

Peroneal Tendinitis, Ankle Sprains and Instability

Peroneal Tendinitis, Ankle Sprains and Chronic Ankle Instability

- How are these three things related?
 - The peroneal tendons are on the lateral side of the foot and ankle
 - The most common type of ankle sprain is an inversion (lateral) ankle sprain
 - In some cases of inversion ankle sprain, the peroneus brevis tendon is stretched, or strained, to the point of injury. The peroneal retinaculum can also be damaged. It is often difficult to discern whether there was involvement of the tendon or retinaculum as it is difficult to sort out the precise source of the pain or to differentiate between the two. There will be pain caused by the ligamentous injury, so it can be very difficult to assess whether there is additional pain from a tendon strain or retinaculum injury, as well.
 - Finally, a significant percentage of people who experience an inversion ankle sprain will go on to develop chronic ankle instability; which, of course, makes them more susceptible to additional sprains and so on and so forth...

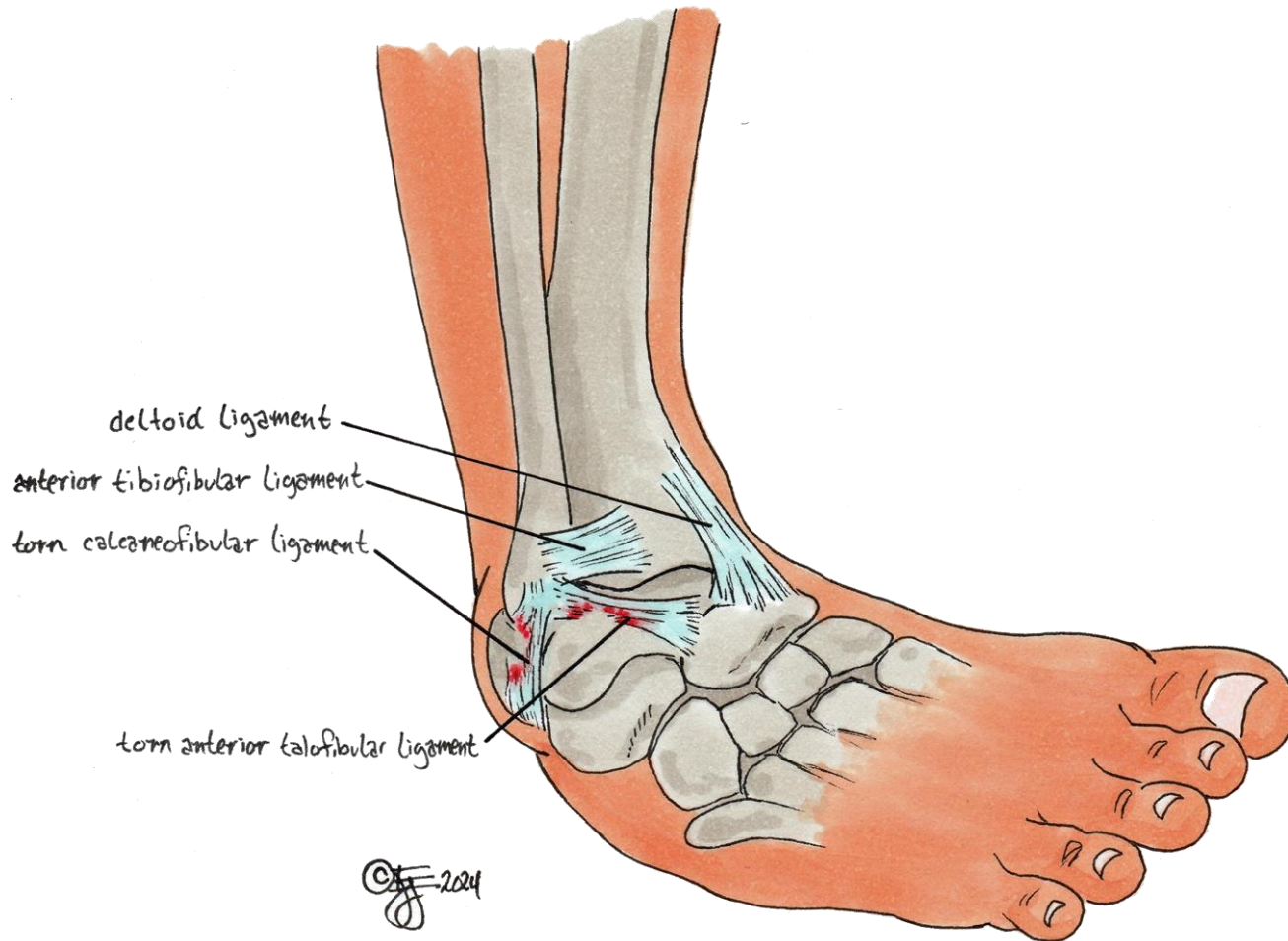
Inversion Ankle Sprain

Ankle Sprains

- Very common injury
 - According to UConn Health, 25,000 Americans experience an ankle sprain each day
 - Ankle sprains comprise nearly half of all sports injuries
- Lateral ankle (inversion) sprain most common
