Popliteal fossa,
Posterior compartment of leg
&
Sole of foot

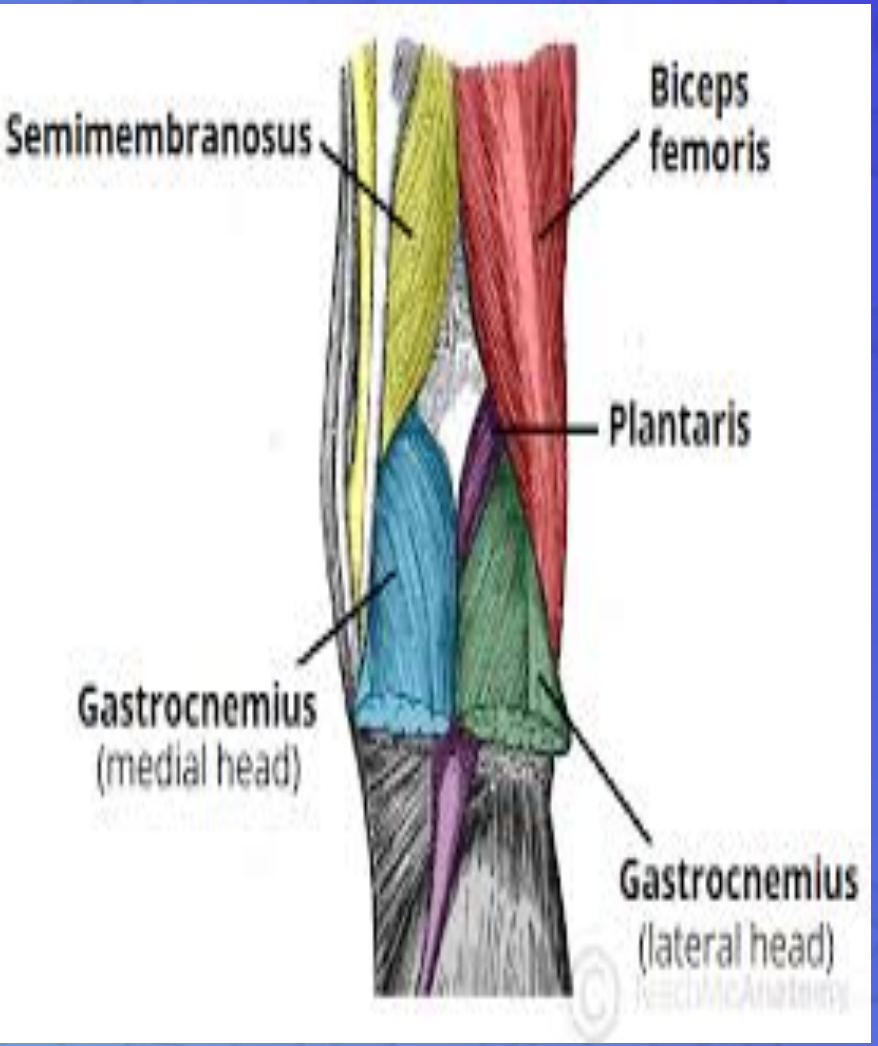
OBJECTIVES

At the end of this lecture the students should be able to know:

- **The location, boundaries & contents of the popliteal fossa**
- **The contents of posterior fascial compartment of Leg.**
- **The structures hold by retinacula at ankle.**
- **Layers forming in the sole of foot & bone forming the arches of the foot.**

Popliteal Fossa

Is a diamond-shaped intermuscular space at the back of knee



Boundaries :

Laterally: ***above:*** biceps femoris.

Below: lateral head of gastrocnemius & plantaris

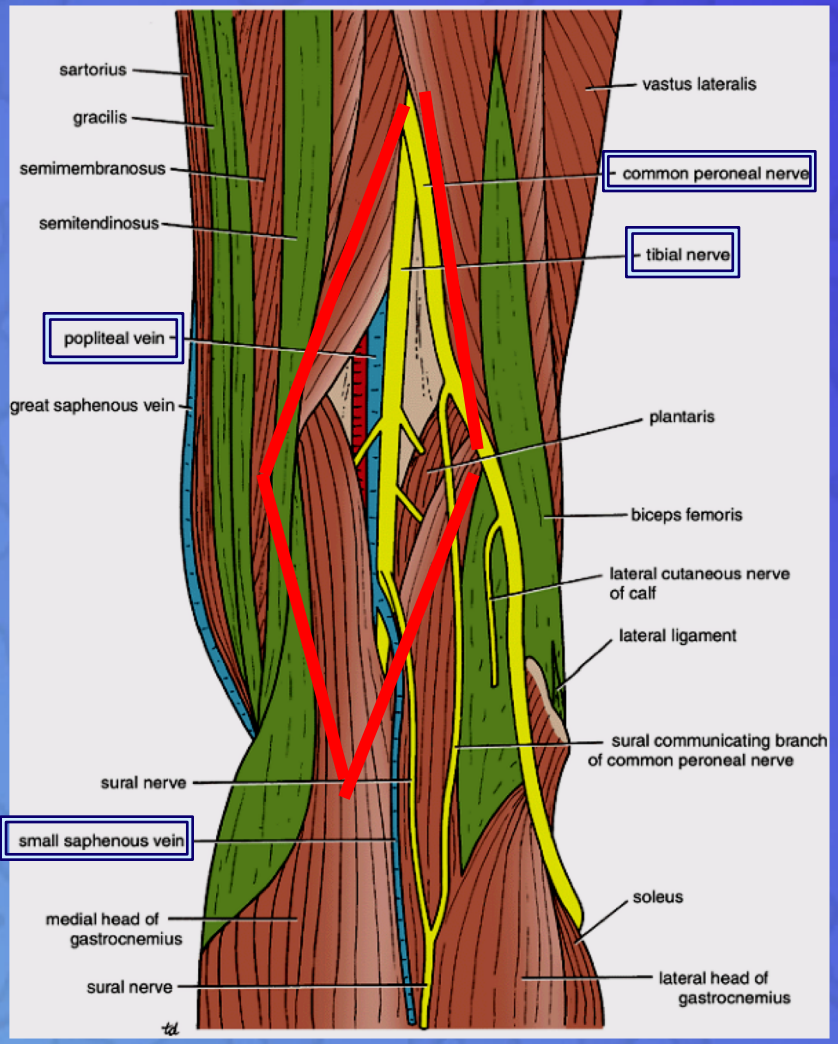
Medially: ***above:*** semimembranosus & semitendinosus.

Below: medial head of gastrocnemius

Roof: Skin, superficial fascia and deep fascia of the thigh.

Floor: popliteal surface of femur, posterior ligament of knee joint and popliteus muscle.

Popliteal Fossa



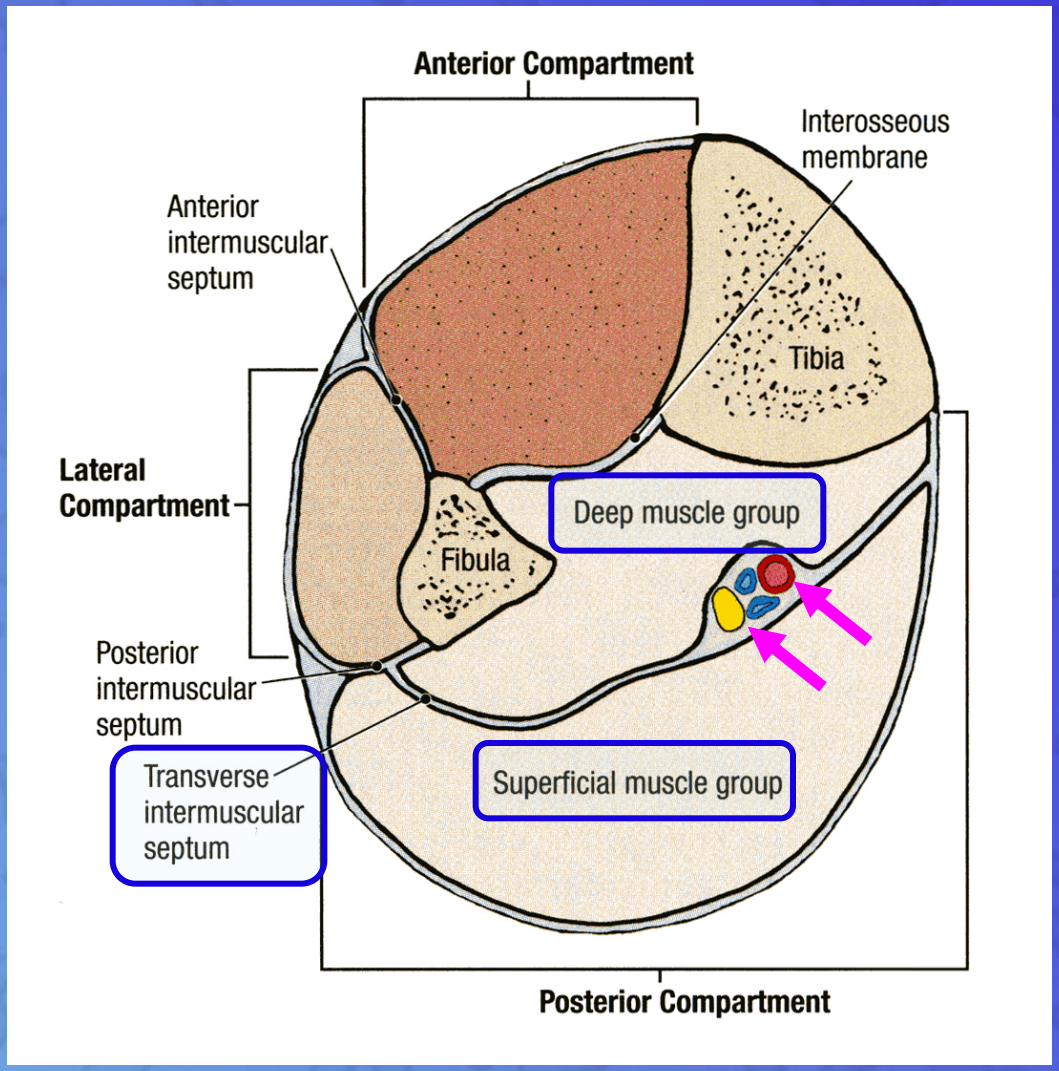
Contents:

From medial to lateral

1. Popliteal vessels
2. Small saphenous vein
3. Tibial nerve.
4. Common peroneal nerve.
5. Posterior cut. nerve of thigh.
6. Connective tissue & popliteal lymph nodes.

The deepest structure is popliteal artery.

