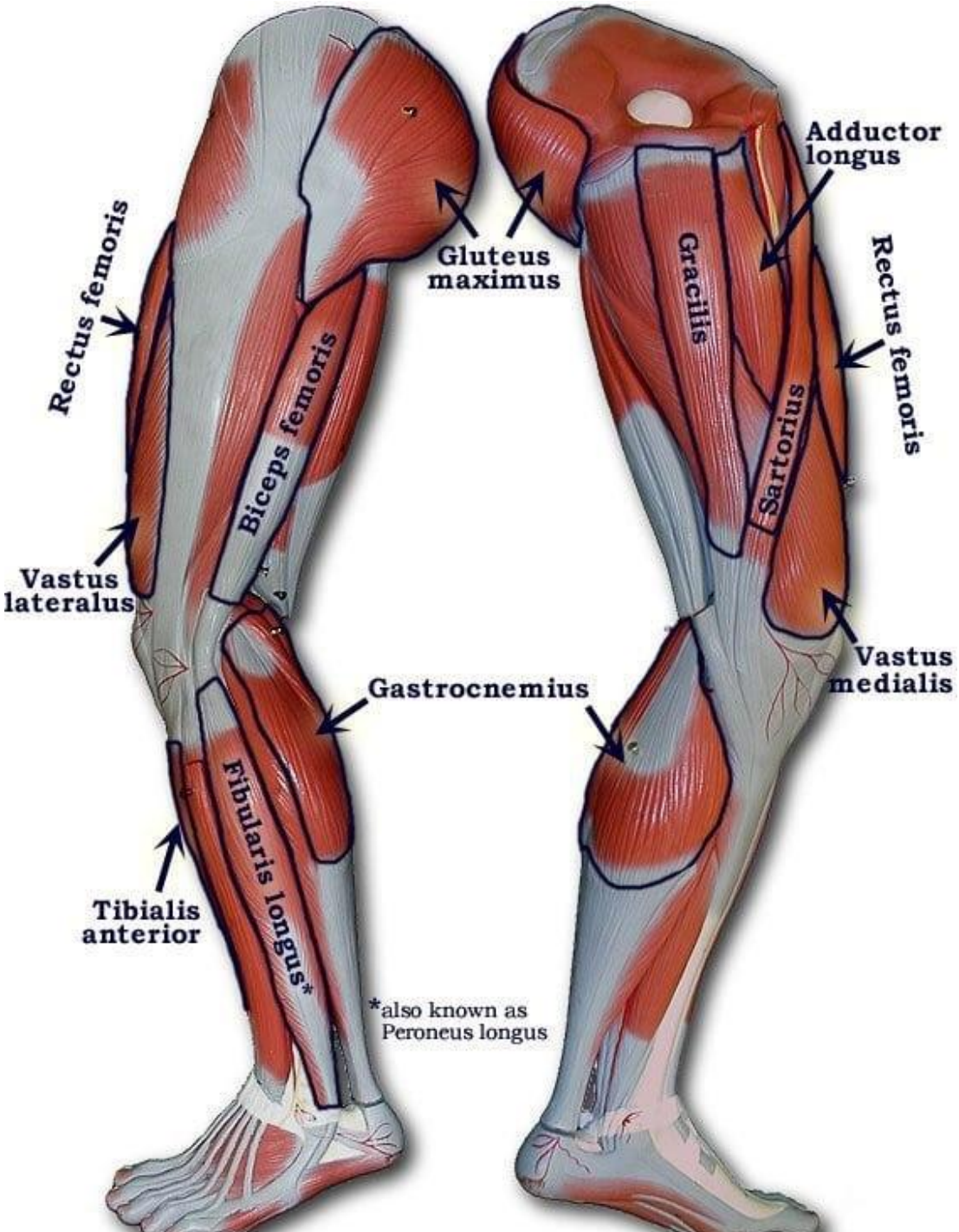
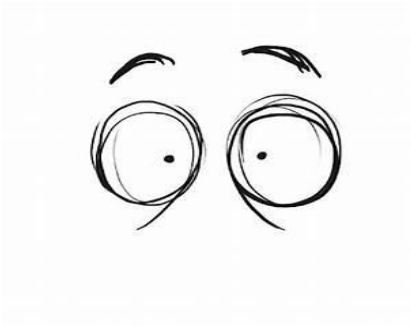
Muscles of the Thigh COMPARTMENTS ANT,MED,POST

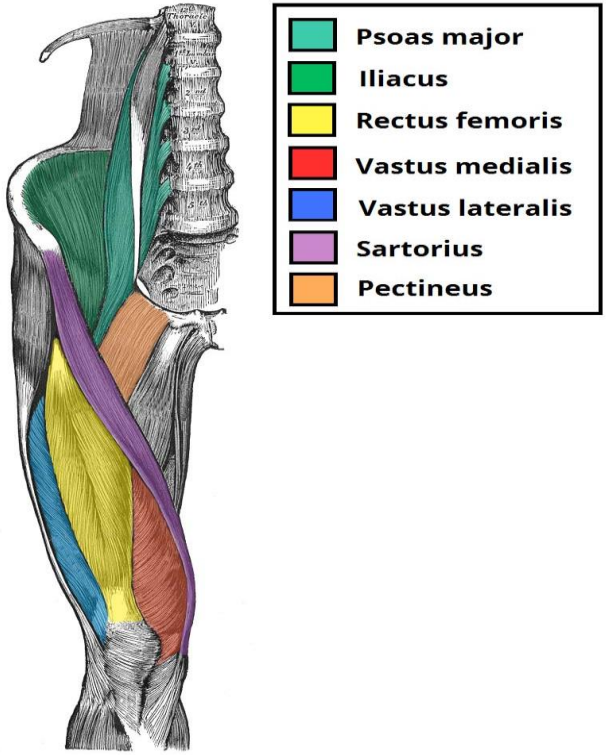
Dr.Attaullah DPT,MSPT*

Khyber Medical University

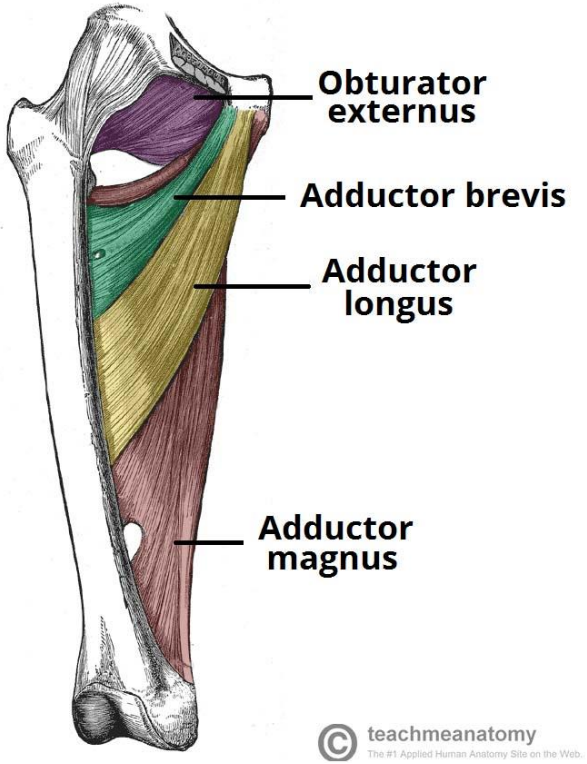

Rectus femoris
Gluteus maximus
Adductor longus
Gracilis
Rectus femoris
Biceps femoris
Sartorius
Vastus lateralus
Vastus medialis
Gastrocnemius
Fibularis longus*
Tibialis anterior
*also known as Peroneus longus