 - Eversion ankle sprains do happen, but they are quite rare. They can occur while playing sports like football or soccer where the foot is flat on the ground with slight external rotation and the ankle or calf is struck laterally with great force.
- Ankle sprains happen when the foot twists, rolls or turns beyond its normal motions. A great force is transmitted upon landing, causing the ligaments to stretch beyond their normal range in an abnormal position.
- If the force is too strong, the ligaments can tear. One may lose their balance when the foot is placed unevenly on the ground. They may fall and be unable to stand on that foot. When excessive force is applied to the ankle's soft tissue structures, a "pop" sound may even be heard. Pain and swelling often result.



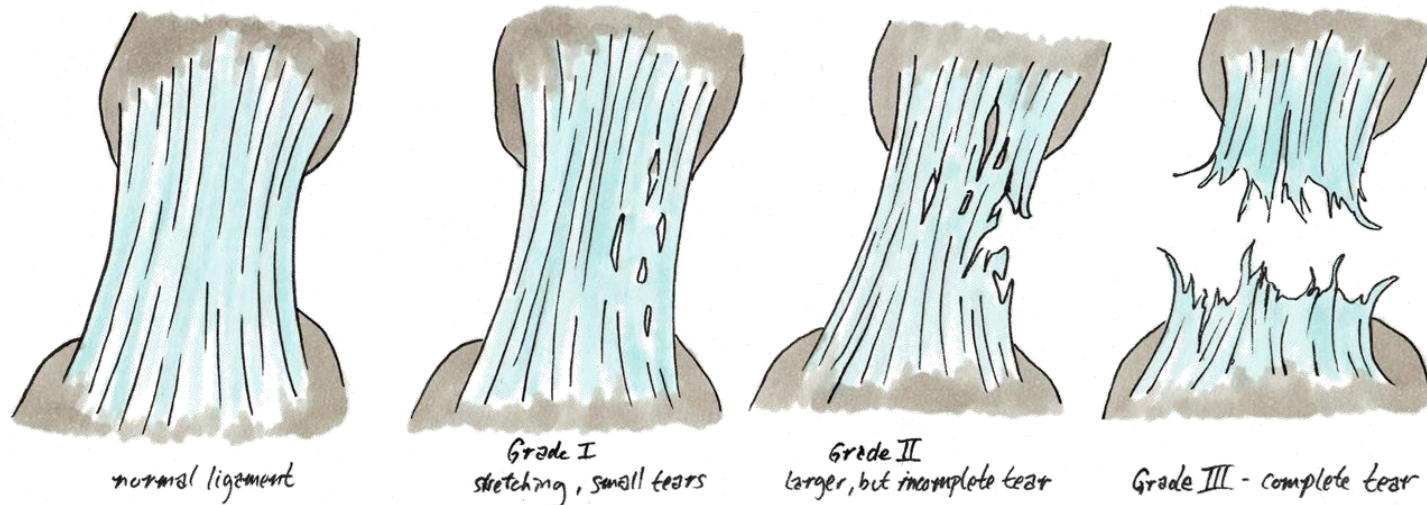
Inversion Ankle Sprain



- Ankle sprains most commonly involve injury to the anterior talofibular ligament (ATFL) and/or the calcaneofibular ligament (CFL).
- Ankle sprains vary depending on the mechanism of injury (high- versus low-energy injuries), position of the foot, and rotational force on the joint and stabilizing ligamentous structures.
- Low grade injuries (grade I and II) result in stretching or microscopic tears of the stabilizing ligaments, while a high grade (grade III) ankle sprain compromises the syndesmotic structures.
- The mechanism may also lead to complete tendon disruptions and fractures of the ankle and foot in the highest energy scenarios.

