teresa n. tobin, dpm ira d. meyers, dpm a.j. donley jr., dpm gina d. khoury, dpm
montgomery podiatry associates
tel 215.938.7725 fax 215.938.7990

NINE NIFTY EXERCISES TO STRENGTHEN AND STRETCH THE FOOT AND LEG MUSCLES

Basics

- All strengthening exercises require use of a rubber tube or theraband or something equivalent
- All strengthening exercises start with both feet together
- The heels remain together and the forefoot of each foot is then separated from one another

Basics Continued

- Separate feet slowly and bring back to start position slowly (total time per repetition is about 2-3 seconds).
- Do 10 repetitions of each exercise

Peroneus muscle/tendons

- Peroneus longus and peroneus brevis muscle/tendon
- Are the 2 muscle on the outside of the foot and leg
- Start with heels together and separate at the forefoot

Peroneus one

- Feet start together with toes facing towards the ground
- Separate at the forefoot

Peroneus One

Holy Redeemer Professional Park 727 Welsh Road, Suite 203 Huntingdon Valley, PA 19006

teresa n. tobin, dpm ira d. meyers, dpm a.j. donley jr., dpm gina d. khoury, dpm
montgomery podiatry associates
tel 215.938.7725 fax 215.938.7990

Peroneus Two

- Same as Peroneus one, except feet start with toes facing upwards

Peroneus Two

Posterior Tibial Muscle

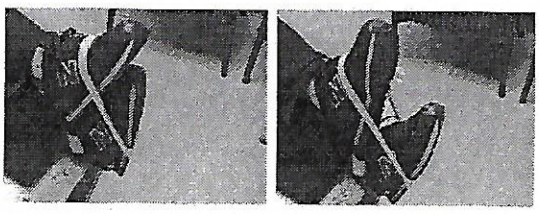
- Start with one foot crossed over the other
- Separate at forefoot
- For exercise number 4 reverse positions

Posterior tibial Muscle

Anterior Tibial Muscle and Calf Muscles

- Start with one foot on top of the other
- Bring one foot towards your head (for the anterior tibial muscle)
- Bring the other foot towards the ground (for the calf muscle)
- For exercise 6, switch feet.

Anterior tibial and calf strengthening exercises



Holy Redeemer Professional Park 727 Welsh Road, Suite 203 Huntingdon Valley, PA 19006

teresa n. tobin, dpm ira d. meyers, dpm a.j. donley jr., dpm gina d. khoury, dpm
montgomery podiatry associates
tel 215.938.7725 fax 215.938.7990

Calf stretching

- Start with knee straight and rubber tubing/theraband around the foot
- Gently pull the foot towards you. Hold for 3 seconds
- Repeat 10 times

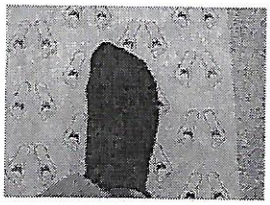
Achilles and plantar fascia stretching

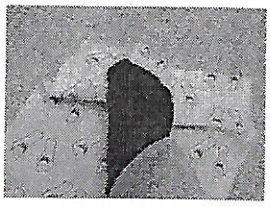
- Same as calf stretching, except bend your knee.
- You should feel more of a stretch in your achilles and on the bottom of your foot.
- To better isolate the plantar fascia, pull on your big toe using your hand instead of the rubber tubing

Strengthening the small muscles of the foot

- Toe curls
  - Use a towel
  - Place towel on the ground and slowly pick it up with your toes.
  - May be done sitting or standing.
  - If you can't pick the towel up, slowly crunch your toes to try to move the towel (about 2-3 seconds)
  - Do this exercise 25 times twice daily

Toe Curls





Holy Redeemer Professional Park 727 Welsh Road, Suite 203 Huntingdon Valley, PA 19006

Is it Plantar Fasciitis?

Many runners experience heel pain. In most cases, when a runner does have heel pain, s/he thinks that the diagnosis is plantar fasciitis. Many times the diagnosis is in fact plantar fasciitis. However, about half of the runners that I see who think they have plantar fasciitis, have something else.

The plantar fascia is a thick ligamentous structure that connects the heel to the forefoot. There are 3 small intrinsic muscles that also start at the heel and connect to various parts of the forefoot (abductor digiti minini, flexor digitorum brevis and abductor digiti quinti). Since these little muscles are in fact muscles they can spasm or cramp just like the hamstring or calf muscle.

If the plantar fascia is inflamed, then plantar fasciitis is present (itis= inflammation). Problem is there is a lot of variability of how thick the plantar fascia can be. A routine xray is questionably diagnostic. An mri may be more definitive, but much more expensive and often of limited use in treatment. There are 3 bands of the plantar fascia (medial—inside of foot, middle and lateral- outside of the foot). Anyone or all 3 can become problematic.

If the plantar fascia becomes painful for more than 1 month, it is probably starting to degenerate. When that starts to occur, it is called plantar fasciosis. This is similar to a tendon that starts to degenerate. That is called tendinosis. A rubber band is a good analogy. As a rubber band ages, it starts to lose its elasticity and starts to get small tears. That is essentially occurring with fasciosis.

