

Frontal Lateral Compartments of the leg and dorsum foot

Lecture 20



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هذا العمل لا يغني عن المصدر الأساسي للمذاكرة

{وَمَنْ يَتَوَكَّلْ عَلَى اللَّهِ فَهُوَ حَسْبُهُ}

Objectives:

At the end of the lecture, student should be able to:

Identify the deep fascia of leg

Identify the fascial compartments of the leg

Describe the anatomy of the anterior & lateral compartments

List the contents of each compartment (muscles, vessels & nerves)

Describe the anatomy and contents of the dorsum 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

Fascia of the leg

- The deep fascia surrounds the leg and is attached to Anterior & Medial borders of Tibia.

- **Two Intermuscular Septa:**

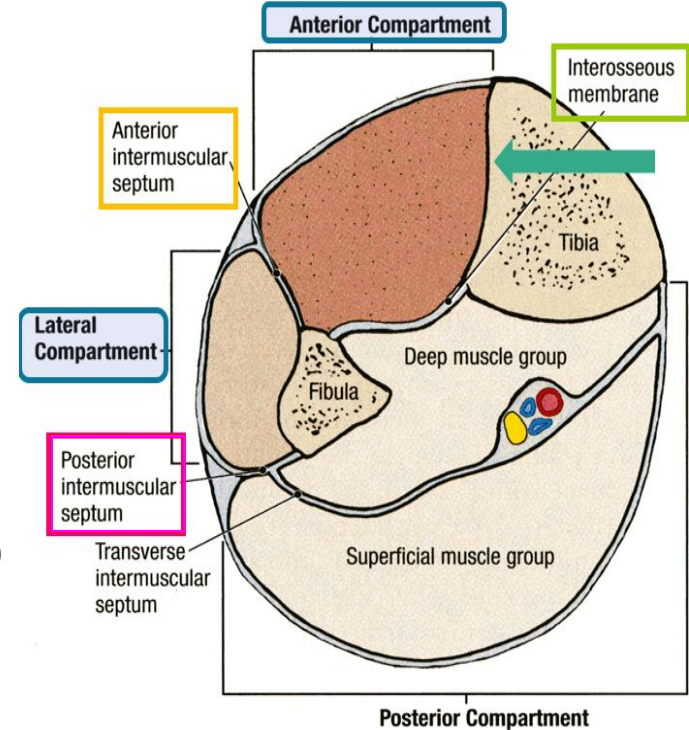
Pass from the deep aspect of this fascia to be attached to :

Anterior border of fibula (Anterior intermuscular septum)

Posterior border of fibula (Posterior intermuscular septum)

- **Interosseous membrane:**

A thin & strong membrane, that binds the interosseous borders of tibia & fibula. It binds the two bones and provides attachment for muscles.



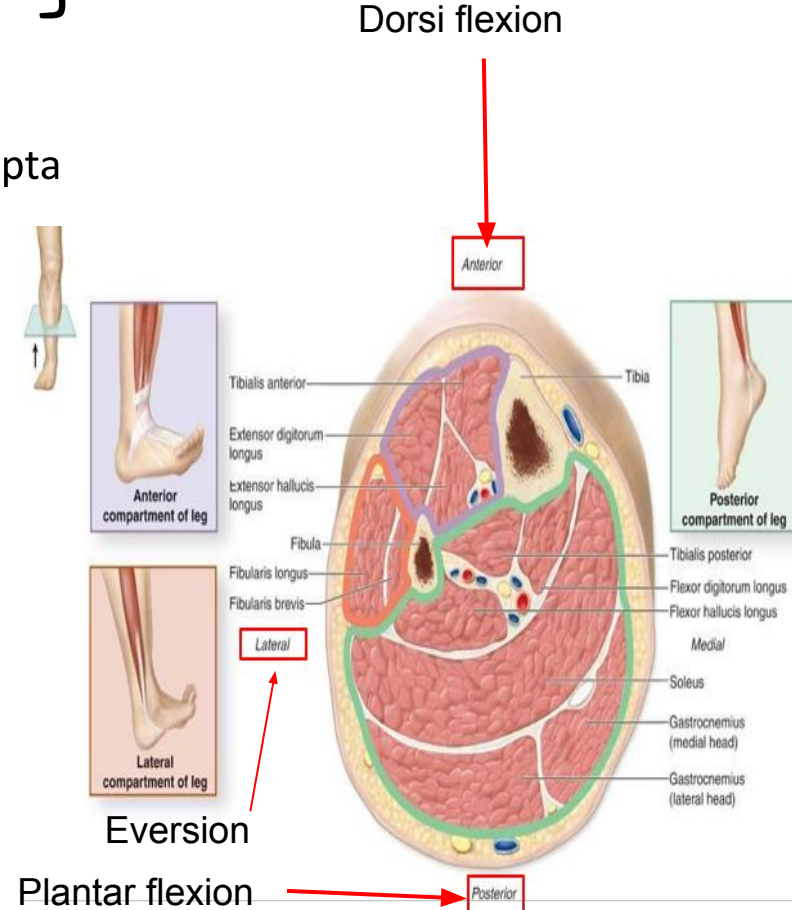
Fascial Compartments of Leg

The **interosseous membrane** and the two intermuscular septa divide the leg into

3 Compartments:

1. Anterior
2. Lateral (peroneal)
3. Posterior

Each one has its own **Muscles** (with specific action), **Blood vessels** and **Nerves**.



