

大體老師 無語良師



大體解剖學實驗

HUMAN DISSECTION

THE LOWER LIMB DISSECTION II

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臺北醫學大學醫學系 解剖學暨細胞生物學科

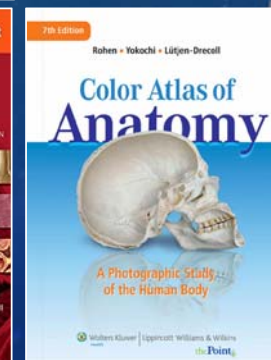
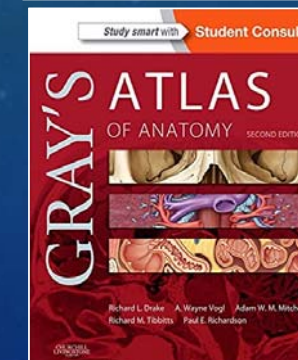
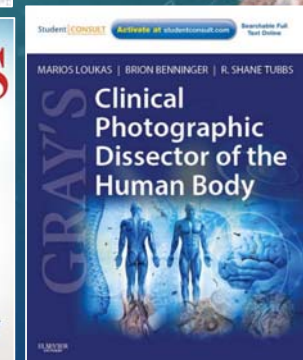
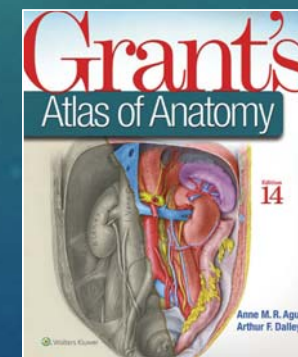
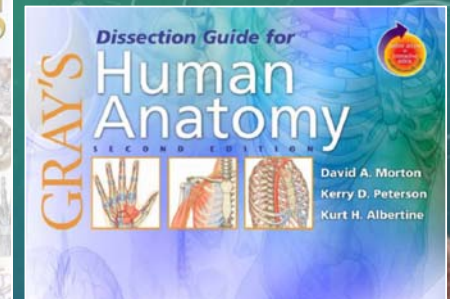
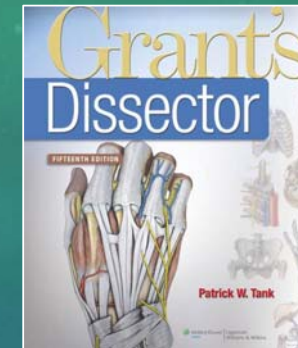
臺北醫學大學醫學院 轉譯影像研究中心

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REFERENCES

- **Dissector's guide**
 - [1] Dissection Guide for Gray's Human Anatomy, 2ed, 2006
 - **[2] Grant's Dissector, 15ed, 2012**
- **Photographic Dissector**
 - [3] Gray's Clinical Photographic Dissector of the Human Body, 2013
- **Human Atlas**
 - [4] Gray's Atlas of Anatomy, 2ed, 2014
 - **[5] Grant's Atlas of Anatomy 13ed, 2012**
 - [6] Color Atlas of Anatomy: A Photographic Study of the Human Body, 7ed, 2011
 - [7] Atlas of Human Anatomy, 6ed, 2014

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LOWER LIMB (2/4)

- Posterior region of thigh & popliteal fossa
- Posterior and lateral regions of leg



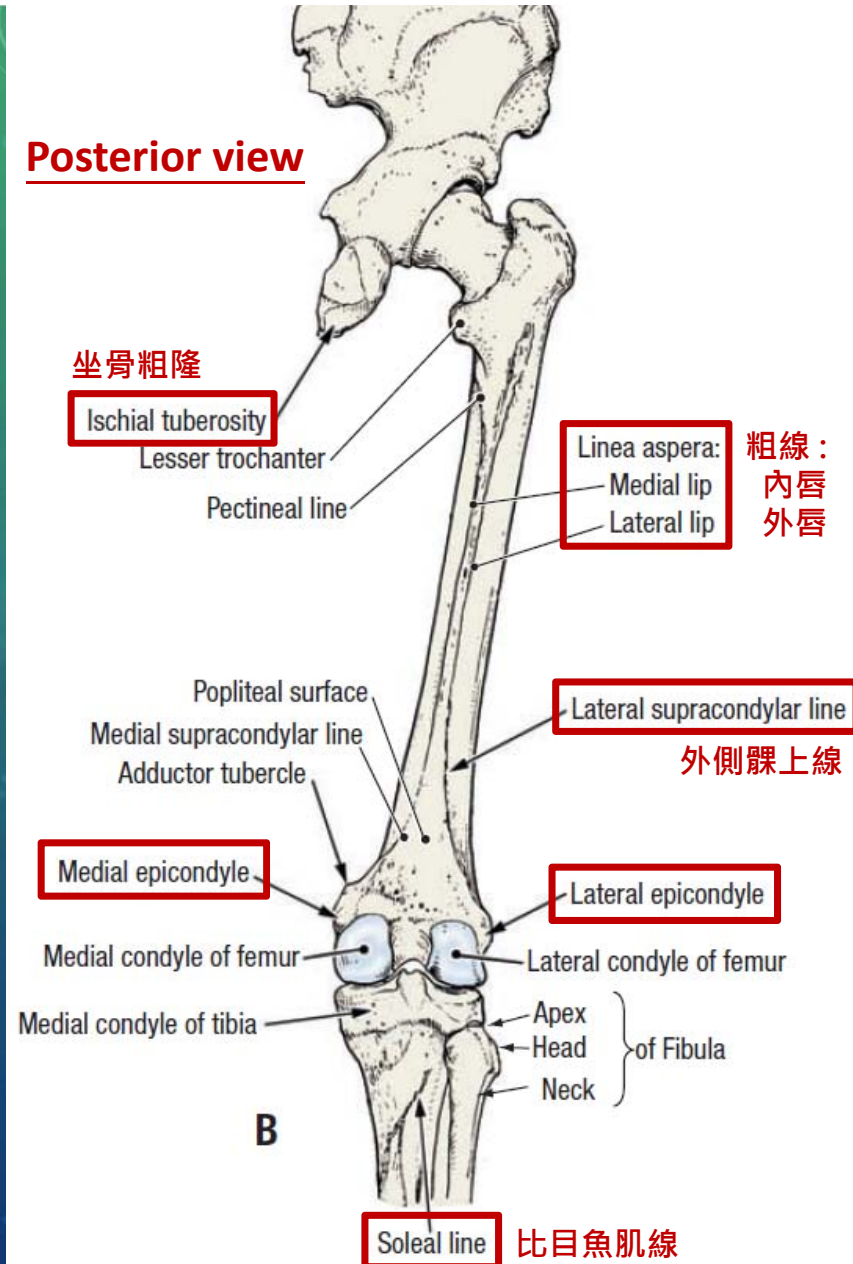
POSTERIOR REGION OF THIGH & POPLITEAL FOSSA

大腿後側 & 膕窩

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OSTEOLOGY

Posterior view

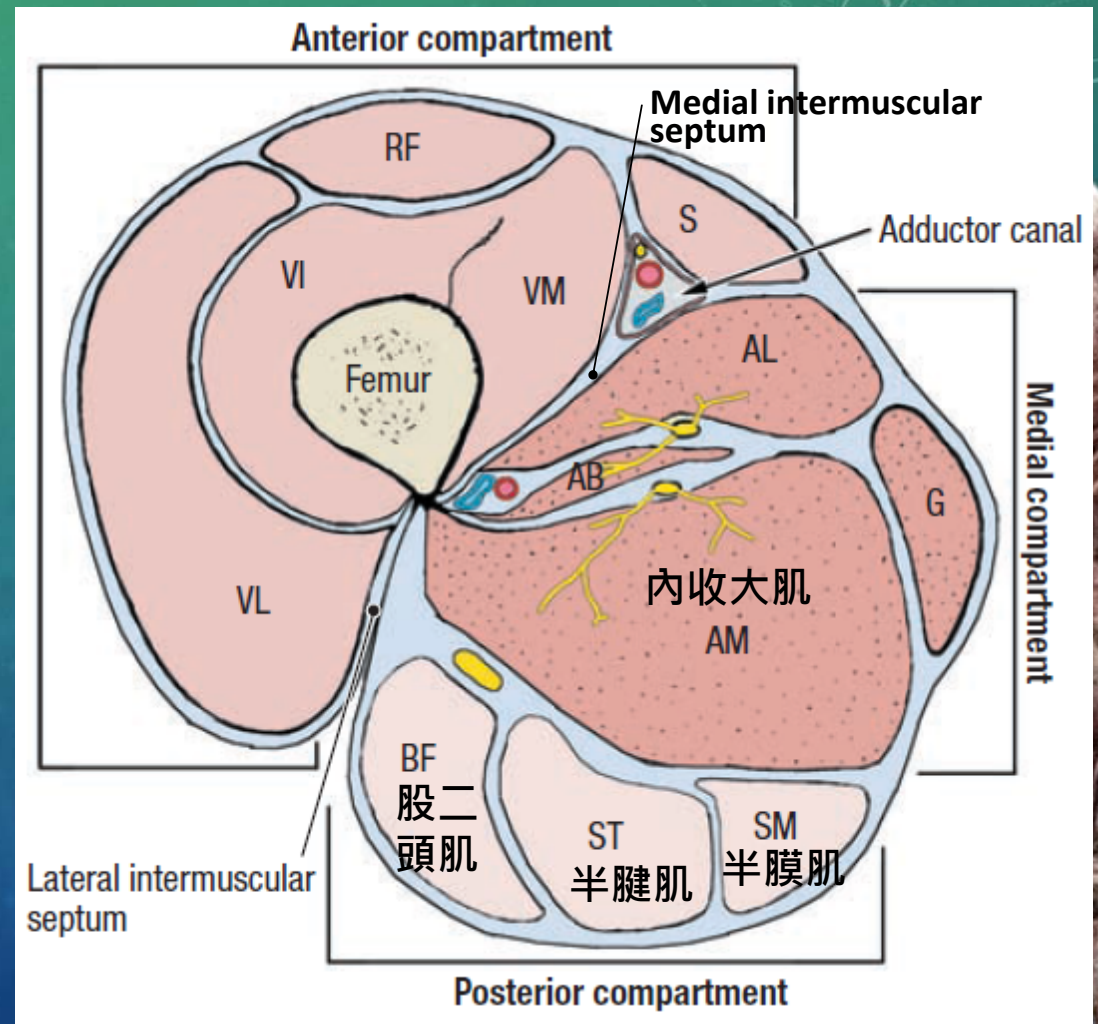


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COMPARTMENTS OF THIGH

- Anterior compartment:
 - *VI*, vastus intermedius; *VL*, vastus lateralis; *VM*, vastus medialis; *RF*, rectus femoris; *S*, sartorius.
- Medial compartment:
 - *AB*, adductor brevis; *AL*, adductor longus; *AM*, adductor magnus; *G*, gracilis.
- **Posterior compartment:**
 - *BF*, biceps femoris; *ST*, semitendinosus; *SM*, semimembranosus



