Self-Tests of the Lower Leg

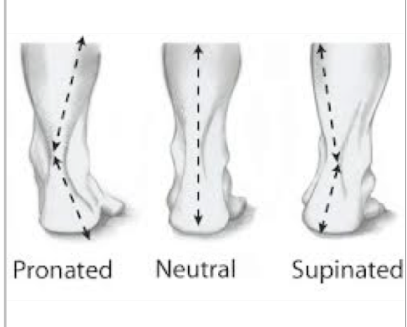
See red high-lighted questions for Self-Tests

The lower leg assessment gives you an understanding of postural alignment, range of motion, stability, strength, and function of the lower leg (calf, ankle, and foot). Issues with any on of these (flat feet, arch arches, pronation, etc.) could impact lower leg function. Exercises and strategies will be included to help restore and/or maintain leg health. If you have pain talk to your doctor.

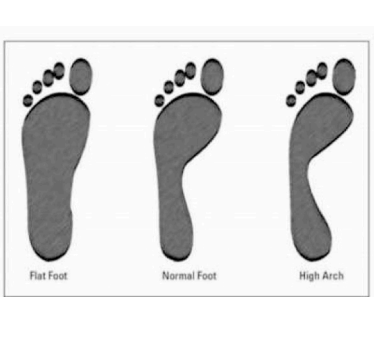
Posture/Stability and Lower Leg Health

Do you have normal lower leg posture? It is essential for foot, knee, hip, and low back health.

Feet Standing (pronated, supinated, normal): Look at your feet and heels from the rear. **What does your feet resemble the most compared to the picture?** Understand foot pronation and supination by reading more below.



Plantar Aspect of Foot (normal, flat, high arch): What kind of arches do you have? Standing shoulder width apart and look down at your feet. Does there seem to be an equal size arch on each foot and does the second toe line up with the knee cap; this is considered normal. If the arch drops where it is flat to the ground then you may have flat feet (no arch-pes planus). Opposite to this is where there is a high arch; where you feel the weight of your body on the outer aspect of the foot (high arch-pes cavus). Both conditions make you more susceptible to injury. Look at your arch while you walk and run as well. **A great test is the wet test that you can do yourself. See below, right.**



UNDERSTAND: What is Pronation?

Pronation refers to the inward roll of the foot during normal motion and occurs as the outer edge of the heel strikes the ground and the foot rolls inward and flattens out. A moderate amount of pronation is required for the foot to function properly, however damage and injury can occur during excessive pronation. When excessive pronation does occur the foot arch flattens out and stretches the muscles, tendons and ligaments underneath the foot.

UNDERSTAND: What is Supination?

Supination (or under-pronation) is the opposite of pronation and refers to the outward roll of the foot during normal motion. A natural amount of supination occurs during the push-off phase of the running gait as the heel lifts off the ground and the forefoot and toes are used to propel the body forward. However, excessive supination (outward rolling) places a large strain on the muscles and tendons that stabilize the ankle, and can lead to the ankle rolling completely over, resulting in an ankle sprain or total ligament rupture.

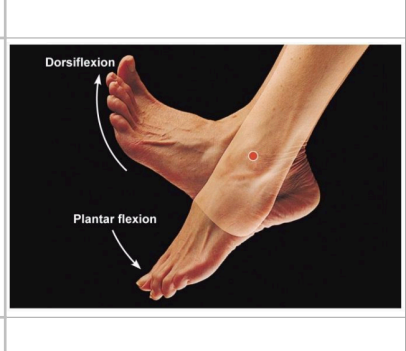
Wet Test: Another easy way to understand your feet is to wet the bottom of one foot and then step onto a flat surface. A flat foot will leave a fat, almost complete footprint. A normal foot will show about half of the arch. You can use the same technique while walking and running to see if problems exist while moving.

Flexibility and Lower Leg Health

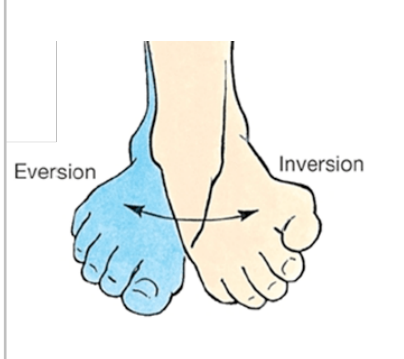
Tightness in the calf muscles or tibialis anterior can place increased stress on the tibia during walking and running. Compare your flexibility on each leg.

Can your dorsiflex 10 degrees on both feet? Dorsiflexion is bringing your toes towards your shin.

Can your plantarflex 180 degrees on both feet? Plantarflexion is bringing your toes away from your shin.

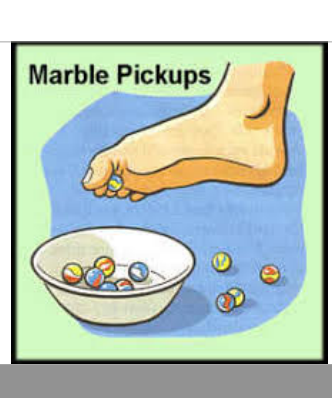


Can you invert and evert 10 degrees on both feet? Inversion is brining your toe inward, while eversion is bringing your toe out? Inward and outward movement at the ankle is also important (inversion and eversion), again compare left and right and work on correcting any differences.



