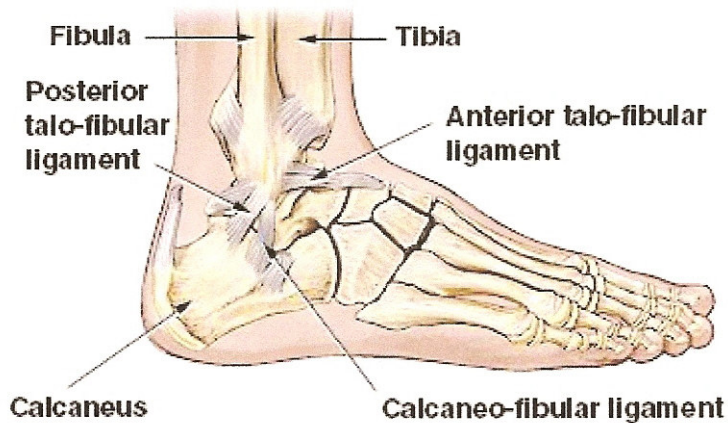


## ANKLE SPRAIN

The ankle sprain is the most common sports-related injury, with lateral ankle injuries occurring most often. Without adequate care, acute ankle trauma can result in chronic joint instability. Use of a standardized protocol enhances the management of ankle sprains.

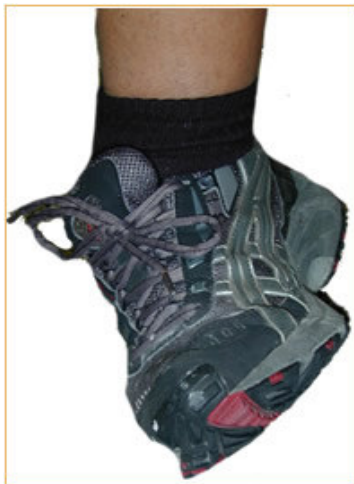
### Anatomy

The lateral ankle ligaments are the anterior talofibular (ATFL), calcaneofibular (CFL), and posterior talofibular ligaments (PTFL). These ligaments resist inversion of the ankle. The ATFL is the most commonly injured lateral ankle ligament. When these ligaments are disrupted, the ATFL usually tears first, followed by the CFL, and lastly, the PTFL.



### Mechanism of Injury

The history given by the patient is a valuable tool in the evaluation of ankle injuries. The patient may recall hearing a "pop" or "snap." The patient also may be able to relate the position of the foot and the motion that occurred during the injury. This recollection may give insight as to the mechanism of injury and therefore indicate the anatomic structures likely to have been injured, which may help in distinguishing lateral ankle sprains from high ankle or syndesmotic sprains.



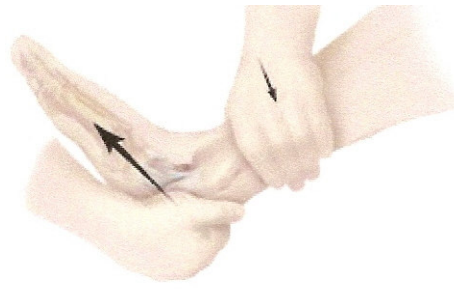
The patient's history may provide evidence of ankle instability. Patients may relate a history of multiple ankle sprains in the past as well as a recurrent problem with their ankle "giving out." The ability to bear weight following an ankle sprain should be ascertained. An inability to bear weight suggests a more severe injury.

## Diagnosis

The joint is examined in an attempt to determine the degree of ligament injury.



Inversion stress test to assess the integrity of the calcaneofibular ligament.



Anterior drawer test to assess the integrity of the anterior fibular ligament.

Once diagnosed, lateral ankle sprains are classified.

Grade I injuries involve a stretch of the ligament without tear or instability. There is mild pain or swelling and the ability to bear weight is preserved.

