

# Foot Anatomy

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# Physical Therapy in Congress Park, Denver Downtown, Central Park, and Highlands Area for Foot



Welcome to Atlas Physical Therapy's patient resource about from foot injuries and surgery. The following is an article on foot anatomy. Please see the left hand menu for specific information on ankle injuries.

Our feet are constantly under stress. It's no wonder that 80 percent of us will have some sort of problem with our feet at some time or another. Many things affect the condition of our feet: activity level, occupation, other health conditions, and perhaps most importantly, shoes. Many of the problems that arise in the foot are directly related to shoes, so it is very important to choose shoes that are good for your feet.

The foot is an incredibly complex mechanism. This introduction to the anatomy of the foot will not be exhaustive but rather highlight the structures that relate to conditions and surgical procedures of the foot.

### **This guide will help you understand:**

- what parts make up the foot
- how the foot works

Hear from some of our **Foot Therapy** patients

●  
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“ Atlas Physical Therapy is the best! I came in with a sprained ankle and the staff was super patient and helpful as we worked through the injury. Brett and Will were amazing and I would recommend them to anyone! The downtown location is super convenient for anyone who works down there too! ”

Leanne S

Denver, CO

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“ By far the best physical therapists I have ever gone to! Alex and Kate have fixed everything that has come up from foot issues, to knee problems to all the tiny little things that happen during...” ”

“ By far the best physical therapists I have ever gone to! Alex and Kate have fixed everything that has come up from foot issues, to knee problems to all the tiny little things that happen during training or just life in general. Lexi and Emma are awesome at making sure im doing exercises correctly and making it fun at the same time. With the help of everyone at Atlas Physical Therapy I was able to complete my first ultramarathon and look forward to completing many other ridiculous goals. ”

Amanda H

Denver, CO

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●  
“ I had been referred to Alex at Atlas by several different people, but it ended up being my daughter's plantar fasciitis that finally got us in there. He did absolutely great with her really does well...” ”

“ I had been referred to Alex at Atlas by several different people, but it ended up being my daughter's plantar fasciitis that finally got us in there. He did absolutely great with her really does well with kids. I don't have any acute injuries at this point, but while I was in there with her, I asked about various ongoing issues/problem areas I have, and ended up beginning treatment with him as well. He takes a well rounded and very practical approach that for us has included tissue work (both), dry needling (me), ultrasound (her), adjustments (me), and obviously various exercises and stretches. The rest of the staff there is great as well. Highly recommend. ”

Dan O

Denver, CO

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●  
“ I am a runner and runners sometimes get hurt! Alex has magic hands. The man has helped me get through plantar fasciitis on both feet, hip and knee issues and a pulled hamstring! All while keeping it...” ”

“ I am a runner and runners sometimes get hurt! Alex has magic hands. The man has helped me get through plantar fasciitis on both feet, hip and knee issues and a pulled hamstring! All while keeping it fun and just being an amazing coach. If something ails you- go see him! He has magic hands and will get you back on

track in no time ”

Maili Aring Dilworth

Denver, CO

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“ Iâ€ˆve been going to Atlas for a couple of months to work on some issues with my peroneal and Achilles, and Iâ€ˆve been thoroughly impressed with every single person who works at Atlas. Iâ€ˆve worked with at least 5 people here, and they have all been knowledgeable, helpful, friendly, caring and cool. They remember who I am every time I come back, have been great at listening and helping with my recovery, and I quite honestly look forward to each visit. Iâ€ˆve been getting dry needling done lately, and I was pretty afraid since I hate needles. Both Kate and Amanda have done an excellent job however with minimal discomfort and great results afterwards. Iâ€ˆm happy to have discovered Atlas, and Iâ€ˆve been recommending it to friends and family. ”

Matt G

Denver, CO

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“ Heather is great! Â She took me from barely walking to being able to run again. Â I broke/dislocated my ankle last year and started seeing Heather once I was weight bearing again. Â I wouldnâ€ˆt have gotten to the point Iâ€ˆm at now without her! ”

Mark W

Denver, CO

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“ This place is great. I worked with Alex for a little over a month. I visited several PT's prior to meeting with Alex all of whom suggested to remove screws post ankle surgery. With Alex's help, I was able to avoid a second surgery, AND am now feeling like I did before the injury. Thanks Alex ”

