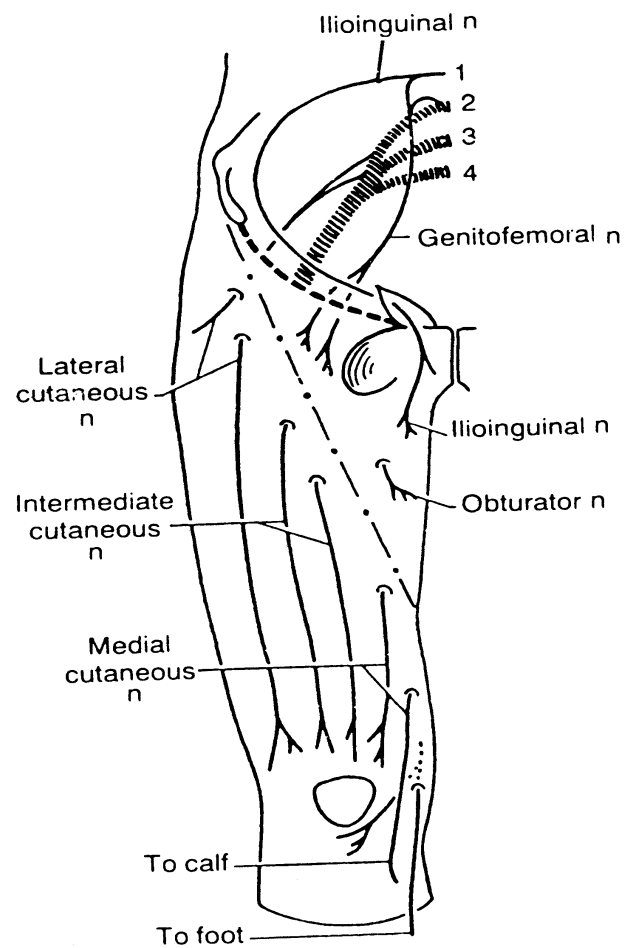
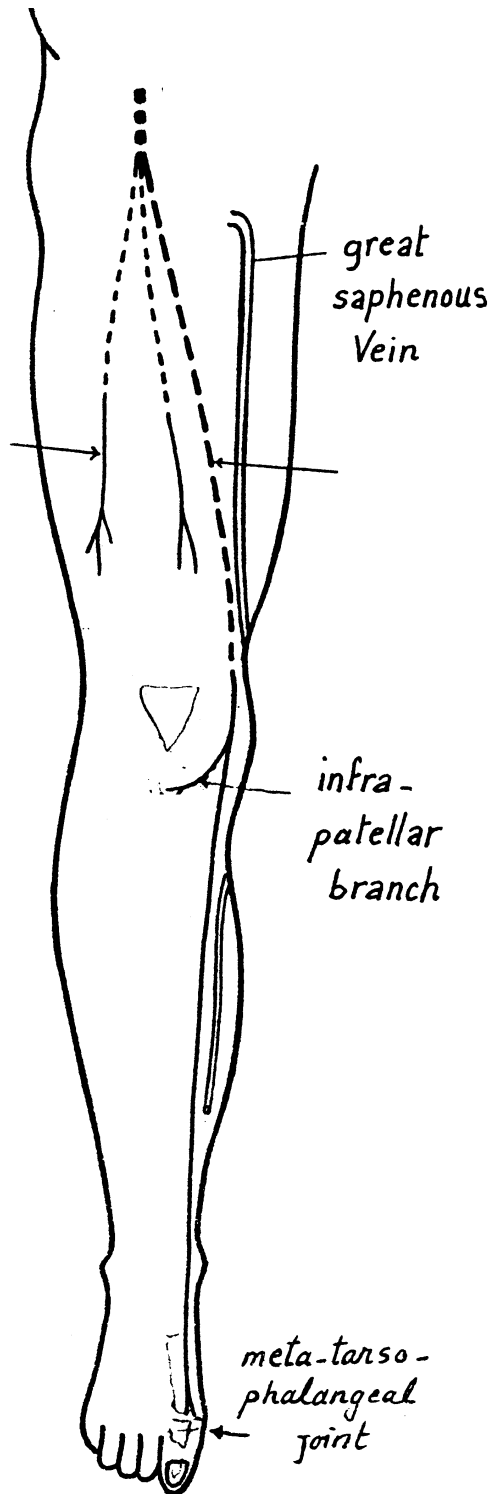


NERVES OF LOWER LIMB

FEMORAL NERVE

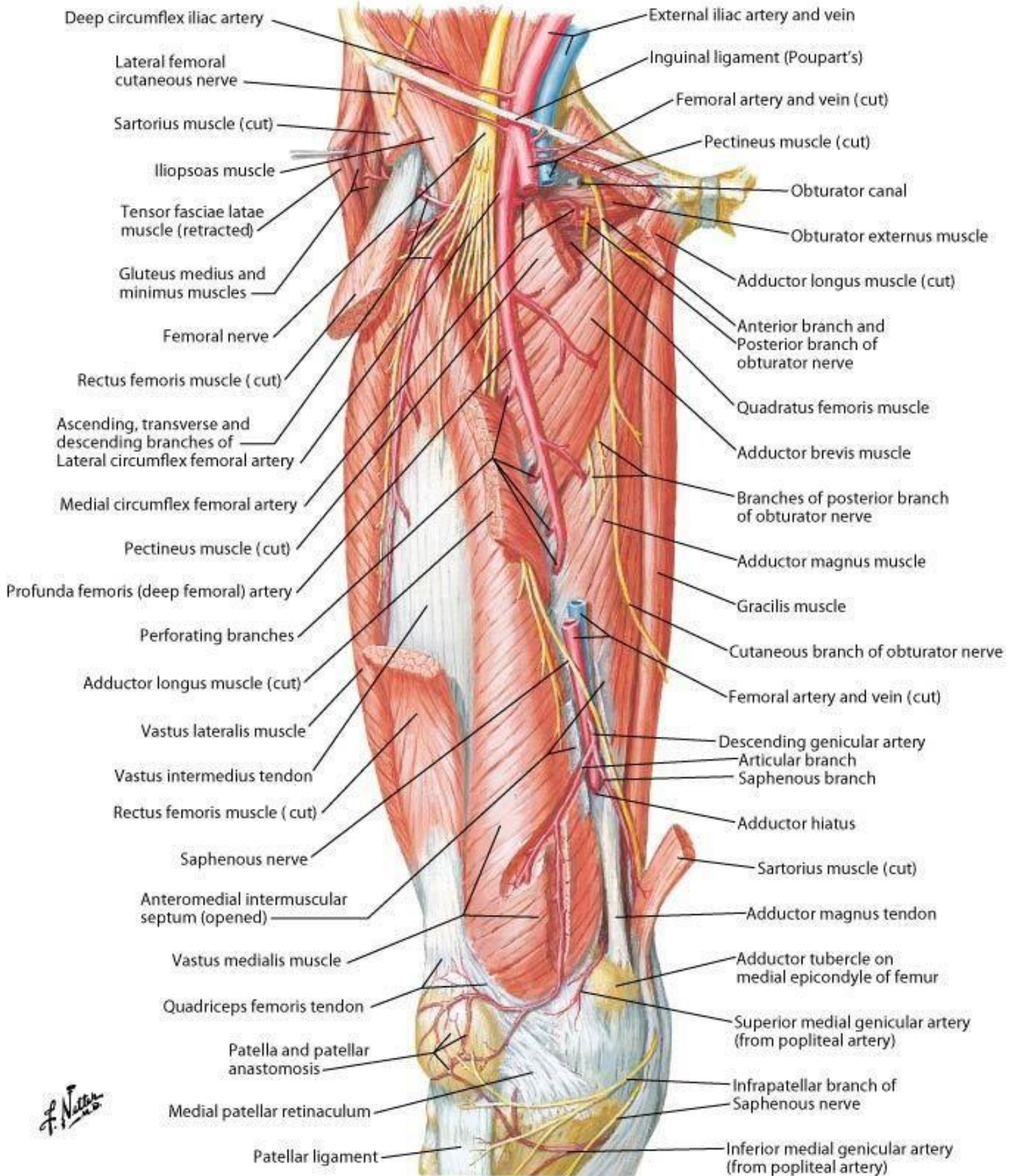
- It begins as a branch of lumbar plexus from *dorsal divisions of anterior primary rami of L2, 3, 4* .
- **It ends** 2 cm below the inguinal ligament by dividing into a number of terminal branches.
- **Important relations :**
 - It appears at the *lateral border of psoas major* muscle between it and the iliacus .
 - It *descends* in the groove *between the two muscles* covered by the fascia iliaca (therefore it lies outside the femoral sheath) .
 - It enters the *femoral triangle* deep to the inguinal ligament and *lateral to the femoral sheath* .
- **Branches:**
 - a) **Muscular:** (iliacus, sartorius, Quadriceps femoris, pectineus).
 - b) **Cutaneous:**
 - Medial & intermediate cutaneous nerve of thigh .
 - **Saphenous nerve :** (it runs on the medial side of leg & foot *with the long saphenous vein* & supplies the over lying skin. It is the *longest nerve* in the body. It can be used as a *nerve graft* . It is liable for *injury* in any operation on long saphenous vein in the region of the foot or leg)
 - c) **Articular:** To hip & knee joints.
- **Effects of injury of the femoral nerve:**
 - 1-Motor effect :** paralysis of the quadriceps muscle leading to ***loss of knee extension.***