CONTENTS OF THE POSTERIOR FASCIAL COMPARTMENT OF THE LEG



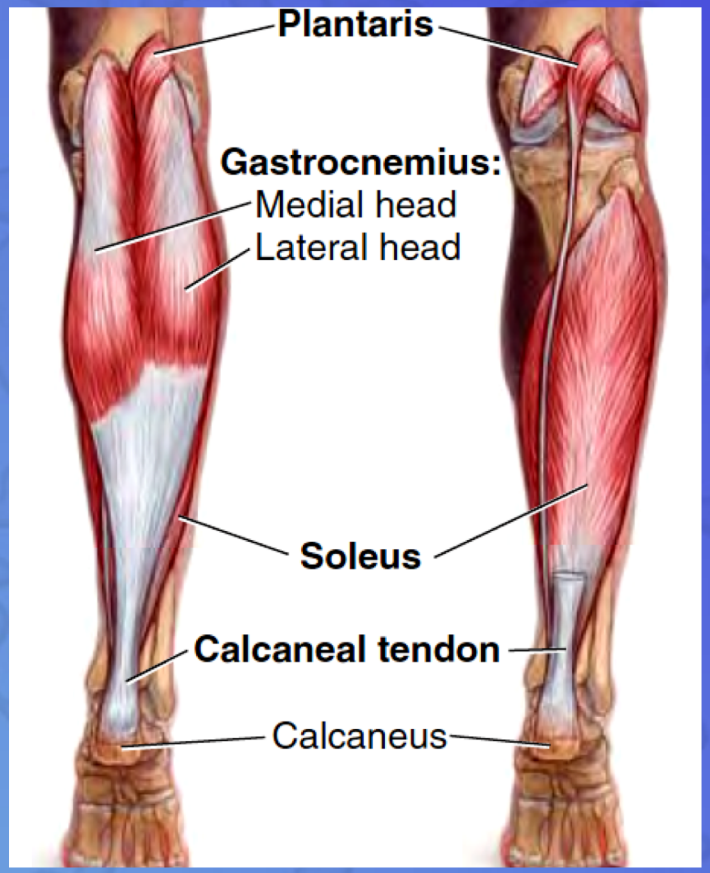
The transverse intermuscular septum of the leg is a septum divides the muscles of the posterior compartment into superficial and deep groups.

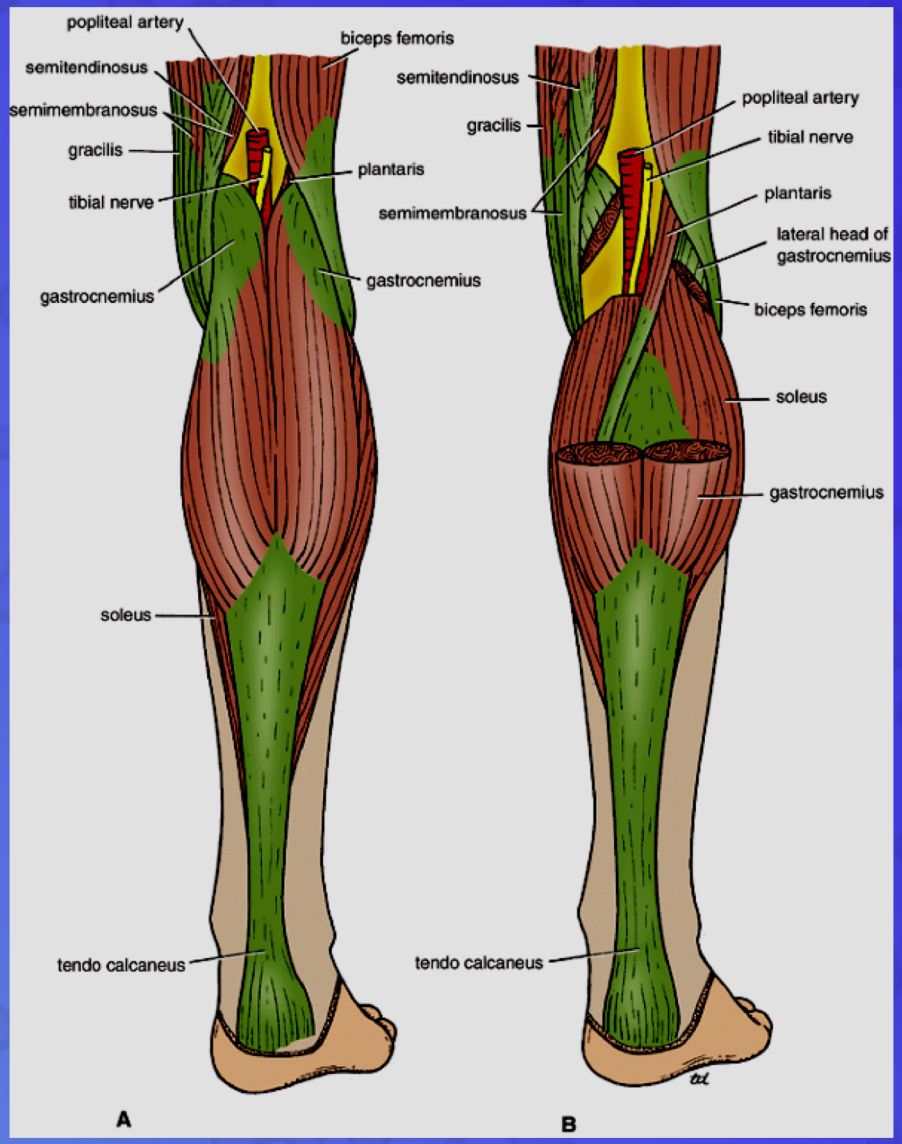
Contents:

1. **Superficial group of muscles**
2. **Deep group of muscles**
3. **Posterior tibial artery**
4. **Tibial nerve**

SUPERFICIAL GROUP

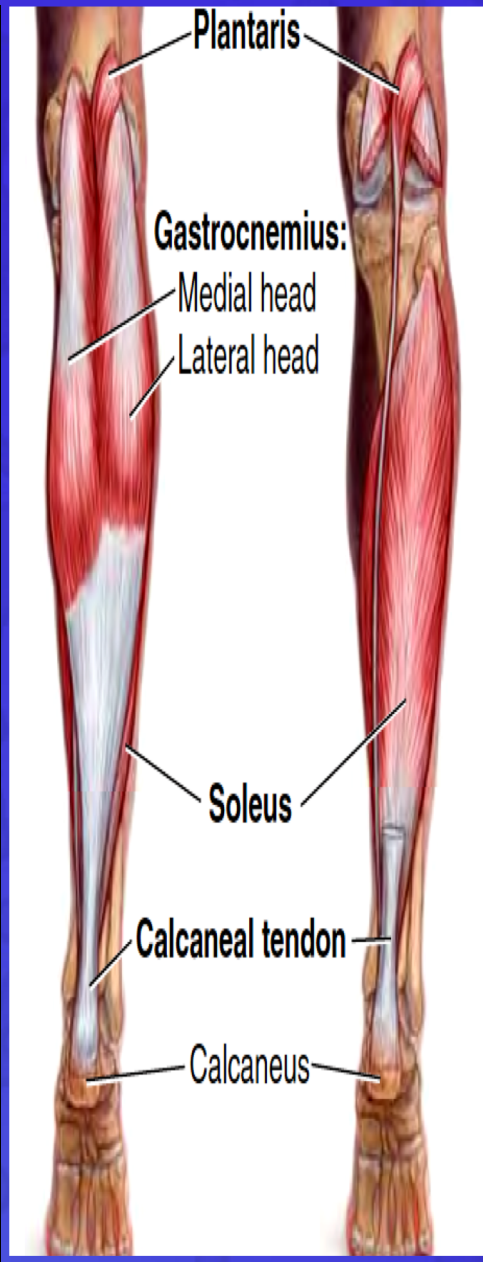
1. Gastrocnemius 2. Plantaris 3. Soleus





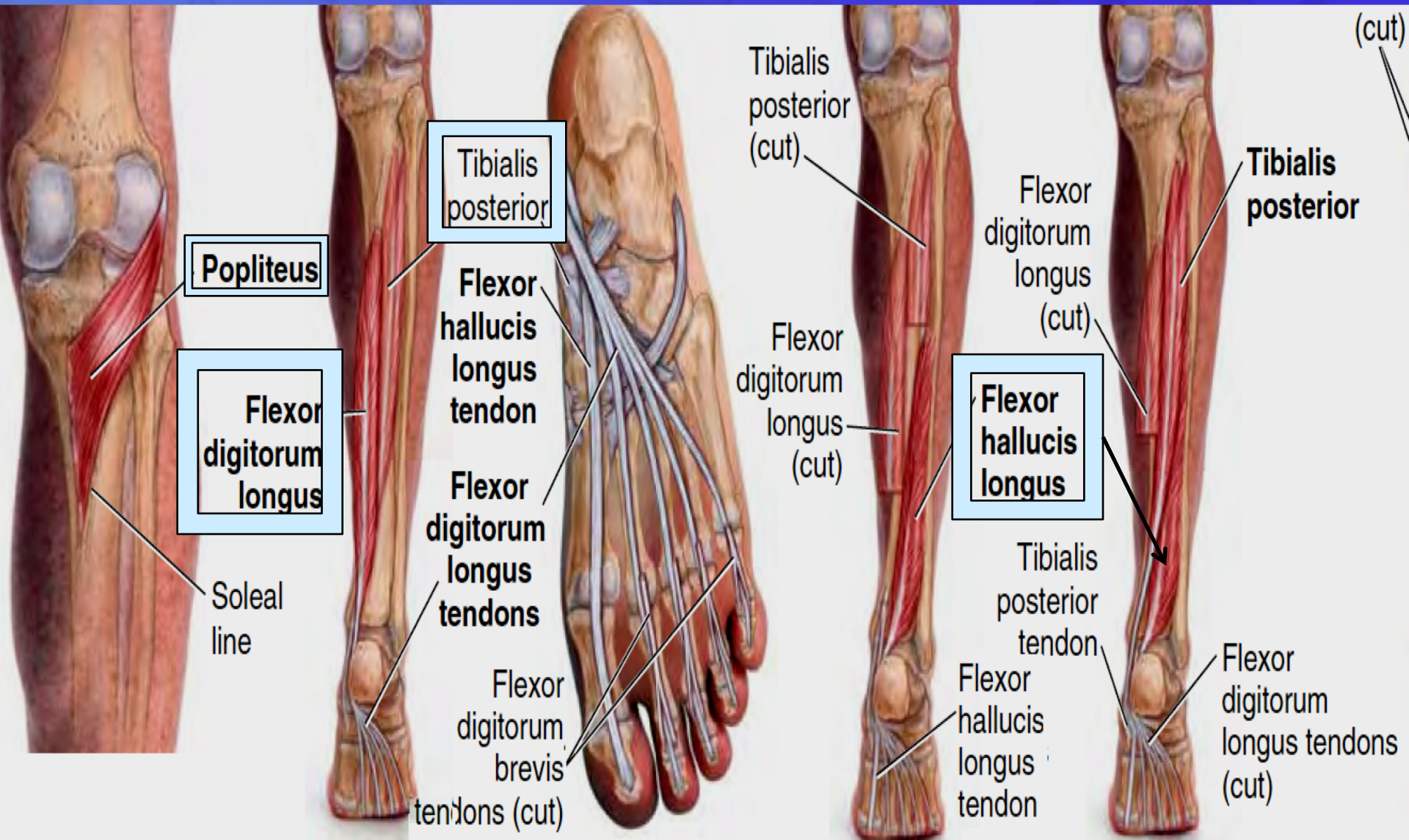
SUPERFICIAL GROUP

Muscle	Origin	Insertion	Nerve	Action
Gastrocnemius	**Lateral head** from lateral condyle of femur & **medial head** from above medial condyle	**Posterior surface of calcaneum via tendo calcaneus**	Tibial	Plantar flexes foot at ankle joint; flexes knee joint
Plantaris	Lateral supracondylar ridge of femur	**Posterior surface of calcaneum**	Tibial	Plantar flexes foot at ankle joint; flexes knee joint
Soleus	Shafts of **tibia** and **fibula**	**Posterior surface of calcaneum via tendo calcaneus**	Tibial	Together with gastrocnemius and plantaris is powerful plantar flexor of ankle joint; provides main propulsive force in walking and running



