

THE FRONT OF THE THIGH

The skin and cutaneous nerves

The skin of the anterior and medial sides of the thigh is relatively thinner than on the lateral and posterior sides. The skin on the front of the thigh is supplied by seven cutaneous nerves which are derived from the lumbar plexus. And may be described in two areas with the oblique line of Sartorius muscle in between. The line of Sartorius extends from the anterior superior iliac spine to the medial femoral condyle.

□ Below the line of Sartorius;

□ The **lateral cutaneous nerve of the thigh (L2–L3)** from the lumbar plexus supplies the anterolateral part of the thigh from the anterior superior iliac spine to the knee.

□ The **intermediate and medial cutaneous nerves of the thigh (L2–L3)** from the femoral nerve supply the anterior and anteromedial sides from the line of Sartorius to the knee.

□ The **saphenous nerve (L3, L4)** is a branch of the posterior division of the femoral nerve. It pierces deep fascia on the medial side of the knee and runs downward in front of the great saphenous vein. It gives *infrapatellar branch* before piercing the deep fascia, which runs downward and laterally to supply skin over the ligamentum patella.

□ Above the line of Sartorius;

□ The **femoral branch of the genitofemoral nerve (L1)** supplies the skin over the femoral triangle.

□ The **ilioinguinal nerve (L1)** supplies the skin of the upper anteromedial side opposite the scrotum (or labium majus).

□ The **cutaneous branch of the obturator (L2–L3)** nerve supplies the skin of the lower anteromedial side above the line of sartorius.

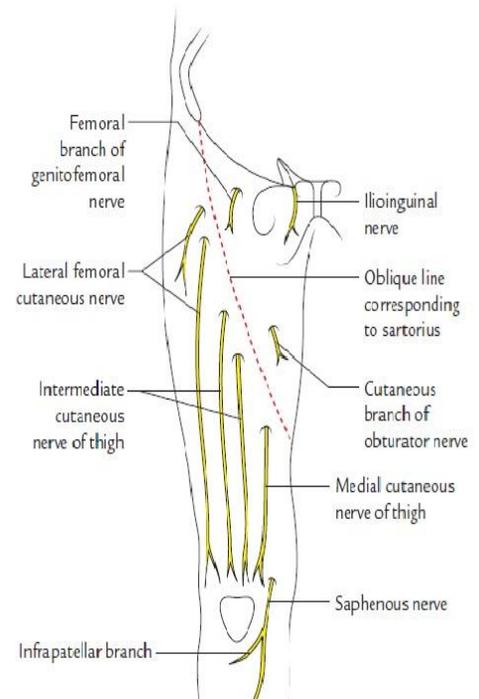


Figure. Cutaneous nerves of the front of the thigh

Patellar Plexus

It is a plexus of nerves present in front of the patella, ligamentum patellae, and the upper end of the tibia, and supplies the skin over these structures. It is formed by the branches from (a) the lateral cutaneous nerve of thigh, (b) the intermediate cutaneous nerve of thigh, (c) medial cutaneous nerve of thigh, and (d) infrapatellar branch of the saphenous nerve.

The superficial fascia

The superficial fascia of the front of the thigh is continuous with that of the anterior abdominal wall which is composed of 2 layers below the level of the umbilicus;

□ A **superficial fatty layer** which is continuous from the fatty layer of the abdomen and extends over the whole length of the lower limb.

□ A **deeper membranous layer** continues for a short distance only at the uppermost part of the thigh where it fuses with the deep fascia of the thigh (fascia lata) at a line lying a fingerbreadth below the inguinal ligament and extending medially to the pubic tubercle. The line of fusion passes from the pubic tubercle on the front of the body of the pubis, the sides of the pubic arch and backwards to the ischial tuberosity and the perineal body. Here, the membranous layer is called the **superficial perineal membrane (Colle's fascia)**. This fascia forms a tubular sheath for the penis or clitoris and separates the thigh from the submembranous area of the anterior abdominal wall and the perineum. Therefore, a fluid accumulation in that area of the abdominal wall or the perineum will not extend down the thigh because of the linear fusion.

The inguinal ligament

The inguinal ligament represents the posteriorly curved, thickened free lower border of the aponeurosis of the external oblique muscle of the anterior abdominal wall. It extends from the anterior superior iliac spine to the pubic tubercle. Just lateral to the pubic tubercle, the deep surface of the inguinal ligament extends posteriorly to be attached to the pecten pubis as the triangular **lacunar ligament**. The apex of the lacunar ligament is attached to the pubic tubercle while its base forms a sharp free crescentic margin. The strong deep fascia of the thigh (fascia lata) attaches to the inguinal ligament and pulls it downwards and is therefore responsible for its downward curvature.

