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ORTHOPAEDIC FOOT & ANKLE  
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## ANKLE SPRAIN

### What is an Ankle Sprain?

An ankle sprain refers to tearing of the ligaments of the ankle. The most common ankle sprain occurs on the lateral or outside part of the ankle. This is an extremely common injury which affects many people during a wide variety of activities. It can happen in the setting of an ankle fracture (i.e. when the bones of the ankle also break). Most commonly, however, it occurs in isolation.

### Symptoms and Clinical Presentation

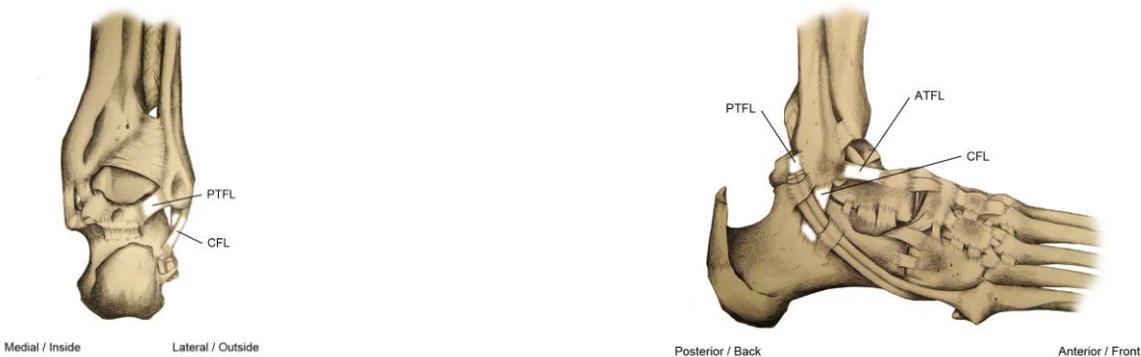
Patients present after having twisted their ankle. This usually occurs due to an inversion injury which means the foot rolls underneath the ankle or leg. It commonly occurs during sports. Patients will present with pain on the outside of their ankle. They can have various degrees of swelling and bleeding under the skin (i.e. bruising). Technically, this bruising is referred to as “ecchymosis.” Depending on the severity of the sprain, a person may or may not be able to put weight on the foot.

### Cause (including risk factors)

As noted above, these injuries occur when the ankle is twisted underneath the leg, called inversion. Risk factors are those activities, such as basketball and jumping sports, in which an athlete can come down and turn the ankle or step on an opponents’ foot. There are other predispositions as well. In people with a hindfoot “varus,” which means that the general nature or posture of the heels is slightly turned towards the inside, these injuries are more common. This is because it is easier to turn on the ankle. In those who have had a severe sprain in the past, it is also more easy to turn the ankle and cause a sprain. Therefore, one of the risk factors of spraining the ankle is having instability. Those who have weak muscles, especially those called the peroneals which run along the outside of the ankle, may be more predisposed. The job of the peroneal muscles is to “evert” the ankle (i.e. the opposite of invert which is what happens during a sprain).

### The Anatomy

There are multiple ligaments in the ankle. Ligaments in general are those structures that connect bone-to-bone. Tendons on the other hand connect muscle-to-bone and allow those muscles to exert their force. In the case of an ankle sprain, there are several commonly sprained (i.e. torn) ligaments. The two most important are the following (Figures 1 and 2):



1. The ATFL which stands for the “anterior talofibular ligament,” which connects the talus to the fibula on the outside of the ankle.
2. The “calcaneal fibular ligament,” CFL, which connects the fibula to the calcaneus below.

Finally, there is a third ligament which is not as commonly torn, which runs more in the back of the ankle and is called the PTFL which stands for the “posterior talofibular ligament.” These must be differentiated from the so called “high ankle sprain ligaments” which are completely different and located higher up the leg. These connect the tibia with the fibula and are described in a different chapter.