Anterior Compartment:

Muscles :

Extensor Hallucis Longus, Extensor Digitorum Longus, Peroneus Tertius, Tibialis Anterior

- All muscles take origin from the fibula EXCEPT **Tibialis Anterior**.

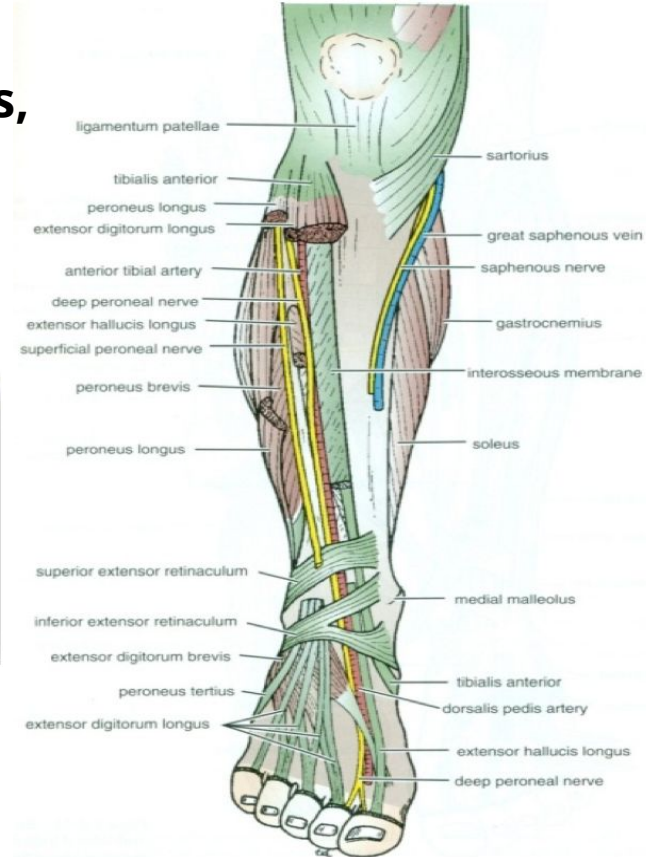
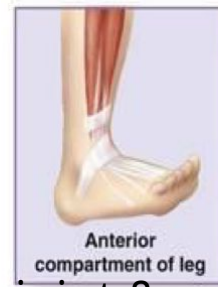
Nerve supply:

- Deep Peroneal.

Blood Supply:

- Anterior tibial.

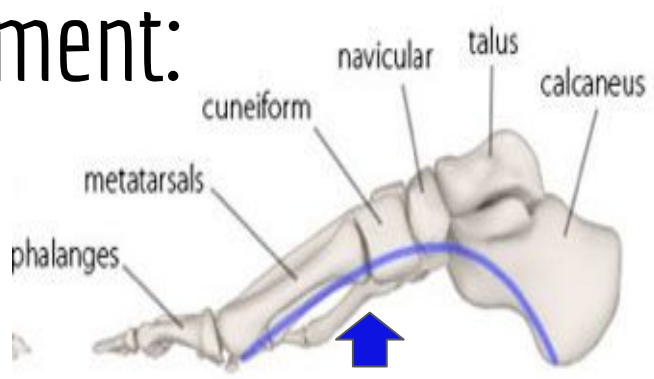
Action: **Dorsiflexion (extension)** of the ankle joint & **Extension** of the toes & **Inversion** (tibialis anterior & extensor hallucis longus only).



Anterior comp. of leg	Origin	Insertion	Action	BLOOD & NERVE SUPPLY
<p>TIBIALIS ANTERIOR</p>	<p>Lateral surface of shaft of tibia & interosseous membrane</p>	<p>Medial cuneiform & Base of first metatarsal bone</p>	<p>Extends foot/dorsiflexion Inverts foot at subtalar & transverse tarsal joints & Holds up medial longitudinal arch of foot</p>	<p>ANTERIOR TIBIAL & DEEP PERONEAL</p>
<p>EXTENSOR DIGITORUM LONGUS</p>	<p>Anterior surface of shaft of fibula</p>	<p>Extensor expansion of lateral four toes</p>	<p>Extends toes Extends foot/dorsiflexion</p>	
<p>PERONEUS TERTIUS <small>peroneus=fibularis</small></p>	<p>Anterior surface of shaft of fibula</p>	<p>Base of 5th metatarsal bone</p>	<p>Extends foot/dorsiflexion Everts foot at subtalar & transverse tarsal joints (The only evtor in the anterior compartment)</p>	
<p>EXTENSOR HALLUCIS LONGUS <small>hallucis=big toe</small></p>	<p>Anterior surface of shaft of fibula</p>	<p>Base of distal phalanx of great toe</p>	<p>Extends big toe Extends foot/dorsiflexion Inverts foot at subtalar & transverse tarsal joints</p>	

