



The Lower Limb VI:



The Leg

Anatomy

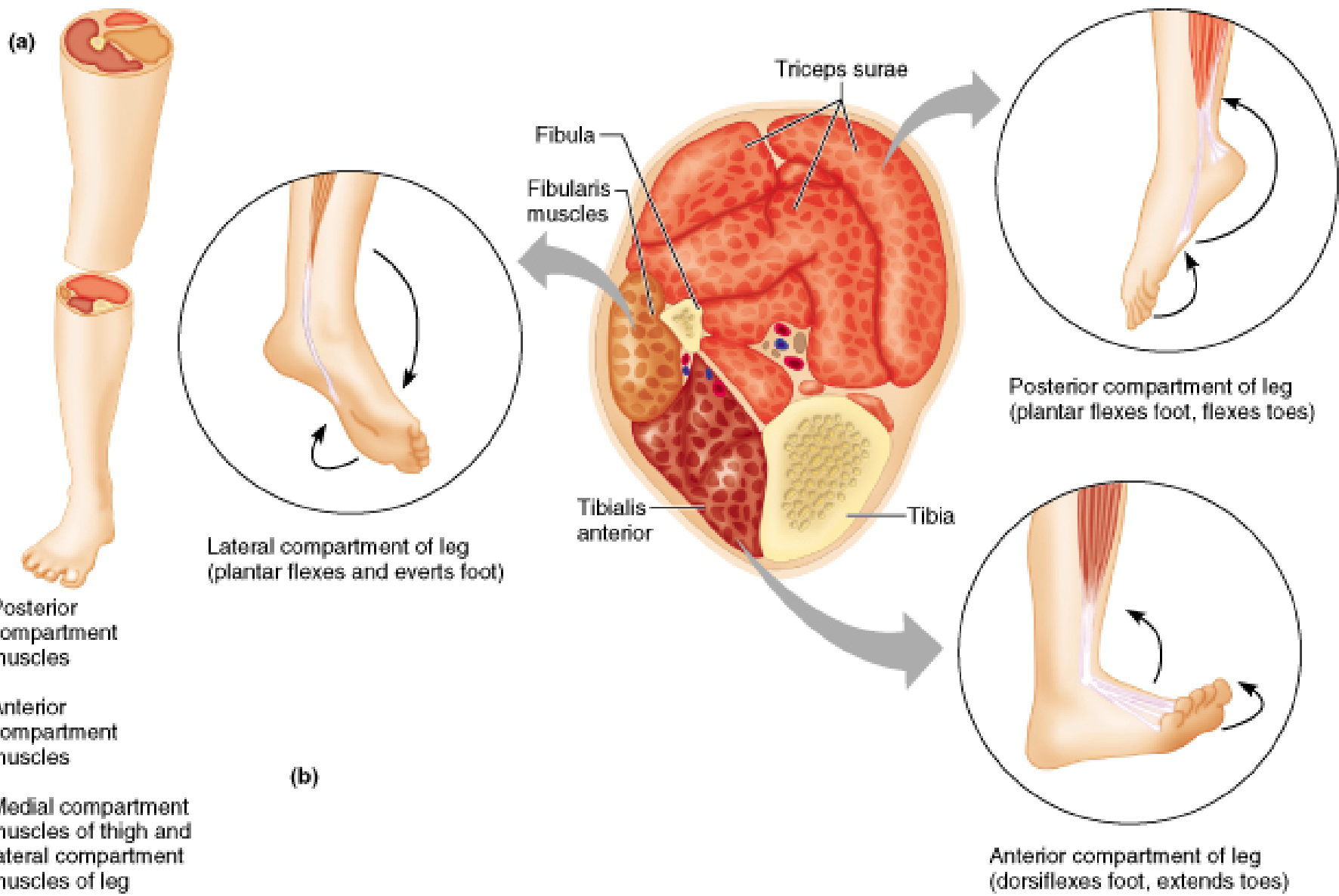
RHS 241

Lecture 6

Dr. Einas Al-Eisa

Muscles of the leg

- **Posterior** compartment (superficial & deep):
 - primary plantar flexors of the foot
 - flexors of the toes
- **Anterior** compartment:
 - dorsiflexors & invertors of the foot
 - extensors of the toes
- **Lateral** compartment:
 - muscles that assist plantarflexion and eversion of the foot



