

MUSCLES OF THE GLUTEAL REGION

CN: In the posterior and lateral views (superficial dissections), the upper fibers of the iliotibial tract (*) have been cut away, exposing gluteus medius. (1) Color each muscle in all views, including the directional arrows, before going on to the next. The origin of piriformis (E) cannot be seen in these views, but see Plate 52. A better view of the origin of obturator internus (F) also can be seen on Plate 52.

2 GLUTEAL MUSCLES

GLUTEUS MAXIMUS_A

GLUTEUS MEDIUS_B

GLUTEUS MINIMUS_C

TENSOR FASCIAE LATAE_D

The gluteal muscles are arranged in three layers: the most superficial is *gluteus maximus*. The large sciatic nerve runs deep to it, as every student nurse has learned well. Its thickness varies. Gluteus maximus extends the hip joint during running and walking up-hill, but does not act in relaxed walking. The intermediately placed, more lateral *gluteus medius* is a major abductor of the hip joint and an important stabilizer (leveler) of the pelvis when the opposite lower limb is lifted off the ground.

6 DEEP, LATERAL ROTATORS

PIRIFORMIS_E

OBTURATOR INTERNUS_F

OBTURATOR EXTERNUS_G

QUADRATUS FEMORIS_H

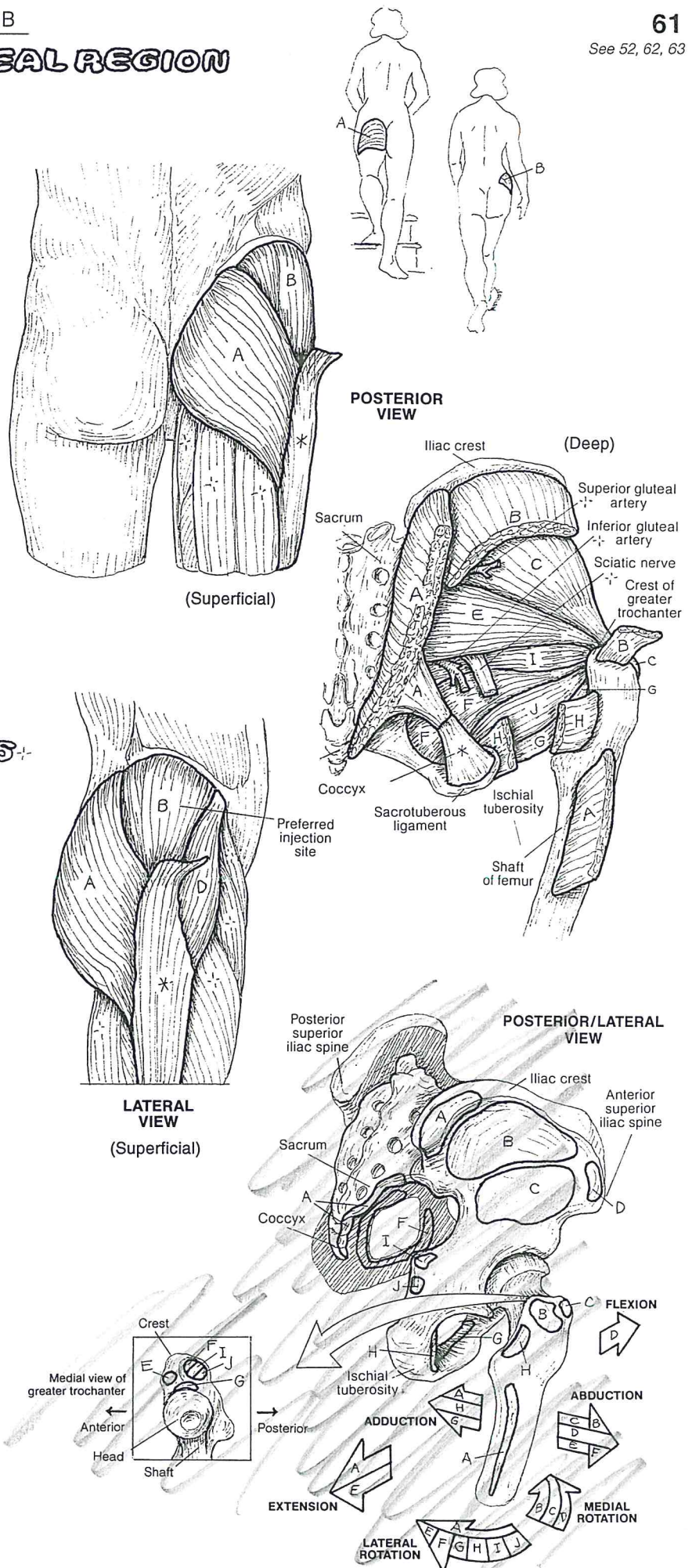
GEMELLUS SUPERIOR_I

GEMELLUS INFERIOR_J