Jeff W

Denver, CO

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“ Amazing place, awesome team! I broke my ankle in January and had surgery a day later. About 7 weeks after that, I started physical therapy at Atlas and I could not have been happier. I was... ”

“ Amazing place, awesome team! I broke my ankle in January and had surgery a day later. About 7 weeks after that, I started physical therapy at Atlas and I could not have been happier. I was assigned to work with Kate as my PT and she was fantastic. She worked closely with me on movement, strengthening, massaging and flexibility in order to getting me back to my normal self and activities. At times, I even felt bad for her, because I am very ticklish so working on my foot wasn't always the easiest thing for her, but she took it like a champ; she even did a great job of distracting me in order for her to work on my ankle issues. The exercises I was instructed to do were super helpful, and I was able to do them both at home and at the facility (along with many more when I was there). I loved how I was able to work with multiple staff members while working out my ankle and everyone pushed me to keep going and never made me feel bad if I wasn't able to complete something, but rather said it was okay and we would try again the next time I came in. No matter the time of day or how busy they were, everyone said hello to you, by name, when you walked in making you feel very welcomed. Although I have recently graduated, I will sporadically go back so I can have Kate continue to help me recover, get new exercises for strength, and to just say hello to the staff. I could not be more happy with my recovery and the awesome people at Atlas who helped make it happen. ”

Rachel M

Denver, CO

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“ Laura has been a godsend for me and has helped put me back together more than once! I came in when I was pregnant for a hip issues, then post pregnancy for a foot issue. Both situations I was treated... ”

“ Laura has been a godsend for me and has helped put me back together more than once! I came in when I was pregnant for a hip issues, then post pregnancy for a foot issue. Both situations I was treated wonderfully by the administrative staff and the physical therapist. The new location is key, parking is ample. The are communicative, timely and most importantly, work wonders on what ails you! ”

Heidi K

Denver, CO

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“ I've been impressed and very satisfied with Atlas Physical Therapy ever since I started seeing them after a foot surgery in 2021. When I returned a year or so later in 2022 I worked closely with Andrea and Nate. Not only were they fantastic to work with, they were excellent listeners and very effective at finding the best treatment to alleviate my issues. I highly recommend using them for your PT needs! ”

Kristi S

Denver, CO

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“ Am 77 years old and started seeing Lexi at the Stapleton location for strengthening of an achilles tendon injury, core strength training, and flexibility and balance training. Lexi was very sensitive...”

“ Am 77 years old and started seeing Lexi at the Stapleton location for strengthening of an achilles tendon injury, core strength training, and flexibility and balance training. Lexi was very sensitive to all of my needs and concerns and included all of the areas that I wanted to improve upon in each workout. I have improved significantly in each of those areas and Lexi has given me a series of exercises and stretches to maintain and continue to build on my own. I highly recommend Lexi to anyone seeking to improve themselves in a serious yet fun environment. ”

Wayne B

Denver, CO

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“ I am really grateful to Alex and his crew, they helped me with an ankle injury and my back issues. He helped strengthen and rehabilitate my ankle, while leaving me feeling like he was really invested in my recovery. When we had reached a point where I was still having some pain but he had done all that he could, he didn’t just keep taking my money, he made a suggestion for a doctor that might be able to help me further. I recommend them regularly and will be back with any future injuries. ”

Susie B

Denver, CO

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“ I’ve struggled for seven years with ankle pain since tearing a ligament, and also developed really bad runner’s knee while training for my first half marathon last year. The only other time...”

“ I’ve struggled for seven years with ankle pain since tearing a ligament, and also developed really bad runner’s knee while training for my first half marathon last year. The only other time I’d been to physical therapy for a previous injury, the results were temporary. Alex at Atlas PT explained the why behind my pain, gave me detailed exercises and therapy that were doable, I noticed results immediately... and four years later, I can still run, hike, and ski again without pain. ”

Rachel W

Denver, CO

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“ Hey! I’ve been working with Alex Lanton following two surgeries on my foot. He’s so smart, fun, and effective. I would never go anywhere else for my PT needs. ”