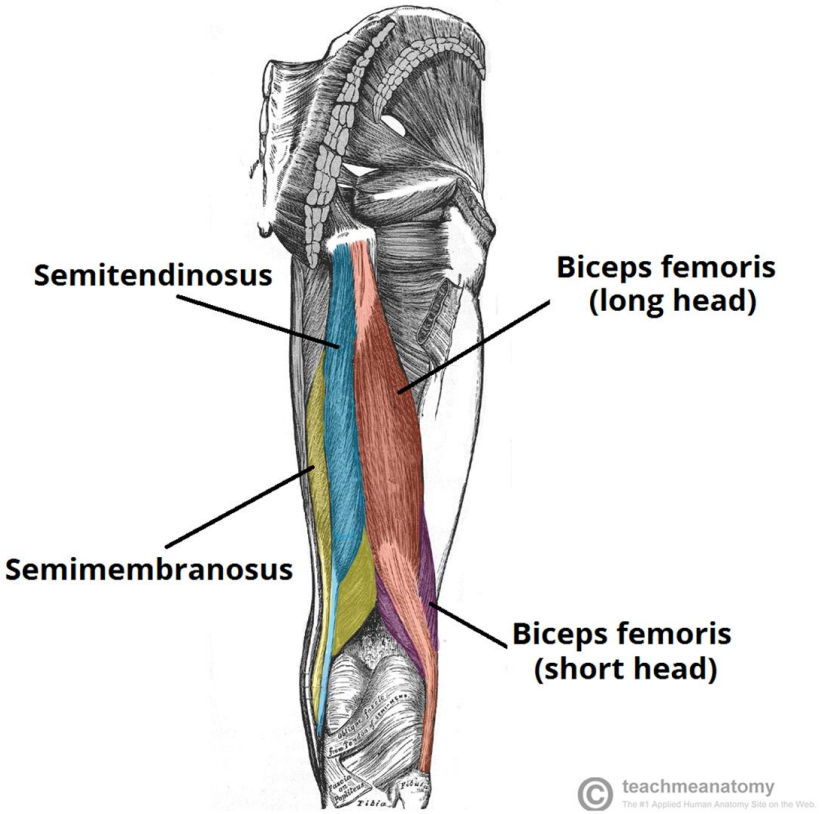
Anterior comp



Medial Comp

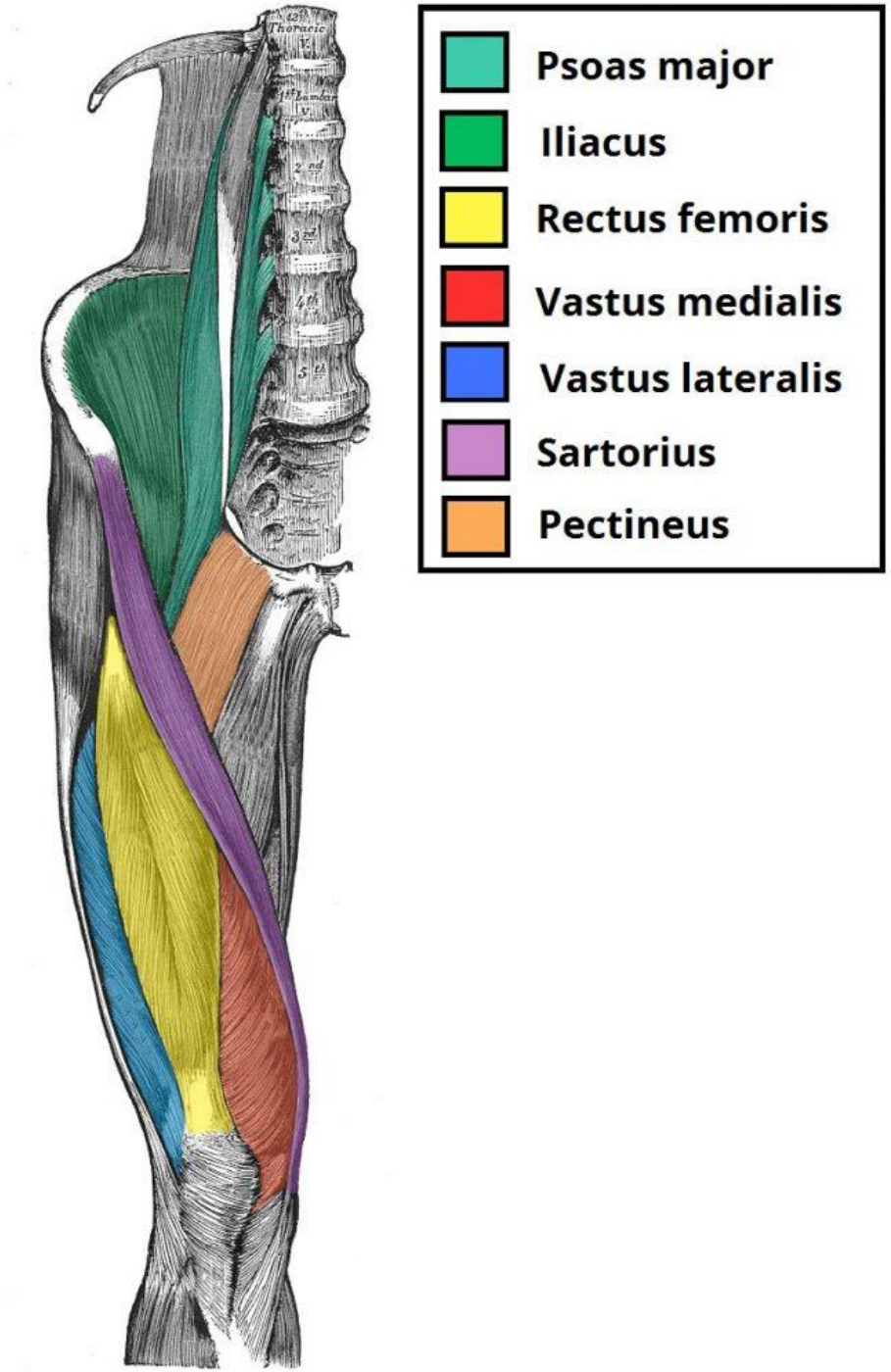


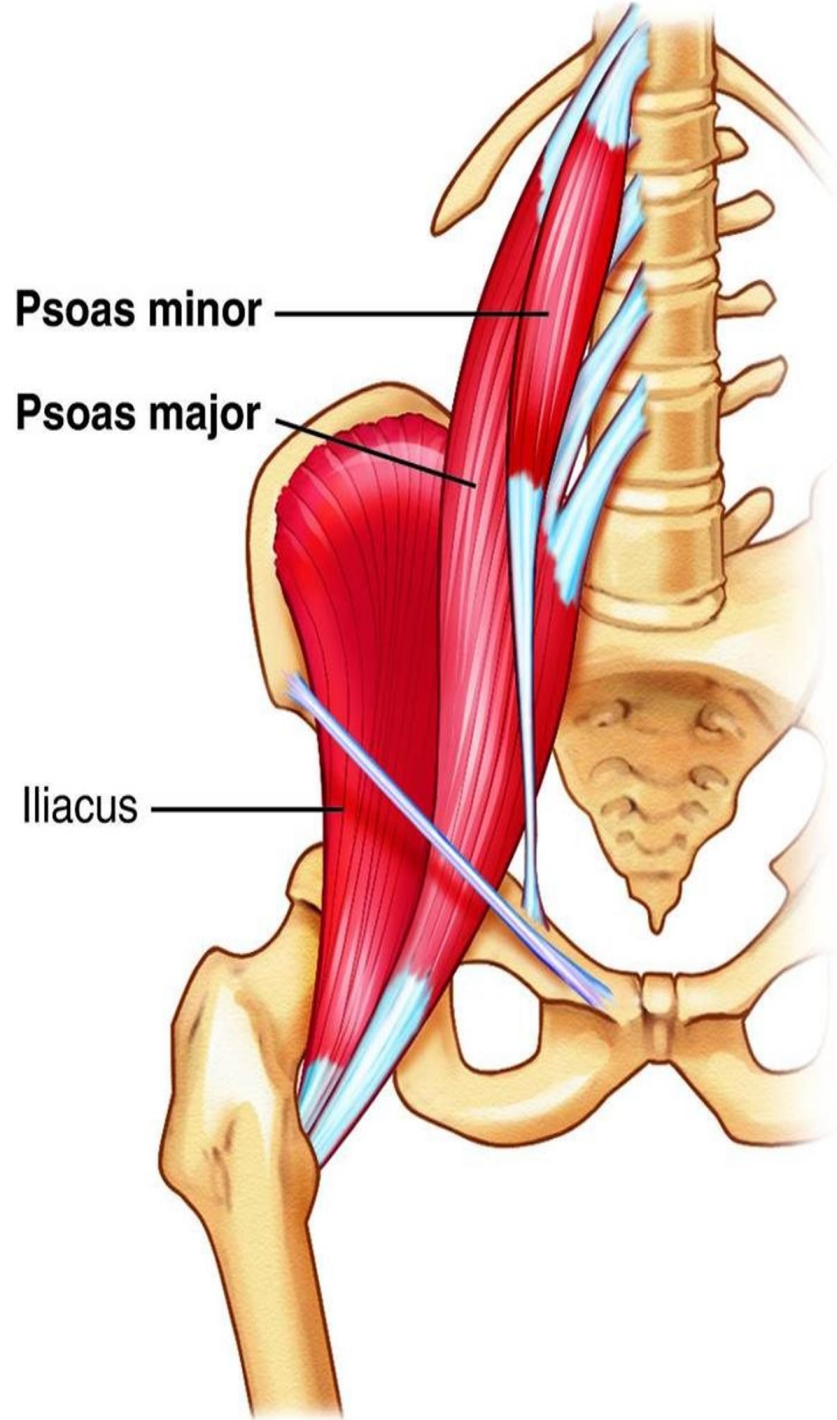
Posterior comp



MUSCLES IN THE ANTERIOR COMPARTMENT OF THE THIGH

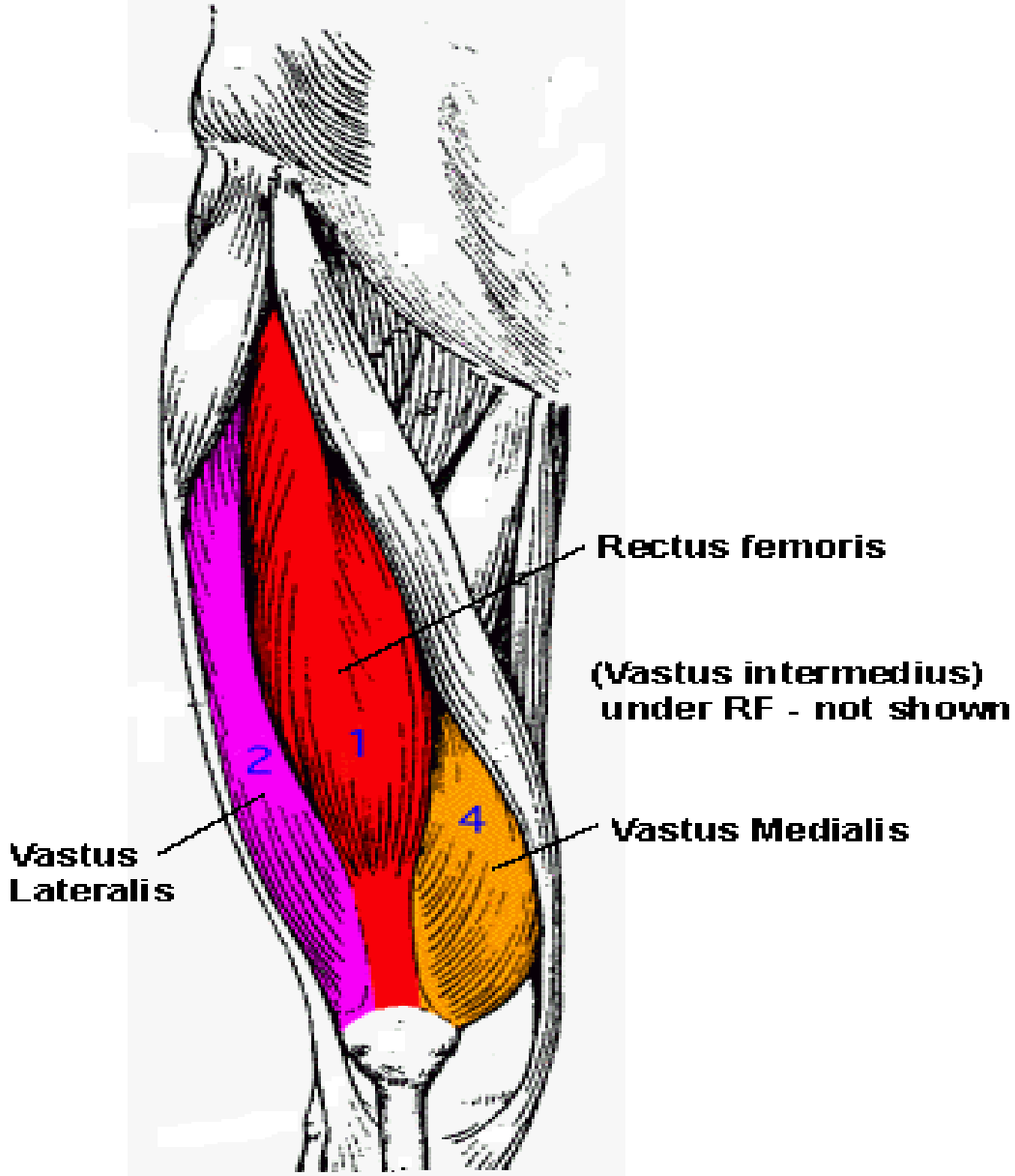
- The musculature of the thigh can be split into three sections; anterior, medial and posterior. Each compartment has a distinct innervation and function.
- The muscles in the anterior compartment of the thigh are innervated by the **femoral nerve** (L2-L4), and as a general rule, act to **extend** the leg at the knee joint
- There are three major muscles in the anterior thigh – the **pectineus**, **sartorius** and **quadriceps femoris**. In addition to these, the end of the **iliopsoas** muscle passes into the anterior compartment.


