

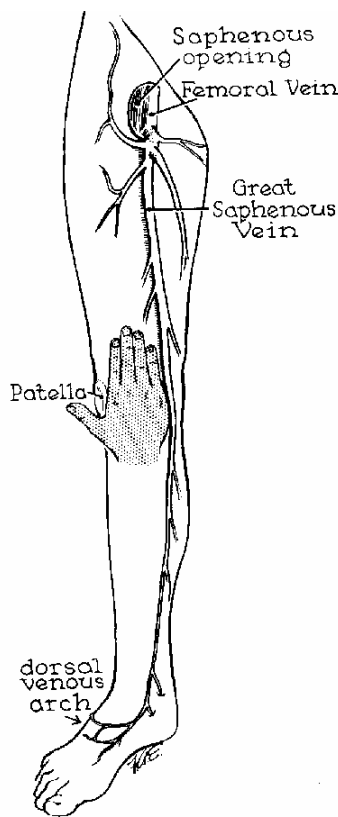
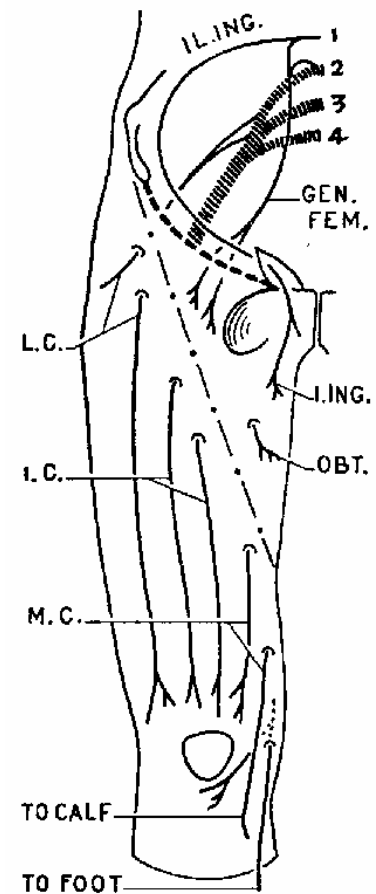
INSTRUCTIONS FOR DISSECTING THE LOWER LIMB

PART 1 – ANTERIOR THIGH – First two weeks

DISSECTION GUIDE: SUPERFICIAL STRUCTURES OF THE ANTERIOR THIGH

Before commencing the dissection read the Introductory section, pages 1-12 from Cunninghams manual of practical anatomy.

1. Make skin incisions (**keep these as shallow as possible**)
 - a. Along the inguinal ligament
 - b. From the ASIS down the lateral aspect of the limb to just below the knee
 - c. From the pubic tubercle, around the genitalia, and down the medial aspect of the limb to just below the knee
2. Reflect the skin from the front of the thigh and leave the superficial fascia in place. Gradually remove the superficial fascia and preserve the **great saphenous vein**, and some cutaneous nerves.
3. The cutaneous nerves are:
 - a. **The lateral cutaneous nerve of the thigh** (L23) that passes under the lateral end of the inguinal ligament.
 - b. **Anterior cutaneous branches of the femoral nerve** (L234). These emerge through the deep fascia along the line of sartorius



4. The great saphenous vein goes up to the top of the thigh in the superficial fascia and there it passes through a hole in the deep fascia (the **saphenous hiatus**) to join the femoral vein. In this region the great saphenous vein receives some veins from the abdominal wall and genitalia. Also in the inguinal region are a group of superficial **lymph nodes** that service the superficial parts of the lower limb, abdominal wall and genitalia, and drain deep through the saphenous hiatus.

DISSECTION GUIDE: DEEPER STRUCTURES OF THE ANTERIOR THIGH

1. Complete the removal of superficial fascia from the anterior thigh and expose the deep fascia (fascia lata).

Identify the saphenous hiatus, where the great saphenous vein pierces the fascia lata and joins the femoral vein.

2. Outline the femoral triangle (bounded by inguinal ligament, and the medial borders of sartorius and adductor longus). You can open the fascial roof of the femoral triangle either by cutting vertically in line with the femoral artery (no branches of the femoral nerve are supposed to cross in front of the artery), or, if the abdomen has been opened you can slide your finger

down from the abdomen in front of the femoral nerve, and then use scissors to open the fascia lata in front of your finger

3. The detailed dissection of the femoral triangle will take time and patience, and should become the focus of one student's work – instructions for the dissection of the femoral triangle follow.

