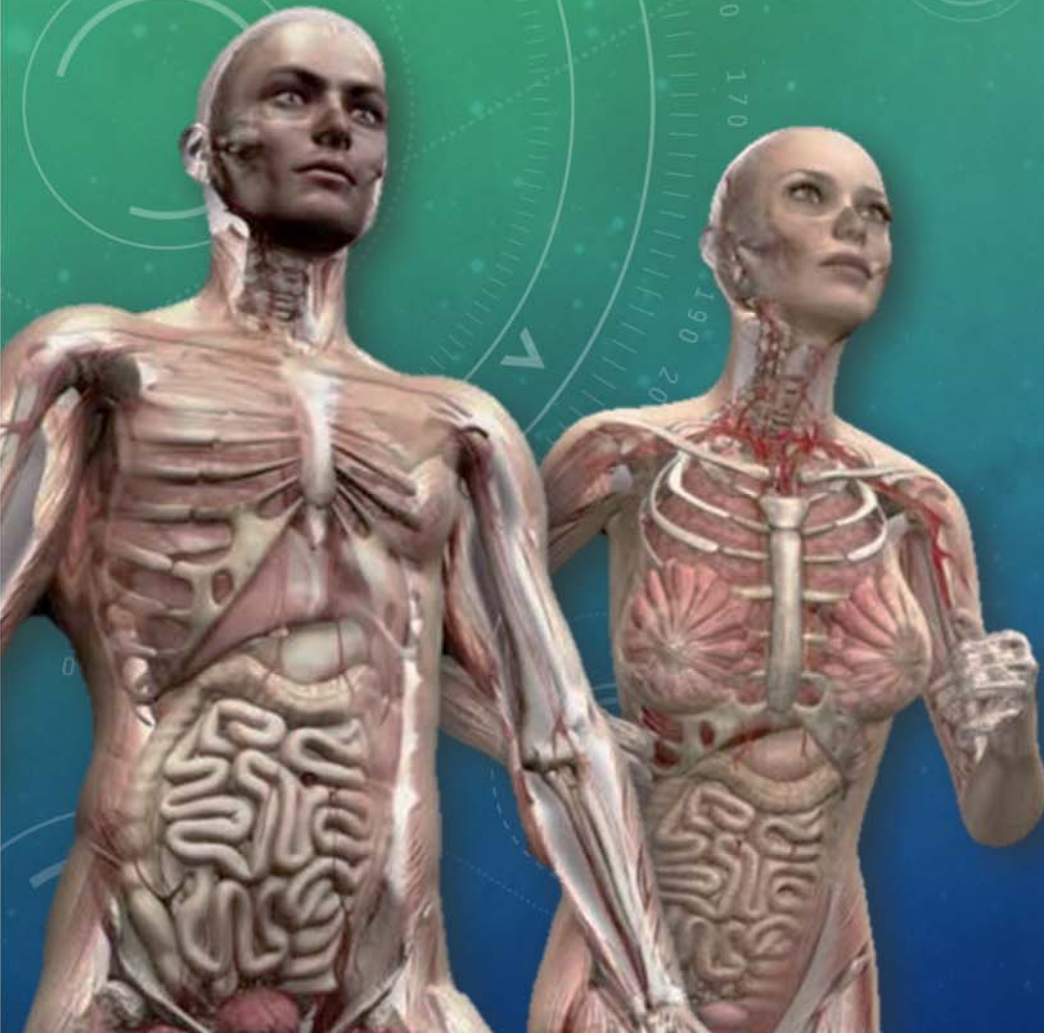


大體老師 無語良師



大體解剖學實驗

HUMAN DISSECTION

THE LOWER LIMB DISSECTION I

盧家鋒 助理教授

臺北醫學大學醫學系 解剖學暨細胞生物學科

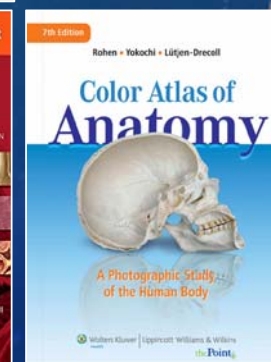
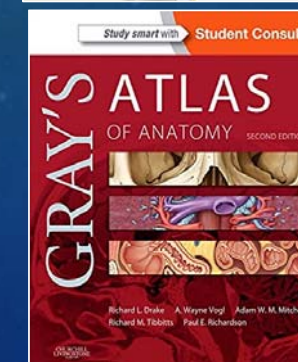
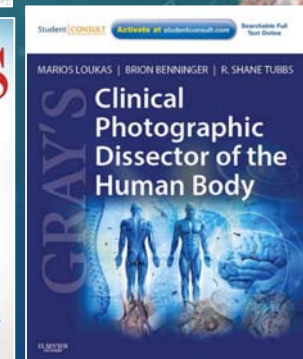
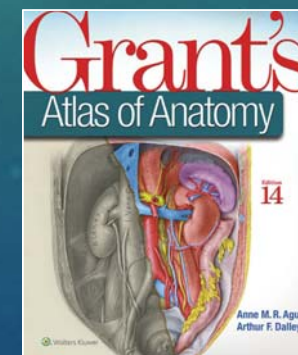
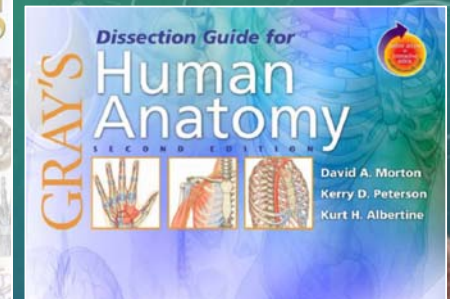
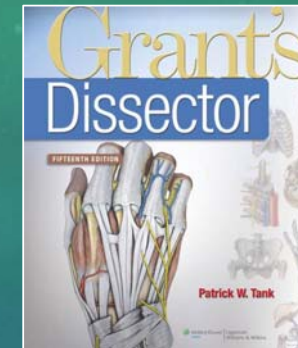
臺北醫學大學醫學院 轉譯影像研究中心

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 - [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
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 - [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 (1/4)