2-Sensory effect: loss of sensation on the front and medial sides of the thigh, and on the medial sides of leg and foot.



Cutaneous nerves of the front of the thigh .

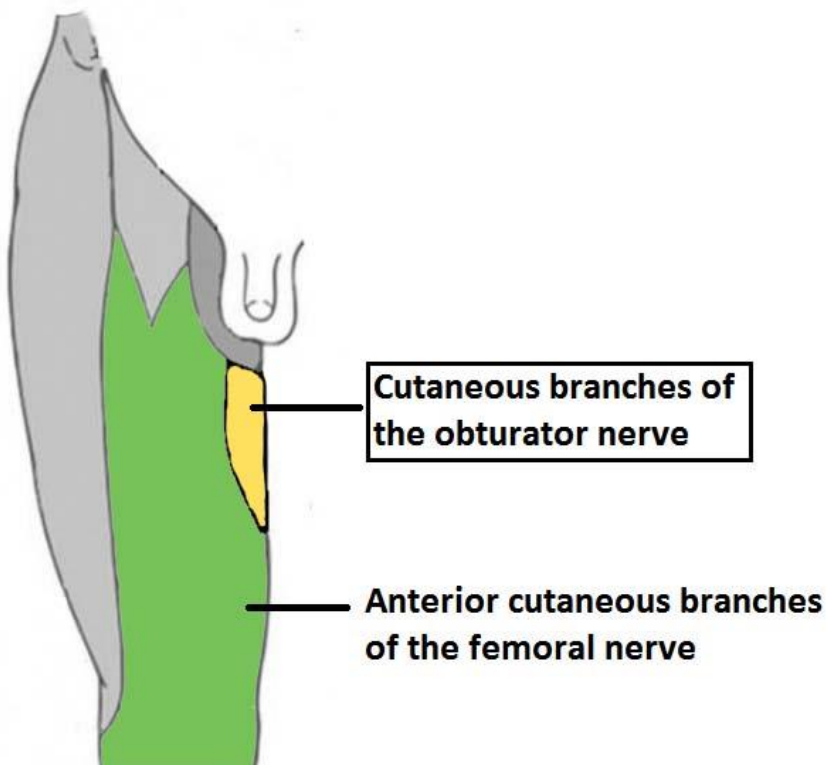
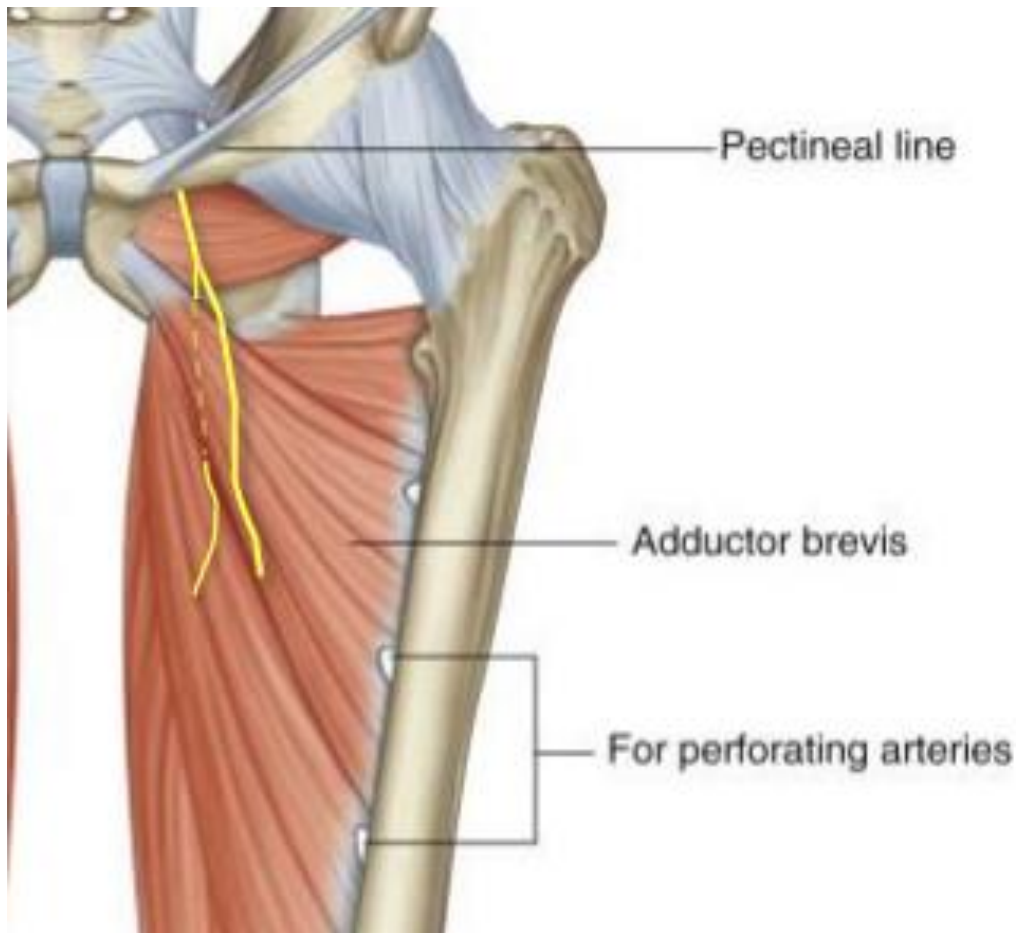
Deep dissection

