

## **ACHILLES TENDON INJURIES**

by Todd C. Battaglia, MD, MS,  
Syracuse Orthopedic Specialists, PC.

### ***What is the Achilles tendon?***

The Achilles is the large tendon at the back of the ankle that connects the calf muscles (gastrocnemius and soleus) to the heel bone (calcaneus).

### ***Statistics***

It is estimated that there are more than 250,000 significant Achilles tendon sports injuries in the U.S. per year. Of these, more than 110,000 prevented sports participation for between one event and one month, and 60,000 prevented participation for more than one month. At least 65,000 required emergency room treatment, a hospital stay, surgery, or therapy.

### ***Types of Achilles Injuries***

- **Tendinosis** (often called tendonitis): degeneration and breakdown of the Achilles with variable amounts of inflammation; in chronic cases, can lead to small tears (“microtears”) within the substance of the tendon.
- **Tenosynovitis**: inflammation of the tissue sheath that surrounds the tendon; can occur with, or lead to, tendinosis.
- **Retrocalcaneal Bursitis**: inflammation of the fluid-filled cushion (bursa) under the Achilles tendon; often associated with tendinosis.
- **Achilles Rupture**: a partial, or often complete, tear of the tendon.

### ***Symptoms***

Tendinosis, tenosynovitis, and bursitis usually come on gradually, without specific injury, and continue to worsen until treated. Symptoms often start with stiffness and creaking when first getting out of bed in the morning. Lightly pinching the Achilles tendon will indicate soreness. Achilles tendinosis is a common injury among middle and long distance runners.

Achilles tendon rupture is a partial or complete tear of the Achilles tendon. It usually comes on suddenly, sometimes with a popping sound, and is debilitating. There is bruising, swelling, and inability to raise up on toes or push off with the foot. Partial and full Achilles tendon ruptures are most likely to occur in sports requiring sudden stretching, such as sprinting, basketball, and racquet sports. Partial Achilles tendon tears are also common among middle and long distance runners. Achilles tendon ruptures are most likely to occur to middle age athletes who have not been training or who have been doing relatively little training.

### ***Causes***

The most common cause of Achilles injury is physical overexertion – too rapidly increasing running speed, running mileage or terrain difficulty. The athletic activity by itself is not the problem, the problem is doing too much too quickly, or resuming too quickly after a layoff.

There are numerous other factors that may contribute to the development of Achilles problems.

- Age: tendons, including the Achilles, tend to lose flexibility with age
- Limb Malalignment: unequal leg length, over- or under-pronation, tight or weak Achilles tendons
- Improper Footwear: shoes with too much or too little arch support, too little heel support or cushioning, high heels
- Medications: (1) the Quinolone group of antibiotics (e.g. Ciprofloxacin) is used to treat infections, but may weaken some people's tendons. This can lead to soreness, or even rupture. (2) Cortisone (a steroid) may indirectly cause tendon injury, by making a weakened Achilles feel too comfortable. A patient who has received cortisone shots in or near the Achilles tendon may be able to overly stretch or strain their Achilles tendon without any pain – until they stretch or strain it to the point of rupture.

### ***Treatment***

- Avoid activities that cause pain.
- Ice the heel several times a day.
- Take nonsteroidal anti-inflammatory medications (for example, ibuprofen).
- Try over-the-counter or custom heel wedges to help decrease the stress on the heel.
- Try ultrasound treatment during physical therapy to reduce inflammation.
- Gentle exercises to improve flexibility and strength around the ankle.

If these treatments don't work, your health care provider may offer more aggressive treatments, such as immobilization in a boot or cast, formal physical therapy, or injection of a small amount of steroids into the bursa. After the injection, you should avoid stretching the tendon too much because it can break open (rupture). Rarely, surgery may be needed to remove and/or repair inflamed bursa and tendon tissue.

### ***When to seek medical attention***

A physician should evaluate any tendinosis or tendon pain that has not improved with home treatment, or has kept you from your desired activities for more than 2-3 weeks. Any suspicion of Achilles rupture should be evaluated by a physician without delay.

### ***Prevention***

Exercise regularly. If you have not been working out regularly, check with a doctor before starting, and if you are not familiar with how to work out properly, read some fitness and workout books before starting, and/or consult with a trainer.

Avoid smoking, which weakens tendons.

Exercise on soft surfaces. Soft surfaces are easier on the muscles, joints, and tendons. Grass courts are better than clay courts. Floors with cushioning or mats are better than hardwood floors. A dirt or grass trail is better than a sidewalk. Overly soft surfaces are bad, however - a surface is too soft if the heel sinks lower than the rest of the foot and overstretches the Achilles (i.e. soft beach sand).

Increase your exercise level in small increments. Pay particular attention to the need for gradual, rather than sudden increases in the distance, speed, and incline (steepness) of walking, stair climbing and running. Gradual increases also apply to the frequency and power of the sudden starts needed in racquet sports and sprints.

