Popliteal Fossa, Posterior Compartment of leg & Sole of foot

Lecture 18

نعمت المراجعة
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و
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Please check our Editing File.

{وَمَنْ يَتَوَكَّلْ عَلَى اللَّهِ فَهُوَ حَسْبُهُ}

Objectives

- 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.

- Text in BLUE was found only in the boys' slides
- Text in PINK was found only in the girls' slides
- Text in RED is considered important
- Text in GREY is considered extra notes

Popliteal Fossa

Definition :

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

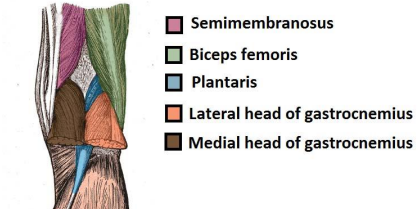
Boundaries :

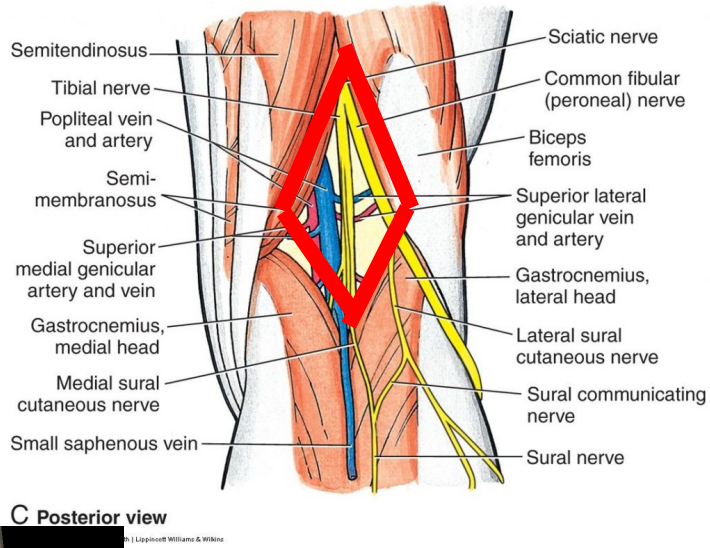
Laterally Above : biceps femoris.

Laterally Below : lateral head of gastrocnemius & plantaris

Medially Above : semitendinosus & semimembranosus.

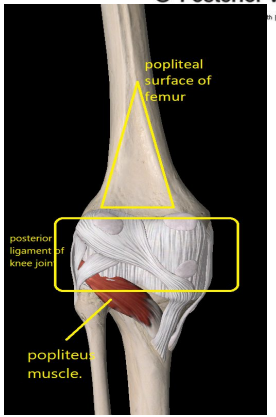
Medially Below : medial head of gastrocnemius.





Roof (يقصد به اللي مغطيه (مو شرط يكون فوق)**:** Skin, superficial fascia and deep fascia of the thigh.

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



يوجد فراغ معين الشكل في الجزء الخلفي من الركبة ويحده أربعة عضلات :

لاترال فوق biceps femoris وتعتبر من عضلات hamstring muscles .

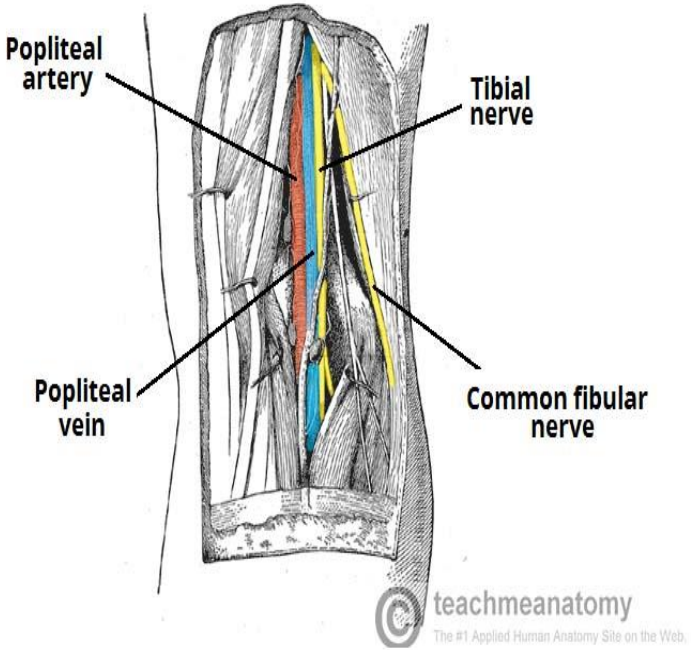
ميديال فوق العضلات السيمي الثنتين من hamstring . اللي تحت فيه عضلة gastrocnemius ولها راسين واحد ميديال والثاني لاترال ويكون مع اللاترال تحت بعد plantaris