Inferior view of right thigh

Inferior gluteal nerve

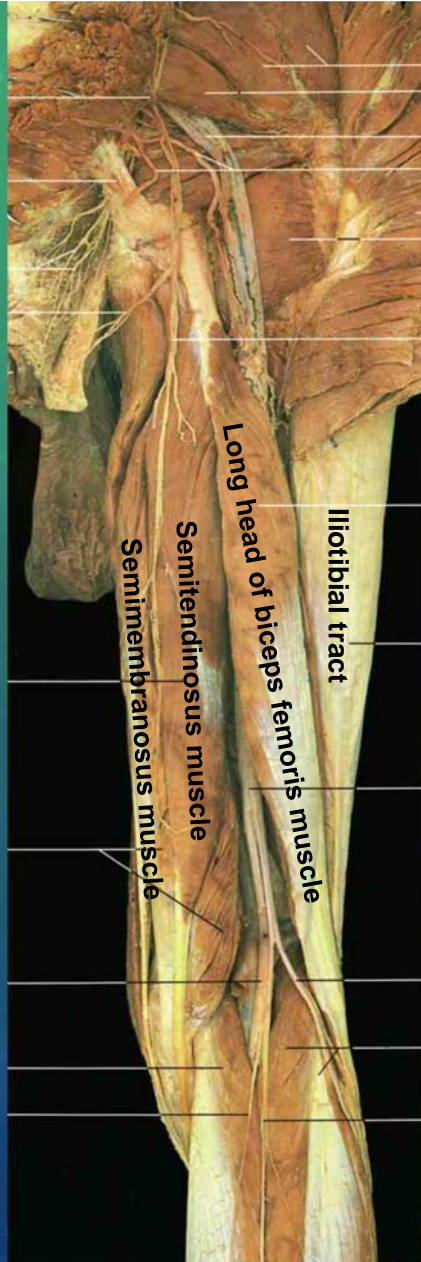
Sacrotuberous ligament

OPEN FASCIA LATA

Make a vertical cut through the fascia lata from the level of the gluteus maximus muscle to the knee.

Tibial nerve

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Gluteus medius muscle
Piriformis muscle

Sciatic nerve
Inferior gluteal artery

Quadratus femoris muscle

Posterior femoral cutaneous nerve

Long head of biceps femoris muscle
Iliotibial tract

Semitendinosus muscle
Semimembranosus muscle

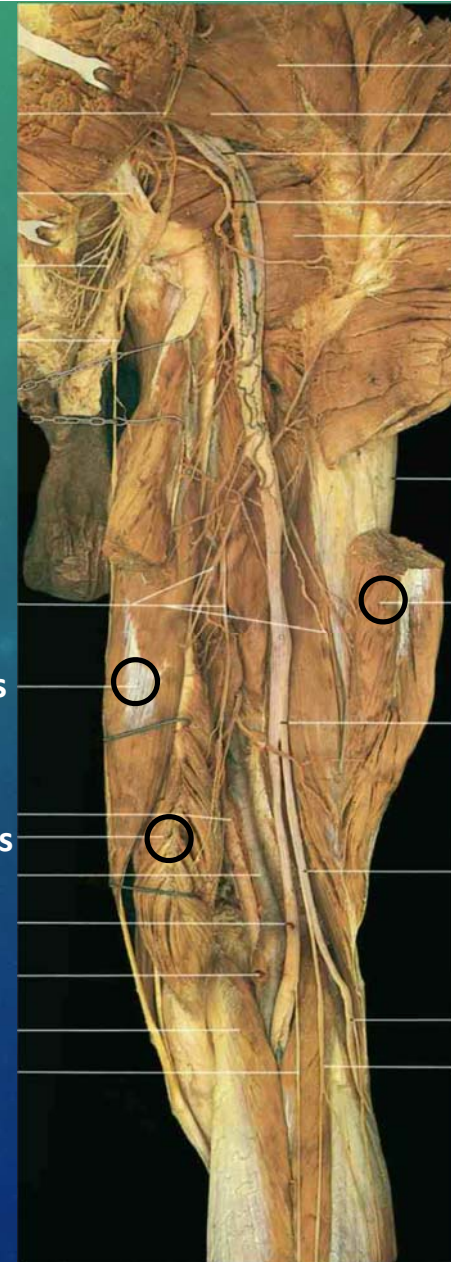
Sciatic nerve

Common peroneal (fibular) nerve

Semitendinosus muscle

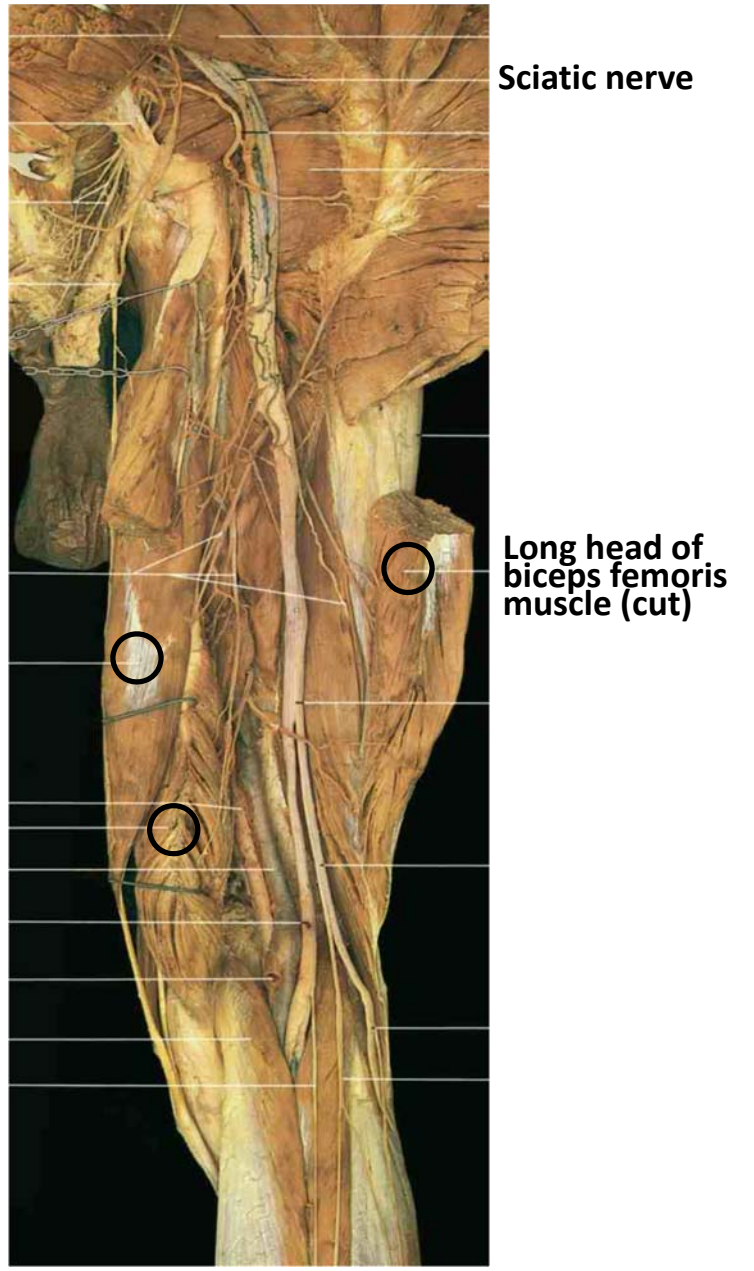
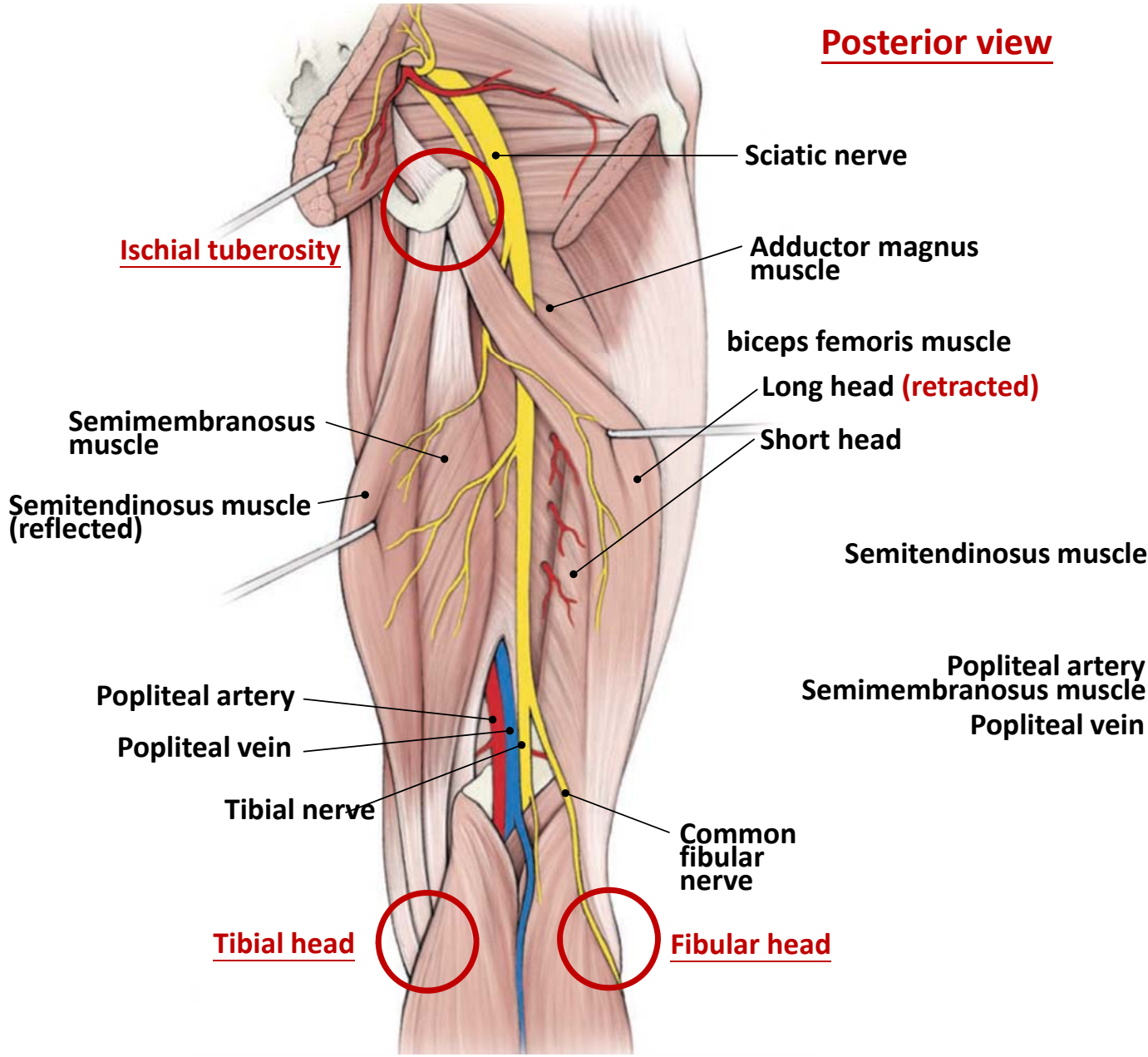
Semimembranosus muscle