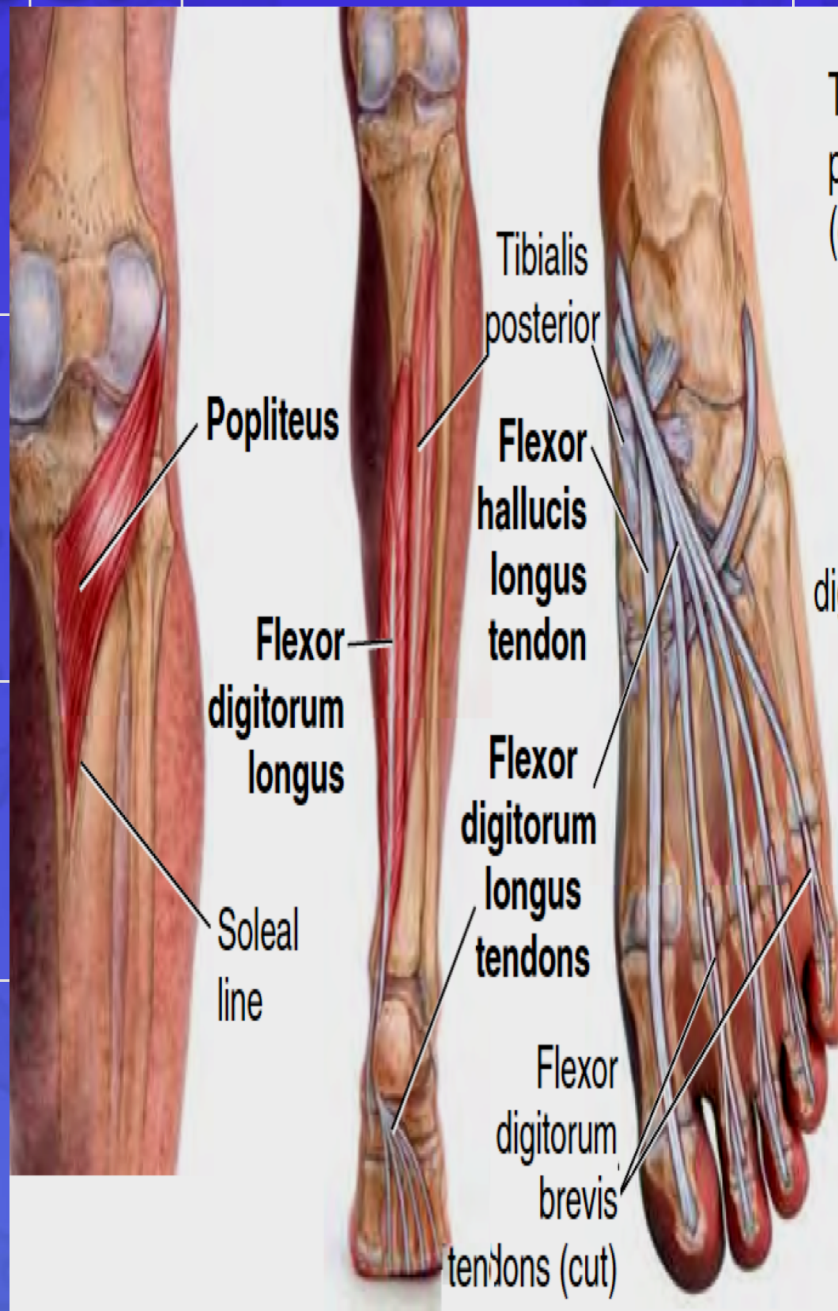
DEEP GROUP

1. Popliteus 2. Flexor digitorum longus 3. Tibialis posterior
4. Flexor hallucis longus

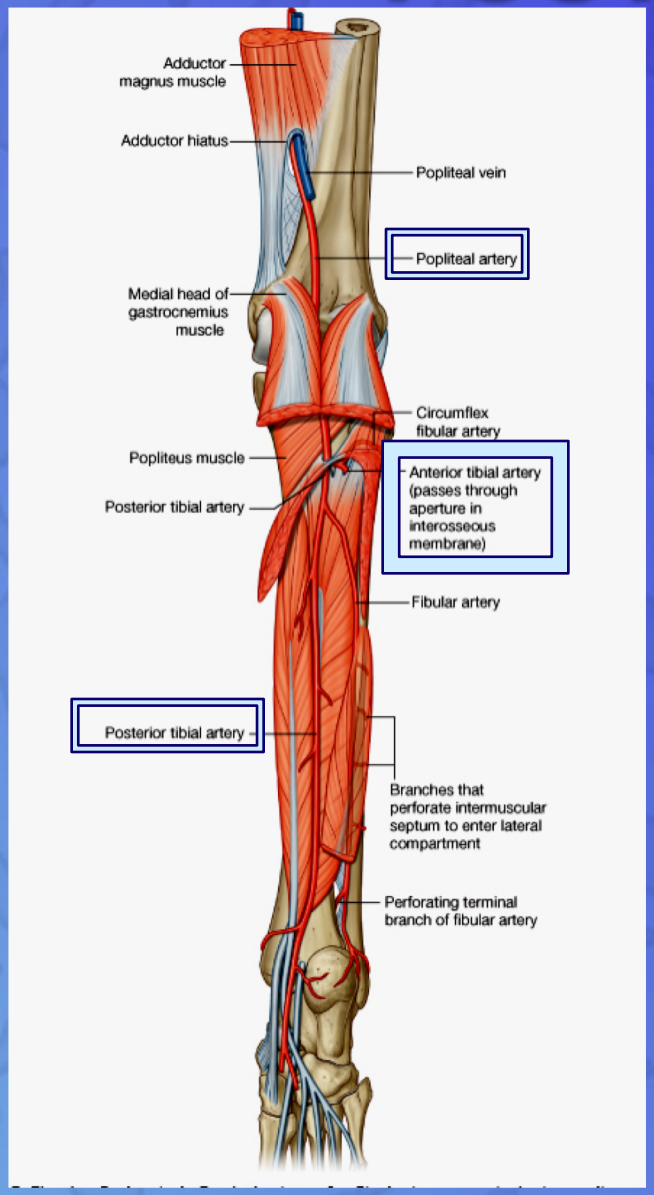


DEEP GROUP

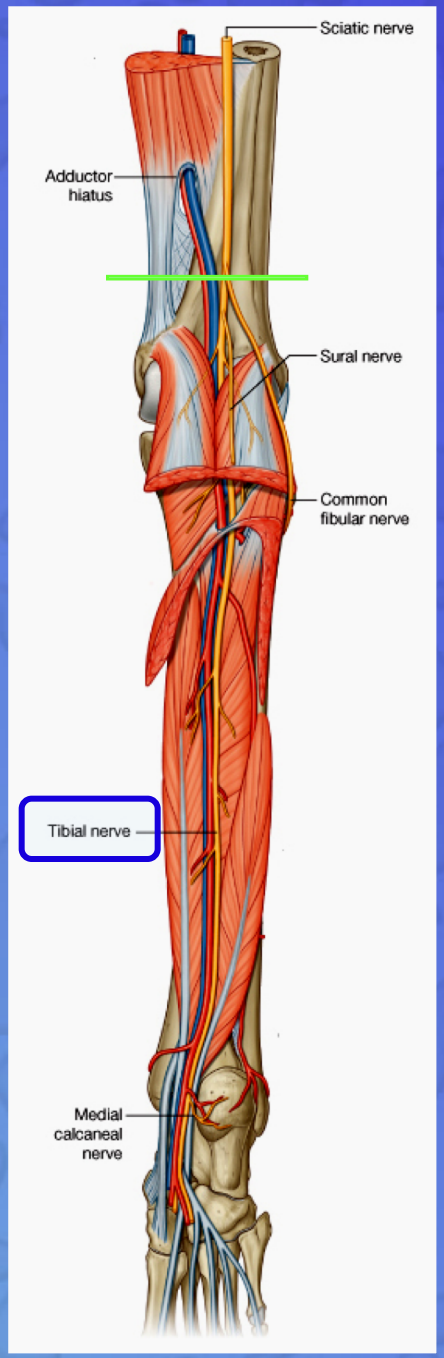
Popliteus	Groove on Lateral surface of lateral condyle of femur (Intracapsular)	Post surface of shaft of tibia above soleal line
Flexor digitorum longus	Posterior surface of shaft of tibia	Bases of distal phalanges of lateral 4 toes
Flexor hallucis longus	Posterior surface of shaft of fibula	Base of distal phalanx of big toe
Tibialis posterior	Posterior surface of shafts of tibia and fibula and interosseous membrane	Tuberosity of navicular bone and other neighboring tarsal bones.



