

Brachial Plexus & Lumbosacral Plexus

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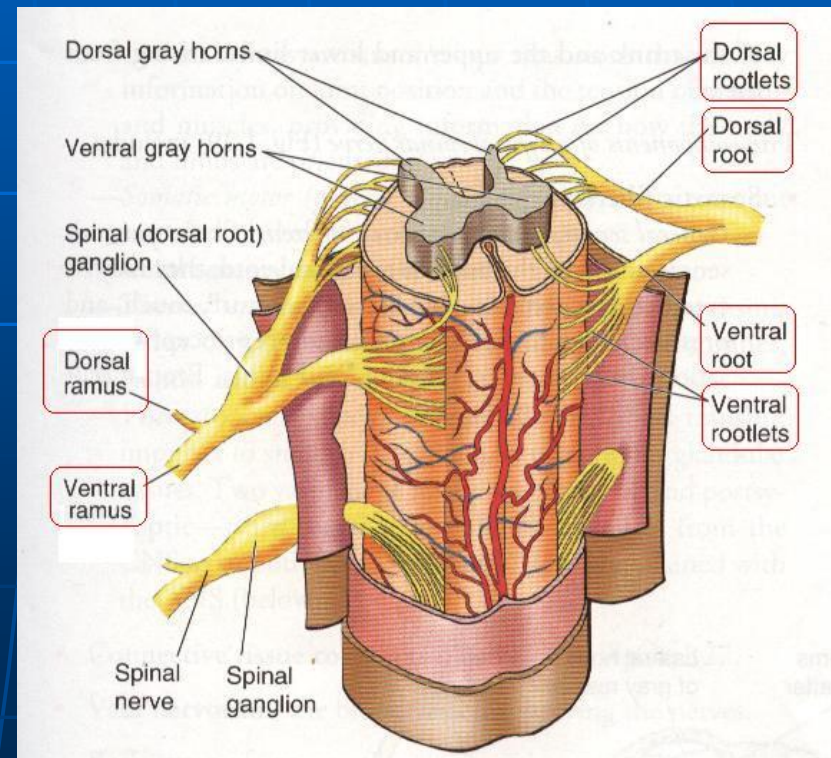
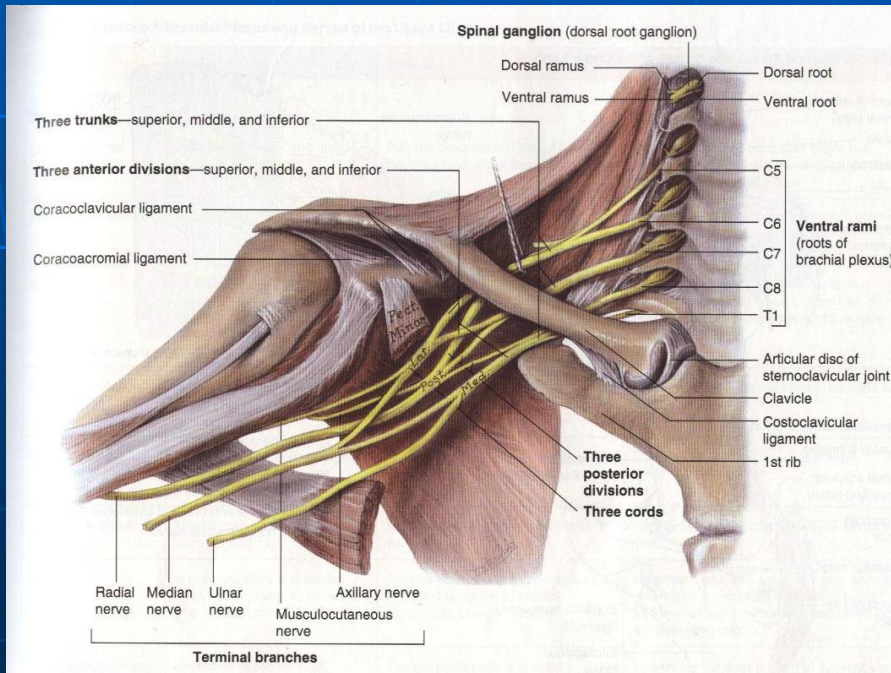
Dr. Sanaa Alshaarawy