Ref. [6] p.485



Long head of biceps femoris muscle (cut)

Posterior view

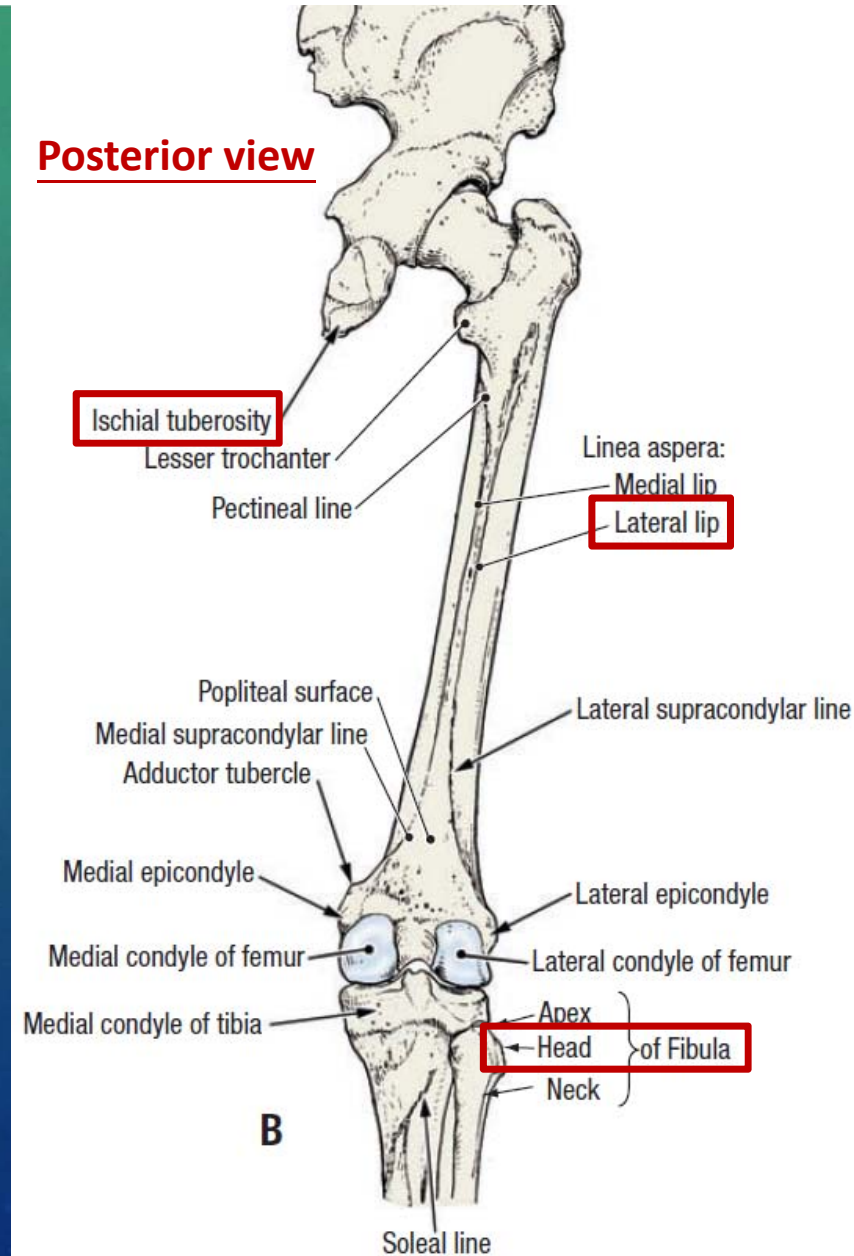


BICEPS FEMORIS MUSCLE

- The superior attachment of the long head of the biceps femoris muscle is the **ischial tuberosity**.
- The superior attachment of the short head of the biceps femoris muscle is the **lateral lip of the linea aspera** of the femur.
- The tendon of the short head of the biceps femoris muscle joins the tendon of the long head and it attaches on the **head of the fibula**.

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Posterior view

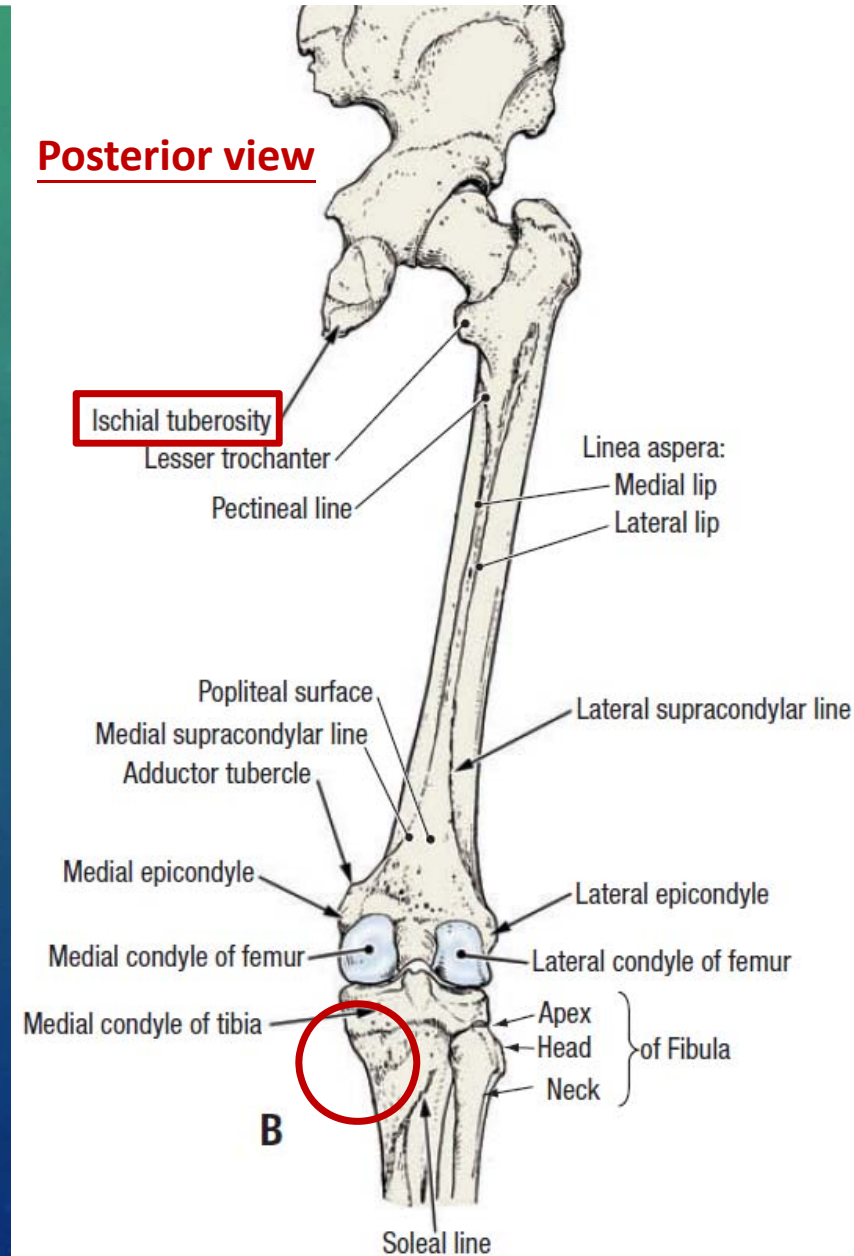


SEMITENDINOSUS MUSCLE

- The semitendinosus (“**half tendon**”) muscle is named for the long, cord-like tendon at its inferior end.
- The superior attachment of the semitendinosus muscle is **the ischial tuberosity**.
- Its inferior attachment is on the **medial surface of the superior part of the tibia**.

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Posterior view

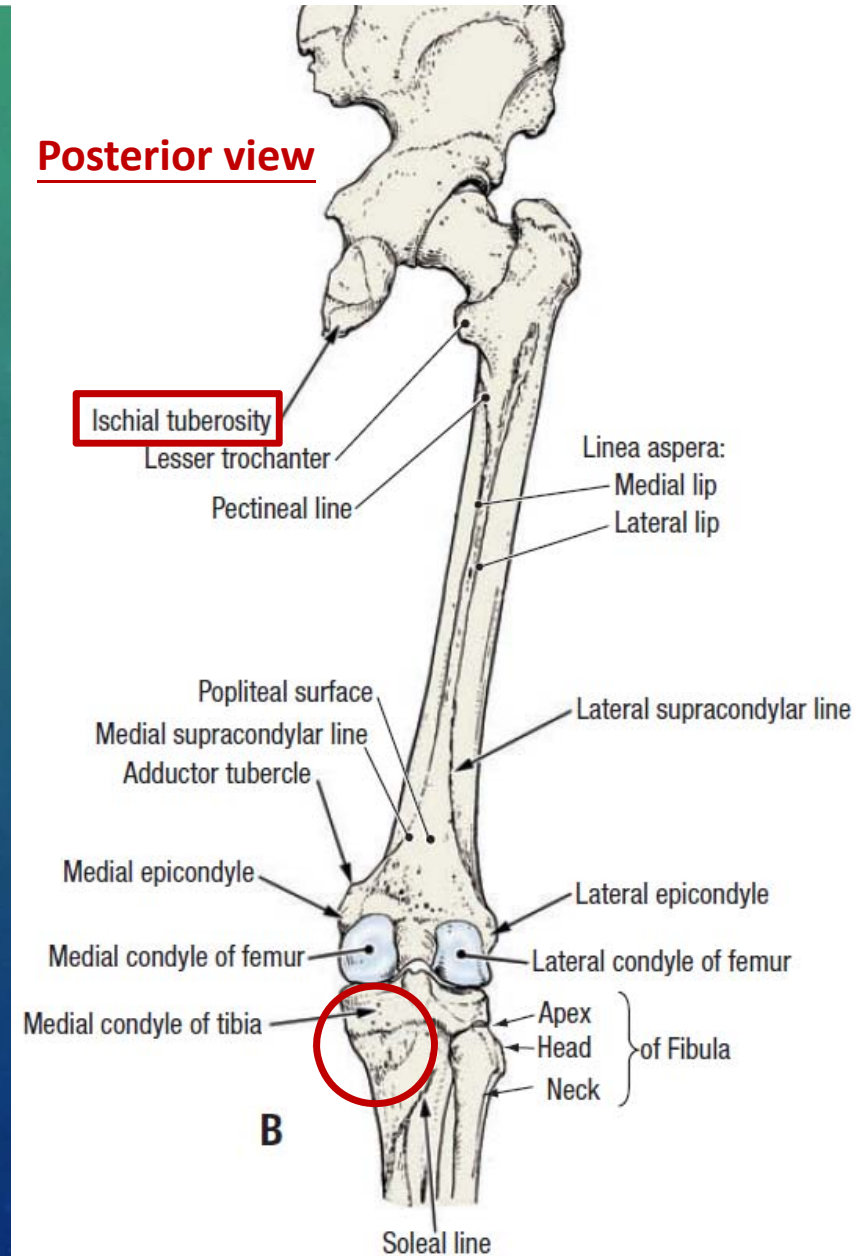


SEMIMEMBRANOSUS MUSCLE

- The semimembranosus (“half membrane”) muscle is named for the broad, membrane-like tendon at its superior end.
- The superior attachment of the semimembranosus muscle is the **ischial tuberosity**.
- Its inferior attachment is on the **posterior part of the medial condyle of the tibia**.