Popliteal Fossa

Contents : **(From medial to lateral)** 6 structures

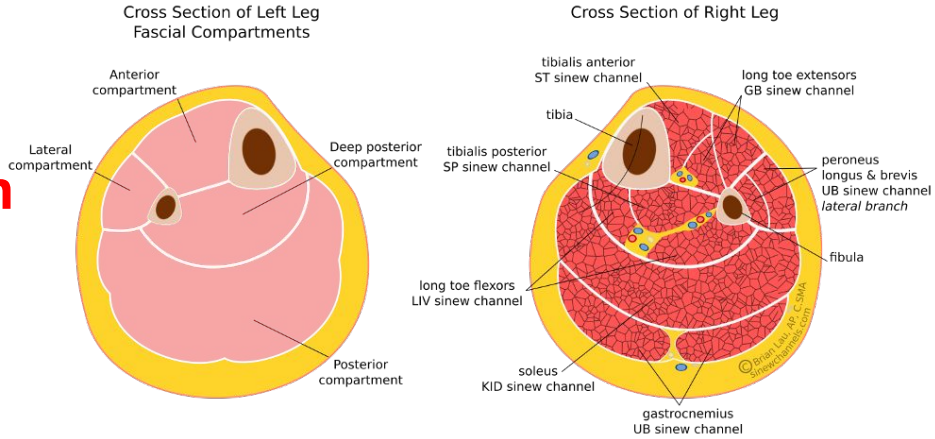
Popliteal vessels(artery & vein) → Small saphenous vein → Tibial nerve → Common peroneal nerve → Posterior cutaneous nerve of thigh → Connective tissue & popliteal lymph nodes.

The deepest structure is popliteal artery.



Contents of The posterior fascial compartment of the leg

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



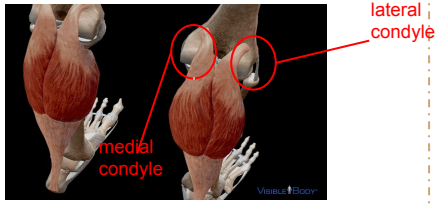
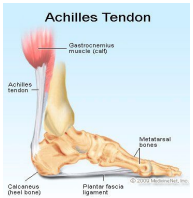
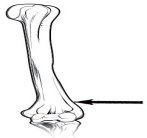
Contents: **no veins

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

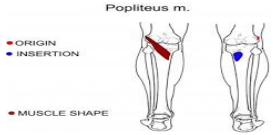
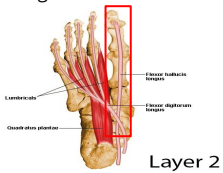
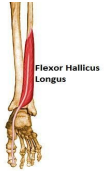
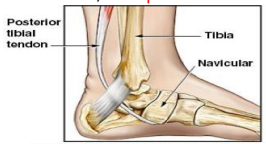
بشكل عام Interosseous membrane يقسم الـ Leg الى anterior and posterior compartment و الـ posterior compartment ينقسمون الى قسمين بواسطة transverse intermuscular septum الى deep and superficial .

Interosseous = بين العظام
intermuscular = بين العضلات

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** 		Plantar flexes foot at ankle joint; flexes knee joint
Soleus 	Shafts of **tibia** and **fibula**	**Posterior surface of calcaneum via tendo calcaneus**		Together with gastrocnemius and plantaris,it is a powerful plantar flexor of ankle joint; provides main propulsive force in walking and running

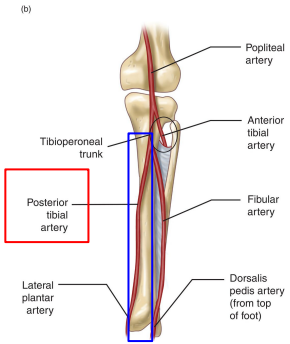
Deep group

muscle	origin	insertion	nerve	action
Popliteus 	Groove on Lateral surface of lateral condyle of femur (Intracapsular)	Post surface of shaft of tibia above soleal line 	Tibial	Flexes knee joint : Unlocks knee joint by lateral rotation of femur on tibia(or slight medial rotation of leg which accompanies the flexion)
Flexor digitorum longus 	Posterior surface of shaft of tibia 	Bases of distal phalanges of lateral 4 toes 		Flexes distal phalanges of lateral four toes; plantar Flexes foot at ankle joint; Supports medial and lateral longitudinal arches
Flexor hallucis longus 	Posterior surface of shaft of fibula	Base of distal phalanx of big toe 		Flexes distal phalanx of big toe; plantar flexes foot at ankle joint; supports medial longitudinal arch
Tibialis posterior 	Posterior surface of shafts of tibia and fibula and interosseous membrane	Tuberosity of navicular bone and other neighboring tarsal bones, except talus 		Plantar flexes foot at ankle joint; inverts foot at subtalar and transverse tarsal joints; supports medial longitudinal arch

Posterior tibial artery and tibial nerve

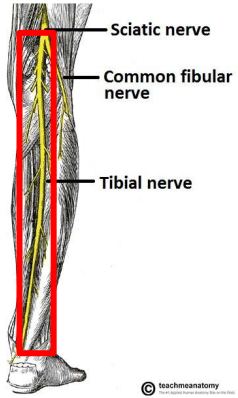
Posterior tibial artery:

It is one of the terminal branches of the popliteal artery.



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 to medial side of calcaneum.