- Skin incision & superficial structure
- Gluteal region



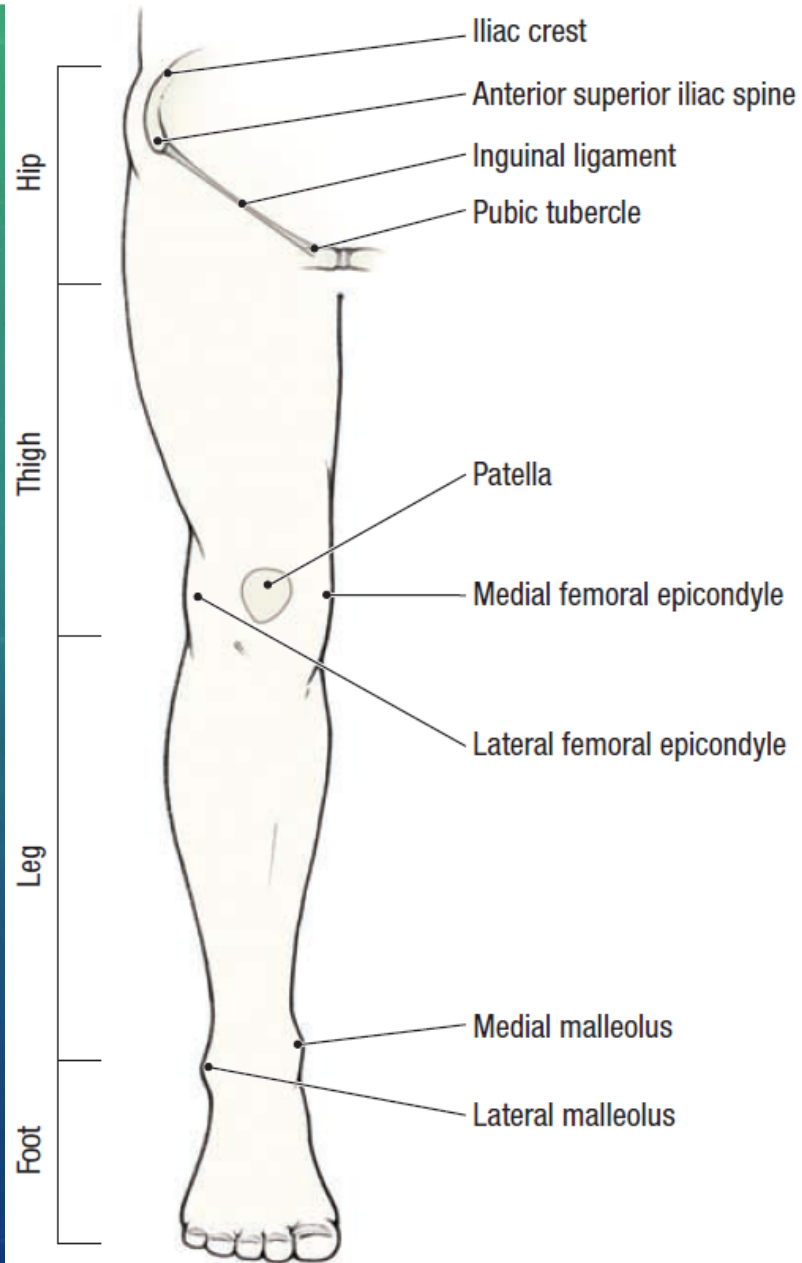
SKIN INCISION & SUPERFICIAL STRUCTURE

翻皮&淺層構造

<http://www.ym.edu.tw/~cflu>

SURFACE ANATOMY

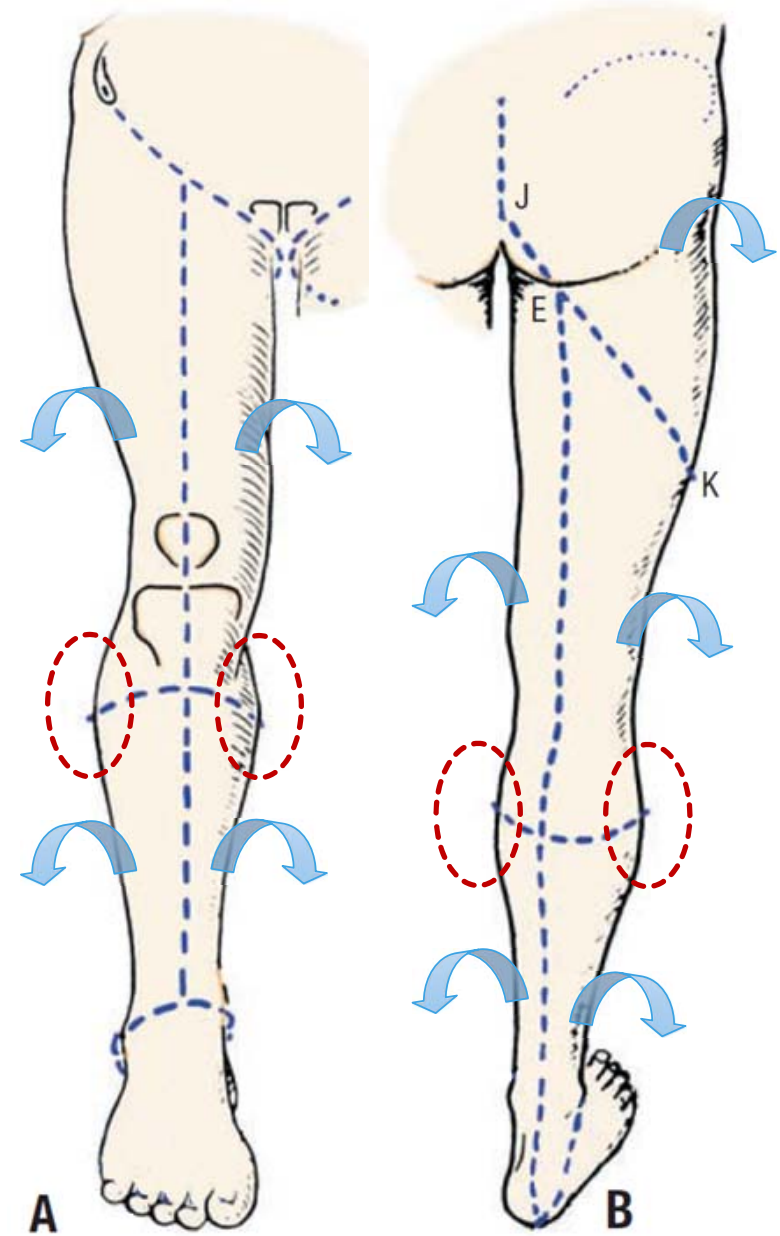
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SKIN INCISIONS

- Remove the skin from the lower limb, leaving the superficial fascia, superficial veins, and cutaneous nerves undisturbed.

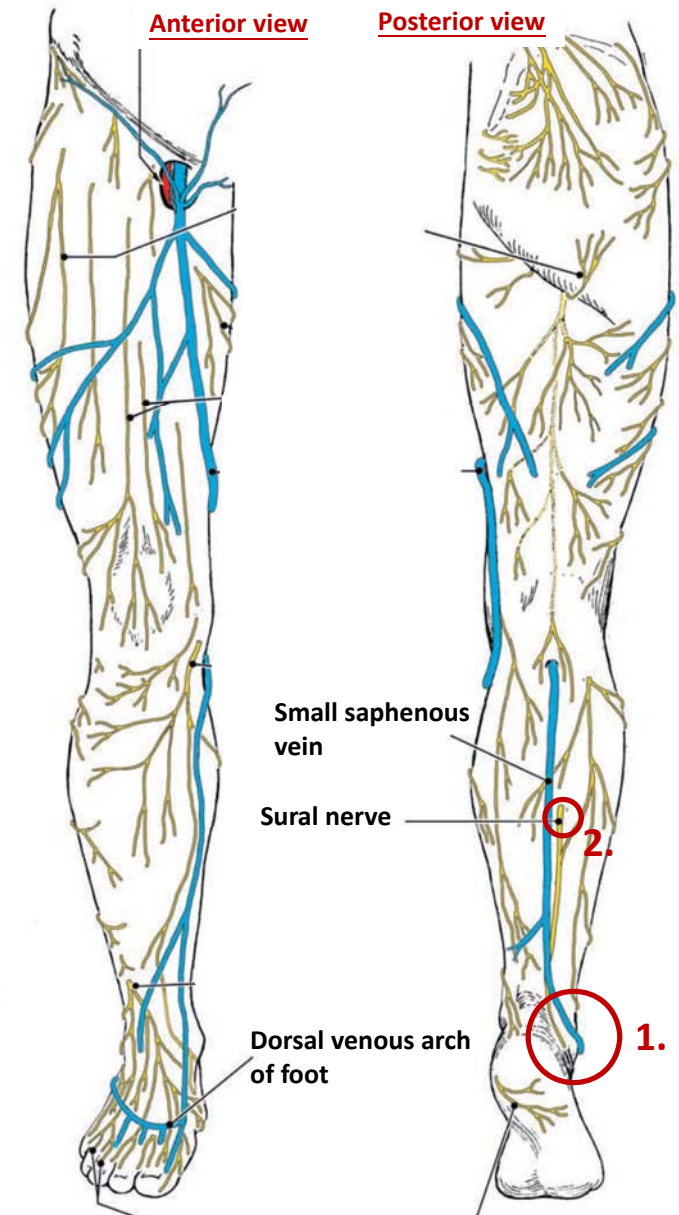
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SUPERFICIAL FASCIA OF POSTERIOR LOWER LIMB **Prone position**

1. Find the **small saphenous vein** where it passes posterior to the lateral malleolus at the ankle.
 - It arises from the lateral end of the **dorsal venous arch**.
 - It pierces the deep fascia in the popliteal fossa.
 - It drains into the **popliteal vein**.
2. Identify the **sural nerve**.
 - It pierces the deep fascia halfway down the posterior aspect of the leg
 - It courses parallel to the small saphenous vein.
 - It innervates the skin of the lateral aspect of the ankle and foot.