4. Remove the fascia lata from the anterior and medial aspects of the thigh (**leave the fascia lata on the lateral side where it is known as the iliotibial tract and the lateral intermuscular septum**).

Anteriorly, clean the surface of sartorius, rectus femoris, and the vasti.

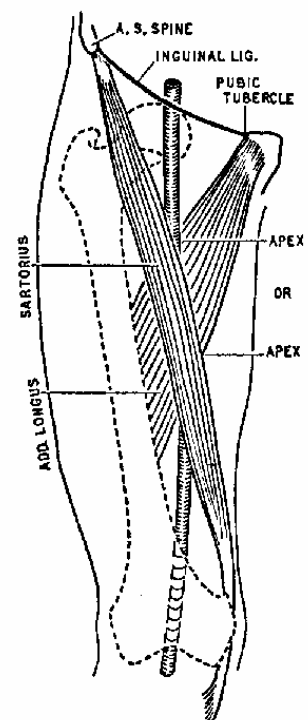
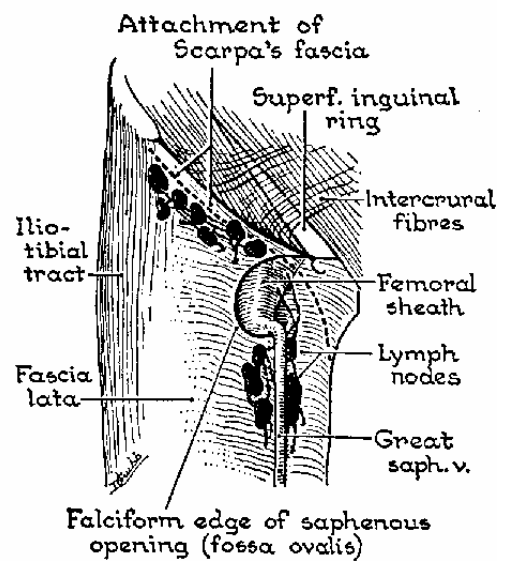
5. Lift sartorius from its fascial sheath and note the subsartorial canal containing

- a. The femoral artery
- b. The saphenous nerve
- c. Nerve to vastus medialis

6. These structures lie in the fascia of the medial intermuscular septum. Clean this fascia away and to expose the contents of the subsartorial canal and the adductor magnus muscle in the floor.

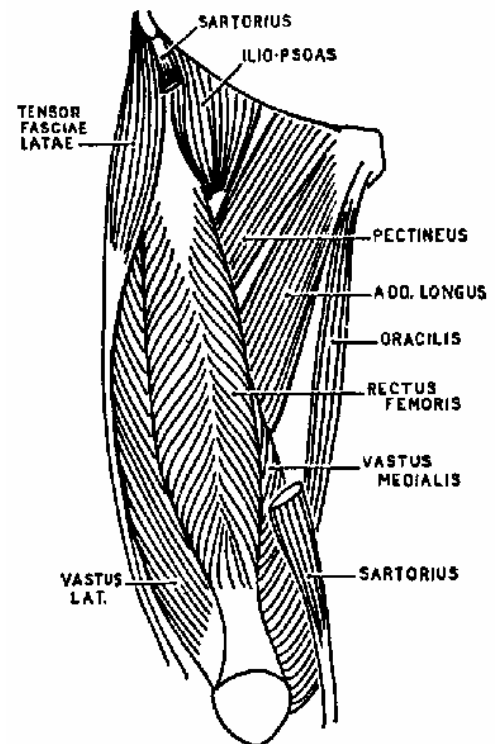
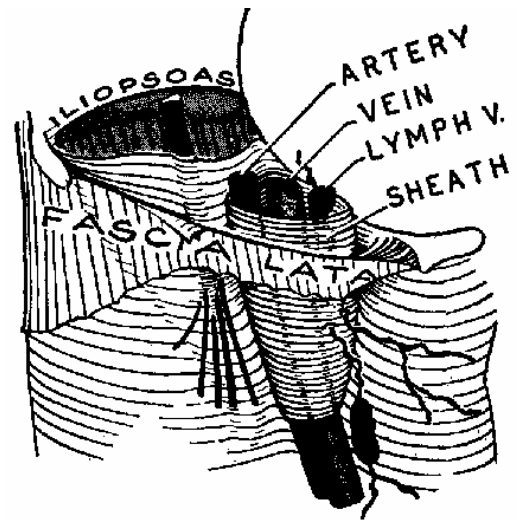
7. On the medial side of the thigh, identify the gracilis, adductor magnus and brevis muscles. Carefully look between these muscles to identify branches of the obturator nerve and vessels.