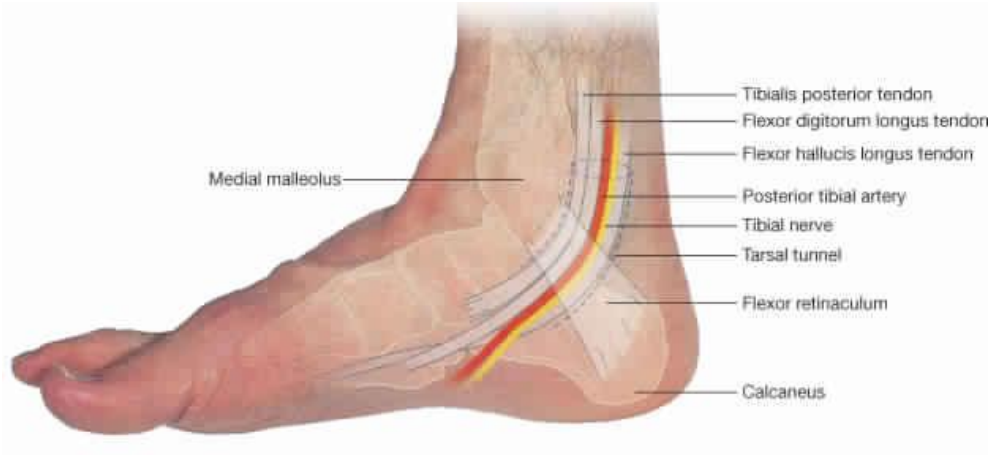
Structures passing posterior to medial malleolus, deep to flexor retinaculum:

Medial to lateral :

1- Tibialis posterior tendon
2- Flexor digitorum longus tendon
3- Posterior tibial artery with venae comitantes
4- Tibial nerve
5- Flexor hallucis longus tendon

(All the tendons are surrounded by a synovial sheath)

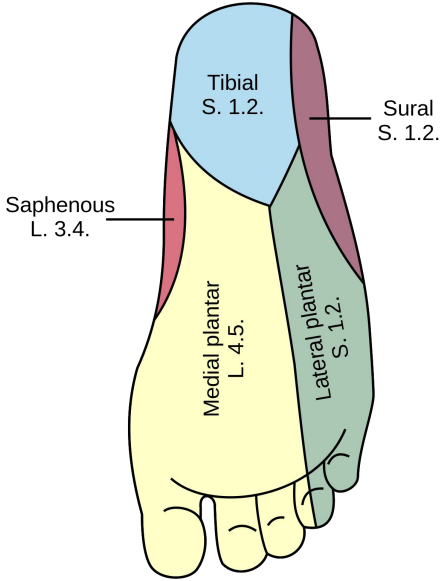
"Tom, Dick And Nervous Harry"



Sensory Nerve supply

The sensory nerve supply to the skin of the sole of the foot is derived from:

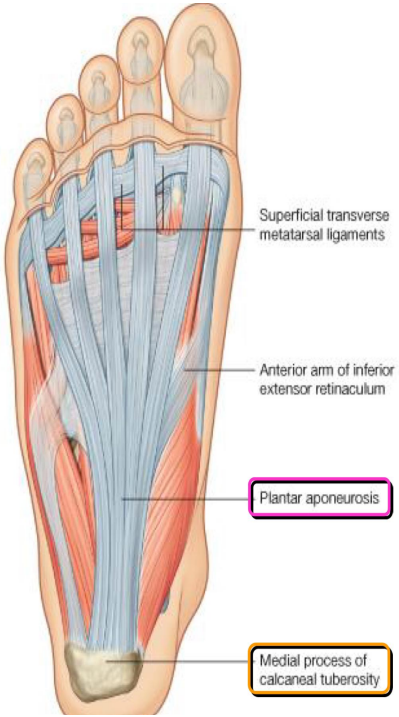
- Lateral plantar nerve innervate the lateral third of the sole.
- Tibial nerve innervates the medial side of the heel.
- Medial plantar nerve innervate the medial two thirds of the sole



Sole of the foot

- The skin of the sole of the foot is thick and hairless.
- The skin of the sole 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 <u>superficial to deep</u>

First Layer

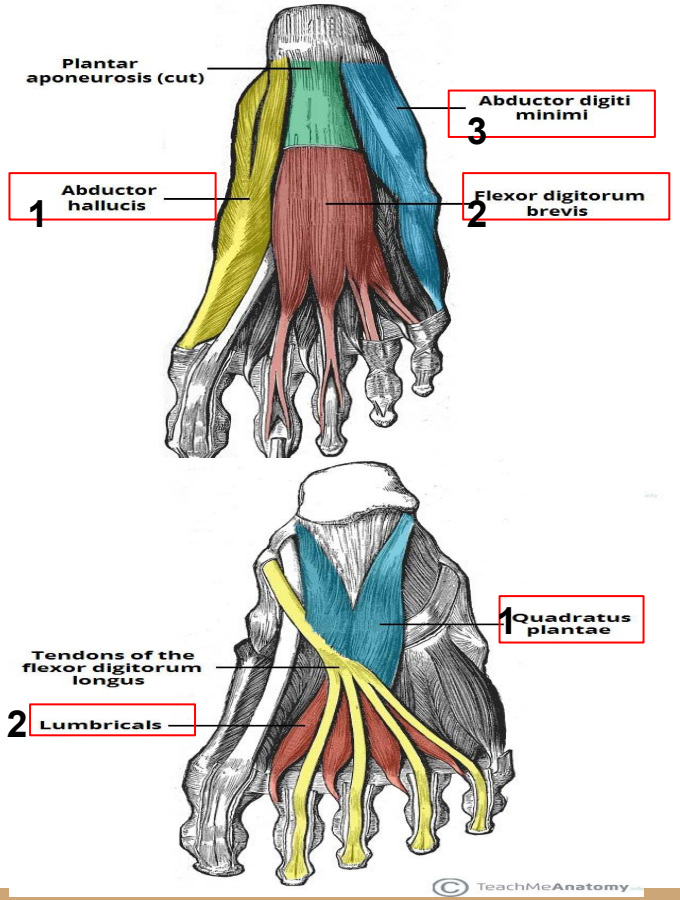
1- Abductor hallucis

2- Flexor digitorum brevis

3- Abductor digiti minimi

Second Layer

1- Quadratus plantea
2- Lumbricals (4 muscles)
3- Flexor digitorum longus **tendon***
4- Flexor hallucis longus **tendon***