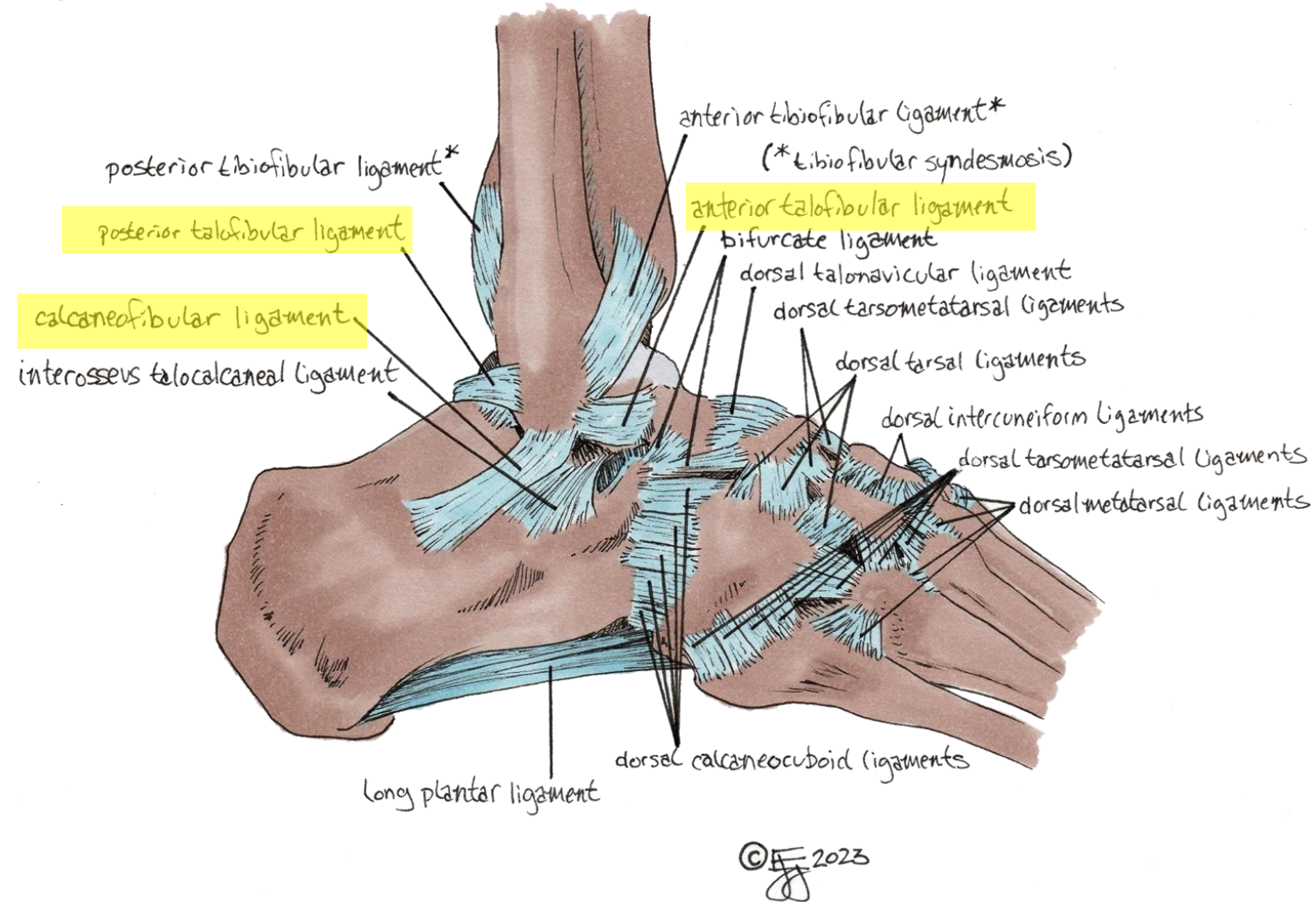
Ankle Sprain

- Grade I - Slight stretching and some damage to the fibers (fibrils) of the ligament.
- Grade II - Partial tearing of the ligament. If the ankle joint is examined and moved in certain ways, abnormal looseness (laxity) of the ankle joint occurs.
- Grade III - Complete tear of the ligament. If the examiner pulls or pushes on the ankle joint in certain movements, gross instability occurs.



Inversion Ankle Sprain

- Lateral ligaments involved:
 - Posterior talofibular
 - Calcaneofibular
 - Anterior talofibular



Ankle Sprains

- Most ankle sprains need only a period of protection to heal. The healing process takes about four weeks to six weeks. The doctor may advise the patient to incorporate motion early in the healing process to prevent stiffness. Motion may also aid in maintenance/restoration of proprioception.
- Even a complete ligament tear can heal without surgical repair if it is immobilized appropriately. Even if an ankle has a chronic tear, it can still be highly functional because overlying tendons help with stability and motion.
- Treatment:
 - Grade I sprain: R.I.C.E (rest, ice, compression and elevation):
 - Grade II sprain: R.I.C.E. guidelines can also be used. More time needed to heal. Immobilization usually recommended.
 - Grade III sprain: Often associated with permanent instability. Surgery is rarely necessary, however. A short leg cast, or a walker boot may be used for 2-3 weeks.