8. Trace the sartorius and gracilis muscles around the medial side of the knee where they insert on the tibia with the semitendinosus muscle.



9. DISSECTION GUIDE: THE FEMORAL TRIANGLE

1. Gradually clean, sort, and follow the many branches of the **femoral nerve** (cutaneous branches and branches to each of the muscles of the anterior compartment), removing fat and fascia as you go.
2. Similarly clean and follow the **femoral artery** and its branches (profunda femoris, medial and lateral circumflex femoral arteries).
3. Follow the great saphenous vein to its junction with the **femoral vein**.
4. Inside the abdomen, identify the femoral nerve, and external iliac artery and vein as they pass behind the inguinal ligament. Note how the nerve is behind, but the vessels are in front of the iliopsoas fascia, and so the vessels emerge into the thigh inside a sleeve of fascia derived from the abdominal lining but the femoral nerve is outside that **femoral sheath**.
5. Clean the fascia from the floor of the femoral triangle to expose the muscles:
 - a. Adductor longus
 - b. Pectineus
 - c. Iliopsoas laterally.
6. Follow the medial and lateral circumflex arteries as far as you can, the medial dives between adductor longus and pectineus, and the lateral passes behind rectus femoris, and has ascending, descending and transverse branches.



PART 2 – GLUTEAL REGION AND BACK OF LOWER LIMB – weeks 3 and 4

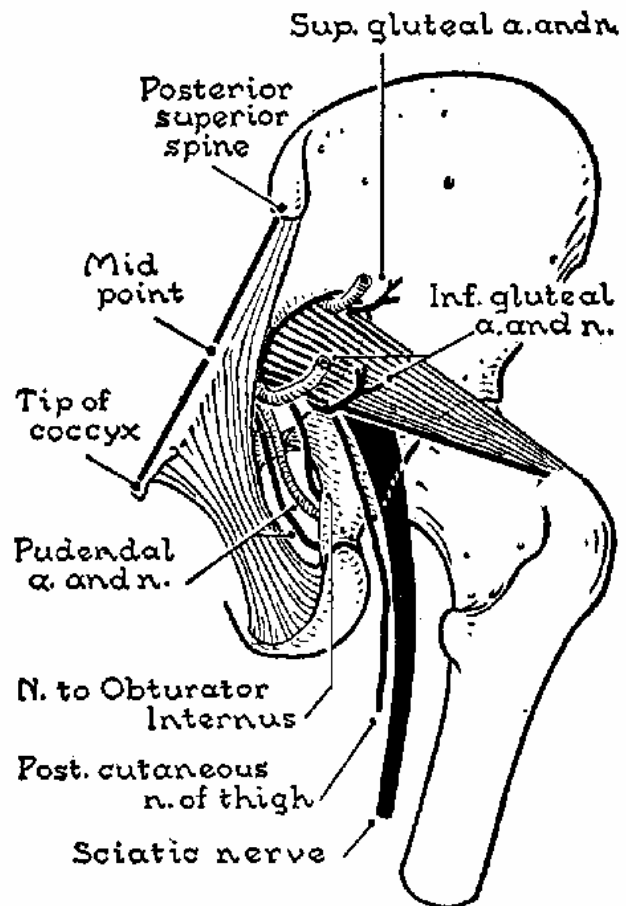
DISSECTION GUIDE: THE GLUTEAL REGION.

1. Make skin incisions (**keep these as shallow as possible**):
 - a. Along the iliac crest from the PSIS to the ASIS
 - b. From the PSIS down the to the midline and then down to the anus
 - c. Encircle the anus and continue to join medial thigh incision
2. Reflect the skin and superficial fascia to expose and clean the surface of gluteus maximus.
3. Identify the origin of gluteus maximus from the sacrum and iliac crest, and locate and clean its lower free border. The superficial nerves that you may find in this region are dorsal rami of lower lumbar and sacral nerves, lateral cutaneous branches of T12 and L1, and at the lower border of gluteus maximus there will be gluteal branches of the posterior cutaneous nerve of the thigh

4. Then continue to reflect the skin and superficial fascia from the back of the thigh. It is important at this stage to leave the deep fascia in place on the thigh. You should be able to see the posterior cutaneous nerve of the thigh running just deep to the fascia lata and giving branches that become superficial. In the lower part of the thigh (popliteal fossa) find the small saphenous vein piercing the deep fascia to join the popliteal vein.