The deepest layer of gluteal muscles is the *gluteus minimus* and the *lateral rotators* of the hip joint. They cover up/fill the greater and lesser sciatic notches. These muscles generally insert at the posterior aspect of the greater trochanter of the femur. The gluteal muscles (less *gluteus maximus*) correspond to some degree with the rotator cuff of the shoulder joint: lateral rotators posteriorly, abductor (*gluteus medius*) superiorly, medial rotators (*gluteus medius* and *minimus*, *tensor fasciae latae*) anteriorly.

ILIOTIBIAL TRACT*

The iliotibial tract, a thickening of the deep fascia (fascia lata) of the thigh, runs from ilium to tibia and helps stabilize the knee joint laterally. The muscle *tensor fasciae latae*, a frequently visible and palpable flexor and medial rotator of the hip joint, inserts into this fibrous band, tensing it. Despite its major flexor function, this anterolaterally-placed muscle is considered a part of the more posterior gluteal group; it shares its insertion into the iliotibial tract with *gluteus maximus*, and it is supplied by the superior gluteal nerve and artery.



MUSCLES OF THE POSTERIOR THIGH

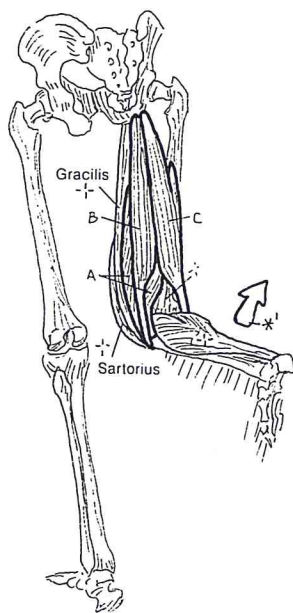
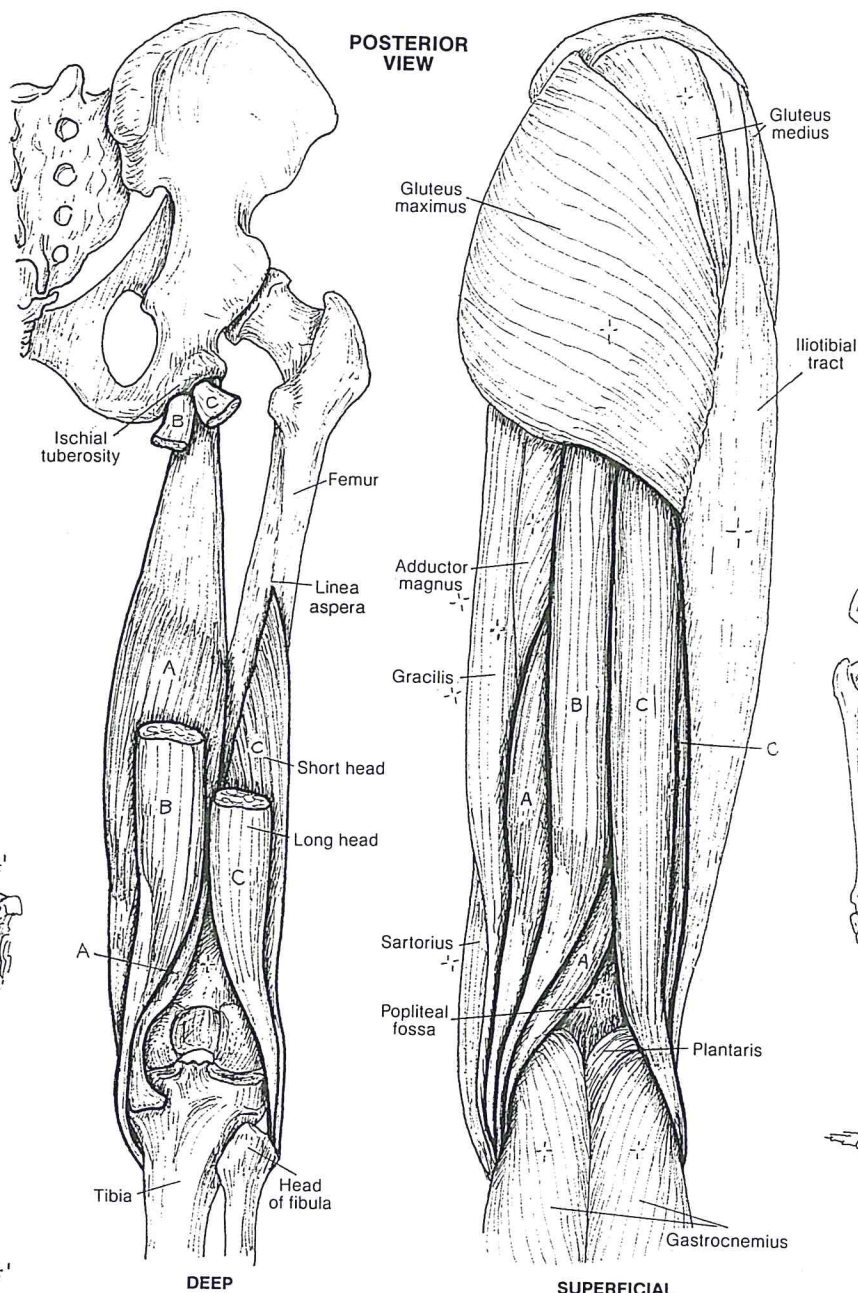
HAMSTRINGS*

