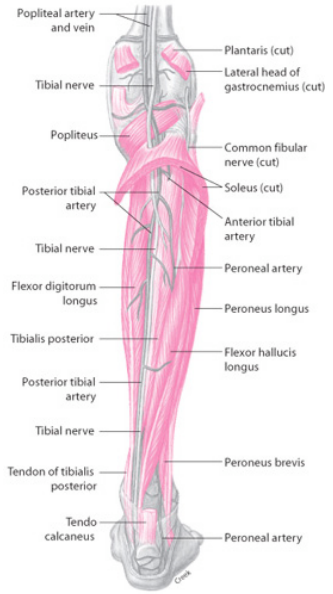
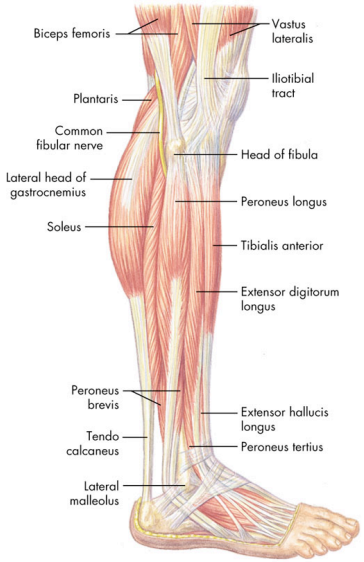
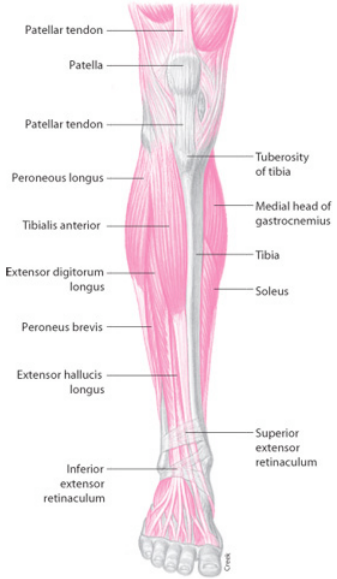
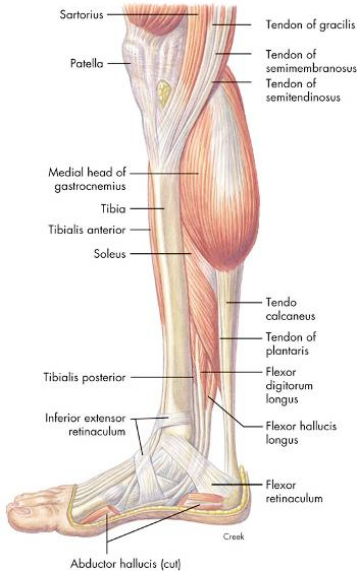
MUSCLES OF THE ANKLE AND FOOT

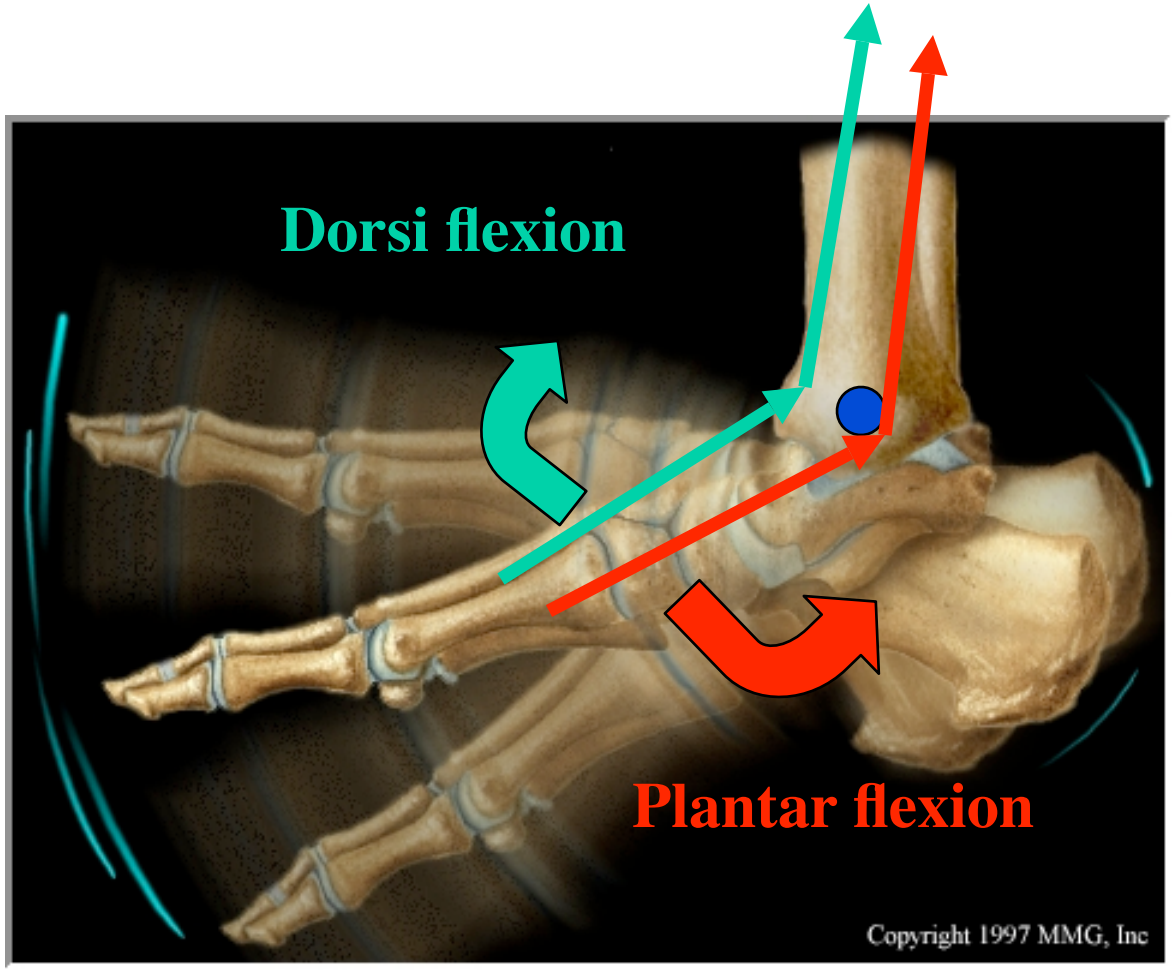






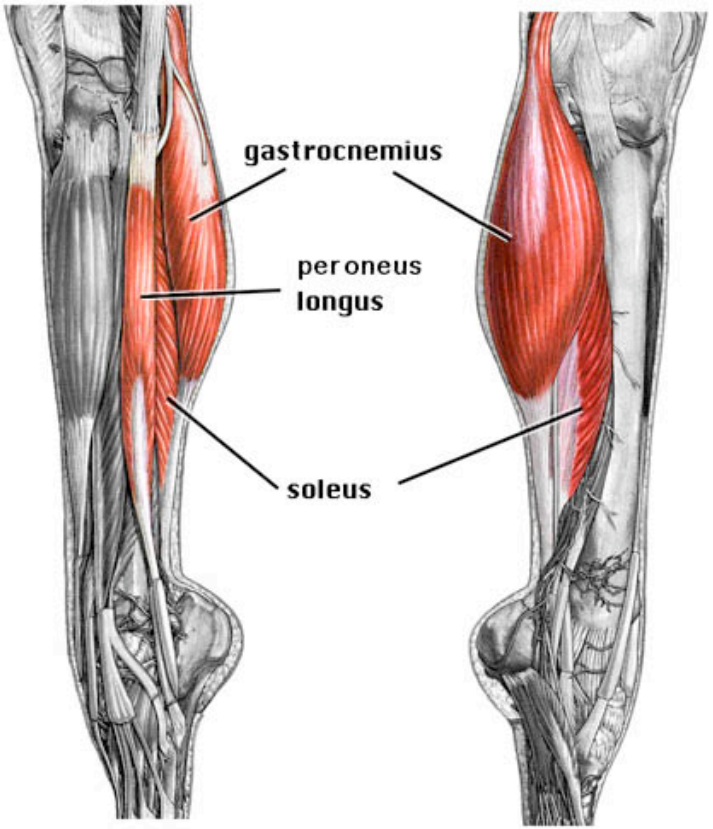


Posterior versus Anterior



POSTERIOR MUSCLES

Plantar flexion muscles



Posterior muscles

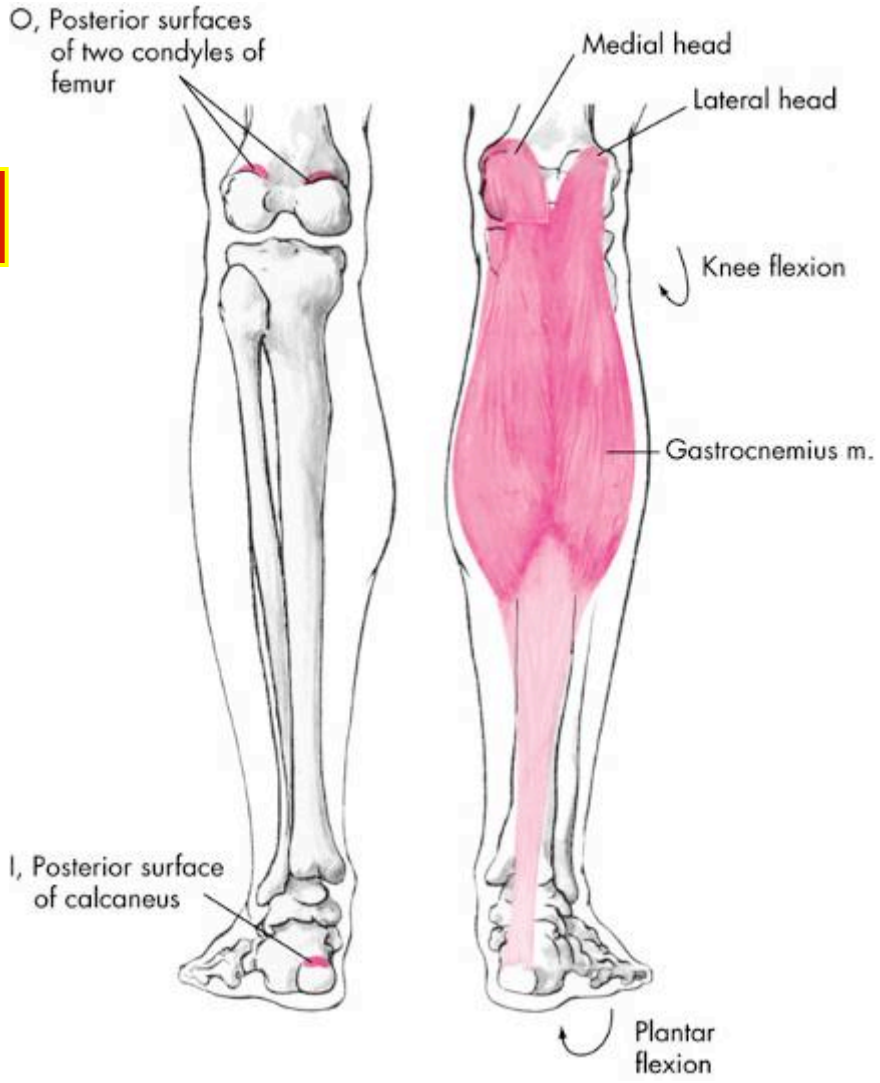
Gastrocnemius

- Origin: posterior surface of the two femur condyels
- Insertion: posterior surface of the calcaneus via Achilles tendon
- Actions:
  - plantar flexion of the foot
  - flexion of the knee
- Stronger plantar flexion when the knee is extended

Posterior

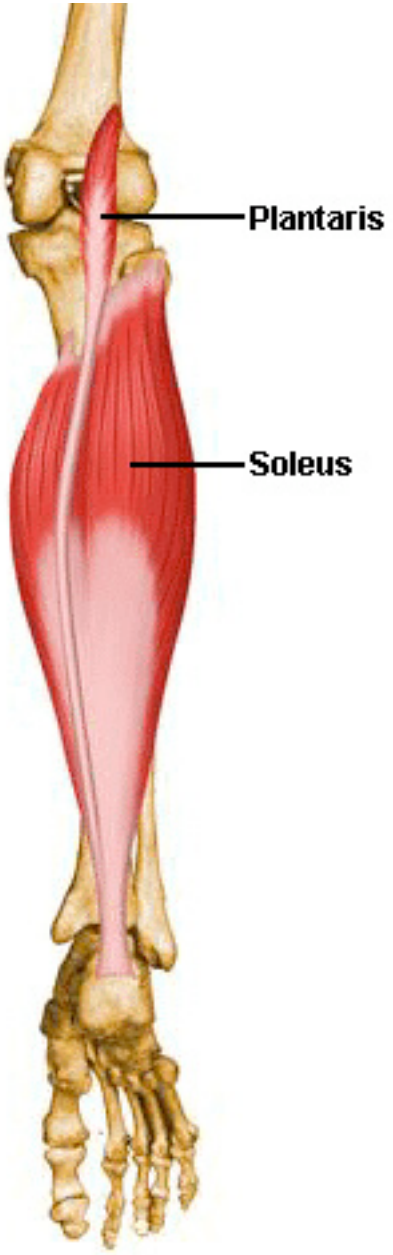
Gastrocnemius Muscle

Plantar flexion of ankle



Soleus

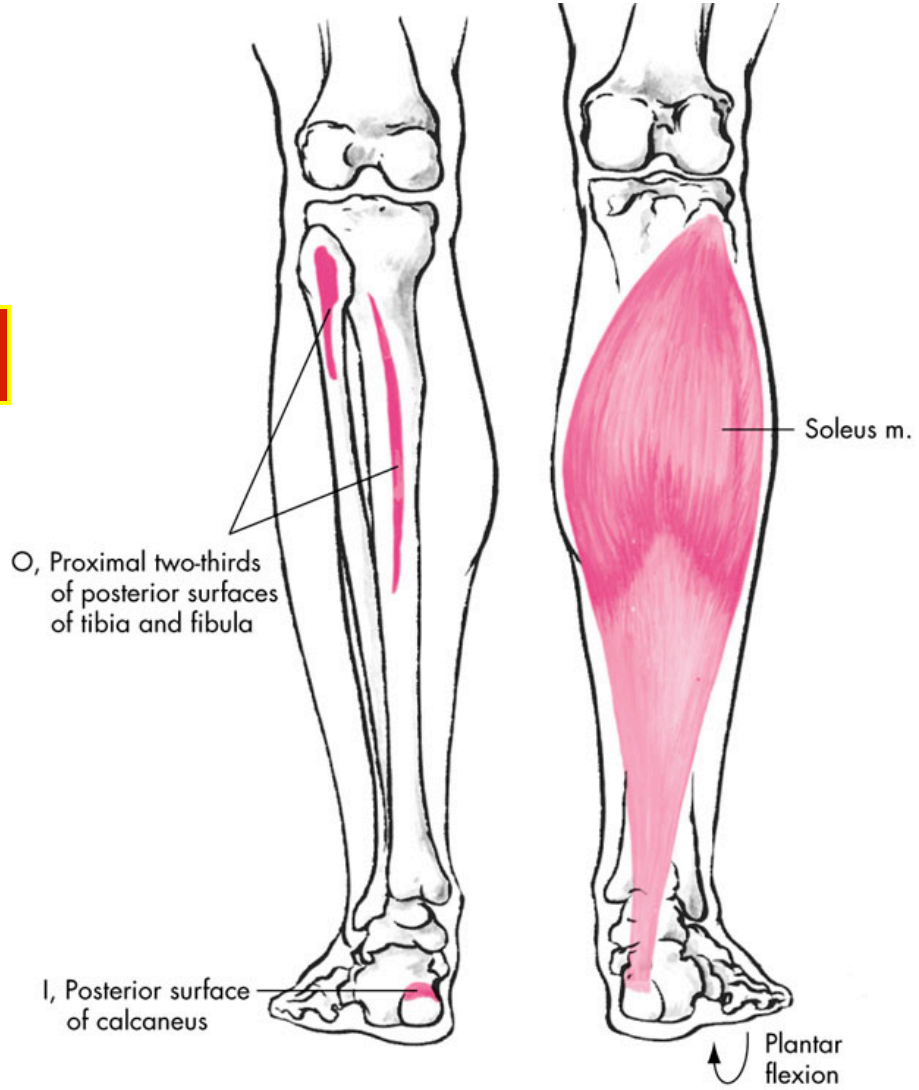
- Located beneath the gastrocnemius
- Origin: upper 2/3 of the posterior surfaces of the tibia and fibula
- Insertion: posterior surface of the calcaneus via Achilles tendon
- Action:
  - plantar flexion