Ankle Sprains



- Physical therapy may be used to help to decrease pain and swelling and to prevent chronic ankle problems. Ultrasound and electrical stimulation may also be used as needed to help with pain and swelling.
- At first, rehabilitation exercises may involve active range of motion or controlled movements of the ankle joint without resistance. Water exercises may be used if land-based strengthening exercises, such as toe-raising, are too painful.
- Lower extremity exercises and endurance activities are added as tolerated. Proprioception training is very important, as poor proprioception is a major cause of recurrent sprains and ankle joint instability.
- Once pain has resolved, other exercises, such as agility drills, may be added. The goal is to increase strength and range of motion as balance improves over time.
- Ankle sprain recovery can be broken into three stages:
 - **Phase 1** includes resting, protecting the ankle and reducing the swelling (one week).
 - **Phase 2** includes restoring range of motion, strength and flexibility (one week to two weeks).
 - **Phase 3** includes gradually returning to activities that do not require turning or twisting the ankle and doing maintenance exercises. This will be followed later by being able to do activities that require sharp, sudden turns (cutting activities) such as tennis, basketball or football (weeks to months).

Inversion Ankle Sprains

- Pedorthic intervention

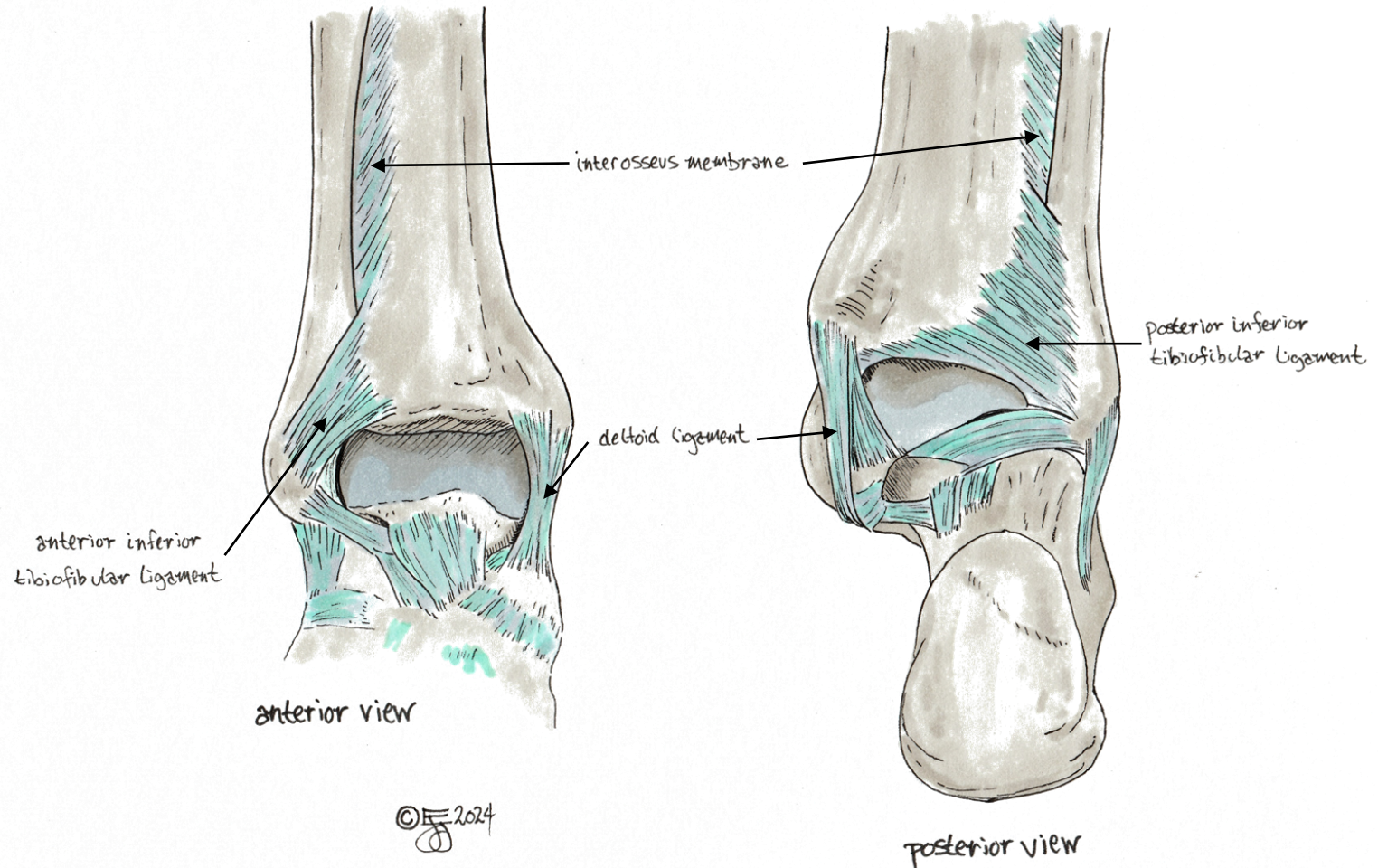
- Footwear: High top, lace shoes or boots that provide good lateral support/control. In depth to accommodate FO or SCFO. *Not a* so-called “motion control” or anti-pronator shoe.
- Shoe modifications: Lateral heel wedge and/or lateral heel flare
- Foot Orthoses: Functional or total contact FO with lateral heel post/wedge
- SCFO: Arizona-style gauntlet, short-articulated AFO, Richie-type brace. SCFO needs to provide frontal plane control.
- If your facility provides other DME items, a walker boot or an Aircast-type stirrup or other OTC brace may be ordered.
- Note, for an eversion sprain, a motion control shoe is fine. The shoe and orthoses would have a *medial* wedge/flare instead.



