

### INCIDENCE OF INJURY

It is estimated that each year 4% of the Western population suffer ankle sprains (de Bie et al. 1998). A large majority of these injuries are sustained during sporting activity; in fact ankle sprains have been shown to be the most common injury in a total of 24 different sports (Fong, 2007). They are particularly common in sports that involve change of direction or jumping, with high incidences reported in Gaelic football and hurling (Watson 1999).

### MECHANISM OF INJURY

Almost 70-85% of ankle injuries involve the lateral ligaments (the ligaments on the outside of the ankle). Eversion or external rotation injuries are less common and damage the ligaments on the inside (medial) part of the ankle. A 'syndesmotic' or 'high ankle sprain' involves the tibiofibular joint (the joint just above the ankle at the front of the shin) and can often take longest to heal.



Figure 1 Ankle anatomy

### Not to be missed

Some ankle injuries may be more serious than others. Often, further investigations (XRay, Diagnostic Ultrasound, MRI) may be required. Your physiotherapist should advise you on this if they suspect that other concomitant injuries have occurred including:

- ✦ Fracture (an X Ray or a skilled examination using the Ottawa ankle rules (Steill, 1992 can often rule out the majority of ankle fractures)
  - ✦ Total ligament rupture
  - ✦ Impingement
  - ✦ Chronic ankle instability
  - ✦ Sinus tarsi syndrome
  - ✦ Osteochondral injury
  - ✦ Nerve injury (peroneal or sural nerves)
- Intrinsic risk factors

### Intrinsic Risk Factors

Recent evidence (Watson, 1999; Willems, 2005; de Noronha, 2006) shows that some athletes may have physical traits that increase their risk of sustaining an ankle injury during sports. These include:

- ✦ Decreased lower limb balance (proprioception)
- ✦ Slower running speed
- ✦ Decreased cardiovascular endurance
- ✦ Decreased ankle muscle strength
- ✦ Decreased ankle dorsiflexion (tight calf muscles can be the main cause of this!)
- ✦ Decreased co-ordination
- ✦ Previous ankle injury



## Extrinsic risk factors

### Extrinsic Risk factors

Extrinsic factors are external to the athlete but may also increase the risk of sustained an ankle injury. Very often these involve training errors or poor planning throughout the season, and therefore in most cases they may be easier to control for. They include:

- ✦ Poor underfoot conditions
- ✦ Poor training surface
- ✦ Inappropriate footwear / studs
- ✦ Training drills / fitness and conditioning not suited to individual / stage of season
- ✦ Foul play

### REHABILITATION

If you are unfortunate enough to sprain your ankle then rehabilitation is the key. The overall healing time, and the speed of progression through each stage of rehabilitation will depend on the grade / severity of the ankle sprain. Generally the approximate healing time is as follows:

**Grade 1** (microtearing 3 weeks of ligament): 5 days

**Grade 2** (partial 6 weeks ligament tear): 3

**Grade 3** (complete 12 weeks ligament tear): 6

\*In certain cases surgical repair of grade 3 sprains may be the treatment of choice\*

### Early Stage Rehab

Key aims:

- ✦ Provide optimal conditions for healing
- ✦ Minimise the degree of inflammation / prevention further damage to the area.
- ✦ General exercises
- ✦ Rest, ice, compression and elevation • Full or partial weight-bearing should be performed as pain allows. Crutch use may be beneficial depending on severity
- ✦ Calf stretching
- ✦ Mobility exercises
- ✦ Static strengthening
- ✦ Hydrotherapy (avoid immersion in hot water during the first week)
- ✦ Upper body conditioning
- ✦ Manual therapy (massage, joint mobilisations) or electrotherapy treatments

\*Decreasing pain, normalising range of movement and performing basic 'normal' movement patterns (without over stressing the area) at this early stage are key goals if reoccurrence is to be avoided. \*

### Middle Stage Rehab

Key aims:

- ✦ Enhance joint positional sense and proprioception (the awareness of where your ankle is in space, general balance and reaction time)
- ✦ Develop ankle range of movement and strength



- ✦ Cardiovascular training
- ✦ General rehabilitation exercises may include:
- ✦ Weight transfers
- ✦ Single leg balance
- ✦ Developing to single leg balance with:
- ✦ Eyes closed
- ✦ Throwing / catching / passing
- ✦ On a dynamic surface e.g. wobble or balance board
- ✦ Strengthening
- ✦ Toe walking
- ✦ Calf raises
- ✦ Single leg squats
- ✦ Lunging / multidirectional lunging

Your physiotherapist can develop these drills to progressively challenge your motor control, reaction time and decision-making.

### Late Stage Rehab

Before progressing to this stage of rehabilitation you should aim to have full pain free range of movement, a good baseline of strength and be able to maintain good lower body alignment and control during complex balance exercises.

### Running and agility

- ✦ Progressive running (straight line jogging progressing up to sprinting) • Curved / figure of eight running
- ✦ Run stops
- ✦ 45° / 90° cuts and side steps
- ✦ Spins

- ✦ Agility / ladder drills
- ✦ Plyometric / power exercises (progressing up to jumping with rotation)

Again it is important that these exercises are developed to progressively challenge motor control, reaction time and decision-making. Your physiotherapists will best advise you when it is safe to bring in more sports specific training such as ball catching, jump to catch, pressure from opposition, contact and tactical decisions.

### WHEN CAN I RETURN TO PLAY?

*You must have:*

- ✦ Full range of movement
- ✦ No swelling
- ✦ 95-100% strength
- ✦ Full confidence

This may be tested with some field tests such as 30 metre sprint time, t-shuffle agility test and vertical or counter movement jump height / distance.

### PREVENTIVE STRATEGIES

Remember prevention is better than cure! Numerous PREhabilitation strategies can help minimise the risk of incurring an ankle sprain. This is supported by recent evidence published by (Bahr, 2007). Many of these strategies are best performed little and often, for example, by incorporating them into a group warm up or training session.

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Wobble / balance board training (Verhagen, 2004)

\*Wobble board training has been shown to decrease injury incidence by 77% in American footballers. (McHugh, 2007)\*

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- ✦ Calf stretching
  - ✦ Ankle strengthening (theraband strengthening exercises)
  - ✦ Appropriate, sport and position specific fitness training
  - ✦ Agility drills
  - ✦ Landing mechanic / joint alignment training
  - ✦ Taping / bracing
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