Fascia

- Crural fascia = deep fascia of the leg
- Tough fibrous layer that gives origin to some muscles (in its upper part)

Crural Fascia

- Blends with the periosteum of the tibia and laterally sends 2 septa to fibula:
 - **anterior intermuscular septum:** separates the anterior from the lateral muscles of the leg
 - **posterior intermuscular septum:** separates the lateral muscles from the posterior muscles

Crural Fascia

- Each of the 3 muscle groups lie in its own compartment
- The fascia of the calf muscles give rise to the ***transverse crural septum*** (deep transverse crural fascia) that separates the superficial group of calf muscles from the deep group

Crural Fascia

- Both the **anterior and deep posterior groups** of muscles lie in tight compartments that any trauma to them that produces swelling interferes with their circulation, which can lead to pain and degeneration

Anterior compartment

- None of the muscles of this compartment cross the knee joint....so?
- Their tendons of insertion lie anterior to the mediolateral (frontal) axis of the ankle joint



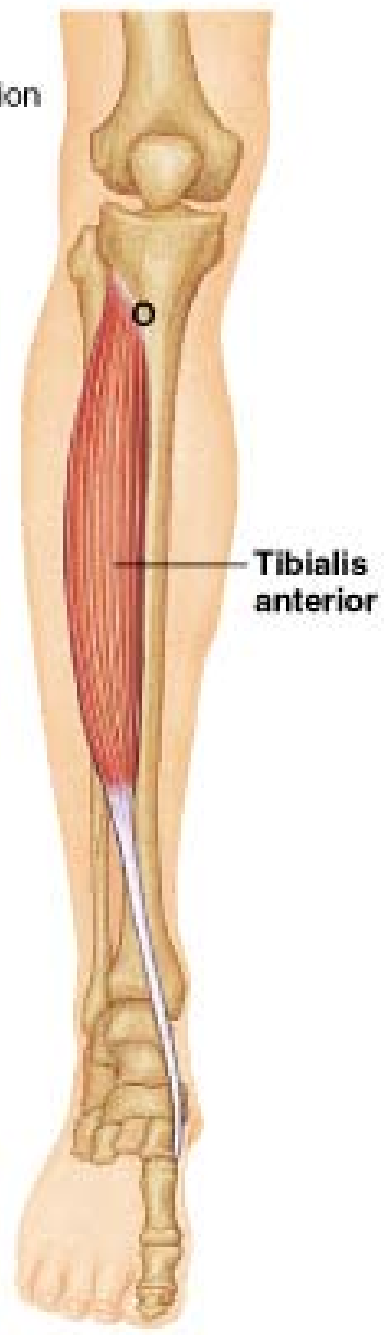
primary function is to assist dorsiflexion & extension of toes

Tibialis anterior

- **Origin:** lateral tibial condyle; proximal lateral surface of tibia; interosseous membrane; deep fascia of leg
- **Insertion:** medial cuneiform & base of 1st metatarsal
- **Action:** inversion & dorsiflexion of foot
- **Innervation:** deep peroneal nerve