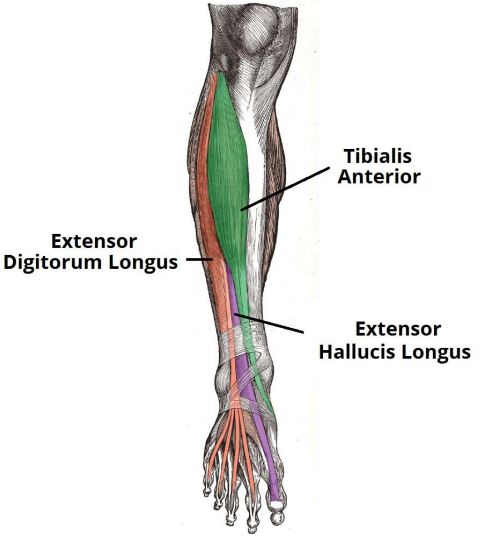
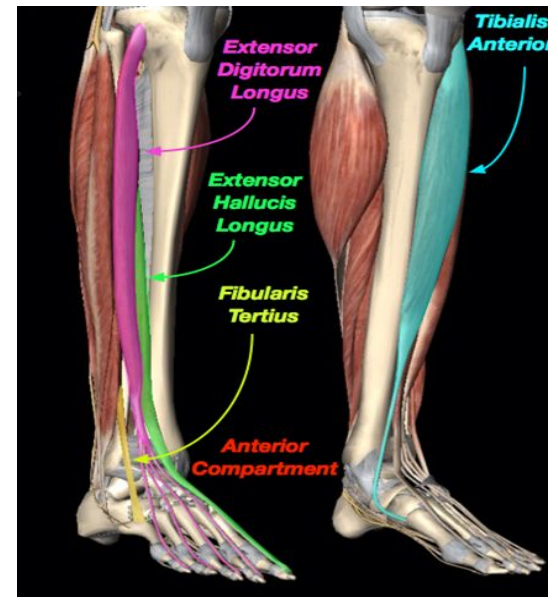
Anterior Compartment:

Visuals to help understanding:

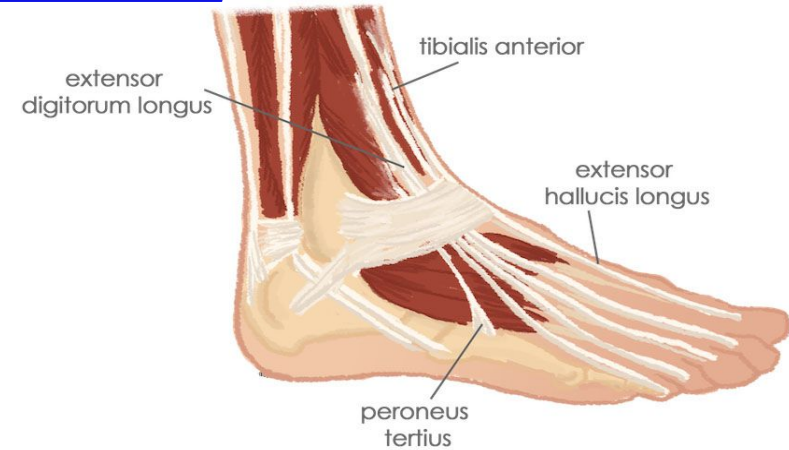
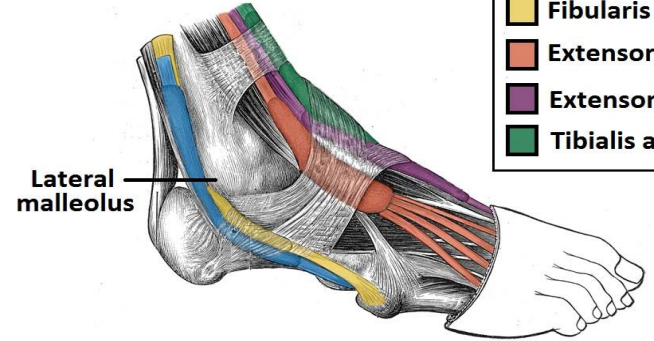


medial (inner) arch

Tibialis anterior attachment to inferior surface of cuneiform and metatarsal



- Fibularis longus
- Fibularis brevis
- Extensor digitorum longus
- Extensor hallucis longus
- Tibialis anterior