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Jenna T

Denver, CO

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Sarah J

Denver, CO

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## Important Structures

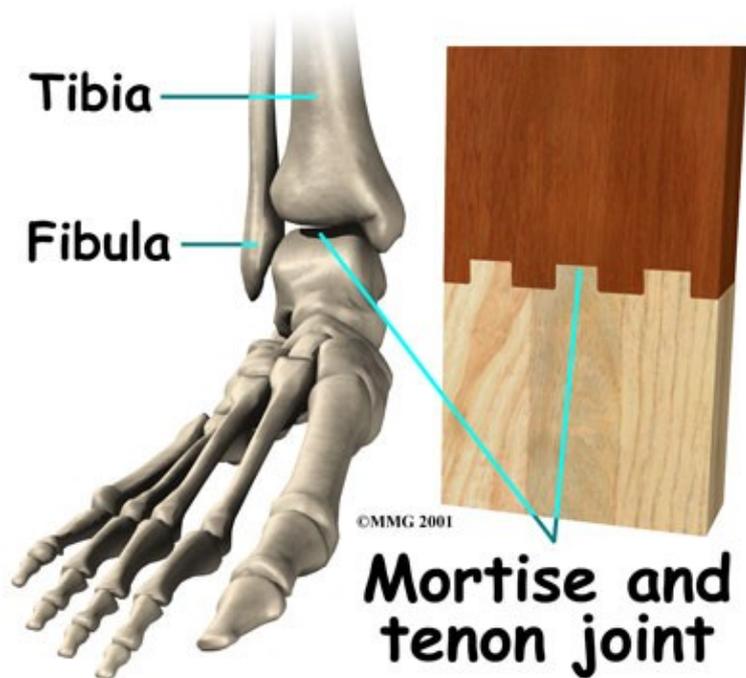
The important structures of the foot can be divided into several categories. These include:

- bones and joints
- ligaments and tendons
- muscles
- nerves
- blood vessels

## Bones and Joints

The skeleton of the foot begins with the *talus*, or ankle bone, that forms part of the ankle joint. The two bones of the lower leg, the large *tibia* and the smaller *fibula*, come together at the ankle joint to form a very stable structure known as a mortise and tenon joint.

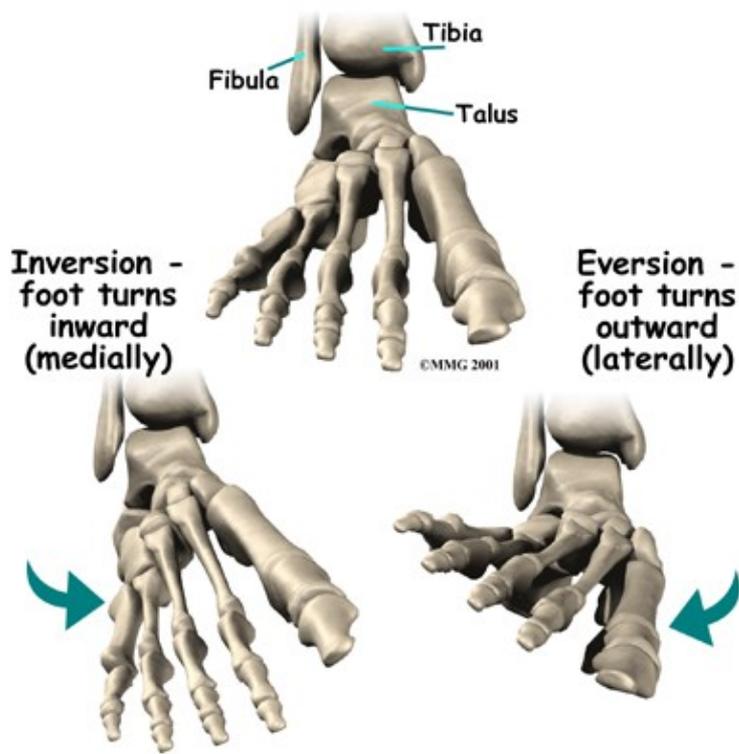
## Mortise and Tenon



The mortise and tenon structure is well known to carpenters and craftsmen who use this joint in the construction of everything from furniture to large buildings. The arrangement is very stable.