POSTERIOR TIBIAL ARTERY



- **It is one of the terminal branches of the <u>popliteal artery.</u>**

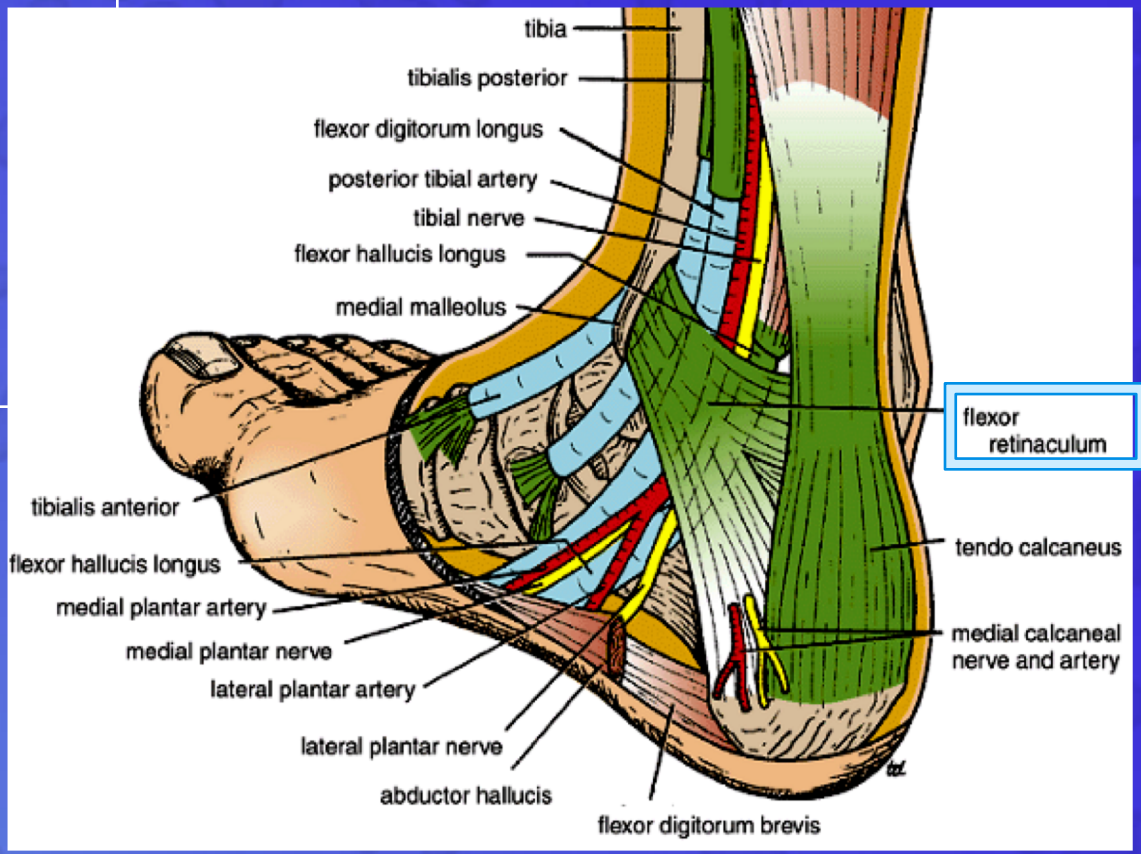


TIBIAL NERVE

- It is the larger terminal branch of the sciatic nerve in the lower 1/3 of the back of the thigh

Flexor Retinaculum

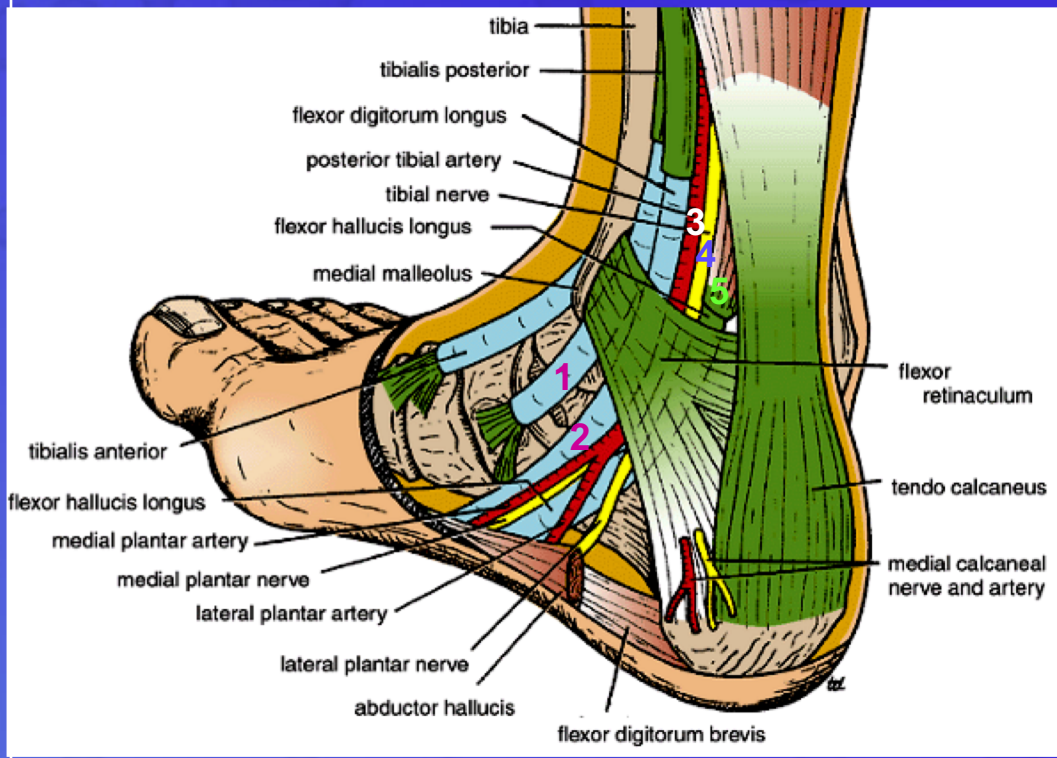
Extends from back of medial malleolus of tibia to medial side of calcaneum

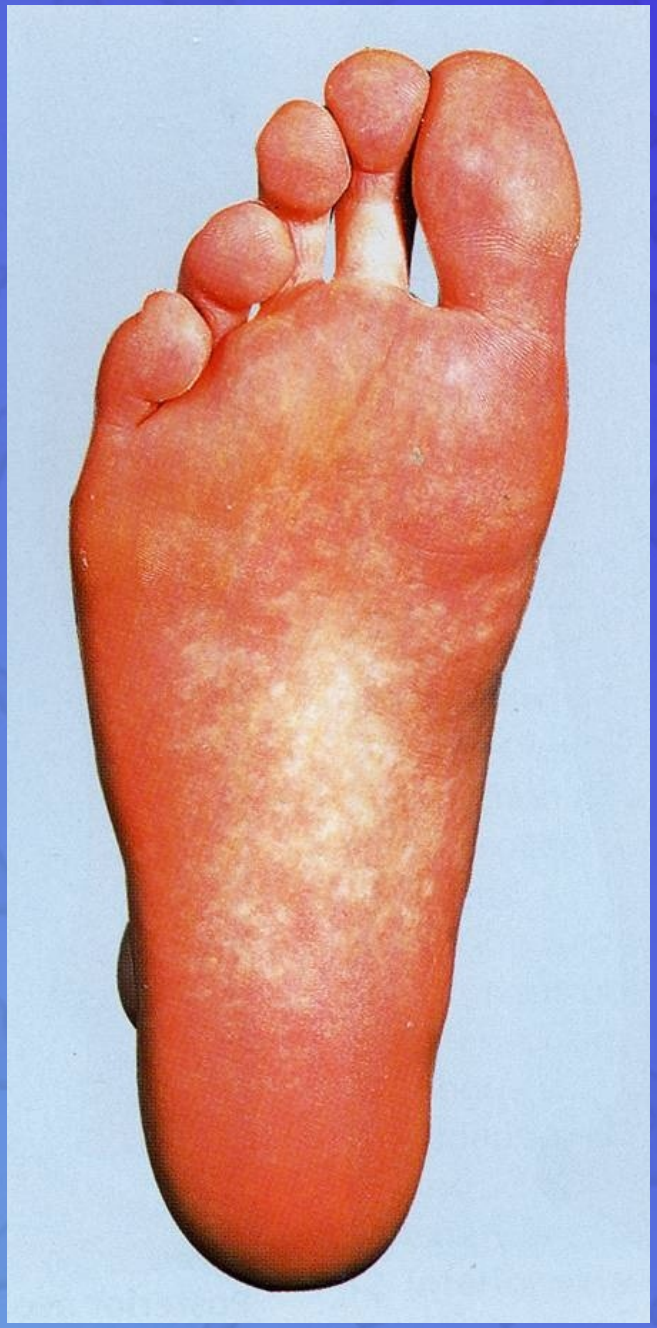


Structures passing posterior to medial malleolus, deep to flexor retinaculum

- *Medial to lateral*
- Tibialis posterior tendon
- Flexor digitorum longus tendon
- Posterior tibial artery with venae comitantes
- Tibial nerve
- Flexor hallucis longus tendon

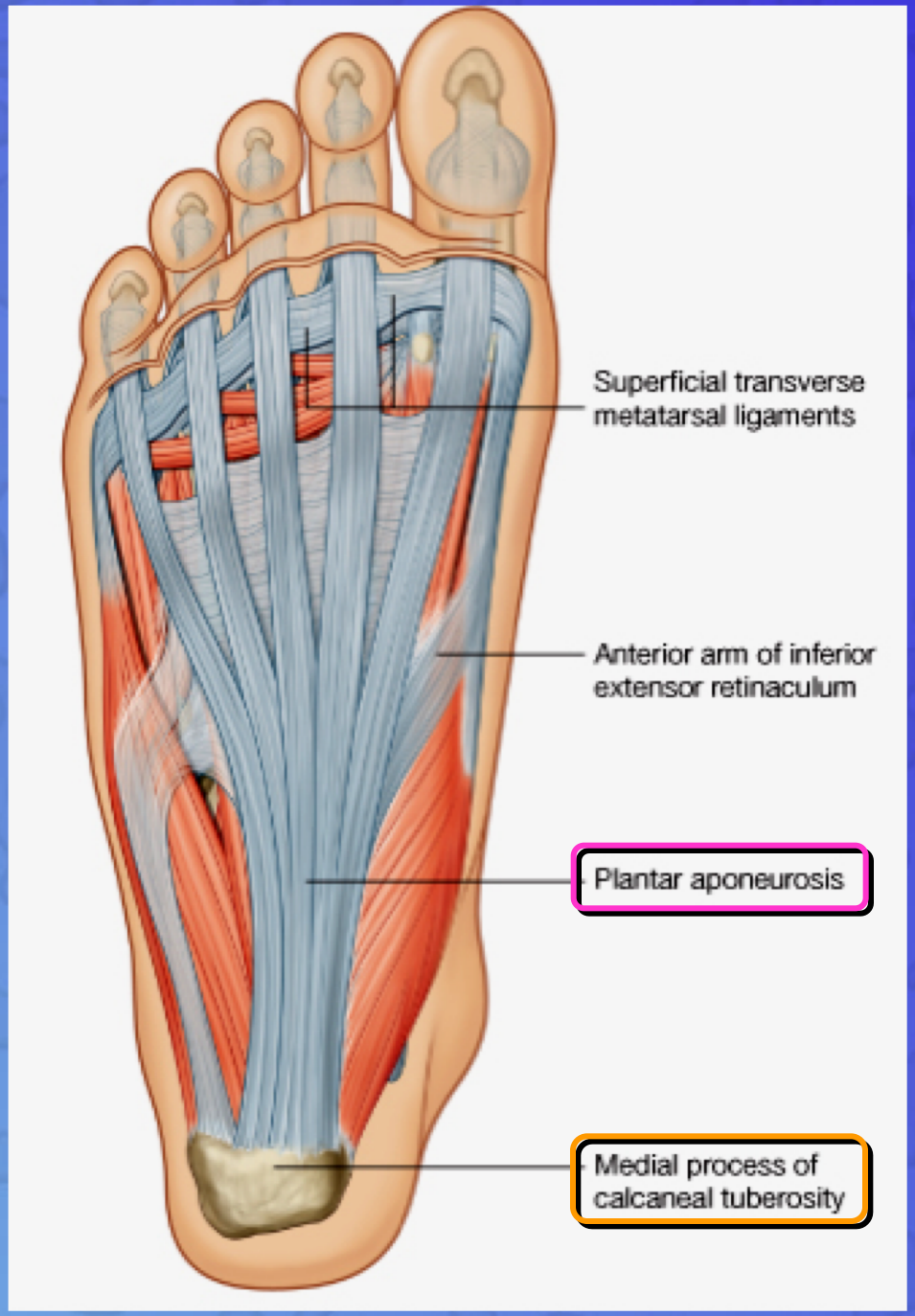
All the tendons are surrounded by a synovial sheath