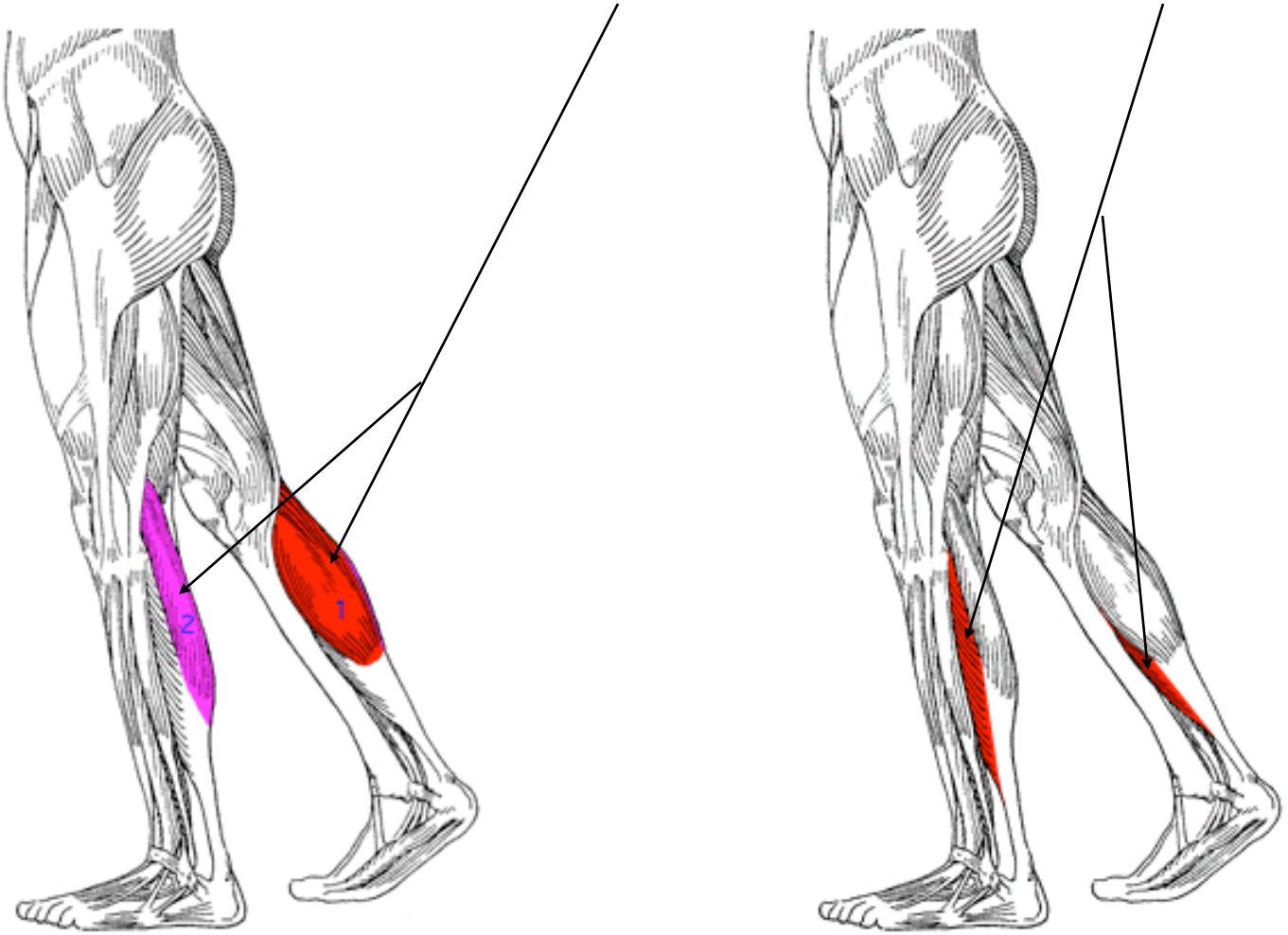
Posterior

Soleus Muscle

Plantar flexion of ankle



Gastrocnemius & Soleus



•Gastronemius and Soleus = “triceps surae” due to their three heads

Achilles

- *Encyclopedia Britannica*
- In Greek mythology, Achilles was the bravest and strongest of the Greek warriors in the Trojan War.
- Because his mother dipped him into the River Styx, he was invulnerable except at the heel by which she held him.
- During the war against Troy Achilles took 12 nearby cities, but after a quarrel with Agamemnon he refused further service.
- He allowed his beloved cousin Patroclus to fight in his armor, and when Hector slew Patroclus, Achilles returned to battle, killed Hector, and dragged his body around the walls of Troy.
- Homer mentions Achilles' funeral but not the circumstances of his death; the later poet Arctinus relates that Paris killed Achilles with an arrow guided by Apollo.

Achilles Tendon

- Named after Achilles
- Largest tendon
- 1000 pounds of force
- Tendon of the Gastrocnemius and Soleus

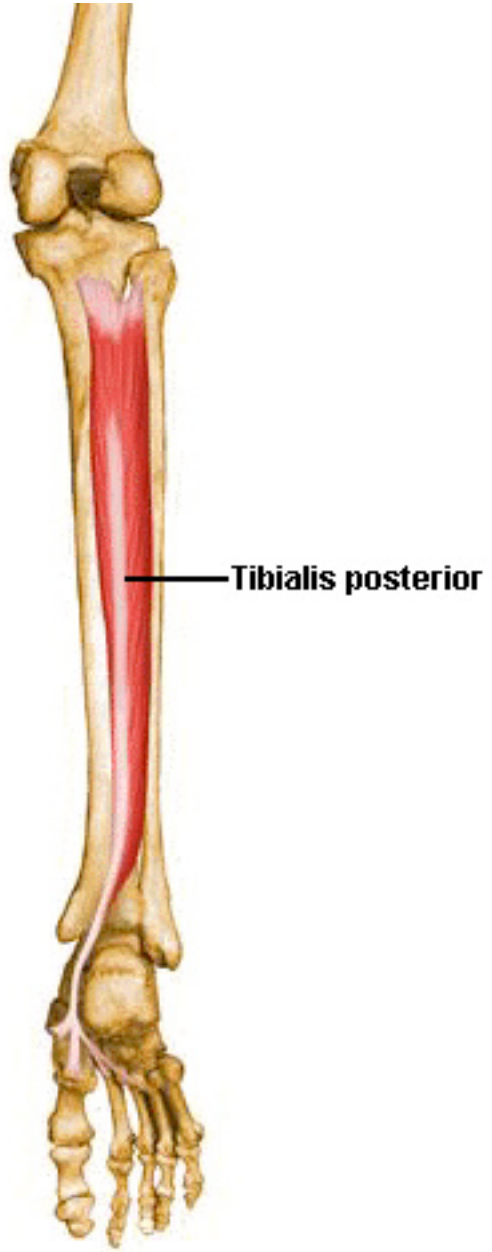
Plantaris

- Absent in some humans
- Origin: lateral epicondyle
- Insertion: calcaneus
- Actions:
  - plantar flexion
- Superficial posterior compartment

Posterior

Tibialis posterior

- Origin: posterior surface of the upper half of the adjacent surface of tibia & fibula
- Insertion: navicular, cuneiforms, and cuboid bones and bases of the 2nd-5th metatarsal bones.
- Note: passes <u>posterior</u> to medial malleolus.
- Actions:
  - plantar flexion
  - inversion of the foot

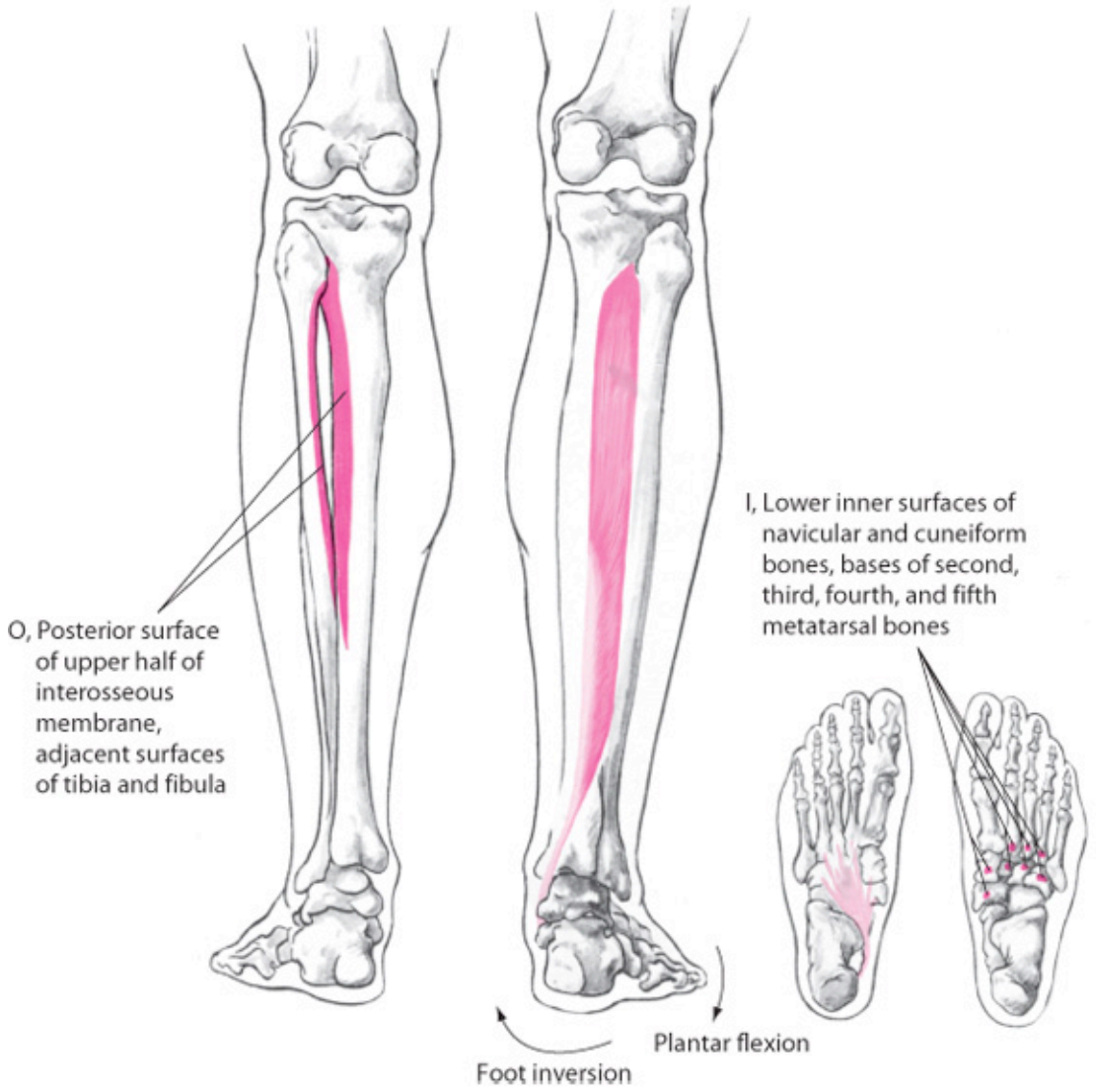


Posterior

Tibialis Posterior Muscle

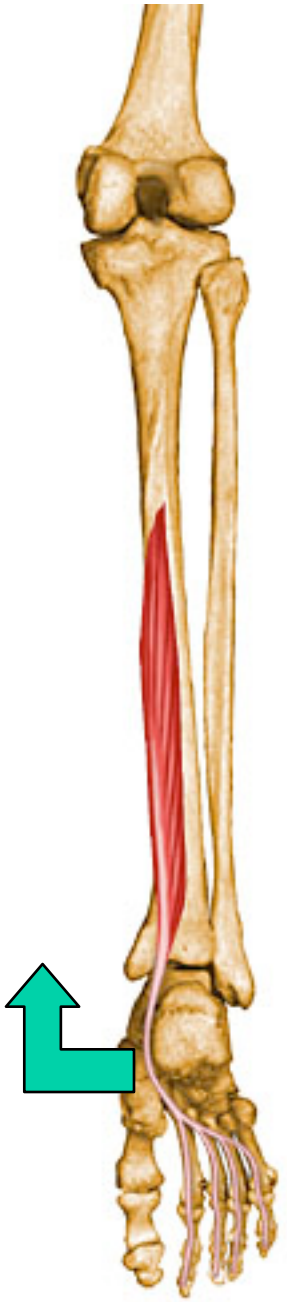
Plantar flexion of ankle

Inversion of foot



Flexor Digitorum Longus

- Origin: middle 1/3 of the posterior surface of the tibia
- Insertion: base of the distal phalanges of each of lateral four toes
- Note: passes <u>posterior</u> to medial malleolus.
- Actions:
  - toe flexion
  - plantar flexion,
  - inversion of the foot



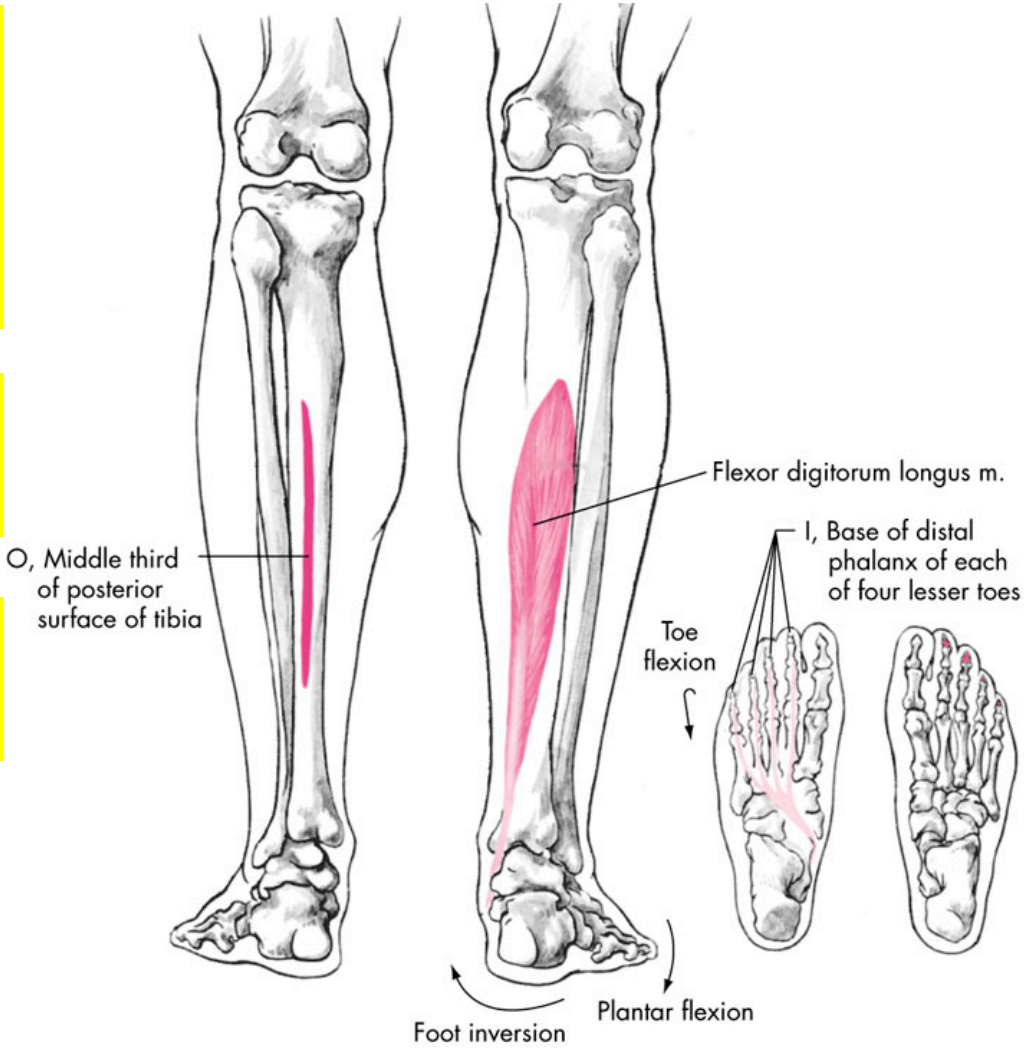
Posterior

Flexor Digitorum Longus Muscle

Flexion of 4 lesser toes at metatarsophalangeal, proximal & distal interphalangeal joints

Inversion of foot

Plantar flexion of ankle



Flexor Hallicus Longus

- Origin: middle half of the posterior surface of the fibula
- Insertion: distal phalanx of the large toe, plantar surface
- Note: passes posterior to medial malleolus.
- Actions:
  - Flexion of the great toe
  - Inversion
  - Plantar flexion