### Diagnosis

Ankle sprains can be diagnosed fairly easily given that they are common injuries. The location of pain on the outside of the ankle with tenderness and swelling in a patient who has twisted their ankle with inversion is very suggestive. In these patients, normal x-rays also suggest that the bone has not been broken and instead the ankle ligaments have been torn or sprained. It is very important, however, not to simply regard any injury as an “ankle sprain” because other injuries can occur as well. For example, the peroneal tendons mentioned above can be torn. There can also be fractures in other bones around the ankle including the fifth metatarsal and the anterior process of the calcaneus. In very severe cases, an MRI may be warranted to rule out other problems in the ankle such as damage to the cartilage. An MRI, however, is not necessary to diagnose a sprain.

### Treatment Options

Surgery is not required in the vast majority of ankle sprains. Even in severe sprains, these ligaments will heal without surgery. The grade of the sprain will dictate treatment. Sprains are traditionally classified into several grades. Perhaps more important, however, is the patient’s ability to bear weight. Those that can bear weight even after the injury are likely to return very quickly to play. Those who cannot walk may need to be immobilized. In general, however, treatment consists in the first 48 to 72 hours of resting the extremity, icing 20 minutes every two to three hours, compression by providing an ACE wrap, and elevation, which means keeping the leg and ankle so that the toes are above the level of patient’s nose (i.e. “toes above the nose”). Those patients as noted above who cannot bear weight are better treated in a Cam Walker boot (i.e. removable walking boot) until they can comfortably bear weight. In either case, physical therapy is a mainstay. Patients should learn to strengthen the muscles around the ankle, particularly the peroneals. It is also important to train in what is called “proprioception.” An ankle brace can be used in an athlete until a therapist believes that the ankle is strong enough to return to play without it. Surgery is rarely indicated. Surgery may be needed in a patient who has cartilage damage or other concomitant injuries. Ligaments are only repaired or strengthened in cases of chronic instability in which the ligaments have healed but not in a strong fashion.

## Recovery

Recovery depends on the severity of the injury. As noted above, for those minor injuries, people can return to their activities in sports within several days. For very severe sprains, it may take longer and up to several weeks. It should be noted that high ankle sprains, covered in another chapter, have considerably longer return to play.

## Outcome

Outcomes for ankle sprains are generally quite good. Most patients heal from an ankle sprain and are able to get back to their normal lives, sports, and activities. Some people, however, who do not properly rehab their ankle and have a rather severe sprain may go on to have ankle instability. Chronic instability occurs in patients repeatedly spraining the ankle which can cause pain. Such repeated episodes can be dangerous because they can lead to damage within the ankle. These patients should be identified and considered for repair.

## Complications

Because surgery is rarely warranted, there are not commonly complications from surgery. As noted above, however, an improperly rehabbed ankle may end up having chronic instability. It is important to address this with either therapy or surgery before further damage occurs to the ankle.

## Frequently Asked Questions

*What is a “high” ankle sprain and is that different from a “regular” ankle sprain?* A high ankle sprain refers to tearing of the ligaments that connect the tibia to the fibula (this connection is also called the syndesmosis). These are different and much less common than the standard lateral ankle sprains, meaning those that occur on the side of the ankle.

*Do ankle sprains ever need to be repaired acutely?* Ankle sprains rarely, if ever, needed to be treated with surgery. The vast majority simply need to be treated with rest, ice, compression, elevation followed by physical therapy and temporary bracing.

*I have sprained my ankle many times, should I be concerned?* Yes. The more one sprains an ankle, the greater the chance that problems will develop. For example, turning the ankle can lead to damage to the cartilage inside the ankle joint. You should see your doctor if this is occurring.

## Additional Resources

1. American Academy of Orthopaedic Surgeons (AAOS) website, Patient Education: “Sprained Ankle.” <http://orthoinfo.aaos.org/topic.cfm?topic=A00150>
2. Foot Education.com website: “Sprained Ankle.” <http://www.footeducation.com/sprained-ankle>
3. The Hospital for Special Surgery website, Patient Information, Conditions and Treatments: “Sprained Ankle.” [http://www.hss.edu/condition-list\\_sprained-ankle.asp](http://www.hss.edu/condition-list_sprained-ankle.asp)