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STRETCHING EXERCISES

Stretching exercises are used to increase the flexibility of the muscles of the thigh and calf and of the plantar fascia itself. Tightness in the muscles of the leg can result in disproportionate stress being applied to the plantar fascia during walking and running, increasing the risk of injury. Stretching exercises for the plantar fascia itself can increase the flexibility of the fascia and, thus, reduce the potential for damage. Five examples of stretching exercises with illustration follow:

A. WALL GASTROCNEMIUS STRETCH

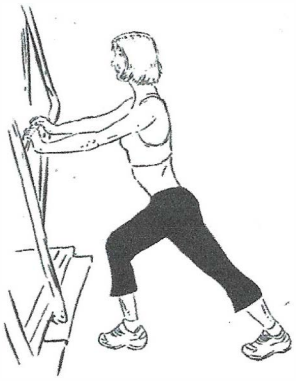

Figure 2: Wall Gastrocnemius stretch

The gastrocnemius is one of the major muscle groups in the calf. To stretch this muscle, place your hands against the wall and stand with both feet flat on the floor, one foot forward of the other (Figure 2). Keep the rearmost leg straight and the foot pointed straight ahead. Lean forward without arching the back, placing your weight on the forward leg while bending it at the knee. You should feel a stretch in the mid-calf of the straight leg. Hold the stretch for 10-15 seconds, release, and then repeat 6-8 times. Reverse the position of the legs and then stretch the other leg.

B. STAIR GASTROCNEMIUS STRETCH

Figure 3: Stair stretch

The gastrocnemius can also be stretched using a simple exercise that can be performed while standing on a stair (Figure 3). Stand with the ball of the foot on the edge of a stair and heels off the step. While holding the banister for balance, rise as high as possible on the toes and then lower yourself slowly as far as you can without rolling the foot inward or outward until you feel a stretch in the calf. Hold this position for 1-2 seconds and then repeat 10-20 times.

C. SOLEUS STRETCH

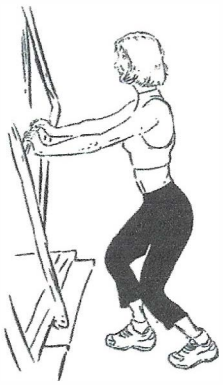

Figure 4: Soleus stretch

The soleus is the other major muscle in the calf. To stretch this muscle, assume a position similar to that for the gastrocnemius wall stretch but with both of the legs bent and the buttocks dropped (Figure 4). Make sure your feet are facing straight ahead and not turned out. Gently lean into the wall and keep your heels on the floor while bending both knees, putting a little more weight on the back leg. Continue until you feel stretch in the lower calf. Hold the stretch for 30 seconds and repeat 2-3 times on each side.

D. HAMSTRING STRETCH

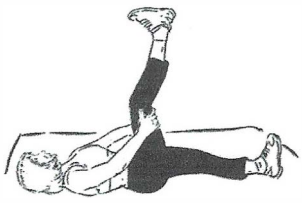

Figure 5: Hamstring stretch

The hamstring is a major muscle of the thigh that runs from just below the knee to the buttocks and lifts the lower leg and bends the knee. If the hamstring is too tight, the bend in the knee during walking and running is exaggerated, which, in turn, results in increased pull on the heel bone and too much tension in the plantar fascia.

To stretch the hamstring, lie with your back flat to the floor with your eyes focused upward. Grasp the back of the thigh with both hands and the leg bent, pull the thigh until it is perpendicular to the floor and then slowly straighten the knee (Figure 5). Repeat the exercise with the other leg.

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E. SEATED PLANTAR FASCIA STRETCH

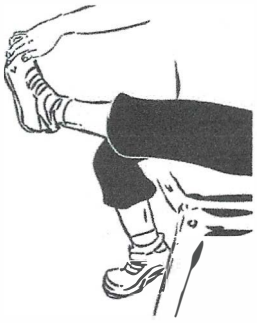

Figure 6: Seated plantar fascia stretch

During normal walking, the plantar fascia lengthens and then shortens as the foot lands. If the plantar fascia is insufficiently elastic repetitive lengthening and shortening can result in damage to the fibers of the fascia with subsequent inflammation. Exercises that stretch the plantar fascia can improve its flexibility and help it withstand the stresses that are placed on it without damage.

The plantar fascia can be easily stretched while sitting. Sit on a chair or on the edge of a bed with one leg crossed over the other (Figure 6). Place the fingers of the hand of the same side as the crossed leg across the base of the toes and pull the toes back toward the shin while keeping the leg steady until stretch is felt in the bottom of the foot. Repeat the exercise 5 times for each foot. This exercise is particularly effective when done before taking the first steps of the day and after prolonged sitting or inactivity.

F. ROLLING STRETCH

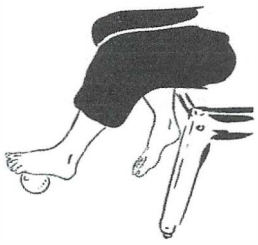

Figure 7: Rolling plantar fascia stretch

The rolling stretch (Figure 7) is another simple way to stretch the plantar fascia. To perform this exercise, sit on the edge of a bed and place your foot on a hard cylindrical object such as a plastic water bottle or a ball. Roll the foot over the object while maintaining pressure against it. Continue rolling for 30 - 60 seconds, stop, and then repeat for a total of 5 times. This stretch should be performed 3 times per day. For pain relief while performing the exercise, use a water bottle filled with cold water or chill the ball in the refrigerator prior to performing the exercise.

STRENGTHENING EXERCISES

These exercises are designed to strengthen the muscles in the foot and ankle that support the arch of the foot. Strengthening these muscles will take stress off the plantar fascia. All of these exercises are best done barefoot Three examples with illustrations will follow:

A. TOWEL CURLS

Figure 8: Towel curls

Lay a hand towel on an uncarpeted floor and place the bare foot on the towel (Figure 8). Keeping the heel on the floor, curl the toes, pulling the towel toward you. Continue pulling the towel with the toes until it is bunched under the arch of the foot. Repeat this procedure 10 times with each foot. As your feet get stronger, resistance can be increased by placing a soup can or other weighted object on the end of the towel.

B. TOE WALKING

Figure 9: Toe walking

With your body erect and your hands behind your back, walk on your toes with the toes pointed straight ahead (Figure 9). As the foot is placed down, allow the heel to come as high as possible before pushing off the ground. Taking very short steps, walk across the room. Repeat the exercise with the toes pointed outward 30° and then with the toes pointed inward 30°.