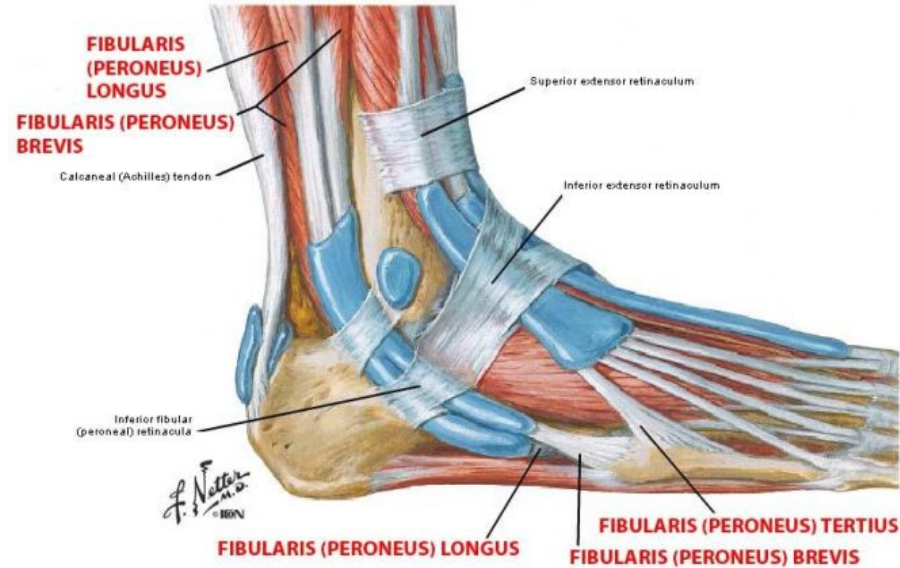


Extensor Retinacula

- A thickening of deep fascia that keeps the long tendons around the ankle joint in position.

Superior extensor retinaculum:

- Attached to anterior borders of tibia and fibula above ankle.
(above lateral and medial malleolus)



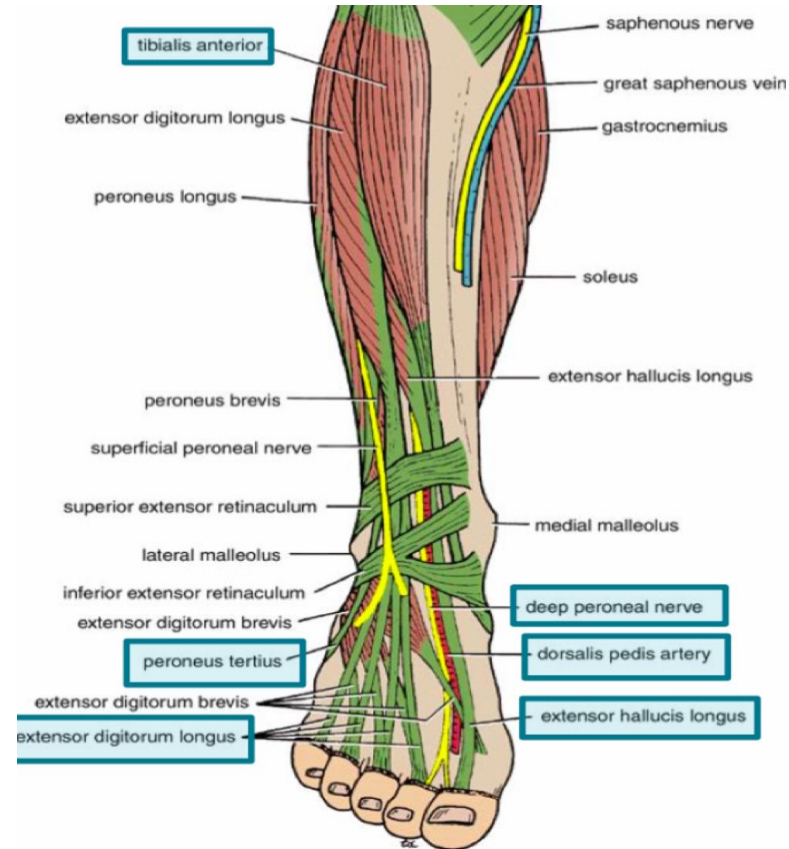
Inferior extensor retinaculum:

- Y-shaped band located inferior to ankle.
(its base is attached to the calcaneum)

Structures passing deep to extensor retinacula

From medial to lateral :

- 1-**T**om: **T**ibialis Anterior
- 2-**H**as: Extensor **h**allucis longus tendon
- 3-**V**ery: Anterior tibial **v**essels
- 4-**N**ice: Deep peroneal **n**erve
- 5-**D**og: Extensor **d**igitorum longus tendon
&
- 6-**P**igeon: **P**eroneus tertius tendon



These structures pass both superior & inferior retinacula

Lateral Compartment of the Leg:

***Peroneus brevis only supports lateral longitudinal arch while Peroneus longus supports it + transverse arch**

Muscles	Origin	Insertion	Action	Blood & Nerve Supply
Peroneus Longus	Lateral surface of shaft of fibula	Base of first metatarsal + medial cuneiform* (same as Tibialis Anterior)	Plantar flexes foot at ankle joint; Everts foot at subtalar and transverse tarsal joints;	Peroneal Artery & Superficial Peroneal Nerve
Peroneus Brevis		Base of fifth metatarsal (same as Peroneus Tertius)	Supports Lateral longitudinal & transverse* arches	