High Ankle Sprain

High Ankle Sprain

- A syndesmosis is a fibrous joint in which two adjacent bones are linked by a strong membrane or ligaments.
- Tibiofibular syndesmosis
 - Anterior inferior tibiofibular ligament
 - Posterior inferior tibiofibular ligament
- The tibiofibular syndesmosis helps to maintain proximal integrity between the tibia and fibula.
- A syndesmotic injury is also called a *high ankle sprain* and is common in impact sports like football.



What's the difference?

- The differences between a high ankle sprain and a low ankle sprain aren't just location.
- High ankle sprains involve twisting/tibial rotation while the foot is in dorsiflexion. Pain, bruising and swelling will be just proximal to the malleoli.
- Most low ankle sprains happen when the foot and ankle invert and the pain, bruising and swelling is mostly distal to the malleoli.
- Low ankle sprains don't involve the high ankle ligaments.
- Low ankle sprains are what most of us think of when we hear someone has a sprained ankle.

High Ankle Sprain

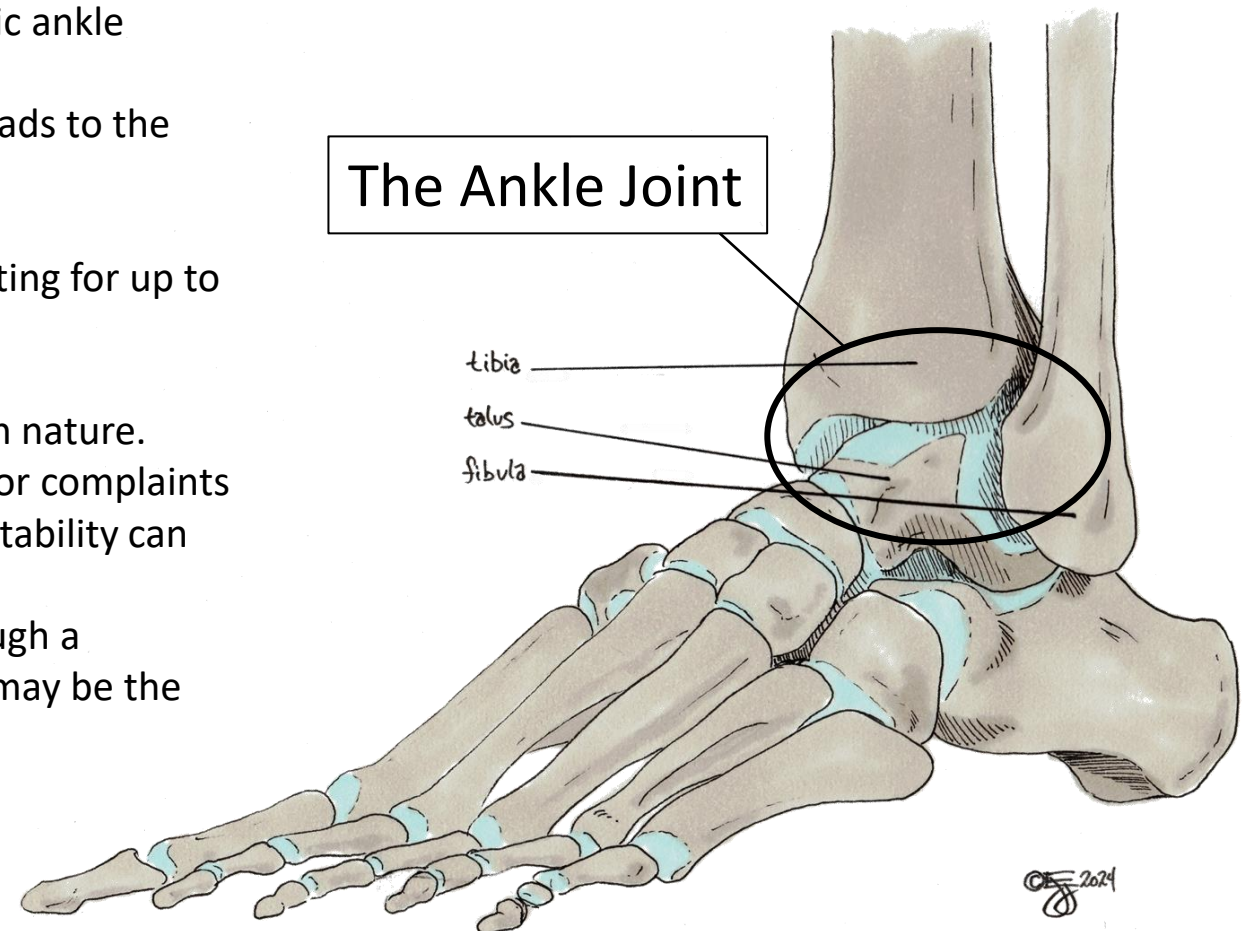
- Immobilization is the first line treatment for a high ankle sprain.
- A high ankle sprain is likely to lead to residual ankle pain after recovery.
- The earlier in the recovery process that the pedorthist is called upon, the more likely a SCFO will be the modality of choice.
- Pedorthic Intervention
 - Footwear: High top, lace shoes or boots that provide good lateral support/control. In depth to accommodate FO or SCFO.
 - Shoe modifications: Flares may be helpful. Lateral, or medial *and* lateral
 - Foot Orthoses: Functional or total contact FO with neutral heel post and deeper heel cup.
 - SCFO: Arizona-style gauntlet, short-articulated AFO, Richie-type brace. SCFO needs to provide frontal plane control. In some cases, sagittal plane restriction may be necessary, too.