Anterior compartment

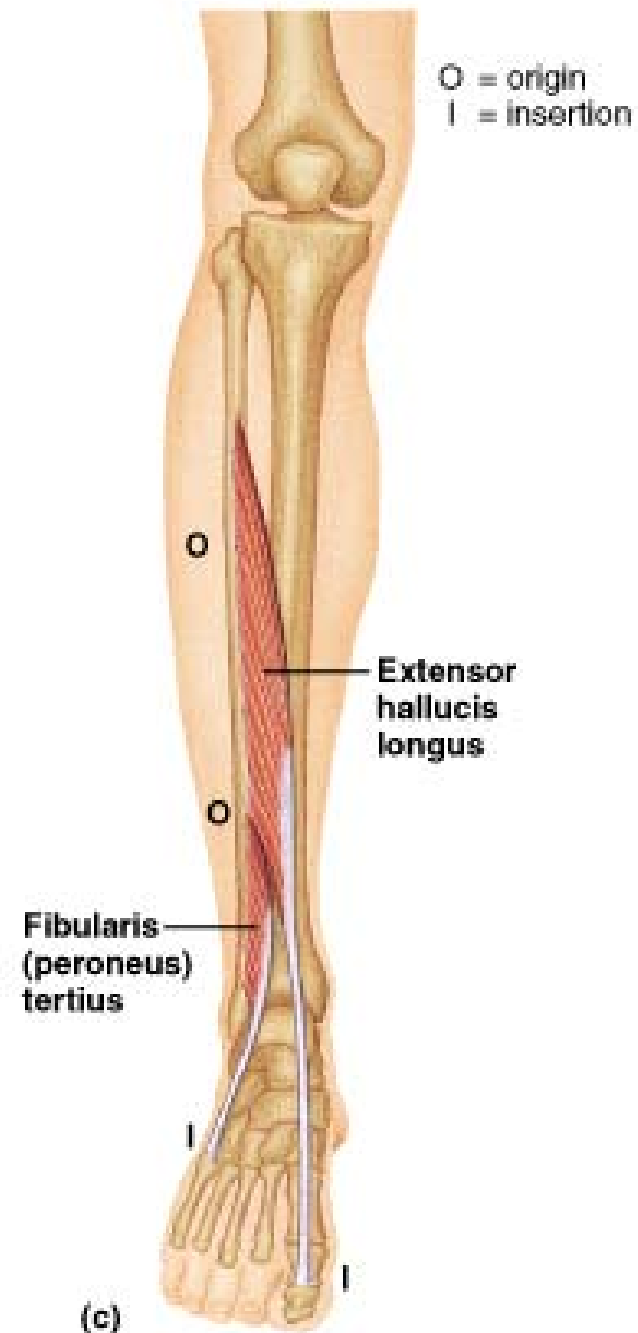
O = origin
I = insertion



Extensor hallucis longus

- **Origin:** fibula (middle third of anterior surface); interosseous membrane
- **Insertion:** distal phalanx of big toe (hallux)
- **Action:** extension of big toe; inversion & dorsiflexion of foot
- **Innervation:** deep peroneal nerve

Anterior compartment



Extensor digitorum longus

- **Origin:** lateral tibial condyle; proximal anterior surface of fibula; interosseous membrane; deep fascia of leg
- **Insertion:** middle & distal phalanges of lateral four toes
- **Action:** extension of lateral four toes; dorsiflexion & eversion of foot
- **Innervation:** deep peroneal nerve