SOLE OF THE FOOT

- **The skin** of the sole of the foot is **thick and hairless**
- It shows a **few flexure creases** at the sites of skin movement
- **Sweat glands** are present in large numbers

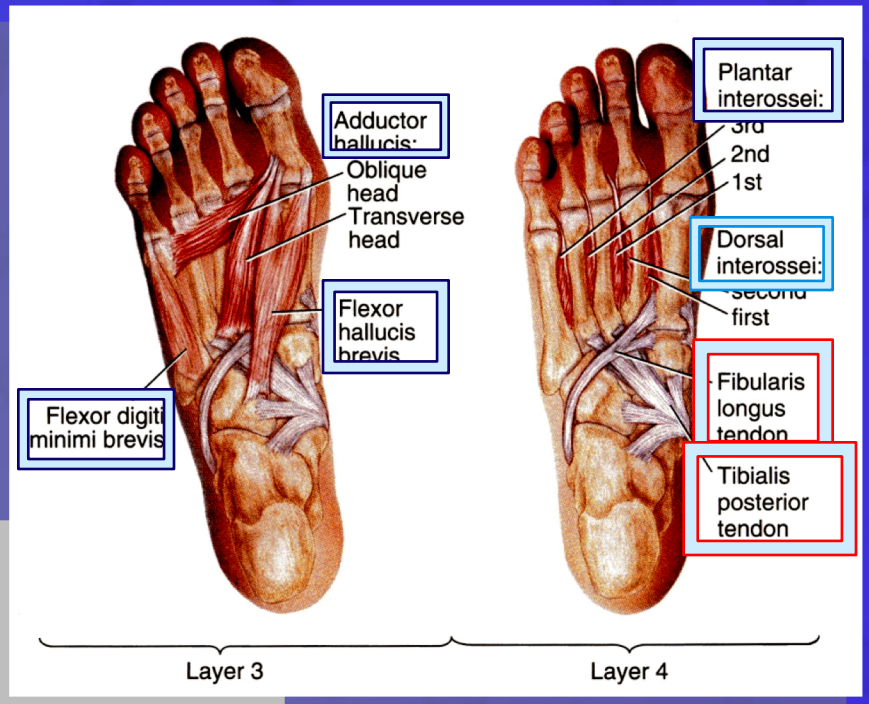


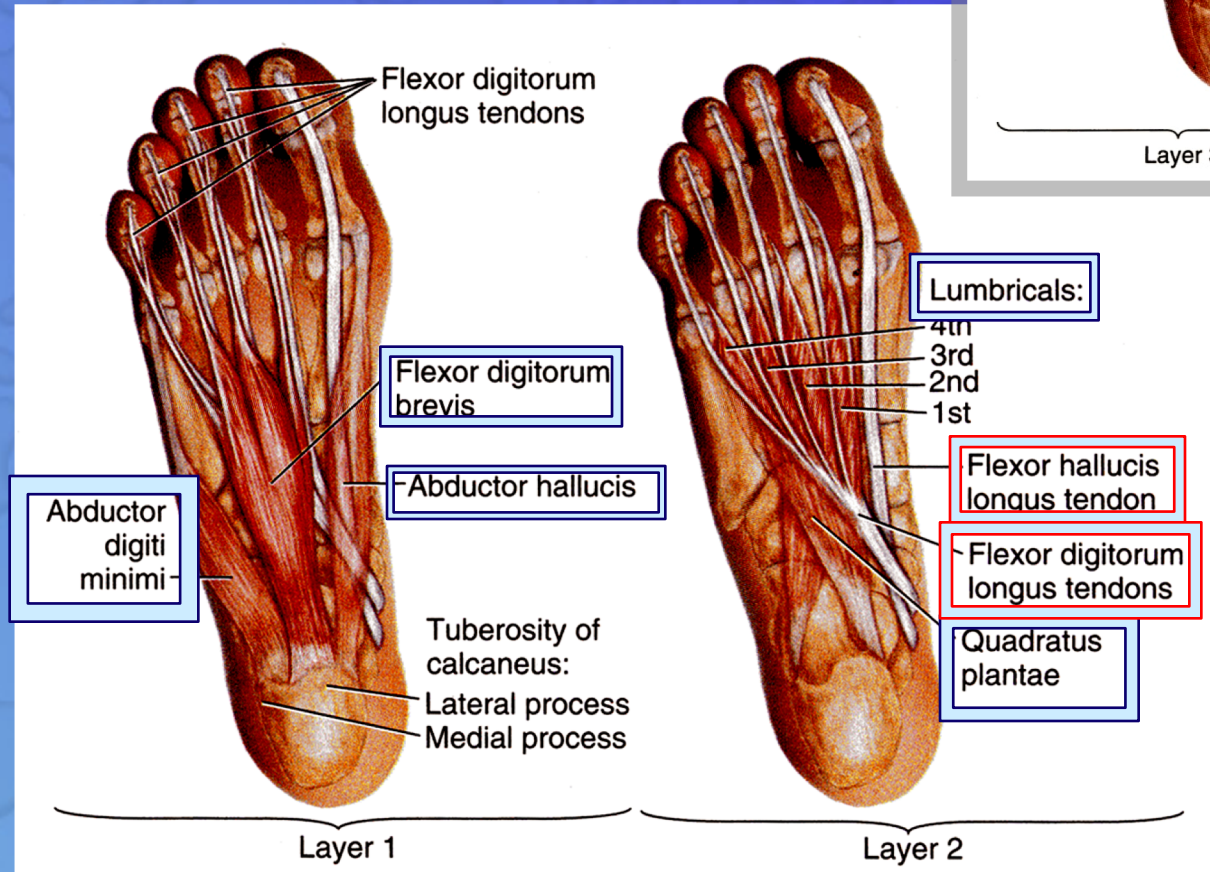
DEEP FASCIA

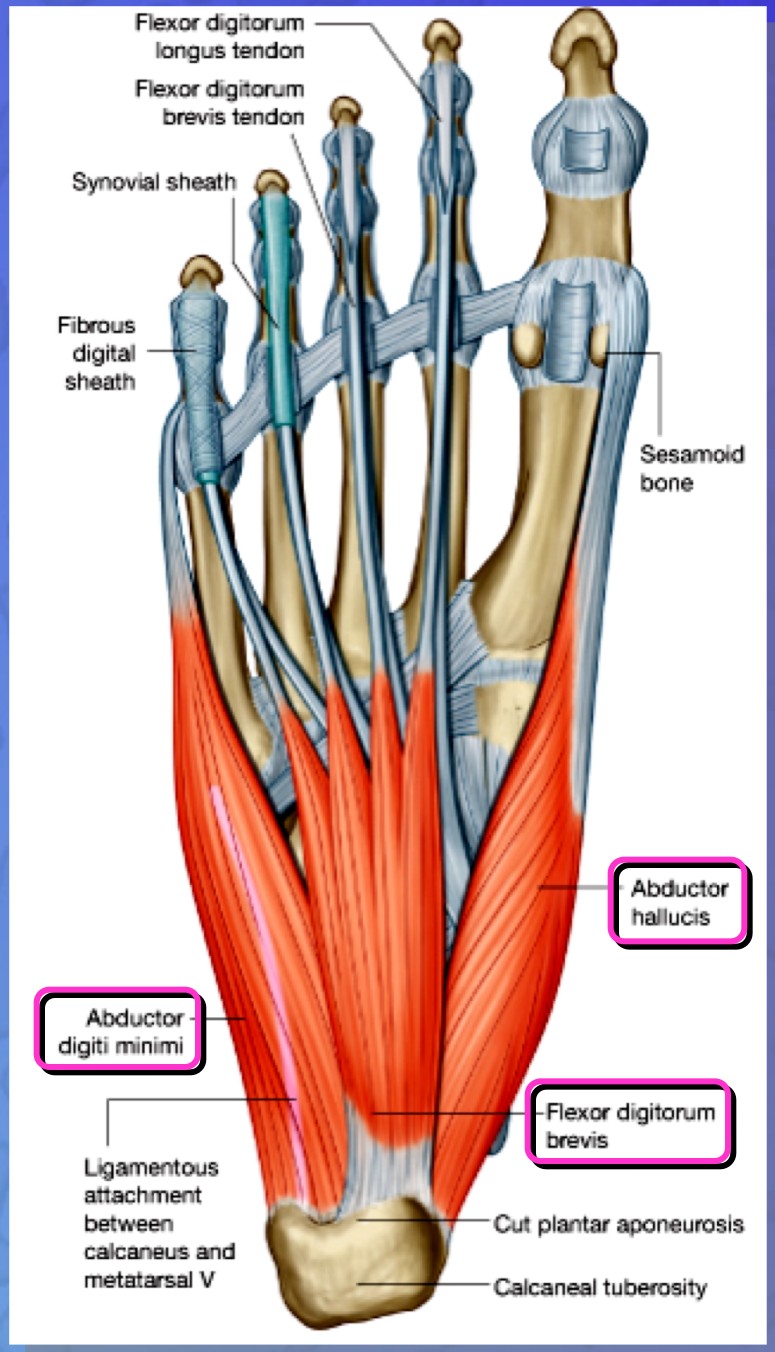
- The **plantar aponeurosis** is a triangular thickening of the deep fascia that protects the underlying nerves, blood vessels, and muscles.
- Its apex is attached to the *medial and lateral tubercles* of the calcaneum.
- The base of the aponeurosis divides into five slips that pass into the toes.