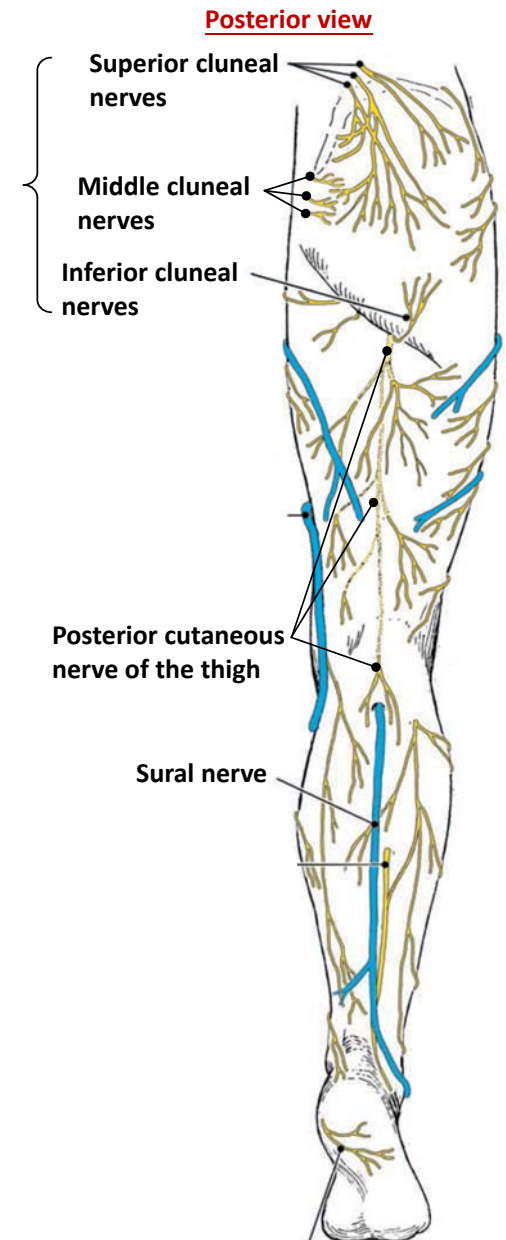
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SUPERFICIAL FASCIA OF POSTERIOR LOWER LIMB **Prone position**

- Study the cutaneous innervation of the posterior surface of the lower limb:
 - **Cluneal nerves** innervate the skin of the gluteal region.
 - **Posterior cutaneous nerve of the thigh** lies deep to the deep fascia. It innervates the skin on the posterior surface of the thigh and popliteal fossa.
 - **Sural nerve** innervates the skin of the posterior side of the leg and lateral side of the foot.

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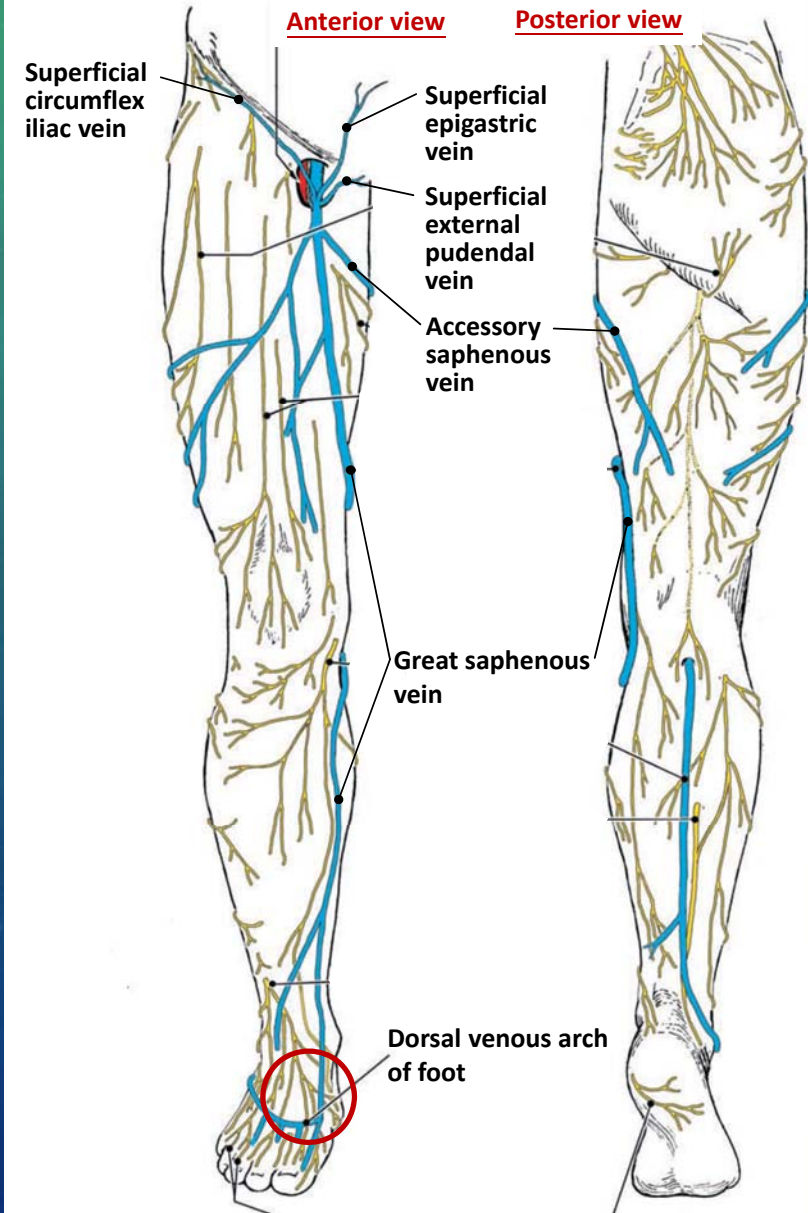


SUPERFICIAL FASCIA OF ANTERIOR LOWER LIMB

Supine position

- Find the **great saphenous vein** where it arises from the medial end of the dorsal venous arch of the foot.
 - At the ankle, it passes anterior to the medial malleolus; at the knee, it passes over the posterior border of the medial epicondyle of the femur.
 - **Accessory saphenous vein** drains the superficial fascia and skin of the medial side of the thigh into it.
 - **Superficial external pudental, superficial epigastric, and superficial circumflex iliac veins** join the great saphenous vein near its proximal end.

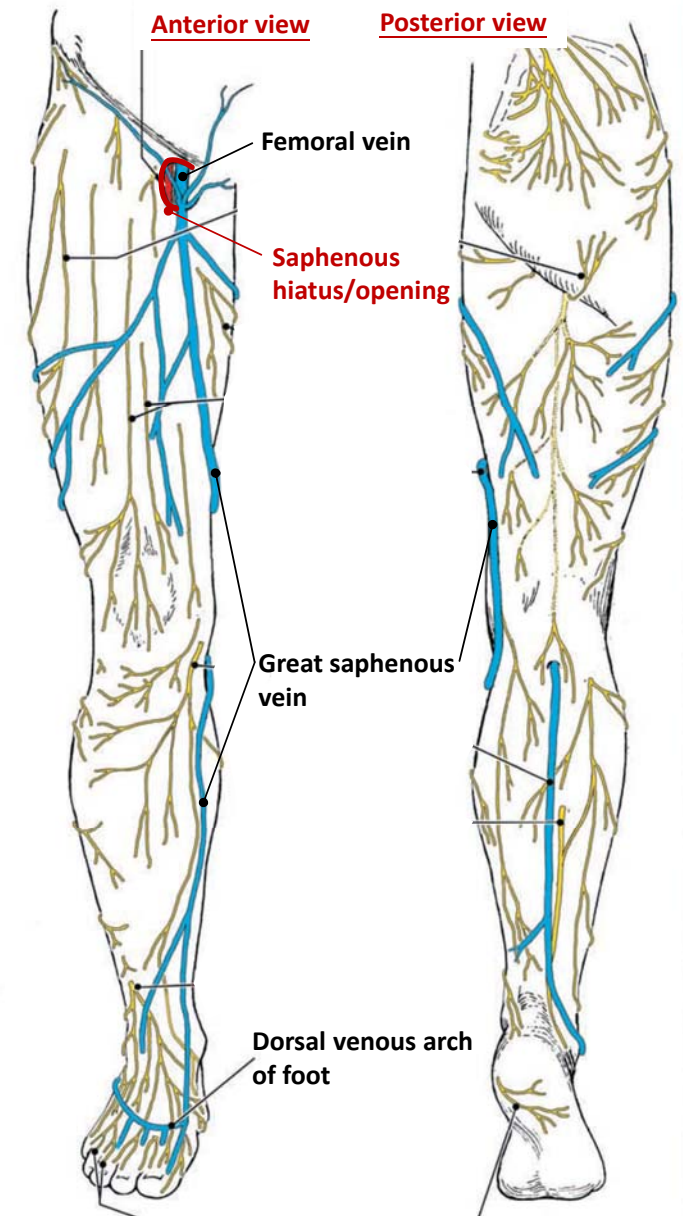
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SUPERFICIAL FASCIA OF ANTERIOR LOWER LIMB

Supine position

- About 4 cm inferior to the inguinal ligament, the great saphenous vein passes deeply through the saphenous opening (saphenous hiatus) and drains into the femoral vein.