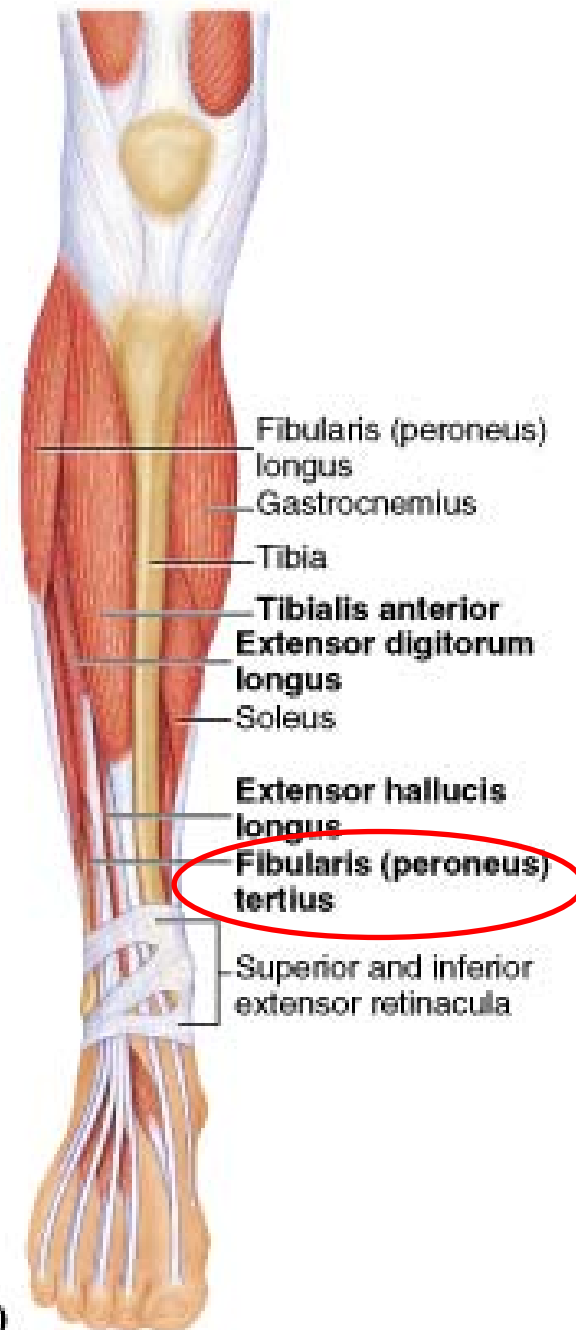
Anterior compartment



Peroneus tertius

- **Origin:** fibula (in common with the lower fibers of extensor digitorum longus)
- **Insertion:** dorsal surface of base of 5th metatarsal
- **Action:** dorsiflexion & eversion of foot
- **Innervation:** deep peroneal nerve

Anterior compartment



Common peroneal nerve

- A terminal division of the sciatic nerve
- Divides into superficial & deep peroneal nerves as it crosses the proximal end of fibula to enter the leg

Common Peroneal Nerve Entrapment

- **Sensory loss:** paresthesia within the central & lateral skin of the dorsum foot
- **Motor loss:** may affect the anterior & lateral muscles of the leg (e.g., foot dorsiflexion & toes extension)
- **Results when walking:** foot drop (foot slap) at heel-strike

Deep peroneal nerve

- **Motor** distribution: supply the muscles of the anterior compartment of the leg
- **Sensory** distribution: skin of the first dorsal web-space

Lateral compartment

- Muscles that act as a pulley over the posterior surface of the lateral malleolus
- Lie posterior to the mediolateral axis of the ankle joint