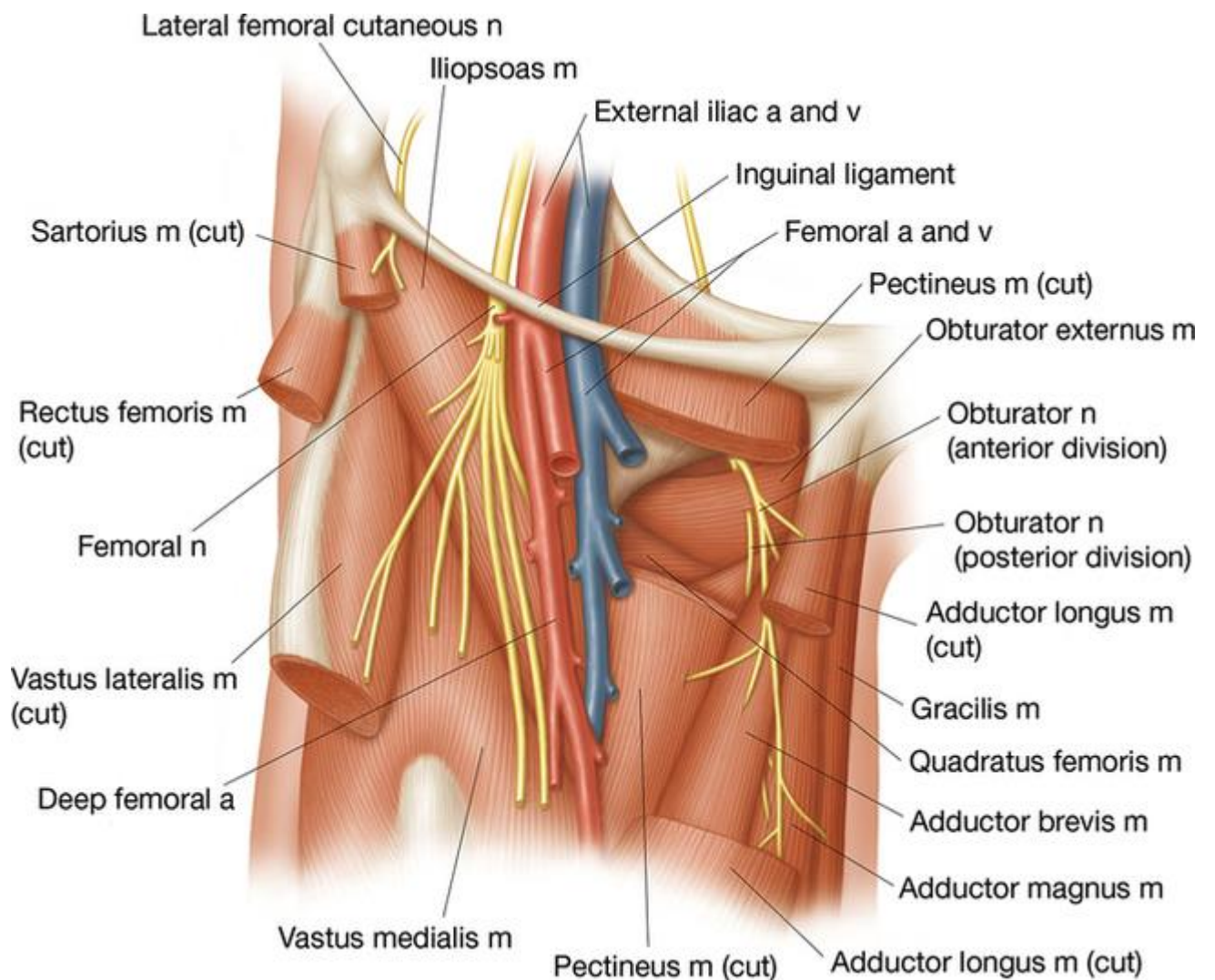
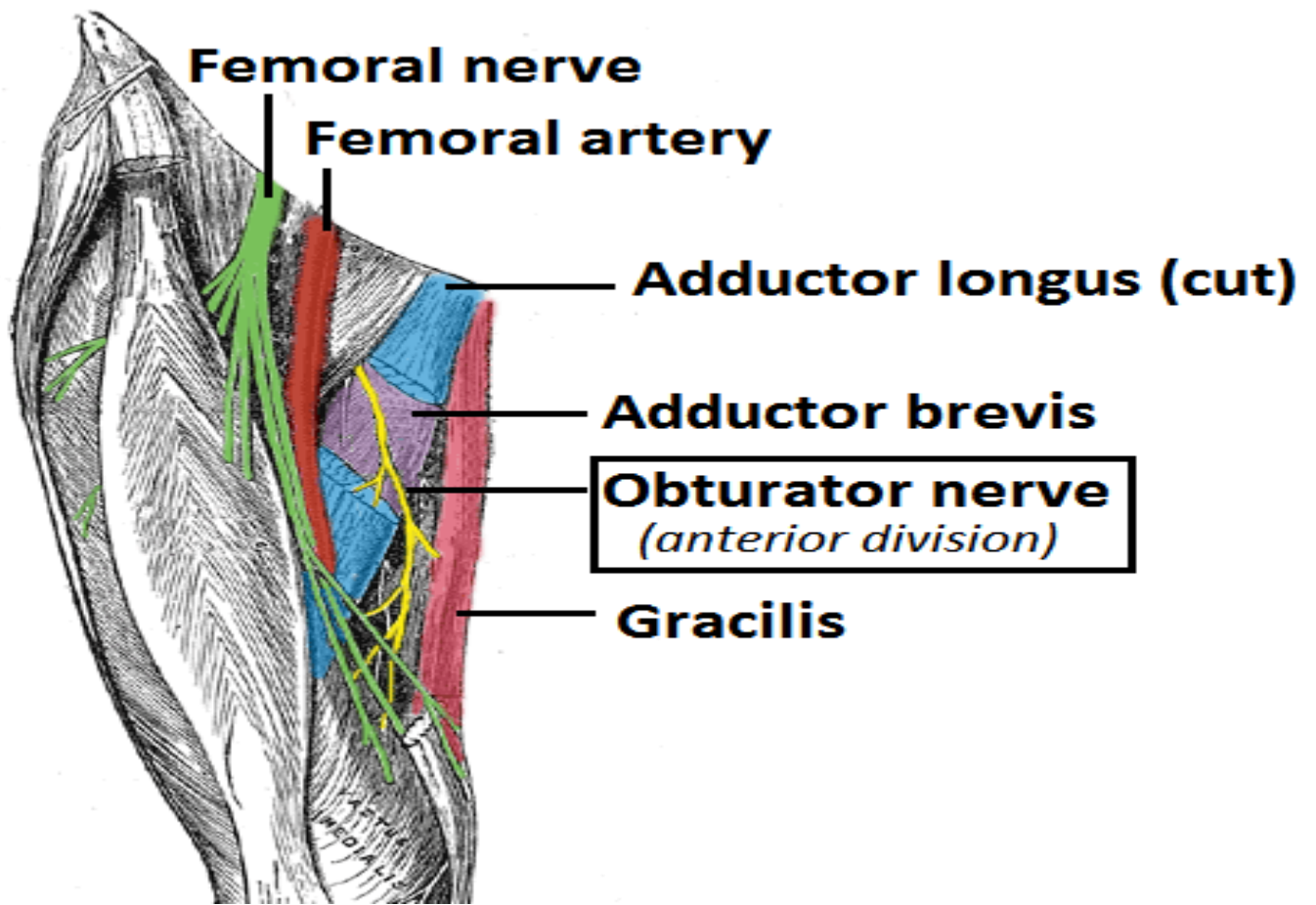


F. Netter

OBTURATOR NERVE

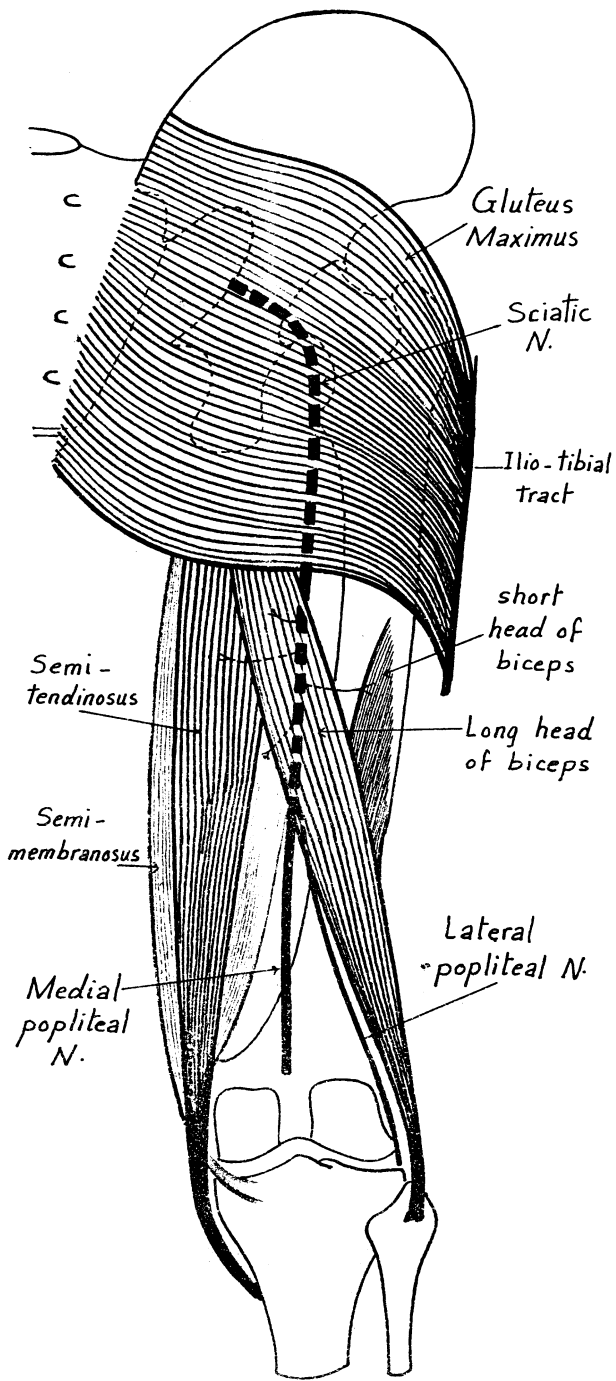
- It begins as a branch of **lumbar plexus** from the ventral divisions of of the anterior primary rami of *L2, 3, 4* .
- **Important relations :**
 - It appears at the *medial side of psoas* major muscle.
 - It descends on the *lateral wall of the pelvis* in company with the obturator vessels.
 - It passes through the *obturator canal* to reach the *medial* compartment of the thigh where it *ends* by dividing into:
 - 1.Anterior division:* passes in *front* of the adductor *brevis* between it and the adductor longus.
 - 2.Posterior division:* passes *behind* the adductor *brevis* between it and the adductor magnus.
- **Branches:**
 - a) **Muscular:** Muscles of **medial** aspect of thigh (except pectineus & ischeal part of adductor magnus.) & **obturator externus**.
 - b) **Cutaneous:** Upper part of medial side of the thigh.
 - c) **Articular:** To hip & knee joints.
- **Effects of injury of the obturator nerve:**
 - 1.Motor effect:* paralysis of medial group of muscle of thigh leading to loss of adduction of hip joint .
 - 2.Sensory effect:* loss of sensation on the upper part of medial sides of the thigh.



