

## Glossary of Foot & Ankle Terms

**Achilles tendon** - The Achilles tendon connects the three strongest flexor muscles of the leg to the foot. It is a tendon that connects the two heads of the gastrocnemius muscle and the deeper soleus muscle to the calcaneus, or heel bone. The Achilles can be felt in the back of the ankle and is just under the skin. This tendon is a common source of pain in runners and other athletes. [Achilles tendinitis](#), tendinosis and rupture are some common problems.

**Accommodative shoes** - Shoes designed specifically for comfort. An accommodative shoe usually fits the shape of the foot with a wide toe box and good arch support.

**Adducted foot or metatarsus adductus** - A pediatric condition where the front of the foot twists inward. Treatment may include special shoes, braces or surgery depending on the severity of the deformity.

**American Orthopaedic Foot & Ankle Society (AOFAS)** - A national medical specialty society of orthopaedic surgeons who specialize in foot and ankle care. With a large international membership, the AOFAS is the world's premiere society for foot and ankle surgeons. The society offers continuing medical education programs and sponsors research grants, humanitarian outreach and public education initiatives.

**Ankle instability** - Chronic, repetitive sprains of the ankle. This can be due to an injury that never healed properly, weak ankle ligaments or a heel that tilts inward (varus heel).

**Ankle joint** - The joint between the foot and the lower leg. The ankle joint allows the foot to move upward (dorsiflex) and move downward (plantarflex). It is made up of the two bones of the lower leg (tibia and fibula) and the ankle bone (talus). There are ligaments that hold the joint together on the inside (deltoid) and outside (lateral ankle ligament complex).

**Arthritis** - Arthritis typically refers to the wearing away of joint surfaces. Arthritis falls into one of three categories. Osteoarthritis is primary arthritis of the joint and may be related to family history. Traumatic arthritis develops after injury to a joint. Inflammatory arthritis occurs when a disease affecting the patient causes the cartilage to wear away. Treatment is determined based on the cause and extent of the arthritis and may include medication, bracing, physical therapy or surgery.

**Bunion** - A painful swelling or lump where the big toe meets the foot. Many people believe a bunion is a growing bone spur, but it is usually the result of an imbalance of the muscles that pull on the big toe, which causes the big toe joint to slip out of place.

**Bunionectomy** - A surgical procedure to remove the bunion and realign the big toe. Surgery may involve bone cutting (osteotomy) of one or more bones of the foot, removal of spurs around the joint and rebalancing of the tendons around the bit toe. Recovery time depends on the complexity of the surgery.

**Bunionette** - A painful swelling or lump where the little toe meets the foot. This may be a spur on the outside of the joint, or it may be related to the fifth toe joint becoming angled.

**Calcaneus** - The heel bone. There are two joints of the heel bone: the subtalar joint that allows motion with the ankle (talus) bone, and the calcaneocuboid joint, which has a complicated biomechanical function that controls flexibility of the foot and controls the arch of the foot. The Achilles tendon attaches to the back of the calcaneus, and the plantar fascia attaches to the bottom of the calcaneus.

**Callus** - Hard skin that grows in an area of increased pressure. Usually caused by an ill-fitting shoe.

**Cartilage** - Cartilage is a living tissue that lines our joints. It is a matrix of proteins and collagen that is tough, absorbs shock and is very smooth. Healthy cartilage can, and often does, last our whole life without problems. Disease of the cartilage or trauma can cause the cartilage cells to die. Unlike most tissues in our body, joint cartilage cells do not reproduce themselves once our skeletons are fully grown. Basic science and clinical research has led to recent innovations in cartilage transplantation and growth.

**Charcot joints** - Charcot joint typically refers to painless foot fracture and dislocation in patients who lack normal sensation or feeling in their feet. Loss of sensation in the foot for any reason can be responsible for developing a Charcot fracture, although it is most commonly seen with neuropathy. Neuropathy of the nerves that affect the foot is most common with diabetes but is associated with other diseases as well. Treatment depends on the severity of the condition and the amount of foot deformity that is present. Much research is focused on diagnosis and treatment of Charcot fractures in the foot and ankle.

**Claw toe** - Most deformities of the lesser toes are commonly referred to as claw toe. This is usually the result of muscular imbalance within the foot that causes the lesser toes to deform.

**Clubfoot** - Clubfoot is a condition where the foot is malformed at birth. Usually the foot is tightly and rigidly twisted downward at the ankle and inward at the heel and midfoot. Correction with stretching and casting can be effective, although sometimes surgery is necessary. This condition requires treatment by an orthopaedic foot and ankle surgeon and should be evaluated soon after birth.