(TEAM436)
*Only the TENDON not the muscle
To remember: only the even layers have tendons (2,4)

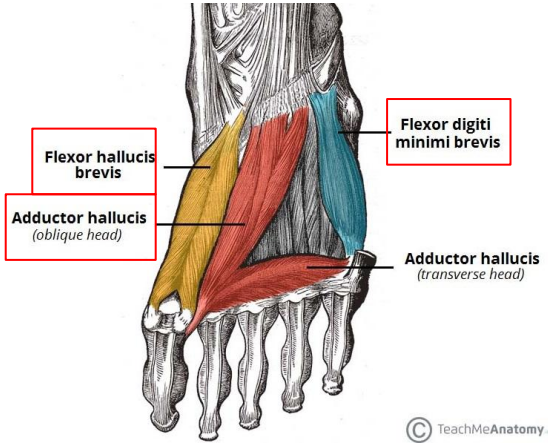
Muscles of the sole of the foot cont

Third Layer

1-Flexor hallucis brevis

2-Adductor hallucis

3-Flexor digiti minimi brevis

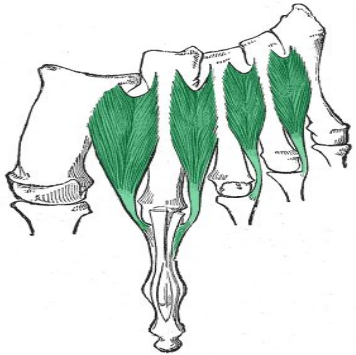


Fourth Layer

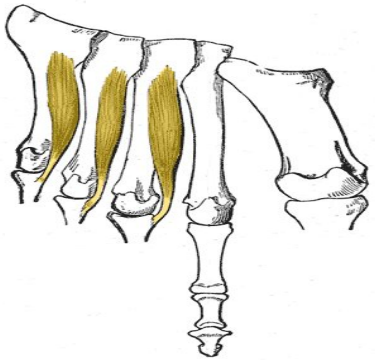
1-Interossei, (3 plantar + 4 dorsal).

2-Peroneus longus **tendon**,

3-Tibialis posterior **tendon**



a) Dorsal Interossei

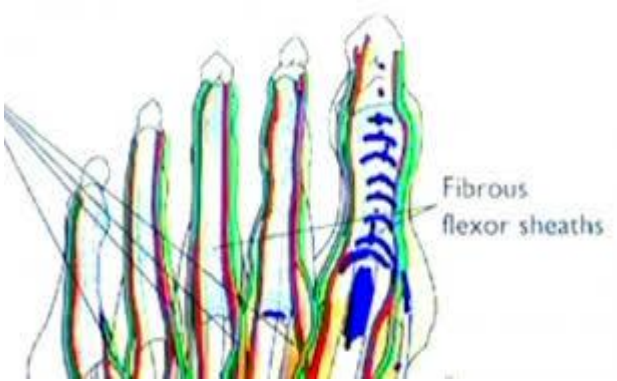


b) Plantar Interossei

Fibrous Flexor Sheaths

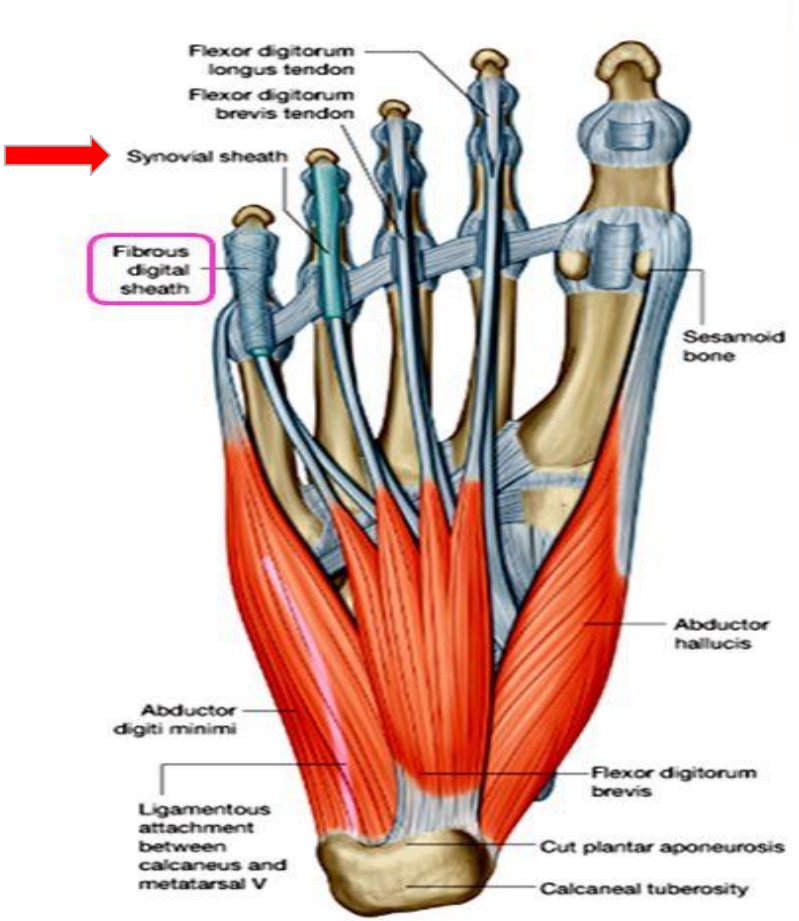
the inferior surface of each toe, from the head of the metatarsal bone to the base of the distal phalanx, is provided with a strong fibrous sheath which is attached to the sides of the phalanges.