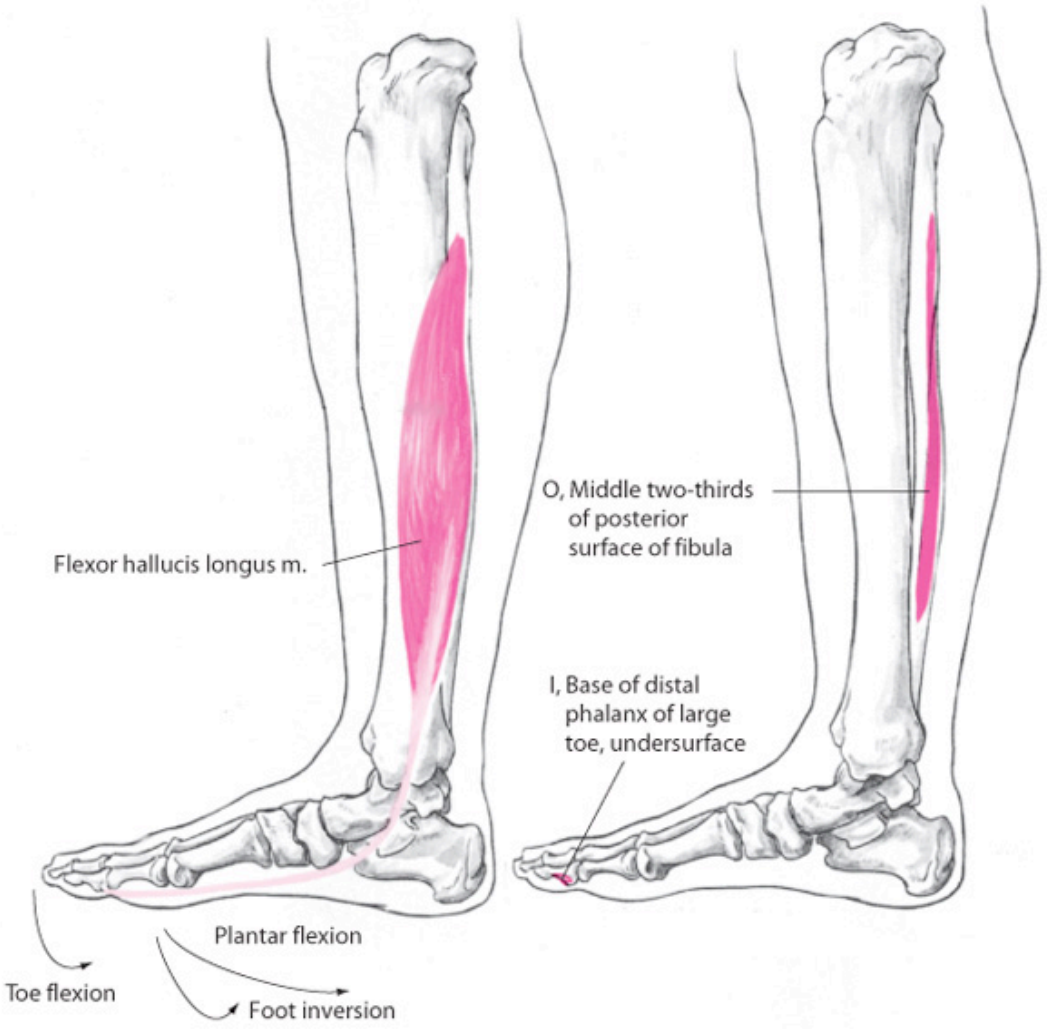
Posterior

Flexor Hallucis Longus Muscle

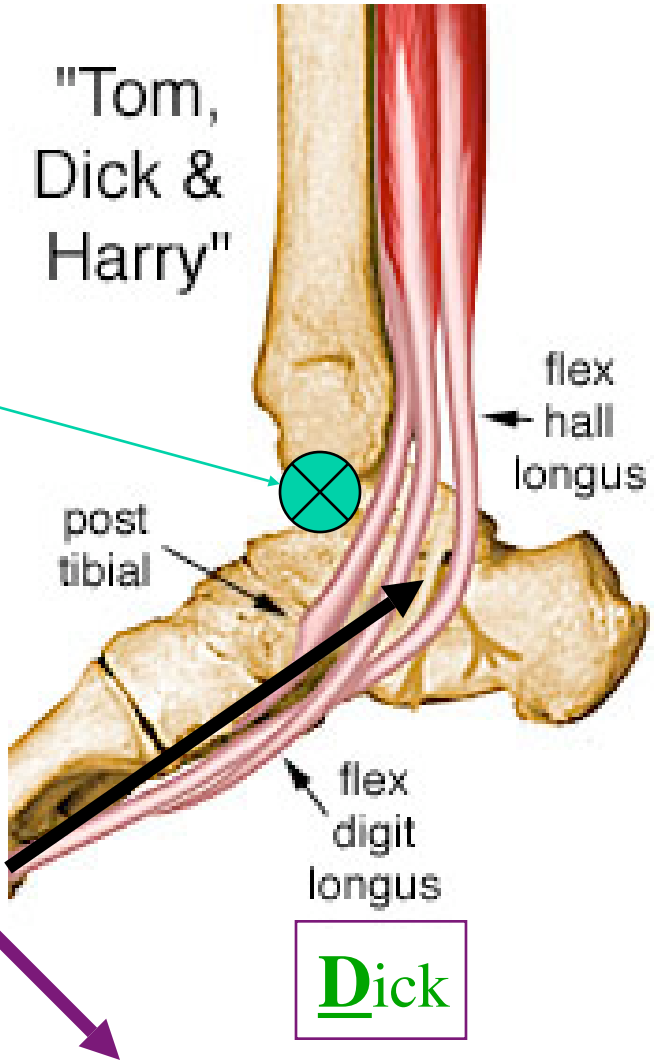
Flexion of great toe at metatarsophalangeal & interphalangeal joints

Inversion of foot

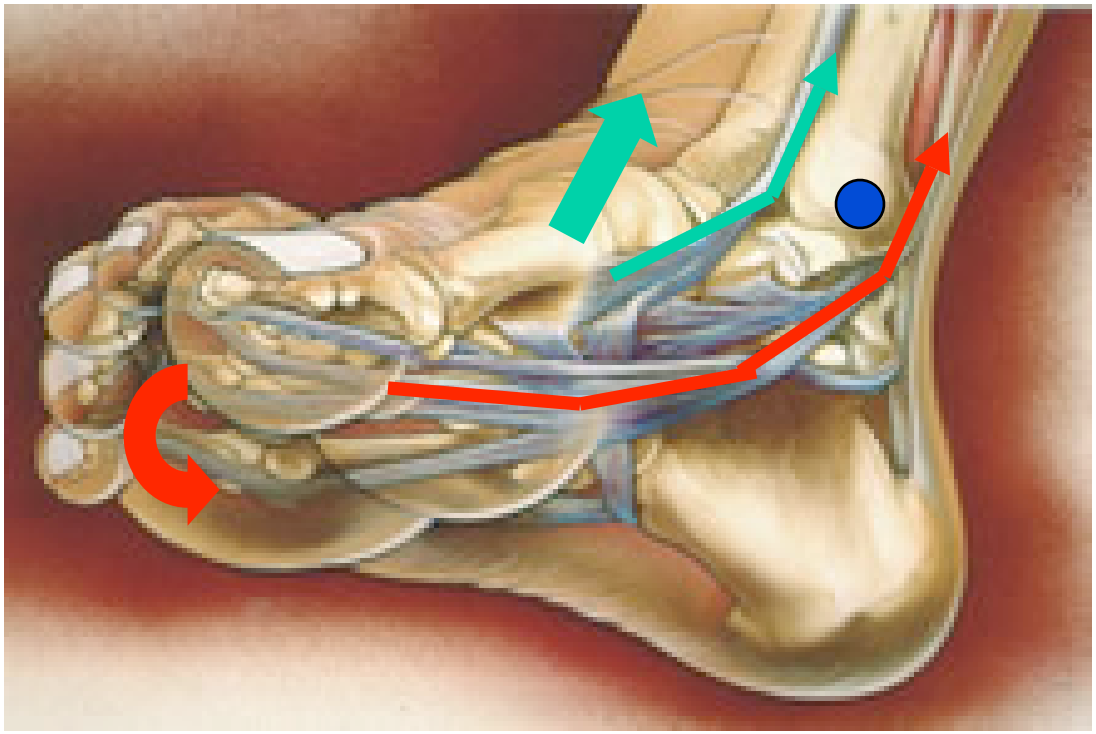
Plantar flexion of ankle



Medial Ankle



Medial Ankle



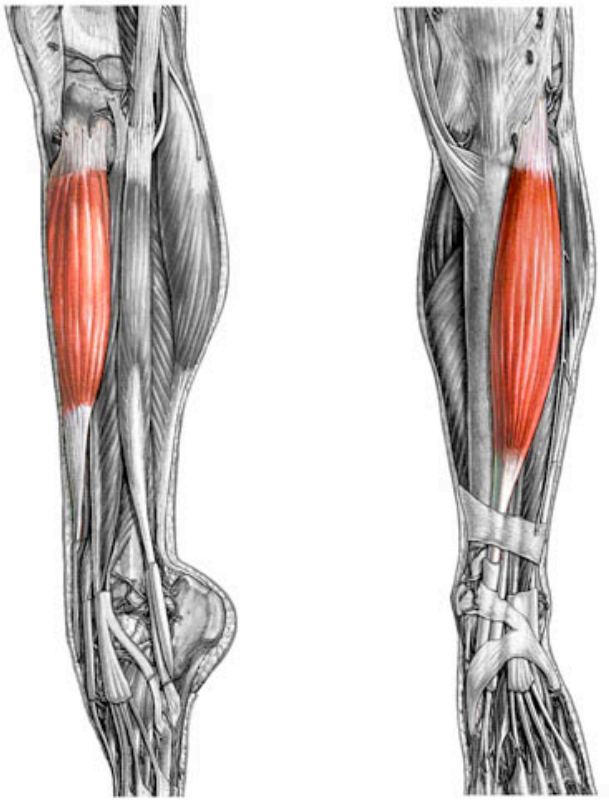
Medial: Inversion

Posterior: Toe Flexion and Plantar Flexion

Anterior: Toe Extension and Dorsal flexion

ANTERIOR MUSCLES

Dorsiflexion muscles



Anterior muscles

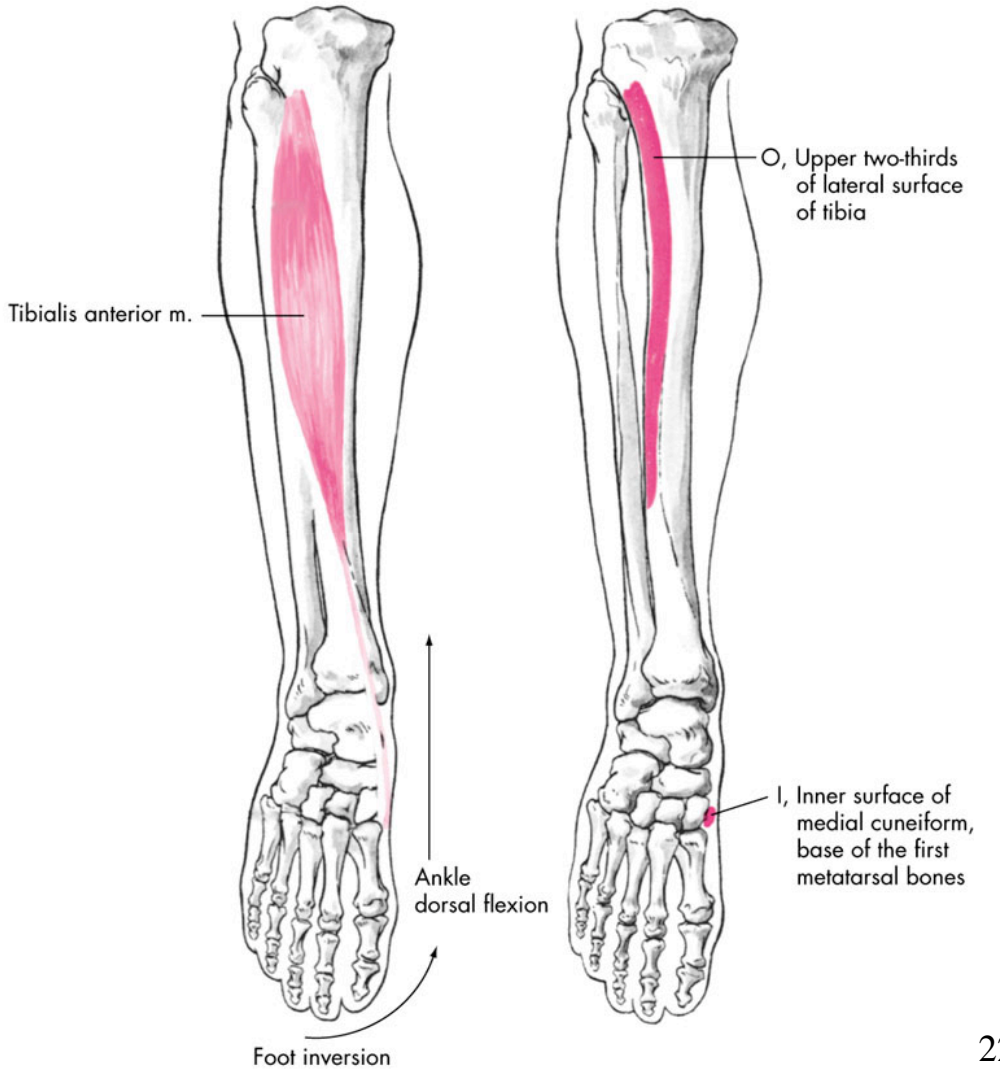
Tibialis anterior

- Origin: upper 2/3 of the anterior surface of the tibia
- Insertion: medial cuneform and the first metatarsal
- Note: passes anterior to medial malleolus.
- Actions:
  - Dorsiflexion
  - Inversion.

Anterior

Tibialis Anterior Muscle

- Dorsiflexion of ankle
- Inversion of foot



Extensor hallicus longus

- Origin: middle 2/3 of the inner surface of the front of the fibula
- Insertion: top of the distal phalanx of the great toe
- Note: passes anterior
- Actions:
  - Extension of big toe
  - Dorsiflexion
  - Weak inversion of the foot

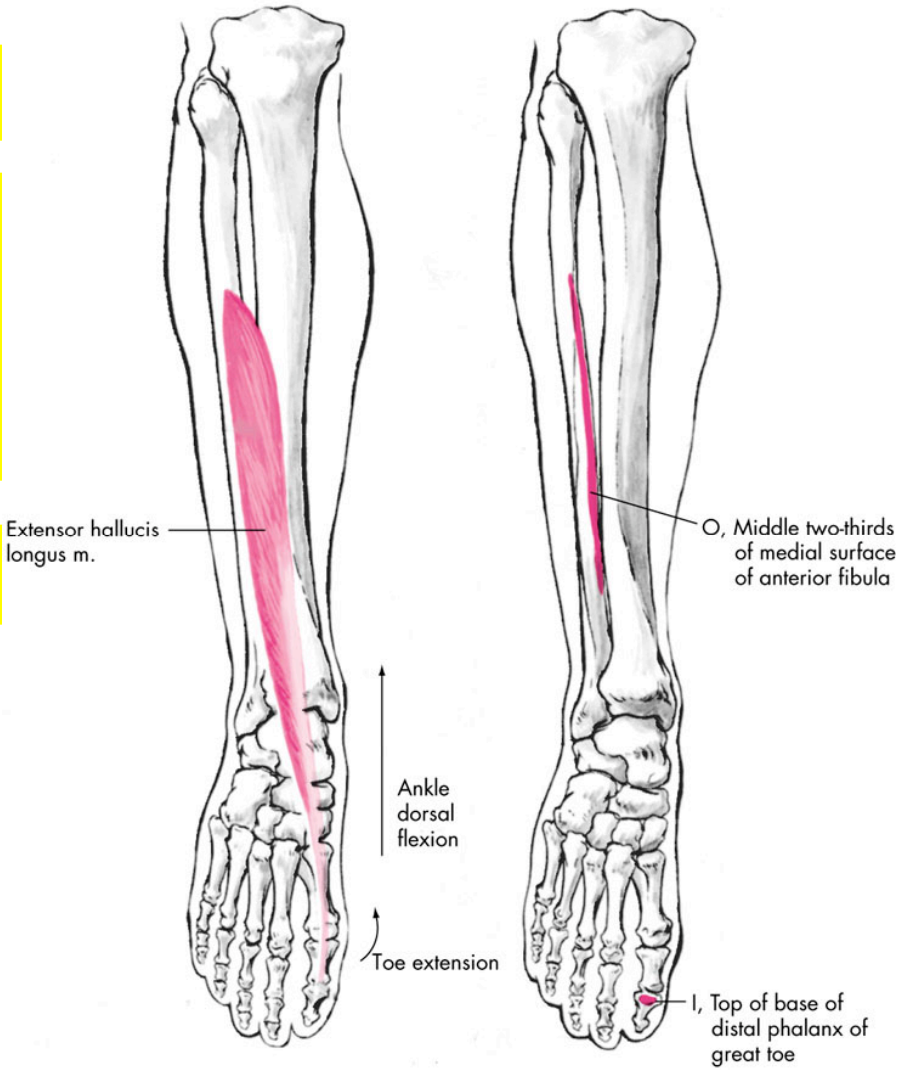
Anterior

Extensor Hallucis Longus Muscle

Dorsiflexion of ankle

Extension of great toe at metatarsophalangeal & interphalangeal joints

Weak inversion of foot



Extensor digitorum longus

- Origin: lateral condyle of the tibia and anterior surface of the fibula
- Insertion: middle and distal phalanges of the four lateral toes.
- Note: passes anterior to lateral malleolus.
- Actions:
  - Toe extension
  - Dorsiflexion
  - Eversion