**Congenital vertical talus (CVT)** - A condition where the foot is malformed at birth. The ankle bone (talus) is not formed correctly and this condition frequently requires surgery. The foot may have a reversed arch or "rocker bottom" deformity where the middle of the foot sits lower than the heel and toes. This condition requires treatment by an orthopaedic surgeon.

**Corns** - Corns are hardened areas of abnormal skin on the foot. They usually form in an area where there is increased pressure on the foot, most typically on the tops or sides of toes where a shoe pinches. Corns can also form on the sole of the foot when deformity of the toes is present, most commonly on the ball of the foot. An orthopaedic foot MD can pare down corns but they will return if footwear isn't changed.

**CT scan** - Also known as a computerized tomography scan, a CT scan is a special X-ray that uses X-ray images in conjunction with a computer to produce a series of two-dimensional pictures of the body. The CT scanner emits a series of thin X-ray beams that pass through the body at

different angles. The CT is very useful for looking at bones as it allows the physician to see the edges of the bone without shadows from other bones that are seen on X-ray.

**Cuboid** - The midfoot bone on the outside of the foot. This bone lies between the calcaneus and metatarsals. This bone may be crushed when the midfoot is injured. When this happens it's called a Nutcracker fracture.

**Cuneiform** - Three cuneiform bones are present in the foot: the medial cuneiform, the intermediate cuneiform and the lateral cuneiform. These are of primary importance in injuries to the tarsometatarsal joint or Lisfranc injuries.

**D.O. - Doctor of Osteopathy** - The D.O. degree means that the physician has successfully completed a four-year program in Osteopathic Medicine.

**Diabetic foot** - Diabetes affects the feet in a profound way and can lead to foot disease, fractures and ulcers. Diabetic foot problems may be the result of poorly functioning nerves (neuropathy), hardening of the arteries (atherosclerosis) and decreased resistance to infection (immunosuppression). Diabetic foot problems should be monitored carefully by the patient, a primary care physician and an orthopaedic foot and ankle specialist.

**Eversion** - Twisting out, away from the midline of the body.

**Extensor digitorum longus** - A foot extensor is a muscle that raises the toes or ankle. The extensor digitorum longus stabilizes the toes against the ground in push-off and propulsion.

**Extensor hallucis longus** - The extensor hallucis longus helps to stabilize the first metatarsophalangeal joint (where the toes meet the foot) and forefoot during push-off.

**Extracorporeal Shock Wave Therapy** - A new technology using shock waves to treat chronic, painful conditions of the musculoskeletal system. A shock wave is an intense but very short energy wave traveling faster than the speed of sound. The word extra-corporeal means "outside the body" and refers to the fact that the shock waves are generated externally.

**Fibula** - The most prominent bone on the outer side of the ankle that also extends to the knee.

**Flat feet** - Flat feet (pes planovalgus) can be present from birth (congenital) or develop with time (acquired). Congenital flat foot may be the result of a deformity of one or more bones in the foot, or a failure of the bones to separate during growth before birth (tarsal coalition). Sometimes it simply runs in families. Acquired flat foot is usually the result of injury, arthritis or a torn tendon (posterior tibial tendon). Treatment for mild cases may be shoe inserts (orthotics). More severe cases may require corrective bracing or surgery.

**Foot ulcer** - A breakdown of the skin in the foot. This is usually a problem with patients who have other diseases such as diabetes, rheumatoid arthritis, neuropathy, venous stasis or other long-standing medical problems. Ulcers can range from a superficial breakdown of the skin to deep ulceration that extends through muscle and bone. All ulcers need the care of a physician.

**Fracture** - A fractured bone is one that has cracked or broken. Bones are comprised primarily of calcium and are quite hard. A crack usually occurs as a result of an injury. In cases of abnormal bone structure, a fracture can occur after a very minor injury. Overuse can cause a [stress fracture](#). Displacement refers to the amount the two broken pieces have moved from each other. In nondisplaced fractures the pieces of bone haven't separated at all. Displaced fractures have some separation between the broken pieces. Some bones can heal properly even with a lot of displacement, but some fractured bones require surgery for even a small amount of displacement. Evaluation and treatment by an orthopaedic surgeon is necessary.

**High arches** - High arches (pes cavus) is a condition that can be normal or problematic. No two people have the exact same arch height and shape, and some high arches may not need treatment. High arches that are problematic are often related to the way the bones of the foot developed as a child, or sometimes high arches are the result of serious neurological conditions that require treatment. An orthopaedic surgeon can help you decide whether your arches are within the normal range or whether they require treatment.

**Hallux rigidus** - Arthritis of the big toe, specifically at the joint where the big toe meets the foot. Treatment may be with orthotics or surgery.