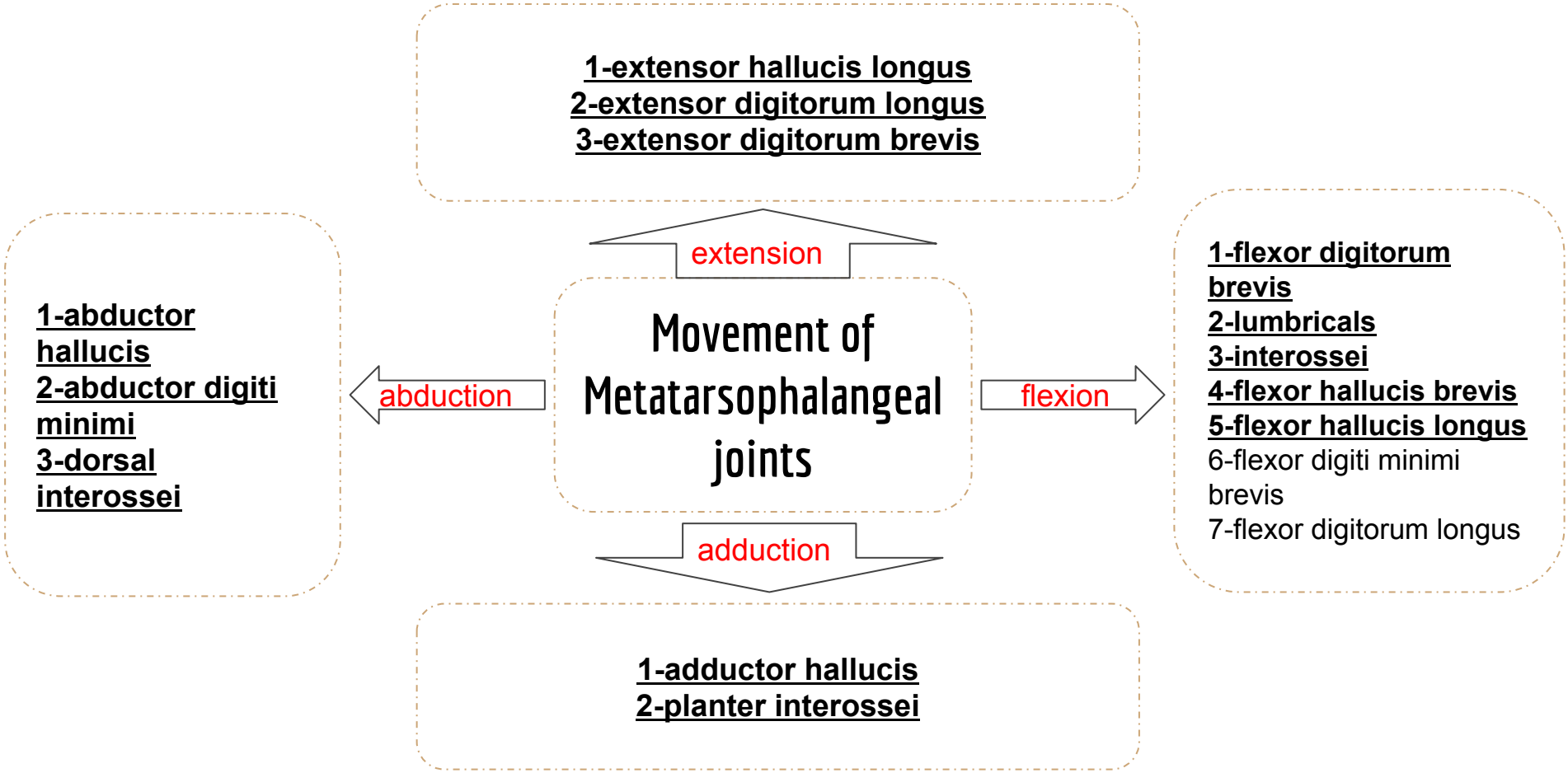
the fibrous sheath, together with the inferior surfaces of the phalanges and the interphalangeal joints, forms a blind tunnel in which lie the flexor tendons of the toe.



Synovial Flexor Sheaths

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





muscles in **bold** are chiefly responsible for the movement, the other muscles assist them