Psoas major
Iliacus
Rectus femoris
Vastus medialis
Vastus lateralis
Sartorius
Pectineus


Psoas minor
Psoas major
Iliacus

Quadriceps Femoris

- The **quadriceps femoris** consists of four individual muscles; three vastus muscles and the rectus femoris. They form the main bulk of the thigh, and collectively are one of the most powerful muscles in the body.
- The muscles that form the quadriceps femoris unite proximal to the knee and attach to the patella via the **quadriceps tendon**. In turn, the patella is attached to the tibia by the patella ligament. The quadriceps femoris is the main extensor of the knee.


Rectus femoris
(Vastus intermedius)
under RF - not shown
1
2
4
Vastus
Lateralis
Vastus Medialis

Quadriceps Femoris

- **Vastus Lateralis**
- **Actions:** Extends the knee joint and stabilises the patella.
- **Innervation:** Femoral nerve.
- **Vastus Intermedius**.
- **Actions:** Extends the knee joint and stabilises the patella.
- **Innervation:** Femoral nerve.

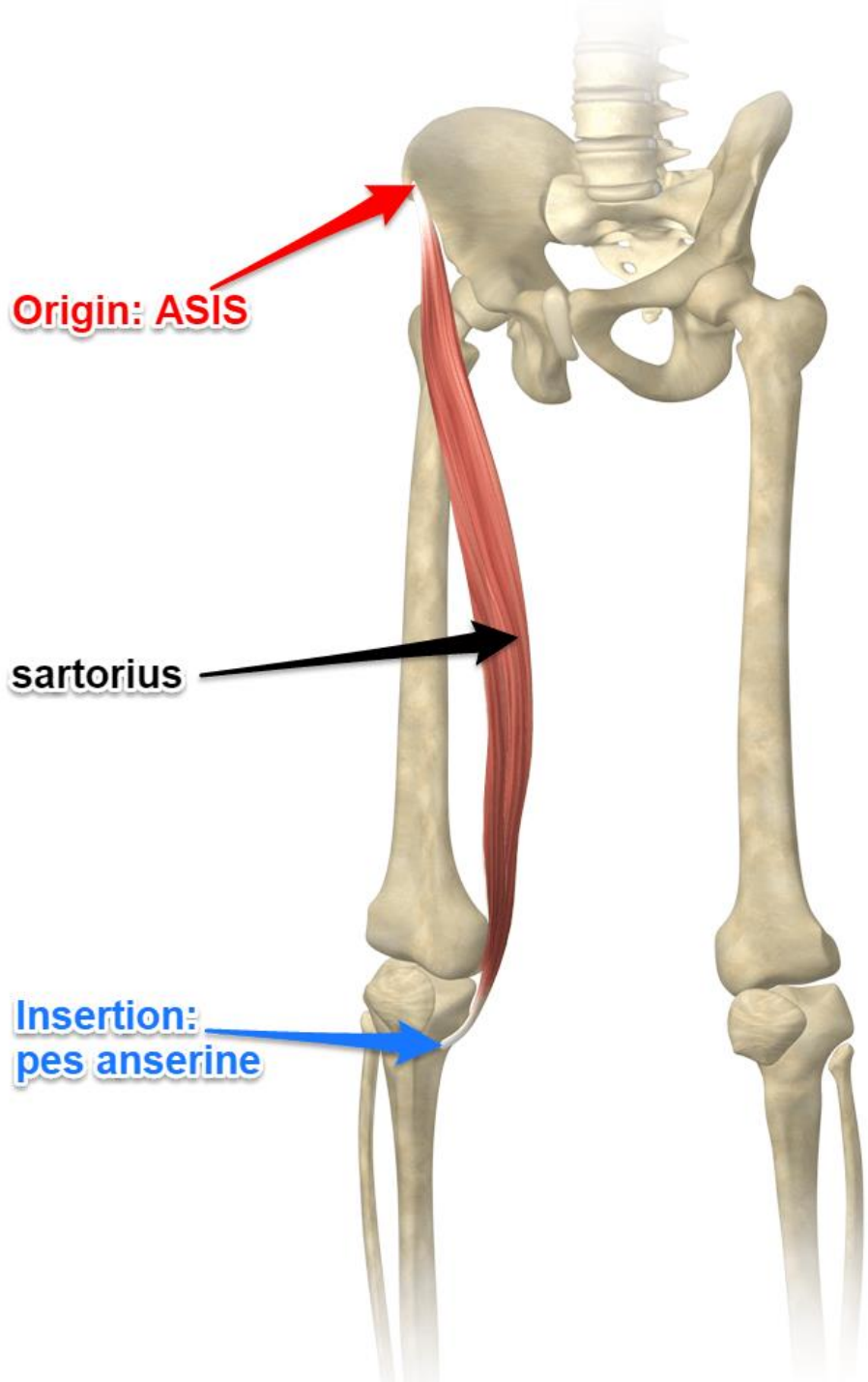
Quadriceps Femoris

- **Vastus Medialis**
- **Actions:** Extends the knee joint and stabilises the patella
- **Innervation:** Femoral nerve.
- **Rectus Femoris**
- **Actions**: The only muscle of the quadriceps to cross both the hip and knee joints. It flexes the thigh at the hip joint, and extends at the knee joint.
- **Innervation**: Femoral nerve.

Sartorius

- The sartorius is the longest muscle in the body. It is long and thin, running across the thigh in a inferomedial direction. The sartorius is positioned more superficially than the other muscles in the leg.
- **Actions**: At the hip joint, it is a flexor, abductor and lateral rotator. At the knee joint, it is also a flexor.
- **Innervation**: Femoral nerve.