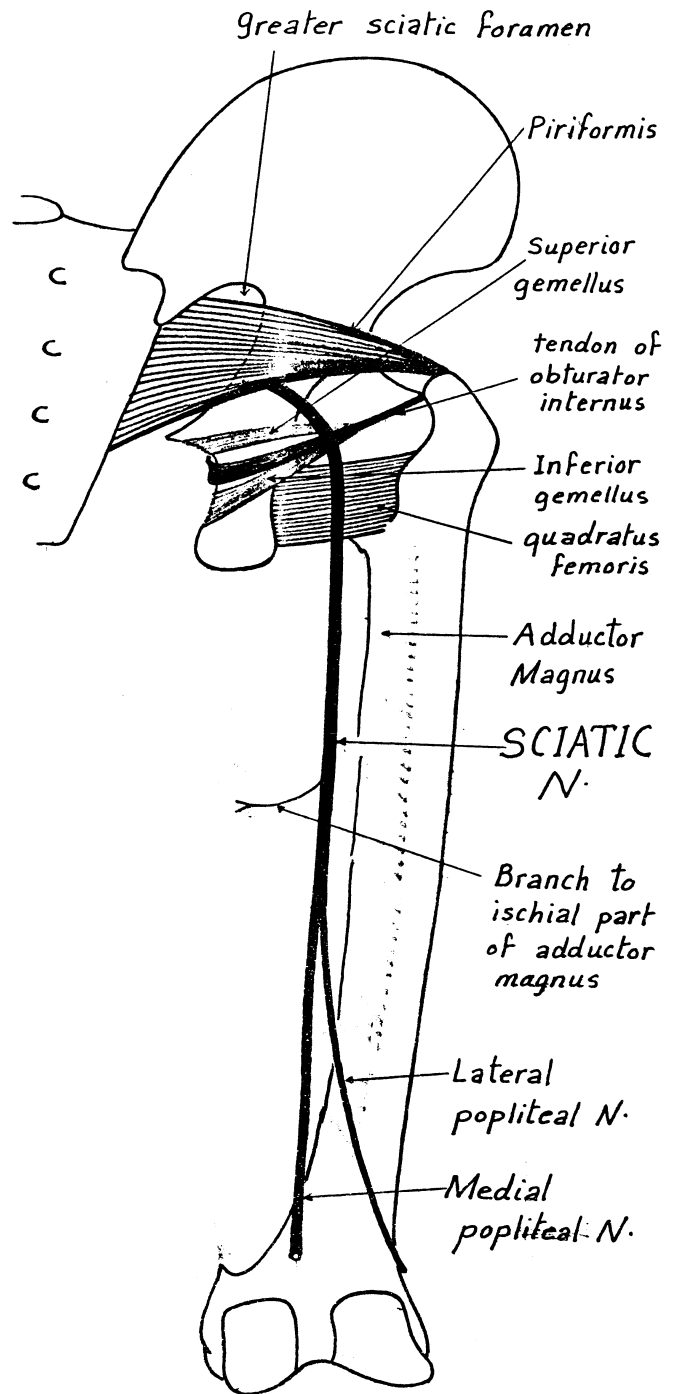


SCIATIC NERVE

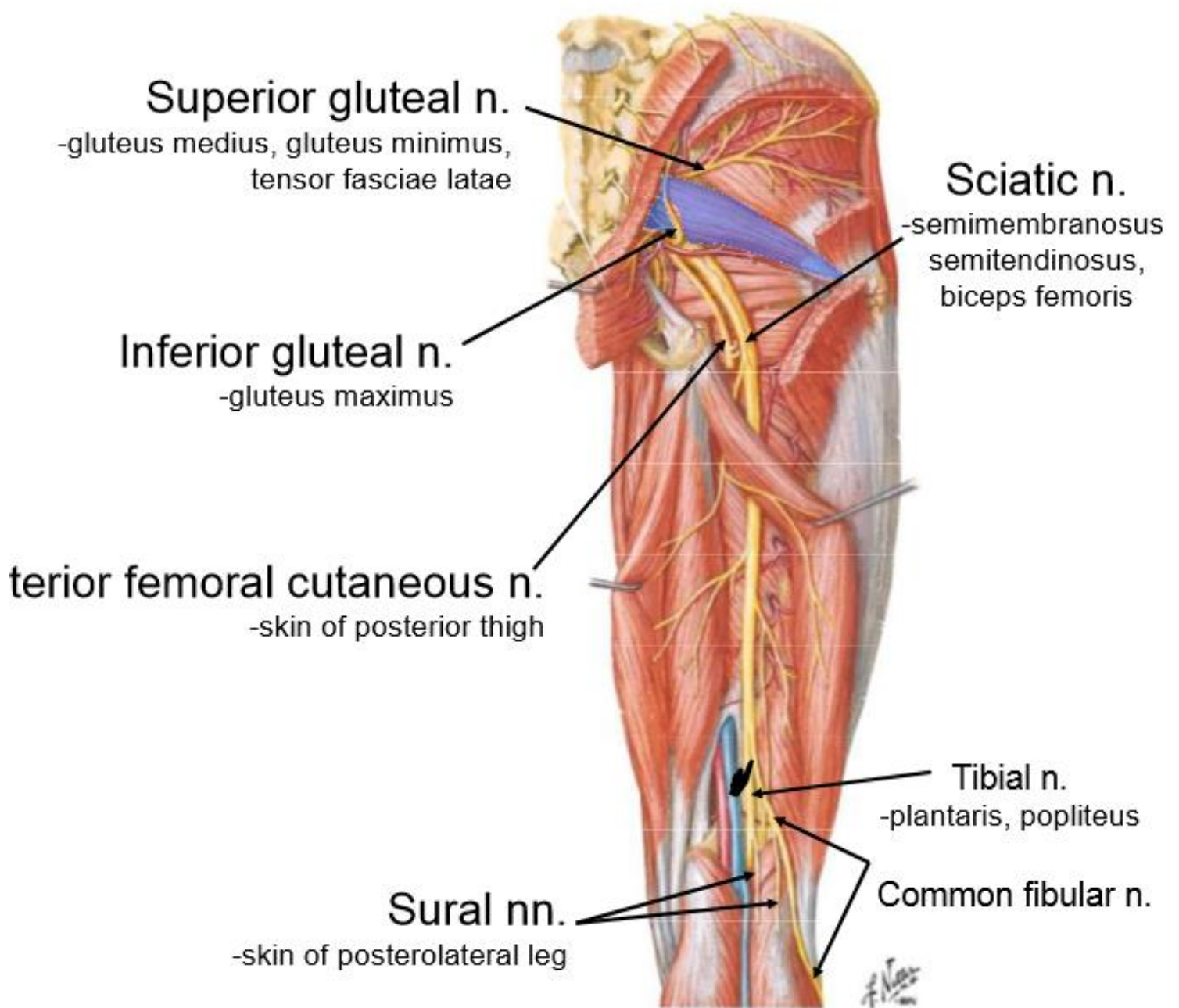
- It is a one of 2 terminal branches of *sacral plexus* arises from the *ventral & dorsal divisions of the anterior primary rami L4, 5 & S1, 2, 3*).
- It is the **thickest** nerve in the body.
- **It ends** at the upper angle of popliteal fossa by dividing into *tibial & common fibular nerves*.
- **Important relations :**
 - It *leaves the pelvis* through the greater sciatic foramen below the piriformis.
 - It runs down in the *gluteal region* & then in the *back of thigh under cover* of gluteus maximus then long head of biceps.
 - It descends to enters the back of the thigh *midway* between the greater trochanter and the ischial tuberosity.
 - *Deeply* it is related to the 6 lateral rotators (except piriformis & obturator externus) then ischeal part of adductor magnus .
 - *It is separated from the back of hip joint by* obturator internus with the two gemelli and the quadratus femoris .
- **Branches:**
 - a) **Muscular** : Hamstrings & ischeal part of add. Magnus .
 - b) **Articular** : to hip joint & knee .