assist plantarflexion & eversion of the foot

Peroneus longus

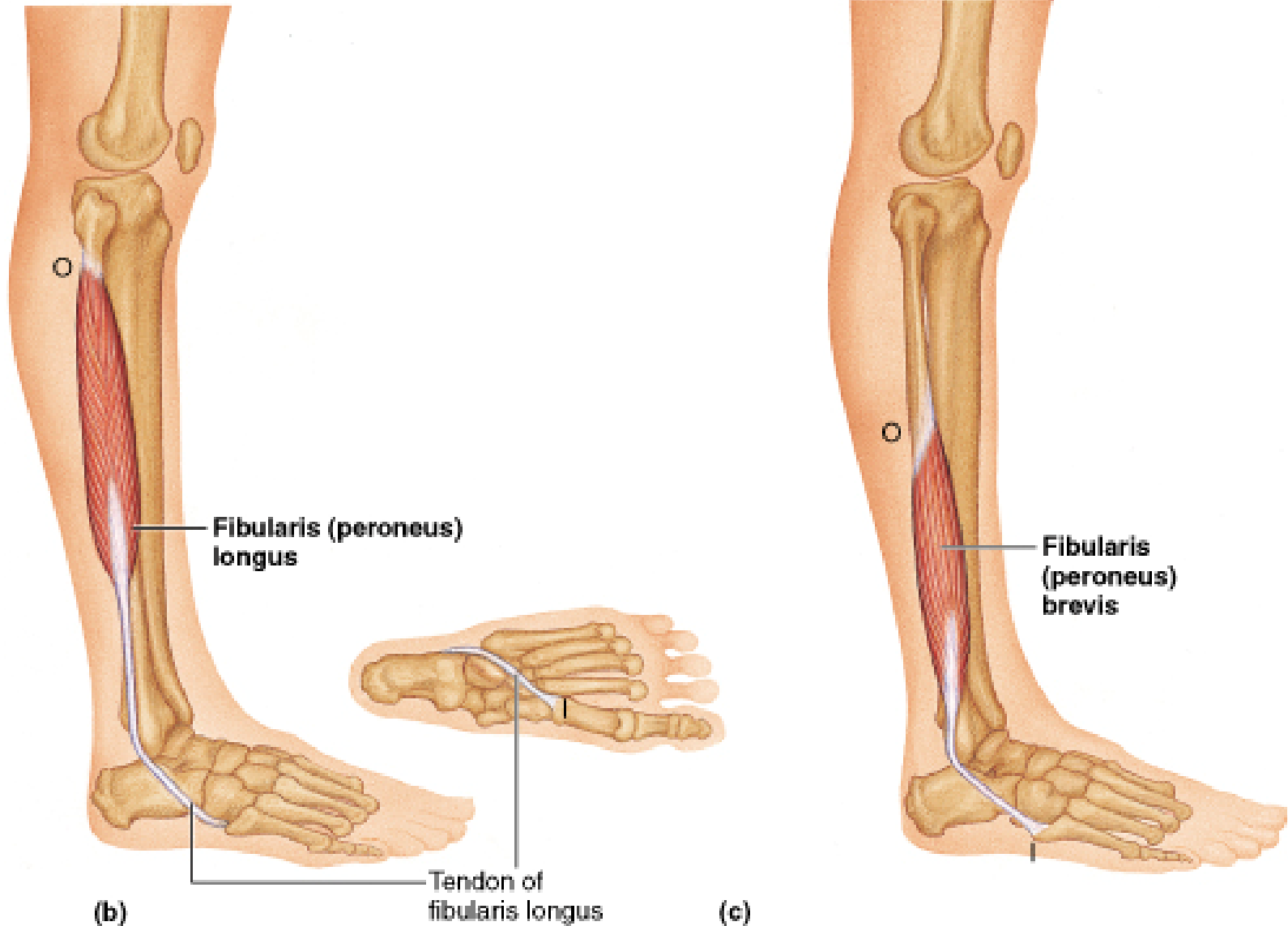
- **Origin:** proximal two thirds of lateral surface of fibula
- **Insertion:** base of 1st metatarsal; medial cuneiform
- **Action:** eversion & weak plantarflexion of foot
- **Innervation:** superficial peroneal nerve