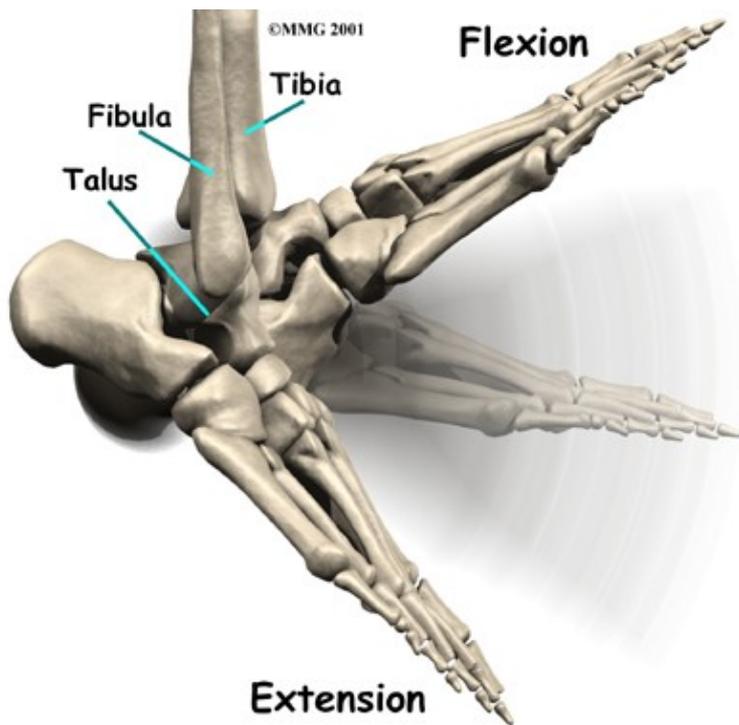
The two bones that make up the back part of the foot (sometimes referred to as the hindfoot) are the talus and the *calcaneus*, or heelbone. The talus is connected to the calcaneus at the *subtalar joint*.

## Hindfoot

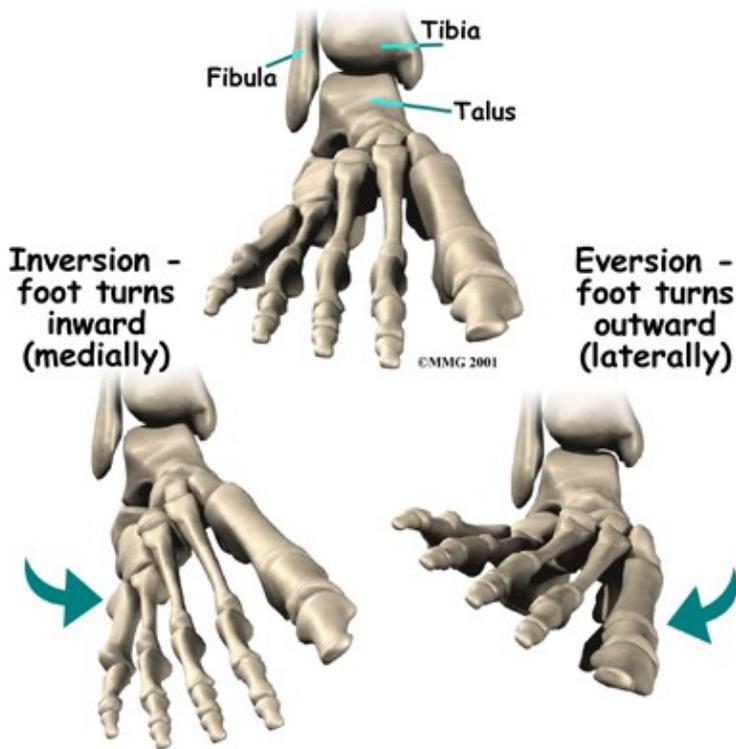


The ankle joint allows the foot to bend up and down. The subtalar joint allows the foot to rock from side to side.

## Joint Bends Up and Down



# Foot Rocks Side to Side



Just down the foot from the ankle is a set of five bones called *tarsal bones* that work together as a group. These bones are unique in the way they fit together. There are multiple joints between the tarsal bones. When the foot is twisted in one direction by the muscles of the foot and leg, these bones lock together and form a very rigid structure. When they are twisted in the opposite direction, they become unlocked and allow the foot to conform to whatever surface the foot is contacting.