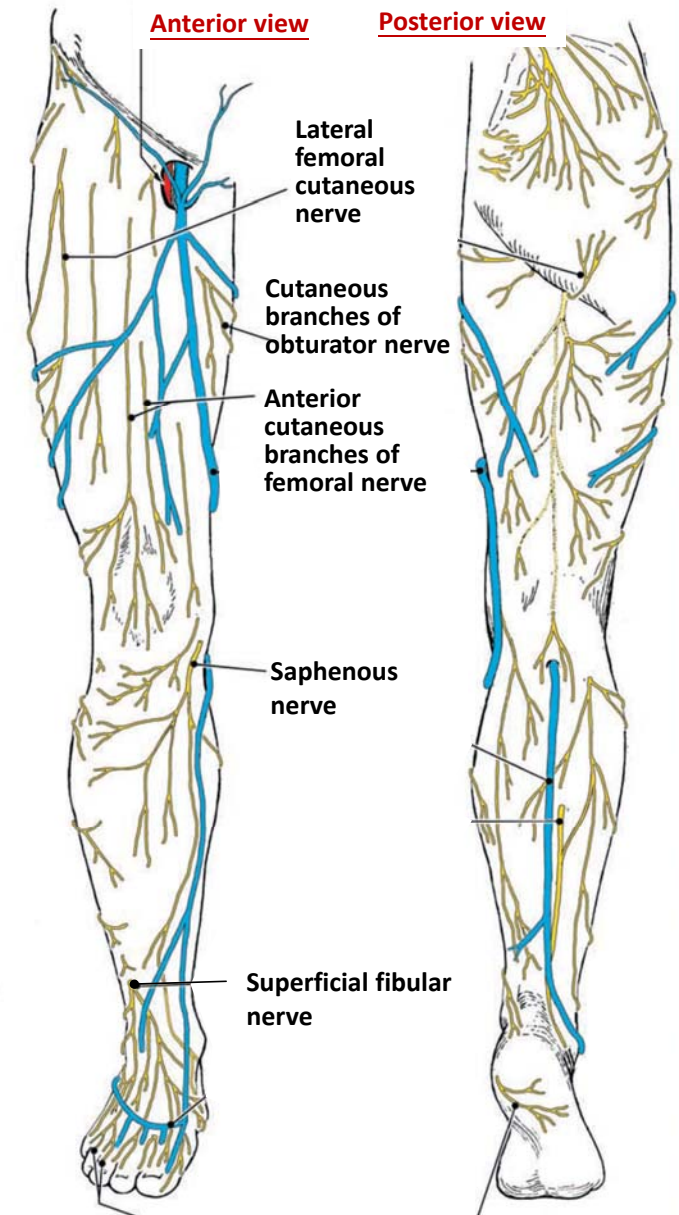


SUPERFICIAL FASCIA OF ANTERIOR LOWER LIMB

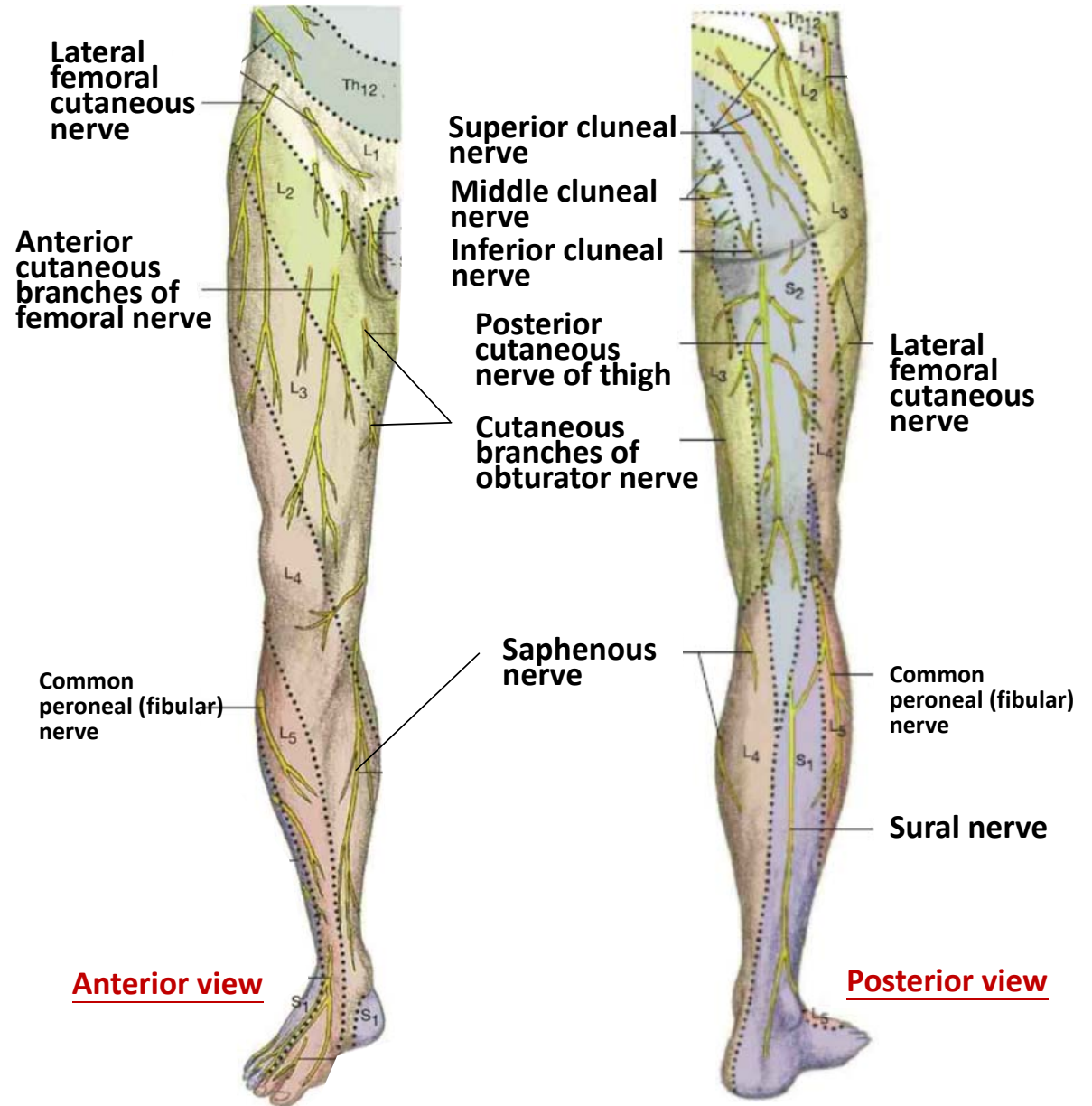
Supine position

- **Lateral femoral cutaneous nerve** – passes deep to the lateral end of the inguinal ligament and innervates the skin of the lateral thigh.
- **Anterior cutaneous branches of the femoral nerve** – innervate the skin of the anterior thigh.
- **Cutaneous branches of the obturator nerve** – innervate the skin of the medial thigh.
- **Saphenous nerve** – innervates the medial side of the knee and accompanies the great saphenous vein into the leg. The saphenous nerve innervates the skin on the anterior and medial sides of the leg and the medial side of the ankle and foot.

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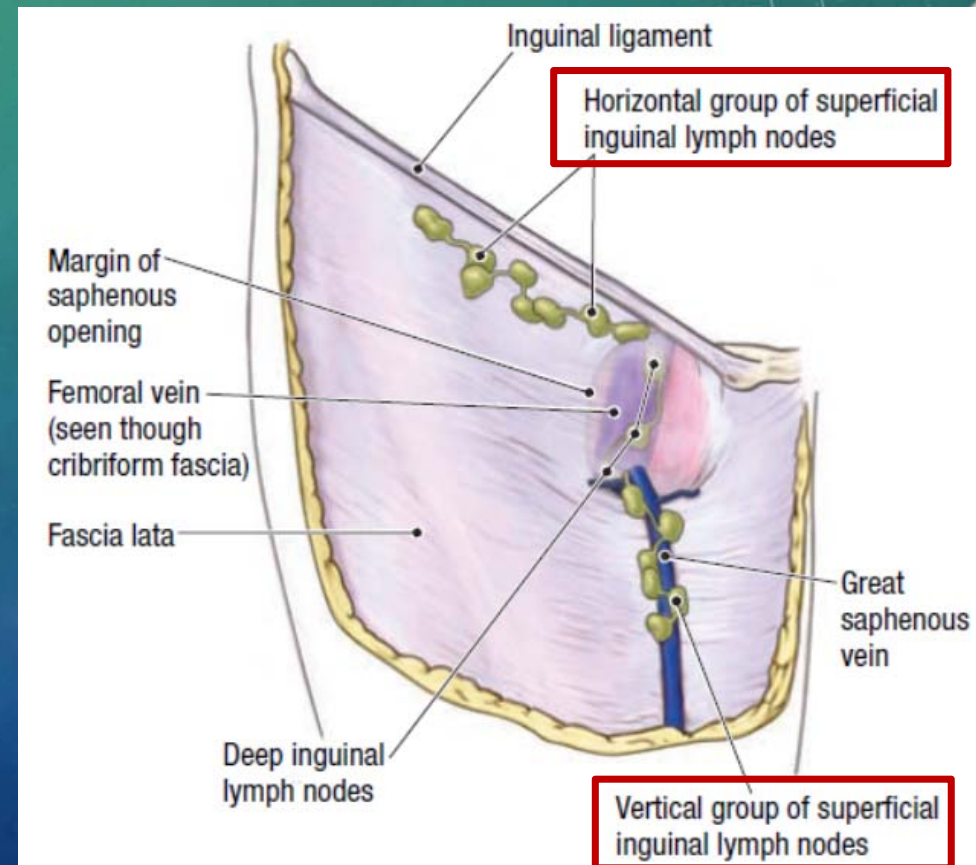