5. Reflect gluteus maximus from the gluteal region by cutting it from its origin and reflecting it laterally. Look out for:

- a. The attachment of the lower part of gluteus maximus to the sacrotuberous ligament (you will have to carefully detach it without damaging the ligament).
 - b. The posterior cutaneous nerve of the thigh.
 - c. The superior gluteal vessels and inferior gluteal nerves and vessels entering the deep surface of the muscle (these will have to be cut in order to reflect gluteus maximus).
6. Identify and clean:
- a. Gluteus medius

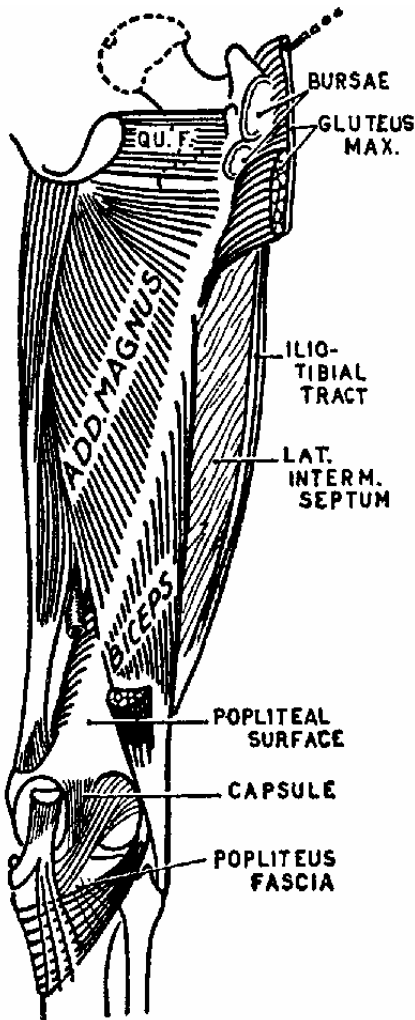


- b. Superior gluteal vessels
- c. Piriformis
- d. Inferior gluteal nerve and vessels
- e. Sciatic nerve
- f. Quadratus femoris, Obturator internus tendon (and the gemelli)

7. Locate the ischial spine and sacrospinous ligament, and find the pudendal nerve and internal pudendal vessels crossing into the lesser sciatic foramen.

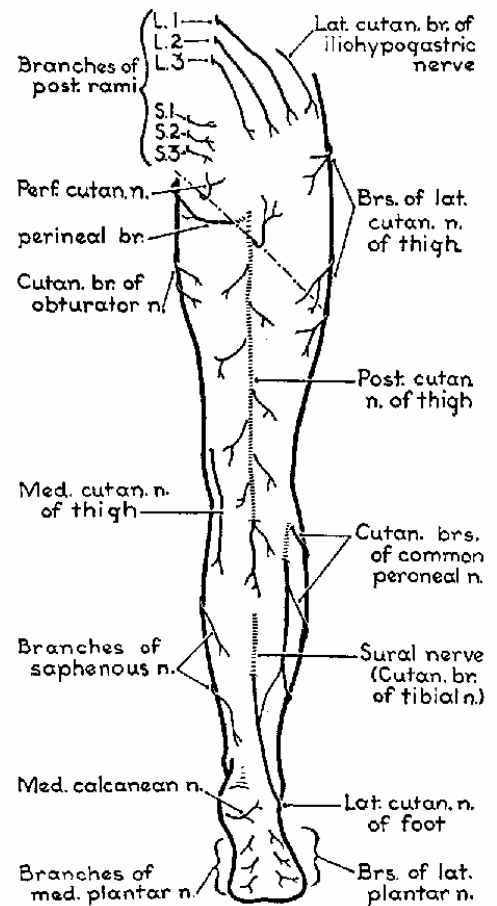
DISSECTION GUIDE: THE BACK OF THE THIGH

1. Open the deep fascia on the back of the thigh (**but do not remove the iliotibial tract**). Note that the iliotibial tract is continuous with the strong lateral intermuscular septum.
2. Loosen and clean the hamstring muscles and identify each
 - a. Semitendinosus
 - b. Semimembranosus
 - c. Long head of biceps
3. Trace the sciatic nerve through the thigh until it divides