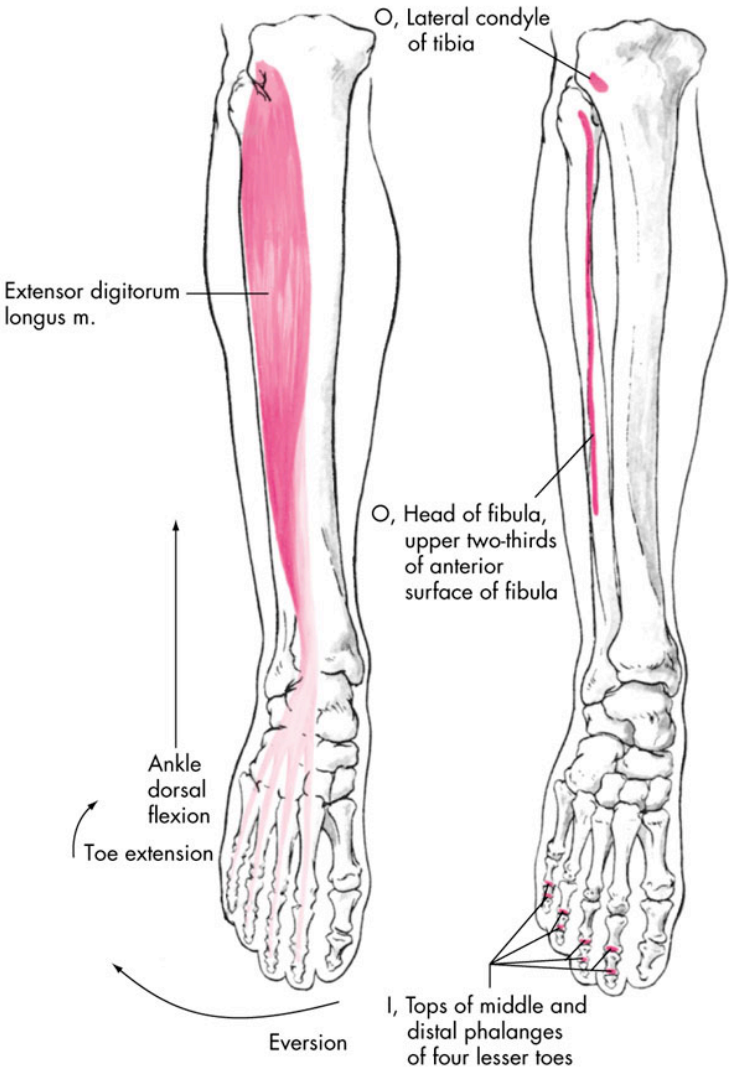
Anterior

Extensor Digitorum Longus Muscle

Extension of four lesser toes at metatarsophalangeal, proximal & distal interphalangeal joints

Dorsiflexion of ankle

Eversion of foot



Peroneous tertius

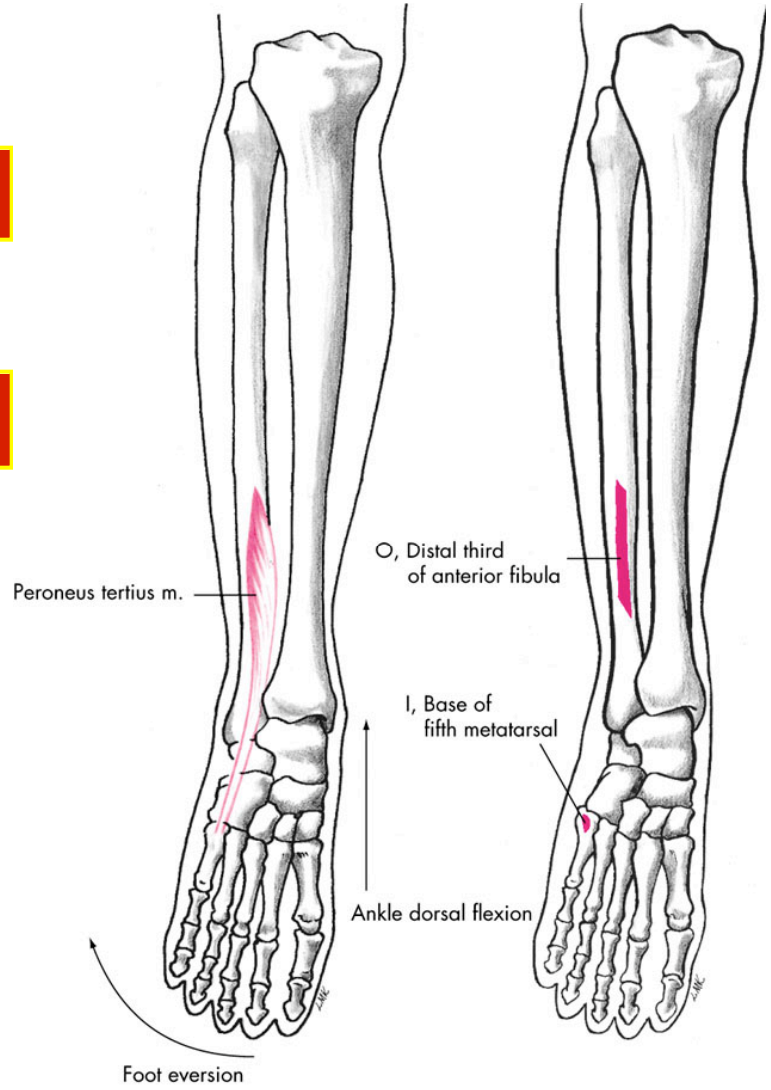
- Origin: lower fibula
- Insertion: dorsal surface of the 5th metatarsal
- Note: passes anterior to lateral malleolus.
- Action:
  - Dorsiflexion
  - Eversion

Anterior

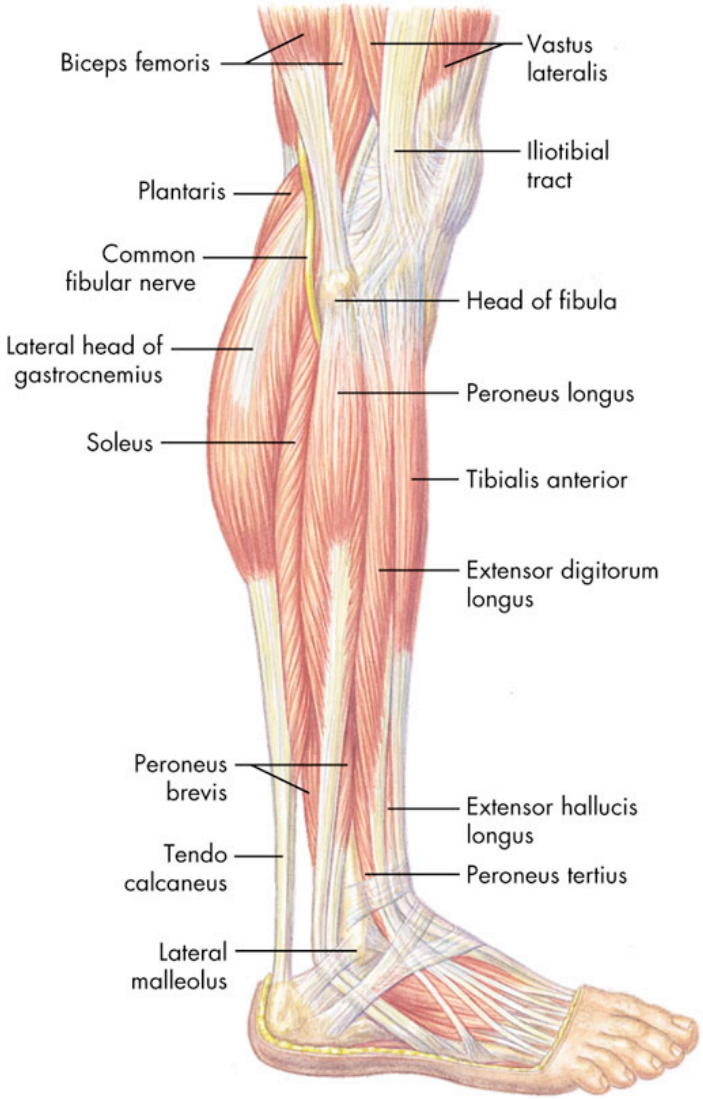
Peroneus Tertius (fibularis) Muscle

Eversion of foot

Dorsiflexion of ankle



Lateral Muscles



Peroneus longus muscle

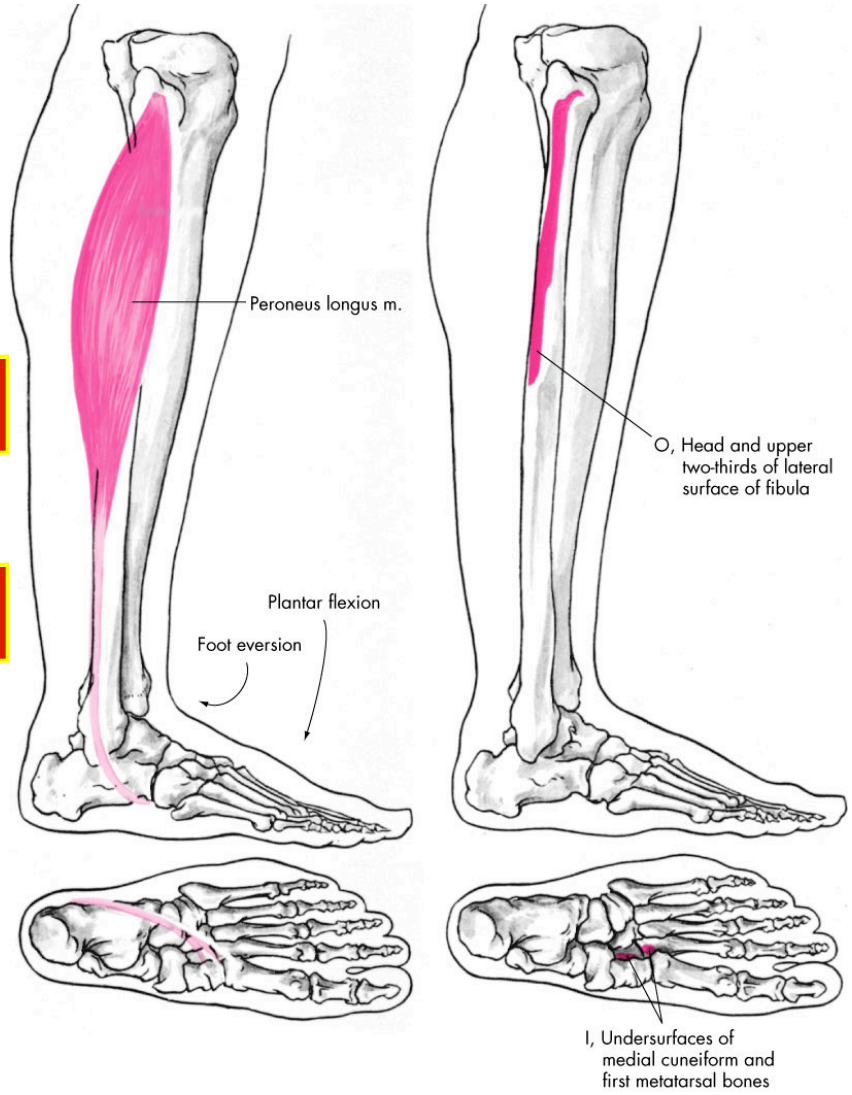
- Origin: head and upper 2/3 of the outer surface of the fibula
- Insertion: undersurfaces of the 1st cuneiform and first metatarsal bones
- Note: passes posterior to lateral malleolus.
- Actions:
  - Eversion
  - Plantar flexion
- The tendon goes under the foot from the lateral to the medial surface, thus aiding in support for the transverse arch.

Latera

Peroneus Longus (fibularis) Muscle

Eversion of foot

Plantar flexion of ankle



Peroneus brevis muscle

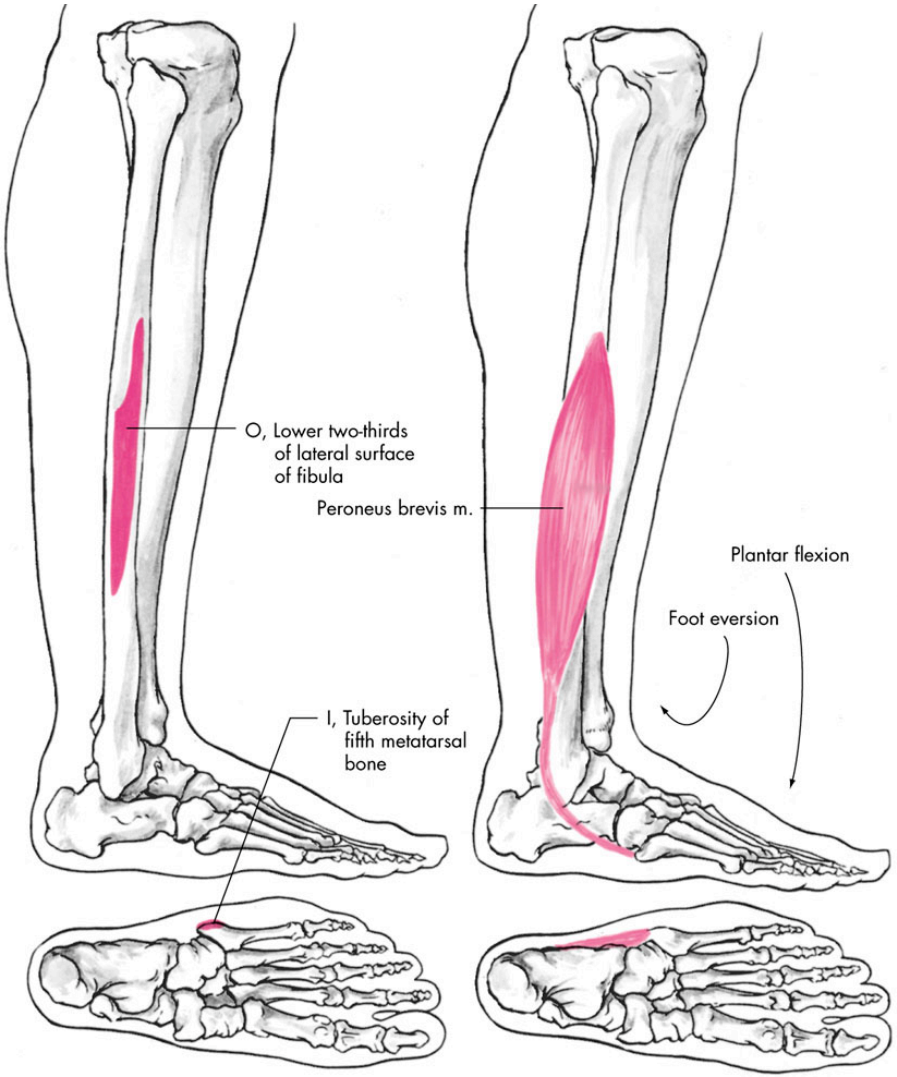
- Origin: lower 2/3 of the outer surface of the fibula
- Insertion: dorsal surface of the 5th metatarsal
- Note: passes posterior to lateral malleolus.
- Actions:
  - Plantar flexion
  - Eversion
- Anterior compartment