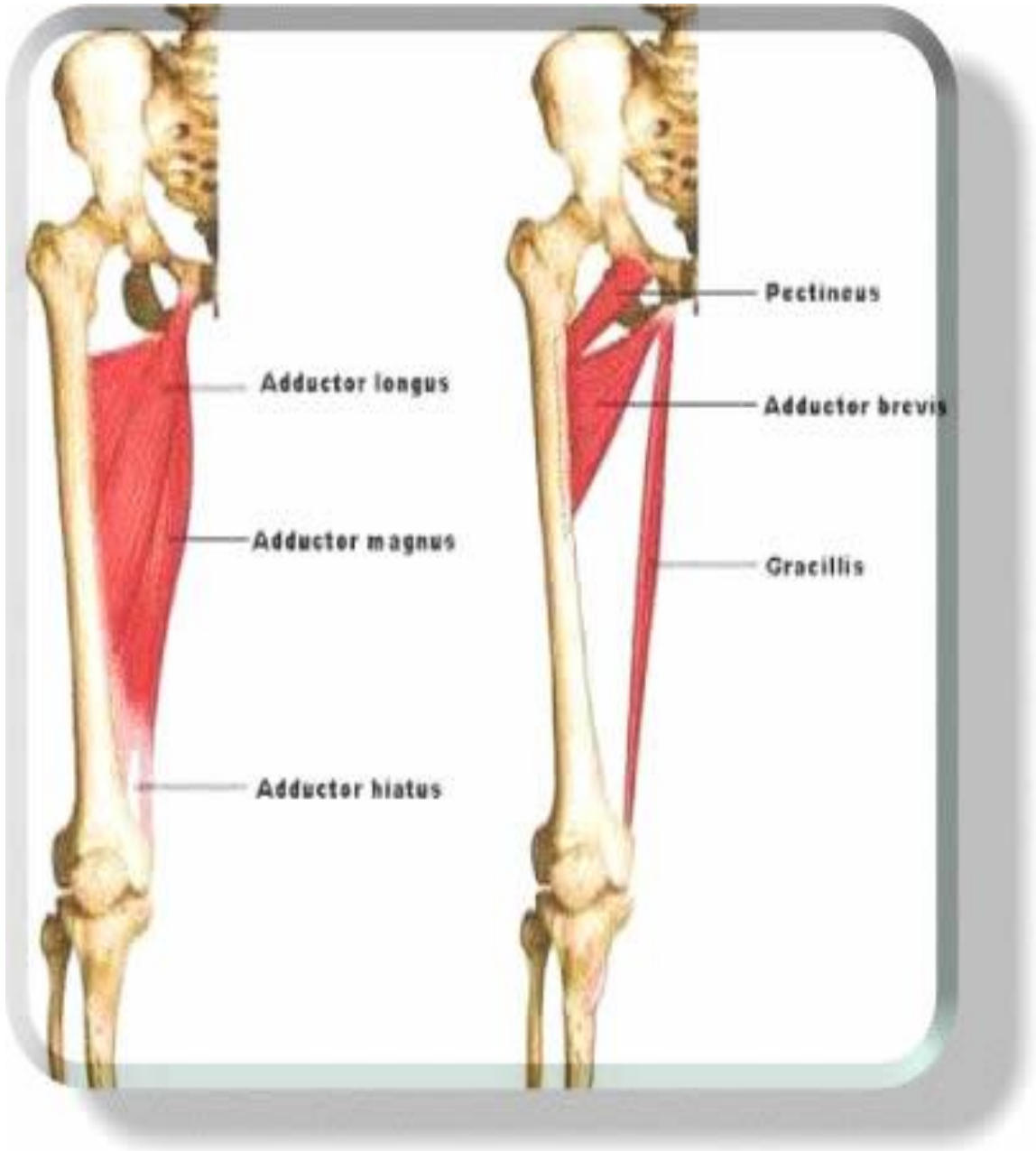
https://en.wikipedia.org/wiki/Sartorius_muscle#Etymology