SEMIMEMBRANOSUS_A

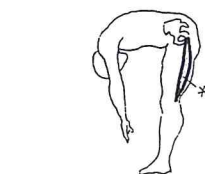
SEMITENDINOSUS_B

BICEPS FEMORIS_C

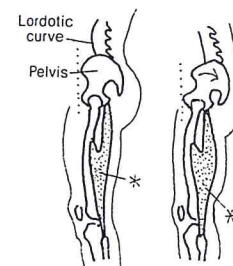
CN: (1) Color each hamstring muscle in the deep view before going on to the superficial. Then color the diagrams of flexion and extension. (2) Color gray the outline of the muscles in the drawings at upper right.



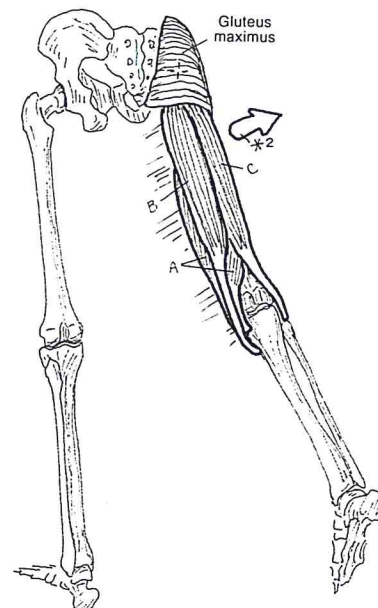
FLEXORS OF THE KNEE JOINT*



Tight hamstrings limit flexion of hip when knee joint is extended.



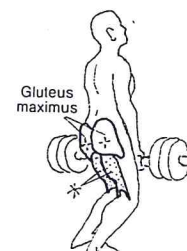
Tight hamstrings (at right) tilt pelvis backwards, flattening lordotic curve of lower back.



EXTENSORS OF THE HIP JOINT*

The hamstring muscles are equally effective at both extension of the hip joint and flexion of the knee joint. Unlike the hip extensor gluteus maximus, the hamstrings are active during normal walking. In relaxed standing, both gluteus maximus and the hamstrings are inactive. In knee flexion, the hamstrings act in concert with sartorius, gracilis, and gastrocnemius (Plates 63 and 66). Long tendons of the hamstrings can be palpated just above the partially flexed knee on either side of the midline.