Chronic Ankle Instability

Chronic Ankle Instability

- While ankle sprain is reported to be among the most common recurrent injuries, about 20% of acute ankle sprain patients develop chronic ankle instability.
- The failure of functional rehabilitation after acute ankle sprain leads to the development of chronic ankle instability.
- In athletics, the ankle is the most traumatized body part, accounting for up to 30% of all sports injuries.¹
- Chronic ankle instability can be either functional or mechanical in nature. Functional instability depends on the patient-generated reports or complaints that could be accompanied by clinical laxity while mechanical instability can be identified by physical examination.
- When patients with chronic ankle instability fail to improve through a conservative management course and physical therapy, surgery may be the only option for them.



Chronic Ankle Instability

- Depending on the severity of the sprain, the ligaments may be permanently damaged contributing to:
 - Deficits in postural control
 - Compromised proprioception
 - Delays in muscle reaction time
 - Loss of strength
- Clinically, the history of patients with chronic ankle instability reveals past recurrent ankle sprains and severe inversion injury. They may take special precautions against weight-bearing, strenuous activities, and/or walking on uneven surfaces.
- Physical therapy can be often be helpful.

Chronic Ankle Instability

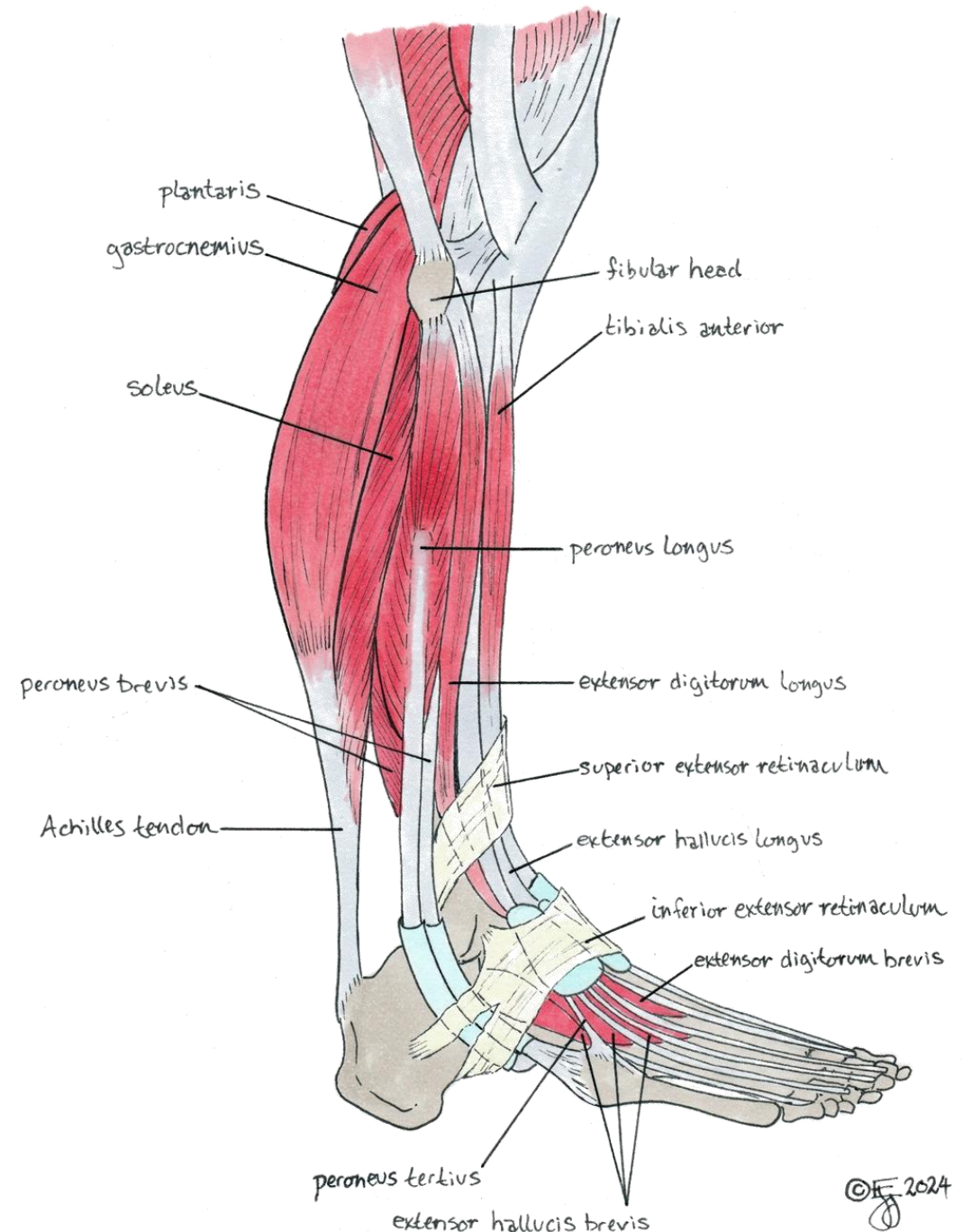
- Pedorthic intervention focuses on providing frontal plane support and control
 - Footwear: High-top boot for ankle support, extra depth to accommodate FO or SCFO
 - Shoe modifications: Lateral and/or medial flares (heel vs full)
 - Foot orthoses: Semirigid with deep heel cup, long flanges and reinforcement
 - SCFO: Arizona-type molded plastic/leather gauntlet, short-articulated AFO, Richie-type AFO, Aircast-type stirrup