The tarsal bones are connected to the five long bones of the foot called the *metatarsals*. The two groups of bones are fairly rigidly connected, without much movement at the joints.

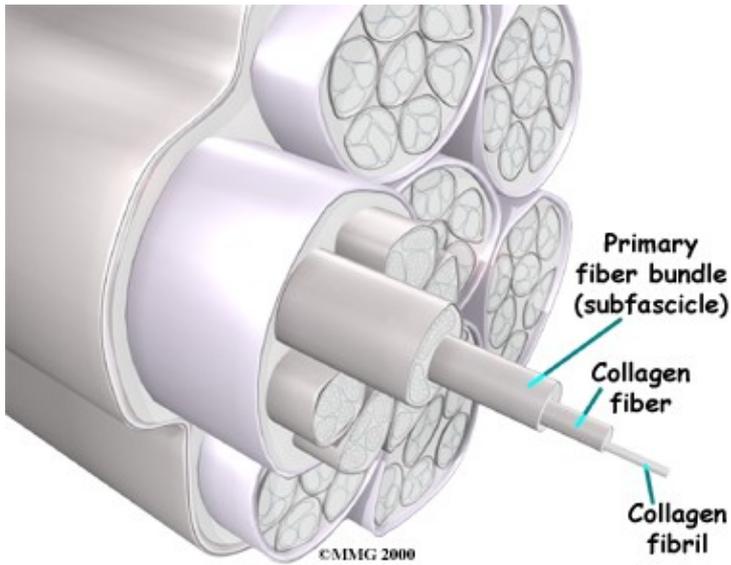
Finally, there are the bones of the toes, the *phalanges*. The joints between the metatarsals and the first phalanx is called the *metatarsophalangeal joint* (MTP). These joints form the ball of the foot, and movement in these joints is very important for a normal walking pattern.

Not much motion occurs at the joints between the bones of the toes. The big toe, or *hallux*, is the most important toe for walking, and the first MTP joint is a common area for problems in the foot.

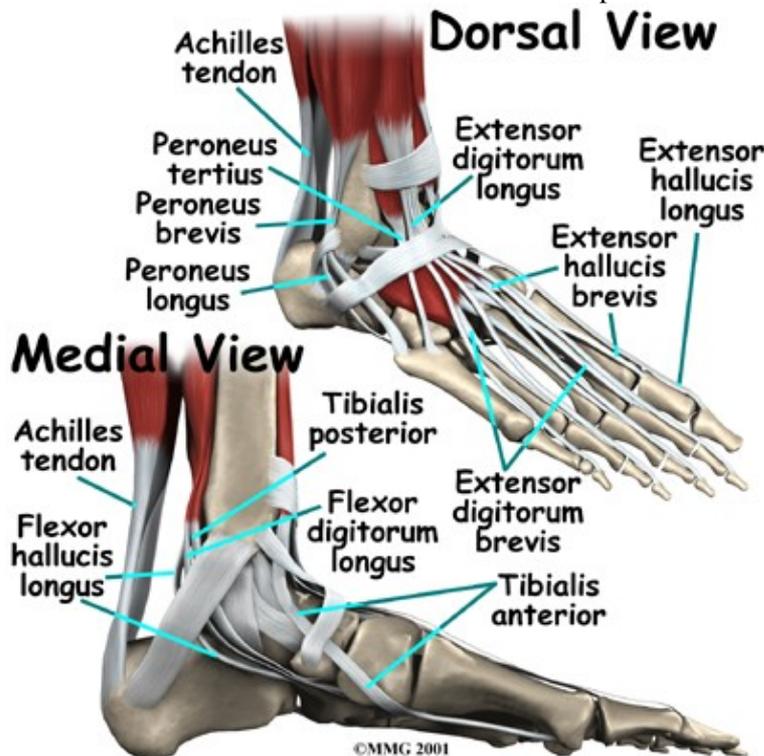
## Ligaments and Tendons

*Ligaments* are the soft tissues that attach bones to bones. Ligaments are very similar to *tendons*. The difference is that tendons attach muscles to bones. Both of these structures are made up of small fibers of a material called collagen. The collagen fibers are bundled together to form a rope-like structure. Ligaments and tendons come in many different sizes, and like rope, are made up of many smaller fibers. The thicker the ligament (or tendon) the stronger the ligament (or tendon) is.