CUTANEOUS NERVES OF THE LOWER LIMB



SUPERFICIAL INGUINAL LYMPH NODES

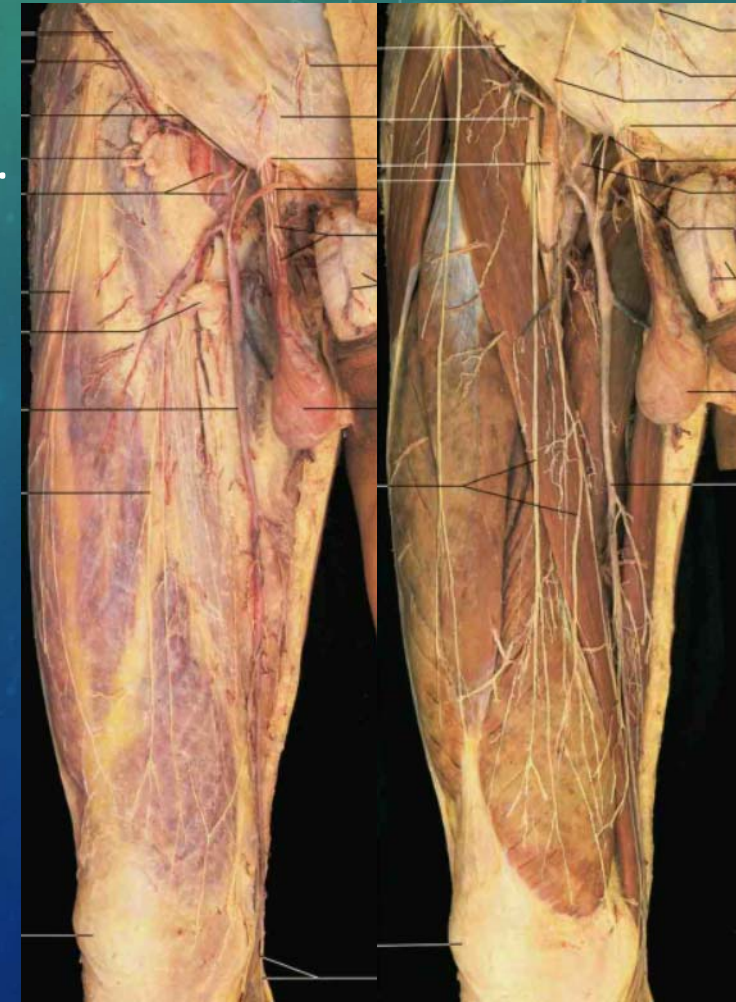
- **Horizontal group** – about 2 cm below the inguinal ligament.
- **Vertical group** – around the proximal end of the great saphenous vein.



DEEP FASCIA OF THE LOWER LIMB

Ref. [6] p.478-479

- Remove remnants of superficial fascia from thigh and leg.
- Examine the deep fascia of the lower limb. It is named regionally:
 - **Fascia lata** – in the thigh. The lateral portion of the fascia lata is particularly strong and is called the **iliotibial tract**.
 - **Crural fascia** – in the leg.
 - **Pedal fascia** – in the foot.

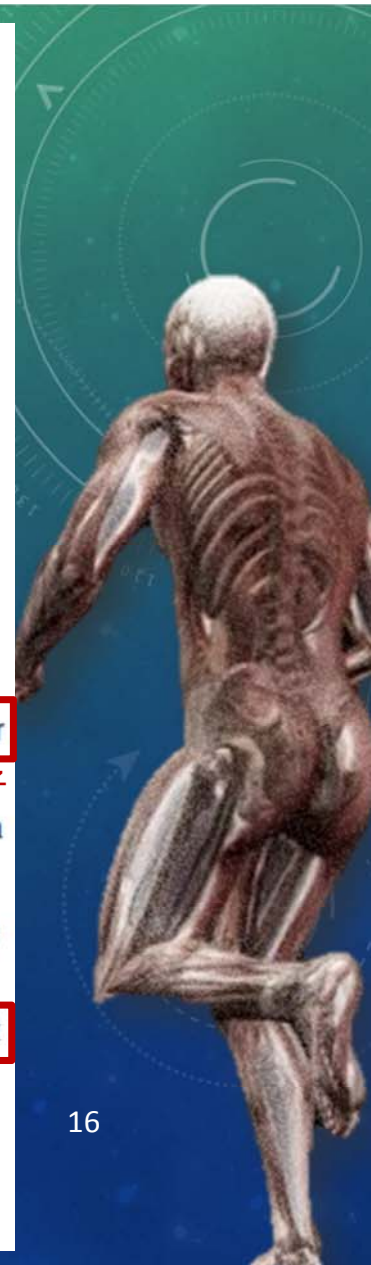
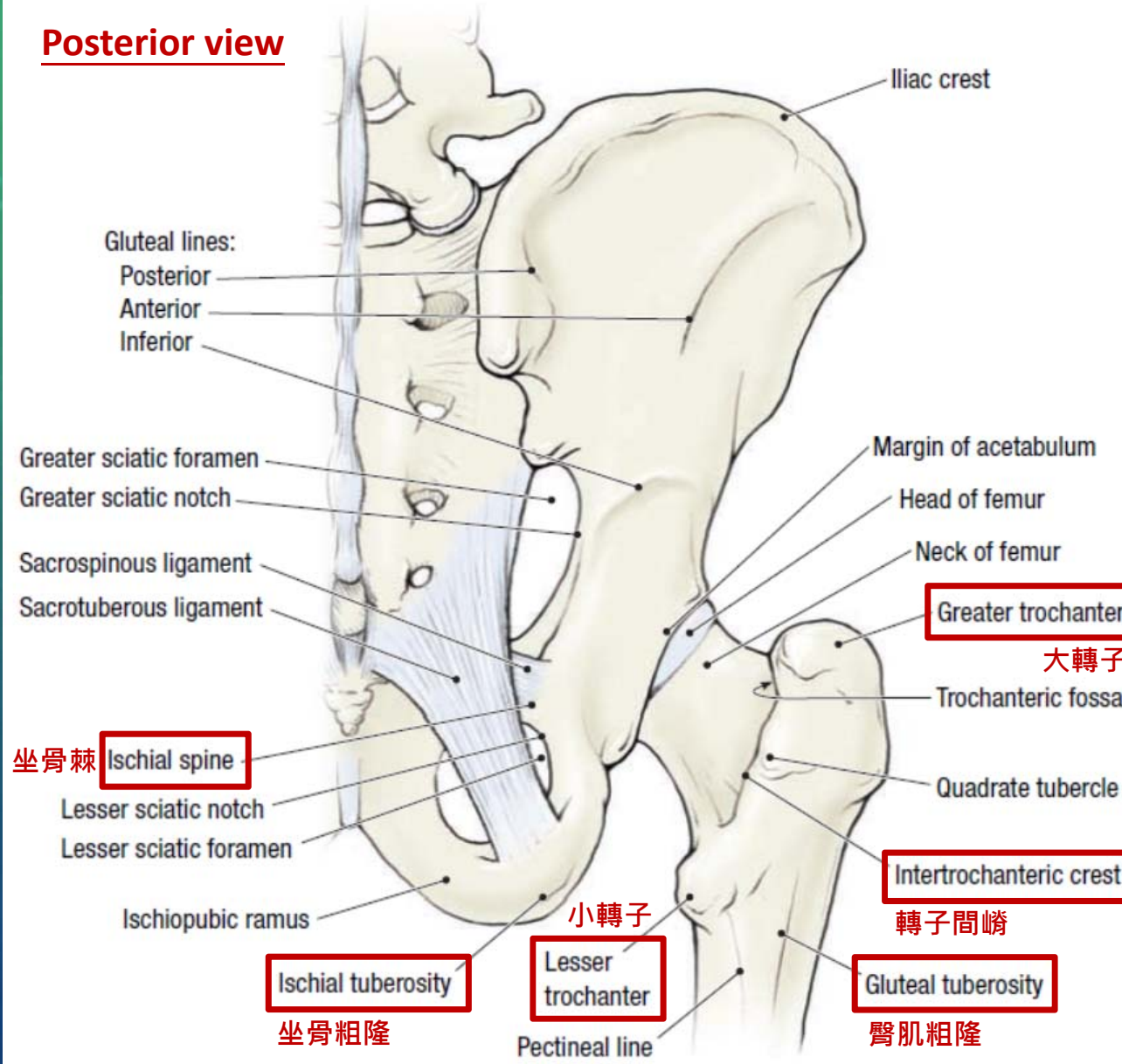