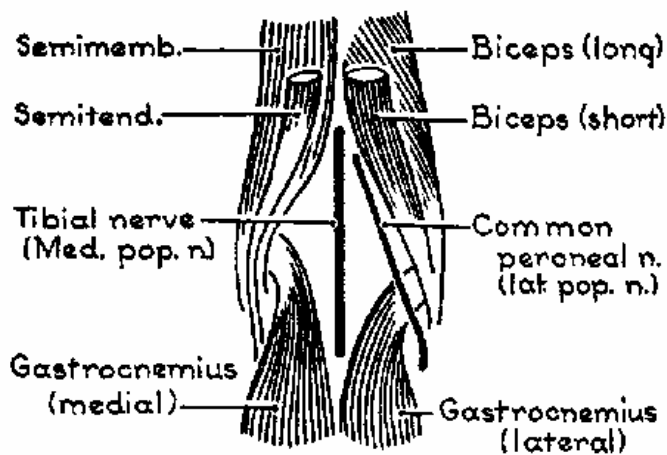


into the tibial and common peroneal nerves. Look at the other dissections and compare where this division occurs. It may be as high as the piriformis muscle or as low as the popliteal fossa.

4. Identify and clean the nerve branches to the hamstrings, adductor magnus and the short head of biceps femoris – try to determine whether each of those muscles receives its supply from the tibial or common peroneal nerve.
5. Identify and clean the short head of biceps and the adductor magnus muscle in the floor of the posterior compartment. They both attach to the linea aspera but go in opposite directions.
6. Note that the insertion of adductor magnus is pierced by perforating branches of the profunda femoris artery that supply the posterior thigh.



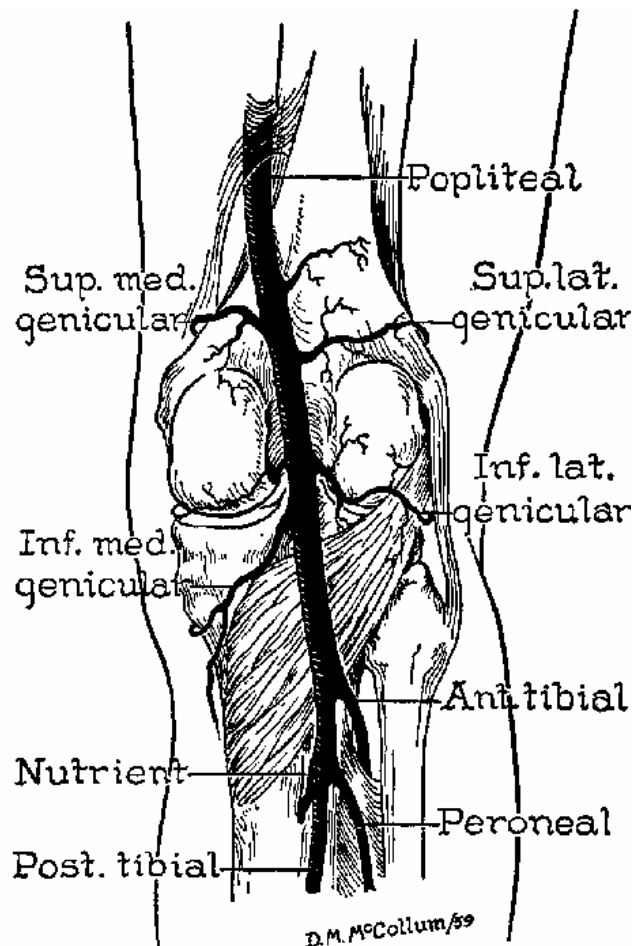
DISSECTION GUIDE: THE POPLITEAL FOSSA



1. Outline the boundaries of the popliteal fossa: biceps femoris and semimembranosus superiorly and the two heads of gastrocnemius inferiorly. Open the fascial roof and find the tibial and common peroneal nerves.