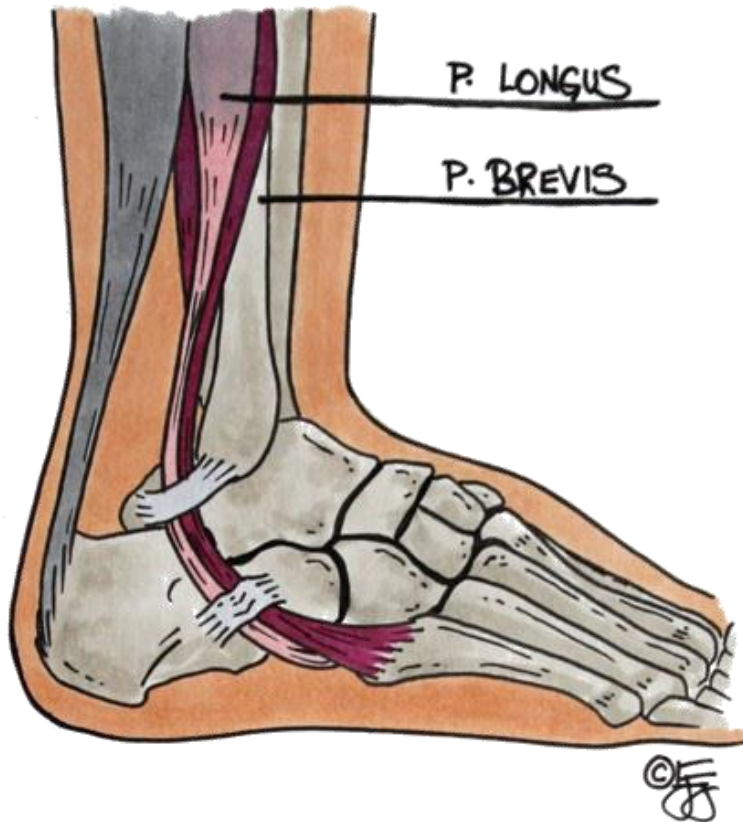
Peroneal Tendinitis

Peroneal Tendons

- **Peroneus (Fibularis) Longus**
 - Proximal attachment: Fibular head and proximal 2/3 of fibula
 - Distal attachment: Base of 1st metatarsal and medial cuneiform
 - Action: Eversion of STJ and plantarflexion
- **Peroneus (Fibularis) Brevis**
 - Proximal attachment: Distal 2/3 of fibula
 - Distal attachment: Styloid process of 5th metatarsal
 - Action: Eversion of STJ and plantarflexion
- **Peroneus (Fibularis) Tertius and Quartus**
 - Present in approx. 8% of population
- The peroneal tendons provide lateral ankle stability during ambulation



Peroneal Tendinitis

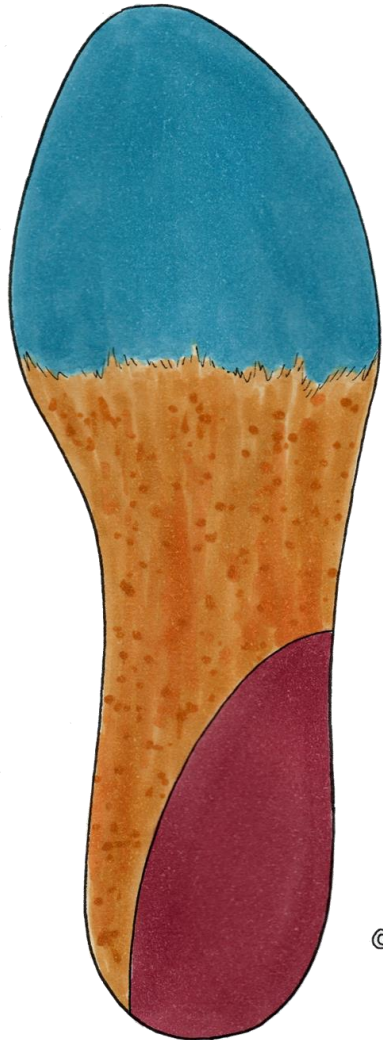


- Peroneal tendon problems mostly occur where the tendons glide within the pulley behind the lateral malleolus, causing irritation of the lining of the tendons. This condition is called tenosynovitis. The irritation can also occur after an ankle injury, such as a blow to the outside of the ankle or an ankle sprain.
- Repetitive ankle motions in sports can lead to wear and tear on the tendons inside the groove.
- A cavovarus foot structure also puts extra tension on the peroneal tendons within the groove and has also been shown to contribute to the development of peroneal tendon problems.
- Peroneal tendon problems can occur from an inversion ankle sprain which damages the ligaments that support the lateral ankle. The forceful stretch on the peroneals when the foot inverts can cause a lengthwise tear in the peroneal tendons.
- An inversion ankle sprain can also cause the peroneal tendons to momentarily slip out of the groove (*subluxation*).
