5- FOOT

Bones , Muscles, Ligaments, Nerves

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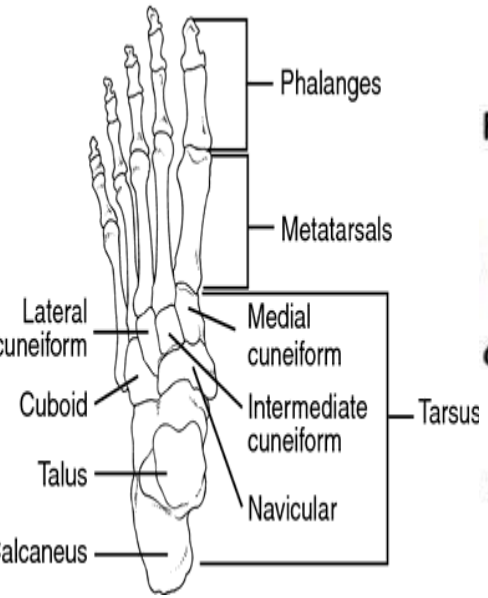
BONES OF FOOT : TARSAL, METATARSAL & PHALANGES

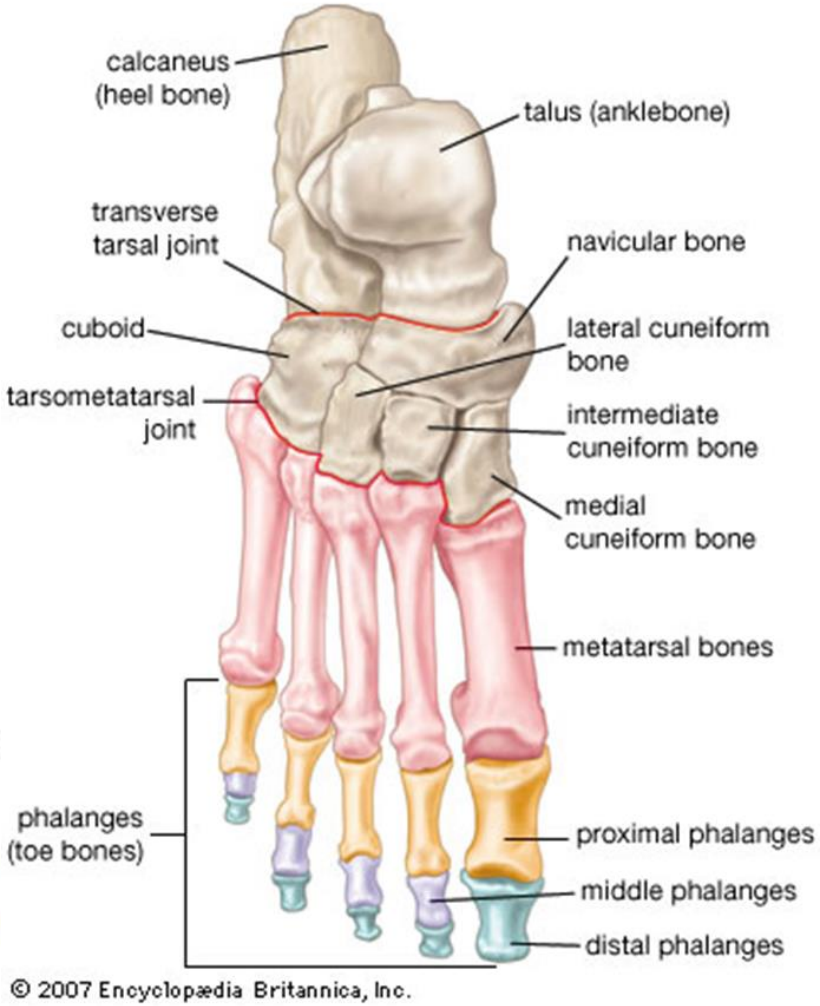
The human foot is a complex structure containing 26 bones, 33 joints and more than 100 tendons, muscles, and ligaments . It is the terminal portion of a lower limb which bears weight and allows locomotion.