# Collagen



The large Achilles tendon is the most important tendon for walking, running, and jumping. It attaches the calf muscles to the heel bone to allow us to raise up on our toes. The *posterior tibial*



*tendon* attaches one of the smaller muscles of the calf to the underside of the foot. This tendon helps support the arch and allows us to turn the foot inward. The toes have tendons attached that bend the toes down (on the bottom of the toes) and straighten the toes (on the top of the toes). The *anterior tibial tendon* allows us to raise the foot. Two tendons run behind the outer bump of the ankle (called the *lateral malleolus*) and help turn the foot outward.

Many small ligaments hold the bones of the foot together. Most of these ligaments form part of the *joint capsule* around each of the joints of the foot. A joint capsule is a watertight sac that forms around all joints.

It is made up of the ligaments around the joint and the soft tissues between the ligaments that fill in the gaps and form the sac.

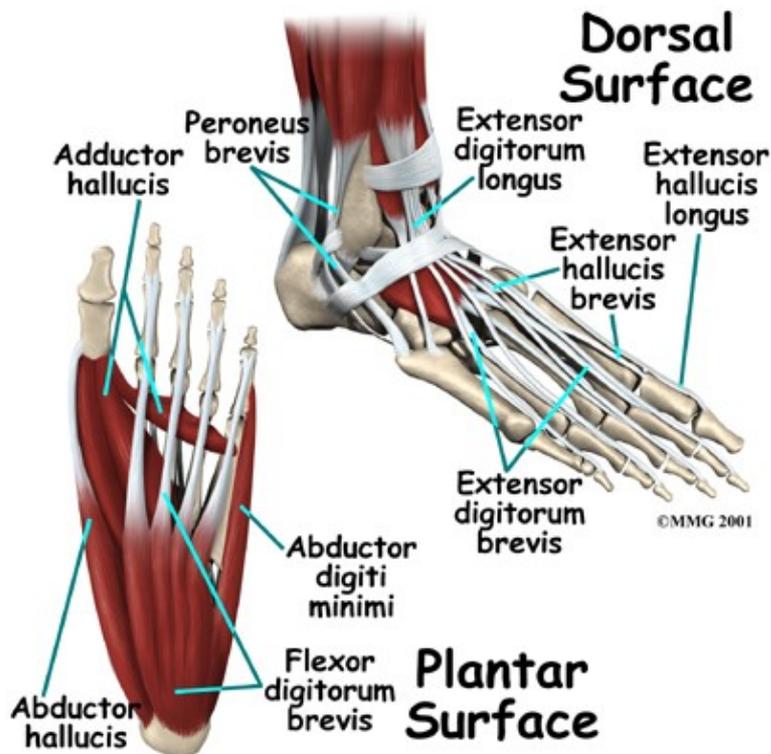
### Muscles

Most of the motion of the foot is caused by the stronger muscles in the lower leg whose tendons connect in the foot. Contraction of the muscles in the leg is the main way that we move our feet to stand, walk, run, and jump.

There are numerous small muscles in the foot. While these muscles are not nearly as important as the small muscles in the hand, they do affect the way that the toes work. Damage to some of these muscles can cause problems.

Most of the muscles of the foot are arranged in layers on the sole of the foot (the *plantar* surface). There they connect to and move the toes as well as provide padding underneath the sole of the foot.