The deep fascia (Fascia Lata)

The fascia lata is thick and strong and surrounds the thigh like a stocking extending from the root of the lower limb above to the knee below.

□ **Superiorly**, it is attached to the iliac crest laterally, the inguinal ligament anteriorly, the anterior surface of the body and inferior ramus of the pubis medially and to the ischial tuberosity; sacrotuberous ligament and sacrum posteriorly.

□ **At the knee**, it is attached anteriorly to the patella, femoral and tibial condyles and to the head of the fibula. Posteriorly, it is continuous with the deep fascia of the popliteal fossa and back of the leg.

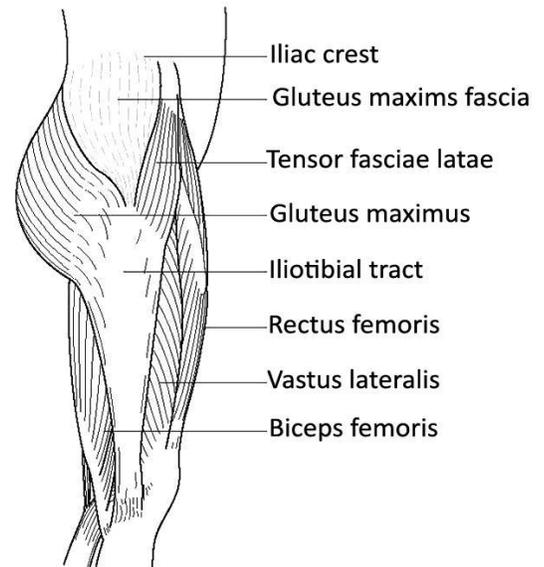


Figure . The iliotibial tract

□ **Laterally**, the fascia lata is thickened to form the **iliotibial tract** [Figure above] as a thick band running from the iliac crest to the lateral tibial condyle. The tract has the greater part of the gluteus maximus muscle inserted into its posterior aspect while it encloses the tensor fasciae latae muscle anteriorly. Through the tract, the two muscles stabilize the pelvis on the femur in an anteroposterior plane and keep the knee extended during standing without continuous contraction of the knee extensors.

□ **Medially**, the fascia lata is thinned forming the **cribriform fascia** over the **saphenous opening**.

□ The fascia lata sends 3 **intermuscular septa** to the linea aspera dividing the thigh into 3 muscular compartments [Figure. below];

The lateral intermuscular septum is the strongest and extends from the iliotibial tract to the lateral lip of linear aspera. The medial intermuscular septum is attached to the medial lip of the linear aspera. The posterior intermuscular septum is poorly defined.

