of the posterior border of the tibia)
- inability to walk four weight bearing steps immediately after the injury and in the emergency department

Ottawa Rules with Respect to Foot X-rays

Website: www.catalystphysio.com
Phone: 01256 212260
Email: dfox@catalystphysio.com

A foot x-ray is required if there is any pain in the midfoot zone and any of these findings:

- bone tenderness at Navicular bone (C)
- bone tenderness at base of the 5th metatarsal (D)
- inability to weight bear both immediately and in the emergency department

What to do next?

When it come to the next step of your rehabilitation, it is vital you seek advice from your physiotherapist. This is so important because of the number of structures that can be involved, there is 'no one size fits all' rehabilitation approach. But what we will say there are some core principles that need to be achieved.

There is no specific time frame for when to progress from each stage to the next. Your injury rehabilitation will be determined by many factors during your physiotherapist's clinical assessment. You'll find that in most cases, your physiotherapist will seamlessly progress between the rehabilitation phases as your clinical assessment and function improves.

It is also important to note that each progression must be carefully monitored as attempting to progress too soon to the next level can lead to re-injury and the frustration of a delay in your recovery.

Phase 1 - Injury Protection: Pain Relief & Control Inflammation

As with most soft tissue injuries the initial treatment is **RICE - Rest, Ice, Compression and Elevation. (Active) Rest:** In the early phase you'll most likely be unable to walk on your sprained ankle. Your first aim is active rest from pain-provoking postures and movements. This means that you should stop doing the movement or activity that provokes the ankle pain. In most cases, you will need to be non-weight bear. You may need to be placed in an ankle walking boot, a supportive ankle brace or utilise crutches.

Ice is a simple and effective modality to reduce your pain and swelling. Please apply for 20-30 minutes each 2 to 4 hours during the initial phase or when you notice that your injury is warm or hot.

Compression: A compression bandage, tubigrip compression stocking or kinesiology supportive taping will help to both support the injured soft tissue and reduce excessive swelling.

Website: www.catalystphysio.com
Phone: 01256 212260
Email: dfox@catalystphysio.com

Elevation: Elevating your injured ankle above your heart will assist gravity to reduce excessive swelling around your ankle.
Your physiotherapist will utilise a range of helpful tricks including pain relieving techniques, joint mobilisations, massage, strapping and acupuncture to assist you during this painful phase.

Anti-inflammatory medication and natural creams such as arnica may help reduce your pain and swelling. However, it is best to avoid anti-inflammatory drugs during the initial 48 to 72 hours when they may encourage additional bleeding. Most people can tolerate paracetamol as a pain reliever.

Phase 2: Regain Full Range of Motion

If you protect your injured ankle ligaments appropriately the torn ligaments will successfully reattach and heal a normal functional length. **Mature scar formation takes at least six weeks.** During this time period you should be aiming to optimally remould your scar tissue to allow for full functional ankle movement and prevent a poorly formed scar that will re-tear in the future. It is important to lengthen and orientate your healing scar tissue via massage and exercises designed to address your joint range of motion, muscle length and normal neural tissue motion.

IMPORTANT: Researchers have identified that the history of a sprained ankle predisposes you to a stiff ankle joint that further predisposes you to an array of injuries including ankle sprains, foot pain, calf and leg injuries plus back pain. Therefore, anyone who has suffered a sprained ankle should seek professional guidance to assess the amount of ankle joint motion you have. Please contact your physiotherapist for specific testing and advice.

Just as importantly, you should not overstretch ligaments and soft tissue, or you may develop a passively unstable ankle. Your physiotherapist will prescribe the exercises that are best suited to your needs.

Phase 3: Restore Muscle Strength

Your calf, ankle and foot muscles will require strengthening after an ankle sprain. It is important to regain normal muscle strength to provide normal dynamic ankle control and function. Your strength and power should be gradually progressed from non-weight bear to partial and then full weight bear and resistance loaded exercises. You may also require strengthening for your other leg, gluteal and lower core muscles depending on your assessment findings.

Your physiotherapist will guide you.

Phase 4: Normalise Foot Biomechanics

Sprained ankles can occur from poor foot biomechanics eg flat foot or high arch. To prevent a recurrence, your foot arch and its control should be assessed by your physiotherapist. In some instances you may require a foot orthotic (shoe insert) or you may be a candidate for the Active Foot Posture Stabilisation Program.

Your physiotherapist will happily discuss the pros and cons of both options to you.

Phase 5: Restore High Speed, Power, Proprioception and Agility

Most sprained ankle injuries occur during high speed activities, which place enormous forces on your ankle and adjacent structures.

Balance and **proprioception** (the sense of the relative position of neighbouring parts of the body) are both known to be adversely affected by injuries such as a sprained ankle. To prevent a re-injury, both aspects need to be assessed and retrained.

To prevent a recurrence as you return to sport, your physiotherapist will guide you with exercises to address these important components of rehabilitation to both prevent a recurrence and improve your sporting performance.

Depending on what your sport or lifestyle entails, a speed, agility, proprioception and power program will be customised to prepares you for light sport-specific training.

Phase 6: Return to Sport

If you play sport, and depending on the demands of your chosen sport, you may require **sport-specific exercises** and a progressed training regime to enable a safe and injury-free return to your chosen sport.

Your physiotherapist will discuss your goals, time frames and training schedules with you to optimise you for a complete and safe return to sport. The perfect outcome will have you performing at full speed, power, agility, and function with the added knowledge that a through rehabilitation program has minimised your chance of future injury.

Complications?

There are several things that need to be checked and assessed after an inversion injury.

Website: www.catalystphysio.com
Phone: 01256 212260
Email: dfox@catalystphysio.com

- Metatarsal fractures
- Peroneal tendon integrity
- Cartilage tears
- Bony bruising
- Gross instability

Recovery Time?

There is no specific time frame in that a sprained ankle recovers. While we do know that the ligaments themselves will take at least six weeks to heal, your muscle strength, range of motion, proprioception and return to function can vary considerably. Here are some general guidelines.

Grade 1 - Mild

In mild cases, you can expect full ligament healing within 2 to 3 weeks, but it will take at least six weeks for full scar tissue maturation.

Despite most people being told to simply "rest" and it will recover, we find that these mild sprains often result in joint stiffness, ligament laxity, muscle weakness or tightness plus reduced proprioception (balance and joint awareness).

If not adequately treated these often cause your ankle and foot joints to compensate movement at adjacent joints, which can lead to several other injuries months or years down the track.

Grade 2 - Moderate

Grade 2 injuries occur when you have a significant ligament injury that allows the ligament to excessively stretch. In most cases these injuries result in a recovery period of 4 to 6 weeks. With increasing injury severity, the rehabilitation process becomes more complex and extensive.

All Grade 2 injuries should be thoroughly rehabilitated to enable:

- full range of motion and strength
- full proprioception, power and agility
- full return to sport-specific drills

Grade 3 - Severe

Grade 3 ligament injuries are when the ligament is completely ruptured. More severe ankle sprain

injuries can also include fractures of the bones or high ankle sprains, which will require additional rehabilitation time to a simple lower ankle sprain.

The rehabilitation of a Grade 3 ankle sprain normally takes 6 to 12 weeks, but is quite variable depending on your specific injury. Your physiotherapist or surgeon will be able to provide you with more specific guidelines and advice.

For more specific advice about your sprained ankle, please ask your physiotherapist.

Website: www.catalystphysio.com
Phone: 01256 212260
Email: dfox@catalystphysio.com