

Ankle Sprain

Ankle sprains are among the most common orthopedic injuries seen in athletics. They occur when a person runs or jumps and lands on an uneven surface. For example, ankle sprains often occur when basketball players come down from a jump and land on another player's foot.

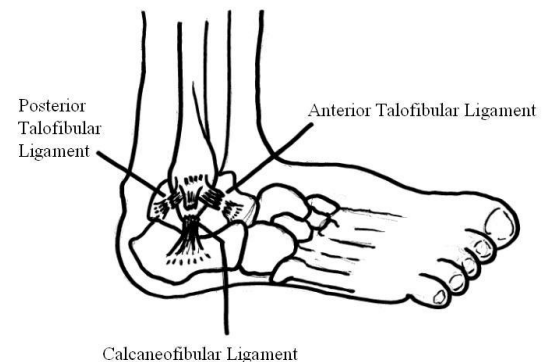
What is a Sprained Ankle?

An ankle sprain is an injury to one or more ligaments of the ankle joint. Ligaments are bands of tough tissue that connect bone to bone and provide support and control excessive movement within a joint. When an ankle sprain occurs, one or more ligaments are put on an excessive stretch that either stretches, partially tears, or completely tears the ligament or ligaments.

Types of Ankle Sprains

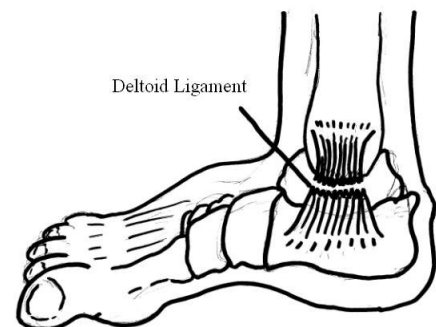
I. Inversion or Lateral Ankle Sprain

This is by far the most common type of ankle sprain accounting for 90% of all ankle sprains. It occurs when a person's foot is rolled inward (inverted). There are three ligaments that support the outside (lateral) portion of the ankle. One, two, or all three of these ligaments may be damaged when an inversion or lateral ankle sprain occurs. Pain and swelling are felt on the outside of the ankle.



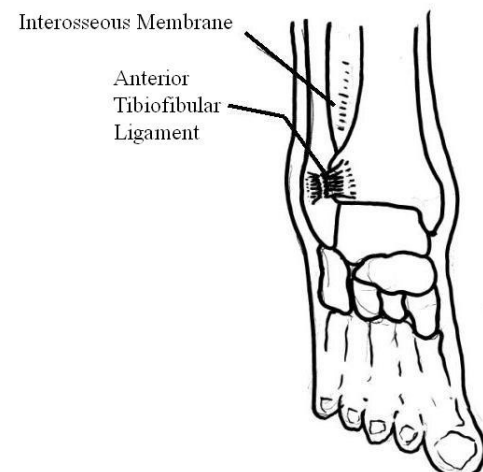
II. Eversion or Medial Ankle Sprain

This type of ankle sprain occurs when a person's foot is rolled outward (everted). There is a large, strong complex of ligaments (commonly called the deltoid ligament) that support the inside portion of the ankle. It is this deltoid ligament that is damaged when an eversion or medial ankle sprain occurs. This type of sprain is much less frequent than an inversion or lateral ankle sprain because the deltoid ligament is much larger and stronger than the ligaments involved in an inversion or lateral ankle sprain. Pain and swelling are felt on the inside of the ankle.



III. "High Ankle" or Syndesmodic Sprain

This type of ankle sprain can happen by itself, but it often occurs along with one of the above ankle sprains. Two primary ligaments and other tissue called the syndesmodic membrane provide support between the two bones of the lower leg. These tissues may be damaged when an excessive outward twisting force is applied to the foot. It often takes a longer duration of time to completely heal from this type of sprain. Pain and swelling are felt in the front of the ankle and lower leg.



Signs and Symptoms of an Ankle Sprain

- Pain
- Swelling
- Discoloration
- Inability to properly bear weight on the injured ankle
- A “popping” type sensation within the ankle when the injury occurs

* It is not uncommon for swelling and discoloration to spread down to the toes in the days after initial injury due to gravity diffusing fluid that accumulates around the injured site down to the tissue of the foot.

Severity of an Ankle Sprain

The degree of symptoms listed above tend to relate well to the extent of damage that has occurred to the involve ligaments when an ankle sprain occurs. There are three grades used to classify the severity of an ankle sprain:

Grade I Ankle Sprain (mild)

The involved ligament/s is stretched. Pain and swelling will be present. Most individuals are able to walk without the use of crutches.