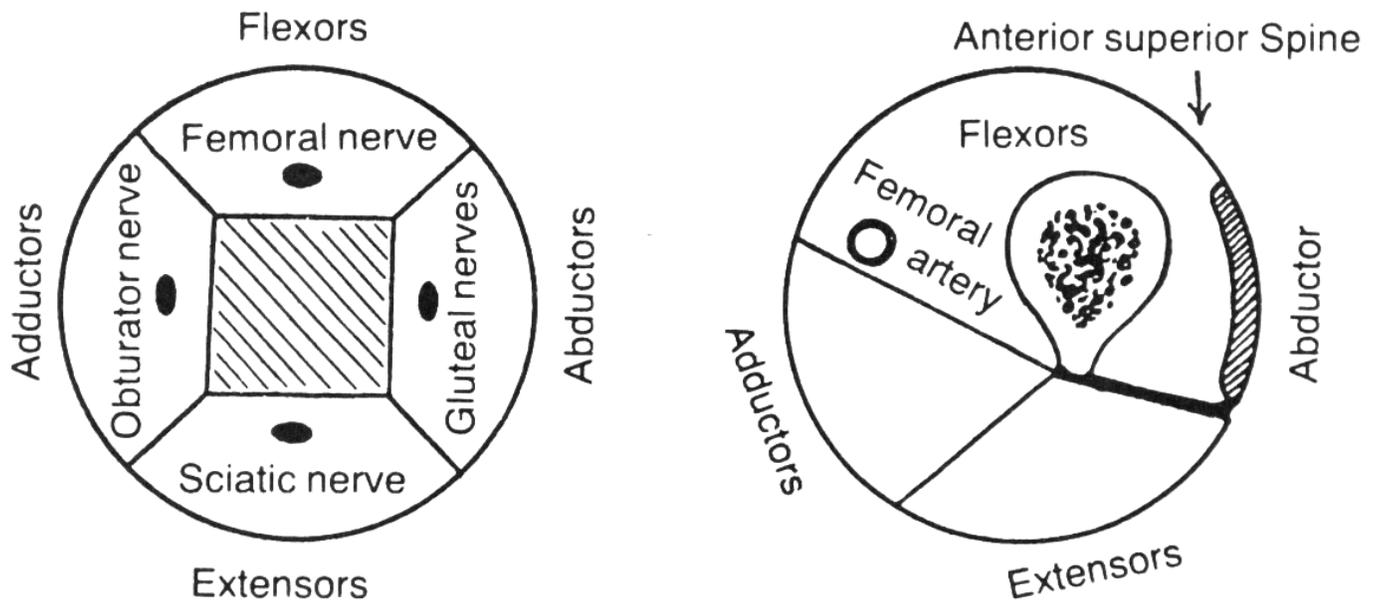


Figure. Organization of the thigh compartments

- The **flexor compartment** anterolaterally contains the **flexors of the hip** (extensors of the knee) supplied by the **femoral nerve**.
- The **adductor compartment** medially contains the **adductors of the hip** supplied by the **obturator nerve**.
- The **extensor compartment** posteriorly contains the **extensors of the hip** (flexors of the knee) collectively known as the **hamstring muscles** supplied by the **sciatic nerve**.

The saphenous opening

This is a virtual aperture on the upper medial part of the front of the thigh measuring 3cm x 1.5cm and lying 3-4 cm inferolateral to the pubic tubercle. It is covered by a thin perforated part of the fascia lata called the **cribriform fascia** and is related posteriorly by the **femoral sheath**. From the pubic tubercle laterally, the margin of the opening is thickened and crescentic and is called the **falciform ligament**.

- Structures that pass through the cribriform fascia into the saphenous opening are;
- The **great saphenous vein** draining into the femoral vein.

- **Efferent lymph vessels** from the superficial to the deep inguinal lymph nodes.
- Structures that pass through the cribriform fascia out of the saphenous opening are the three superficial branches of the femoral artery;
 - The **superficial external pudendal artery**.
 - The **superficial epigastric artery**.
 - The **superficial circumflex iliac artery**.