Peroneal Retinacula

Superior peroneal retinaculum

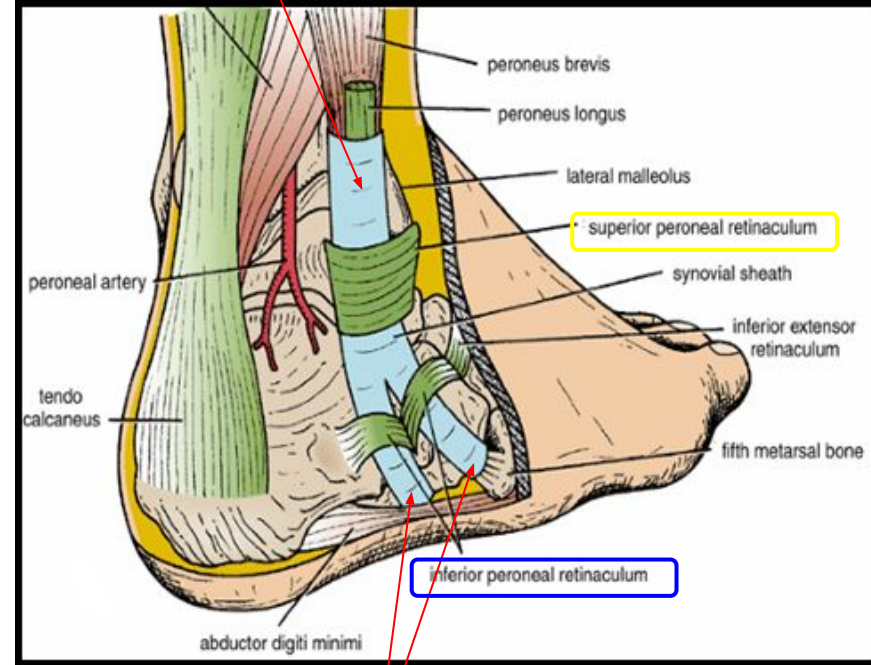
Connects the lateral malleolus to calcaneum & holds the tendons of peroneus longus & brevis

Inferior peroneal retinaculum

Synovial Sheaths of Peroneal Longus & Brevis:

Above the superior peroneal retinaculum tendons of peronei are surrounded by a single common tubular synovial sheath. Below the superior peroneal retinaculum, they have separate sheaths.

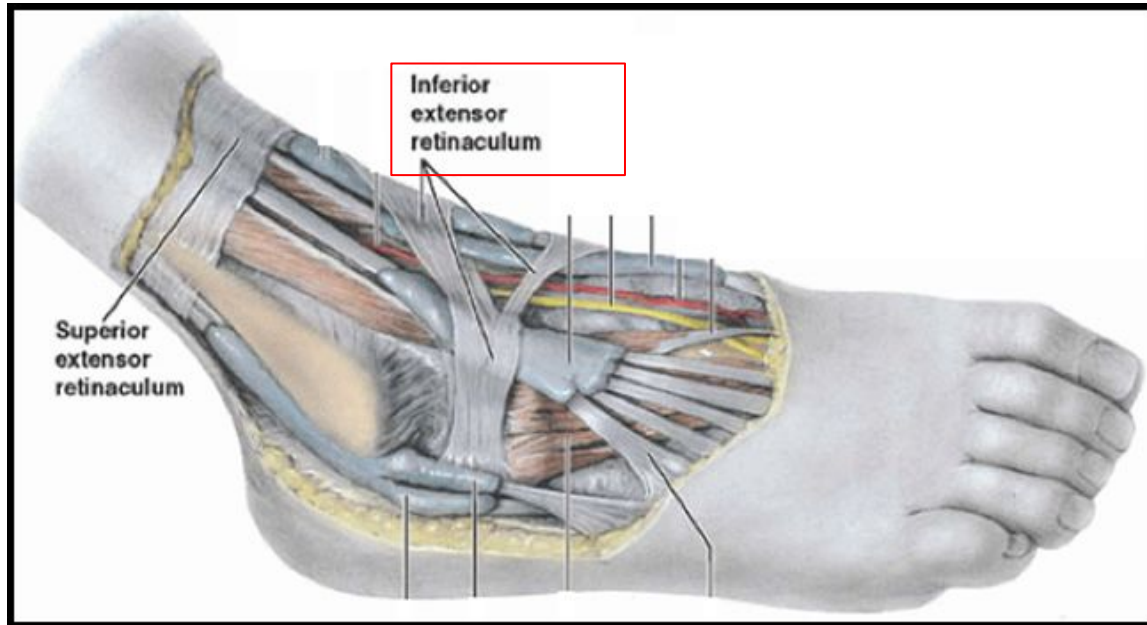
One single sheath



Each tendon has its own

Deep Fascia of Dorsum of Foot

It is very thin, but just distal to the ankle joint, it is thickened to form the **Inferior extensor retinaculum**