Grade II Ankle Sprain (moderate)

The involved ligament/s is partially torn. There is more significant swelling and bruising. Individuals may be given crutches to help with walking.

Grade III Ankle Sprain (severe)

The involved ligament/s is completely torn. Pain and swelling are more severe. Individuals may complain of instability, or a giving-way sensation in the joint.

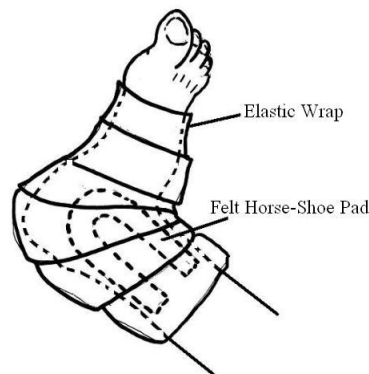
Initial (Acute Phase) Treatment (The First 24-72 Hours After Injury)

Beginning initial treatment as soon as possible after an injury is critical in lessening the total rehabilitation time for a sprained ankle. The goals of the initial treatment are to control pain and limit swelling. The swelling that occurs after injury plays an important role in healing, but the human body creates too much of it. This excess swelling damages the tissues around the initial injured area. The more that swelling can be limited during the first 24-72 hours after the injury, the better. This is accomplished through the “RICE” method (Rest, Ice, Compression, Elevation).

Rest – Weight-bearing activities that cause pain should be avoided. In the cases where walking is painful, the use of crutches may be advised for as long as walking is painful.

Ice – Ice should be applied to the injured site every 3-4 hours for 15-20 minutes at a time (NO LONGER THAN 20 minutes). This will help slowdown swelling and ease pain.

Compression – Applying some form of compression to the ankle will limit the amount of swelling that occurs. The use of a “horse-shoe” pad and ace wrap that is wrapped snugly from the toes up to the lower leg is effective. This type of wrap should NOT be worn so tight that the foot becomes numb and it should be taken off at night when sleeping. Other recommended compression devices include neoprene ankle sleeves and gel-cast ankle braces. Do not wear sandals during this time because they do not provide any protection or compression for the injured site.



Elevation – Use the effects of gravity to help the body eliminate swelling from the injury site. Elevate the ankle above the heart to allow for the drainage of fluid. With the ankle elevated, perform “ankle pumps” (pointing the toes towards and away from the body) to help the lower leg muscles “squeeze” swelling from the nearby tissues. When sleeping, elevate the ankle slightly above the heart by placing it on a pillow or two.

* Taking anti-inflammatory medication such as Ibuprofen or other medication that is prescribed by a doctor will help limit/decrease inflammation (swelling) and pain during this acute phase of injury.

Sub-Acute Treatment (Beginning 48 Hours to Several Days After Injury)

The pain and swelling of a sprained ankle should decrease after the first couple of days of injury. At this time the injured person's body begins to "repair" the injured tissue by laying down scar tissue in the affected areas. The body lays this tissue down in an unorganized pattern. It is the role of rehabilitation to create a good environment for this scar tissue formation and to help the body align/organize it properly. The first exercises during this stage to be started are range of motion exercises.

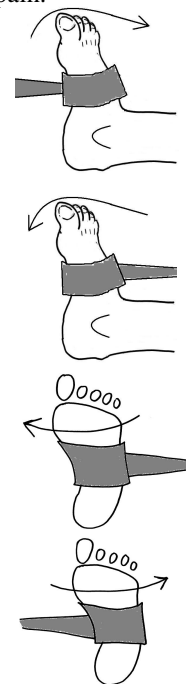
I. Range of Motion (ROM) exercises – These exercises help maintain normal ankle motion and promote proper scar tissue formation.

1. **Alphabet Writing** – Use the toes to write the alphabet by creating movement at the ankle. Make the letters as big as possible. Be creative with this. Write lower case and upper case letters, do math problems, etc.
2. **Achilles (Calf) Stretch** – Stretching of the Achilles tendon can be started early on. This is important because flexibility often becomes restricted in this area after an ankle sprain which can lead to tendon issues such as tendonitis. While sitting or laying down, take a folded towel and loop it around the toes. Pull the ends of the towel towards the body so that a stretch is felt on the back side of the lower leg. This can be done several times a day for a few minutes at a time.

II. Strengthening Exercises – Strengthening of all the muscles around the ankle joint is important to support the ankle joint and help prevent future sprains. When ligaments are stretched, they may never return to their original length. This creates laxity (looseness) within the joint. When there is laxity present, the muscles that surround the joint play a larger role in protection of that joint. These exercises should only be done when they can be completed without pain.

