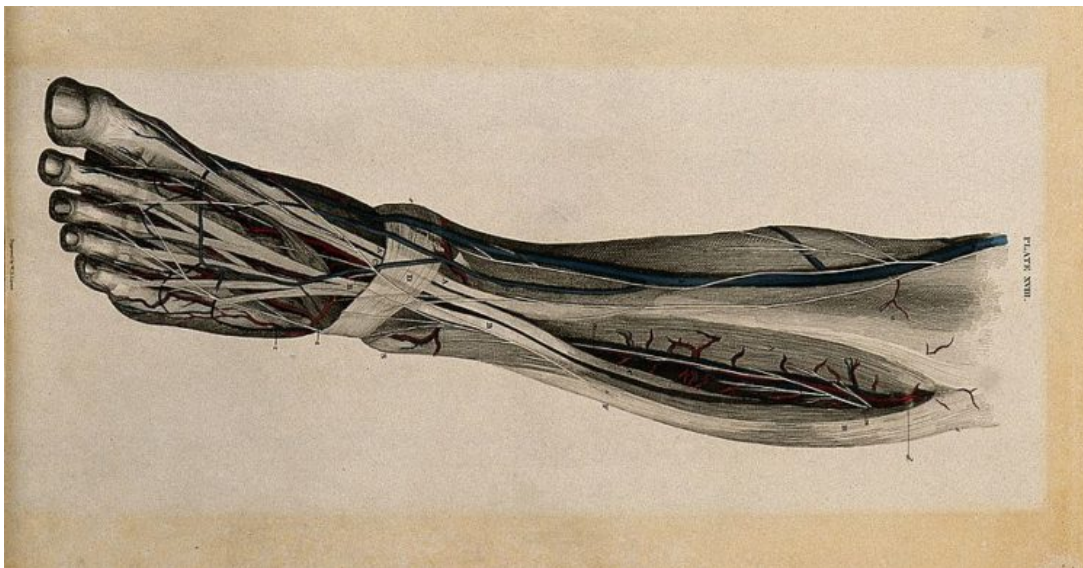


# Venous Drainage and Cutaneous Innervation of the Lower Limb

[See online here](#)

The venous system of the lower limb consists of a superficial and deep system. The superficial veins drain into the deep veins of the lower limb, which eventually drain into the common iliac vein and inferior vena cava. This article also provides information about the cutaneous innervation (dermatomes) of the lower limb.



## Diseases of the Venous System of the Lower Limb

The deep veins of the lower limb are clinically important because they have higher pressure compared to the superficial veins. Valves prevent the backflow of the blood from deep veins into the superficial veins. If these valves malfunction, this may lead to a backflow of blood from the deep veins into the superficial veins. This backflow causes swelling of the superficial veins and pain. The condition is known as 'varicose veins'.

Similarly, if a thrombus is formed in the deep veins, it is called **deep vein thrombosis (DVT)**. DVT becomes **life-threatening** if the thrombus is dislodged and travels to the right side of the heart via the **inferior vena cava**. It then enters the **pulmonary circulation** and can block pulmonary arteries, which is called **pulmonary embolism**.

## Structures of the Lower Limb

The superficial fascia consists of loose connective tissue and fat. It is traversed by several vessels and nerves of the lower limb.

The deep fascia, also known as fascia lata, is made up of dense connective tissues. Its

function is to give strength and stability to the structures of the lower limb by forming muscular compartments. It extends superiorly from the [thigh](#) to become the inguinal ligament and inferiorly it continues as the deep fascia of the leg. It is thickened laterally to form the iliotibial tract.

## Deep Venous System of the Lower Limb

The deep veins of the lower limb are present deep to the fascia lata. They accompany the [arterial system of the lower limb](#) and are named accordingly.

The dorsal venous arch present in the foot drains into the anterior tibial veins and the superficial veins.

On the plantar surface of the foot, the deep venous arch is present, which accompanies the deep arterial arch. The deep plantar arch is formed by the lateral and medial plantar veins, which drain into the posterior tibial veins.

The posterior tibial vein runs behind the medial malleolus with the posterior tibial artery. The anterior and posterior tibial veins drain into the popliteal vein.

The fibular vein, which drains the lateral compartment of the leg, also drains into the popliteal vein.

The popliteal vein along with the [popliteal artery](#), passes through the adductor hiatus of the [adductor magnus muscle](#). It then enters from the posterior compartment into the anterior compartment of the thigh. Here, it becomes the femoral vein.

The femoral vein runs upwards in the thigh where it receives the deep profunda femoris vein. The lateral and medial circumflex femoral veins drain into the profunda femoris. The profunda femoris vein has many perforating branches, similar to the profunda femoris artery.

The femoral vein passes beneath the inguinal ligament and becomes the external iliac vein. The external iliac vein together with the internal iliac vein drains into the common iliac vein.

## Superficial Venous System of the Lower Limb

The superficial venous system consists mainly of two large veins namely the great saphenous vein and small saphenous vein.