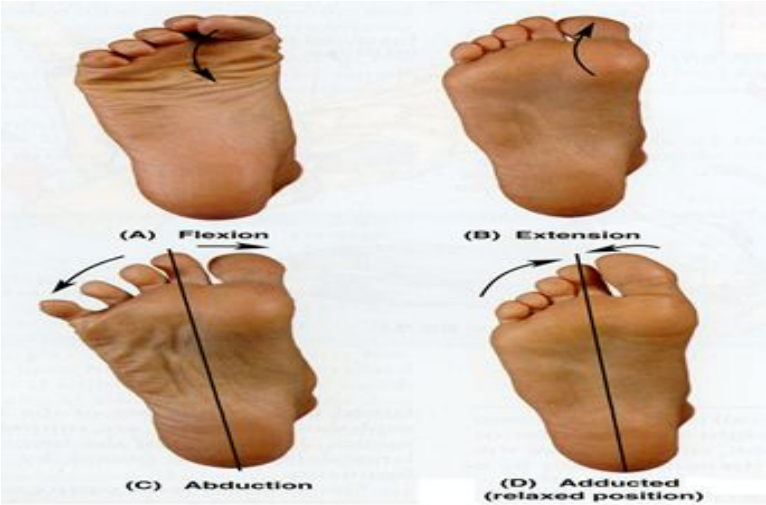
Movement of Interphalangeal joints

extension

1-extensor hallucis longus
2-extensor digitorum longus
3-extensor digitorum brevis

flexion

1-flexor hallucis longus
2-flexor digitorum longus
3-flexor digitorum brevis
4-quadratus plantae

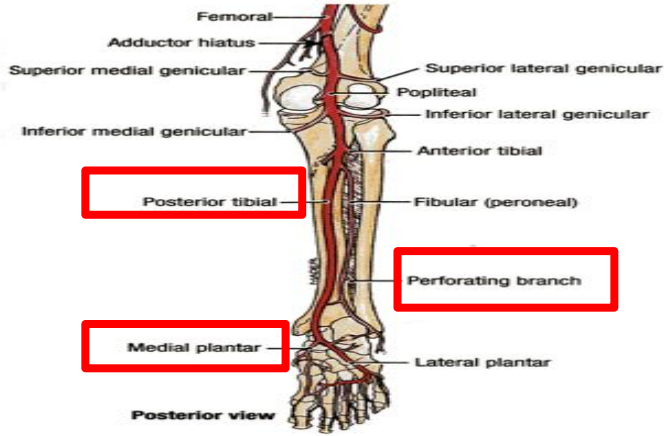


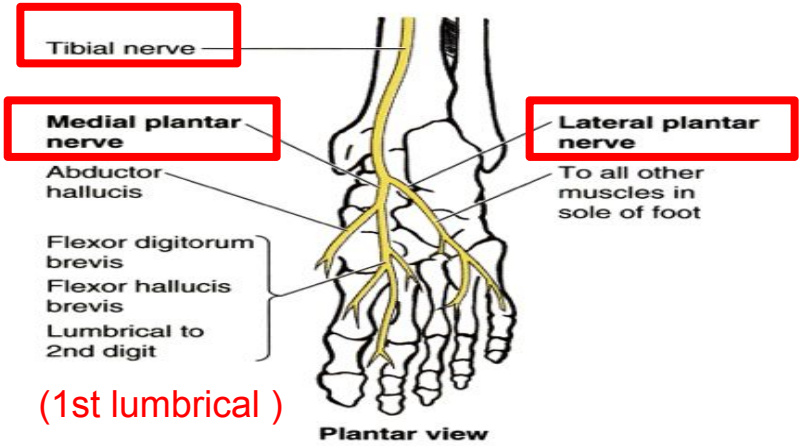
muscles in **bold** are chiefly responsible for the movement, the other muscles assist them

Medial and lateral plantar arteries and nerve

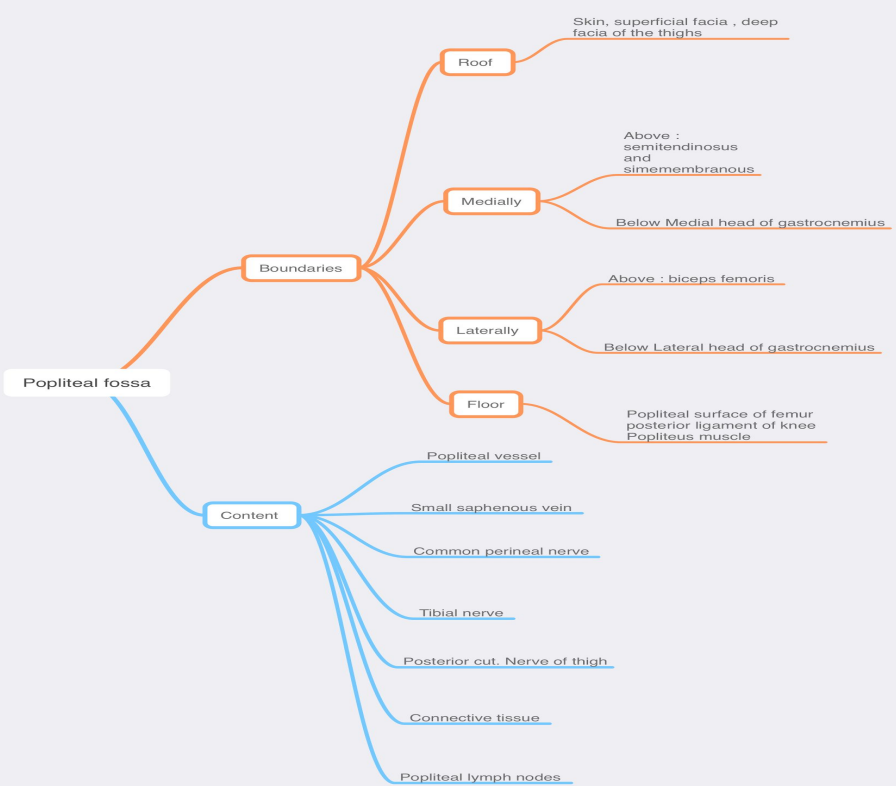
The medial plantar artery is the smaller & lateral plantar artery is the larger of the terminal branches of the posterior tibial artery