Latera

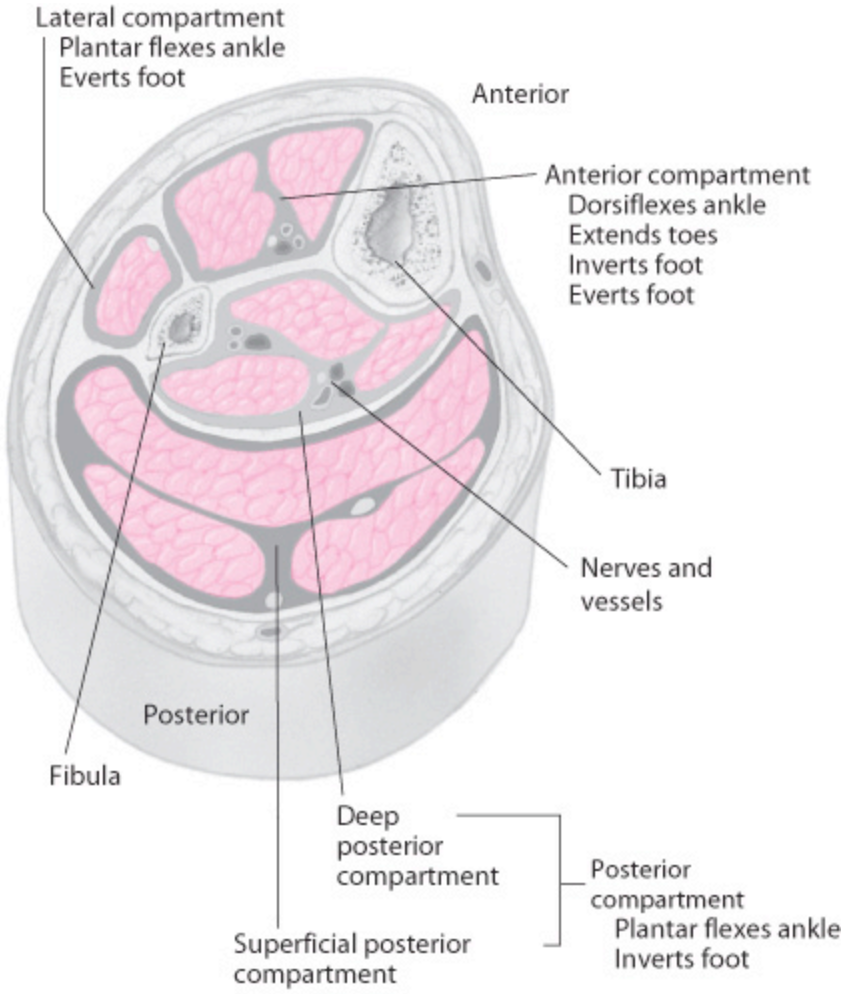
Peroneus Brevis (fibularis) Muscle

Eversion of foot

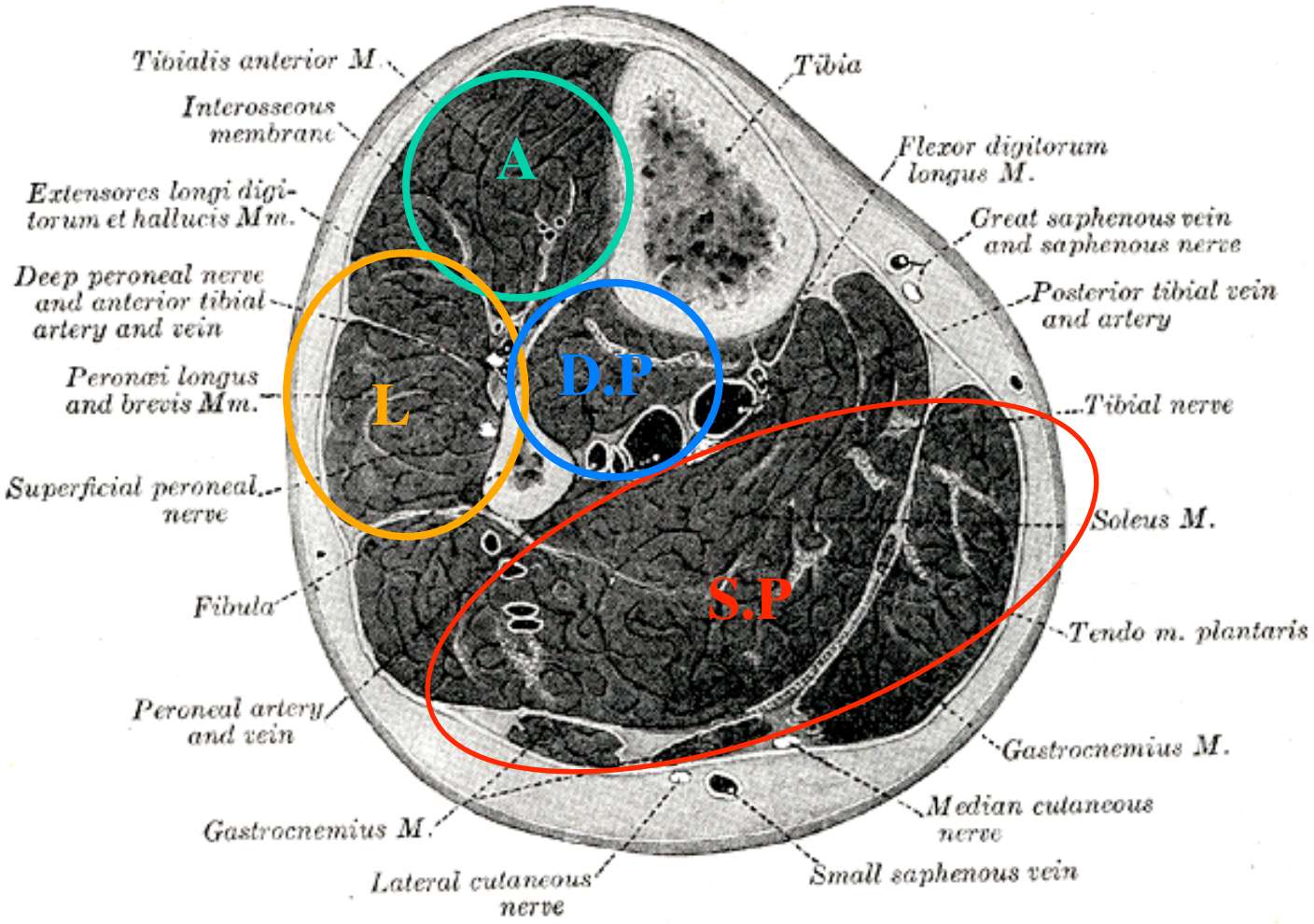
Plantar flexion of ankle



Muscle Compartments

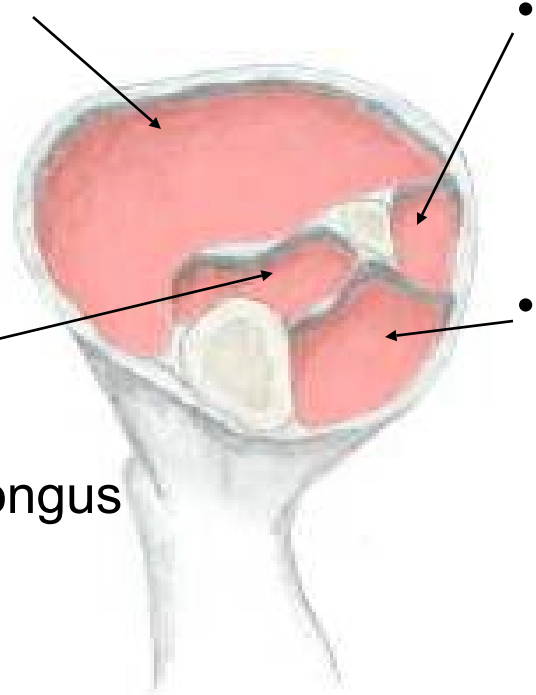


Muscle Compartments



Ankle and Foot Muscles

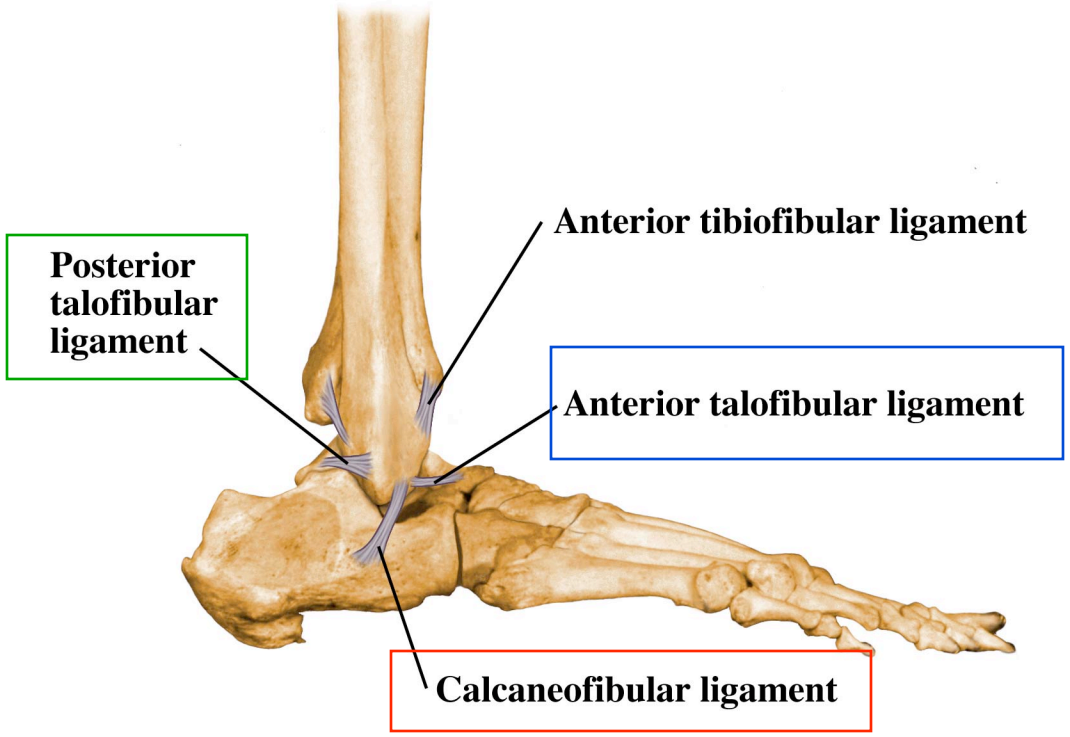
- Superficial Posterior Compartment
  - Gastrocnemius
  - Soleus
  - Plantaris
- Deep Posterior Compartment
  - Flexor digitorum longus
  - Flexor hallicus
  - Tibialis Posterior



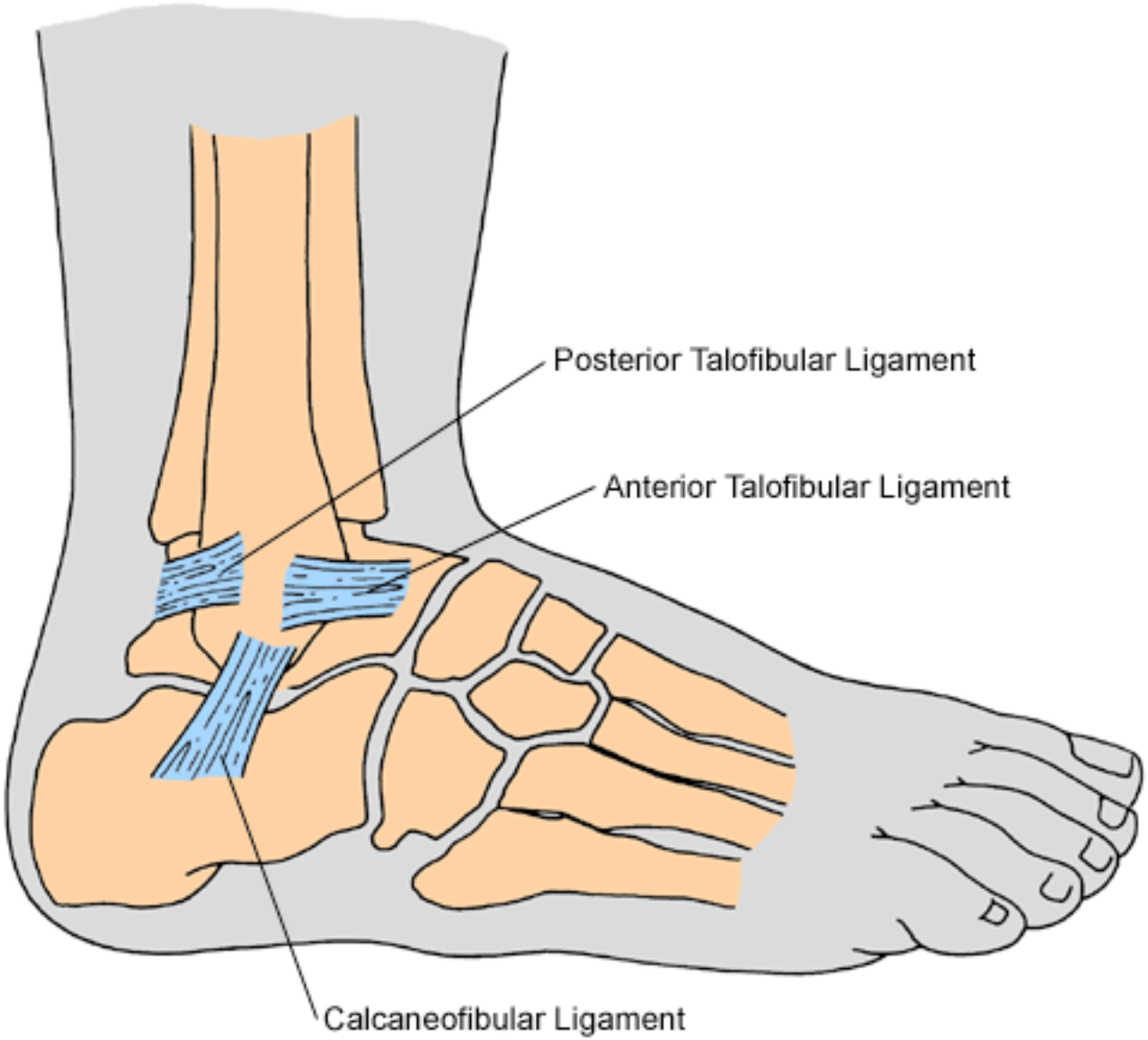
- Lateral Compartment (Evertors)
  - Peroneus longus
  - Peroneus brevis
- Anterior Compartment (Dorsal flexors)
  - Tibialis anterior
  - Peroneous tertius
  - Ext. dig. Longus
  - Ext. hallicus

Ligaments

Lateral Ligaments

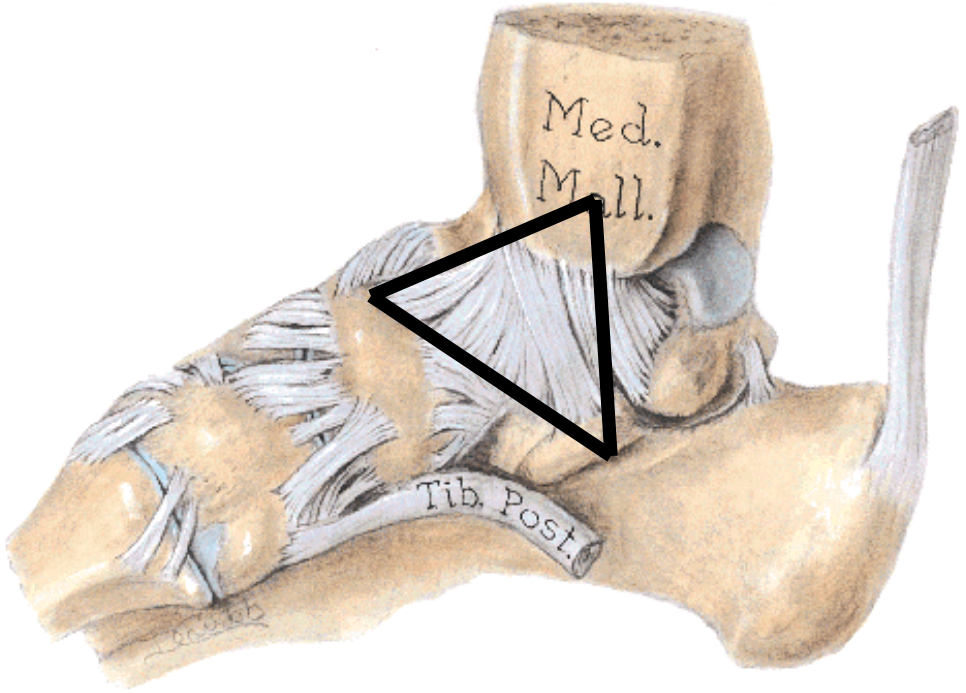


Latera


Posterior Talofibular Ligament
Anterior Talofibular Ligament
Calcaneofibular Ligament

The Deltoid Ligament

- Deltoid ligament is a combination of:
  - Anterior talotibial
  - Tibionavicular
  - Tibiocalcaneal
  - Posterior talotibial

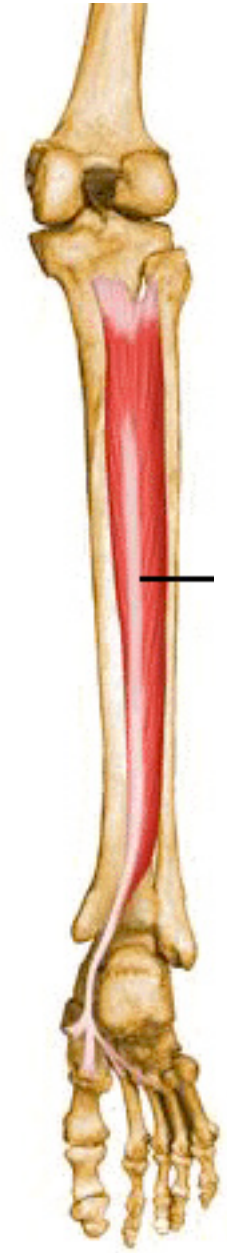


Media

REVIEW SLIDES

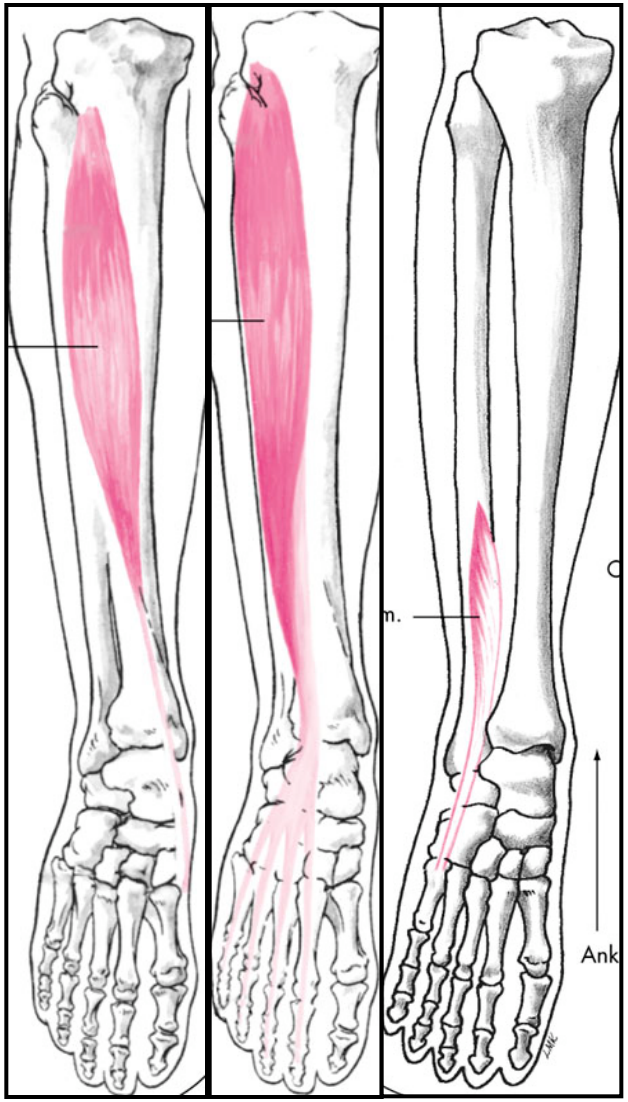
Name the muscle and actions

- Tibialis posterior
- Actions:
  - plantar flexion
  - inversion of the foot



What action do these muscle have in common?