*Sciatic nerve
(superficial relations and branches)*



*Sciatic nerve
(Course, end, and deep relations)*



★ Applied anatomy :

I) Injury of sciatic nerve:

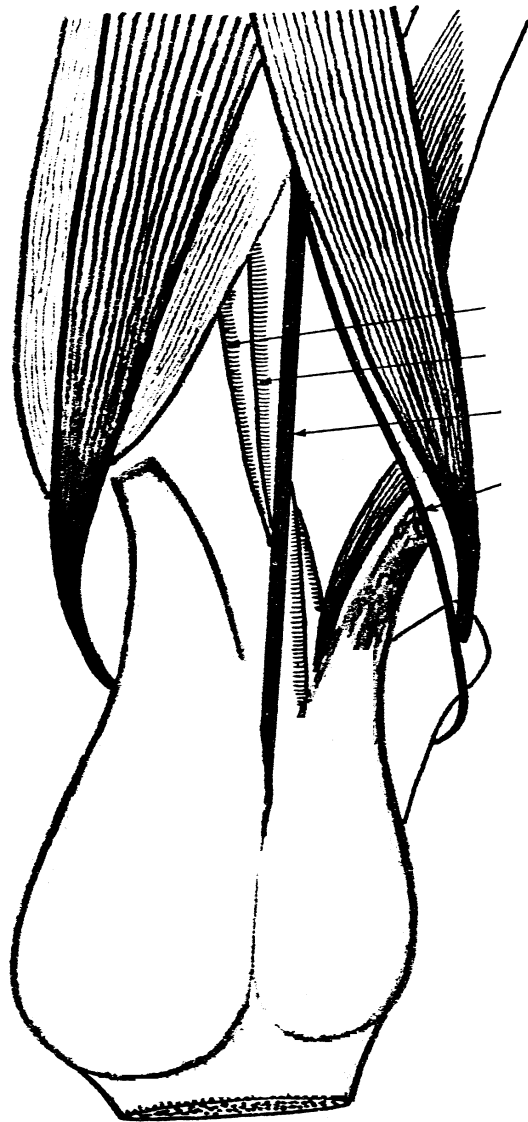
- * **Aetiology** : posterior dislocation of hip joint , fracture neck of femur or wrong intramuscular injection in the gluteal region .
- * **Motor effects**: paralysis of hamstrings and all muscles of leg and foot leading to *foot drop deformity* .
- * **Sensory effects**: loss of cutaneous sensation below the knee in the leg and foot *except* on the **medial side** (supplied by saphenous nerve from femoral nerve) and on the **back of the calf** region (supplied by posterior cutaneous nerve of thigh).

II) Sciatica:

- * It is the *pain* felt along the distribution of the sciatic nerve (from gluteal region to sole of foot) which can be caused by prolapse of an *intervertebral disc* , with pressure on one or more of its nerve roots.
- * Intrapelvic *tumour* pressing on the sciatic nerve or *inflammation* of the nerve can cause sciatica.

III) Any disease in the hip joint may appears by pain in the knee and vice versa because both joints have same nerve supply from femoral , obturator and sciatic nerves therefore *both joints should be examined* in any complaint in the hip or knee joints .

1V) A *small artery passes* inside the sciatic nerve , this artery should be ligated during above knee amputation but no nerve fibres should be included in the ligation.



Popliteal artery

Popliteal vein

Tibial nerve

**Common peroneal
nerve**

Contents of popliteal fossa

TIBIAL NERVE

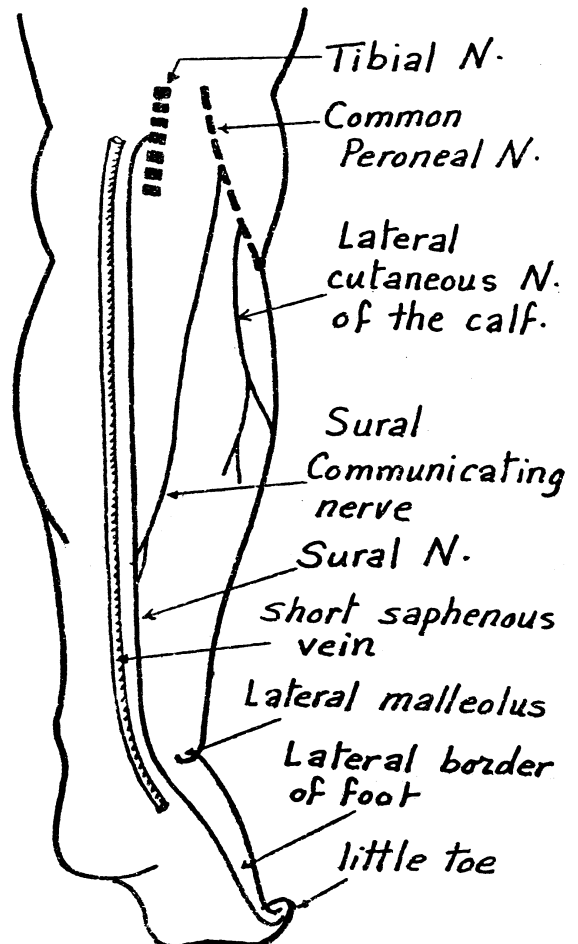
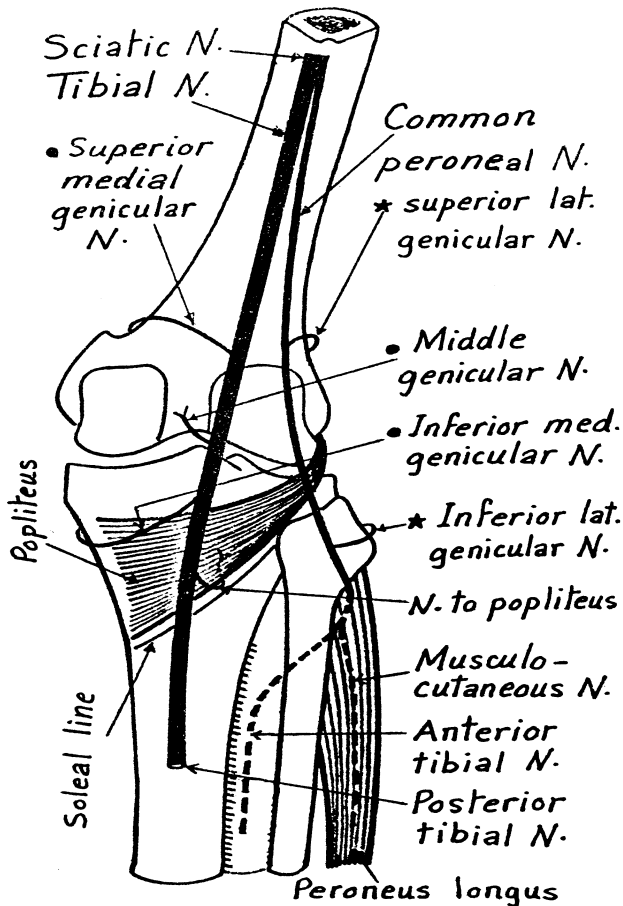
(MEDIAL POPLITEAL nerve)