Wear the right shoes and sports shoes. Biomechanical issues can often be addressed by wearing the right shoes. Consider having your athletic shoes properly fitted at a runner's store.

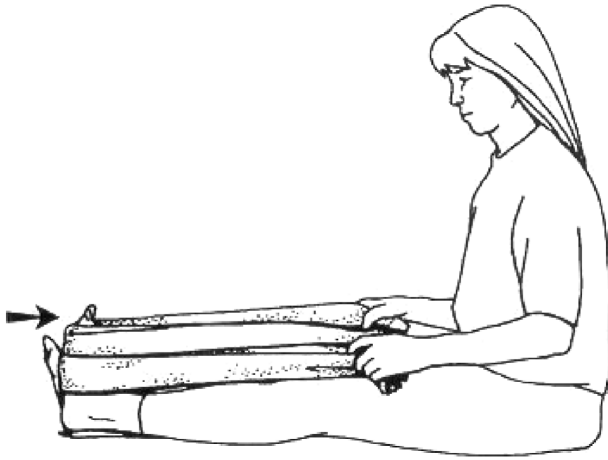
Warm up before stretching or exercising. The term "warm up" should be taken literally: exercise muscles a little to heat them up just prior to stretching or exercise. Spend a minimum of ten minutes on warm-up activity, such as brisk walking, light lifting, bicycling, or easy volleys prior to racquet sports.

Strengthen the leg muscles, particularly the calf muscles. Many people with Achilles injuries have disproportionately weak calf muscles. Leg exercises can be done without any equipment, with an elastic band pull, with free weights, or with exercise machines. Of particular benefit to the calf muscles the Achilles tendons are calf raises and ankle band pulls.

Stretch between warming up and exercising, and then again after exercising. Although there is some controversy about the value of stretching, many professionals believe that stretching helps prevent injury and that flexibility is a key component of fitness. As part of a stretching program, also consider light massage. Massage may reduce muscle and tendon tightness, promote healing, reduce the time muscles need to recover from exercise, and increases flexibility. Use the fingers to massage the Achilles tendons. Use a rolling pin (or similar commercial device) for the calf muscles.

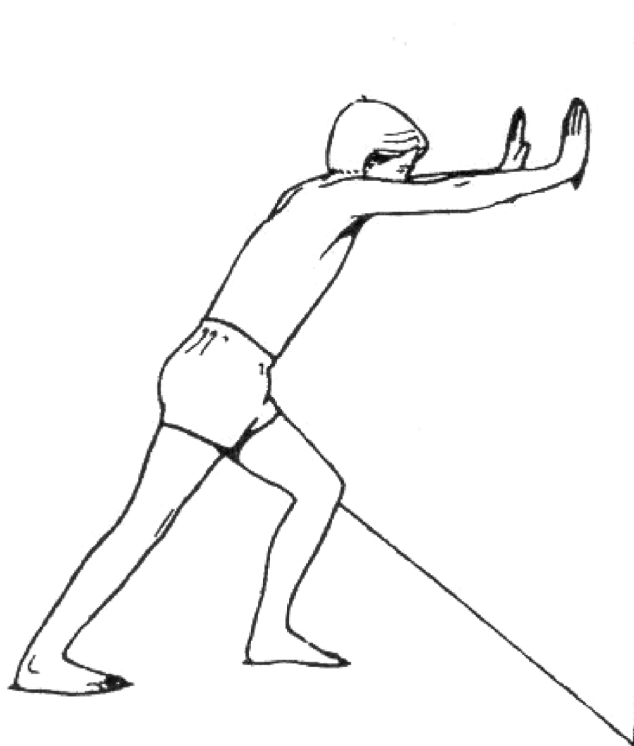
***TOWEL CALF STRETCH***

Sit with knee straight and towel looped around foot. Gently pull on towel until a comfortable stretch is felt in calf.



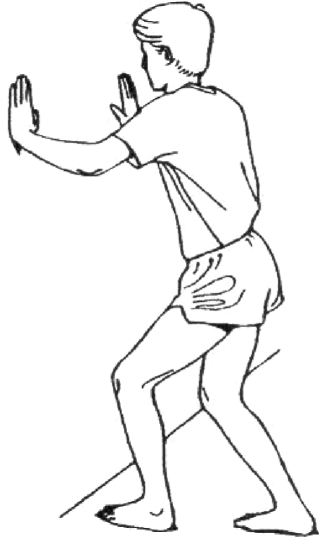
***GASTROC STRETCH***

Keep back leg straight, heel on floor with foot turned slightly outward. Lean toward wall until stretch is felt in calf.



***SOLEUS STRETCH***

Stand with both knees bent, and involved foot back. Gently lean into wall until stretch is felt in calf.



***STANDING HEEL RISE***

A strengthening exercise. Rise up on balls of both feet, focus on slowly lowering heels to ground. Repeat.

