South Shore Hospital

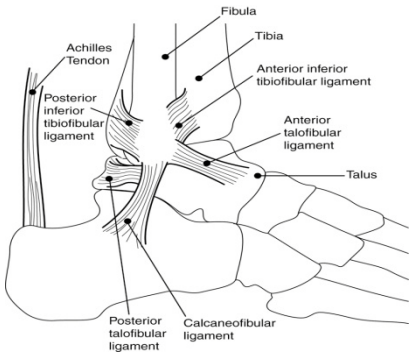
Orthopedic, Spine and Sports Therapy

Ankle Sprain

Anatomy

Ligaments are the soft tissue structures in the body that give the joints their stability. When one of these structures are overstretched, it is called a sprain. Ankle sprains account for almost 85 % of all acute ankle injuries and are a very common injury in both active and sedentary individuals. The most common ankle sprain is a lateral (outer) ankle sprain. This occurs typically when the foot is in a position of being pointed down and turned inwards. There are three primary ligaments on the outside of the ankle:

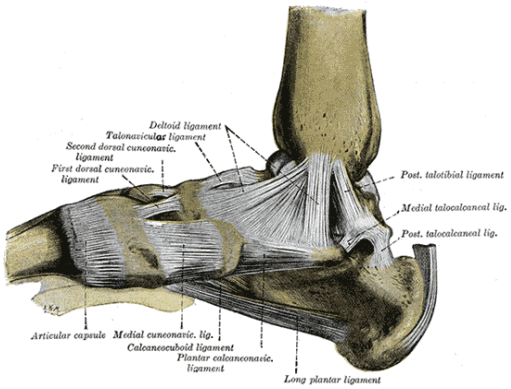
- Anterior talofibular ligament (ATFL)
- Calcaneofibular ligament (CFL)
- Posterior talofibular ligament (PTFL)



National Institute of Arthritis and Musculoskeletal and Skin Diseases

The inner portion of the ankle can also be sprained although it is much less common. The inner or medial ankle ligament is called the deltoid ligament. The deltoid ligament is comprised of the following four ligaments:

- Tibiocalcaneal ligament
- Tibionavicular ligament
- Anterior tibiotalar ligament
- Posterior tibiotalar ligament



Ankle sprains can be classified as the following:

- Grade 1 sprain - slight stretching and some minor damage to the fibers of the ligament.
- Grade 2 sprain - some partial tearing of the ligament. Abnormal looseness of the ankle joint is found if moved in certain directions when tested
- Grade 3 sprain - complete tear of the ligament. Gross instability occurs if the ankle is moved in certain directions when tested

When you sprain your ankle you will typically have pain and swelling located around the area of the sprain. Generally it is painful as you bear weight on the leg and when you turn your ankle in and out. You might develop some bruising as well around ankle.

Treatment

After spraining your ankle you should follow the PRICE guidelines. They are as follows:

- **(P)**rotect – Decrease weightbearing if painful
  - Use of an assistive device such as crutches may be needed
  - Use of a brace or walking boot may be needed depending on grade of the sprain or if a fracture is found (your physical therapist or doctor will assist in making this decision based on what they find on exam)
  - Do not move your foot through a painful range of motion
- **(R)**est – Decreasing your activity in the early stages may be necessary to limit your chances of further injury
- **(I)**ce – Cold provides short pain relief and also limits swelling by reducing the blood flow to the area. ***Caution:*** *when icing the injured area you should never apply the ice directly to the skin and never leave the ice on for more than 15 minutes. Put a pillowcase or thin towel between the ice and your skin. Longer exposure to the ice can lead to frostbite.*
- **(C)**ompression – This can help reduce and limit new swelling from occurring. Some people get pain relief as the swelling goes down. Increased swelling may also slow down the healing process. ACE wraps are the easiest way to compress the ankle. If you feel that the wrap is too tight or the foot is throbbing, just remove the wrap and re-apply.
- **(E)**levation – Elevating the leg can help control/decrease the swelling in the foot/ankle. It is most effective when the foot is above the level of the heart. If you are lying on your back, prop the foot on several pillows.

Not everyone that has had an ankle sprain requires immediate medical attention. However if you have any of the following, you should call your doctor or go to the emergency room:

- Significant pain with moving the ankle or when walking
- Inability to put weight on the foot

- Pain over a bony part of your foot/ankle
- Pain not relieved by medication or ice
- Numbness in the foot, ankle or leg
- No change in your pain after several days
- If you are not sure how bad it is or how to care for it

Even with minor sprains, the ankles ability to respond to the forces and stresses it encounters while walking or with sports, may be hampered. Symptoms may be still present up to 18 months post-sprain. A brief course of physical therapy may lessen the likelihood of residual symptoms and decrease your chances of re-injuring the ankle.