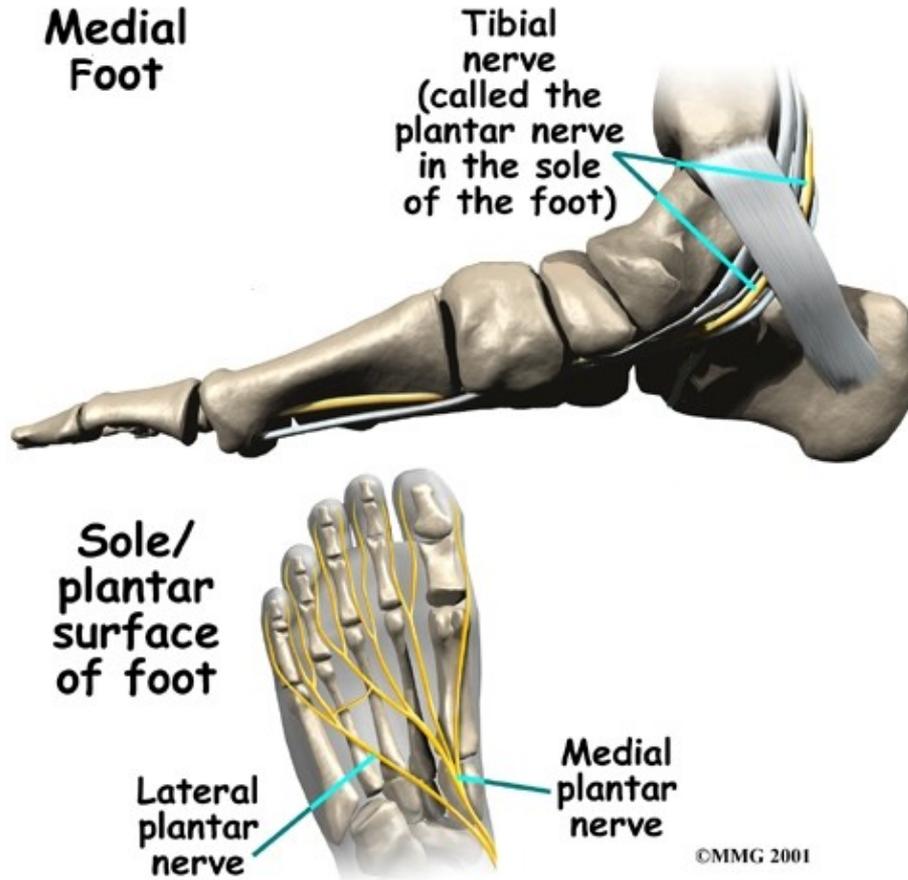
## Foot Muscles



### Nerves

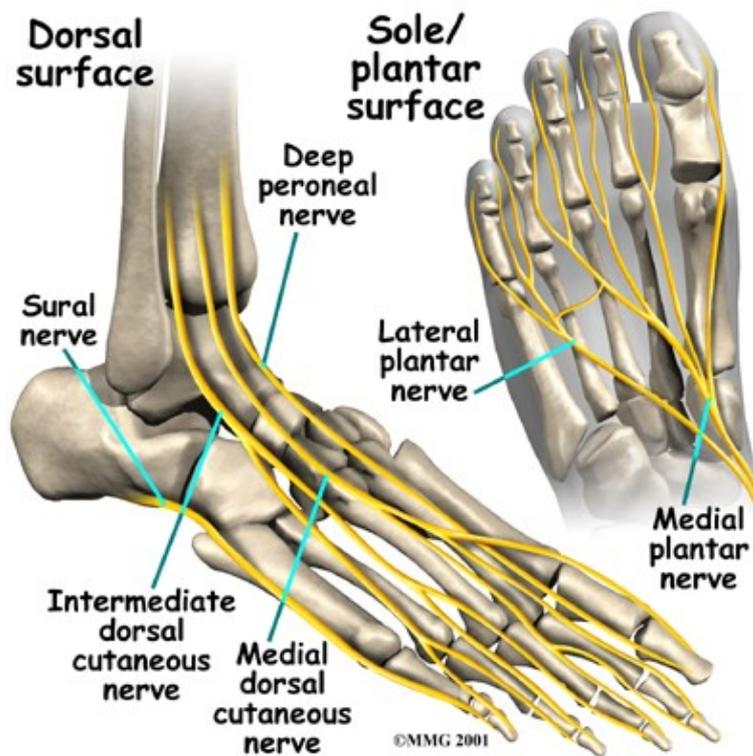
The main nerve to the foot, the tibial nerve, enters the sole of the foot by running behind the inside bump on the ankle, the *medial malleolus*.

## Tibial Nerve



This nerve supplies sensation to the toes and sole of the foot and controls the muscles of the sole of the foot. Several other nerves run into the foot on the outside of the foot and down the top of the foot. These nerves primarily provide sensation to different areas on the top and outside edge of the foot.