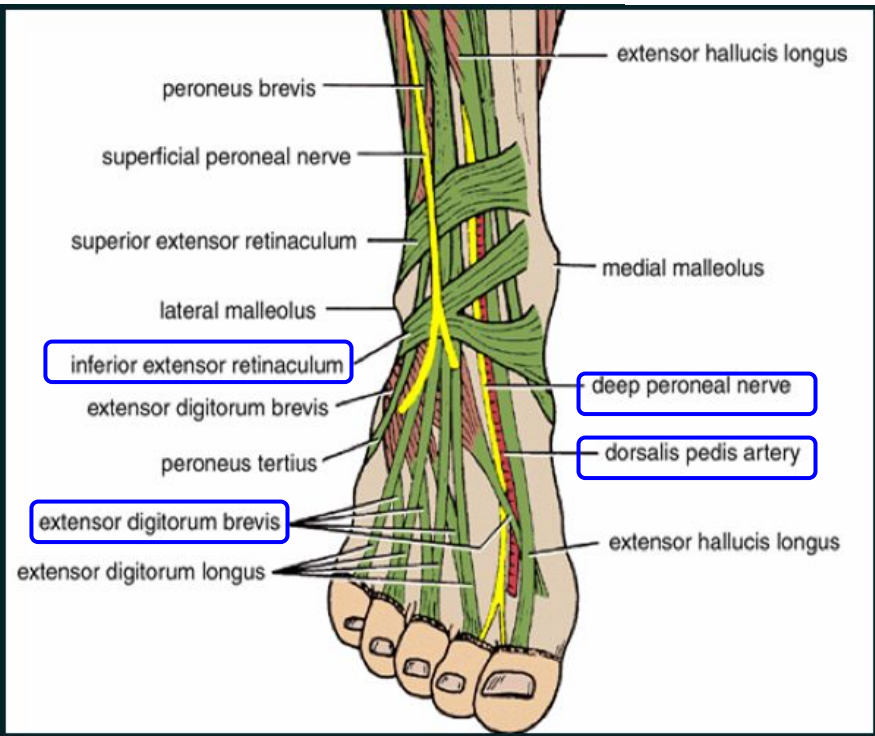


Dorsum of Foot



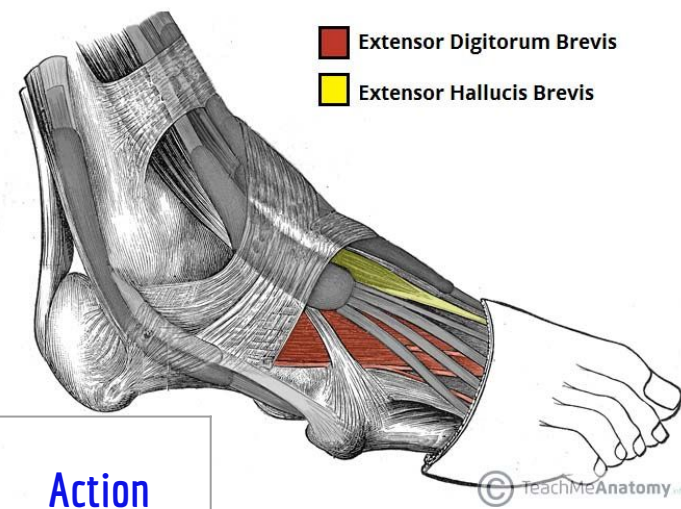
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MUSCLE	BLOOD VESSEL	NERVE
Extensor Digitorum Brevis	Dorsalis Pedis Continuation of anterior tibial artery	<u>DEEP & Superficial</u> Peroneal