- 7 tarsal bones(**tarsus**): the seven bones composing the **ankle joint**, including the **talus** (ankle bone), **calcaneus** (heel bone), **navicular** bone (like a little boat), **cuboid** bone (cube shaped), and medial, intermediate, and lateral **cuneiform** bones.
articulation between the foot and the leg .

- 5 Metatarsal bones

- 14 Phalanges (toe bones).

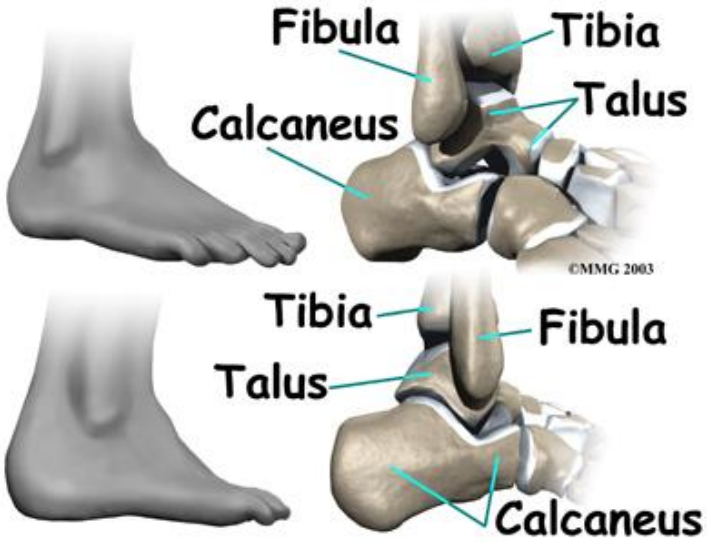


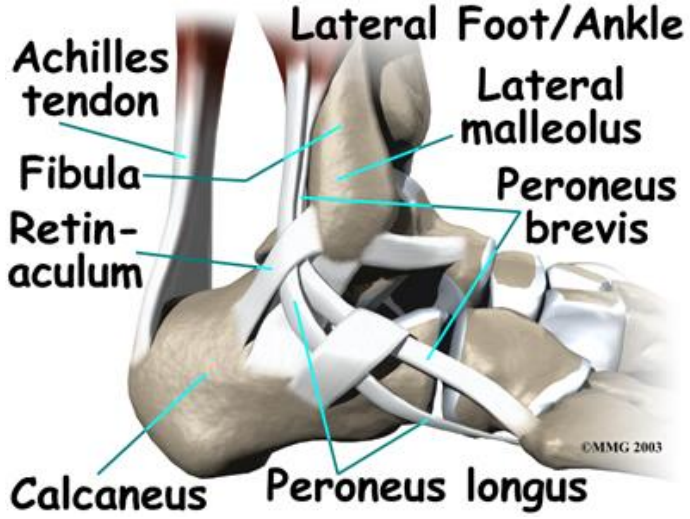


Tarsal bones(tarsus)

-Talus is the only bone that articulates with the fibula and tibia to form the ankle joint [talocrural joint]

-During walking the talus distributes about half the weight to the calcaneus the rest to the other tarsal bones





* Metatarsus

- 5 metatarsal bones: numbered I - V (1- 5) medial to lateral

- Each has a proximal base, an intermediate shaft and a distal head-articulate proximally with the first second and third cuneiform bones and the cuboid to form the **tarsometatarsal joints**

-Articulate distally with the phalanges to form the **metatarsophalangeal joint**.

* phalanges (digits)

-Numbered I – V medial to lateral

-Each phalanx : proximal base, intermediate shaft and distal head.

-Hallux: has two phalanges(proximal & distal)

-Other toes have three phalanges: proximal, middle and distal

-**Interphalangeal joints**(between phalanges).