Dorsiflexion

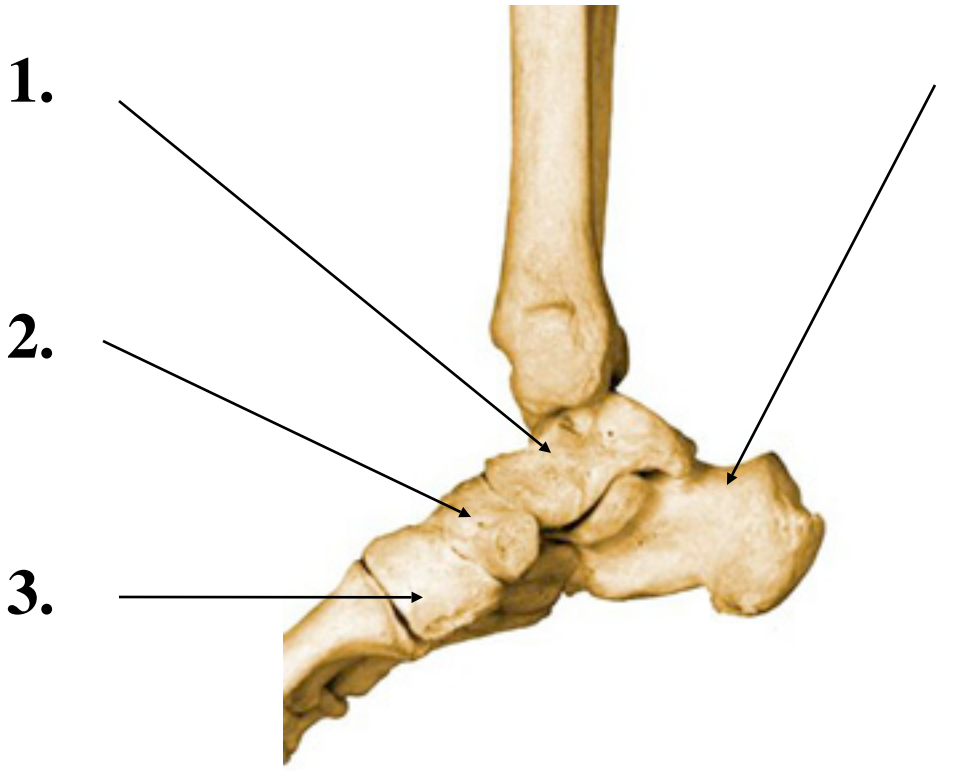


Name the muscle and its actions

- Flexor hallicus longus
- Actions:
  - Flexion of the big toe
  - Plantar flexion
  - Inversion

- Name the landmark

Lateral Malleolus



1?
Talus
2?
Navicular
3?
1st Cuneform
4?
Calcaneous

Name the muscle and its actions

- Tibialis anterior
- Actions:
  - Dorsiflexion
  - Inversion.

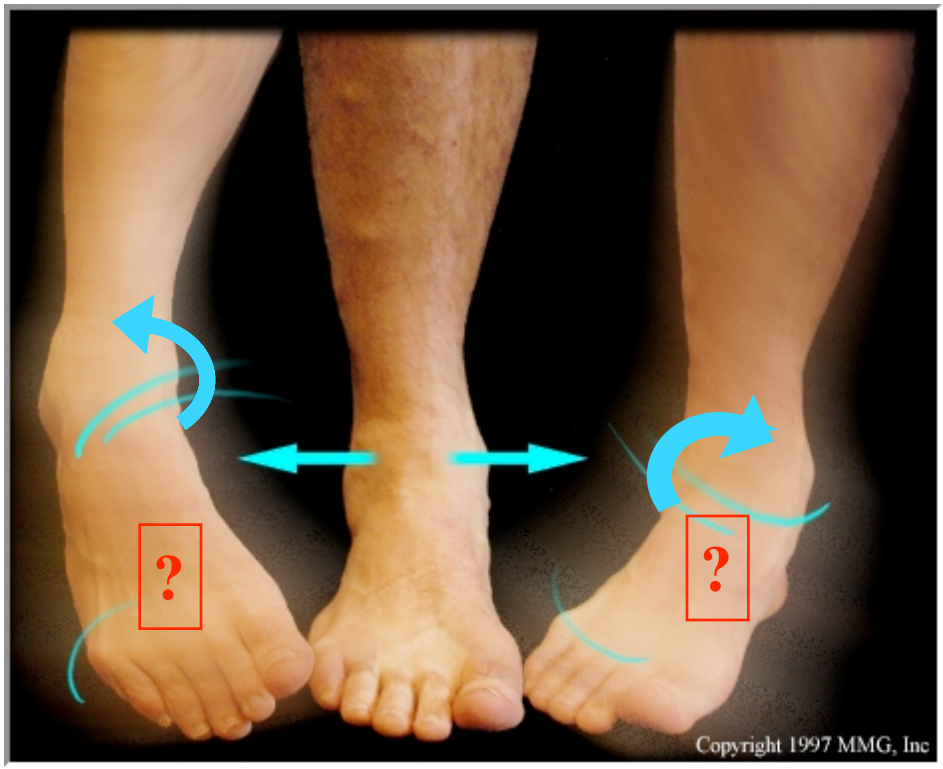
Name the muscle and its actions

- Peroneus longus muscle
- Actions:
  - Eversion
  - Plantar flexion

What action do these muscle have in common?

Inversion

Name the actions



Inversion

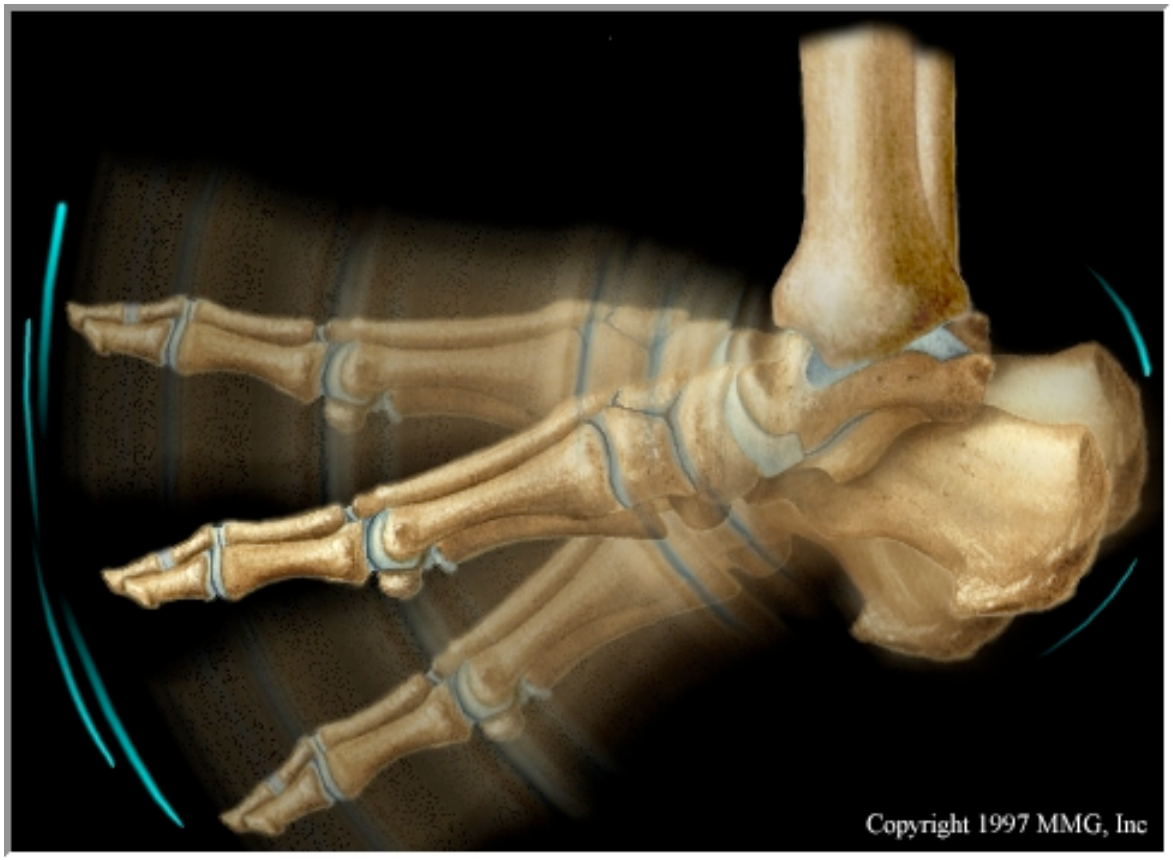
Eversion

Name the muscles of the anterior compartment

- Tibialis anterior
- Peroneous tertius
- Extensor digitorum longus
- Extensor hallicus

Dorsi Flexion

1. Name the action

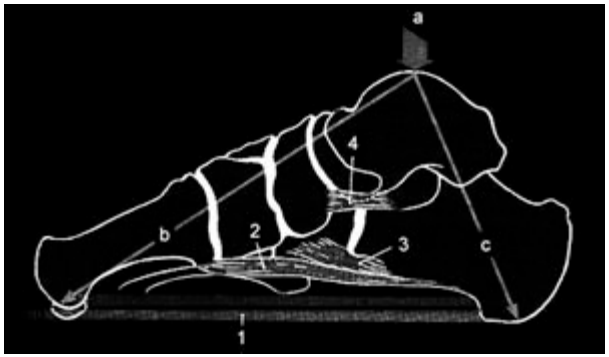


2. Name the action

Plantar Flexion

What bone is known as the "keystone" bone? Why?

- Talus

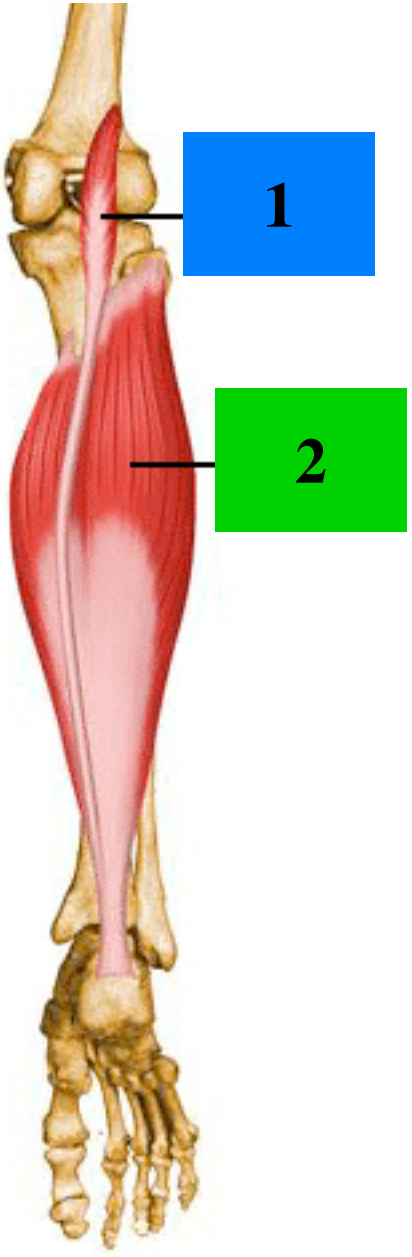


1. Name the muscle and its actions

- Plantaris
- Action:
  - plantar flexion

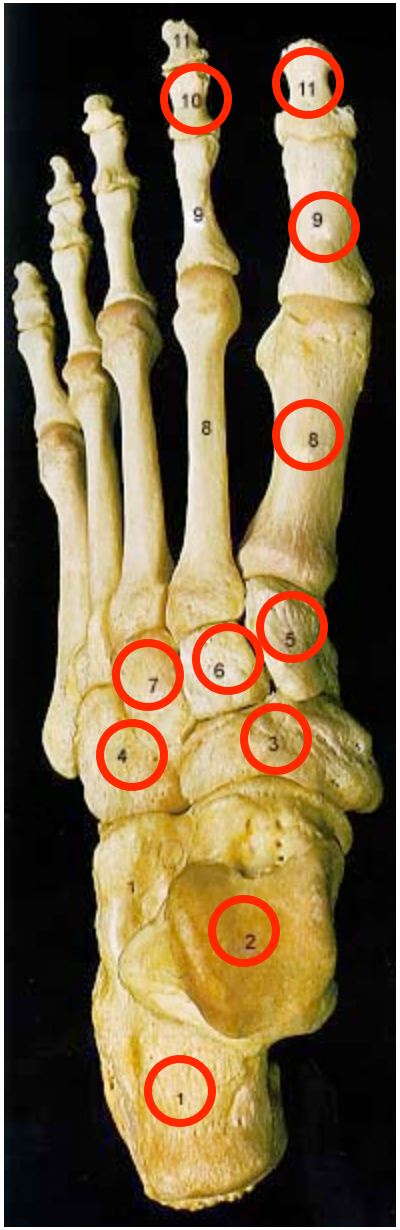
2. Name the muscle and its actions

- Soleus
- Action:
  - plantar flexion



- 1 is the…?
- Calcaneous
- 2 is the…?
- Talus
- 3 is the…?
- Navicular
- 4 is the…?
- Cuboid
- 5 is the…?
- First Cuneiform

- 6 is the…?
- Second Cuneiform
- 7 is the…?
- Third Cuneiform
- 8 is the…?
- First metatarsal
- 9 is the…?
- Proximal phalange
- 10 is the…?
- Middle phalange
- 11 is the…?
- Distal phalange



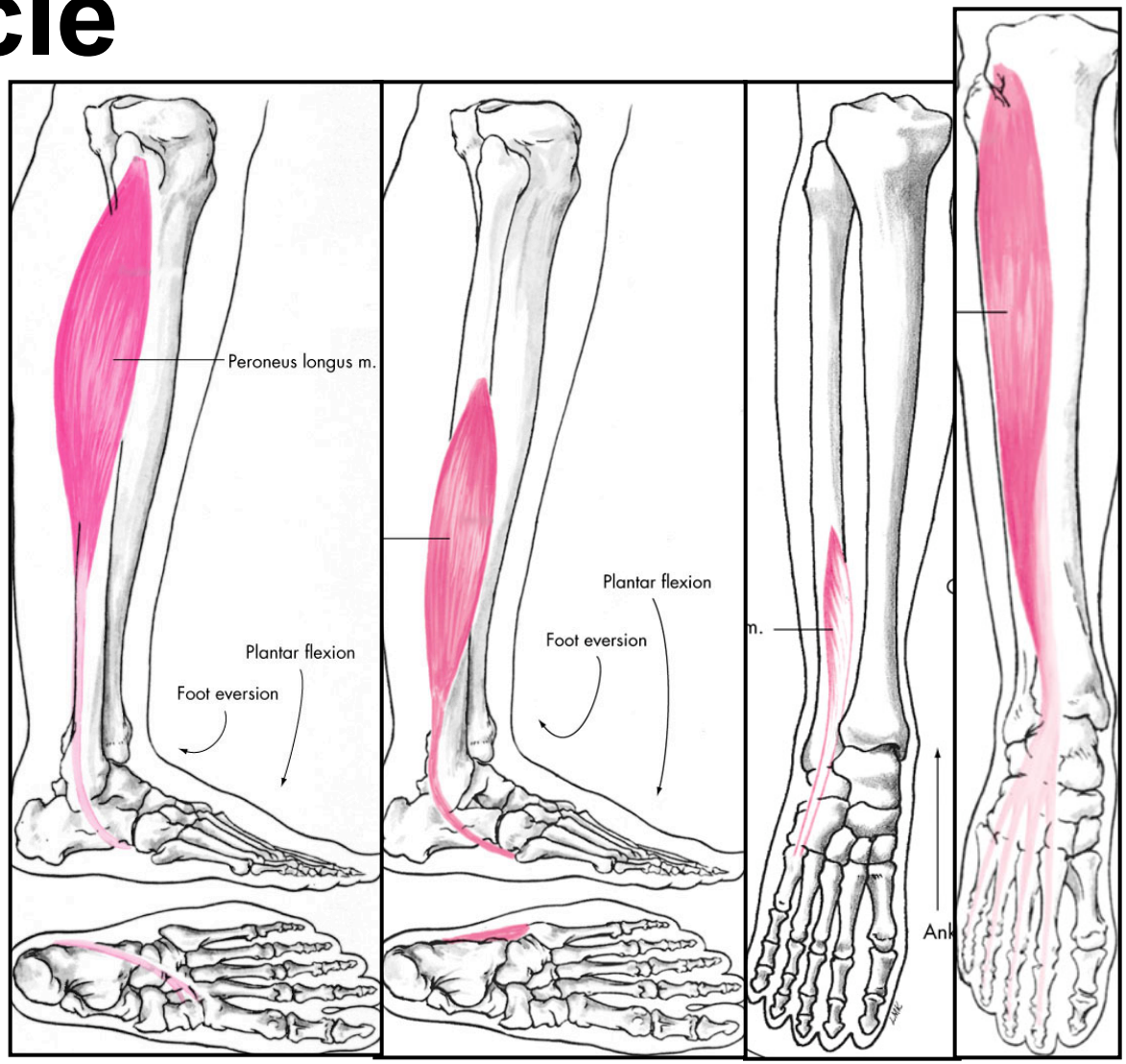
Name the muscles of...