MUSCLES OF THE SOLE OF THE FOOT

The muscles of the sole are conveniently described in four layers from superficial to deep.

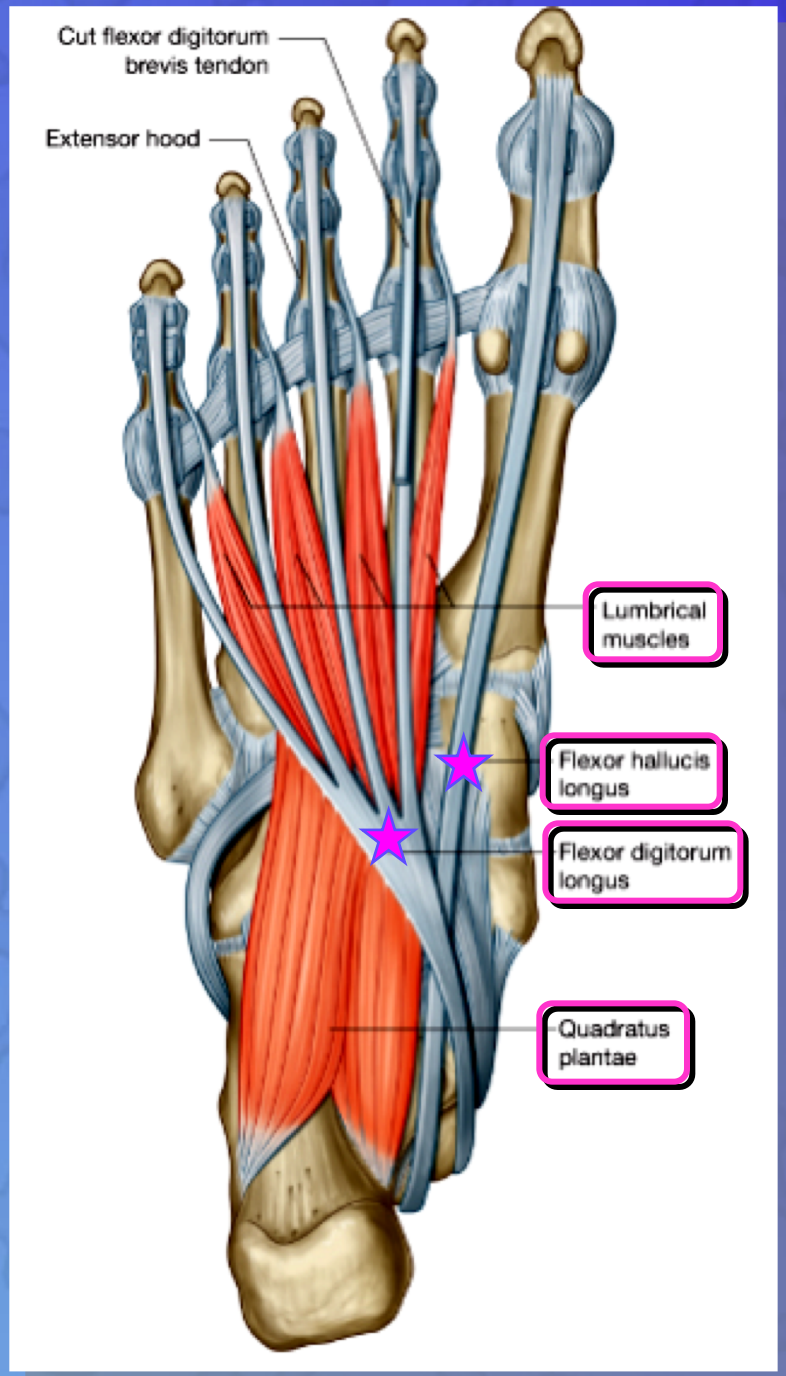






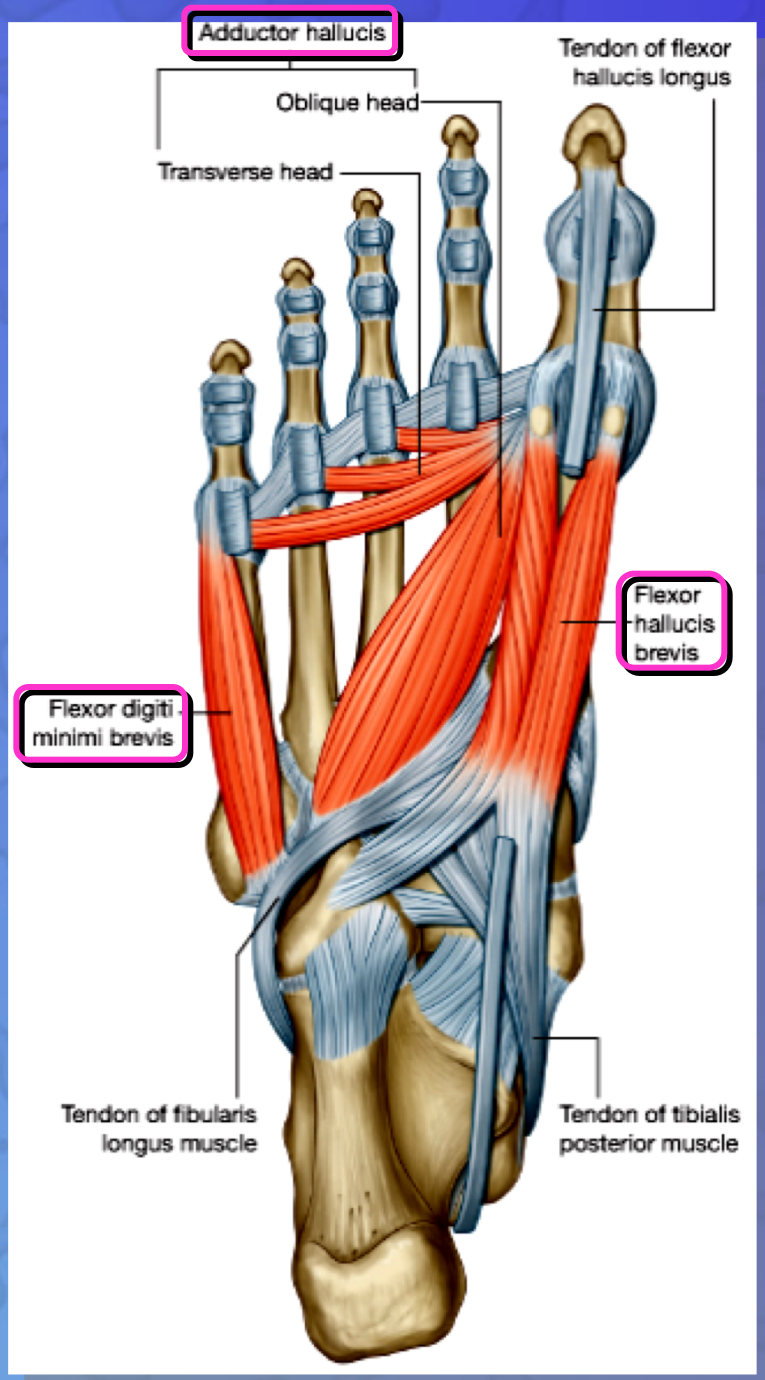
First Layer

1. Abductor hallucis,
2. Flexor digitorum brevis,
3. Abductor digiti minimi



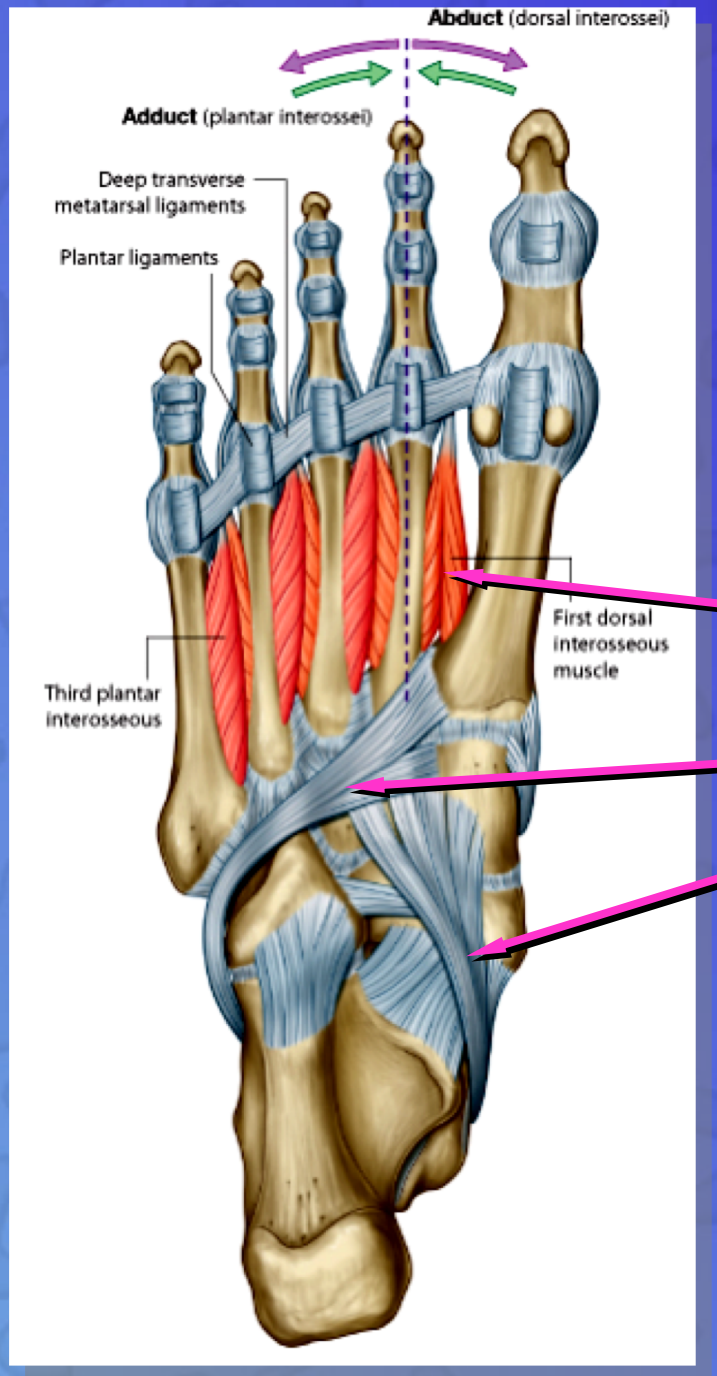
Second Layer

1. Quadratus plantae,
2. Lumbricals,
3. Flexor digitorum longus tendon,
4. Flexor hallucis longus tendon



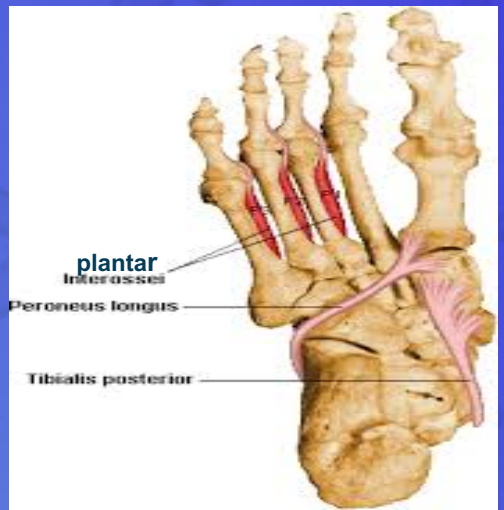
Third Layer

1. Flexor hallucis brevis
2. Adductor hallucis
3. Flexor digiti minimi brevis

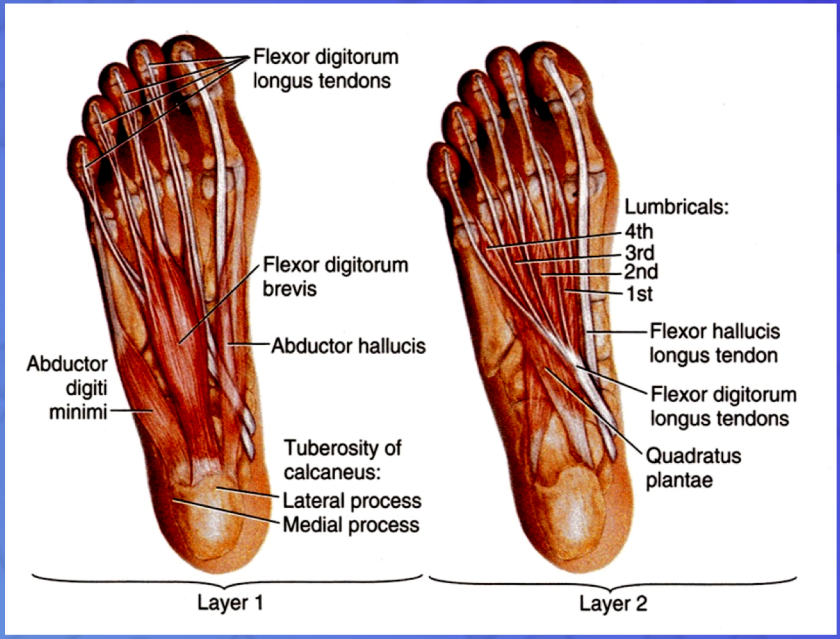


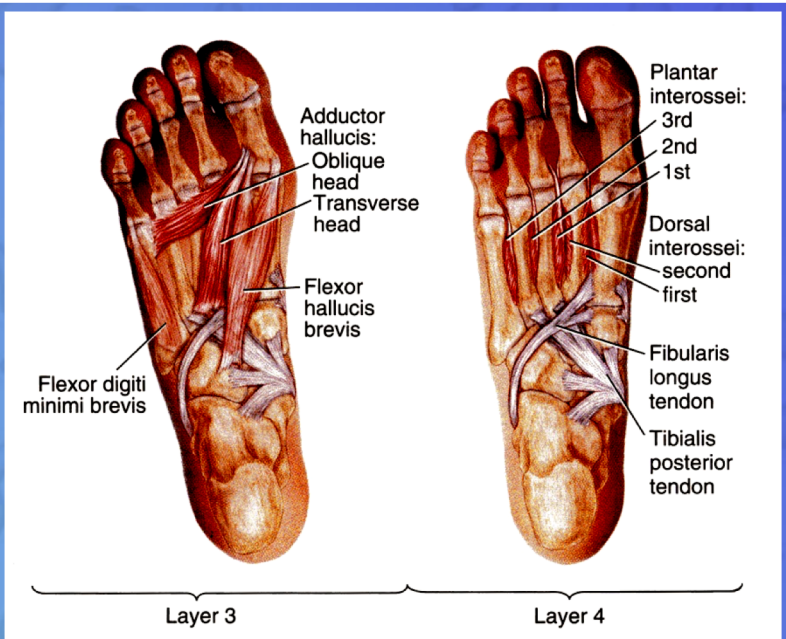
Fourth Layer

1. Interossei;
   (3 plantar + 4 dorsal).
2. Peroneus longus tendon,
3. Tibialis posterior tendon

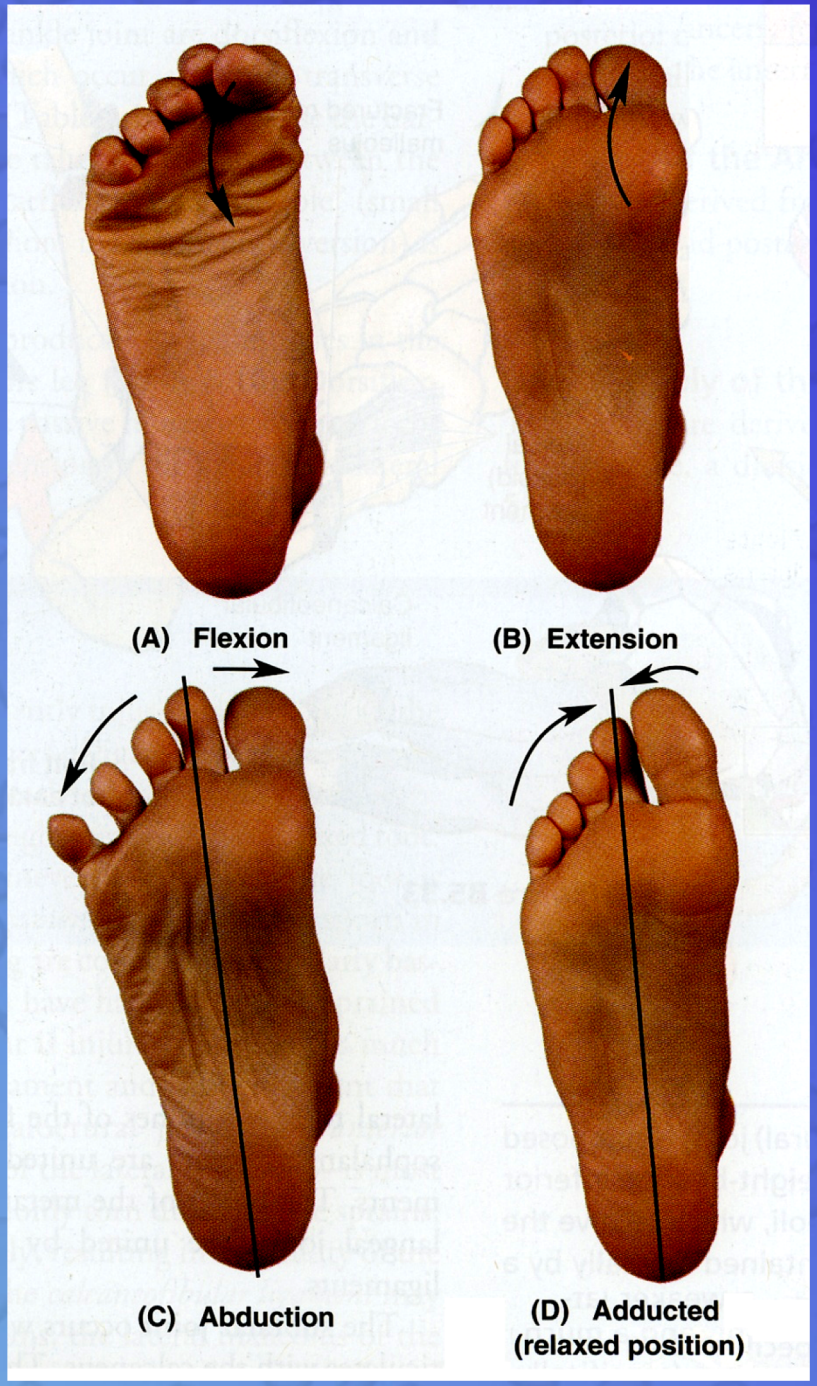


Function of small muscles of sole of Foot



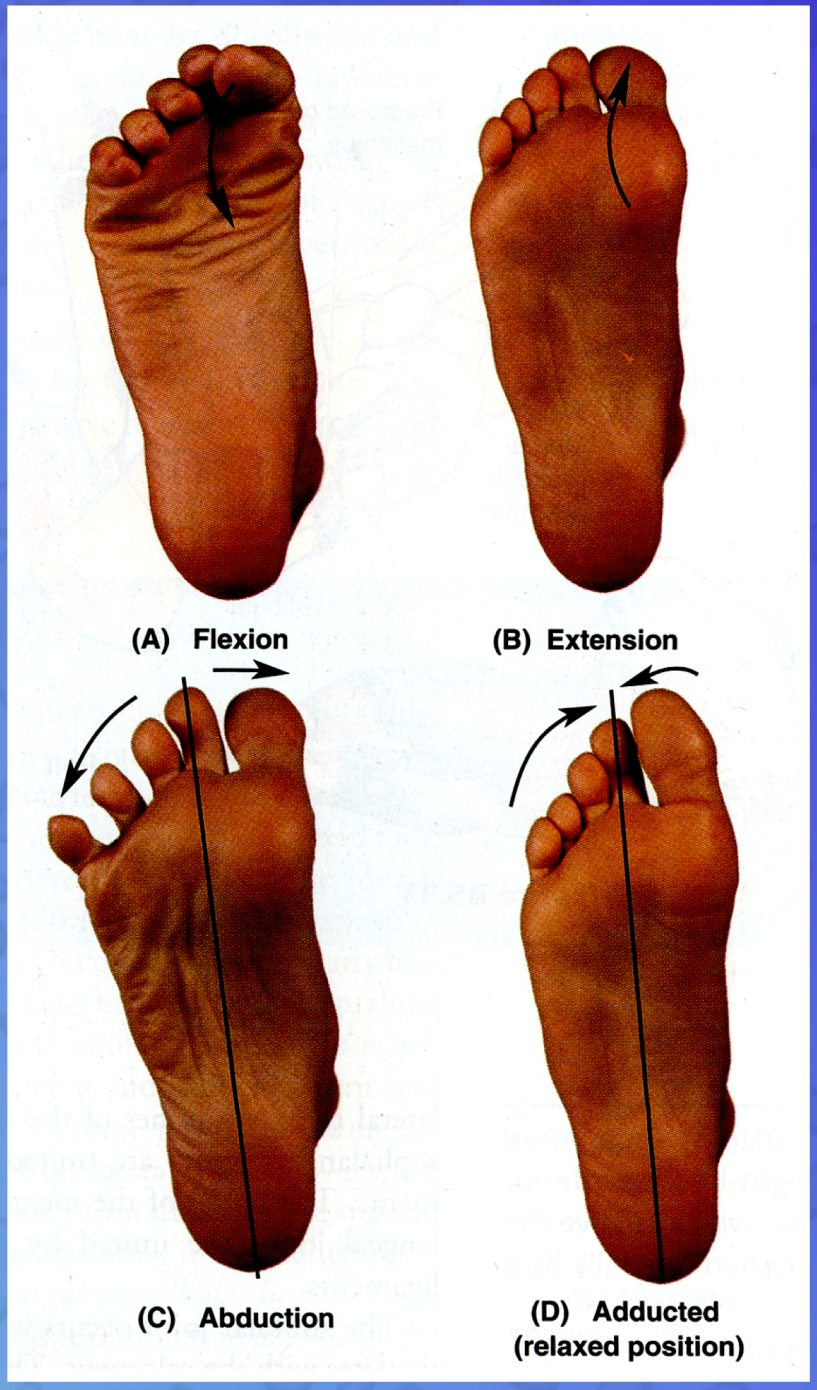


- Unlike the small muscles of the hand, the **sole muscles** have few delicate functions and are chiefly concerned with supporting the arches of the foot.
- They control movements of individual toes, **this function is rarely used** in most people