Reduced hamstring stretch ("tight hamstrings") limits hip flexion with the knee extended; flexion of the knee permits increased hip flexion. Try this on yourself. Tight hamstrings, by their ischial origin, pull the posterior pelvis down, lengthening the erector spinae muscles and flattening the lumbar lordosis, potentially contributing to limitation of lumbar movement and back pain. Tight hamstrings often cause posterior thigh pain on straight leg raise testing (subject is supine, lower limbs horizontal; one heel is lifted, progressively flexing the hip joint with knee extended). This pain from muscle stretch may be confused with sciatic nerve/nerve root pain, which normally shoots into the leg and foot.

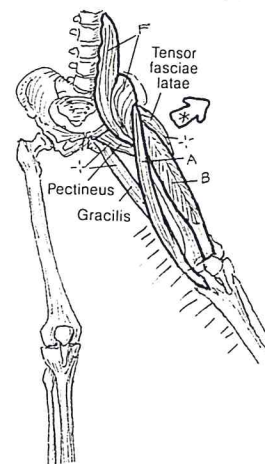
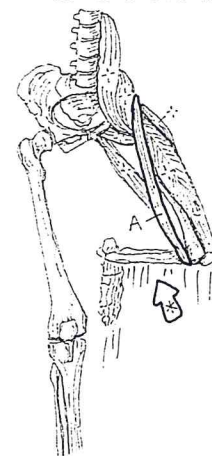
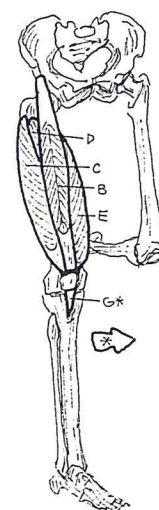


Powerful extensors of the hip joints.

MUSCLES OF THE ANTERIOR THIGH

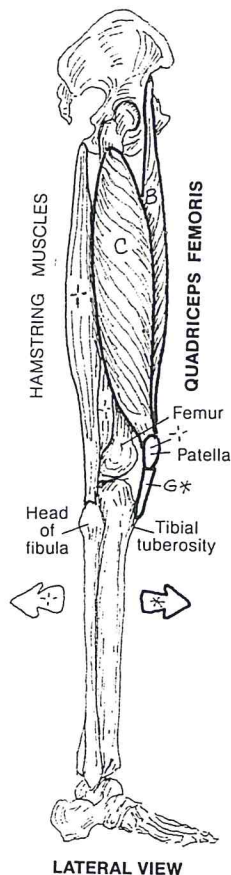
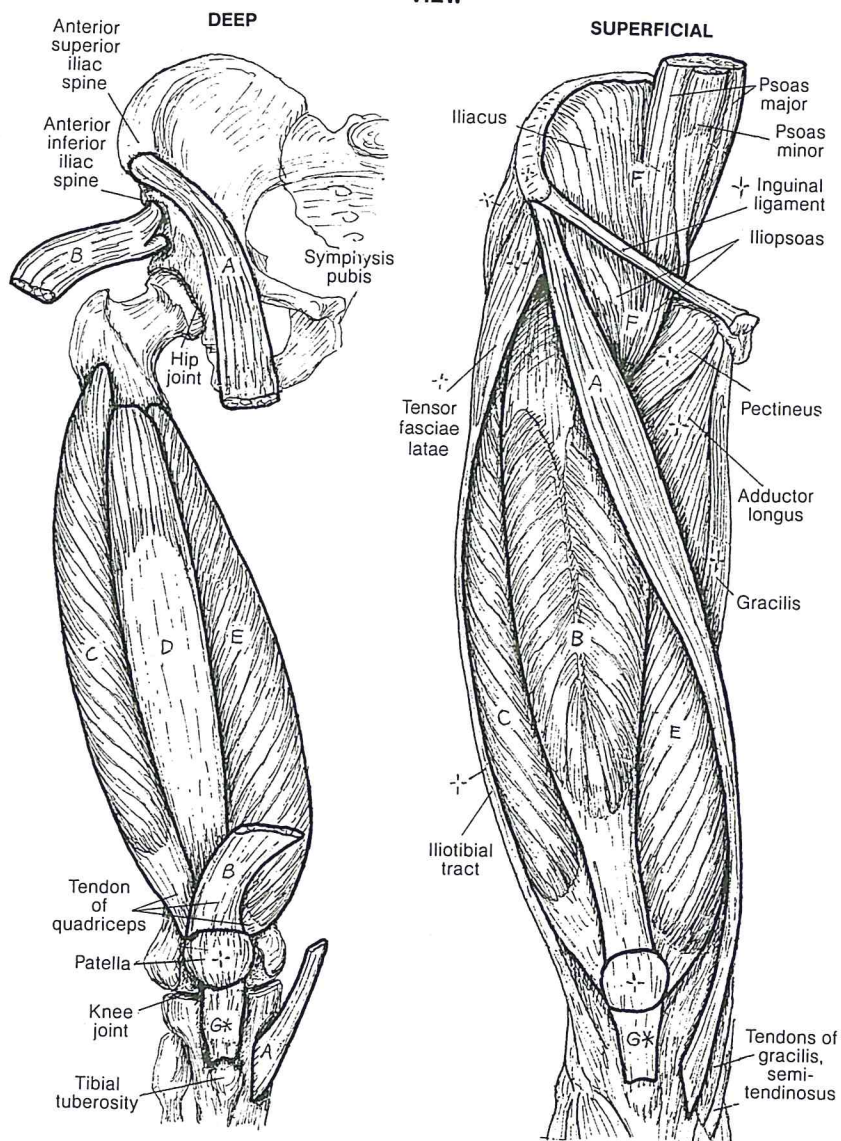
SARTORIUS_AQUADRICEPS FEMORIS₊RECTUS FEMORIS₊VASTUS LATERALIS₊VASTUS INTERMEDIUS₊VASTUS MEDIALIS₊~~ILIOPSOAS₊~~PATELLAR LIGAMENT_{G*}