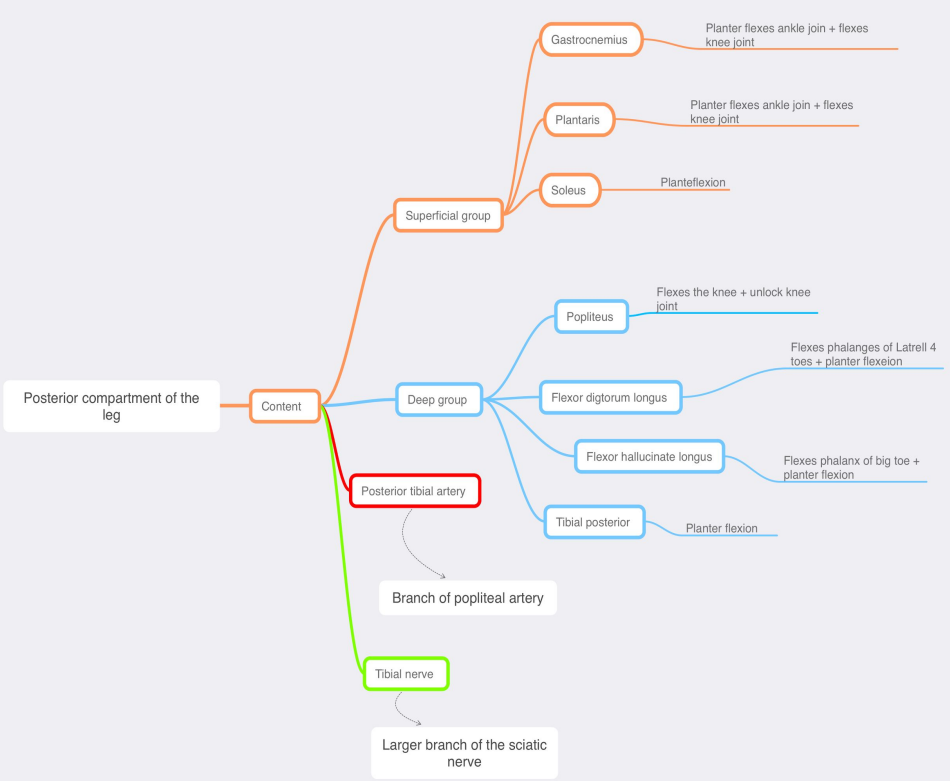
- The medial plantar nerve is a terminal branch of the tibial nerve.
- The lateral plantar nerve is a terminal branch of the tibial nerve.