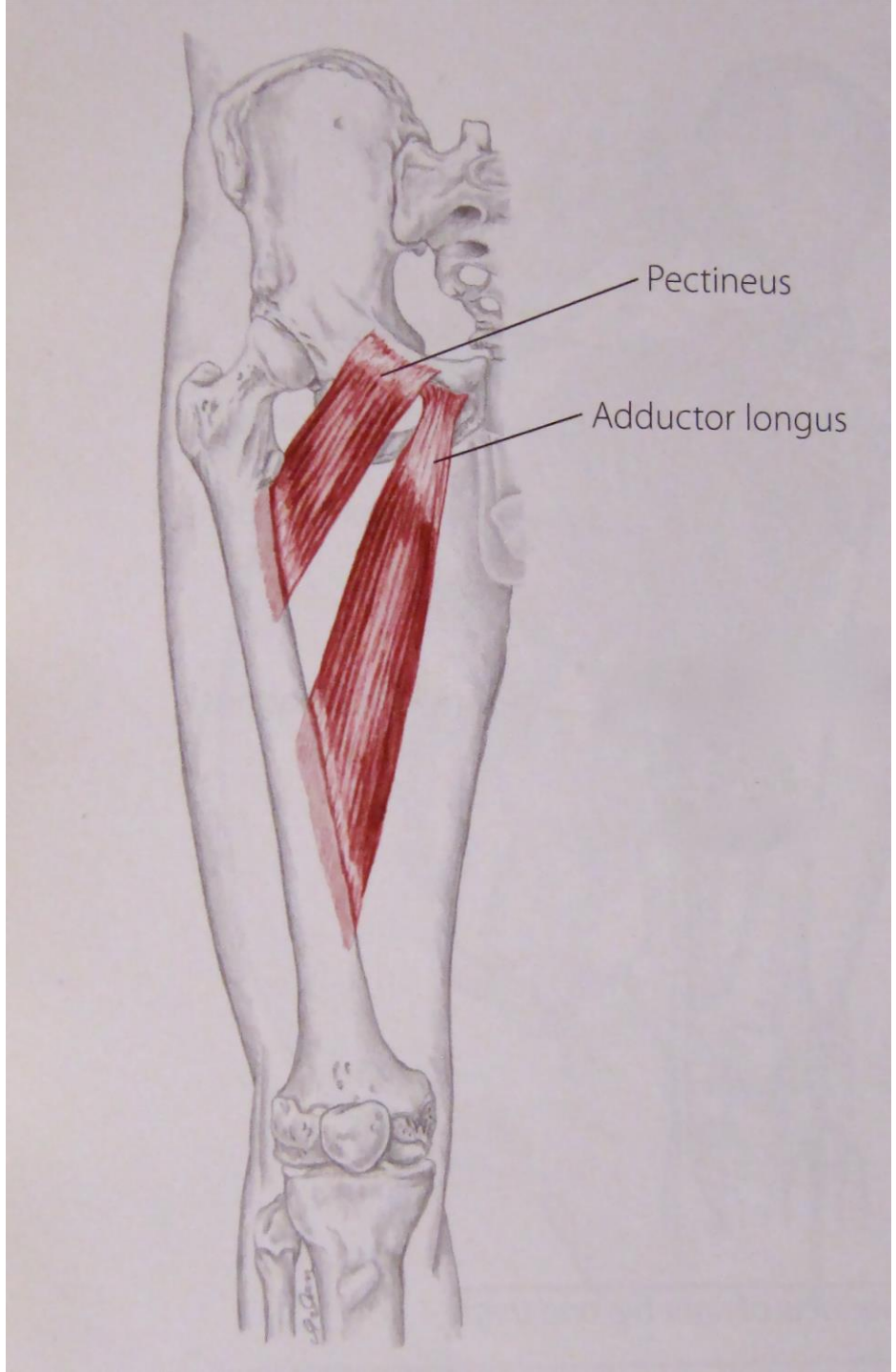

Origin: ASIS
sartorius
Insertion:
pes anserine

Pectineus

- The **pectineus muscle** (/pɛkˈtɪniəs/, from the Latin word *pecten*, meaning comb[1]) is a flat, quadrangular muscle, situated at the anterior (front) part of the upper and medial (inner) aspect of the thigh. The pectineus muscle is the most anterior adductor of the hip. The muscle does adduct and medially rotate the thigh but its primary function is hip flexion.
- It can be classified in the medial compartment of thigh[2] (when the function is emphasized) or the anterior compartment of thigh (when the nerve is emphasized)

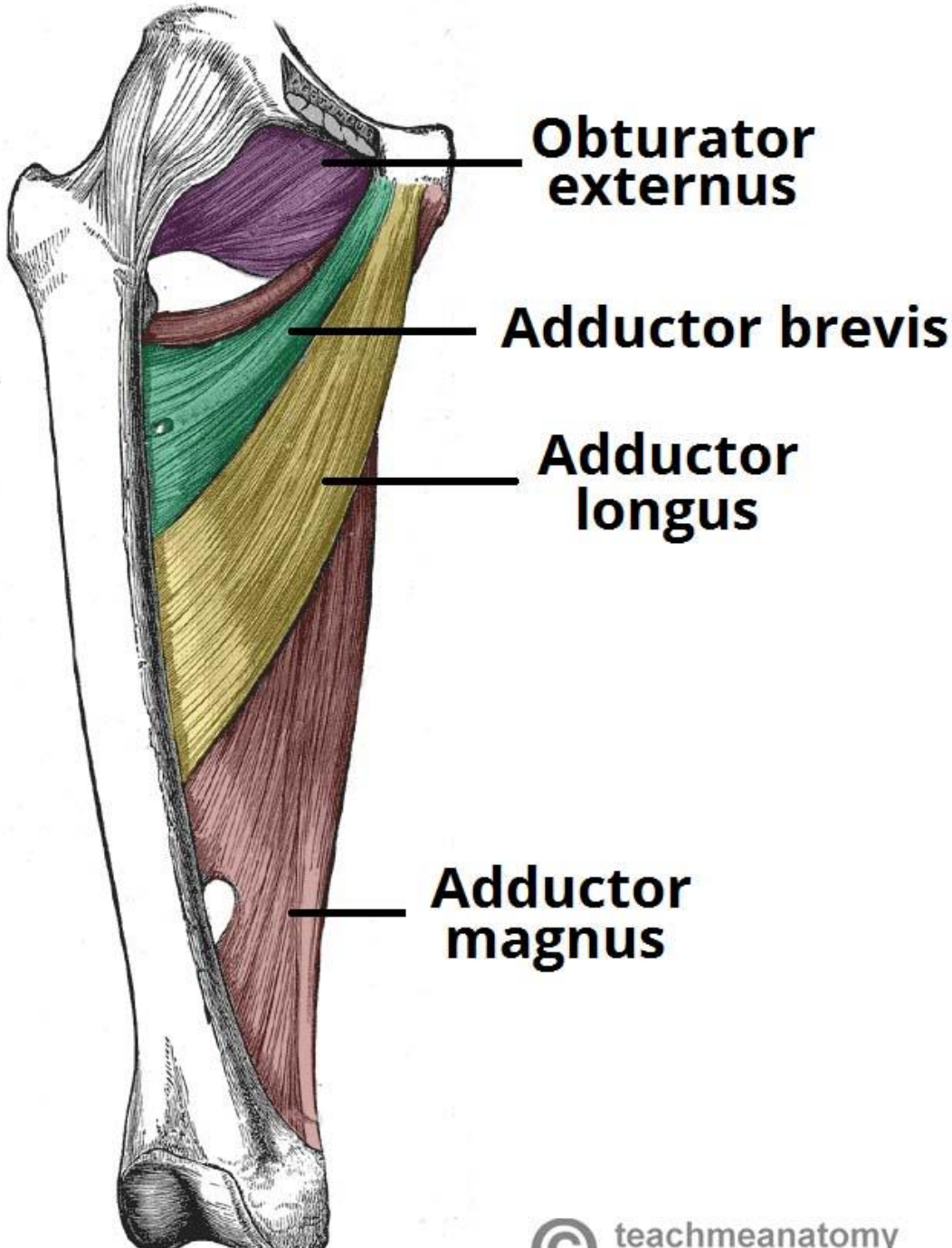
- It has a dual innervation, and thus can be considered a transitional muscle between the anterior thigh and medial thigh compartments.
- **Attachments**: It originates from the pectineal line on the anterior surface of the pelvis, and attaches to the pectineal line on the posterior side of the femur, just inferior to the lesser trochanter.
- **Actions**: Adduction and flexion at the hip joint.
- **Innervation**: Femoral nerve. May also receive a branch from the obturator nerve.