GLUTEAL REGION 臀區

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OSTEOLOGY

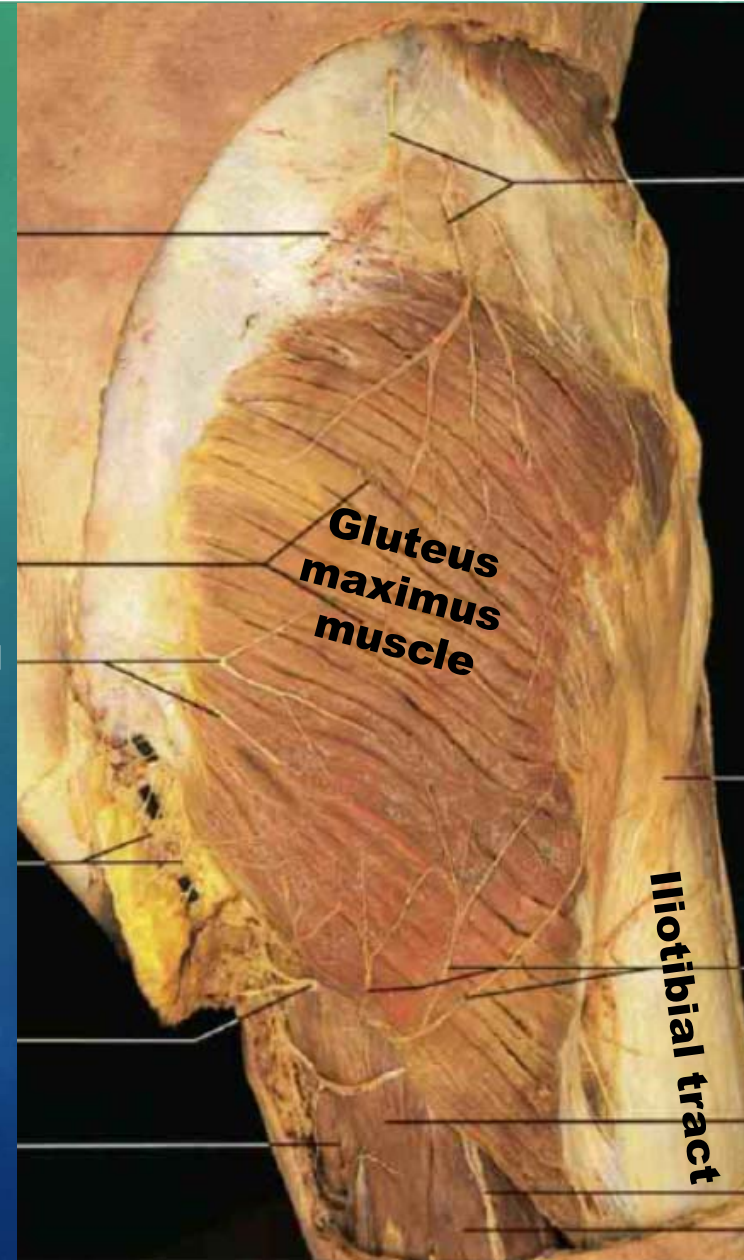
Posterior view



GLUTEAL REGION

- Remove the superficial fascia from the surface of the fascia lata in the gluteal region.

Middle cluneal nerve



Superior cluneal nerve

Inferior cluneal nerve

Iliotibial tract

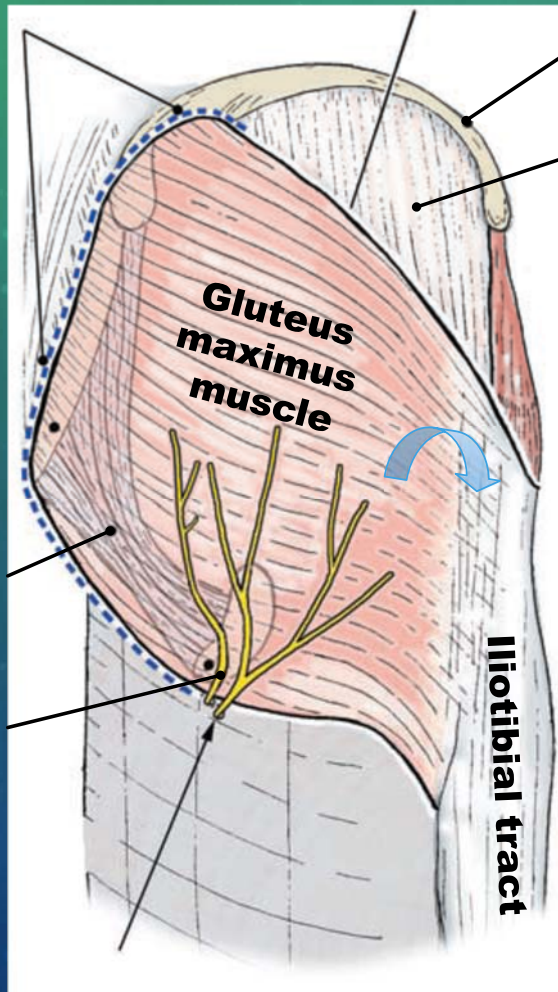
GLUTEUS MAXIMUS MUSCLE

Line of detachment of muscle

- Use scissors to detach the gluteus maximus from its medial attachment.