CN: The patellar ligament (G*) is colored gray but the patella is left uncolored.
 (1) Begin with the deep view of the thigh and then complete the superficial view. (2) On the far left, color the visualized portions of the quadriceps that are antagonists to the hamstring group. (3) Complete the action diagrams along the right margin.

FLEXORS OF THE HIP JOINT₊FLEXOR OF THE KNEE JOINT₊EXTENSORS OF THE KNEE JOINT₊

ANTERIOR VIEW

SUPERFICIAL



The sartorius ("tailor's" muscle; so-called because of the role of this muscle in enabling a crossed-legs sitting posture) is a flexor and lateral rotator of the hip joint and a flexor of the knee joint, as you can infer from its illustrated attachments. The quadriceps femoris muscle arises from four heads. The vastus medialis and lateralis arise from the linea aspera on the posterior aspect of the femur; the vastus intermedius arises from the anterior femoral shaft. All four converge onto the superior aspect (base) of the patella to form the patellar tendon. Some tendon fibers continue over the patellar surface to join the ligament below. At the inferior aspect (apex) of the patella, the tendinous fibers continue to the tibial tuberosity.

The tendon between the patella and the tibial tuberosity is called the patellar ligament. Rectus femoris, a strong hip joint flexor, is the only member of quadriceps to cross that joint. Quadriceps femoris is the only knee extensor. The significance of its role becomes crystal clear to those having experienced a knee injury; the muscles tend to atrophy and weaken rapidly with disuse, and "quad" exercises are essential to maintain structural stability of the joint. The iliopsoas is the most powerful flexor of the hip, having a broad thick muscle belly and attaching at the lesser trochanter at the proximal end of the femoral shaft. Recall Plate 50 for its posterior abdominal origin.

MUSCLES OF THE ANTERIOR & LATERAL LEG

CN: Take care with the narrow attachment sites of the anterior leg. Although the muscles A, B, and C arise from the interosseous ligament as well as the tibia and the fibula, the ligament has been left out of the attachments illustration for purposes of simplification. Attachment sites on the plantar surface of the foot are shown at upper right.