Movement	Muscles[a]
Metatarsophalangeal joints	
Flexion (*A*)	**Flexor digitorum brevis** **Lumbricals** **Interossei** **Flexor hallucis brevis** **Flexor hallucis longus** Flexor digit minimi brevis Flexor digitorum longus
Extension (*B*)	**Extensor hallucis longus** **Extensor digitorum longus** **Extensor digitorum brevis**
Abduction (*C*)	**Abductor hallucis** **Abductor digiti minimi** **Dorsal interossei**
Adduction (*D*)	**Adductor hallucis** **Plantar interossei**

[a]Muscles in boldface are chiefly responsible for the movement; the other muscles assist them.



Movement	Muscles[a]
Interphalangeal joints	
Flexion (fig. *A*)	**Flexor hallucis longus** **Flexor digitorum longus** **Flexor digitorum brevis** Quadratus plantae
Extension (fig. *B*)	**Extensor hallucis longus** **Extensor digitorum longus** **Extensor digitorum brevis**

[a]Muscles in boldface are chiefly responsible for the movement; the other muscles assist them.

Arches of Foot

➢ **Medial longitudinal arch**

Is formed of calcaneum, talus, navicular, 3 cuneiform bones, and 3 medial metatarsal bones.

➢ **Lateral longitudinal arch**