Calcaneal (heel) stress fractures can also mimic plantar fascial pain. The key diagnostic clue is to squeeze the sides of the calcaneus. If that produces pain, a stress fracture may be present. Xrays are rarely helpful. MRIs or bone scans can be used to rule out a stress fracture, but a positive test doesn't always mean that a stress fracture is present.

Nerve entrapments can also mimic plantar fascial pain. A nerve can be entrapped as it exits the spinal cord, in the gluteal region (usually sciatica), around the outside of the knee, the inside of the ankle (tarsal tunnel syndrome) or within the muscle layers in the foot (Baxters neuritis). Physical exam, history and specific diagnostic studies are used to evaluate for these conditions.

Several other possibilities exist that may cause heel pain/plantar fascia type symptoms. Calcaneal bone tumor benign or malignant, systemic diseases such as diabetes, several types of arthritis are some examples. About 100 years ago, the most common cause of heel pain was syphilis.

The main point is to try to establish the correct diagnosis. Once that is done treatment can be initiated. If your symptoms are not responding to treatment, the diagnosis may need to be reevaluated.

Other Causes of Heel Pain

Ira Meyers, D.P.M.

Most runners first thought of heel pain is plantar fasciitis/heel spur syndrome. In most cases that is the correct diagnosis. A quick review of plantar fasciitis is that it is a strain of the plantar fascia. The heel spur forms as a result of the plantar fascia "pulling" on the heel. The plantar fascia connects the calcaneus (heel bone) to the forefoot. Usual symptoms include pain on the bottom of the heel and/or arch area. The heel spur is usually not the cause of the pain. This is the most common running injury affecting the foot. There is an abundant amount of information on the internet about plantar fasciitis. However, there are several other causes of heel pain.

Calcaneal stress fracture:

Pain may be on the side of the heel and/or on the bottom. Xrays usually are normal. A positive bone scan or MRI MAY rule in a calcaneal stress fracure. A negative bone scan and/or MRI rules out the possibility of this.

Treatment usually consists of a period of no running (usually 3 weeks) with or without a cast (depends on clinical presentation and studies).

Calcaneal cyst:

A benign bone cyst occurs less than 1% of the time. And when it is present it is often asymptomatic. But \it may be symptomatic and more importantly, it may cause the bone to weaken. Malignant cysts are even more rare, but do occur.

Xrays will show a cyst, but further studies are needed to evaluate it and treat it.

Posterior tibial tendinopathy

The posterior tibial tendon runs along the medial (inside, same side as the big toe) side of the ankle. Its main insertion is the navicular. This can present in varying degrees. MRI is often used to assess the degree of tendinopathy. This can be a lengthy topic by itself. So, for now, if pain is present along the medial side of the rearfoot, consider the posterior tibial tendon.

Peroneal tendinopathy

The peroneal tendons are on the lateral (outside) aspect of the ankle and foot. Swelling may or may not be present. Pain usually follows the course of the tendon. As the peroneus longus (not brevis) tendon progresses toward the toes, it makes a sharp turn under a square bone called the cuboid and the goes to the medial aspect of the foot. Peroneal/cuboid syndrome is sort of a type of peroneal tendinopathy. Pain can be quite advanced, even though minimal swelling is present.

Tarsal tunnel syndrome

Most people have heard of carpal tunnel syndrome. Tarsal tunnel is the foot equivalent. Signs and symptoms usually include more of a burning type of pain on the bottom of the heel that may radiate into the forefoot or toes.

Radiculopathy

This refers to pain originating in the back. A herniated disc at L5/S1 will often cause pain in the heel. Remember that the nerves in the foot start in the back.

Peripheral artery disease

This refers to poor circulation. Not a common cause of heel pain in runners since circulation is usually good. But this is a common cause of foot pain in patients with poor circulation.

Peripheral neuropathy

There are well over 100 diseases that can effect the nerves supplying the foot. Some are systemic (eg, such as diabetes), familial (eg, charcot marie tooth), idiopathic (isolated cause with nonspecific origin), environmental (lead poisoning) and the list goes on.

Any type of neuropathy can present with heel pain either by itself, or more commonly as part of other symptoms.

Diagnosis often requires multiple tests such as MRI, nerve conduction studies and blood tests.

Baxters neuritis

This refers to an entrapment of a small nerve on the bottom of the foot near the origin of the plantar fascia.

Diagnosis is mostly attained by history and symptoms and by ruling out other possibilities.

It is not uncommon to diagnose plantar fasciitis and have Baxters neuritis and vice versa.

Arthritis

There are several types of systemic arthritis (eg, rheumatoid arthritis, lupus, gout, etc) and also degenerative arthritis.

Many types of arthritis may present initially as heel pain.

Diagnosis is by history, symptoms (both in the heel and other areas), imaging studies and blood tests.

The most unusual cause of heel pain that I've heard about—trichnosis. A patient had pain in the heel that was very consistent with plantar fasciitis, but did not respond to usual treatment and ended up having surgery. A fasciectomy (excision of part of the plantar fascia) was done. The biopsy revealed that the fascia became infected with trichnosis (parasite sometimes found in sushi). Patient was then treated with an appropriate anti-parasitic agent and 1 month later was healed.

I was hoping to demonstrate that not all heel pain is plantar fasciitis. This is by no means a complete list of other possible causes. When in the doctors office, you should not be afraid to ask questions and bring a history of your problem along with a list of medications. If your symptoms do not improve, remember there are often other causes.