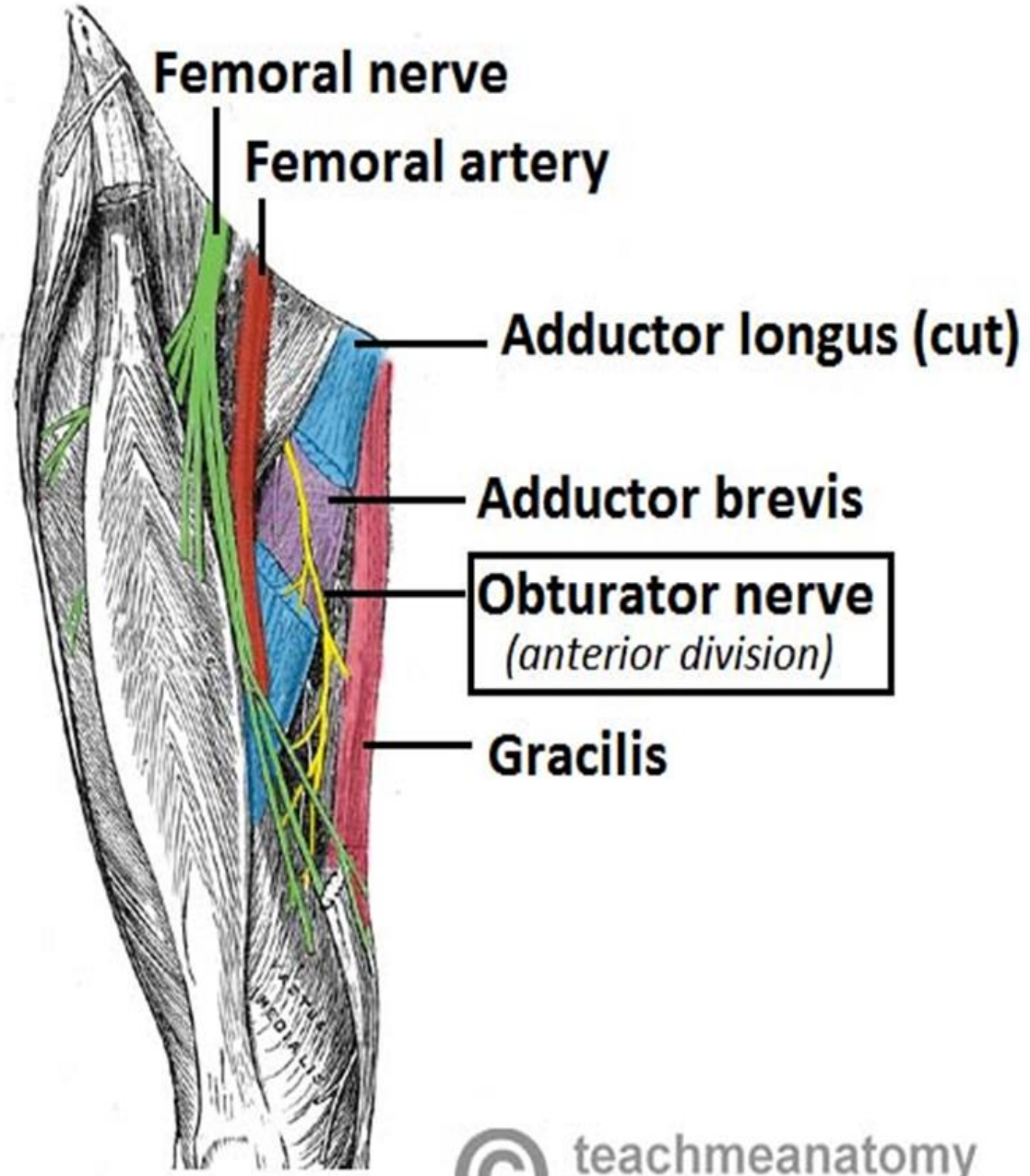

Pectineus
Adductor longus
Adductor brevis
Adductor magnus
Gracillis
Adductor hiatus


Pectineus
Adductor longus

MUSCLES IN THE MEDIAL COMPARTMENT OF THE THIGH

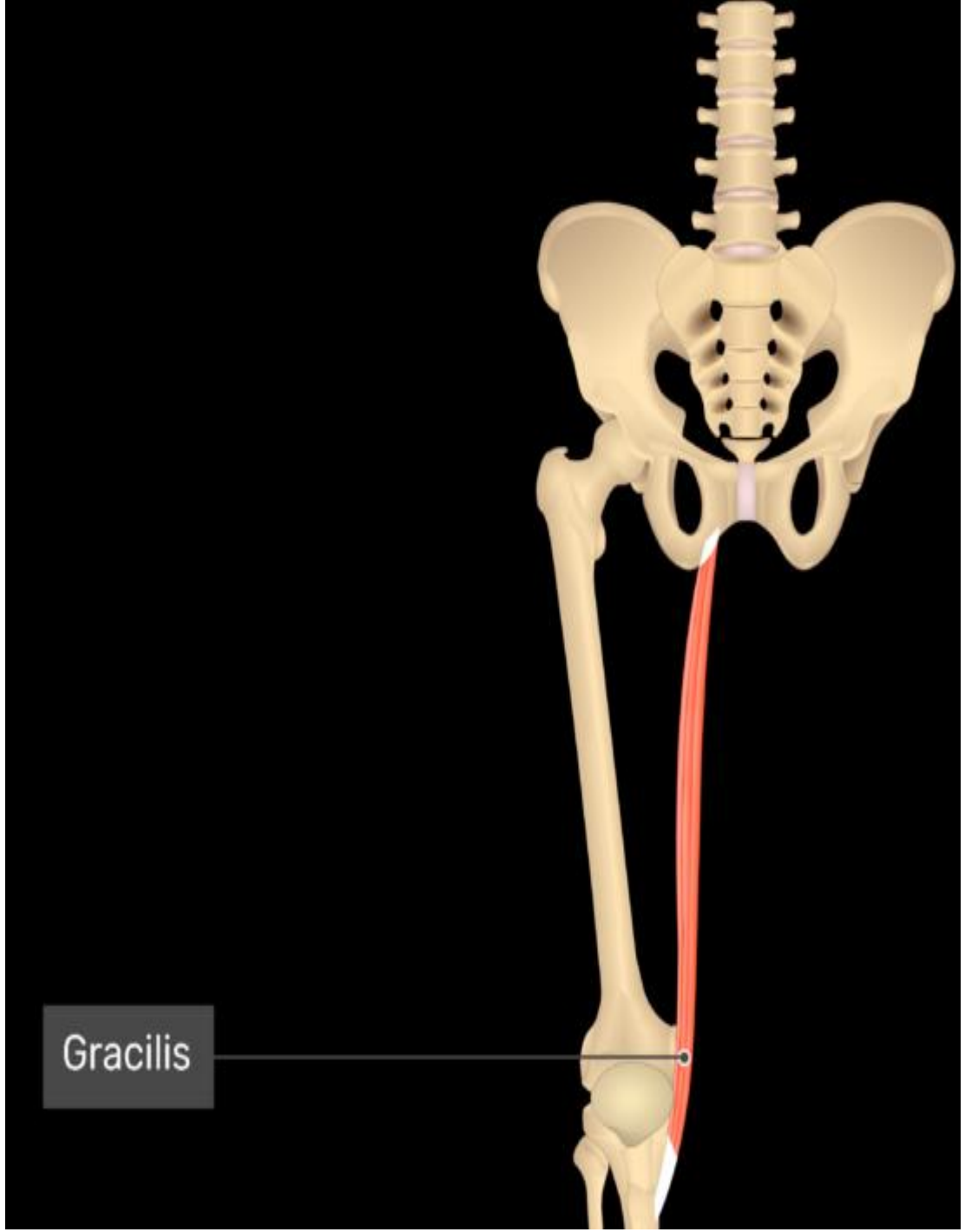
- The muscles in the medial compartment of the thigh are collectively known as the **hip adductors**. There are five muscles in this group; gracilis, obturator externus, adductor brevis, adductor longus and adductor magnus.
- All the medial thigh muscles are innervated by the **obturator nerve**, which arises from the lumbar plexus. Arterial supply is via the **obturator artery.**





Gracilis

- The gracilis is the most superficial and medial of the muscles in this compartment. It crosses at both the hip and knee joints. It is sometimes transplanted into the hand or forearm to replace a damaged muscle.


