

THE FEET & LEGS

YOGA ANATOMY

The Feet: Function

- The triangle-like shape of the foot provides the body with large, efficient, stable contact with the ground.
- The foot acts as a lever for locomotion and transmits thrust.
- The foot absorbs shock and helps distribute the load of gravity.

The Feet: Their Unique Domed-shape

- Each foot forms a half dome—taken together, these two halves create a full dome.
- The rim of the half-dome runs from the inner-heel, along the outer border of the foot to the ball of the foot
- This shape provides stable and adaptable contact with the ground—In other words, the domed shape allows the foot to respond to changes in ground.
- The half-dome is composed of two arches—one that runs the length of the foot from the front of the heel to the ball of the fee (longitudinal arch) and one that runs laterally from the base of the first two to the base of the fifth toe (transverse arch).
- Part of the unique nature of arches is that weight transmitted to an arch increases its stability and therefore reinforces its ability to bear weight. This is true for the arches of the feet as well.
- The combination of the half-domed shape and the arches adds stability and increases the ability to bear weight and absorb shock.

The Feet: Bones

- The basis of the dynamic load-bearing dome is its skeleton, the 26 bones of the dome of the foot. (Note: there are 2 additional sesamoid bones that are part of the tendons)
- There are 3 regions of the foot: the hind-foot, the mid-foot and the fore-foot
- 7 bones comprise the hind foot and mid-foot and 19 bones comprise the forefoot.
- The hind-foot requires large, thick bones that are stacked because this region receives the majority of weight bearing and ground force. The Talus and Calcaneus are the key bones of this region.
- The Mid foot transmits the load to the forefoot. This requires stout cubular type bones laid out in an arch configuration. These are the Cuboid, Navicular and 3 Cuneiforms.

- The forefoot disperses load of weight bearing and transmits thrust of locomotion. This requires long tubular smaller bones reflecting their action as levers. These are the 5 metatarsals, and 14 phalanges.
- There are over 30 synovial joints in each foot.

The Feet: Plantar Fascia

- Plantar fascia is thickened fascial tissue that connects the hind-foot to the fore-foot on the Plantar surface.
- In addition to the bones, the plantar fascia is the key structure that helps maintain the 2 arches of the and the domed shape of the foot.
- This fascia stabilizes the arch and it produces dynamic tension that maintains the dome shape of the foot.
- Extending the toes adds tension to the fascia and increases the stability of the arch. Intrinsic muscles of the foot (muscles that live in the foot and do not cross the ankle) also add tension.

The Feet: Muscles

- There are 2 types of muscles in the feet: intrinsic and extrinsic. Intrinsic muscles live in the feet and do not cross the ankle. Extrinsic muscles cross the ankle joint, living on both the feet and lower legs.
- Intrinsic muscles help tension the plantar fascia and maintain the transverse arch
- Extrinsic muscles support the bones of the arch and provide power to the foot.

The Feet: Additional Dynamics

- The dynamic functions of the foot are predominantly accomplished through the combined actions of the HindFoot (Subtalar joint) and the MidFoot (midtarsal joints) The predominant motion of the Subtalar joint is rotation.

The Lower Legs: Overview and Function

- The tibia and fibula comprise the lower leg column
- The lower-leg has 3 primary functions. First, it provides additional height for the entire body. Second, it provides motion by acting on the ankle joint and providing a location for muscles and tendons that are essential for the knee and ankle. Third, it transmits gravitational load and force to the foot.
- Alignment of this column, is a critical effective motion and force transmission.

The Leg: Muscles

- The Extrinsic muscles of the foot originate on the lower leg.
- The cylindrical construct of the leg creates a muscle sleeve that can be divided into 4 compartments: the anterior compartment, the lateral compartment, the superficial posterior compartment and the deep posterior compartment.
 - The anterior compartment is comprised of the tibialis anterior, extensor digitorum longus and extensor hallucis longus.
 - The anterior compartment extends the toes, elevates (dorsiflexion), the foot and inverts the foot.
 - The lateral compartment is comprised of the peroneus longus and the peroneus brevis.
 - The lateral compartment everts the ankle and assist with plantar flexion.
 - The superficial posterior compartment is comprised of the gastrocnemius, soleus, and plantaris.
 - These muscles into the largest tendon of the body, the Achilles tendon which inserts into the calcaneus and is the major plantar flexor of the foot. It is also the major shock absorber of ground forces as we strike the heel when walking or running.
 - The deep posterior compartment is comprised of tibialis posterior m, flexor digitorum longus, and the Flexor hallucis longus.
 - This compartment plantar flexes the feet and flexes the toes.