Muscles of Ankle and Foot

The muscles acting on the foot can be divided into two distinct groups; extrinsic and intrinsic muscles .

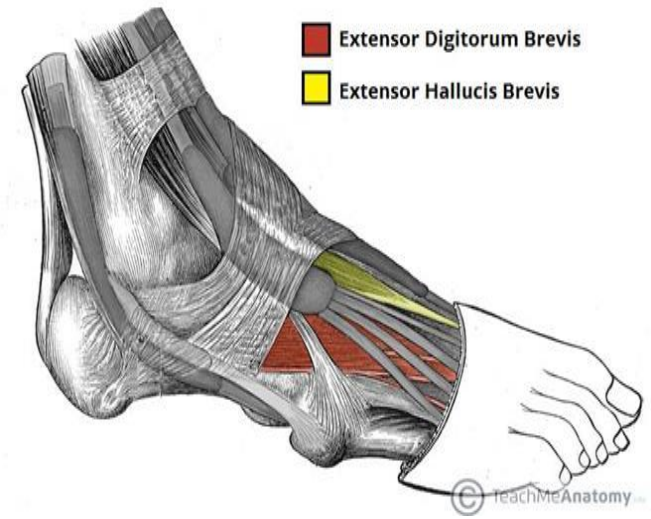
Dorsal Aspect

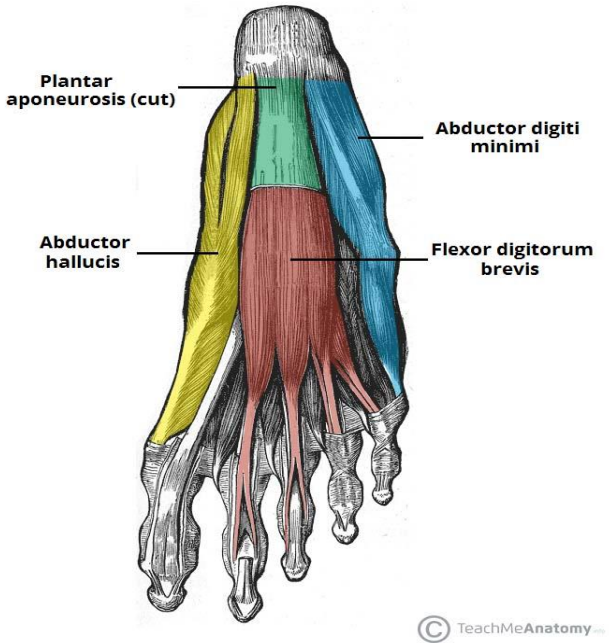
many of the extrinsic muscles attach to the dorsum of the foot, intrinsic muscles– **the extensor digitorum brevis,** and **the extensor hallucis brevis.**

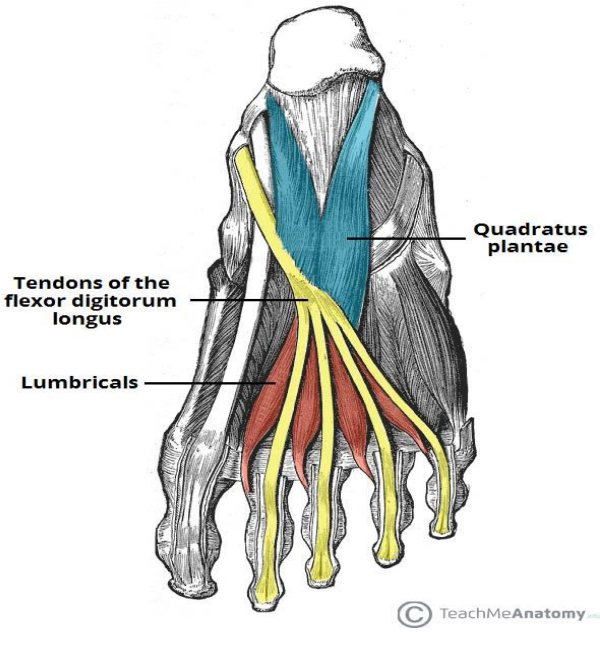
Plantar Aspect

There are 10 intrinsic muscles located in the sole of the foot. They act collectively to stabilize the arches of the foot, and individually to control movement of the digits. All the muscles are innervated either by the **medial plantar nerve** or **the lateral plantar nerve**, which are both branches of the **tibial nerve.**