Peroneus brevis

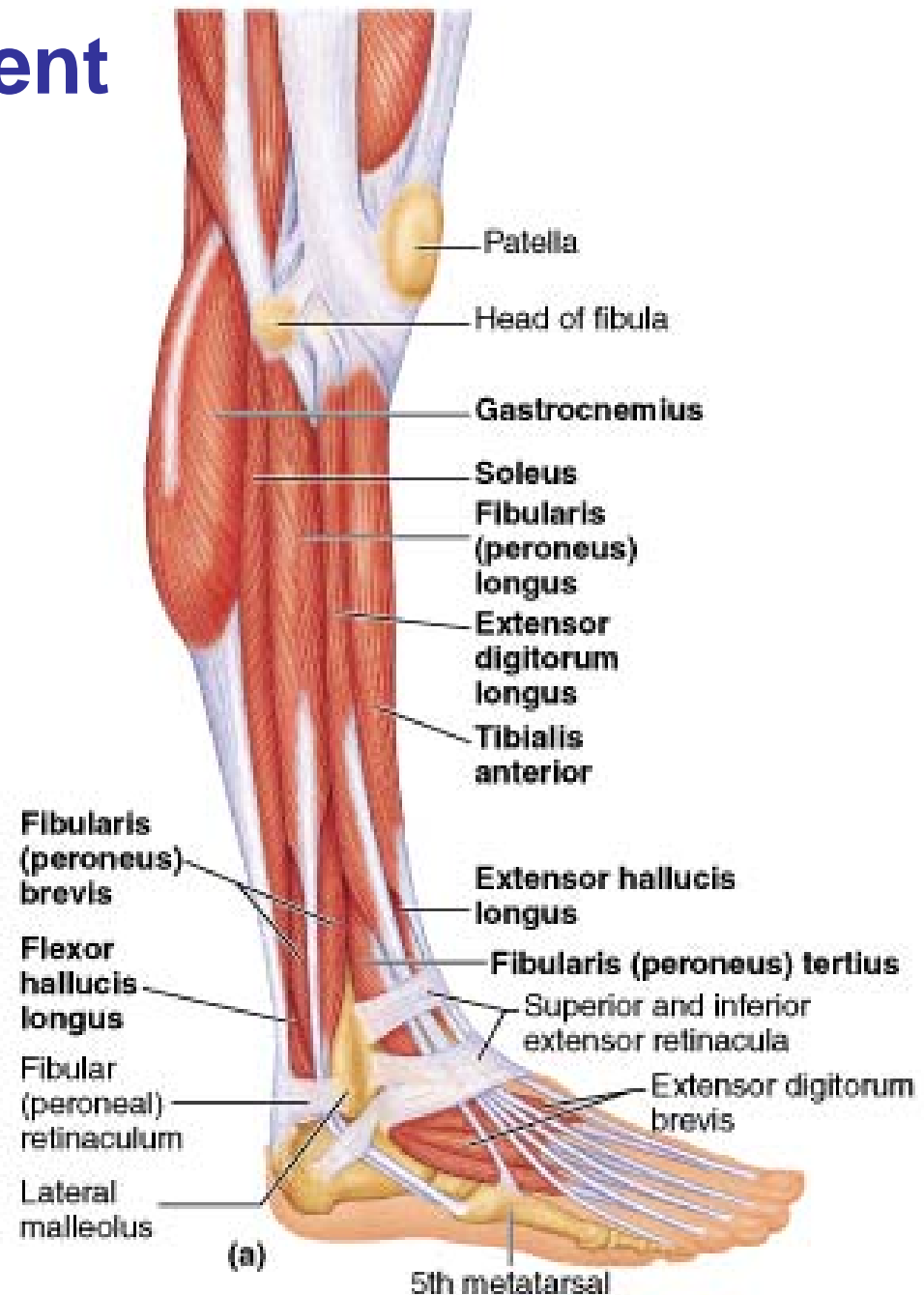
- **Origin:** distal two thirds of lateral surface of fibula
- **Insertion:** dorsal surface of base of 5th metatarsal
- **Action:** eversion & weak plantarflexion of foot
- **Innervation:** superficial peroneal nerve

O = origin
I = insertion

Lateral compartment



Lateral compartment



Superficial peroneal nerve

- **Motor** distribution: supply the muscles of the *lateral* compartment of the leg
- **Sensory** distribution:
 - **Cutaneous:** to the central skin of the dorsum of the foot (part of the L5 dermatome)
 - **Articular:** to the ankle joint & joints of the foot

Lower limb compartments

- **Anterior** (tibial) compartment:
 - Deep peroneal nerve
 - Anterior tibial artery
- **Lateral** (peroneal) compartment:
 - Superficial peroneal nerve
 - Rarely affected by compression

Lower limb compartments

- **Superficial posterior** compartment:
 - Gastrocnemius & soleus muscles
 - No important nerves or vessels
- **Deep posterior** compartment:
 - Posterior tibial vessels and nerves
 - Peroneal artery
 - Serious consequences if damaged