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Posterior view



MUSCLES IN POSTERIOR COMPARTMENT

Muscle	Proximal Attachment	Distal Attachment	Action	Innervation
Semitendinosus	Ischial tuberosity	Medial surface of the proximal tibia	Extends and medially rotates the hip; flexes the knee and medially rotates the tibia	Tibial n. (L5–S2)
Semimembranosus		Posterior medial surface of the condyle of the tibia	Extends and medially rotates the hip; flexes the knee and medially rotates the tibia	
Biceps femoris	Long head: ischial tuberosity Short head: lateral lip of the linea aspera of the femur	Head of the fibula	Long head: extends and laterally rotates the hip Long and short heads: flex the knee and laterally rotate the tibia	Long head: tibial n. (S1–S3) Short head: fibular n. (L5–S2)

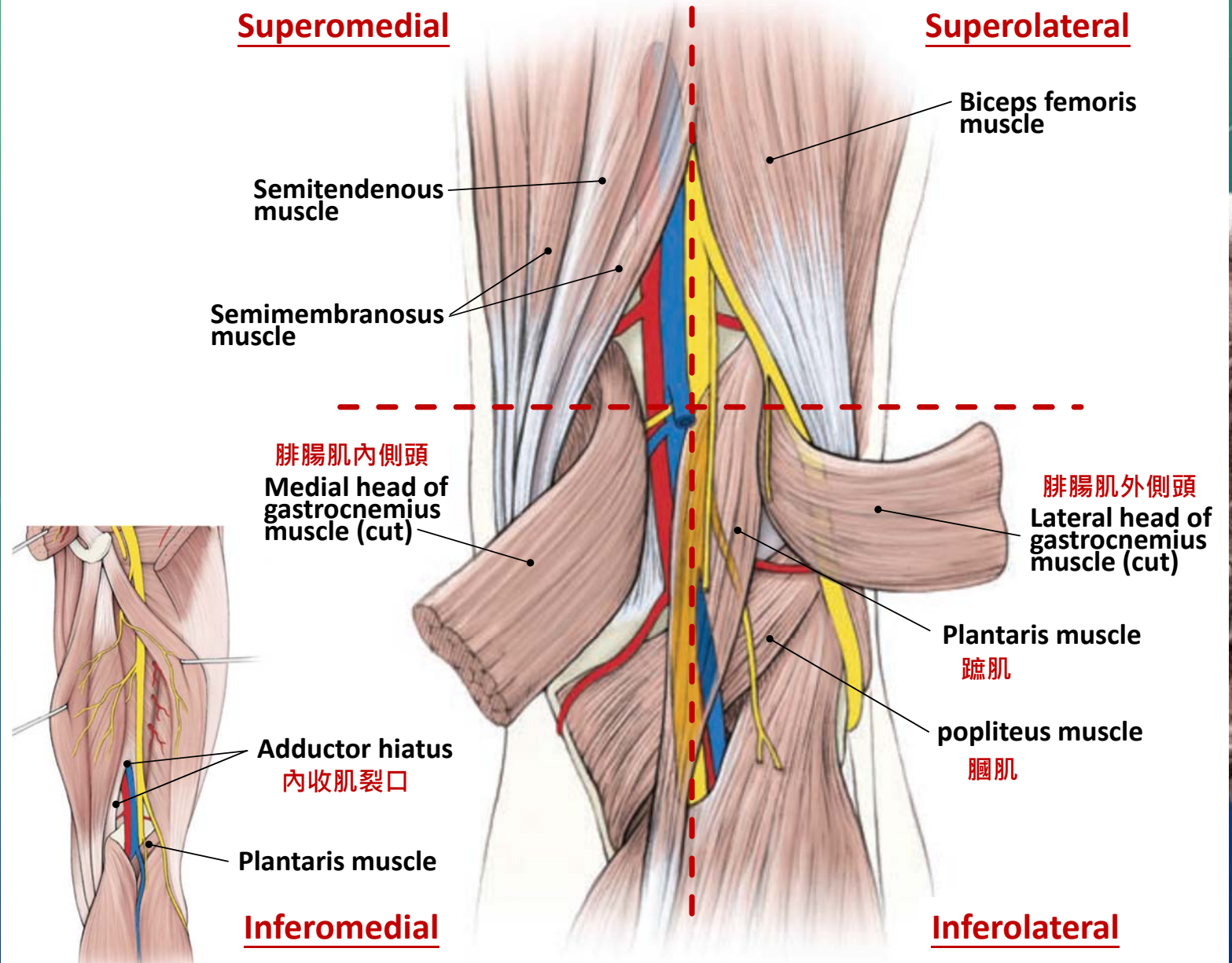
Ref. [1] p.504

BORDERS OF POPLITEAL FOSSA

- **Superolateral** – biceps femoris muscle
- **Superomedial** – semitendinosus and semimembranosus muscles
- **Inferolateral** – lateral head of the gastrocnemius muscle and the plantaris muscle
- **Inferomedial** – medial head of the gastrocnemius muscle
- **Posterior** – skin and deep (popliteal) fascia
- **Anterior** – popliteal surface of the femur, the posterior surface of the capsule of the knee joint, and the popliteus muscle

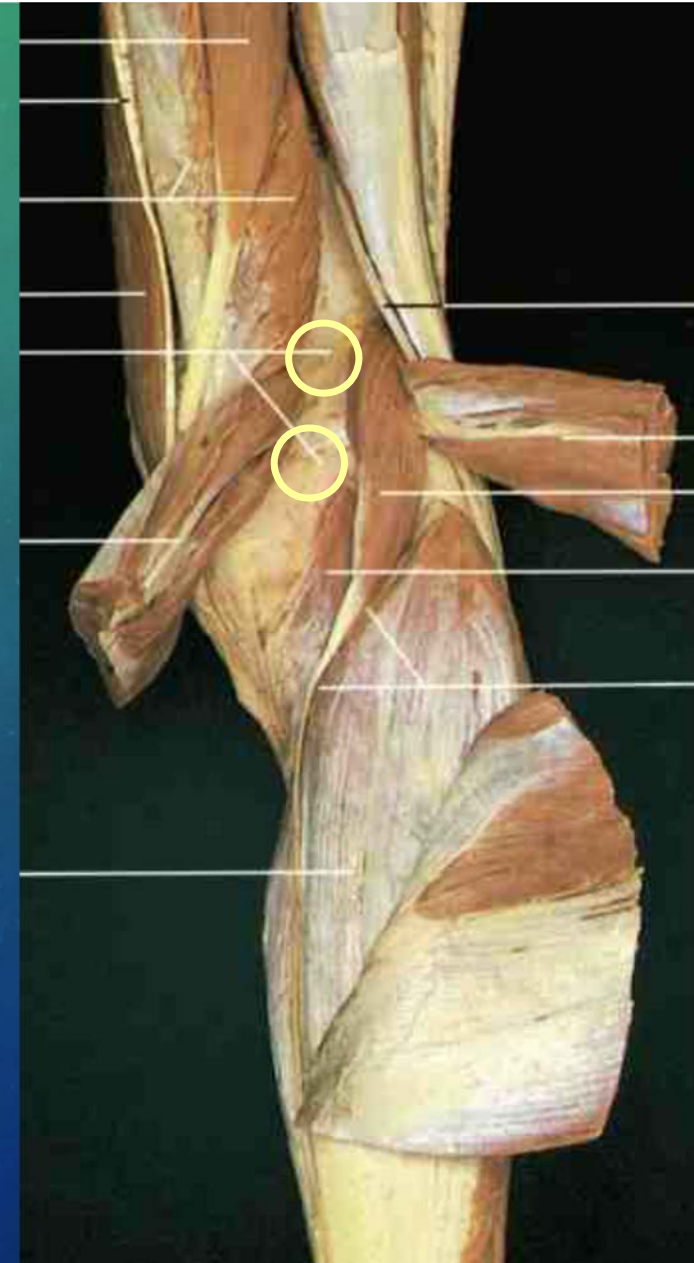


POPLITEAL FOSSA



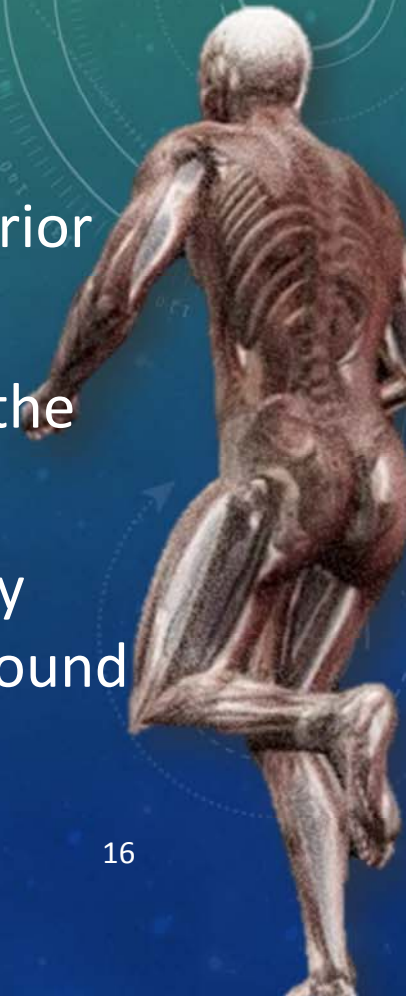
DISSECTION OF POPLITEAL FOSSA

- Remove the remnants of the deep fascia (**popliteal fascia**) to expose the medial and lateral heads of the gastrocnemius muscle.
- Insert your index fingers between the two bellies of the gastrocnemius muscle. Pull the muscle bellies apart for a distance of 5 to 10 cm. This will expose the structures that pass from the popliteal fossa into the leg.