Stand on a stair while facing up the staircase. Hang your heel over the edge and let it go below the level of the stair. If this causes pain, stop the test. If your heel goes below the level of the stair without causing strain in your calf, your flexibility level is adequate. If there is some strain, you can correct it with flexibility exercises. **Do you have normal standing calf flexibility?**

Can you pick up a marble or small dishtowel with just your toes? This test assesses your toe flexibility and ability.

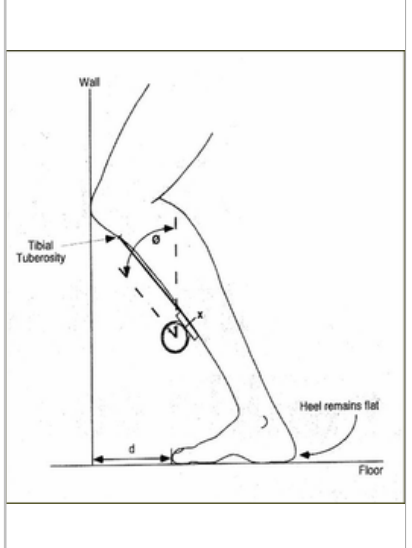


UNDERSTAND: A lack of or too much flexibility may impact foot and knee heath. If an area is found to be too tight stretch that area. If an area is too flexible strengthen that area. There should also be balance between the right and left sides of your body in terms of strength and flexibility. Both sides should be about the same. **Pain is a sign of dysfunction. If you have pain seek medical attention.**

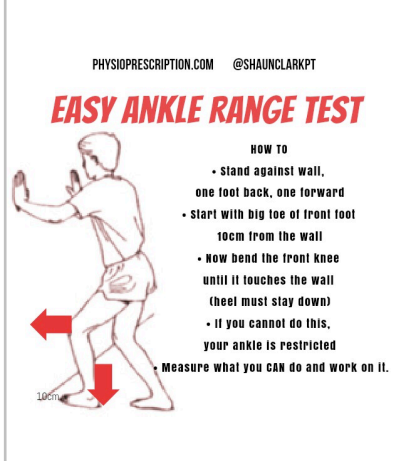
Ankle Mobility and Lower Leg Health

UNDERSTAND Ankle Mobility – if your ankle is stiffer on one side this can have an affect on running gait and biomechanics. For example, ankle dorsiflexion (upward movement) is essential during impact, if the ankle is stiff in this movement the foot often compensates by over pronating. This can increase bone load in the tibia or fibula. One way to test ankle dorsiflexion is the knee to wall lunge test, this is linked to calf muscle tightness as well as joint stiffness (see wall lunge test below).

The Wall (Lunge) Test for ankle mobility- Do this test on yourself (need a ruler). Keeping foot flat find the greatest distance from the wall that you can keep your foot flat and where the knee can touch wall. Record distance - ideal is 6 or more inches.



UNDERSTAND THE LUNGE TEST: This test easily shows whether you are at risk of lower limb injury. It is very reliable and accurate, even when done by nonprofessionals, and it is one of the most common tests used in Physiotherapy. If your range is LESS THAN 10 cm (approx. 4"), that is not good enough and needs to be worked on. Note: if you are naturally a very flexible person, you should be aiming for 15cm (approx. 6"). STUDY: After a "battery" of musculoskeletal tests, a study found that only ankle dorsiflexion range of movement, measured using the weight-bearing lunge test was significantly associated with sustaining a lower extremity injury.



Ankle Strength and Lower Leg Health

UNDERSTAND Muscle Weakness – strong muscles help to absorb the impact involved in walking and running. Those muscles need not only strength, but also the endurance to keep working mile after mile. Look for any areas of muscle weakness in the leg. Compare both sides, check the calf (with repeated toe raises and heel raises-see tests) the quads (repeated single knee dips) the glutes (repeated clam, side lying leg lift, or single leg bridge) and the hamstrings (repeated hamstring curls in standing). You can also compare using weight machines for a more accurate measure (see various tests in this assessment and the knee our assessment).

Dorsiflexion Test for Shin Splints Strength: If your anterior shin pain increases when lifting your toes up while keeping heels on the ground – you are likely to suffer from anterior shin splints. Perform this test with heels on the end of a step. Let toes drop to the floor stretching the front muscles of the shin. Lift toes back up and repeat additional reps till fatigue or pain. If you can do many reps without pain you probably do not have shin splits. If you have pain this same test is a great exercise to strengthen the front of your shin. **A good repetition goal is 25, where < 10 is poor. How many toe lifts were you able to do? Was it adequate?**

Plantarflexion Test for Calf Strength: You need to have an adequate amount of strength in your calf to function normally. Perform this test with balls of feet on the end of a step. Let heel drop to the floor stretching the back muscles of your lower leg (calves). Lift heels back up and repeat additional reps till fatigue or pain. If you can do 25 reps without pain you have a normal degree of calf musculature ability (see test). If you have pain this same test is a great exercise to strengthen the back of your lower leg. A good repetition goal is 25, where < 10 is poor. **How many heel lifts were you able to do? Was it adequate?**