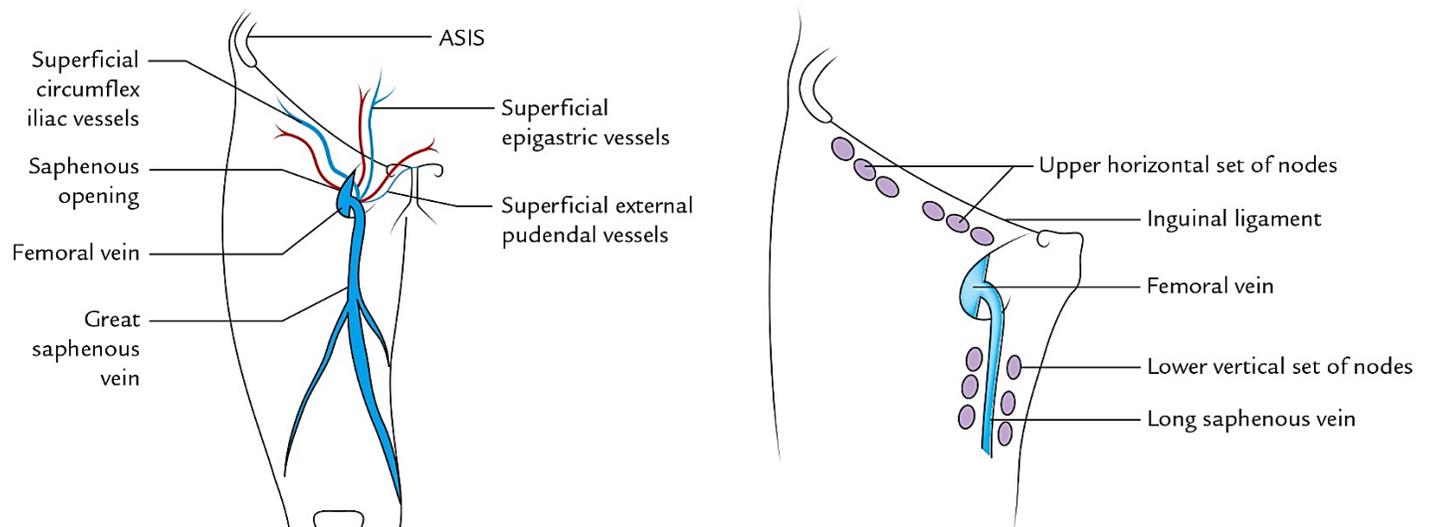


Figure. The saphenous opening & superficial inguinal lymph nodes

The fascia lata is attached to the undersurface of the inguinal ligament. When the thigh is extended, it pulls the abdominal wall downward and makes it tense. Therefore, in order to relax the abdomen (for palpation of abdominal contents) the patient is asked to draw the legs up to overcome the pull of the fascia lata on the abdominal wall.

The inguinal lymph nodes [figure above]

These are divided into superficial and deep groups.

The superficial inguinal lymph nodes

These nodes lie in the superficial fascia and have a T-shaped arrangement with a horizontal group parallel to and below the inguinal ligament, and a vertical group around the upper part of the great saphenous vein. The superficial inguinal lymph nodes drain lymph from the following areas;

□ The trunk below the level of the umbilicus including the perineum, the anal canal, the lower vagina and urethra and the external genitalia and scrotum with the exception of the testes (drained to the lumbar nodes) and glans penis (drained to the deep inguinal nodes).

□ The fundus and body of the uterus through vessels along the round ligament.

□ The skin and fascia of the whole lower limb except the heel and the lateral side of the foot which drain to the popliteal nodes.

The efferent lymph vessels of the superficial inguinal lymph nodes pass through the cribriform fascia to drain lymph to the deep inguinal lymph nodes.

The deep inguinal lymph nodes

These nodes lie vertically in the femoral triangle along the medial side of the femoral vein. They receive lymph from;

□ **The superficial lymph nodes.**

□ **The glans penis.**

□ **The popliteal nodes.**

□ **The deep structures of the lower limb.**

The efferent lymph vessels of the deep nodes pass along the femoral vessels towards the external iliac nodes in the pelvis.

The femoral sheath

This is a funnel shaped extension of the deep fascia of the anterior and posterior abdominal walls extending for about 4cm into the thigh below the inguinal ligament.

The anterior wall of the sheath is the prolongation of the transversalis fascia; the deep fascia of the anterior abdominal wall.

The posterior wall of the sheath is the prolongation of the iliacus fascia; deep fascia of the posterior abdominal wall. The two walls unite inferiorly forming a pocket from which the femoral vessels emerge. The femoral sheath is divided by 2 septa into 3 compartments;

- The **lateral compartment** contains the femoral artery and the femoral branch of the genitofemoral nerve. The femoral nerve enters the thigh lateral (outside) the femoral sheath.

- The **middle compartment** contains the femoral vein.

- The **medial compartment** is a conical space called the **femoral canal** that contains loose fatty tissue, the efferent lymphatics of the deep inguinal nodes and an occasional lymph node (of Cloquet's).