Locate the branches of the tibial and common peroneal nerves (they match the branches of the popliteal artery):

- a. Tibial nerve
 - i. Genicular branches (2 or 3) to the knee joint.
 - ii. Nerve to the heads of gastrocnemius
 - iii. Sural nerve (which runs superficially between the heads of gastrocnemius)
- b. Common peroneal nerve
 - i. Genicular branches (2)
 - ii. Sural communicating nerve
 - iii. Lateral cutaneous nerve of the leg



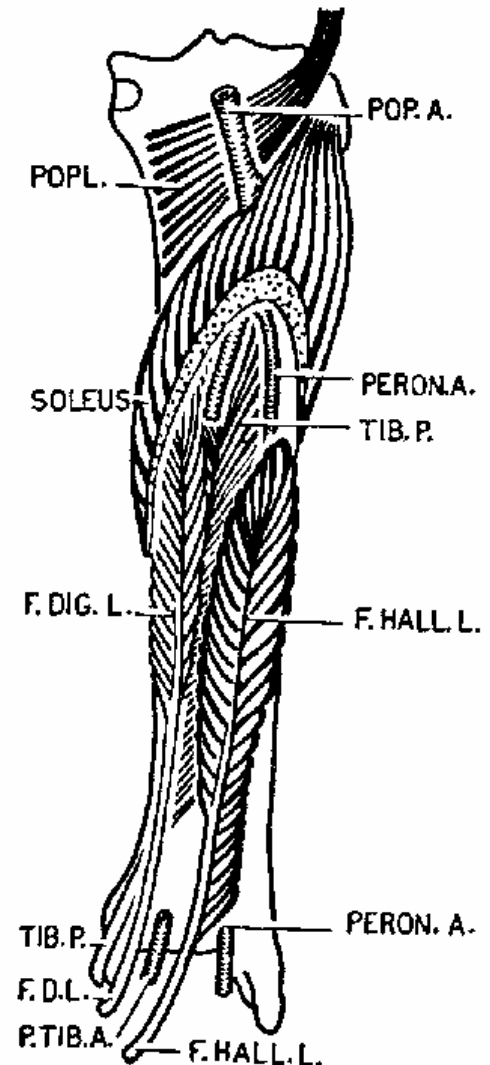
2. Also find and clean the popliteal artery and vein piercing the attachment of adductor magnus (adductor hiatus). Identify the genicular branches of the popliteal artery.

3. In the floor of the popliteal fossa identify, from above down

- a. The popliteal surface of the femur
- b. The capsule of the knee joint
- c. The popliteus muscle

DISSECTION GUIDE: THE CALF

1. Make skin incisions down the medial and lateral sides of the leg to the medial and lateral malleoli.
2. Remove the skin and superficial fascia from the posterior aspect of the leg, and try to preserve the sural nerve and the small saphenous vein.
3. Identify the heads of gastrocnemius and cut them below where their nerve supply enters. Then reflect the gastrocnemius downwards.
4. Clean the soleus muscle and identify its origin from the fibular and the soleal line of the tibia. Detach the soleus from its origins, note the tendinous arch of the soleus muscle between those sites of origin, and reflect soleus downwards. You will need to cut the long thin tendon of plantaris to reflect the gastrocnemius and soleus right down to the Achilles tendon.
5. Remove the fat pad from in front of the Achilles tendon
6. Clean the deeper structures in the posterior compartment of the leg:
 - a. The popliteal artery divides into the anterior and posterior tibial arteries. The anterior tibial artery pierces the interosseous membrane. Follow the posterior tibial artery down through the leg posteriorly and identify its peroneal branch.
 - b. The tibial nerve runs with the artery to behind the medial malleolus.
 - c. Flexor hallucis longus
 - d. Flexor digitorum longus
 - e. Tibialis posterior.
7. Clean these structures in the region behind the medial malleolus.



PART 3 – THE LEG AND DORSUM OF THE FOOT – weeks 5 and 6

DISSECTION GUIDE:

1. Remove the skin and superficial fascia from the anterior aspect of the leg and dorsum of the foot. Identify and retain the great saphenous veins together with the dorsal venous arch of the foot.