The small saphenous vein arises from the lateral aspect of the dorsal venous arch. It passes behind the lateral malleolus, ascends behind the leg and finally joins the popliteal vein behind the [knee joint](#).

The great saphenous vein arises from the medial aspect of the dorsal venous arch. It runs in front of the medial malleolus and remains medial in its entire course. It finally drains into the femoral vein by piercing the deep fascia of the thigh. Perforating veins are also present. They drain blood from the great saphenous vein into the deep venous system.

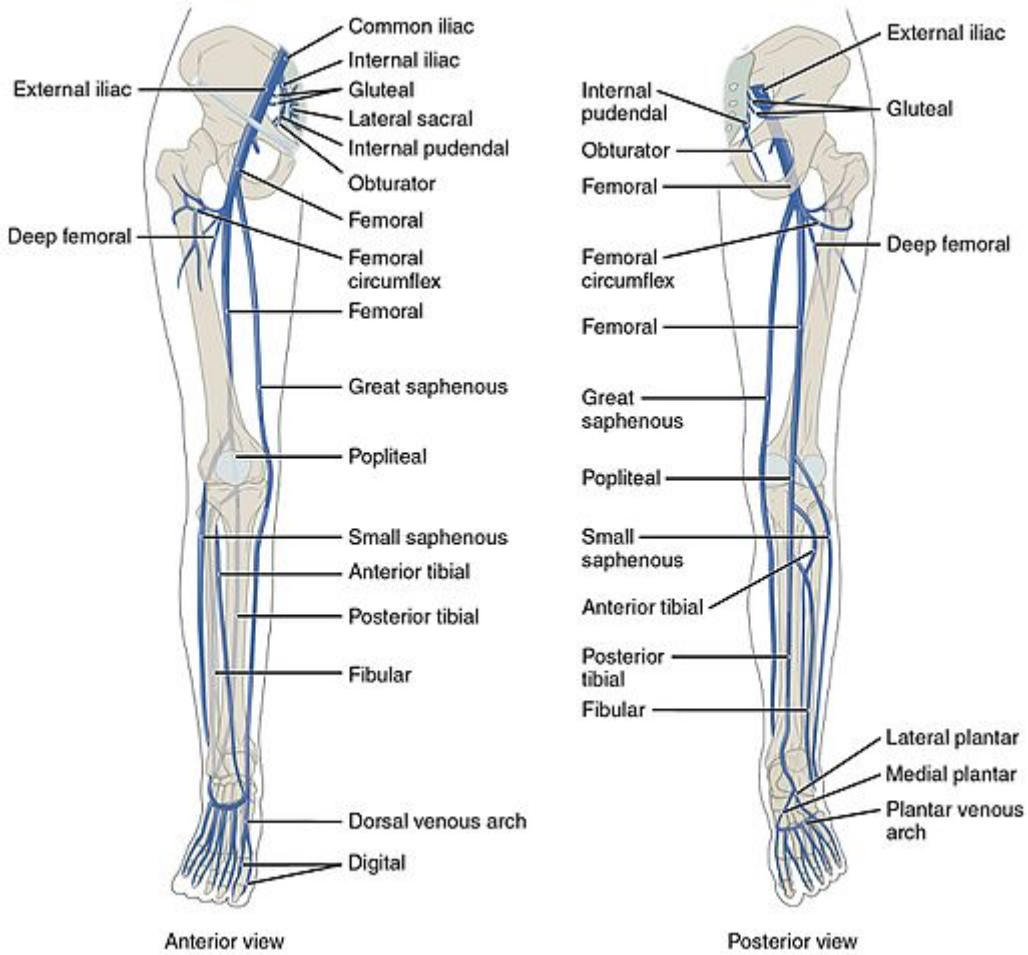


Image: An overview of the venous drainage of the lower limb. By OpenStax College, License: [CC BY 3.0](https://creativecommons.org/licenses/by/3.0/)