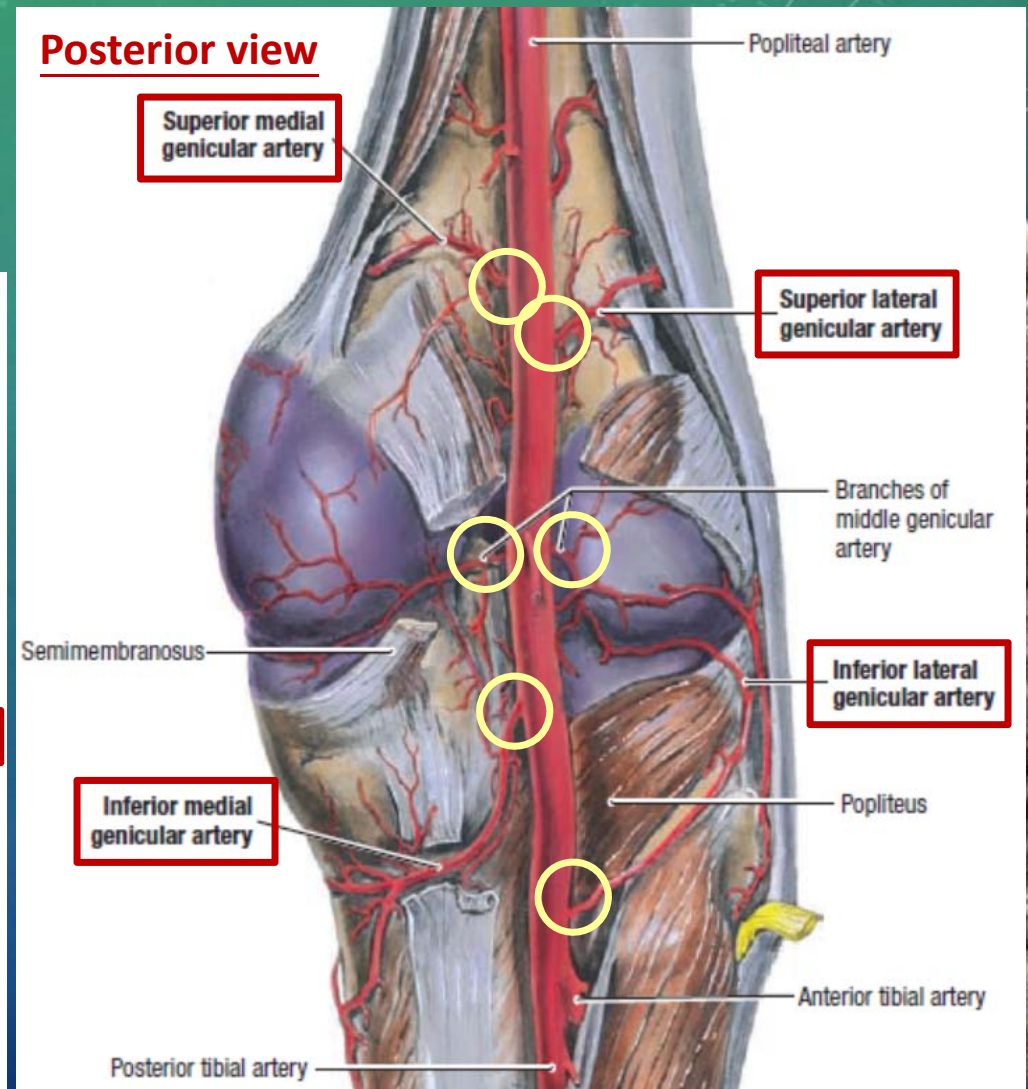
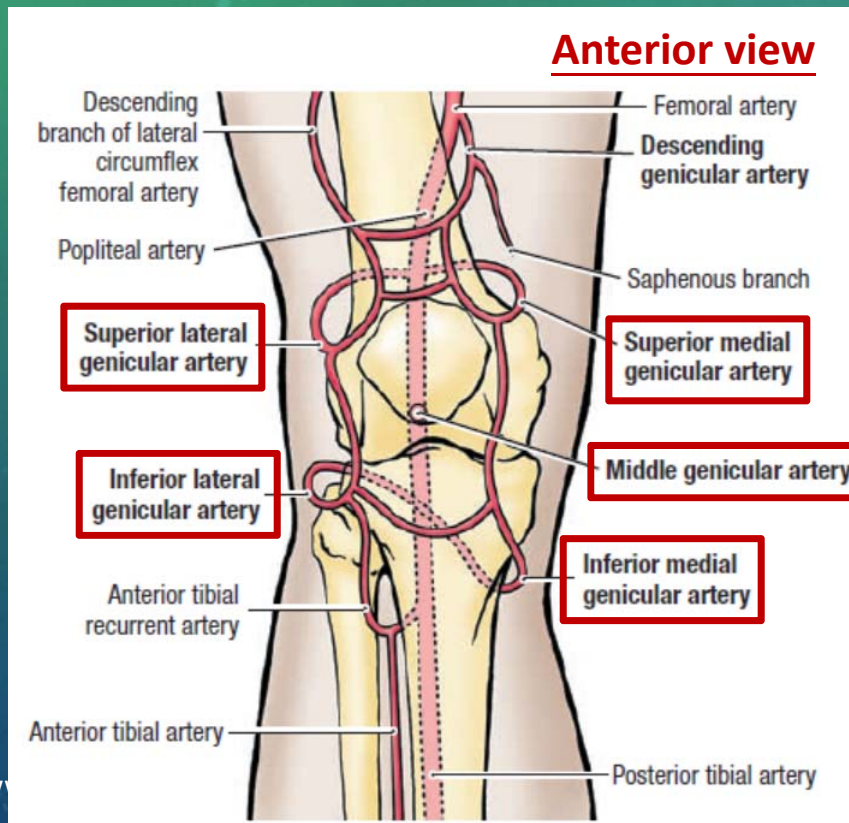
POPLITEAL ARTERY & VEIN

- Note that the popliteal artery and vein are enclosed by a connective tissue sheath. Use scissors to cut this sheath posterior to the vessels.
- Preserve the popliteal vein but remove its tributaries to clear the dissection field, except for small saphenous vein.
- Use an illustration to study the branches of the popliteal artery that anticipate in the formation of the arterial anastomoses around the knee joint (**genicular anastomosis**).



GENICULAR ANASTOMOSIS

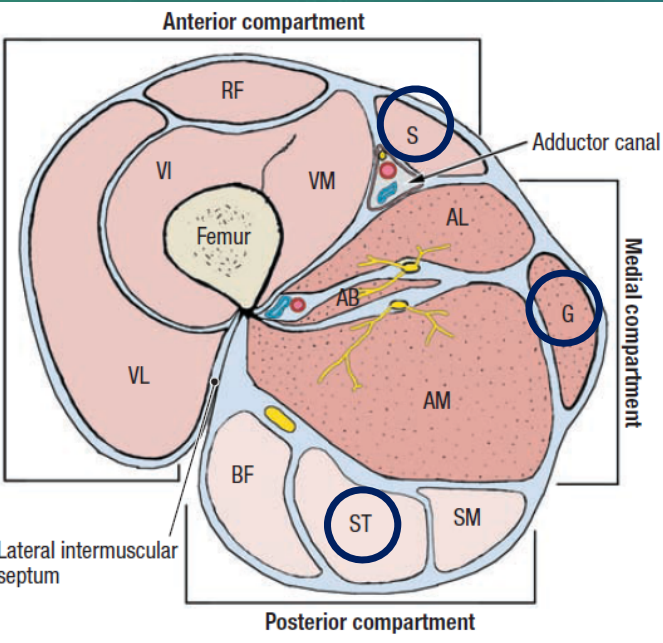
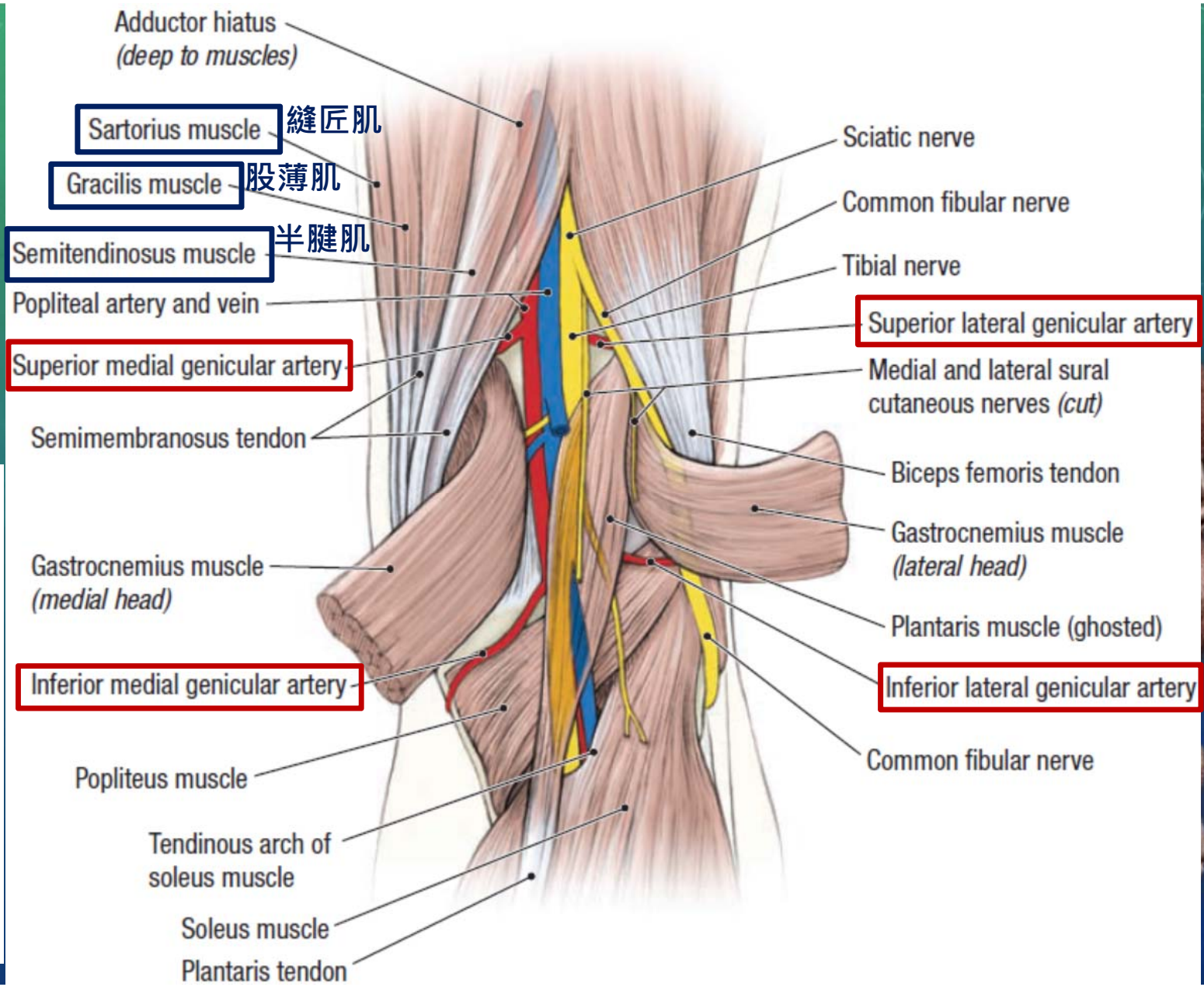
膝關節動脈聯會