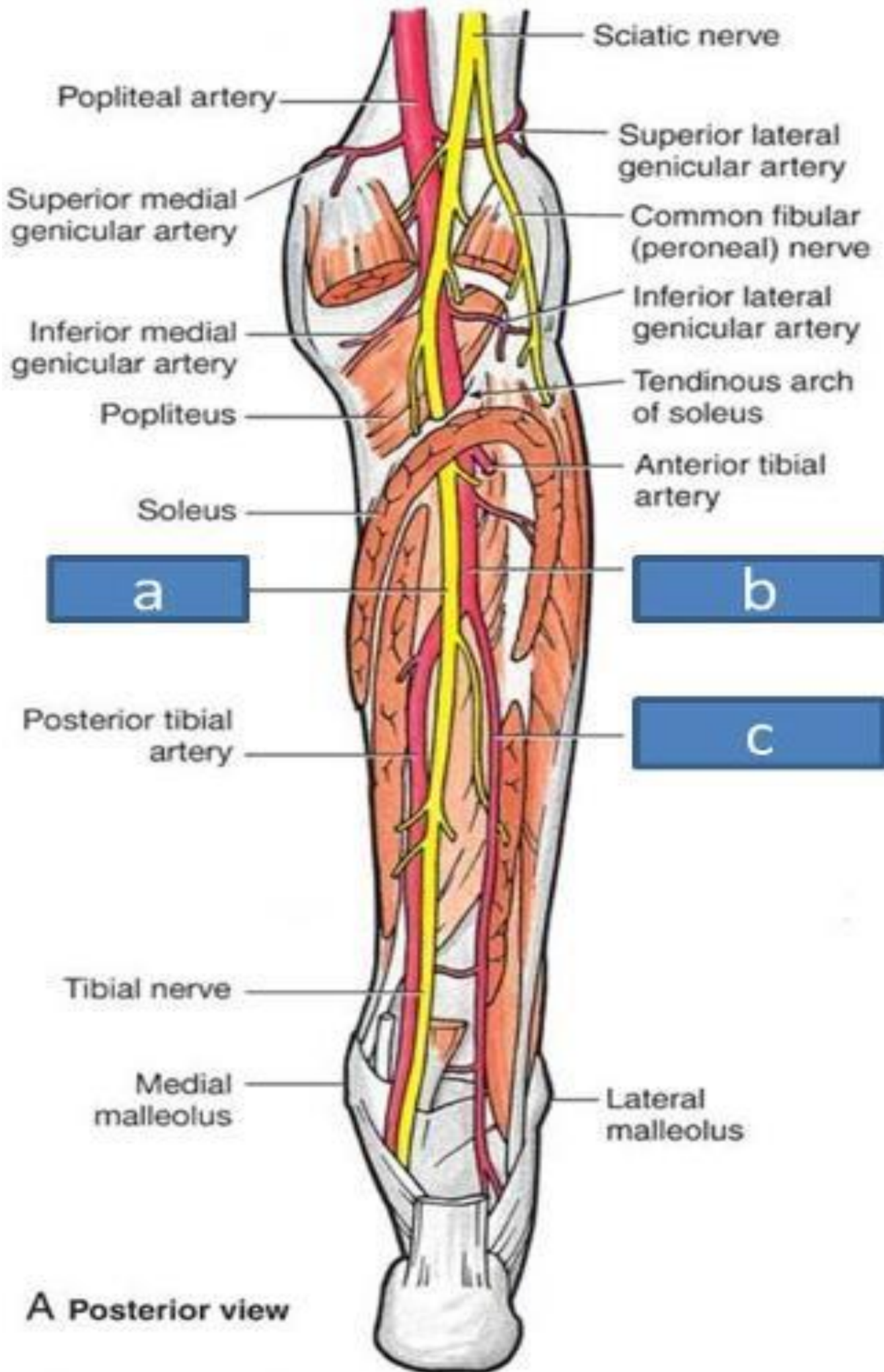
- It **begins** at the upper angle of popliteal fossa as the larger of 2 terminal branches of sciatic nerve .
- It **ends** deep to flexor retinaculum by dividing into medial and lateral plantar nerves .
- **Important relations :**
 - It traverses the *popliteal fossa* (from the upper to lower angle).
 - It descends vertically, *superficial to the popliteal vessels* and crossing them from *lateral to medial* with the vein intervening between the nerve and the artery throughout its course.
 - It pass superficial to *popliteus muscle* then enter the back of the leg deep to the *tendinous arch of soleus* muscle .
 - It descend *deep in the upper 2/3* of back of the leg between tibialis posterior (deep) & soleus (superficial) .
 - In the *lower 1/3 of leg* the nerve is superficial , lies directly on posterior surface of tibia .
 - The tibial nerve crosses behind the *posterior tibial artery* from medial to lateral (*triple relations*) .
 - It passes deep to flexor retinaculum (**Tom Does Very Nice Hat**)
- **Branches:**
 - a) **Muscular:** All muscles of back of leg .
 - b) **Articular:** Three genicular branches to the knee & branches to ankle joint.
 - c) **Cutaneous :**
 - Sural nerve (it runs in the back of leg & lateral side of foot with short saphenous vein & supplies the skin of back of leg & lateral side of foot).
 - Medial Calcanean branches.

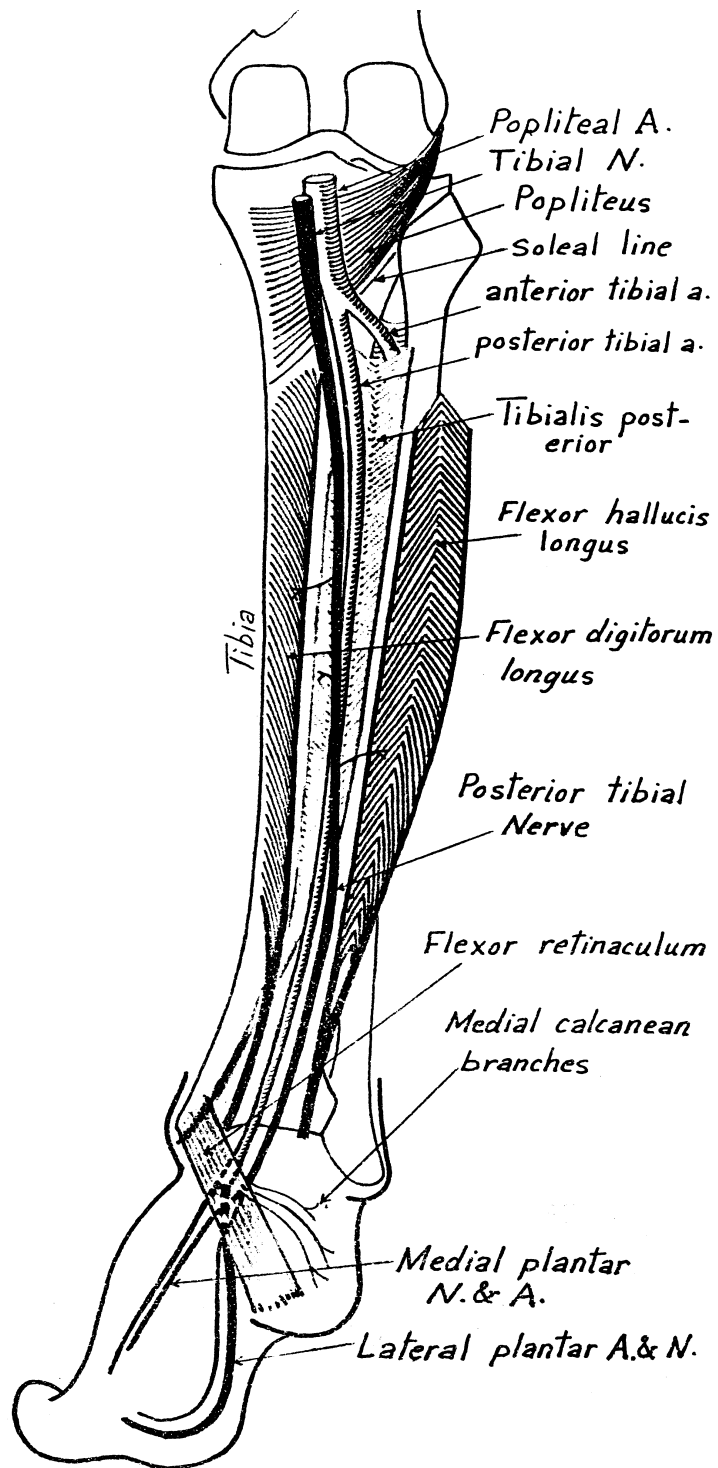
*** Applied anatomy : injury of tibial nerve:**

a) **Motor effects** :paralysis of all muscles of back of leg & sole of foot leading to *talipes calcaneo-valgus deformity* (dorsi-flexion & eversion deformity of the foot).

b) **Sensory effects** : sensory loss in area of skin on the back of the leg and lateral side of the foot (supplied by sural nerve) & sole of foot (supplied by plantar nerves).