Gait and Lower Leg Health

Poor walking and running form – Excessive hip adduction (the hip moving in towards the other leg during running) and over pronation during running have been linked with stress fractures and other lower limb issues. Poor control of impact on landing could also lead to increased bony stress. Basically it is best to land mid-foot when you run and walk (especially when you have heel pain). **How do you walk and run? Are you up on your toes, do you land mid foot, or are you a heel striker?** Again, having your gait analyzed could help identify this, but realize 5 minute jog on a treadmill may not see how your gait changes when you're fatigued after running a distance. **Video yourself from the front and side to see what your body is doing. See Running and Walking check list to understand how you are doing or make an appointment with us.**

Palpation and Lower Leg Health

Palpation –Heel, Calf, and Achilles Cord discomfort can be caused by stress placed on the plantar fascia ligament and Achilles Tendon when it is stretched irregularly from improper and over use, which causes small tears and inflammation. You can feel for it by palpating the areas shown in the diagram. **Did you have pain along the ligament, muscle, or tendon when you palpate the area? If you do have pain do not neglect it for pain is a sign that something is wrong. A great way to stimulate blood flow to decrease pain is through massaging the area that is painful with a cross friction stroke. This should decrease pain and not increase it. Always go light.**

Movement Control and Lower Leg Health

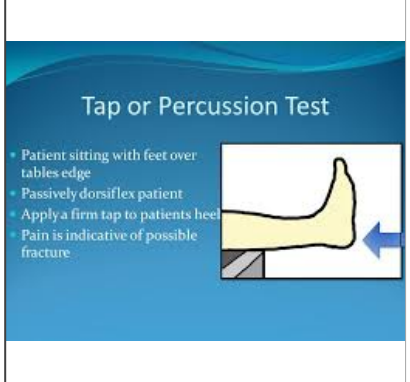
Movement control – With good movement control the ground reaction force is dissipated throughout the leg (I.e. a number of muscles, tendons, ligaments, bones and joints deal with the impact of running). If movement control is poor this can place greater stress on certain areas. Check your single leg balance and single leg dip and compare left and right (see balance and dip tests below).

Single Leg Balance-raise one leg to 90 degrees, close eyes, a good score is the ability to hold for >30 seconds, compare left and right-should be the same. **Did you have good balance?**

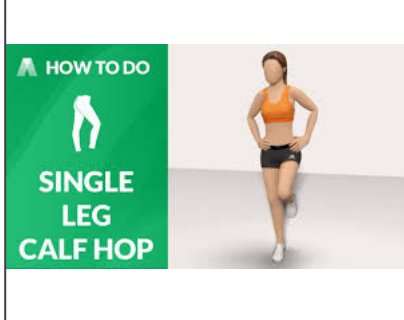
Single Leg Dip-while holding on dip down to 45 degrees, good goal is 10 reps, poor is below 5 repsCompare left and right they should be the same. **Did you have good leg dip ability?**

Stress Test and Lower Leg Health

Tap or Percussion Test -This test is used to determine Stress Fractures. Performing the Test: The subject should not be wearing shoes. The trainer then strikes the heel of the patient. A positive test is reproduction of the subject's pain. Importance of Test: Our bones are covered by a layer of tissue known as the periosteum. It is highly innervated and very sensitive to injury. When a bone is fractured, the periosteum is more easily stimulated and thus pain is experienced. By striking the heel of the foot, a large vibratory/compression force is sent through the limb that stimulates the injured site. **Did you feel pain when your heel was strike?**



Hop Test -Try hopping on one leg in the same spot for a few repetitions. **Did you feel pain when doing the single leg hop?** This is a good way to figure out if you have point tenderness because of a stress fracture or if your calf musculature is ready to go back to doing more physically demanding exercise or sport after injury. Carefully, hop a couple of times on the injured foot. If you have pain when you land, it could be a stress fracture. Swelling in the affected area is another common sign. Weakness is a sign that you need to do more conditioning before going back to a sport after an injury.



Big Toe Circulation, Sensation, Pain and Lower Leg Health

Assess the blood flow: Press down on the nail of your big toe until the color fades, about 5 seconds. Then let go and allow the blood flow to return to your toe. If you have average circulation, the return of normal color to your toe should take 2-5 seconds (from footcaremed.org). **Do you have average circulation?**

See Link

Evaluate sensation: Take a pencil eraser and run it on the top, bottom, and both sides of your feet. The sensation should feel the same on all sides of the foot. It may tickle on the bottom of the foot, which is normal. If you lack sensation in one area, repeat the test over the next few days. If you get the same result, talk to your doctor (from footcaremed.org). **Do you have normal sensation?**

Examine your level of pain: There should be no pain in the average, uninjured calf, ankle, and foot. If you do have pain, make sure to feel the parts to locate the exact position and source of the pain. If the pain persists for more than a few days, make an appointment with your doctor (from footcaremed.org). **Do you have have no pain?**.