The muscles of the plantar aspect are described in four layers (superficial to deep)







Ligaments of foot

- Primary ligaments of ankle include

- medial ligaments :

1- Deltoid ligament

2- Calcaneonavicular ligament (Spring L.)

- Lateral ligaments :

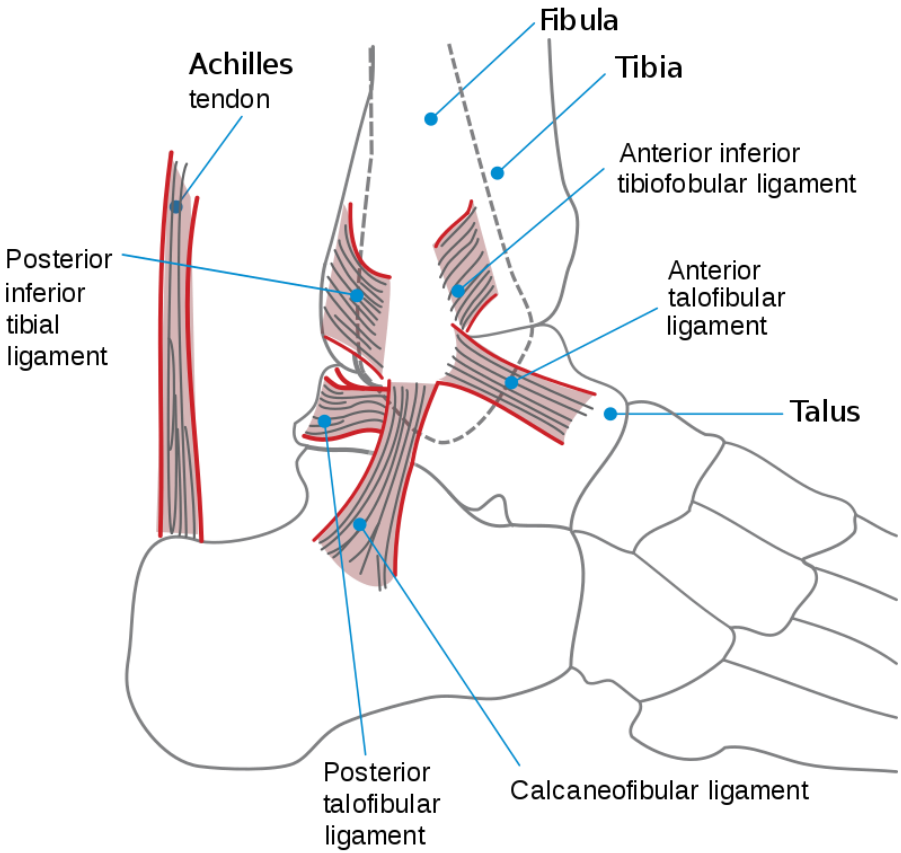
Syndesmosis consists of three bands:

1- Anterior talofibular ligament

2- Calcaneofibular ligament

3- Lateral talocalcaneal ligament

- Posterior talofibular ligament



The main tendon of the foot is the **Achilles tendon,** which runs from the calf muscle (gastrocnemius m.) to the Calcaneus bone (heel bone). The Achilles tendon makes it possible to run, jump, climb stairs and stand on your toes.