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Ref. [5] p.424

PES ANSERINUS 鵝掌狀腱

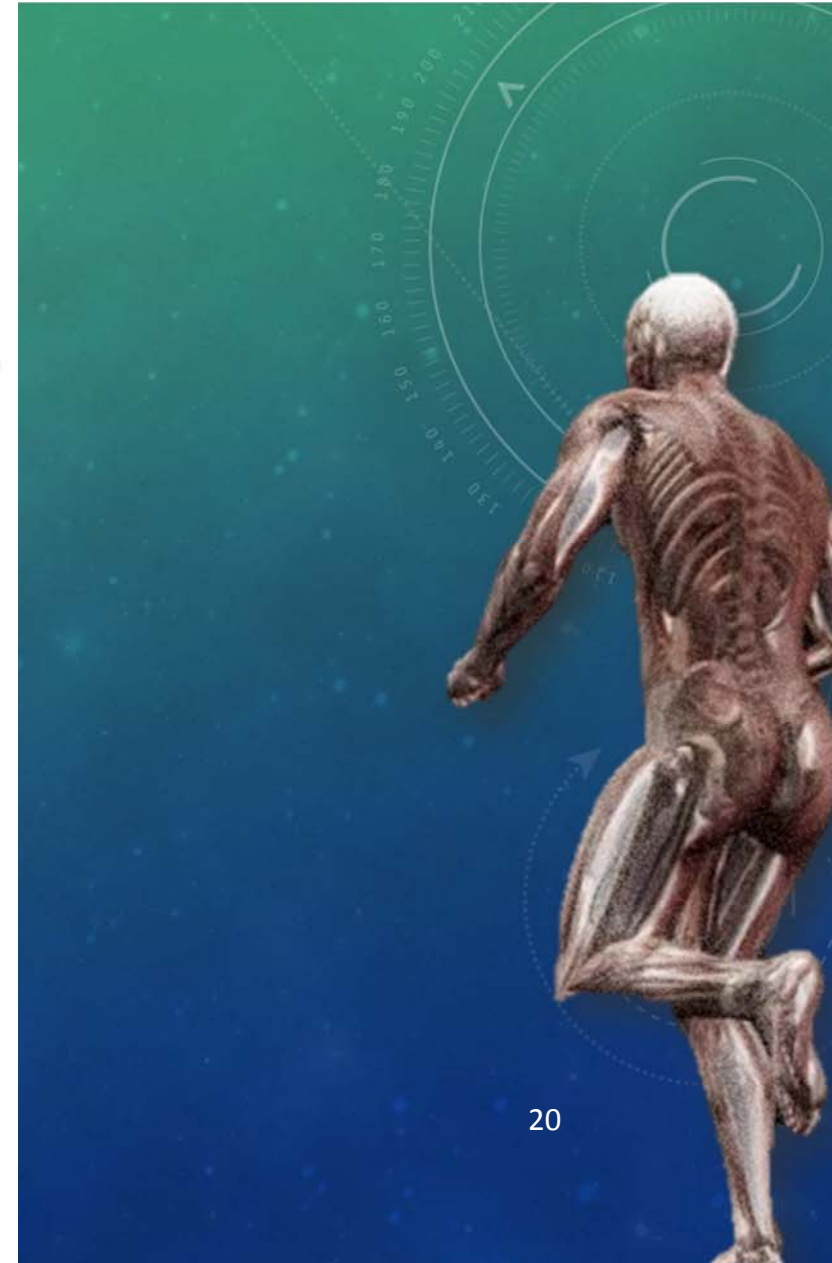
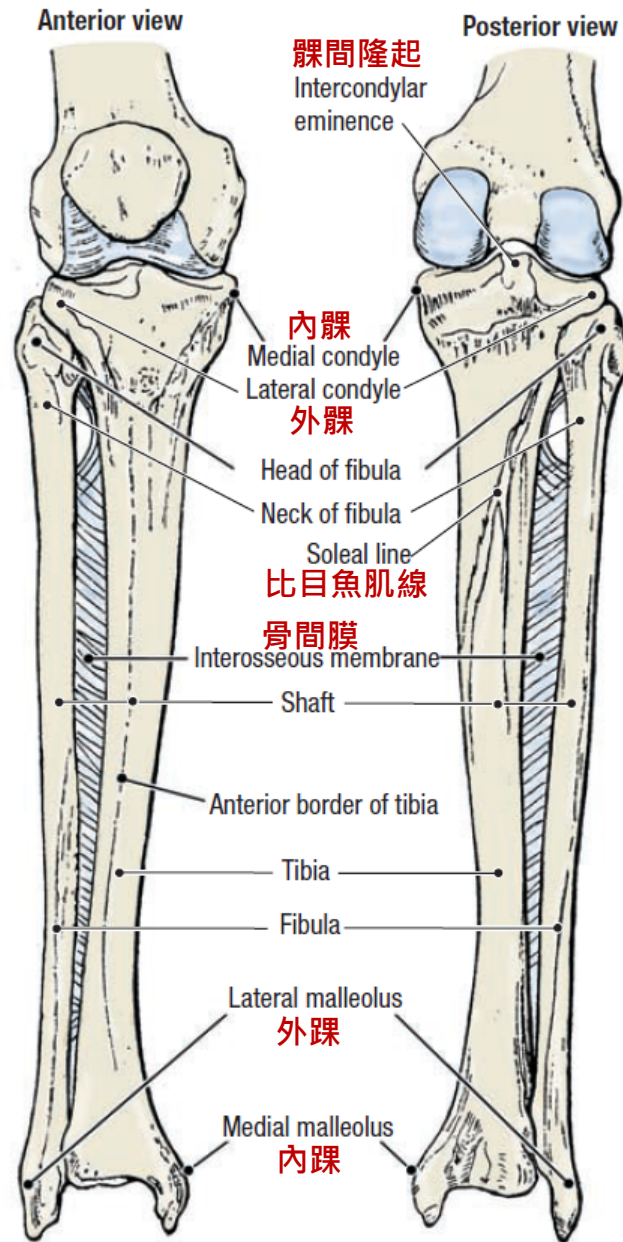


POSTERIOR AND LATERAL REGIONS OF LEG

小腿後、外側

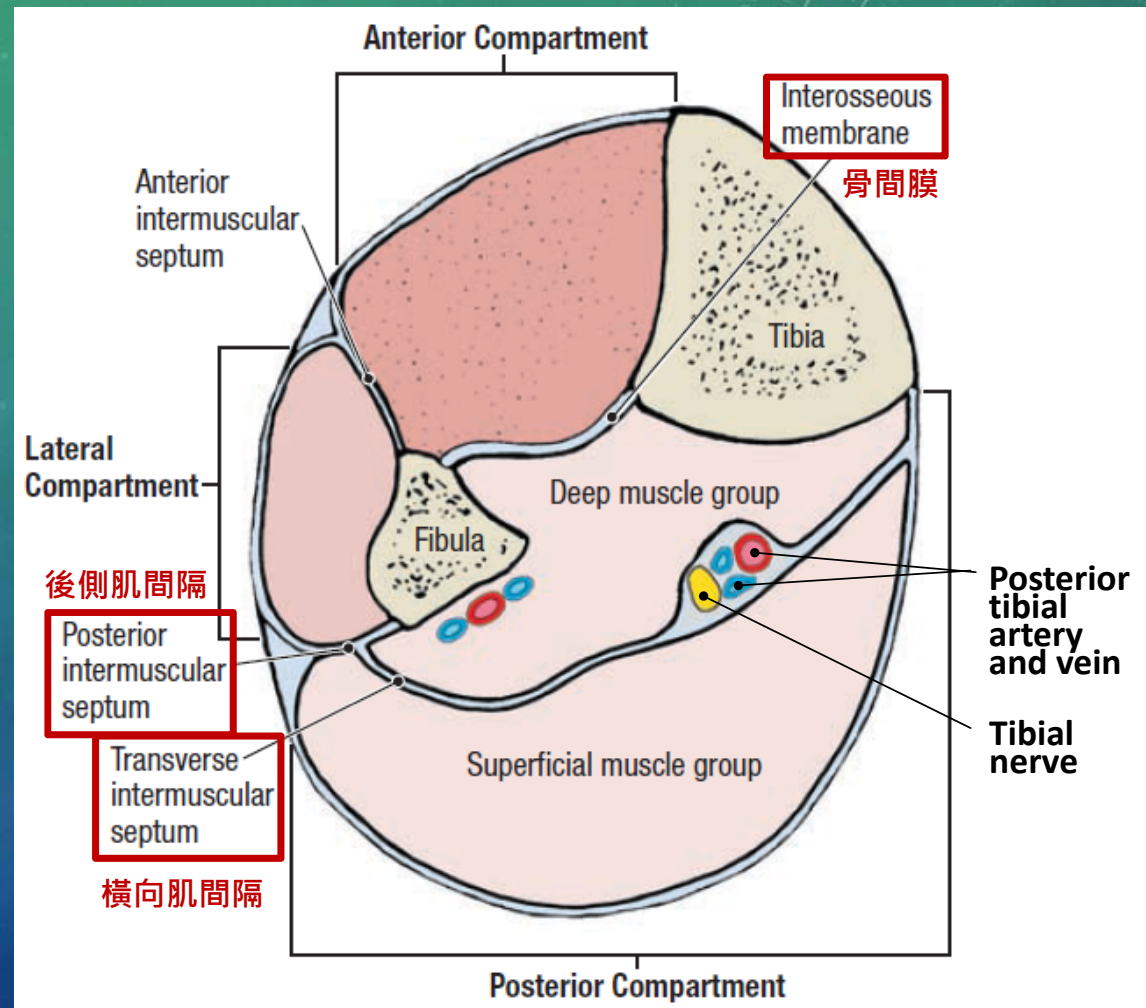
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COMPARTMENTS OF LEG

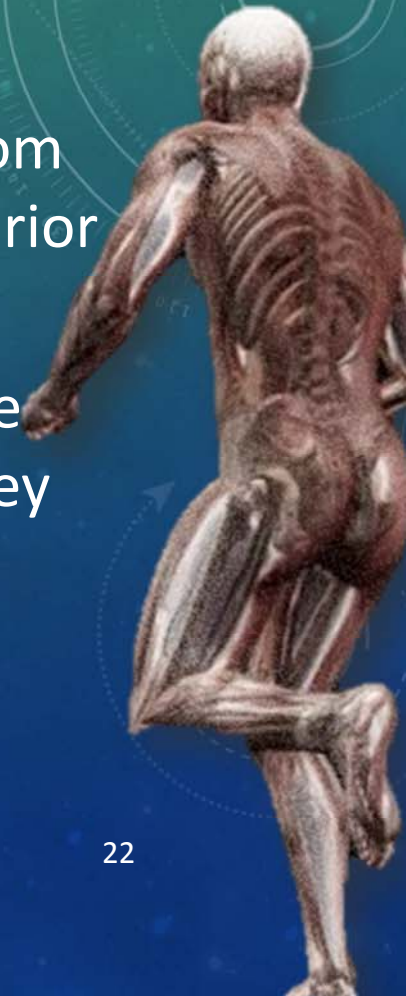
- The superficial posterior group
 - Gastrocnemius, soleus, and plantaris muscles.
- The deep posterior group
 - Popliteus, tibialis posterior, flexor digitorum longus, and flexor hallucis longus muscle.