**Hammer toe** - Deformity of a lesser toe, usually resulting in a fixed position that can cause significant pain and discomfort with tight shoes. Treatment is by shoe modification or surgery.

**Heel cord stretch** - Stretching the Achilles tendon.

**Heel pain** - Pain in the heel can stem from a number of problems. The most common is [plantar fasciitis](#). Other pain-causing conditions include [Achilles tendinitis](#), [stress fracture](#), [peroneal tendonitis](#) and others. Your orthopaedic foot and ankle MD can help determine the specific cause of the pain and how to resolve it.

**Heel spur** - Heel spurs are commonly associated with [plantar fasciitis](#). On X-rays, they appear as a spur on the bottom or back of the heel bone (calcaneus). Surgical removal of the spur is usually not required for successful treatment of plantar fasciitis.

**Inflammatory arthritis** - Inflammatory arthritis occurs when a disease affecting the patient causes cartilage to die off. Treatment is dependent on the cause and extent of the arthritis and may include medication, bracing or surgery.

**Ingrown toenail** - As a nail grows in, it may catch at the inside or outside edge of the toe. When the nail begins to cut through the skin, it can cause an infection with pain, redness and pus. Treatment removes part or all of the nail. Prevention is the best treatment.

**Intoeing** - Intoeing means that the feet curve inward instead of pointing straight ahead when walking or running. If your young child has intoeing, he or she will probably outgrow the condition naturally.

**Inversion** - Twisting in toward the midline of the body.

**Lateral malleolus** - The end of the fibula, the most prominent bone on the outside of the ankle.

**Ligament** - A band of tissue that connects one bone to another, typically to support a joint. Ligaments are made primarily of collagen. Injury to a

ligament is referred to as a sprain.

**Lisfranc** - The ligament between the medial cuneiform and the base of the second metatarsal. Lisfranc injury is important because rupture can lead to significant arthritis of the midfoot.

**MRI** - Also called magnetic resonance imaging, MRI is a type of imaging study in which the patient lies in a large tube and the whole body or just a part is magnetized while pictures are taken. Both open and closed machines are available. Unlike X-rays that only show bones, an MRI is a three-dimensional picture showing soft tissues and bones. Ligaments, tendons, cartilage and muscles are shown and certain biologic conditions such as infection, avascular necrosis and bone bruises can be seen.

**Mallet toe** - Mallet toe is a deformity of a lesser toe similar to a hammer toe but with less of a curvature of the toe. Only the joint at the tip of the toe is flexed in a mallet toe. The condition may be present at birth (congenital) or may develop from wearing ill-fitting shoes. Mallet toe generally leads to a painful callus on the tip of the toe.

**Medial malleolus** - The most prominent bone on the inner side of the ankle.

**Metatarsalgia** - Pain under the ball of the foot.

**Metatarsophalangeal joint** - The joint where the toes meet the foot.

**Morton's Neuroma** - A nerve which is pinched in the forefoot. When longstanding, a "neuroma" or scarring of the nerve can develop. Symptoms include pain and foot numbness that radiates into the toes. Non-operative treatment is usually effective.

**M.D. - Medical Doctor** - The medical degree means that a physician has successfully completed a four-year accredited medical school.

**Navicular** - A boat-shaped bone in the midfoot. Two joints are present: the talonavicular joint, which has a complicated biomechanical function that controls flexibility of the foot and controls the arch of the foot; and the naviculocuneiform joint, which can be injured in midfoot injuries and can contribute to flatfoot deformity.

**Nail fungus infection** - Onychomycosis or fungal infection of the nail is a common condition affecting adults. Usually this results in thickening, discoloration and roughness of the nail.

**Neuroma** - An injured or damaged nerve.

**Neuropathic arthropathy** - Neuropathic or Charcot joint in the foot typically refers to painless fracture and dislocation of the foot in patients who lack normal sensation or feeling in their foot. Loss of sensation in the foot for any reason can be responsible for developing a Charcot fracture, although this is most commonly seen with neuropathy. Neuropathy of the nerves that affect the foot is most commonly seen with diabetes but is associated with other diseases as well. Treatment depends on the severity of the condition and the amount of deformity present. The [American Orthopaedic Foot & Ankle Society](#) funds research focused on diagnosis and treatment of Charcot fractures in the foot and ankle.

**Orthopaedics/Orthopedics** - The medical and surgical specialty focused on treating, repairing and reconstructing the human musculoskeletal system.

**Orthopaedist /Orthopaedic Surgeon** - A surgeon whose specialty is treating, repairing and reconstructing the human musculoskeletal system.