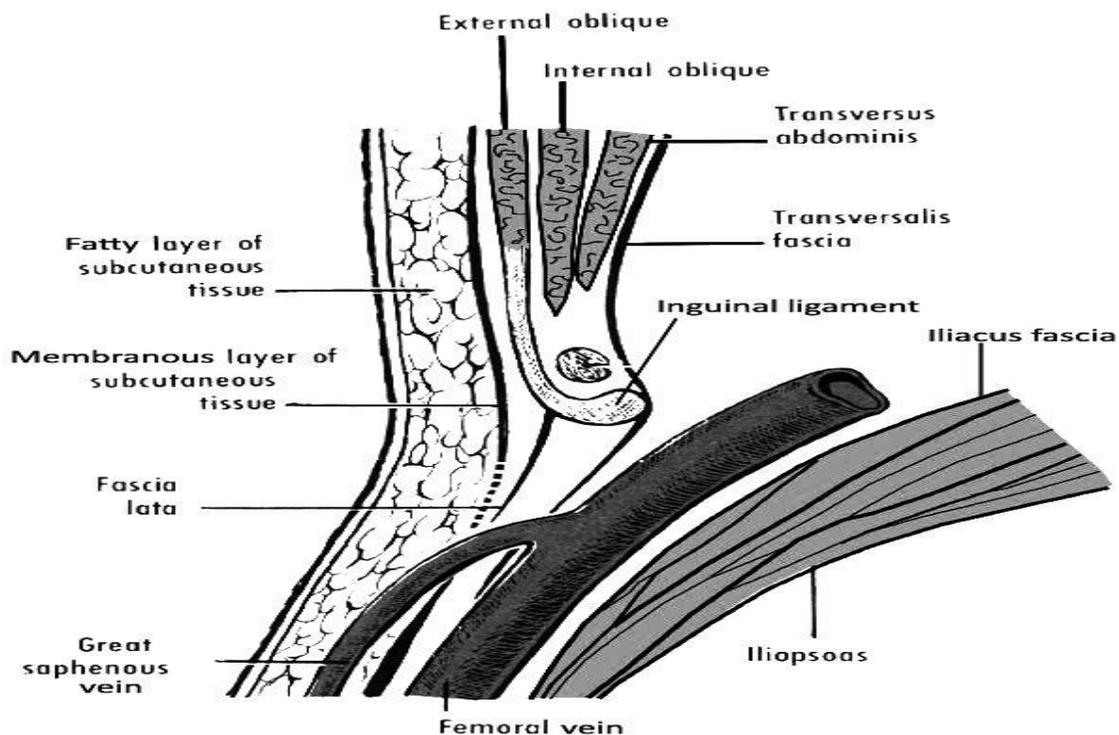
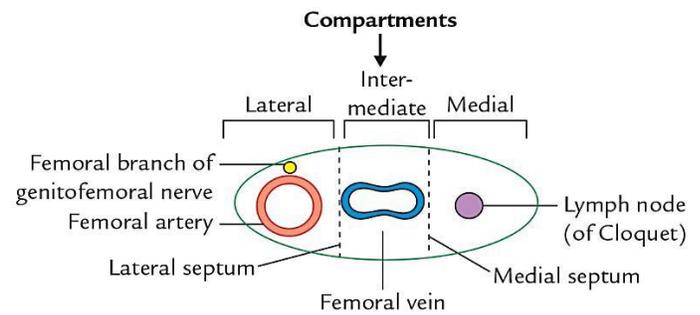
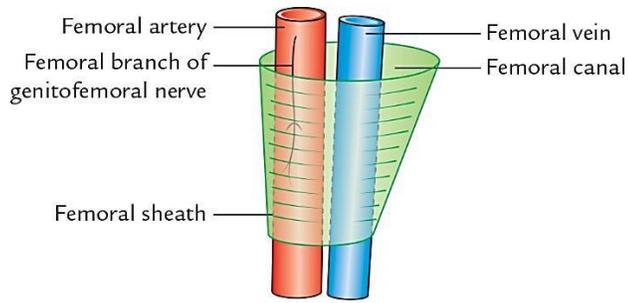


Figure. Sagittal section through the anterior abdominal wall and upper thigh showing the arrangement of musculofascial layers and the walls of the femoral sheath



The femoral canal and femoral hernia

The femoral canal is the short fascial tube of the medial portion of the femoral sheath. The lower end is closed by adhesions of its walls but the upper part; the mouth of the canal; faces the abdominal cavity and is separated from its contents only by the peritoneum. The mouth of the femoral canal is called the **femoral ring** and is bound by;

- **Anteriorly**; the inguinal ligament.
- **Medially**; the sharp crescentic edge of the lacunar ligament.
- **Posteriorly**; the pecten pubis.
- **Laterally**; the femoral vein.

The cribriform fascia and the saphenous opening partly cover the femoral canal anteriorly while the iliacus fascia forms its posterior wall.

***Femoral hernia** is a term applied to the protrusion of an abdominal content; commonly a loop of intestine; with its peritoneal covering into the femoral ring and canal. The abdominal content herniating through the femoral ring forms a hernial sac which bulges anterosuperiorly pushing the cribriform fascia forwards and appearing as a lump inferolateral to the pubic tubercle.*

*Continuous distension of the hernial sac will force it against the tight femoral ring; especially the lacunar ligament; and compromises the blood supply of the hernial content leading to gangrene and tissue death. This condition is known as **strangulation of the hernia** which is a surgical emergency requiring immediate intervention.*