Inferior view of right leg

DISSECTION STEPS

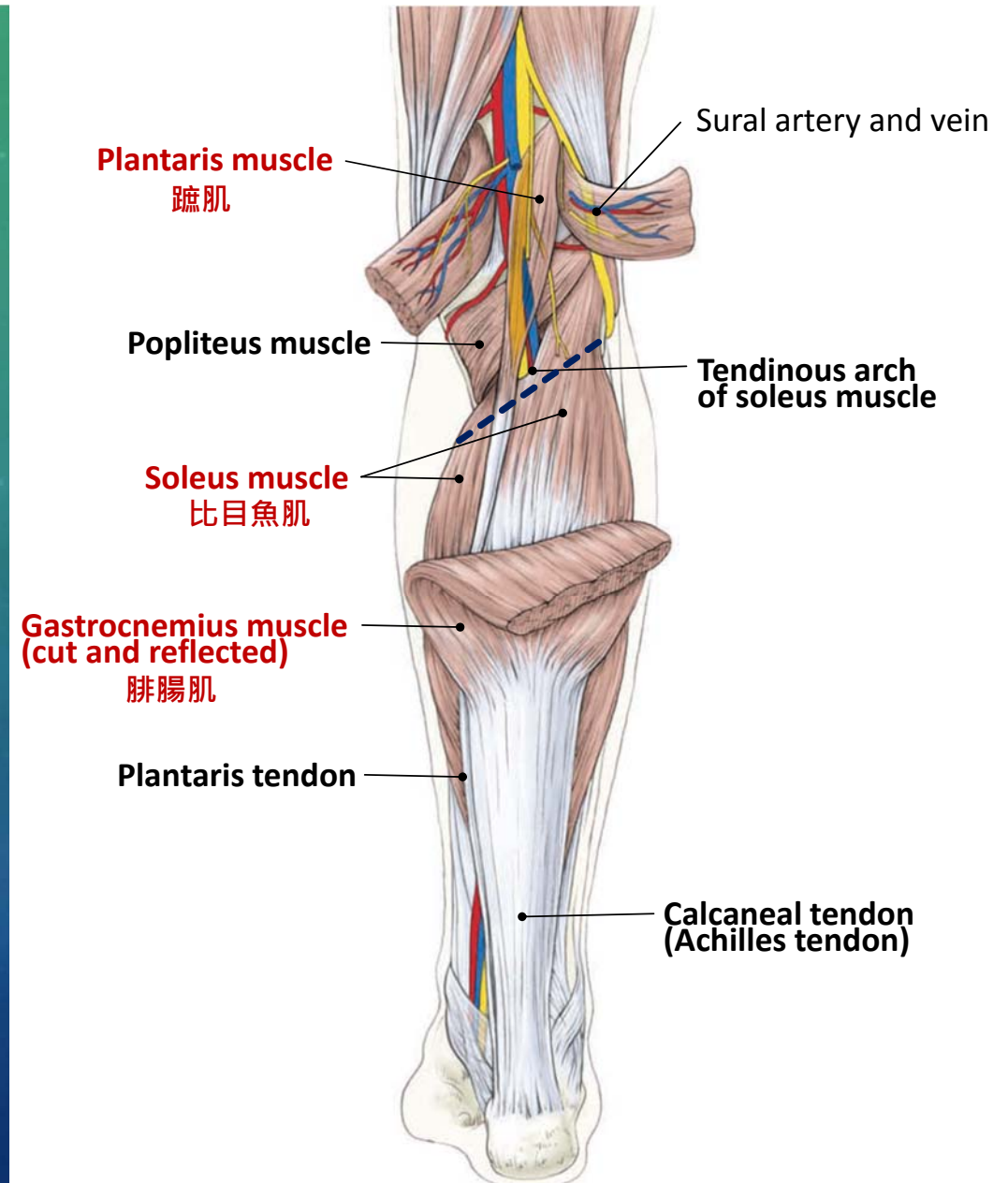
- Use scissors to make a vertical cut through the **crural fascia** from the popliteal fossa to the calcaneal tuberosity. Open the posterior compartment.
- Identify the **gastrocnemius muscle**. Use scissors to transect the two heads of the gastrocnemius muscle at the point where they join and reflect them.



SUPERFICIAL POSTERIOR GROUP

- The plantaris muscle and tendon may be absent in a small percentage of cases.
- The tibial nerve and posterior tibial vessels exit the popliteal fossa by passing deep to the tendinous arch of the soleus muscle.

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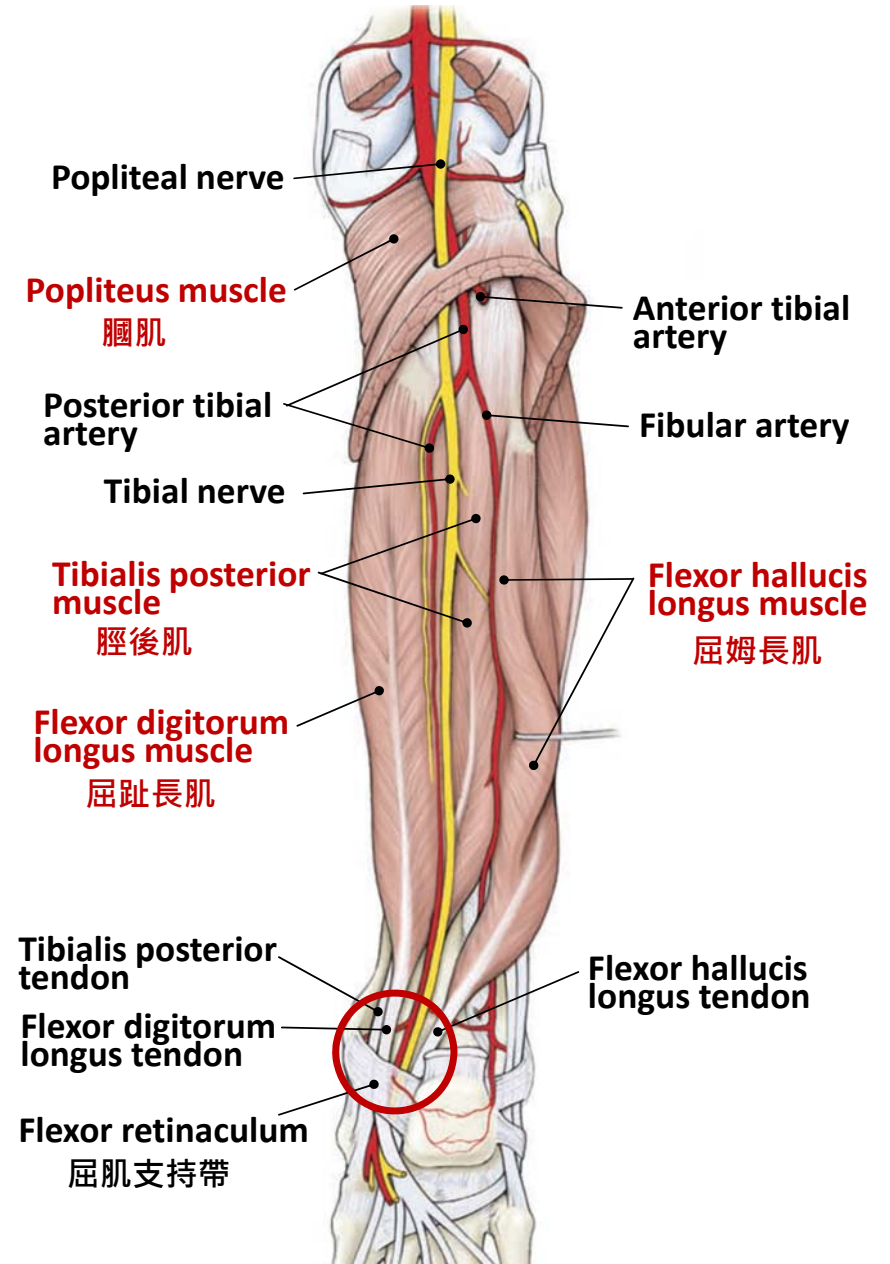


DEEP POSTERIOR GROUP

- Identify the posterior tibial artery and vein and the tibial nerve within the transverse intermuscular septum.
- The posterior tibial artery is usually accompanied by two veins.