Posterior tibial nerve and artery

COMMON FIBULAR NERVE

(common peroneal = lateral popliteal)

- It **begins** at the upper angle of popliteal fossa as the smaller of 2 terminal branches of sciatic nerve .
- It **ends** on the lateral aspect of neck of fibula inside the substance of fibularis longus muscle by dividing into superficial fibular & deep fibular nerves .
- **Important relations :**
 - It *enters* upper angle of the *popliteal fossa* , passes along the *medial border of biceps* .
 - It *leaves* the popliteal fossa at its *lateral angle* by crossing the lateral head of gastrocnemius .
 - It *pierces* the fibularis longus muscle .
- **Branches:**
 - a) **No muscular branches.**
 - b) **Cutaneous:** Sural communicating , lateral cutaneous nerve of calf.
 - c) **Articular:** Two lateral genicular branches to knee joint.

* **Applied anatomy : injury of Common fibular nerve:**

A) **Aetiology :** fracture of head or neck of fibula or pressure from casts or splints.

B) **Motor effects:**

* **Plantar flexion** of foot : due to paralysis of all dorsiflexors (muscles of front of leg).

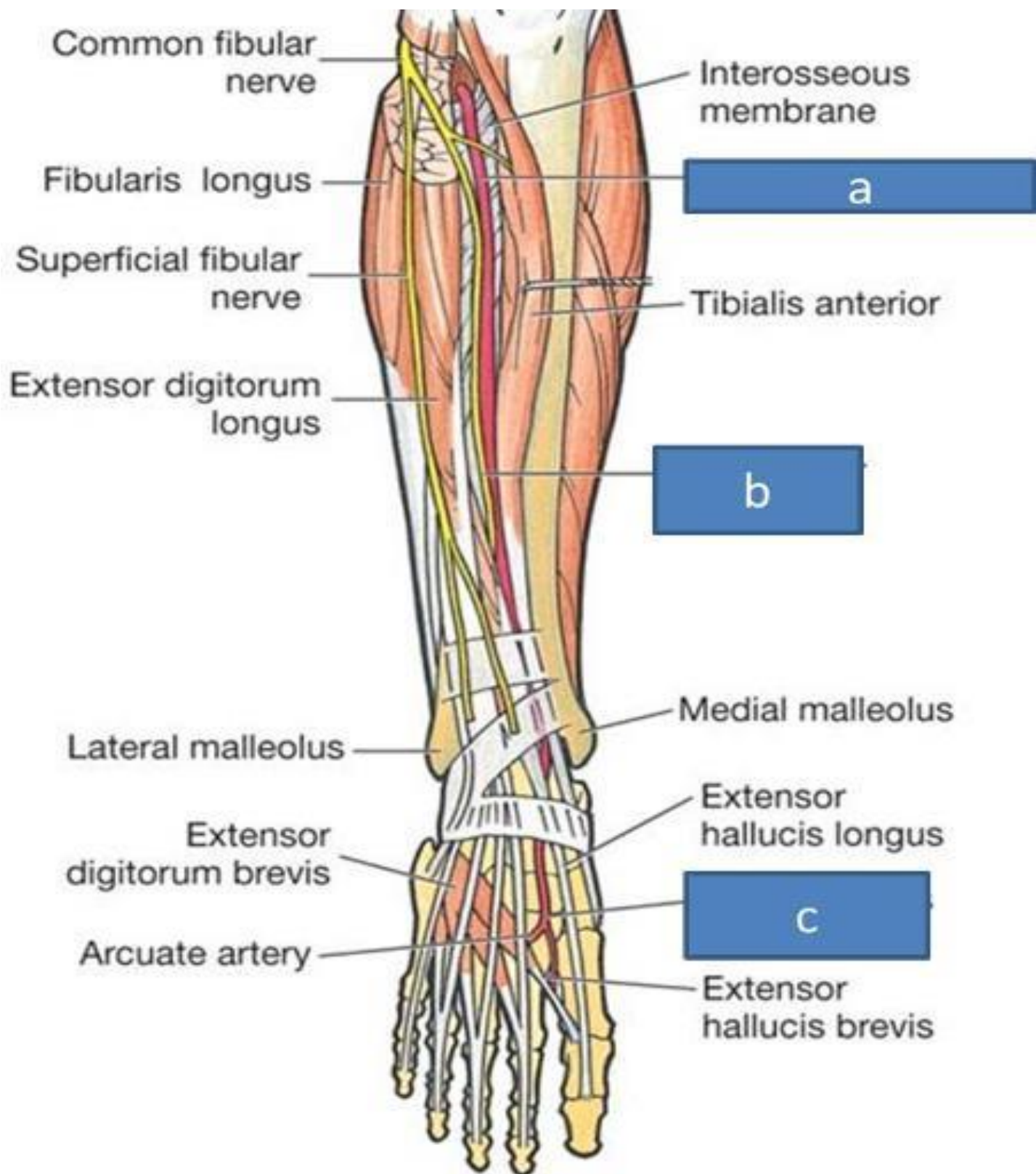
* **Inversion** of the foot : due to paralysis of eversion of foot .

**This deformity is called paralytic talipes equinovarus.*

C) Sensory effects: Loss of skin sensation:

- 1- On the upper lateral side of leg (supplied by lateral cutaneous nerve of calf).
- 2- On the front & lateral part of the lower part of leg and dorsum of foot and 1st cleft (supplied by superficial and deep fibular nerves).