Sacrotuberous ligament

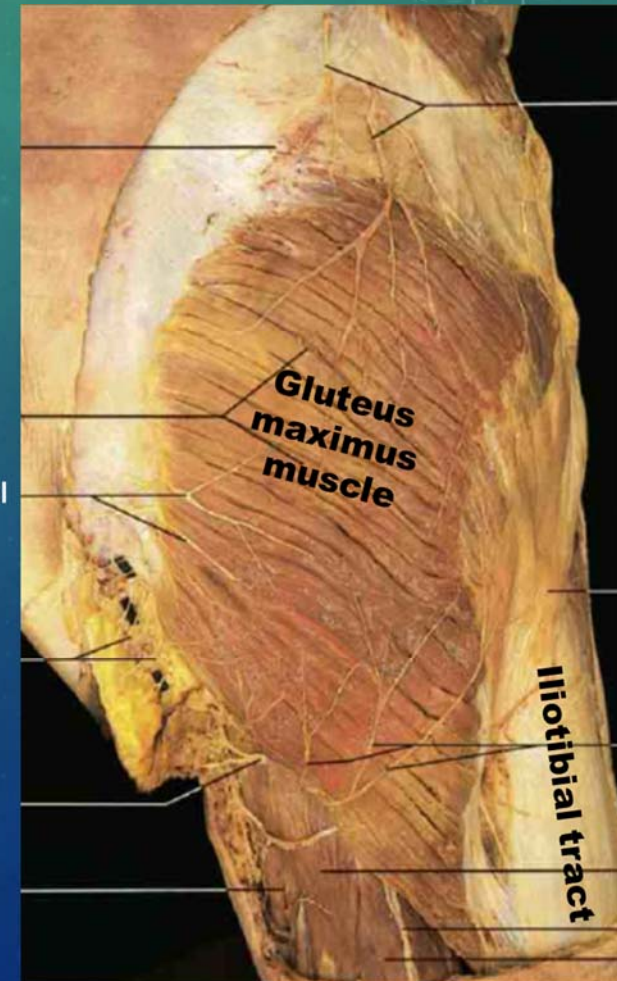
Inferior cluneal nerve



Iliac crest

Gluteal aponeurosis

Middle cluneal nerve

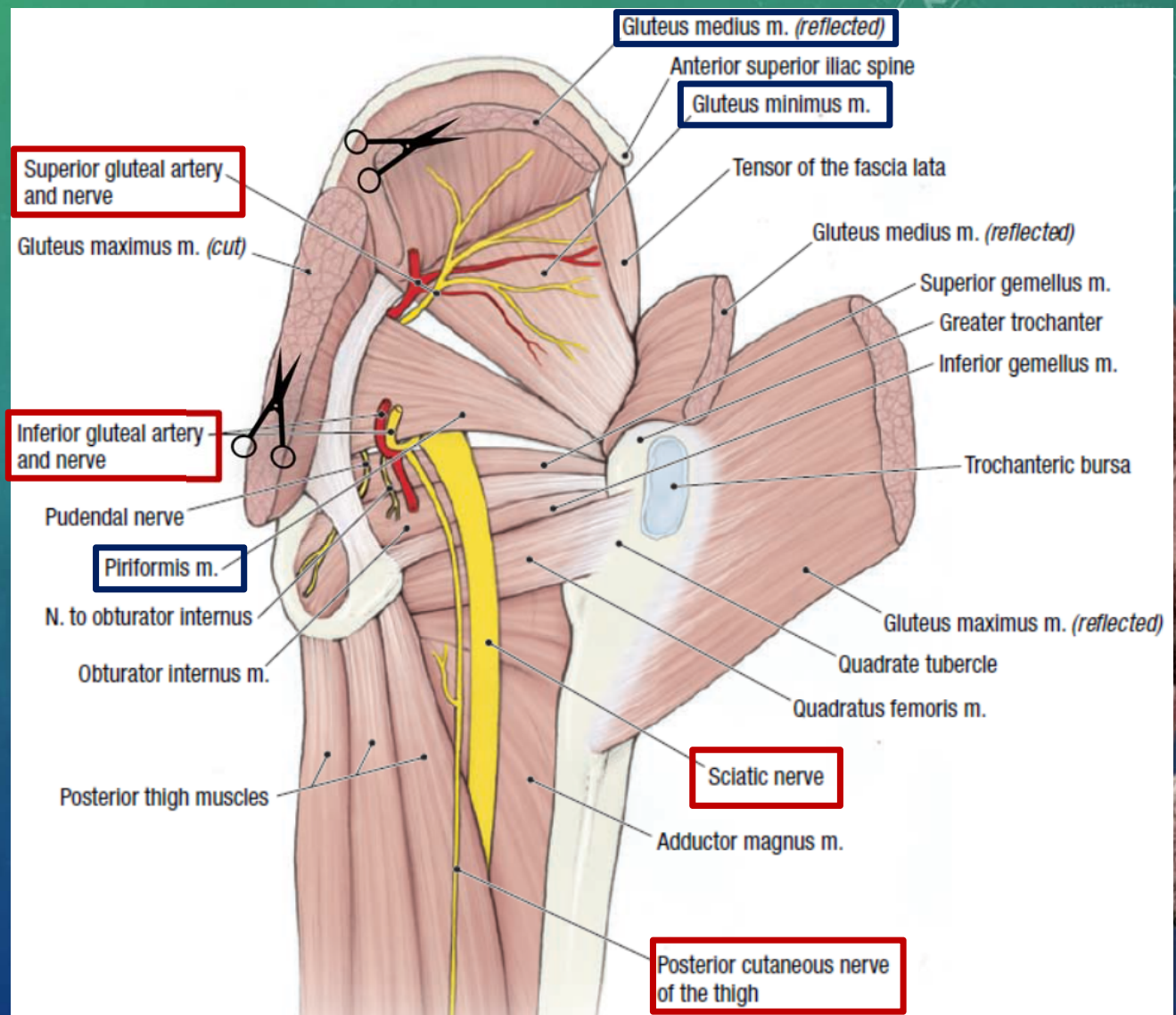


Superior cluneal nerve

Inferior cluneal nerve

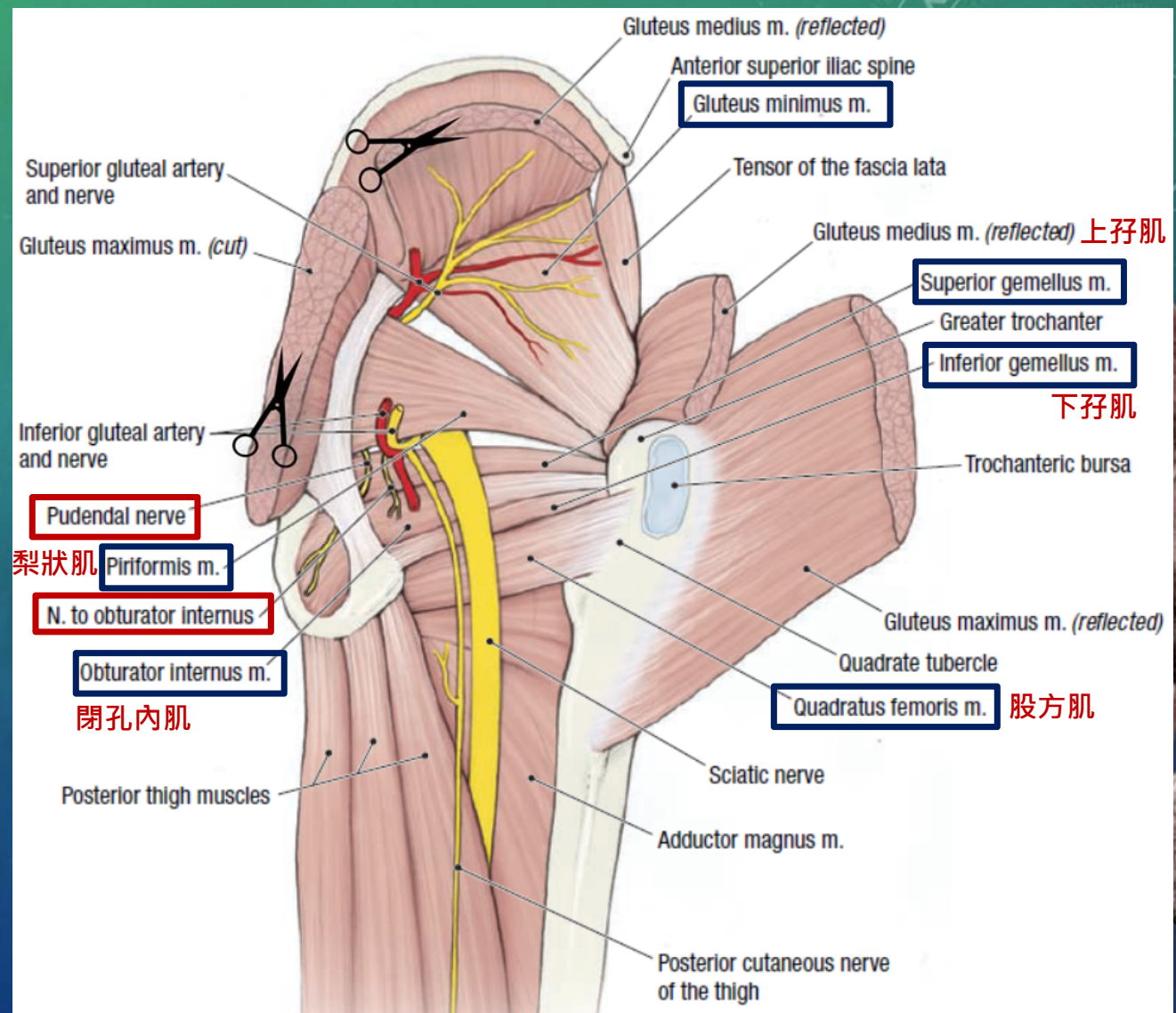
GLUTEAL ARTERIES

- Identify the **inferior gluteal artery, vein, and nerve**, which are located near the center of the gluteus maximus muscle.
- To expose the **gluteus medius muscle**, use skinning motions to remove the **gluteal aponeurosis**.
- Cut and reflect gluteus medius muscle to expose the **superior gluteal artery, vein, and nerve**.