Tom, Dick, ANd Harry

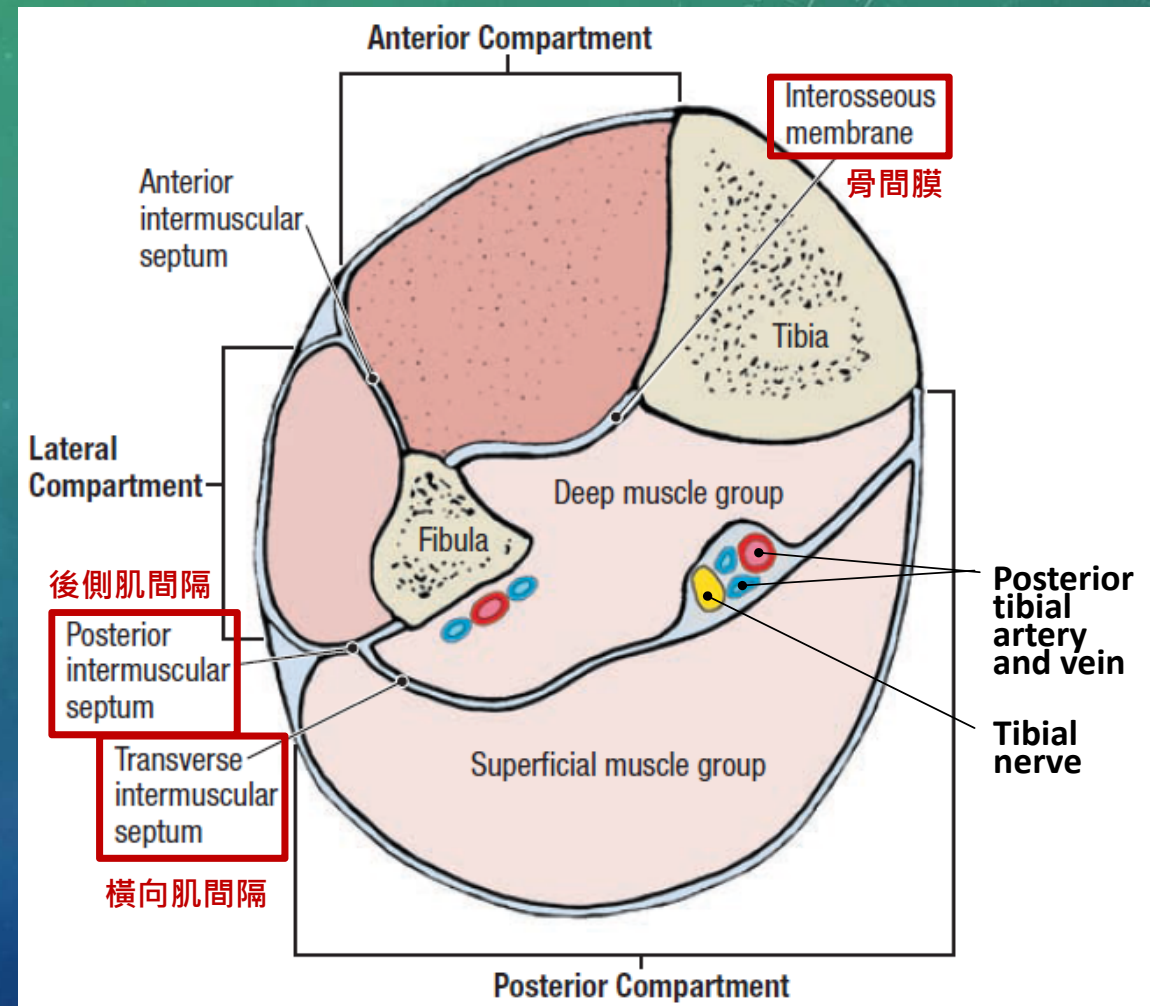
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Muscle	Proximal Attachment	Distal Attachment	Action	Innervation
Gastrocnemius	Medial and lateral condyles of the femur	Posterior surface of the calcaneus via the calcaneal tendon	Flexes the knee and plantar flexes the foot at the ankle	Tibial n. (S1–S2)
Soleus	Posterior aspect of the fibula and tibia		Plantar flexes the foot at the ankle	
Plantaris	Lateral supracondylar line of the femur		Assists the gastrocnemius; flexes the knee and plantar flexes the foot at the ankle	
Popliteus	Lateral condyle of the femur	Posterior surface of the proximal end of the tibia	Unlocks the knee joint (laterally rotates the femur on the fixed tibia)	Tibial n. (L4–S1)
Flexor hallucis longus	Posterior surface of the fibula and interosseous membrane	Base of the distal phalanx of the great toe	Flexes the great toe and plantar flexes the foot at the ankle	Tibial n. (S2–S3)
Flexor digitorum longus	Medial posterior surface of the tibia	Base of the distal phalanx of digits 2–5	Flexes digits 2–5 and plantar flexes the foot at the ankle	
Tibialis posterior	Posterior surface of the fibula, interosseous membrane, and tibia	Mainly to the tuberosity of the navicular and adjacent region of the medial cuneiform bones	Inverts and plantar flexes the foot at the ankle; supports the medial arch of the foot during walking	Tibial n. (L4–L5)

COMPARTMENTS OF LEG

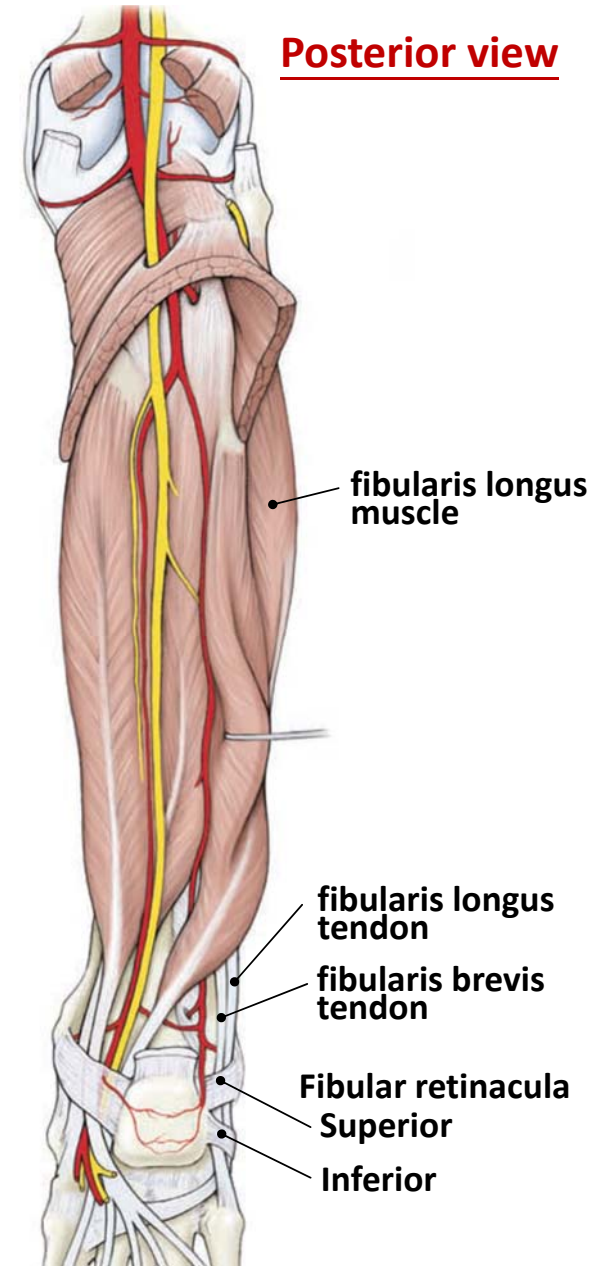
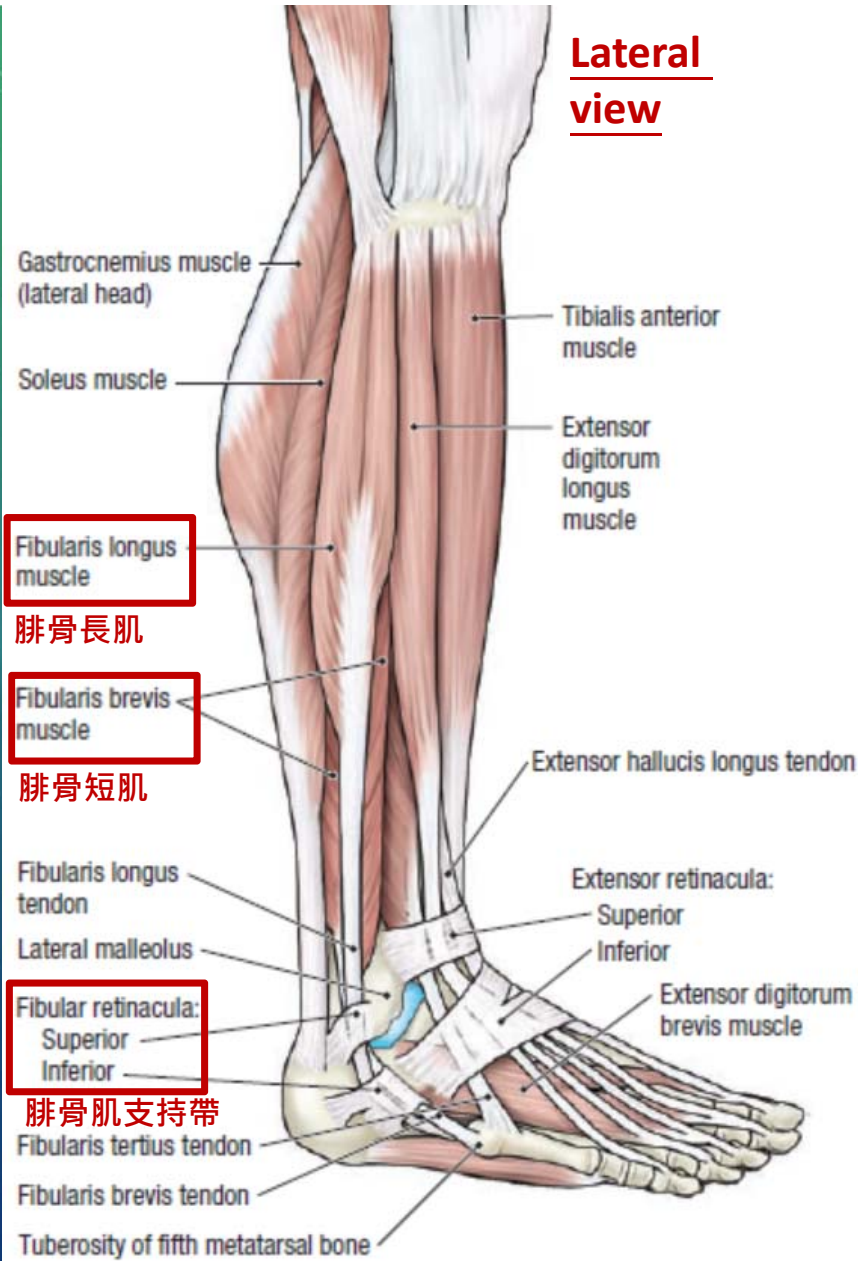
- The lateral compartment
 - fibularis longus muscle
 - fibularis brevis muscle



Inferior view of right leg

LATERAL COMPARTMENT

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LATERAL COMPARTMENT

Muscle	Proximal Attachment	Distal Attachment	Action	Innervation
Fibularis longus	Head and proximal surface of the fibula	Base of the first metatarsal and medial cuneiform bones	Evert and plantar flex the foot at the ankle	Superficial fibular n. (L5–S2)
Fibularis brevis	Distal two thirds of the lateral surface of the fibula	Posterior base of the fifth metatarsal bone		

Ref. [1] p.505

THE END

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