- Peroneal tendonitis often occurs during the recovery period after an ankle sprain. Because the ankle is unstable, the peroneals may need compensate for the damaged and/or weakened lateral ankle ligaments. This overwork sets the stage for subluxation.

Peroneal Tendinitis

- In some patients, a peroneal tendon problem is caused by degenerative changes in the tendons themselves rather than by inflammation around the tendons. The tendon itself becomes abnormal. This is known as *tendonosis*.
- In tendonosis, the tendon becomes weakened. Tendons are made up of strands of a material called collagen. Degeneration in a tendon causes a loss of the normal arrangement of the collagen fibers that join together to form the tendon. Some of the individual strands of the tendon stretch and become elongated due to the degeneration, some fibers break and overall, the tendon weakens.

Peroneal Tendinitis



- Non-surgical treatment includes resting and protecting the sore tendons. Immobilization in a short-leg walking boot for 2-4 weeks.
- In less severe cases, treatment would involve pedorthic intervention:
 - Stirrup ankle brace
 - Custom foot orthoses – Deep heel cup total contact > low-profile functional; lateral heel wedge or full-length lateral wedge
 - Shoes with strong counters and stable soles. *Not* motion control or anti-pronation shoes.
 - Shoe modifications – lateral flare, lateral wedge
 - SCFO – Arizona Mezzo®-style
- PT may include heat, ice, and ultrasound treatments to reduce pain and swelling. Stretching, strengthening, and ankle coordination exercises are sometimes added as symptoms ease.



The End