1. Resistance Band Exercises

- A. **Dorsiflexion** – Sit with the legs straight. Anchor the resistance band to an object below the foot of the injured ankle and the other end around the foot itself. Slowly pull the toes toward the body against the resistance. Return slowly to the starting position. Do 3 sets of 10 repetitions 2 times a day.
- B. **Plantarflexion** – Sit with the legs straight. Loop the resistance band around the foot and hold on to the other end. Slowly press the ball of the foot down and point the toes against the resistance. Return slowly to the starting position. Do 3 sets of 10 repetitions 2 times a day.
- C. **Inversion** – Sit with the legs straight. Cross the uninjured leg over the injured ankle. Wrap one end of the resistive band around the foot of the injured ankle, loop it around the uninjured foot, and hold on to the other end. Slowly turn the injured foot inward and upward against the resistance. Return slowly to the starting position. Do 3 sets of 10 repetitions 2 times a day.
- D. **Eversion** – Sit with both legs straight. Wrap one end of the resistance band around the foot of the injured ankle, loop it around the uninjured foot, and hold on to the other end. Slowly turn your injured foot upward and outward against the resistance. Return slowly to the starting position. Do 3 sets of 10 repetitions 2 times a day.



2. **Heel Raises** - While standing with the feet shoulder length apart, lift the heels off the ground to raise the body up onto the toes. Hold this position for 5 seconds and then slowly return back to the starting position. Do 3 sets of 10 holds 2 times a day. To make more challenging, hold dumbbells while performing this exercise.

III. Proprioception (Balance) Training – When an ankle sprain occurs, tiny "sensors" called proprioceptors are damaged. These proprioceptors, located in our muscles, tendons, ligaments, joints, are responsible for relaying data to the brain and spinal cord such as to what extent a muscle stretched, the amount of pressure in a given area, and what angle a joint is positioned. This information is used to help maintain balance and protect muscles, tendons, and ligaments from being stretched too far. For example, if a person jumps and lands on an uneven surface and their ankle begins to roll, the proprioceptors in the ankle gather information that the brain and spinal cord uses to stop the rolling of the ankle before injury can happen.

1. **Single Leg Balancing** – This simple way to improve proprioception involves standing on the injured leg for a period of at least 30 seconds. Once this can be easily achieved 8-10 times in a row, difficulty can be increased by closing your eyes or standing on a pillow, or both.

Functional Exercises (The Last Step Before Returning to Activity)

Functional exercises should begin when range of motion, strength, and proprioception of the injured ankle are near that of the uninjured leg. Functional exercises are designed to gradually get the body ready to do sport specific activities such as quick change of direction movements, jumping, and sprinting. Each of these activities should be pain free while being performed and also pain free afterwards. Below is the suggested progression of steps to follow in basic functional exercises before returning to activity:

1. Jogging straight ahead
2. Performing build ups to sprinting speed in a straight line
3. Performing 45 degree cuts at half speed
4. Performing 45 degree cuts at full speed
5. Changing direction from running backwards to running forwards, and the other way around
6. Performing "figure 8" runs
7. Performing sport specific activities such as long kicks in soccer, rebounding drills in soccer, etc.

Return to Activity Considerations and Recommendations

A person should be pain free with the sport specific exercises of their activity before returning to that activity. There are several other tips that may be useful when it is time to return to activity:

- ✓ Wear an ankle brace (a lace-up brace is preferred) or have the ankle taped for activity for a period of time after returning to activity. (Ankle braces may protect better than tape because they can be retightened during activity whereas tape may become loose by the end of activity).
- ✓ Warm-up properly prior to activity
- ✓ Continue strengthening and proprioception exercises even after returning to play.
- ✓ Wear the proper shoes for the activity that is being done. Make sure these shoes fit well and are not worn out.

Consulting a Health Care Professional

The preceding information was to educate people about basic types of ankle sprains and activities/exercises that help create the best environment for such an injury to heal properly. It is not a substitute for medical care by a medical professional such as an athletic trainer, physical therapist, or sports medicine physician. It is strongly recommended that a person who has a suspected ankle sprain be examined by a health care professional so that the injured person can be properly evaluated/diagnosed and guided through a more individualized rehabilitation program.

When Should I Consult a Doctor About an Ankle Sprain?

A person who sustains an ankle sprain should be seen by a doctor to rule out a fracture (broken bone) or other condition in cases where:

- There is a large amount of swelling
- Pain is felt in areas above or below the ankle joint.
- Pain is not manageable
- There is numbness, decreased sensation in the foot
- Symptoms do not show gradual improvement as days go by

***An athletic trainer or physical therapist can help determine if a suspected ankle sprain should be referred to a physician for possible x-rays.**