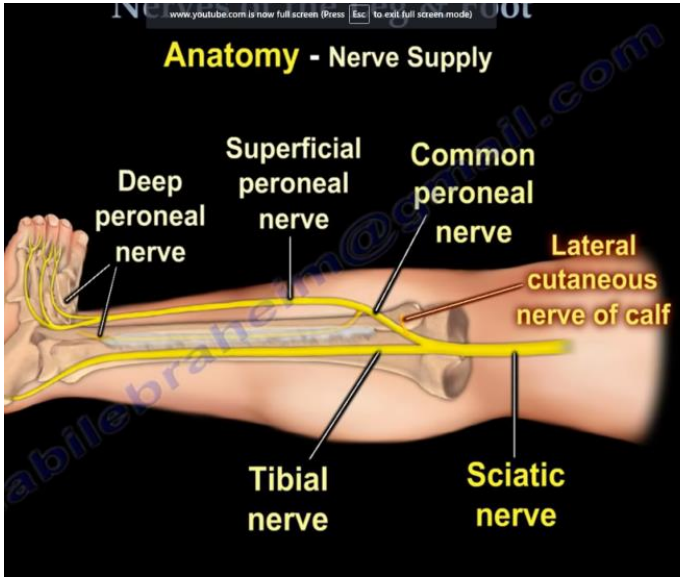
Nerves of the Foot and the Ankle

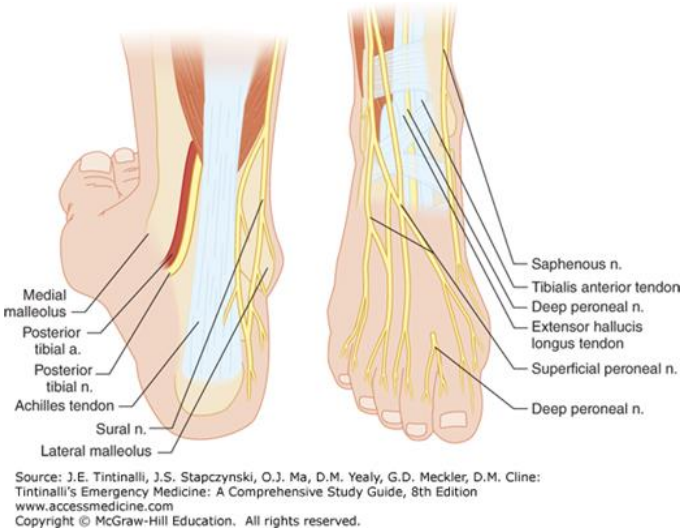
1- Tibial nerve: This nerve is a branch of the sciatic nerve. It runs down the leg, between the heads of the gastrocnemius m., and passes under the soleus m. . It curves under the **medial malleolus** and continues into the foot. It innervates all the muscles in the posterior compartment of the leg.