Grade II injuries involve a partial tear of the ligament with mild instability. There is moderate pain, swelling, and ecchymosis with some difficulty bearing weight.

Grade III injuries consist of complete tear of the ligament with severe instability. There is severe pain, swelling, ecchymosis and the inability to bear weight.

### Treatment

Treatment of acute ankle sprains should focus on rehabilitation with the goal of preventing chronic instability. Initial therapy of acute ankle sprains should reduce pain and inflammation. This is done with RICE therapy (rest, ice, compression, elevation). Anti-inflammatory medications may be used to reduce pain while narcotic medications are rarely necessary.

Grade I injuries are treated with RICE, bracing followed by taping, protected weight bearing and rehabilitation. Treatment is usually three weeks.

Grade II injuries are treated in the same manner with the exception that the patient may need to progress from partial to full weight bearing. Treatment is usually six weeks.

Grade III injuries are treated in a similar manner although there is an initial period of non-weight bearing. There is a progression to partial followed by full weight bearing. There is decreased functional activity and stability requiring more extensive rehabilitation. Treatment is usually six to eight weeks. Competitive athletes with Grade III injuries may undergo primary ligament repair. The general population can be treated with conservative care with rehabilitation. If there is continued pain or instability, surgery may be performed at a later date.

When possible, patients are encouraged to begin range of motion exercises within two to three days of the injury. Isotonic strengthening exercises with elastic tubing in plantar flexion, dorsiflexion, inversion and eversion may be started as early as possible. We also encourage patients to be weight bearing as soon as they are able. Only the most severe injuries need cast immobilization. When tolerable, methods to improve proprioception such as single leg balance or the ankle tilt board may be used.

The degree and extent of rehabilitation is dependent upon the level of function that returns to the patient. Pain and swelling may be used as a guide. Home exercises may be given initially, but those injuries not

responding after one to two weeks may need a formal physical therapy referral. Injuries due to chronic instability or those that respond slowly to care may need more extensive rehabilitation. When there is chronic instability, therapy should include improving the strength of the peroneal tendons, ankle range of motion, ankle joint proprioception, as well as stretching of the Achilles tendon.

There are varied opinions and controversy regarding the methods and regimens used in the treatment of the ankle sprain as well its rehabilitation. Many clinicians have their own preferences, however the goals of treatment are clear: Relief of pain and inflammation, preservation of strength and range of motion, maintaining proprioception, and a return to functional activity with stability.

## **Treatment Protocol**

### **Day 0-3**

- Air stirrup, crutches if needed, discontinue as soon as possible
- Teach pain free ankle range-of-motion and hip and knee open chain progressive resistive exercises
- Apply ice and or contrast bath first two days
- Elevation day and night first two days
- Mild cross-friction massage starting day three to lateral ligaments

### **Day 3-5**

- Step down to lace up ankle brace or ace wrap to be used 1-year post injury with sport
- Open chain ankle progressive resistive exercises with focus on evertors
- Lower levels of ankle tilt board anterior/posterior to medial/lateral
- Anterior/posterior lunges
- Resisted walking forward/backward
- Multi-functional gym squats and plantar flexor and dorsiflexor
- Treadmill
- Stepper
- Heel slides under chart
- Achilles stretching
- Cross-friction to lateral ankle with increased pressure
- Passive range of motion now that produces mild pain only

### **Day 5-7**

- Ace wrap or ankle taping only
- Five plane lunges with increasing speed
- Highest level on ankle tilt board
- Four plane resisted walking to running
- Braiding without to with resistance
- Plyometrics on multi-functional gym to floor
- Continued cross-friction to lateral ankle ligaments
- Continued Achilles stretching
- Passive range of motion until full and painless
- Return to sport activities when there is no pain with end plantar flexion or subtalar inversion elicited manually. There also should not be pain with rapid cutting.

This is a three-phase approach. Patients should be able to complete the activities of a phase followed by at least 15 minutes pain free before progressing to the next level.