Surgery

Only about 10-20% of ankle sprains will result in chronic issues that may require surgery. Your surgeon will discuss the options with you if this is necessary.

Rehabilitation

****The following is an outlined progression for rehab. Advancement from phase to phase as well as specific exercises performed should be based on each individual patient's case and sound clinical judgment by the rehab professional. ****

Phase 1 Acute Phase

Goals

- Decrease swelling
- Full pain-free ROM
- Muscle re-education
- Normal gait pattern

Precautions

- Use assistive device if gait is painful or if an abnormal gait pattern present
- Splint or brace may be needed for ambulation
- Do not move foot through a painful range of motion

Recommended Exercises/Treatment

- PRICE
- Modalities as indicated to decrease swelling and pain
- Manual therapy to increase range and decrease pain as appropriate
- Massage for edema control
- Pain-free active ROM in all planes
- Towel scrunch and/or marble pick up
- Isometric ankle strengthening
- Open chain hip strengthening

Guidelines to progress to Phase 2

- Minimal swelling and pain
- Near or full pain free range on motion
- Normal gait pattern without crutches

Phase 2 Strengthening (early):

Goals

- Full AROM
- Normal gait at higher speeds

Precautions

- Brace may be used with activity if needed
- Avoid exercise that causes more than moderate pain

Recommended Exercises/Treatment

- Continue modalities to manage pain and inflammation as needed
- Joint mobilization as indicated
- Resisted ankle exercises in all planes
- Initiate proprioception/balance exercises
- Aerobic/endurance activity with minimal weightbearing (i.e. biking, swimming…)
- Continue hip/knee/core strengthening

Guidelines to progress to Phase 3

- Minimal pain with activity
- Minimal swelling
- Pain free AROM and higher level gait

Phase 3 Functional Strengthening/Return to Sport

Goals

- Pain free functional weightbearing activity
- Advance strengthening
- Initiate sport specific exercise/agility

Precautions

- Avoid activity that causes pain greater than 3/10 on VAS
- Continuing bracing as needed for activity

Recommended Exercises/Treatment

- Continue general LE strengthening
- Continue ankle strengthening in all planes of motion
- Continue aerobic activity, return to weightbearing activity (running) as tolerated
- Progress proprioceptive/weightbearing/single leg exercises
- Initiate agility drills
- Initiate functional bracing if needed for sport/work

Criteria for discharge

- Full functional strength, balance and proprioception
- Painfree return to sports
- Knowledge of injury prevention/use of functional brace as needed

Phase	Goals	Precautions	Recommended Exercises	Criteria to Progress to Next Phase
Phase 1 – Acute Phase	• Decrease swelling • Full pain-free ROM • Muscle re-education • Normal gait pattern	• Use assistive device if gait is painful or if an abnormal gait pattern present • Splint or brace may be needed for ambulation • Do not move foot through a painful range of motion	• PRICE • Modalities as indicated to decrease swelling and pain • Manual therapy to increase range and decrease pain as appropriate • Massage for edema control • Pain-free active ROM in all planes • Towel scrunch and/or marble pick up • Isometric ankle strengthening • Open chain hip strengthening	• Minimal swelling and pain • Near or full pain free range on motion • Normal gait pattern without crutches
Phase 2 – Strengthening (Early)	• Full AROM • Normal gait at higher speeds	• Brace may be used with activity if needed • Avoid exercise that causes more than moderate pain	• Continue modalities to manage pain and inflammation as needed • Joint mobilization as indicated • Resisted ankle exercises in all planes • Initiate proprioception/ balance exercises • Aerobic/endurance activity with minimal weightbearing (i.e. biking, swimming…) • Continue hip/knee/core strengthening	• Minimal pain with activity • Minimal swelling • Pain free AROM and higher level gait
Phase 3 – Functional Strengthening	• Pain free functional weightbearing activity • Advance strengthening • Initiate sport specific exercise/ agility	• Avoid activity that causes pain greater than 3/10 on VAS • Continuing bracing as needed for activity	• Continue general LE strengthening and ankle strengthening in all planes • Continue aerobic activity, return to weightbearing activity (running) as tolerated • Progress proprioceptive/weightbearing/single leg exercises • Initiate agility drills • Initiate functional bracing if needed for sport/work	• **D/C to HEP if:** • Full functional strength, balance and proprioception • Painfree return to sports • Knowledge of injury prevention/use of functional brace as needed

References

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2. van Rijn RM, van Os AG, Bernsen RM, Luijsterburg PA, Koes BW, Bierma-Zeinstra SM. What is the clinical course of acute ankle sprains? A systematic literature review. *Am J Med*. 2008;121:324-331.
3. Wolfe MW, Uhl TL, Mattacola CG, McCluskey LC. Management of ankle sprains. *Am Fam Physician*. 2001;63:93-104

***Reviewed by Michael Geary, MD**