- ...the deep posterior compartment
- Flexor digitorum longus
- Flexor hallicus
- Tibialis Posterior

- ...the superficial posterior compartment
- Gastrocnemius
- Soleus
- Plantaris

What action do these muscle have in common?

Eversion



Name the muscle and its actions

- Peroneus brevis
- Actions:
  - Plantar flexion
  - Eversion

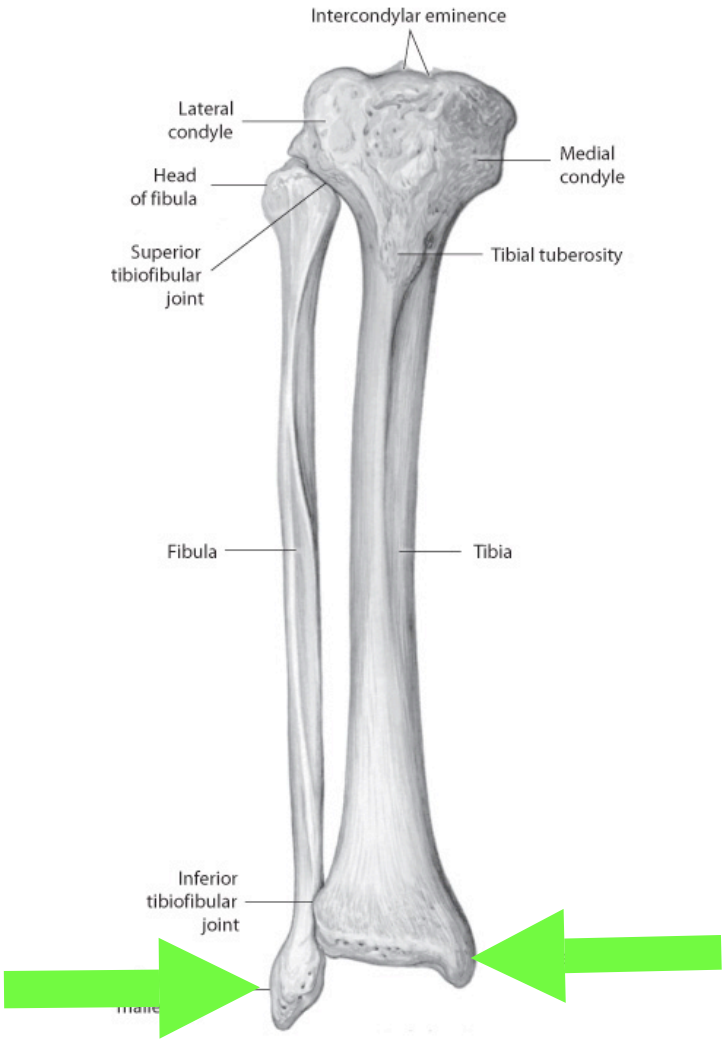
Name the three arches of the foot.

- **Lateral longitudinal arch**
- **Medial longitudinal arch**
- **Transverse arch**

Name the muscle and its actions

- Flexor digitorum longus
- Actions:
  - toe flexion
  - plantar flexion,
  - inversion of the foot

- Name the landmarks



Name the muscle and its actions

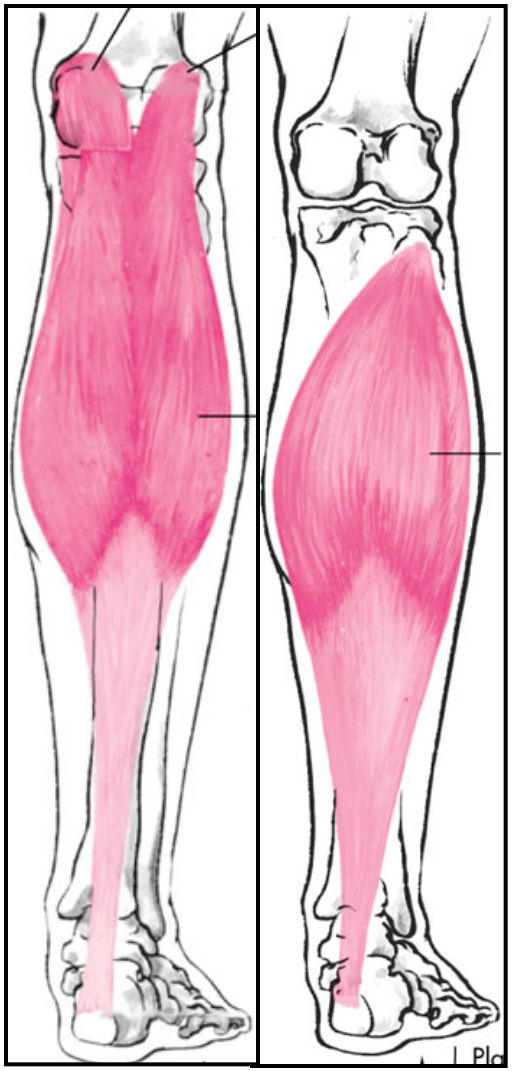
- Peroneous tertius
- Action:
  - Dorsiflexion
  - Eversion

Name the action

- Plantar flexion

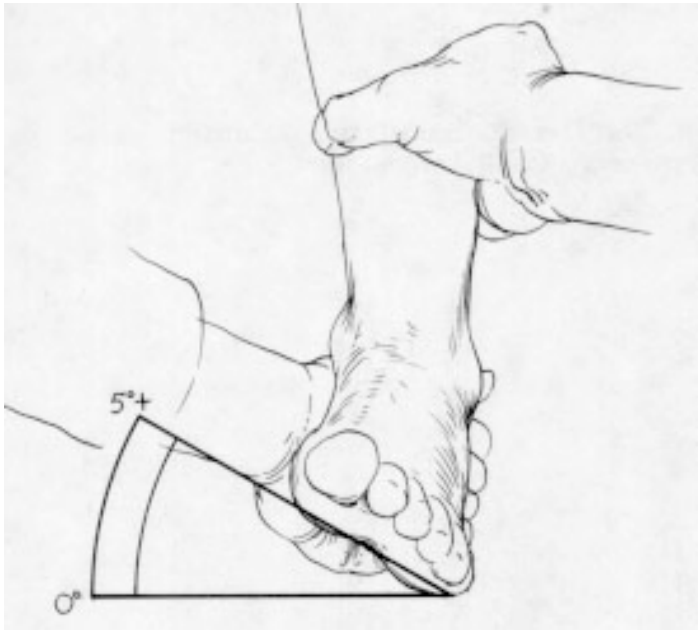
What action do these muscle have in common?

plantar flexion

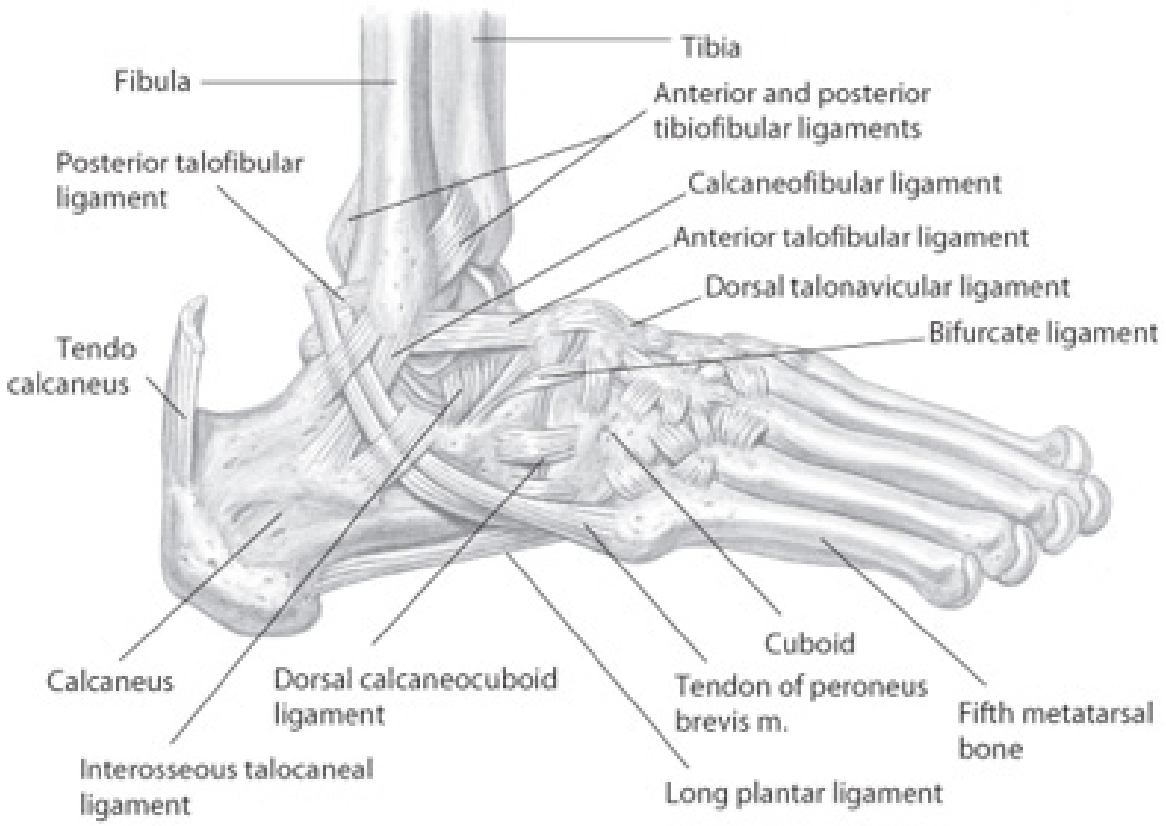


Name the action

- Inversion



What view of the ankle is this?



Name the muscle its action

- Gastrocnemius
- Action:
  - plantar flexion of the foot

Name the bones

1. Calcaneous
2. Talus
3. Navicular
4. Cuboid
5. First Cuneiform
6.Second Cuneiform
7.Third Cuneiform
8. Third Metatarsal (and Fifth Metatarsal)

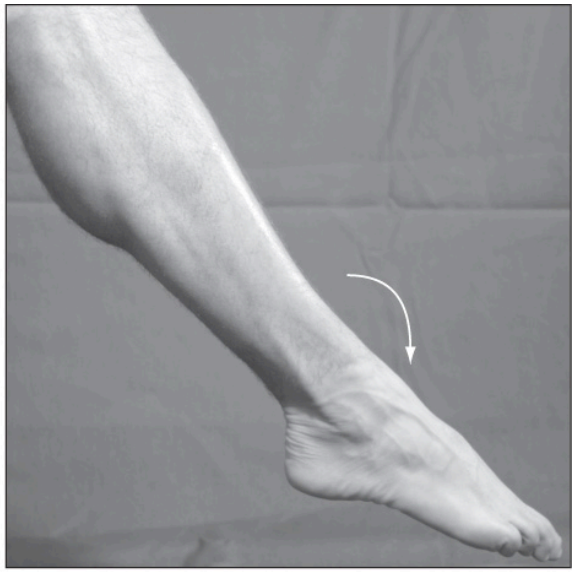
Name the muscles of the lateral compartment