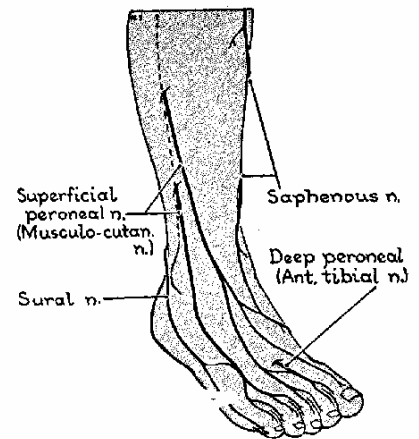
2. Also identify the following cutaneous nerves in the superficial fascia

i. The saphenous nerve running with the great saphenous vein

ii. Lateral cutaneous nerve of the leg:

iii. Cutaneous branches of the superficial peroneal nerve.

Display the cutaneous distribution of the superficial peroneal nerve on the dorsum of the foot - what nerve supplies the web between the 1st and 2nd toes?



3. Remove the deep fascia from the leg, **but leave the superior and inferior retinaculae around the ankle**. Identify the synovial sheaths for the tendons passing through the retinaculae, and confirm the bony attachments of the deep fascia

4. Identify the muscles of the anterior compartment

i. Tibialis anterior

ii. Extensor hallucis longus

iii. Extensor digitorum longus

iv. Peroneus tertius

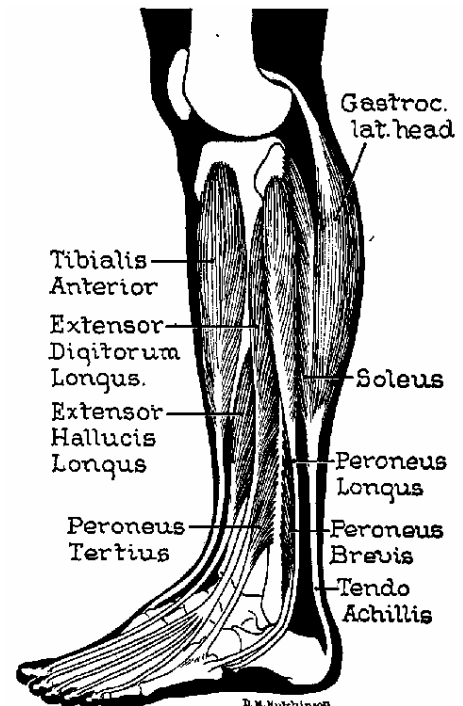
5. Clean the dorsum of the foot and trace the tendons to their insertions.

6. Look between tibialis anterior and extensor hallucis longus to find the deep peroneal nerve and the anterior tibial artery - trace these onto the dorsum of the foot.

7. On the dorsum of the foot identify the extensor digitorum brevis muscle and trace its tendons to the medial 4 toes.

8. In the lateral compartment of the leg identify and clean the peroneus longus and brevis muscles, and trace their tendons behind the lateral malleolus to the lateral side of the foot.

9. Find the common peroneal nerve where it wraps around the neck of the fibula and dives into the peroneus longus muscle. Just within the muscle it divides into its deep, superficial and recurrent genicular branches.



DISSECTION GUIDE: THE SOLE OF THE FOOT

1. Remove the skin and superficial fascia from the sole of the foot and toes. Note the densely lobulated fat in the superficial fascia and clean the plantar aponeurosis. Between the heads of the metatarsals plantar digital nerves can be found and cleaned, and on the plantar surface of the toes the digital flexors pass inside fibrous sheaths.
2. Divide the plantar aponeurosis and the lateral cord to the base of the fifth metatarsal, and reflect to expose the first layer of muscles of the foot (abductor hallucis, flexor digitorum brevis, and abductor digiti minimi).
3. Try to preserve the branches of the medial and lateral plantar nerves.
4. Clean the medial side of the ankle below the malleolus and follow the three tendons
 - a. Tibialis anterior
 - b. Flexor digitorum longus
 - c. Flexor hallucis longus
 - d. The tibial nerve
 - e. Posterior tibial artery.
5. Detach abductor hallucis and follow those structures into the foot.
6. Divide and reflect flexor digitorum brevis to expose the medial and lateral plantar nerves and vessels and the second layer of muscles of the foot;
 - a. Flexor hallucis longus
 - b. Flexor digitorum longus and its associated muscles:
 - i. Four lumbricals
 - ii. Flexor accessorius
7. Follow the medial and lateral neurovascular bundles and note which give rise to the plantar digital nerves to the toes.
8. If you reflect the long tendons you will expose the third layer of muscles in the foot
 - a. Flexor hallucis brevis
 - b. Adductor hallucis
 - c. Flexor digiti minimi