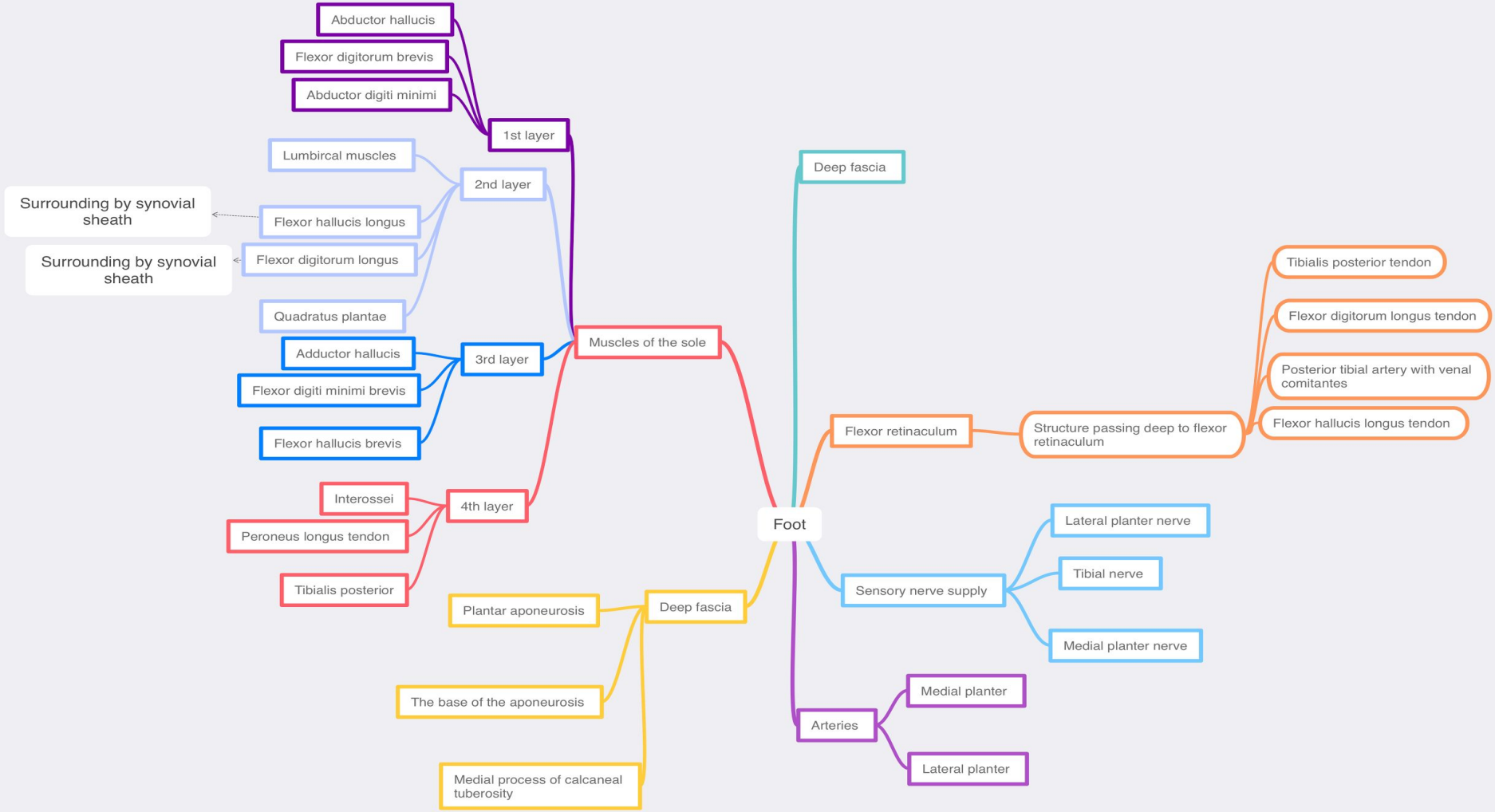




summary


Popliteal fossa
Boundaries
Roof
Skin, superficial facia , deep facia of the thighs
Medially
Above : semitendinosus and simemembranous
Below Medial head of gastrocnemius
Laterally
Above : biceps femoris
Below Lateral head of gastrocnemius
Floor
Popliteal surface of femur
posterior ligament of knee
Popliteus muscle
Content
Popliteal vessel
Small saphenous vein
Common perineal nerve
Tibial nerve
Posterior cut. Nerve of thigh
Connective tissue
Popliteal lymph nodes


Posterior compartment of the leg
Content
Superficial group
Gastrocnemius
Planter flexes ankle join + flexes knee joint
Plantaris
Planter flexes ankle join + flexes knee joint
Soleus
Planteflexion
Deep group
Popliteus
Flexes the knee + unlock knee joint
Flexor digtorum longus
Flexes phalanges of Latrell 4 toes + planter flexeion
Flexor hallucinate longus
Flexes phalanx of big toe + planter flexion
Tibial posterior
Planter flexion
Posterior tibial artery
Branch of popliteal artery
Tibial nerve
Larger branch of the sciatic nerve


Foot
Deep fascia
Flexor retinaculum
Structure passing deep to flexor retinaculum
Tibialis posterior tendon
Flexor digitorum longus tendon
Posterior tibial artery with venal comitantes
Flexor hallucis longus tendon
Sensory nerve supply
Lateral planter nerve
Tibial nerve
Medial planter nerve
Arteries
Medial planter
Lateral planter
Deep fascia
Plantar aponeurosis
The base of the aponeurosis
Medial process of calcaneal tuberosity
Muscles of the sole
1st layer
Abductor hallucis
Flexor digitorum brevis
Abductor digiti minimi
2nd layer
Lumbircal muscles
Flexor hallucis longus
Surrounding by synovial sheath
Flexor digitorum longus
Surrounding by synovial sheath
Quadratus plantae
3rd layer
Adductor hallucis
Flexor digiti minimi brevis
Flexor hallucis brevis
4th layer
Interossei
Peroneus longus tendon
Tibialis posterior

Team Members

Lamia Abdullah Alkuwaiz (Team Leader)
Rawan Mohammad Alharbi
Abeer Alabduljabbar
Afnan Abdulaziz Almustafa
Ahad Algrain
Alanoud Almansour
Albandari Alshaye
AlFhadah abdullah alsaleem
Arwa Alzahrani
Dana Abdulaziz Alrasheed
Dimah Khalid Alaraifi
Ghada Alhaidari
Ghada Almuhanna
Ghaida Alsanad
Hadeel Khalid Awartani
Haifa Alessa
Khulood Alwehabi
Layan Hassan Alwatban
Lojain Azizalrahman
Lujain Tariq AlZaid
Maha Barakah
Majd Khalid AlBarrak
Norah Alharbi
Nouf Alotaibi
Noura Mohammed Alothaim
Rahaf Turki Alshammari
Reham Alhalabi
Rinad Musaed Alghoraiby
Sara Alsultan
Shahad Alzahrani
Wafa Alotaibi
Wejdan Fahad Albadrani
Wjdan AlShamry

Faisal Fahad Alsaif (Team Leader)
Abdulaziz Al dukhayel
Fahad Alfaiz
Akram Alfandi
Saad Aloqile
Saleh Almoaiqel
Abdulaziz Alabdulkareem
Abdullah Almeaither
Yazeed Aldossari
Muath Alhumood
Abdulrahman Almotairi
Abdulelah Aldossari
Abdulrahman Alduhayyim
Abdullah AlOmar
Hamdan Aldossari
Mohammed Alomar
Abdulrahman Aldawood
Saud Alghufaily
Hassan Aloraini
Khalid Almutairi
Rakan Alkharan
Abdullah AL-Essa
Abdulmajeed
Alwardi
Abdulrahman Alageel
Rayyan Almousa
Sultan Alfuhaid
Ali Alammari
Fahad alshughaithry
Fayez Ghiyath
Aldarsouni
Mohammed Alquwayfili
Abduljabbar Al-yamani
Sultan Al-nasser
Majed Aljohani
Zeyad Al-khenaizan
Mohammed Nouri
Abdulaziz Al-drgam
Fahad Aldhowaihy
Omar alyabis