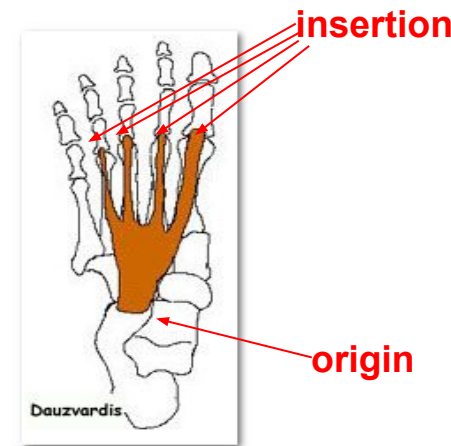


- Superficial fibular**
- Deep fibular**
- Fibular = peroneal**

Extensor Digitorum Brevis

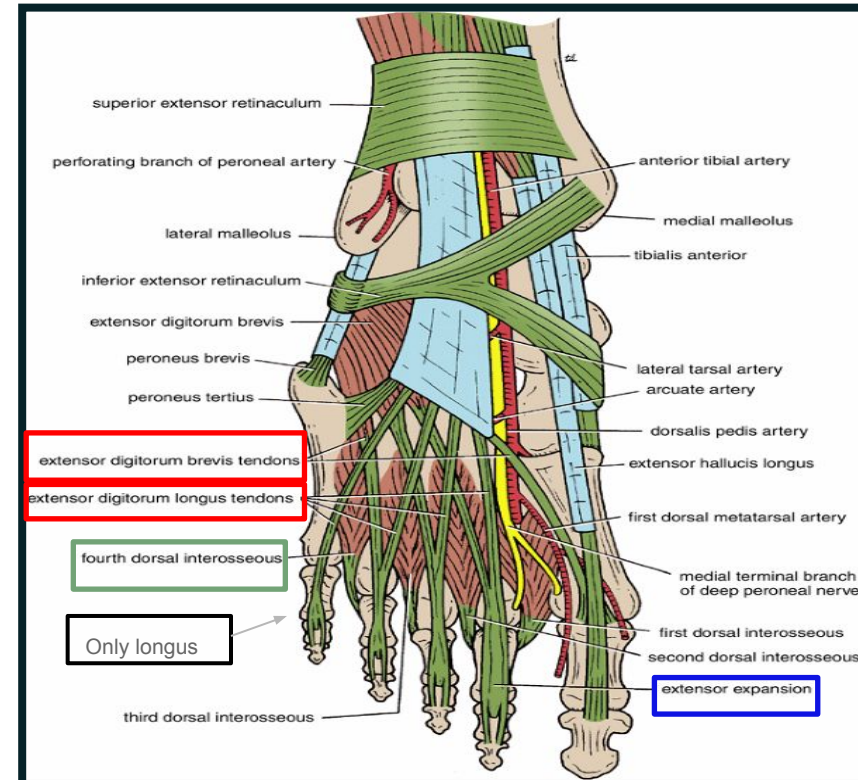


Muscle	Blood & Nerve Supply	Origin	Insertion	Action
Extensor Digitorum Brevis	Dorsalis pedis & Deep & superficial Peroneal	Anterior part of upper surface of the Calcaneum & from the Inferior extensor retinaculum	four tendons into the proximal phalanx of big toe (ex hall brevis) and second, third, and fourth toes	Extend toes



Insertion of Long Extensor Tendons (Extensor Expansion)

- The tendons of Extensor digitorum longus pass to the lateral four toes.
- Each tendon to the 2nd, 3rd & 4th toes is joined on its lateral side by a tendon of Extensor digitorum brevis.
- The extensor digitorum tendons form:
a Fascial Expansion (Extensor Expansion) on the dorsum of each toe.
- The expansion divides into (3) parts:
1-Central part: inserted into the Base of Middle phalange
2-Two Lateral parts: inserted into the Base of Distal phalange
- The Extensor Expansion receives insertion of:
Interossei & Lumbrical muscles.(from the sole)



Synovial Sheaths of Extensor Tendons on the Dorsum of Foot

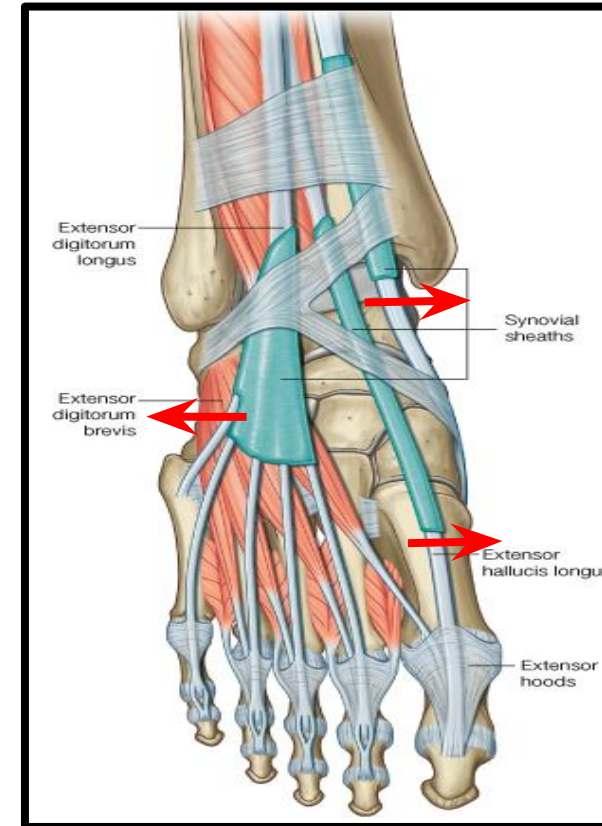
They surround tendons of anterior compartment muscles

1-Tibialis anterior

2-Extensor hallucis longus

(Both have their own synovial sheath)

3-Extensor digitorum longus & peroneus tertius : have a common sheath, it extends to the level of Base of 5th Metatarsal bone. (and the insertion of peroneus tertius)



