

## Foot Breakdowns

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You probably take them for granted, but a healthy pair of feet is a runner's best friend. The average runner's feet hit the ground 2,400 times per kilometer. With each stride, your foot absorbs a force several times your body weight, they land, roll forward and push off. Over and over and over again. Your foot has 26 bones, 33 joints and 112 ligaments and with this complex combination of bones, joints and ligaments, your feet can and do get injured. Prevention is the best policy – stay strong with taking time to stretch before and after your run, include stretching all the muscles that lead into the foot – Achilles tendon, hamstring and calf muscles. Never stretch to the point of pain. While running a good rule of thumb is if you have severe pain and/or swelling –Stop! Do not continue to run. Twinges, run with caution, it is usually an early sign of a bothersome condition; seek preventive treatment from a registered chiropodist or podiatrist. Completely pain-free – Go and enjoy your run!

The causes of all the below conditions is usually poor biomechanics of the foot. Factors such as extreme pronation (foot rolls inward excessively), supination (foot rolls outward excessively), or leg length discrepancy can lead to injuries. I've listed only a few of the most common foot breakdowns, please do hesitate to visit our [website](#), [email](#) or call (905.845.4817) our office for more information on stretching, prevention and treatment.

### Achilles Tendinitis

Treatment involves reducing the stress on the tendon by controlling the amount of pronation the foot goes through and elevating the heel. This is accomplished with the use of an orthotic. Occasionally cortisone injections are also used. Tendons attach a muscle to a bone. (Ligaments run from one bone to another bone.) When a tendon is overly stressed, usually as a result of poor biomechanics coupled with increased mileage, a tendon can become inflamed. When the bones cannot stabilize properly, the muscles in the foot and leg try to make up the difference by working too hard for too long. Each muscle is designed to contract and relax while walking and running. Contracting for too long puts excess stress on the tendon and the sheath causing inflammation and pain. Severe trauma may cause tendon rupturing.

Controlling mechanics of the feet with an orthotic is essential in alleviating the symptoms. Rest, ice, massage and NSAIDs will also help to reduce the inflammation associated with tendonitis. Flexibility is also very important.

### Foot & Ankle Sprain/Strains

#### **Sprains**

Sprains are an injury to a ligament; the tough, fibrous tissue that connects bones to other bone. Ligament injuries involve a stretching or a tearing of this tissue. Sprains typically occur when people fall and land on an outstretched arm, slide into base, land on the side of their foot, or twist a knee with the foot planted firmly on the ground. This results in an overstretch or tear of the ligament(s) supporting that joint.

#### **Strain**

Strain is an injury to either a muscle or a tendon, the tissue that connects muscles to bones. Depending on the severity of the injury, a strain may be a simple overstretch of the muscle or tendon, or it can result in a partial or complete tear. Strains can be acute or chronic. An acute strain is caused by trauma or an injury such as a blow to the body; it can also be caused by improperly lifting heavy objects or overstressing the muscles. Chronic strains are usually the result of overuse - prolonged, repetitive movement of the muscles and tendons.

### Stress Fracture

Stress fractures are small cracks in bones that often develop from chronic, excessive impact and poor foot function. In runners, the bones of the midfoot (metatarsals) are especially prone to these fractures.

### Neuromas

A Neuroma is a nerve tumor (swelling) that occurs in the ball of the foot, between the metatarsals. A nerve courses between each of the metatarsal bones in the foot. When this nerve passes between the metatarsal heads at the ball of the foot, they will sometimes become pinched by a shearing force that occurs during pronation. This occurs most often between the third and fourth, or between the second and third toes. When the nerve is pinched, it becomes irritated, swollen and enlarged. Patients often will describe a burning or stabbing type

of pain in the ball of the foot. The pain will sometimes radiate into the adjacent toes of the foot. Transverse pressure while palpating the toe usually elicits pain. People will say they get relief from removing their shoes and massaging their foot, orthotics to control the underlying pronation and/or metatarsal pads can give relief.

### Plantar Fasciitis

The plantar fascia is a strong, fibrous material, which is located on the bottom of the foot. It runs from the ball of the foot to the heel, and is composed of three main sections. Pain from plantar fasciitis, (inflammation of the plantar fascia) can occur anywhere in the plantar fascia, but most commonly occurs on the inside corner of the heel. The most severe pain usually occurs when a person takes their first steps in the morning. When a person is off their feet for 6-8 hours at night, the plantar fascia will actually shrink or contract. With the first step in the morning, the fibrous band goes from a state of no tension to considerable tension, often resulting in severe pain.

As you walk, the fascia stretches out, and the pain will often diminish or go away completely. As the condition persists, it takes longer and longer for the pain to ease up. Eventually it never does. The primary cause of plantar fasciitis is excessive pronation.

The long term solution to this injury - 95% of the time - is a functional orthotic. By treating the true cause of the problem (the mechanics of the foot), surgery is rarely indicated.

### Bunions

Bunions are enlargements of bone on the first toe joint. Some of the causes may be footwear, disease, genetics and by our old friend, overpronation. They are a progressive deformity. You don't just wake up one morning and there it is. How fast it develops depends on the amount of excess foot motion a person is born with. The area will often become painful and red. Controlling the excess pronation can often take pressure off the first toe joint and help to relieve the pain, but it will not change the size of the enlargement. An orthotic can stop or slow down the progression of the deformity, but only surgery can remove the excess bone.

### Metatarsalgia

Metatarsalgia is a general term for pain in the area of the metatarsophalangeal joints (ball of the foot). Most common causes include Freiberg's disease, interdigital nerve pain (Morton's Neuroma- Interdigital nerve irritation), and capsulitis. Metatarsophalangeal joint (MPJ) pain usually results from tissue changes due to abnormal foot biomechanics. Sesamoiditis - is pain at the sesamoid bones beneath the head of the 1st metatarsal. Diagnosis for these conditions can be made within the clinical setting.

### Runner's Knee – Patellofemoral pain Syndrome

Runner's knee (patellofemoral stress syndrome) is a condition in which the kneecap (patella) rubs against the end of the thighbone (femur) when the knee moves. Normally, the kneecap moves up or down slightly without touching the thighbone during running. If the feet excessively pronate, the lower leg twists inward, pulling the kneecap inward, while the quadriceps muscles pull the kneecap outward. These opposing forces cause the back of the kneecap to rub against the end of the thighbone, resulting in pain. Often custom made foot orthotics is required to biomechanically assist the foot to perform correctly. The right type of running shoe is also important to alleviate knee pain.

If you experience painful foot problems it is recommended that you see a foot care specialist ~ chiropodist or podiatrist.

J. Richard Werkman is a Registered Chiropodist providing exceptional foot care for all ages. For more information or to schedule an appointment, contact him at 905.845.4817 or [info@werkman.ca](mailto:info@werkman.ca) [www.werkman.ca](http://www.werkman.ca).