**Orthoses** - A brace or other external device used to support a joint or the foot.

**Orthotist** - A practitioner who makes and fits braces and devices to support a joint or the foot.

**Osteoarthritis** - Osteoarthritis is primary [arthritis](#) of the joint and may be related to family history.

**Outtoeing** - By age 2, most children walk with their toes pointed slightly outward. If the feet angle out excessively, this is called outtoeing. It is not as common as intoeing, but in most cases, it is also just part of normal development.

**Peroneal tendon** - The peroneal tendons are behind the outside bone of the ankle (the fibula). These two tendons move the foot outward in a direction called eversion. They balance the ankle and the back of the foot and prevent the foot from turning inwards repetitively. The peroneal tendons are susceptible to injury as the ankle turns, rolls or becomes sprained because they are not as strong as the muscles and tendons on the inside of the ankle.

**Phalanges** - Phalanges are the long bones of the fingers or toes.

**Plantar fascia** - Plantar fascia is a thin layer of tough tissue supporting the arch of the foot.

**Plantar fasciitis** - An inflammation of the plantar fascia. Symptoms are usually pain at the bottom of the heel with the first step in the morning. Nonoperative treatment is usually successful.

**Plantar warts** - Warts are a viral infection of the skin that causes lumps or outgrowths. Treatment varies by wart size and severity and may include destruction by freezing, heating, laser, surgical removal or other treatments. Referral to a dermatologist is often appropriate.

**Posterior tibial tendon** - The posterior tibial tendon and other supportive ligaments help maintain the arch of the foot. This tendon goes behind the ankle and around a bone inside the ankle called the medial malleolus.

**Rheumatoid arthritis** - One of the inflammatory arthritis diseases. This is an autoimmune disorder where the patient's immune system malfunctions and attacks cartilage and tendons.

**Sesamoiditis** - Inflammation of the small bones under the great toe.

**Sprain** - An injury causing tearing of a ligament. Sprains vary in severity and can range from a partial tearing of the ligament to a complete rupture.

**Sprained ankle** - A rupture of one or more of the ligaments that surround the ankle.

**Stress Fracture** - A crack in a bone resulting from overuse. This can occur in athletes who are trying to push their performance to a higher level, or in a non-athlete who suddenly increases the amount of walking in a day. Changing shoes, starting a new exercise program or dramatically changing the kind or amount of activity are often inciting events. Often stress fractures do not appear on normal X-rays for weeks or months. Most stress fractures heal of their own accord, although some are problematic due to their location or due to the blood supply of the involved bone. Stress fractures of the navicular bone, fifth metatarsal and tibial shaft are particularly problematic in athletes and may require surgery.

**Talus** - The ankle bone. This bone sits within the ankle "Mortise" or hinge that is made up of the two leg bones, the tibia and fibula. Three joints are present: the ankle, which allows the up and down motion of the foot with the leg; the subtalar joint, which allows inversion and eversion of the foot with the leg; and the talonavicular joint, which has a complicated biomechanical function that controls flexibility of the foot and the arch of the foot. The talus has no muscular attachments and is mostly covered with cartilage, which makes injuries to the talus difficult to heal.

**Tarsals** - Tarsal bone refers to one of the bones of the foot.

**Tendon** - A tendon is a structure in the body that connects muscle to bone. As the muscle contracts, it pulls on the tendon, which moves the bone. Tendons are made mostly of collagen. Inflammation of a tendon is called tendinitis. Tendons can tear or rupture if they are pulled too hard by the muscle or if they degenerate.

**Tendinitis** - Inflammation of a tendon. Most cases of tendonitis are caused by some type of injury, overuse or a mechanical abnormality in the foot or ankle. Treatment depends on the specific tendon involved, the extent of involvement and the length of time the symptoms have been present.

**Tendinosis** - A later stage of tendonitis where the tendon starts to fray and tear.

**Tibia** - The larger, medial bone of the leg that extends from the knee to the ankle.

**Tibialis anterior tendon** - The function of the tibialis anterior is to move the ankle upward. It stabilizes the foot in the latter part of the stance phase of gait and extends the foot at the beginning and middle portions of the swing phase of gait.

**Toe fracture** - A break in one of the bones of the toes.

**Toe walking** - A condition, most commonly diagnosed in children, in which walking is done on the toes. Some forms are not harmful and resolve of their own accord. Some forms are more serious and may represent an underlying neurological problem. All children who are toe walking should be evaluated by an orthopaedic foot and ankle specialist.

**Turf toe** - A sprain of the big toe joint that is usually the result of the toe bending upward violently. Complete rupture of the structures at the bottom of the joint may require surgery. Lesser injuries can be treated with immobilization and taping.

**Valgus** - A term meaning tilted outward or away from the midline of the body.

**Varus** - A term meaning tilted inward or toward the midline of the body.

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