Gracilis

Clinical Relevance: Injury to the Adductor Muscles

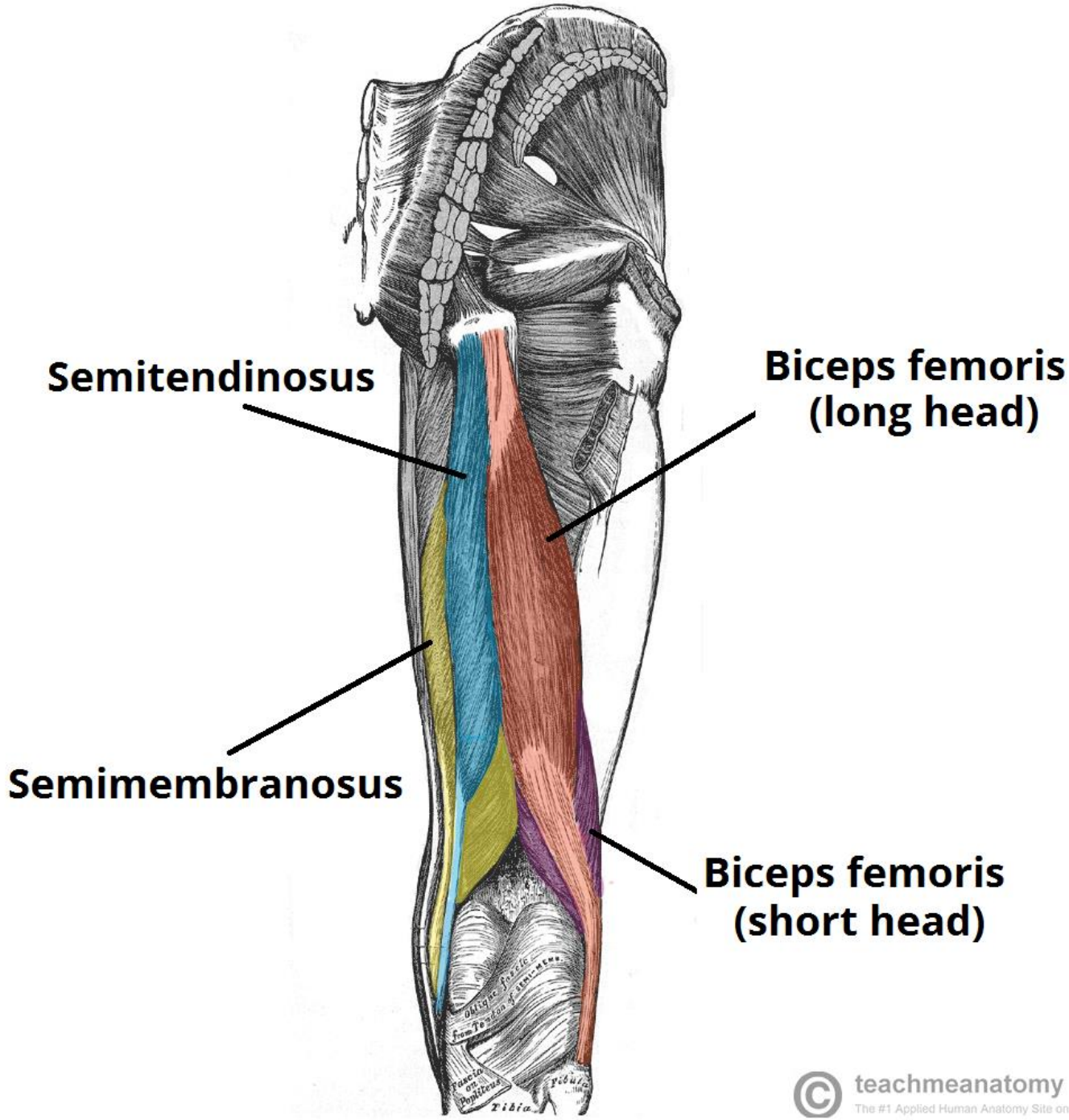
- Strain of the adductor muscles is the underlying cause of what is colloquially known as a '**groin strain**'. The proximal part of the muscle is most commonly affected, tearing near their bony attachments in the pelvis.
- Groin injuries usually occur in sports that require explosive movements or extreme stretching. Treatment of any muscle strain should utilise the **RICE protocol** – rest, ice, compression and elevation.

MUSCLES IN THE POSTERIOR COMPARTMENT OF THE THIGH

- The muscles in the posterior compartment of the thigh are collectively known as the **hamstrings**. They consist of the biceps femoris, semitendinosus and semimembranosus, which form prominent tendons medially and laterally at the back of the knee.
- As group, these muscles act to extend at the hip, and flex at the knee. They are innervated by the sciatic nerve (L4-S3).

Muscles in the Posterior Compartment

- The muscles located within the posterior compartment of the thigh are the biceps femoris, semitendinosus and semimembranosus.
- *Note: The hamstring portion of the **adductor magnus** has a similar action to these muscles, but is located in the medial thigh.*



Biceps Femoris

- Like the biceps brachii in the arm, the biceps femoris muscle has two heads – a long head and a short head.
- It is the most lateral of the muscles in the posterior thigh – the common tendon of the two heads can be felt laterally at the posterior knee.
- **Attachments**: The long head originates from the ischial tuberosity of the pelvis. The short head originates from the linea aspera on posterior surface of the femur. Together, the heads form a tendon, which inserts into the head of the fibula.
- **Actions**: Main action is flexion at the knee. It also extends the thigh at the hip, and laterally rotates at the hip and knee.
- **Innervation**: sciatic nerve

Semitendinosus

- The semitendinosus is a largely tendinous muscle. It lies medially to the biceps femoris, and covers the majority of the semimembranosus.
- **Attachments**: It originates from the ischial tuberosity of the pelvis, and attaches to the medial surface of the tibia.
- **Actions**: Flexion of the leg at the knee joint. Extension of thigh at the hip. Medially rotates the thigh at the hip joint and the leg at the knee joint.
- **Innervation**: sciatic nerve.

Semimembranosus

- The semimembranosus muscle is flattened and broad. It is located underneath the semitendinosus.
- **Attachments**: It originates from the ischial tuberosity, but does so more superiorly than the semitendinosus and biceps femoris. It attaches to the medial tibial condyle.
- **Actions**: Flexion of the leg at the knee joint. Extension of thigh at the hip. Medially rotates the thigh at the hip joint and the leg at the knee joint.
- **Innervation**: sciatic nerve

Clinical Relevance: Damage to the Hamstrings

- **Muscle Strain**
- A hamstring strain refers to **excessive stretch** or **tearing** of the muscle fibres. They are often seen athletes involved in running or kicking sports. Damage to the muscle fibres is likely to rupture the surrounding blood vessels – producing a **haematoma** (a collection of blood).

- Treatment of any muscle strain should utilise the **RICE protocol** – rest, ice, compression and elevation.
- **Avulsion Fracture of the Ischial Tuberosity**
- An avulsion fracture occurs when a fragment of bone breaks away from the main body of bone.
- In an avulsion fracture of the **ischial tuberosity**, the hamstring tendons 'tear off' a piece of the ischial tuberosity. Such an injury usually occurs in sports that require rapid contraction and relaxation of the muscles – such as sprinting, football and hurdling.

Thank You!