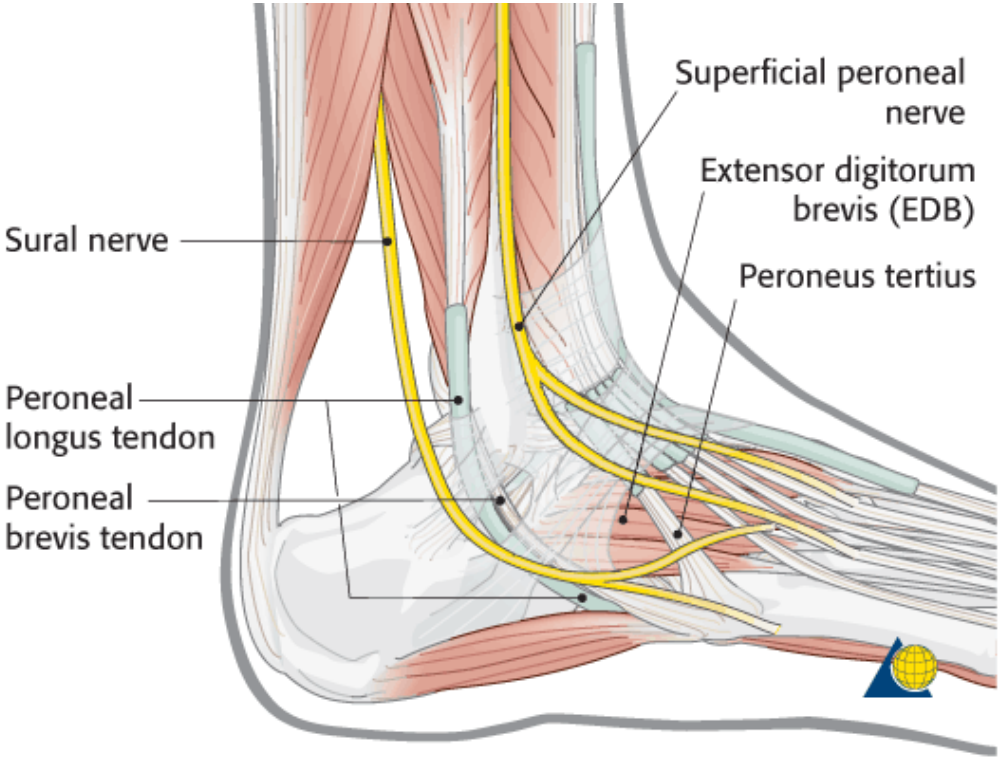
2- Common fibular (peroneal) nerve: This nerve branches of the sciatic nerve in the popliteal region (behind the knee). It travels posterior to the head of the fibula to enter the lateral compartment of the leg deep to the fibularis longus m. . Here it divides into the **superficial and deep fibular nerves**.

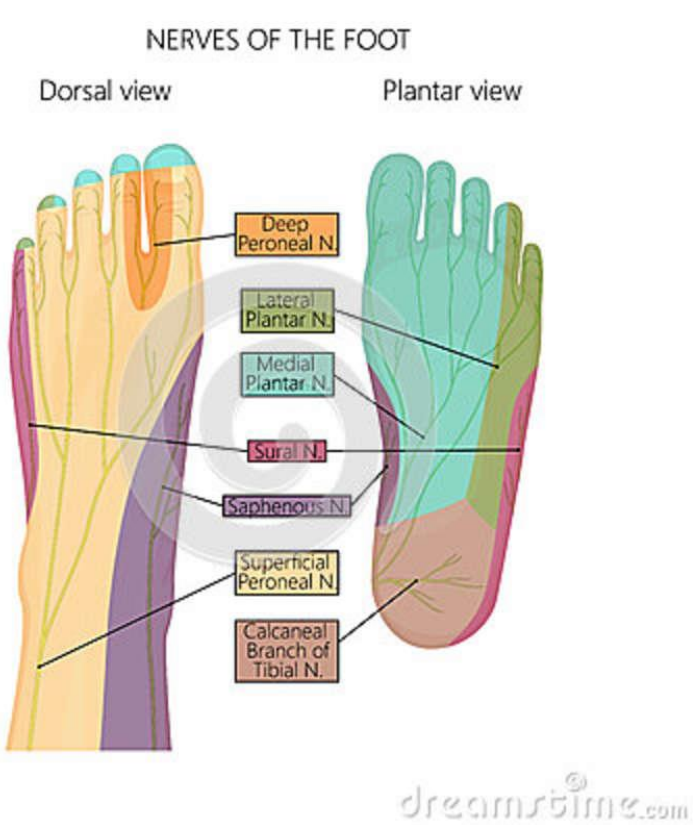
3- Sural nerve: This nerve (formed by the union of branches from both tibial and common fibular nerve) also runs between the heads of the gastrocnemius, but it runs under the **lateral malleolus**. It innervates the skin on the lateral side of the leg and foot.

4- Saphenous nerve: This nerve is a branch of the femoral nerve and runs down the medial portion of the leg to the medial part of the foot and innervates the skin on the medial side of the ankle and foot.









The tendons present in the fourth layer of the foot are
Peroneus longus and tibialis posterior