MUSCLES OF GLUTEAL REGION

- Identify...
 - Piriformis muscle
 - Superior gemellus muscle
 - Obturator internus muscle
 - Inferior gemellus muscle
 - Quadratus femoris muscle



Ref. [6] p.483

Gluteus maximus muscle (cut)

Inferior gluteal nerve

Piriformis muscle

Inferior gluteal artery

Sacrotuberous ligament

Inferior cluneal nerve

Posterior femoral cutaneous nerve

Gluteus medius muscle (cut)

Superior gluteal artery

Gluteus minimus muscle

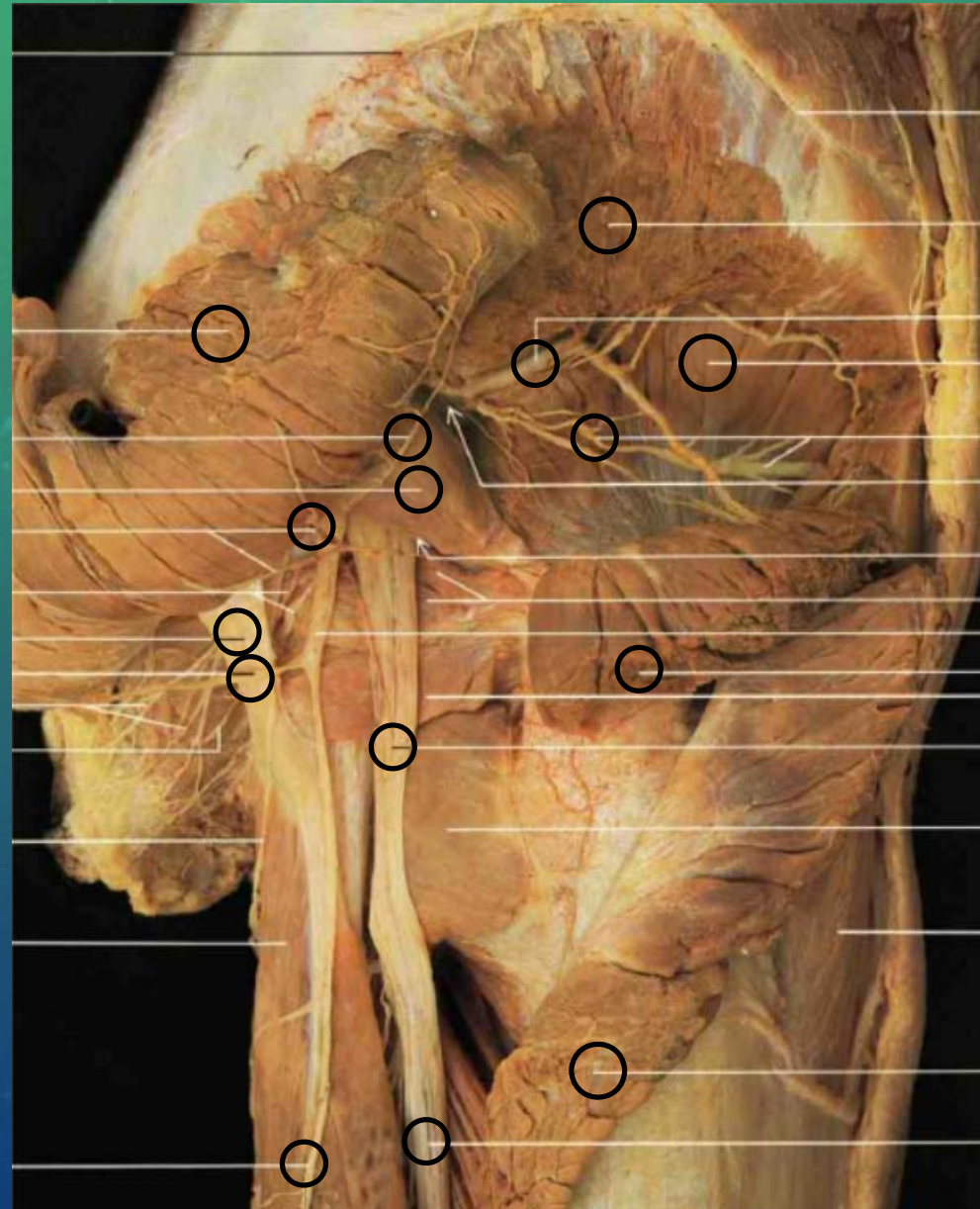
Superior gluteal nerve

Gluteus medius muscle (cut)

Sciatic nerve

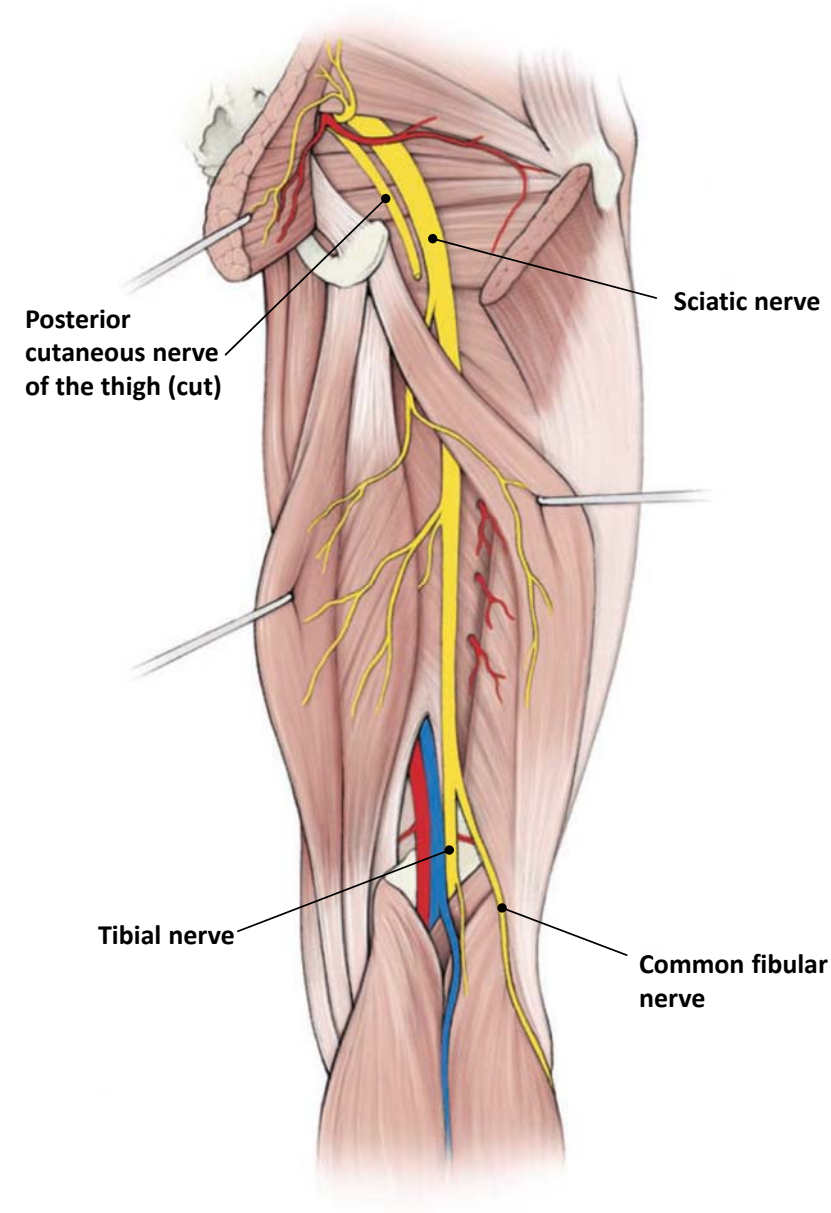
Gluteus maximus muscle (cut)

Sciatic nerve



SCIATIC NERVE

- The sciatic nerve is the largest nerve in the body. It has a **tibial division** and a **common fibular division**.
- To follow the sciatic nerve inferiorly, make a vertical cut through the fascia lata posterior to the nerve. Follow the sciatic nerve for 6 or 7 cm into the thigh.
- On the medial side of the sciatic nerve, identify the **posterior cutaneous nerve of the thigh**.



MUSCLES OF THE GLUTEAL REGION

Muscle	Proximal Attachment	Distal Attachment	Action	Innervation
Gluteus maximus	Ilium and sacrum	Iliotibial tract and gluteal tuberosity	Acts as a powerful extensor of the flexed femur at the hip joint; laterally stabilizes the hip joint and knee joint	Inferior gluteal n. (L5–S2)
Gluteus medius	External surface of the ilium	Greater trochanter of the femur	Abduct the hip; hold the pelvis secure over the stance leg and prevent pelvic drop on the opposite, swing leg during walking	Superior gluteal n. (L4–S1)
Gluteus minimus				
Piriformis	Anterior surface of the sacrum	Greater trochanter of the femur	Laterally rotate the extended femur at the hip; abduct the flexed femur at the hip	Anterior rami L5–S2
Obturator internus	Pelvic surface of the obturator membrane			Nerve to the obturator internus (L5–S1)
Superior gemellus	Ischial spine			Nerve to the quadratus femoris (L5–S1)
Inferior gemellus	Ischial tuberosity			
Quadratus femoris		Intertrochanteric crest of the femur	Laterally rotates the hip	

THE END

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