The muscles of the leg are arranged into anterior-lateral, lateral, and posterior compartments. The bony ridge (anterior margin) of the tibia creates two oblique surfaces, the anterolateral of which relates to the anterior leg muscles; the anteromedial surface is bony (ouch!) and devoid of muscle. The lateral compartment fibular muscles largely arise from the fibula and the interosseous ligament between the tibia and fibula.

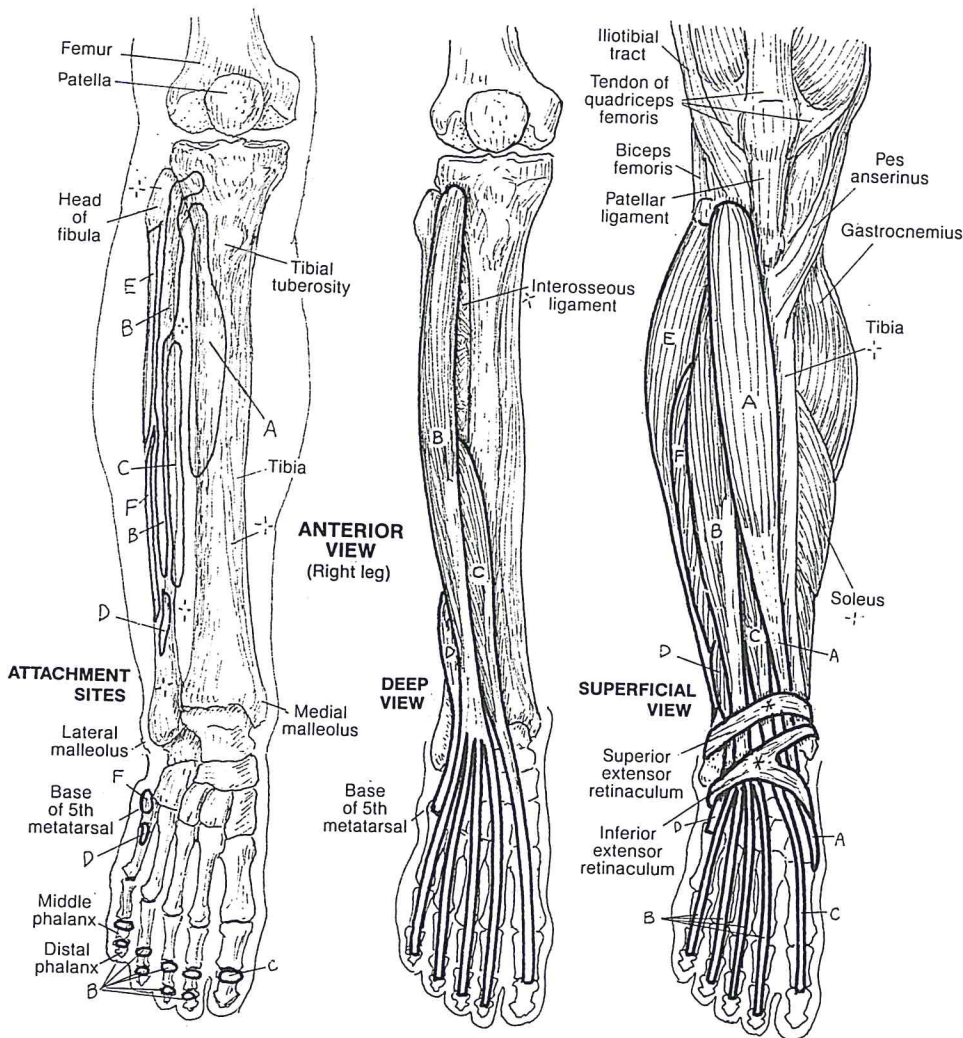
ANTERIOR LEG

TIBIALIS ANTERIOR

EXTENSOR DIGITORUM LONGUS

EXTENSOR HALLUCIS LONGUS

FIBULARIS TERTIUS

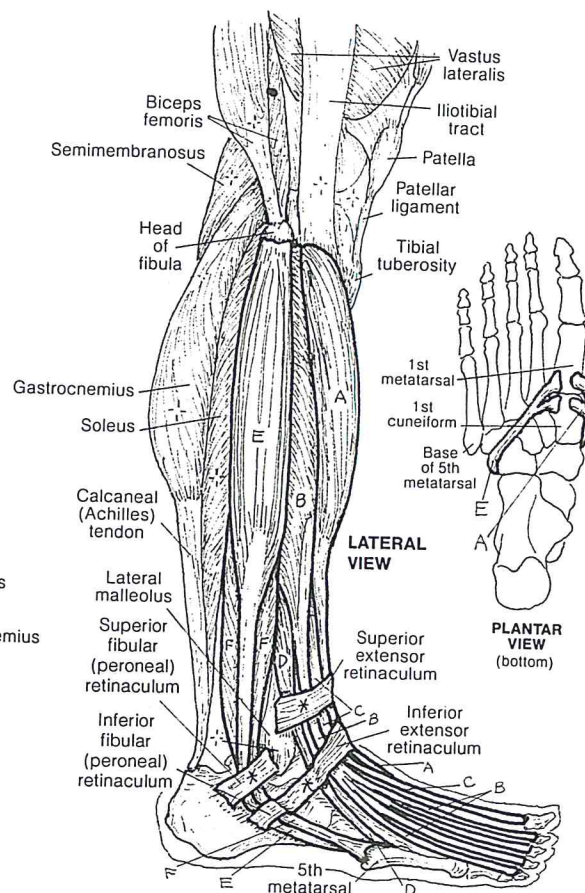


All of the anterior leg muscles are dorsiflexors (extensors) of the ankle; *extensors hallucis and digitorum longus* are toe extensors; *tibialis anterior* is an invertor