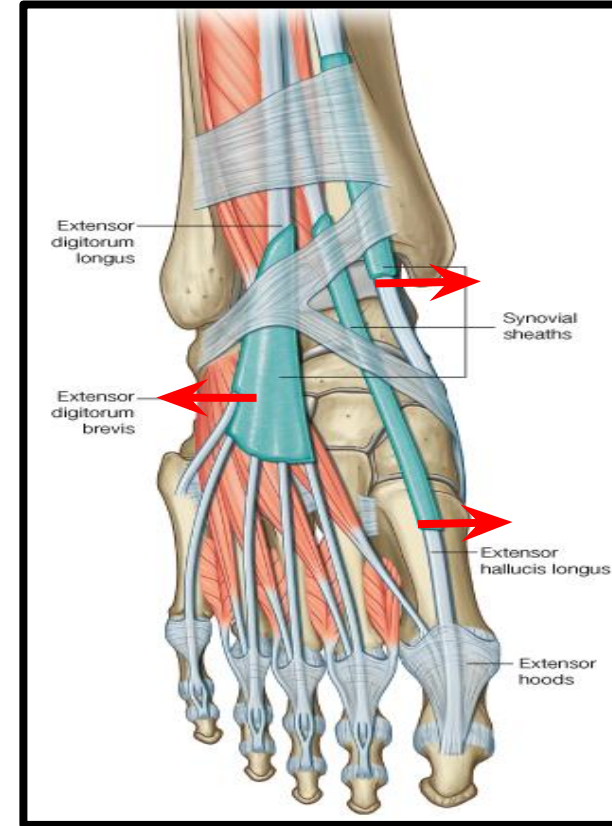
Synovial Sheaths of Extensor Tendons on the Dorsum of Foot

1-Tibialis anterior

2-Extensor hallucis longus

3-Extensor digitorum longus & peroneus tertius :

have a common sheath, it extends to the level of Base of 5th Metatarsal bone.(and the insertion of peroneus tertius)



MUSCLE GALLERY

TABLE 10.17 Summary of Major Actions of Muscles Acting on the Thigh, Leg, and Foot (Figure 10.25) (continued)

Part II:
Muscles Acting on
the Ankle and Toes

Anterior Compartment

Tibialis anterior

Extensor digitorum longus

Fibularis tertius

Extensor hallucis longus

Lateral Compartment

Fibularis longus and brevis

Posterior Compartment

Gastrocnemius

Soleus

Plantaris

Flexor digitorum longus

Flexor hallucis longus

Tibialis posterior

	ACTIONS AT THE ANKLE JOINT				ACTIONS AT THE TOES	
	Plantar Flexion	Dorsiflexion	Inversion	Eversion	Flexion	Extension
Tibialis anterior		× (PM)	×			
Extensor digitorum longus		×				× (PM)
Fibularis tertius		×		×		
Extensor hallucis longus		×	× (weak)			× (great toe)
Fibularis longus and brevis	×			×		
Gastrocnemius	× (PM)					
Soleus	× (PM)					
Plantaris	×					
Flexor digitorum longus	×		×		× (PM)	
Flexor hallucis longus	×		×		× (great toe)	
Tibialis posterior	×		× (PM)			

Questions

1. Which of the following isn't a muscle of the anterior compartment of the leg?

A- Extensor Digitorum Longus B- Extensor Hallucis Longus
C- Peroneus Tertius D- Peroneus Longus

2. All of the following are attached to the fibula except?

A- Tibialis Anterior B- Extensor Digitorum Longus
C- Extensor Hallucis Longus D- Peroneus Brevis

3. The insertion of the peroneus tertius is into:

A- Extensor Expansion B- Base of Distal Phalanx of big toe
C- 5th Metatarsal D- 1st Metatarsal & Medial Cuneiform

4. Which of the following is medial to the vessels in the extensor retinaculum?

A- Deep Peroneal Nerve B- Extensor Hallucis Longus Tendon
C- Extensor Digitorum Longus Tendon D- Peroneus Tertius Tendon

5. The nerve supplying lateral compartment of the leg is:

A- Anterior Tibial B- Deep Peroneal
C- Superficial Peroneal D- Lateral Fibular

6. Which nerve supplies the anterior compartment of the leg ?

A- Anterior Tibial B- Deep Peroneal
C- Superficial Peroneal D- Lateral Fibular

7. Insertion of Extensor digitorum longus Tendons:

A- the lateral four toes B- talus
C- 5th metatarsal D- 1st metatarsal

8. Blood supply for Extensor Digitorum Brevis:

A- anterior tibial artery B- dorsalis pedis
C- peroneal artery D- femoral artery

9. Which is the origin of the peroneus longus?

A- Lateral surface of shaft of fibula B- anterior surface of tibia
C- medial surface of fibula D- medial surface of tibia

10. How many Intermuscular Septa pass from deep fascia to attach to fibula?

A- 1 B- 2 C- 3 D- 4

1-D 2-A 3-C 4-B 5-C 6-B 7-A 8-B 9-A 10-B

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Ahad Algrain

Alanoud Almansour

Albandari Alshaye

AlFhadah abdullah alsaleem

Arwa Alzahrani

Dana Abdulaziz Alrasheed

Dimah Khalid Alaraifi

Ghada Alhaidari

Ghada Almuhananna

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

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Yazeed Aldossari

Muath Alhumood

Abdulrahman Almotairi

Abdulelah Aldossari

Abdulrahman Alduhayyim

Hamdan Aldossari

Abdullah Alqarni

Mohammed Alomar

Abdulrahman Aldawood

Saud Alghufaily

Hassan Aloraini

Khalid Almutairi

Abdulmajeed

Alwardi

Abdulrahman Alageel

Rayyan Almousa

Sultan Alfuhaid

Ali Alammari

Fahad Alshughaihthy

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