- Peroneus longus
- Peroneus brevis

Name the actions

Plantar flexion

B

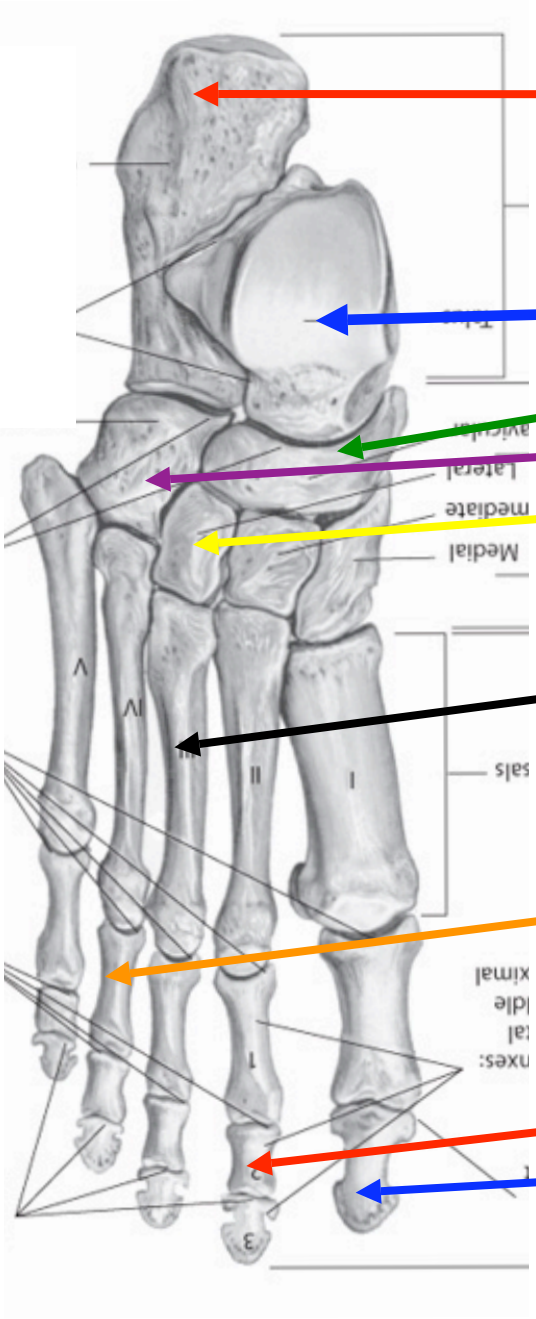


Eversion

C

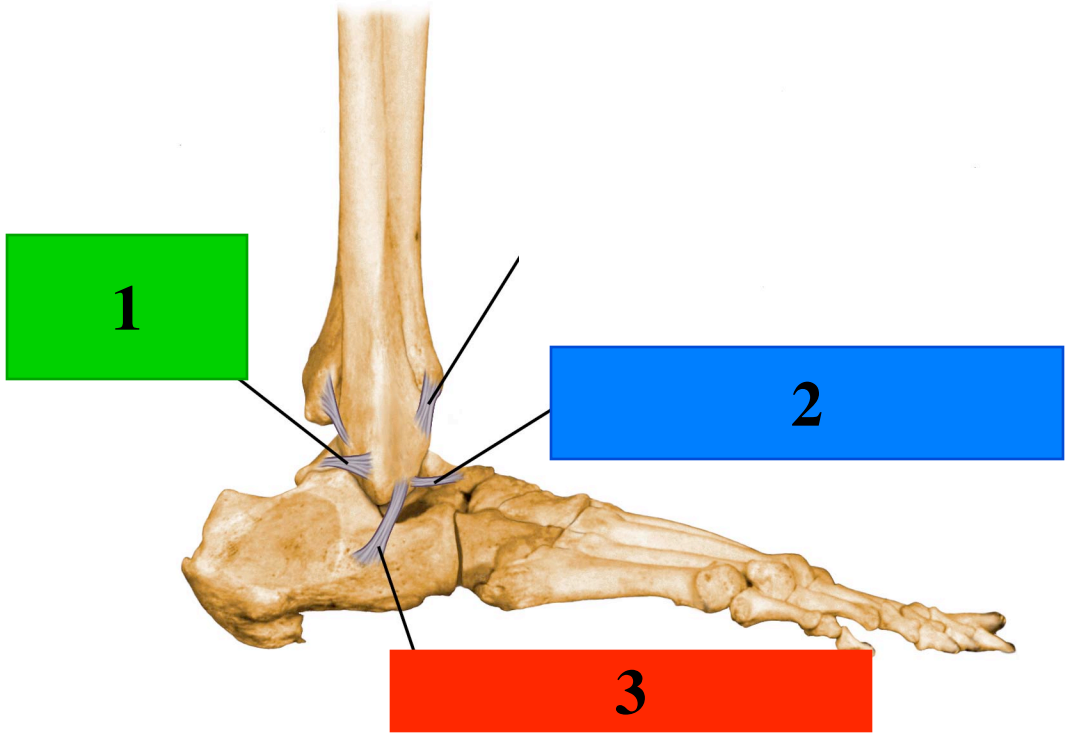
Name the muscle and its actions

- **Plantaris**
- Action: plantar flexion



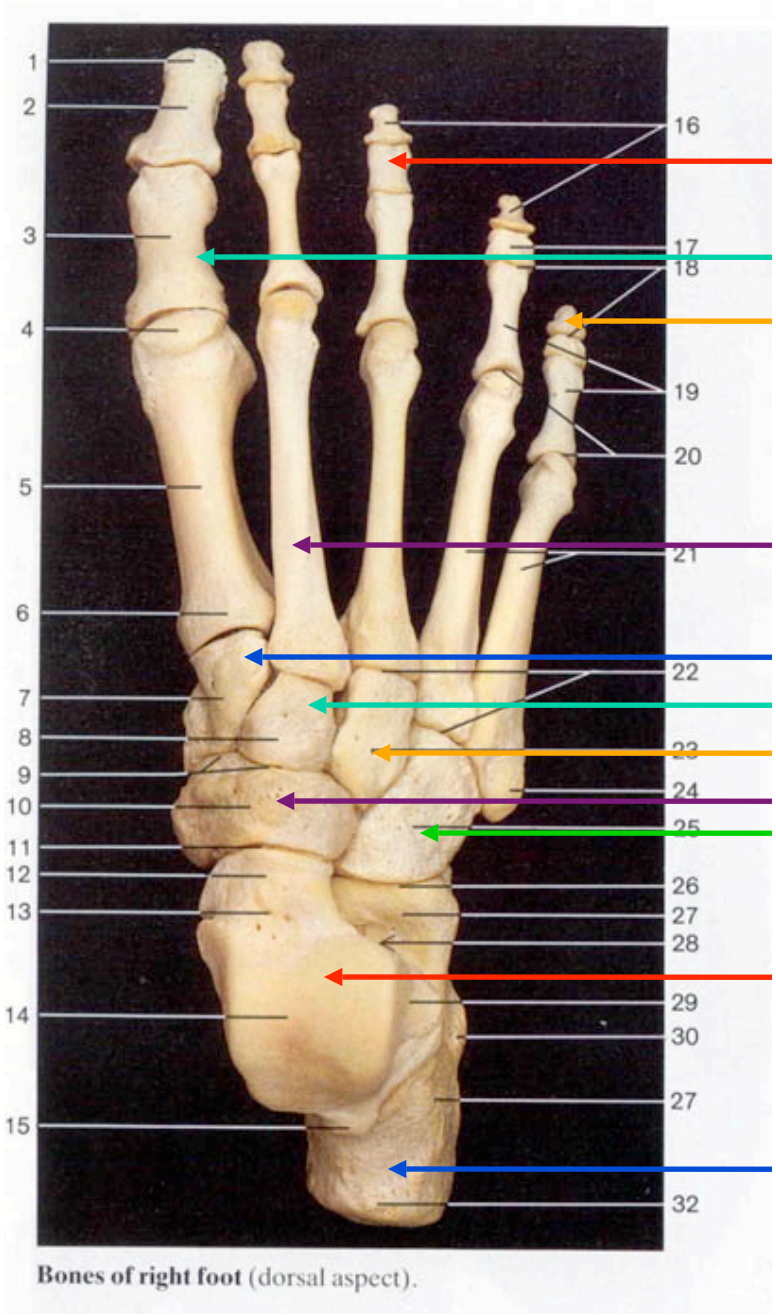
1. Calcaneus
2. Talus
3. Navicular
4. Cuboid
5. 3rd cuneiform
5. 3rd metatarsal
6. 4th proximal phalange
7. 2nd middle phalange
8. 1st distal phalange

Lateral Collateral Ligament



Name the muscle and its actions

- Extensor digitorum longus
- Actions:
  - Toe extension
  - Dorsiflexion
  - Eversion



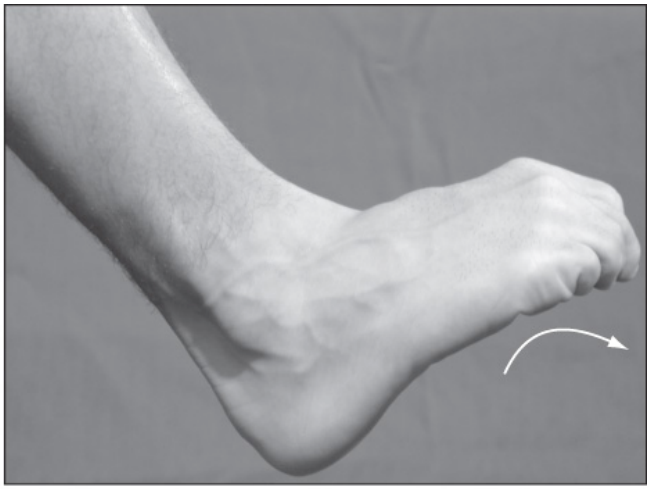
Bones of right foot (dorsal aspect).

- **Middle phalange of the 3rd toe**
- **Proximal phalange of the 1st toe**
- **Distal phalange of the 5th toe**
- **2nd Metatarsal**
- **1st Cuniform**
- **2nd Cuniform**
- **3rd Cuniform**
- **Navicular**
- **Cubiod**
- **Talus**
- **Calcanious**

Name the actions

Flexion of the toes

E



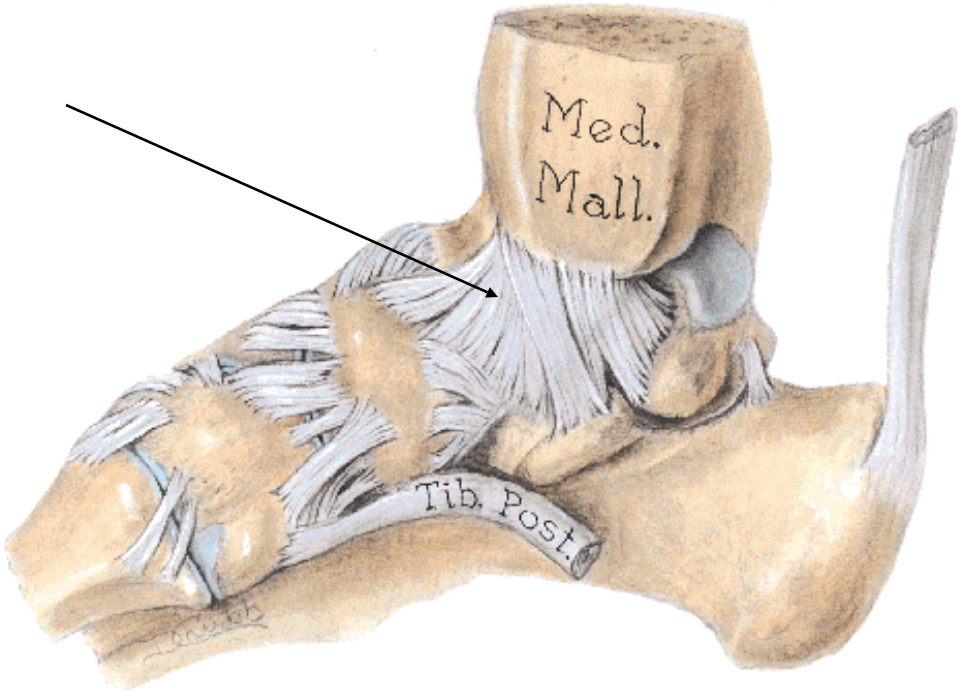
Extension of the toes

F

Name the bones of the <u>medial</u> longitudinal arch of the foot.

calcaneous, talus, navicular, the 3 cuneifroms, 1-3 metatarsals

Name the ligament.



Deltoid Ligament

Name the muscle and its actions

- Extensor hallicus longus
- Actions:
  - Extension of big toe
  - Dorsiflexion
  - Inversion of the foot

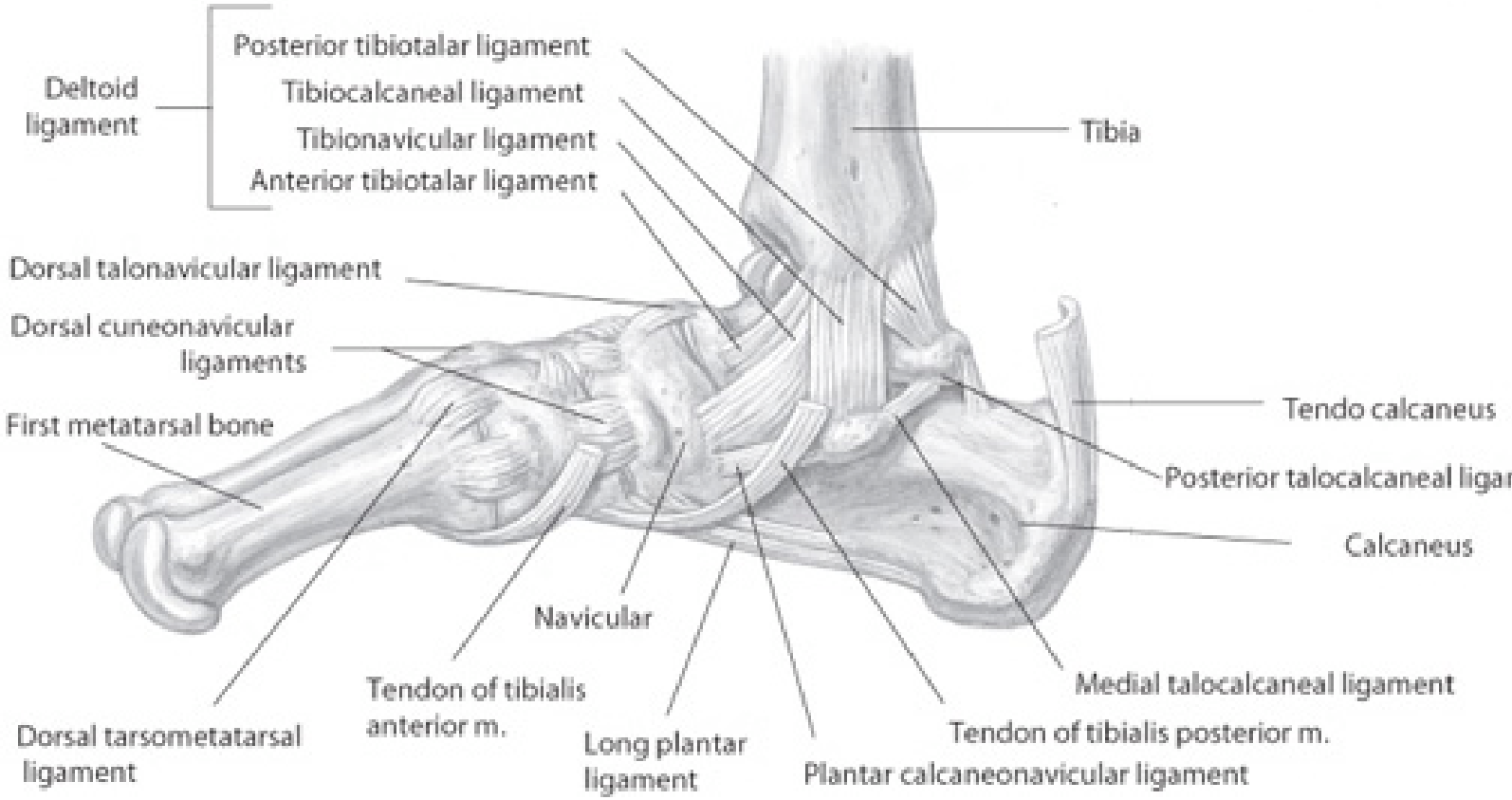
Name the landmark

Medial malleolus

Name the muscle its action

- Soleus
- Action:
  - plantar flexion of the foot

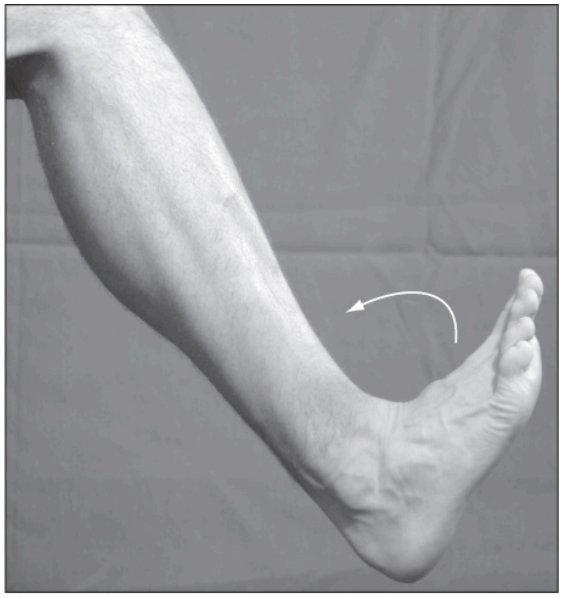
What view of the ankle is this?



Name the actions

Dorsiflexion

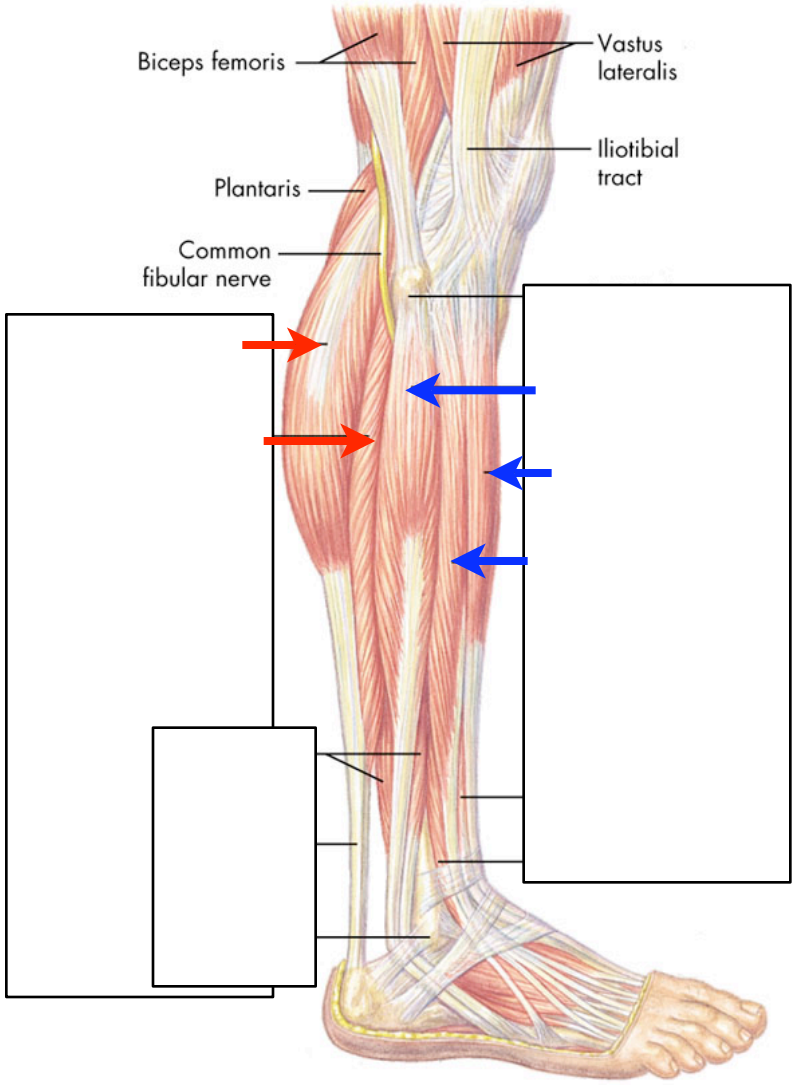
A



Inversion

D

What muscles can you name?



What muscles can you name?