of the subtalar joints as well, and *fibularis tertius* (the 5th tendon of extensor digitorum) is an evertor. Due to rotation of the lower limb during embryonic development, these extensors are anterior to the bones in the anatomical position (unlike the upper limb wrist extensors). *Tibialis anterior* is particularly helpful in lifting the foot up during the swing phase of walking to avoid striking the toes.

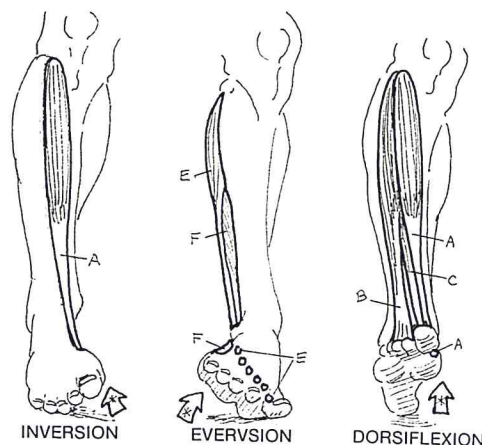
LATERAL LEG

FIBULARIS LONGUS

FIBULARIS BREVIS



The fibular (peroneal) muscles are principally evertors of the foot, and are especially active during plantar flexion, as in walking on the toes or pushing off with the great toe. *Fibularis tertius* arises in the fibular compartment but is actually part of extensor digitorum.