## Cutaneous Innervation of the Lower Limb

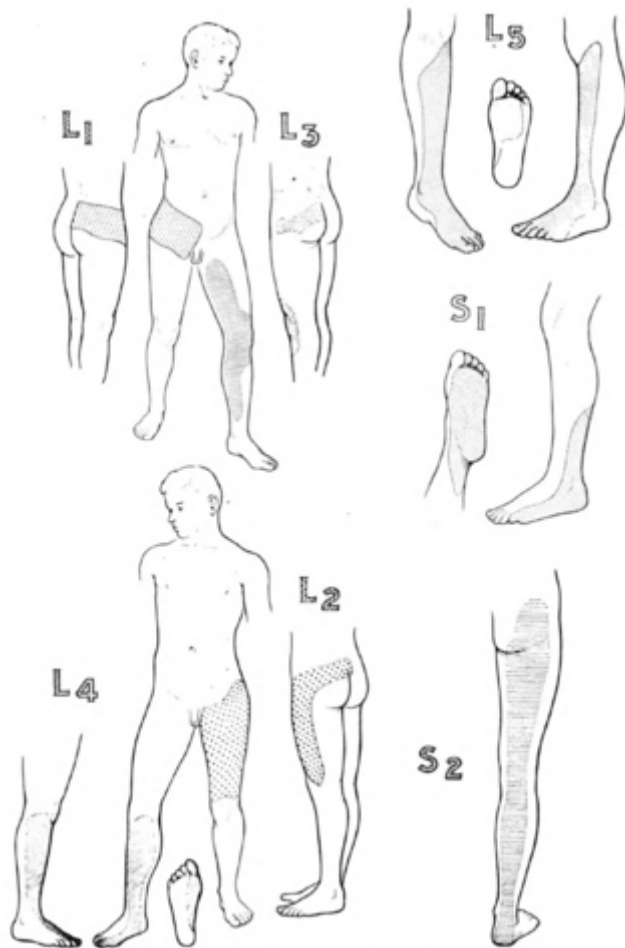
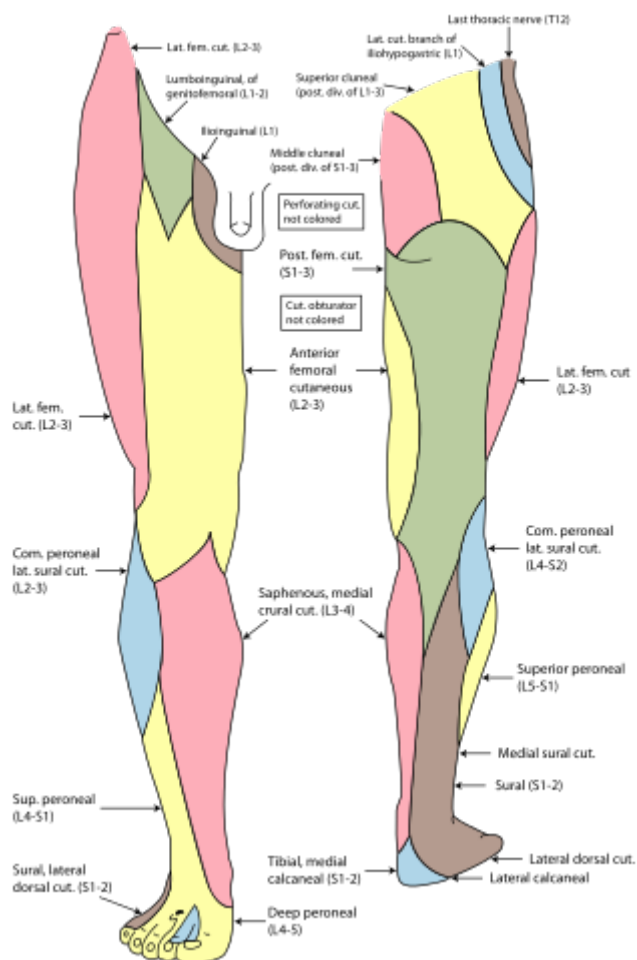


Image: Dermatomes of the lower limb. By Grant, John Charles Boileau, License: Public Domain

An area of the skin that is supplied by a single spinal nerve is known as a dermatome. This dermatome distribution allows the clinical examination of the sensory system that includes pain, touch, temperature, and vibration. In the event of neurological injury, the site of the lesion can be localized, using the dermatomal map.

The dermatomes of the lower limb are mainly supplied by the spinal nerve roots L1-S5. The dermatomes typically form longitudinal bands on the surface of the skin, as shown in the figure at the side. Notice that the L1-L5 nerve roots innervate the anterior surface while S1-S5 innervate the posterior surface of the leg.

These dermatomes are supplied by the cutaneous nerves derived from the lumbosacral plexus. The main peripheral nerves are:



**Image:** The cutaneous nerves of the lower limb. By Henry Vandyke Carter, Henry Gray, modifications made by Fred the Oyster, License: Public Domain

- **Ilioinguinal nerve (L1):** upper medial side of the thigh and perineal region
- **Lumboinguinal nerve (L1-L2):** upper-middle thigh
- **Lateral femoral cutaneous (L2-L3):** lateral thigh
- **Anterior femoral cutaneous (L2-L3):** anterior thigh and knee joint
- **Medial sural cutaneous (L3-L4):** medial aspect of leg
- **Lateral sural cutaneous (L4-S2):** upper lateral aspect of leg
- **Superficial peroneal (L4-S1):** anterolateral aspect of leg
- **Posterior femoral cutaneous (S1-S3):** posterior thigh and knee joint
- **Middle cluneal (S1-S3):** medial aspect of [gluteal region](#)
- **Superior cluneal (L1-L3):** middle aspect of gluteal region
- **Medial plantar (L4-L5):** medial aspect of plantar surface of foot
- **Lateral plantar (S1-S2):** lateral aspect of plantar surface of foot
- **Medial calcaneal (S1-S2):** calcaneal surface of foot

It is important to consider that these dermatomes do not follow a strict border outline and may overlap, as shown in the figure at the side.

## References

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