Vulnerable peripheral nerves

Lower limb

- **Sciatic nerve:**

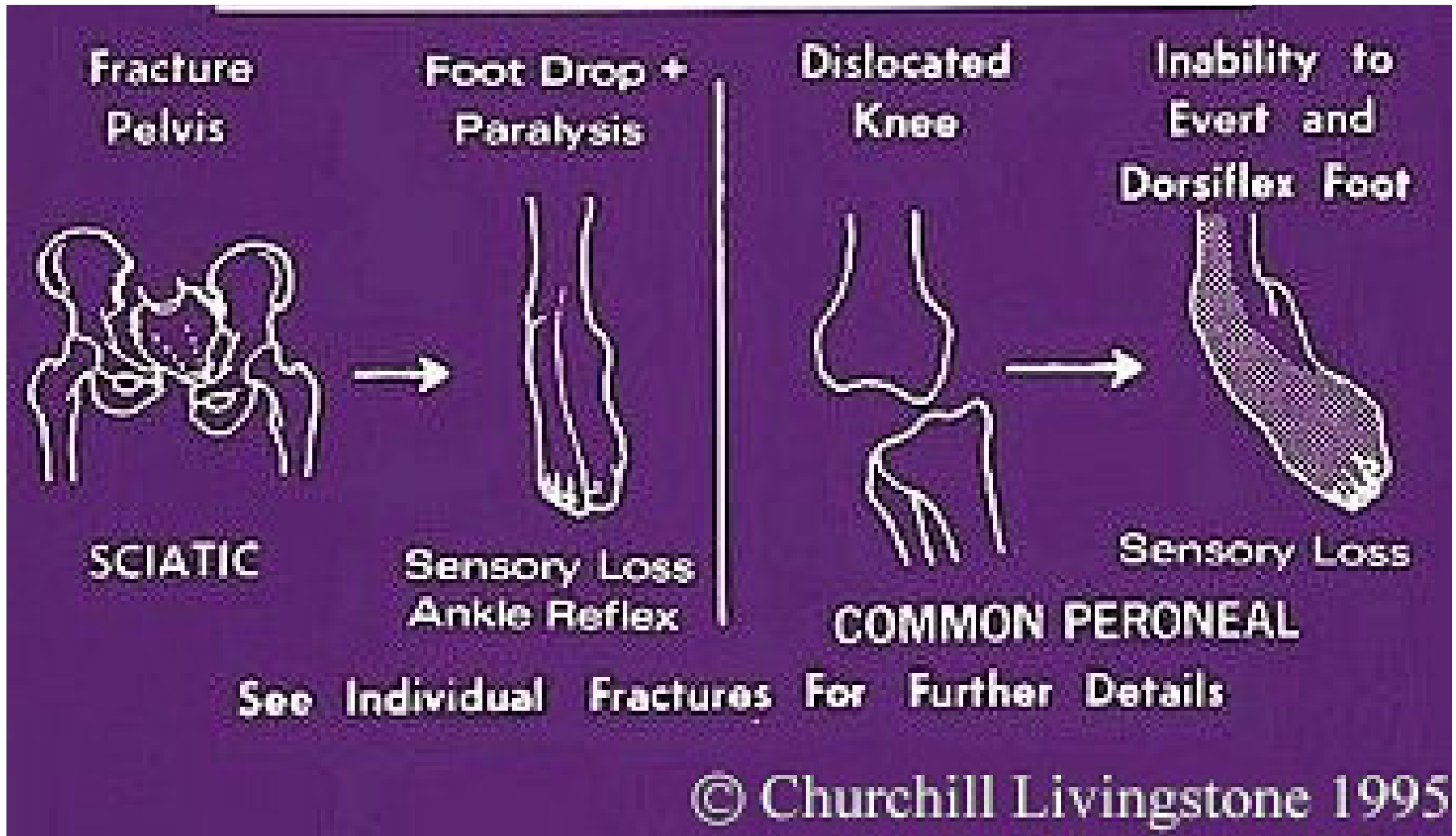
- Posterior dislocation of the hip

- **Common peroneal nerve:**

- Trauma causing lesion as the nerve crosses the neck of fibula

- **Lumbar nerve roots:**


- Prolapsed intervertebral discs



Posterior dislocation of the hip, and a vertical force fracture dislocation of the pelvis may cause a **sciatic nerve** palsy.

Dislocated knee may damage the **common peroneal nerve** as well as the popliteal vessels.

Movement dysfunction

- The line of gravity (center of weight) lies anterior to the ankle joint  activity of plantar flexors is necessary to prevent the foot from going into dorsiflexion
- Injuries to the **tibial nerve** interfere with the “push-off” in walking & make it impossible for the limb to bear weight unless an ankle brace is worn