MUSCLES OF THE POSTERIOR LEG

~~TIBIALIS POSTERIOR~~

~~FLEXOR DIGITORUM LONGUS~~

~~FLEXOR HALLUCIS LONGUS~~

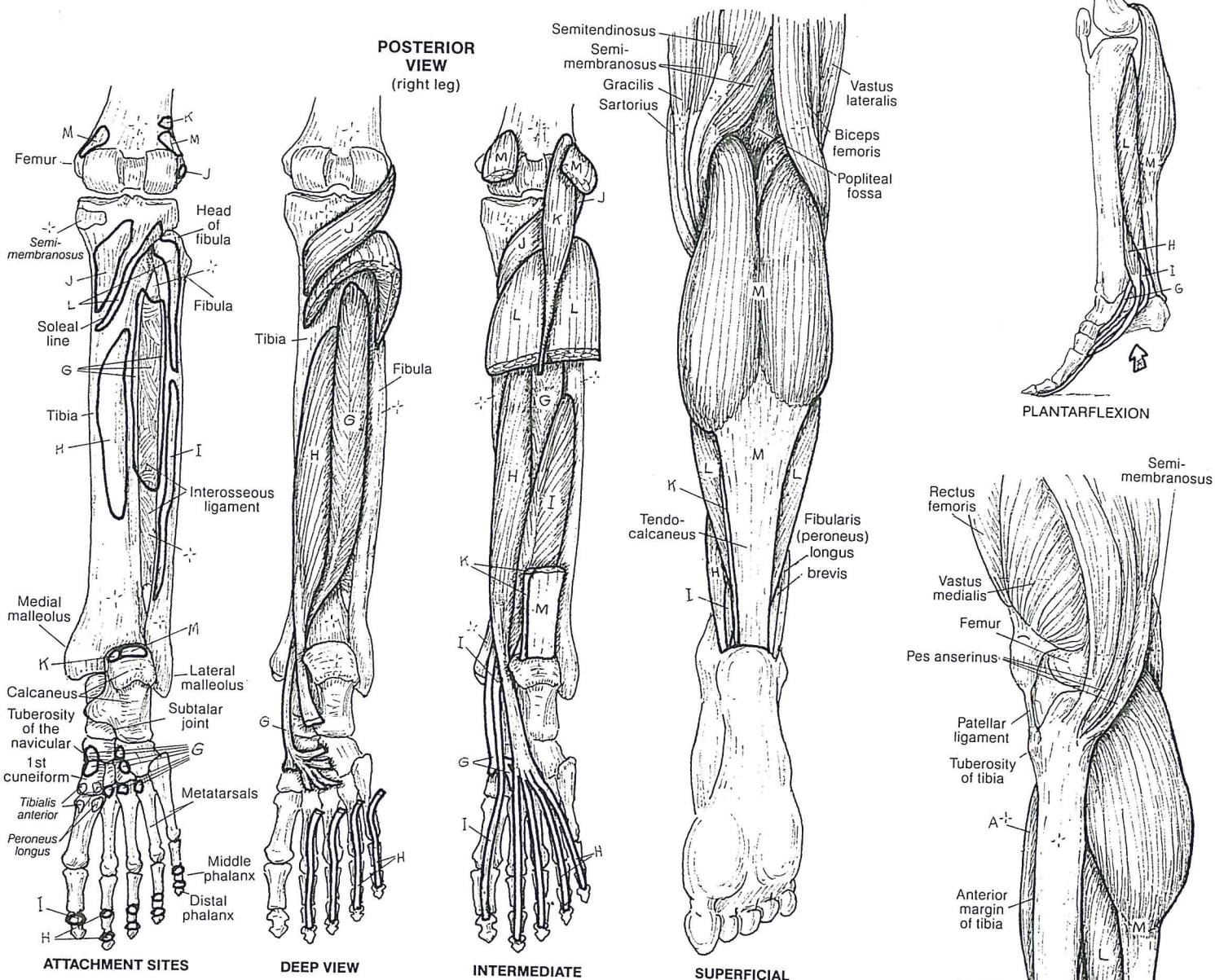
~~POPLITEUS~~

PLANTARIS_K

SOLEUS_L

GASTROCNEMIUS_M

CN: The muscles to be colored on this plate are labeled G–M; any other letter label found here (A–F from Pl. 65; N–Y from Pl. 67) is for identification only, and those muscles should be left uncolored. You may repeat colors used for muscles on Plate 57 on this and/or the next plate. (1) Color one muscle at a time in each of the posterior views. Note that the plantaris (K), the soleus (L), and the gastrocnemius (M) all insert into the same tendon (tendocalcaneus), which receives the color M. (2) Color the upper and lower medial views.



The muscles of the posterior leg are arranged into two compartments separated by a fascial septum (deep transverse fascia, not shown). The superficial group (gastrocnemius, soleus, and plantaris) inserts by way of a common tendon, tendocalcaneus (Achilles tendon; see glossary). These fascial compartments are fairly inelastic. Muscle swelling secondary to vascular insufficiency can result in serious muscle compression/death (compartment syndrome) in the absence of fascial (surgical) decompression.

The major calf muscle is gastrocnemius, which flexes the knee and, with its two fellows, plantarflexes the ankle joint. In knee flexion it is aided by *popliteus*, which also rotates the tibia medially. The other deep flexors plantarflex the ankle joint (both toe and great toe *flexors* and *tibialis posterior*), flex the toes (the flexors), and invert the foot (*tibialis posterior*).