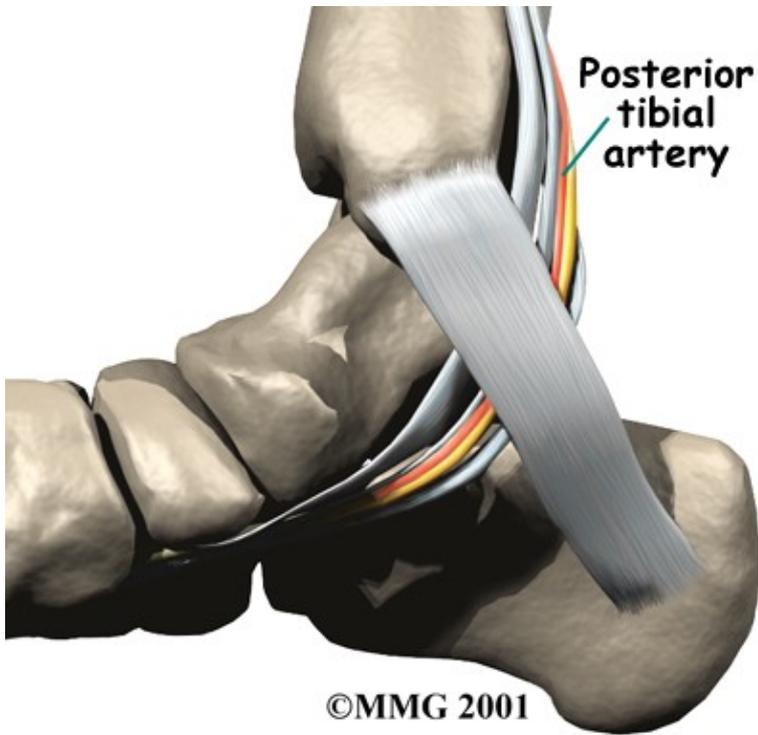
## Other Nerves



## Blood Vessels

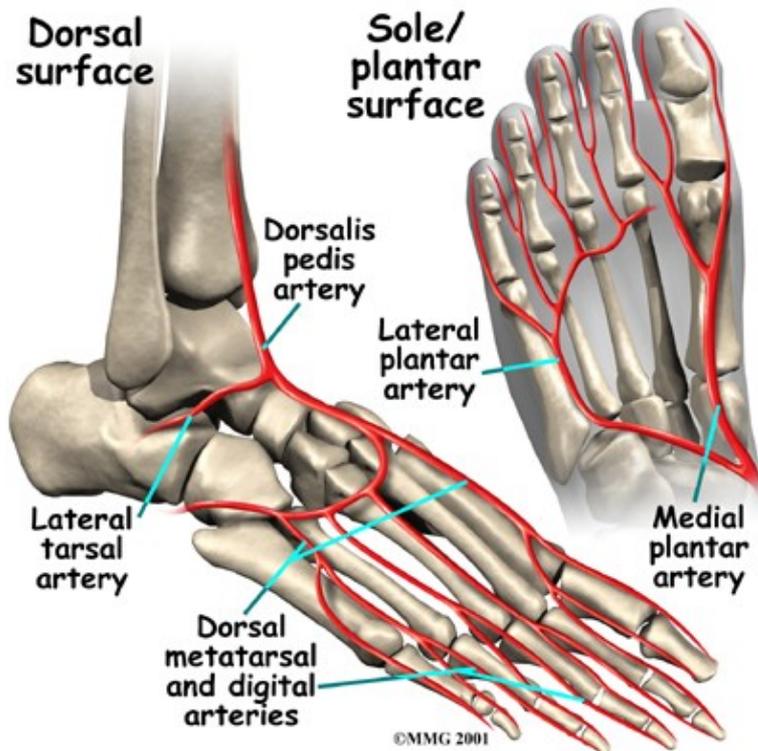
The main blood supply to the foot, the posterior tibial artery, runs right beside the nerve of the same name. Other less important arteries enter the foot from other directions.

## Posterior Tibial Artery



One of these arteries is the dorsalis pedis that runs down the top of the foot. You can feel your pulse where this artery runs in the middle of the top of the foot.

## Dorsalis Pedis



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