D Anterior view

SUPERFICIAL FIBULAR NERVE

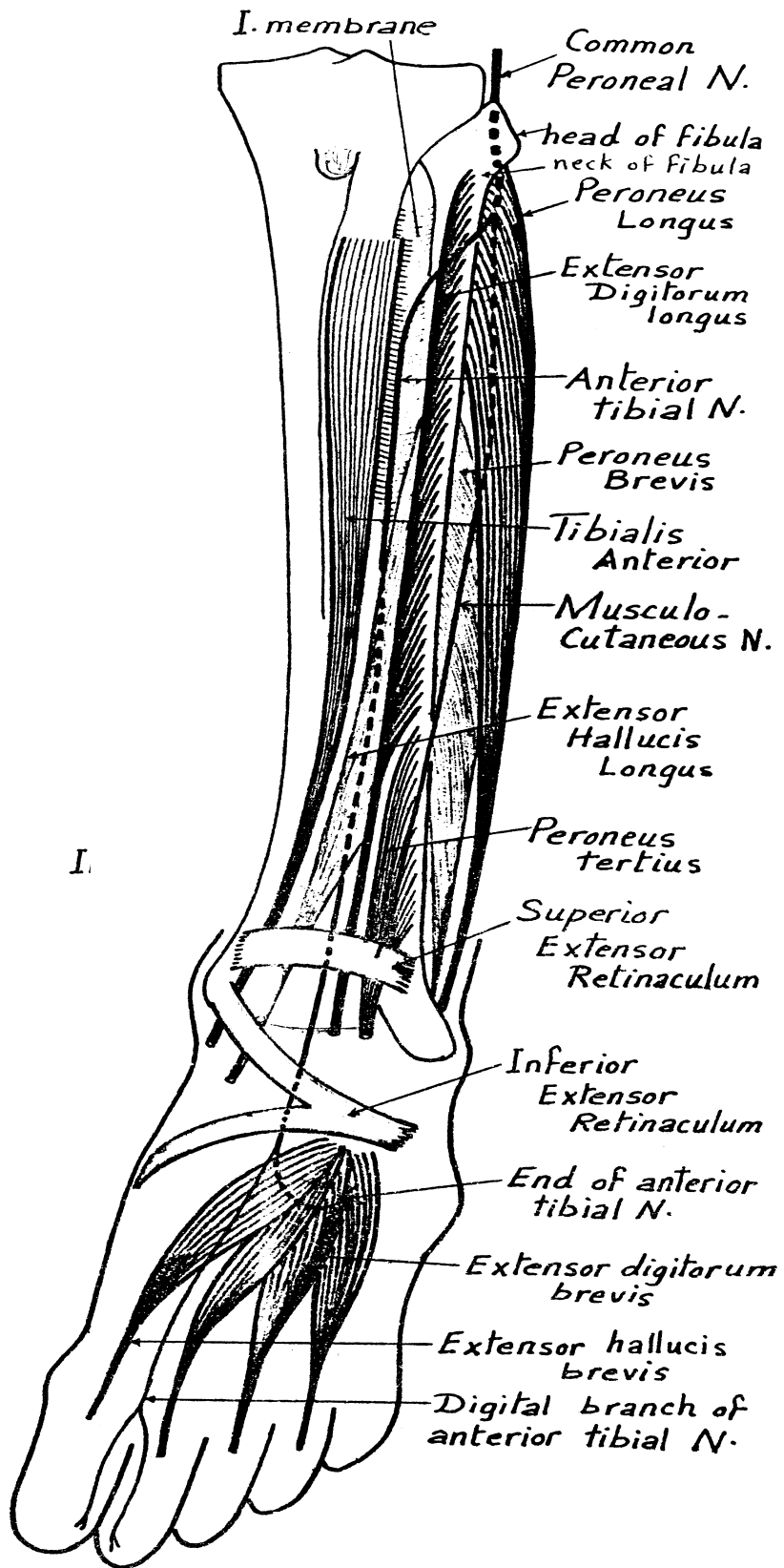
(superficial peroneal = musculo-cutaneous) .

- **It begins** as one of 2 terminal branches of common fibular nerve on the lateral aspect of neck of fibula inside the substance of fibularis longus .
- **It ends** on the dorsum of foot, by dividing into medial and lateral cutaneous branches.
- **Important relations :**
 - **It descends** between fibularis longus & brevis muscles.
 - **In the** lower 1/3 of leg, it pierces the deep fascia and lies in the superficial fascia.
 - It crosses superficial to both extensor retinacula to enter the dorsum of the foot.
- **Branches:**
 - a) **Muscular:** Lateral group of muscles of leg (evertors) .
 - b) **Cutaneous:**
 - Anterior & lateral part of the lower part of leg .
 - Skin of dorsum of foot and toes except:
 - * Cleft between 1st and 2nd toes (supplied by deep fibular nerve)
 - * Lateral side of foot and little toe (supplied by sural nerve).
 - * Medial side of foot as far as the head of 1st metatarsal supplied by saphenous nerve.

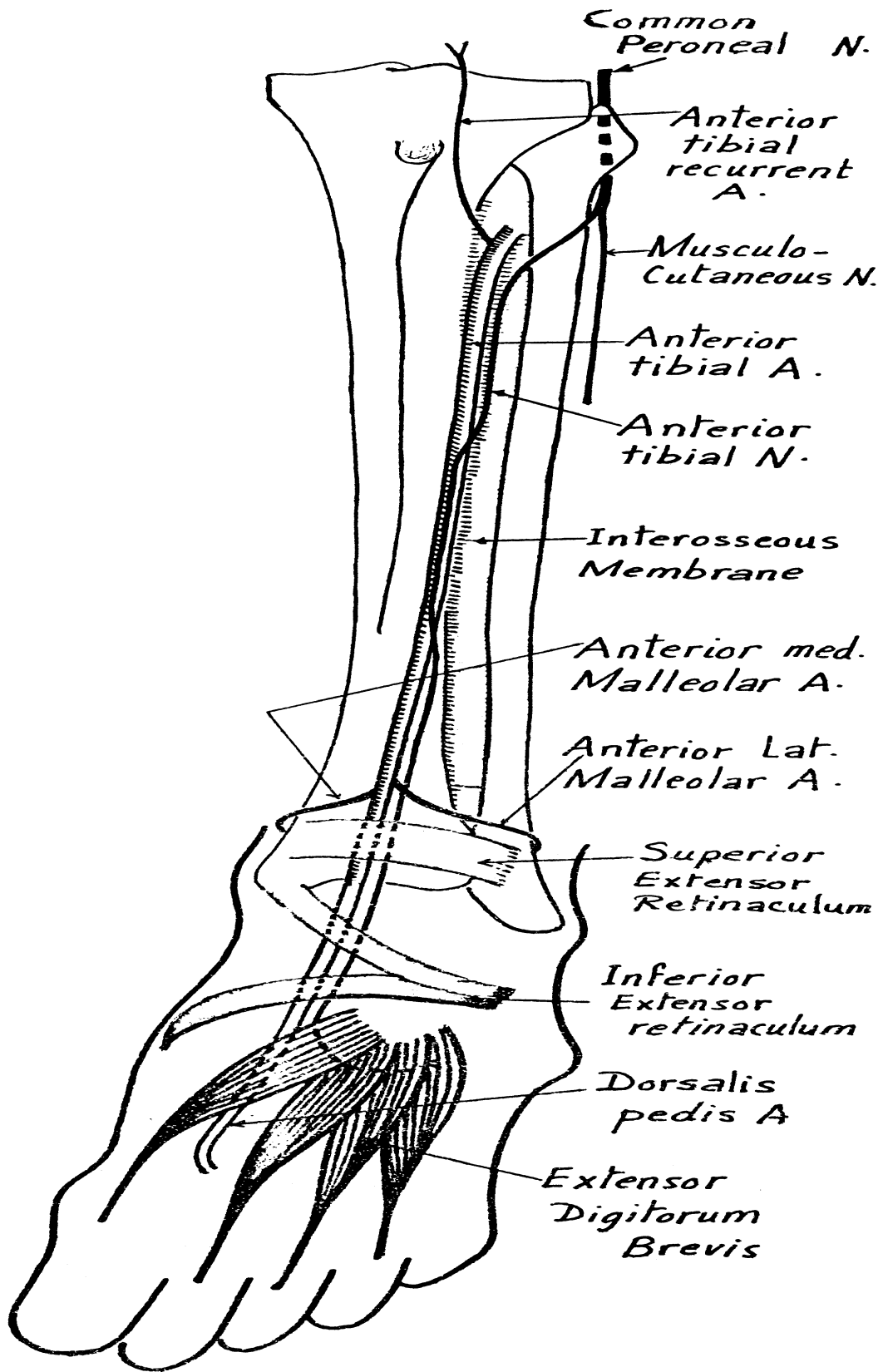
DEEP FIBULAR NERVE

(deep peroneal = anterior tibial nerve)

- **It begins** as one of terminal branches of common fibular nerve on the lateral aspect of neck of fibula inside the substance of fibularis longus .
- It **ends** on the dorsum of the foot by dividing into lateral & medial terminal branches.
- **Important relations :**
 - **It enters** the anterior compartment of the leg by *piercing* the anterior intermuscular septum & extensor digitorum longus .
 - It then *descends deeply* on the interosseus membrane *between* tibialis anterior (medially) and extensor digitorum longus (laterally) *accompanied* by the anterior tibial artery .
 - It lies lateral , anterior then lateral again to the *anterior tibial artery*
 - It passes *in front of the ankle* joint *deep* to the superior & inferior extensor retinaculum to reach the *dorsum of the foot* where it runs lateral to the *dorsalis pedis* artery (Tom Has Very Nice Dog & Pig).
- **Branches:**
 - a) **Muscular:** To the anterior group of muscles of leg (extensors) & extensor digitorum brevis.
 - b) **Articular:** To ankle joint & joints of foot.
 - c) **Cutaneous:** To skin of 1st cleft.



Superficial and deep fibular nerves



Deep fibular nerve & anterior tibial artery