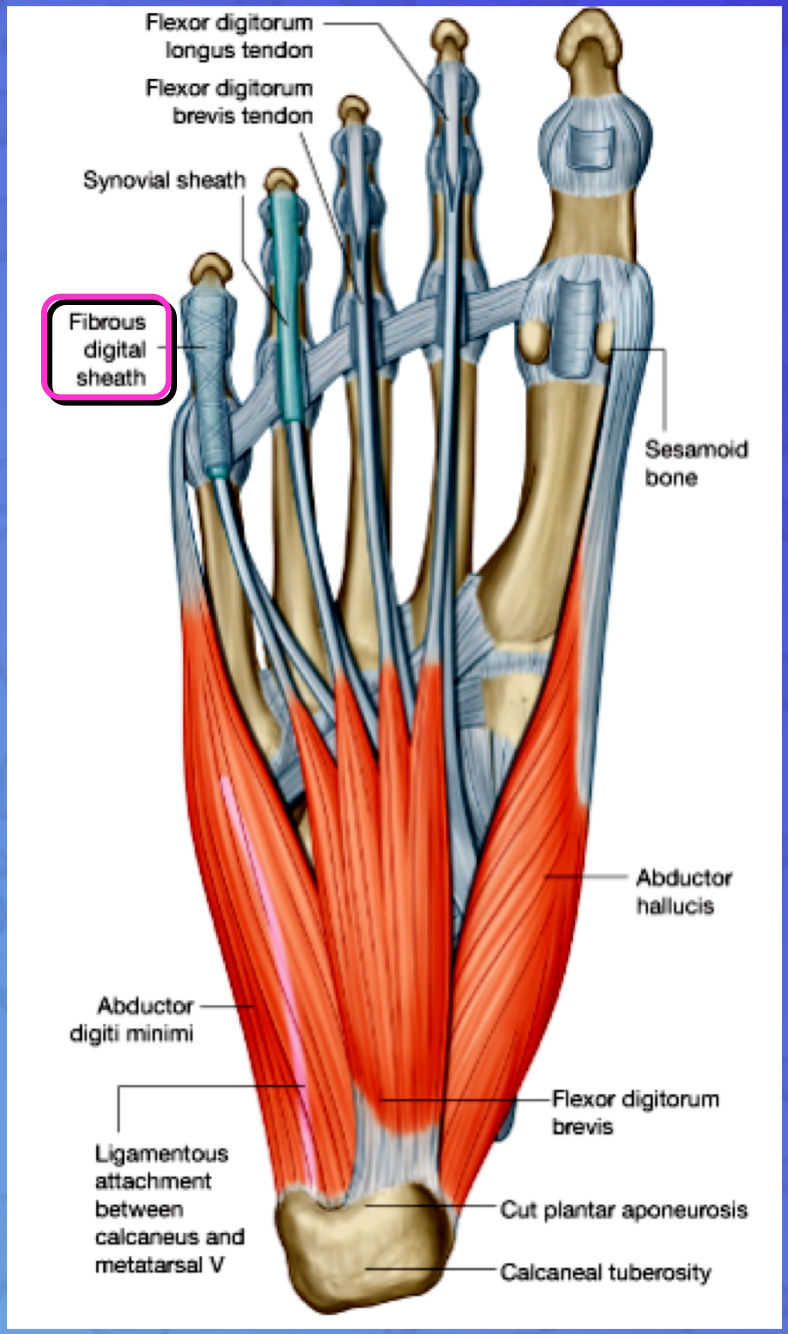
Is formed of calcaneum, cuboid & lateral 4^{th} & 5^{th} metatarsal bones

➢ **Transverse arch**

Lies at the level of tarso-metatarsal joints, formed of bases of metatarsal bones, cuboid & 3 cuneiform bones.

Function of Arches of the Foot

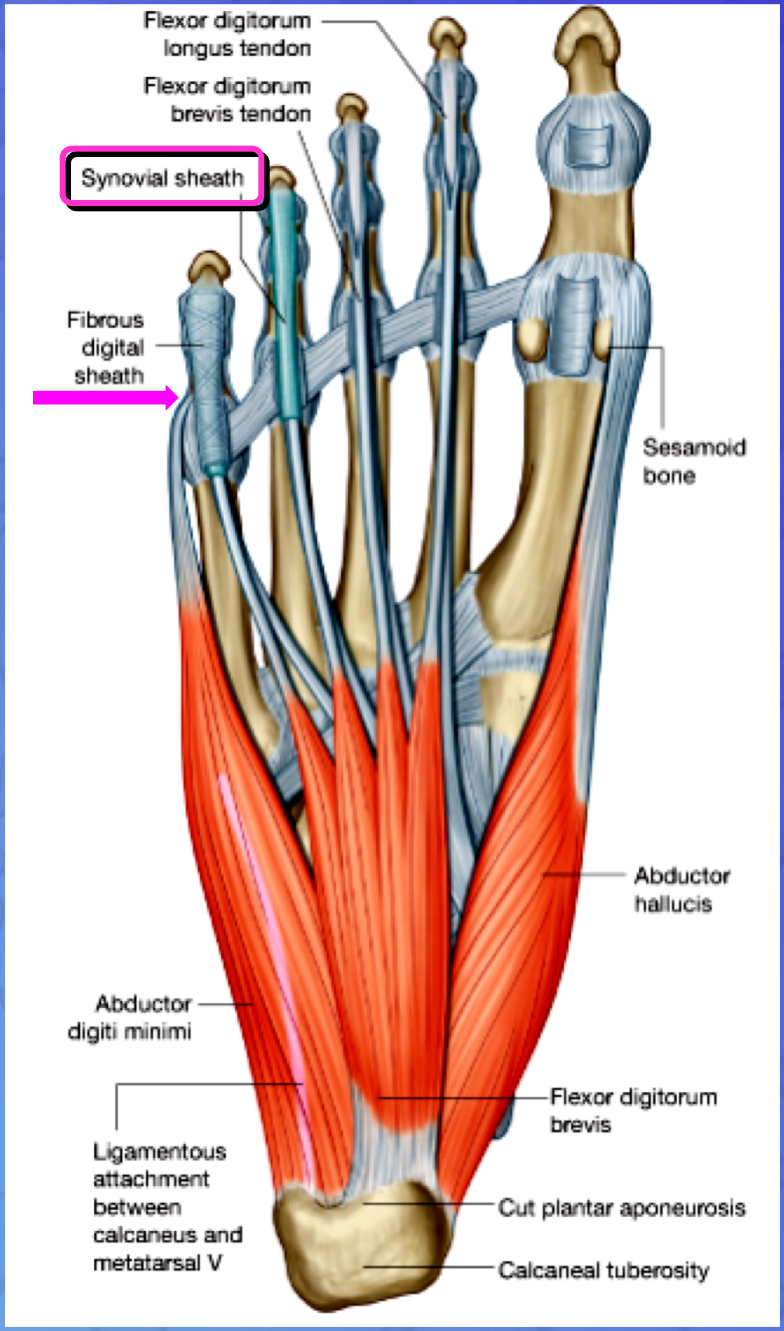
- Weight bearing
- Support walking & running
- Provide potential space for neurovascular bundle of the sole
- Act as shock absorber
- *In young child, the foot appears to be flat because of presence of a large amount of subcutaneous fat on the sole of foot*



Fibrous Flexor Sheaths

- The inferior surface of each toe, from the head of the metatarsal bone to the base of the distal phalanx, is provided with a strong fibrous sheath, which is attached to the sides of the phalanges.
- The fibrous sheath, together with the inferior surfaces of the phalanges and the interphalangeal joints, forms a *blind tunnel* in which lie the flexor tendons of the toes.

Synovial Flexor Sheaths



The tendons of the **flexor hallucis longus** and the **flexor digitorum longus** are surrounded by **synovial sheaths**

THANK YOU