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## Ankle Sprains

### Anatomy

The ankle is a joint which is formed by the tibia and fibula (bones above the ankle in the foreleg) and the talus (below the ankle joint). The ankle joint allows for the upwards (dorsiflexion) and downwards (plantarflexion) motion. The end of the shin bone (tibia) forms the inner bony prominence of the ankle called the medial malleolus. The outer bony prominence is called the lateral malleolus and is formed by the small outer bone in the foreleg called the fibula. Stability of the joint comes from several factors:



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- the unique structural arrangement of the bones forming the joint
- the surrounding ligaments.

Sprains are caused when the ligaments become stretched more than their normal length, resulting in a partial or complete tear. This ligament damage results in the development of abnormal motion at the joint due to the loss of stability.

Ankle sprains often occur in activities requiring rapid changes in direction, especially if these take place on uneven surfaces (e.g.: grass fields). The lateral stabilizing ligaments are most often damaged.

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## Classification of Ankle Sprains

Ankle sprains range in severity from Grade I to Grade III:

	<b>Physical Examination</b>	<b>Impairment</b>	<b>Pathophysiology</b>
Grade 1	Mild tenderness and swelling.	Minimal Weightbearing as tolerated. No mechanical instability.	Microscopic tearing of collagen fibers
Grade 2	Moderated tenderness and swelling. Bruising around the ankle may extent down the foot. Decreased range of motion	Moderate Some loss of motion and function (i.e. pain with weight-bearing) Mild to moderate joint instability	Complete tears of some but not all collagen fibers in the ligament
Grade 3	Significant swelling, bruising and tenderness Often associated with fracture of fibula	Severe Loss of joint function and motion (i.e. inability to bear weight). Mechanical instability Bracing injured ankle with an "Aircast" boot or stabilizing brace as well as a brief period of partial weight bearing with crutches may be required.	Complete tear/ rupture of ligament

## Management

### *Early management*

- **RICE (Rest, Ice, Compression and Elevation)**. Ice should be used immediately after the injury to decrease in tissue metabolism. The foot and ankle should be cooled for approximately 20 minutes every two to three hours for the first 48 hours or until the inflammation has stabilized. **\*\*\*Heat should not be applied to an acutely injured ankle joint because it encourages swelling and inflammation.**
- Gradually increased weight-bearing will help reduce the swelling and increase the ankle motion enhancing the rehabilitation (Nonsteroidal anti-inflammatory drugs are preferable to narcotics for pain relief).
- While cold therapy is being used, exercises should be initiated to maintain range of motion and assist lymphatic drainage.

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## *Muscle conditioning*

- Active strengthening exercises should begin as soon as pain allows ( a common method to strengthen the ankle joint is to use rubber tubing)
- Weight-bearing exercises are encouraged at this stage to re-educate the muscles crossing the ankle joint.

## *Balance work*

- Balance is often impaired after ankle ligament injuries.
- A common example to retrain balance after an ankle injury is to balance yourself on one leg.
- The difficulty level should gradually increase by balancing with the eyes closed or on unstable surfaces (e.g. rubber disc, trampoline)
- Has been shown to significantly reduce the rate of re-injury

## *Functional exercises*

- Can be applied when the ankle is pain-free, has full range of movement adequate strength and balance.
- They involve activities such as hopping, jumping, twisting, figure-of-eight running.

## *Return to sport*

- Return to sport is permitted if the functional exercises can be performed without pain and difficulty.
- Upon return, it is ideal to protect the ankle with an ankle support brace or asking your physiotherapist to tape the ankle.
- The use of protective taping or applying the brace should be for a minimum period of 6 to 12 months post-injury depending on the severity of initial injury.
- Ankle braces have the advantage of cost effectiveness, ease of fitting and adjustment as well as lack of skin irritation in comparison with taping.
- For purposes of protection, the lace up brace is popular and effective.

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