Objectives

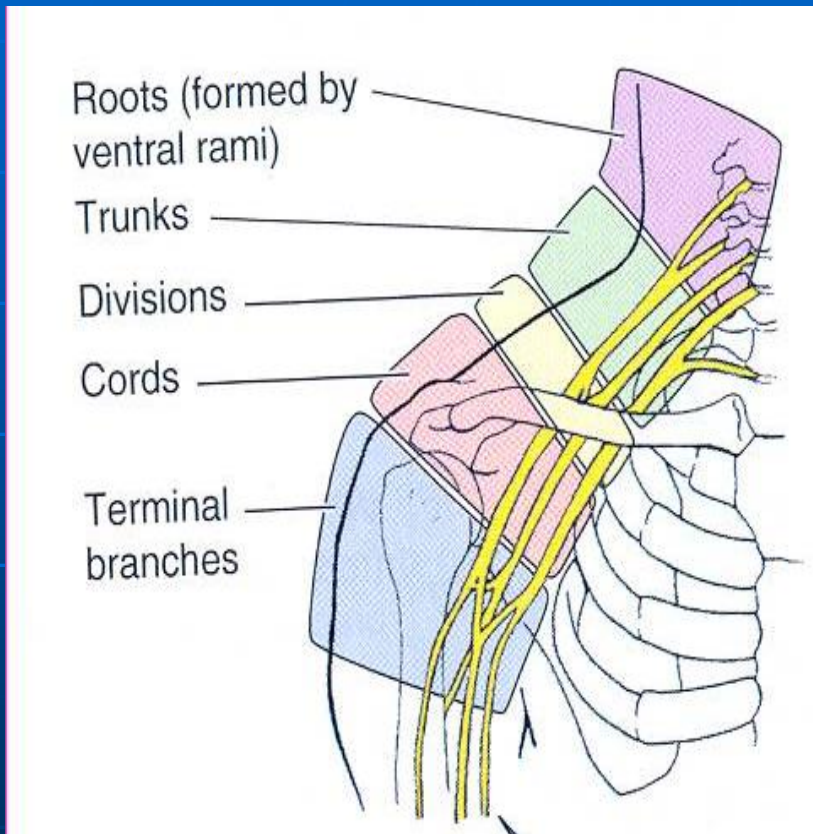
- At the end of this lecture, the students should be able to :
- Describe **the formation** of brachial plexus (site, roots)
- List the **main branches** of brachial plexus
- Describe **the formation** of lumbosacral plexus (site, roots)
- List the **main branches** of lumbosacral plexus
- Describe the important **Applied Anatomy** related to the brachial & lumbosacral plexuses

Formation of Brachial Plexuses

- It is formed in the **posterior triangle** of the neck.
- It is the union of the **anterior rami** of the **5th, 6th, 7th, 8th cervical** and the **1st thoracic** spinal nerves

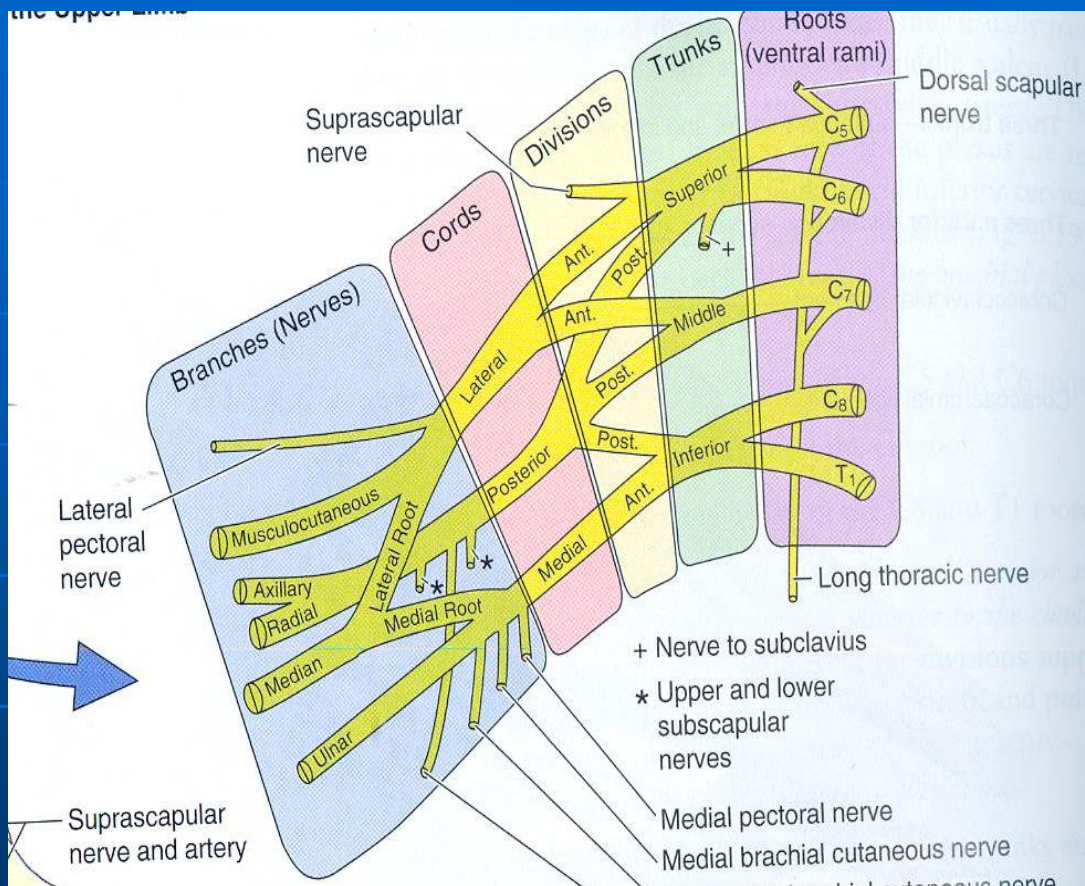


Divisions



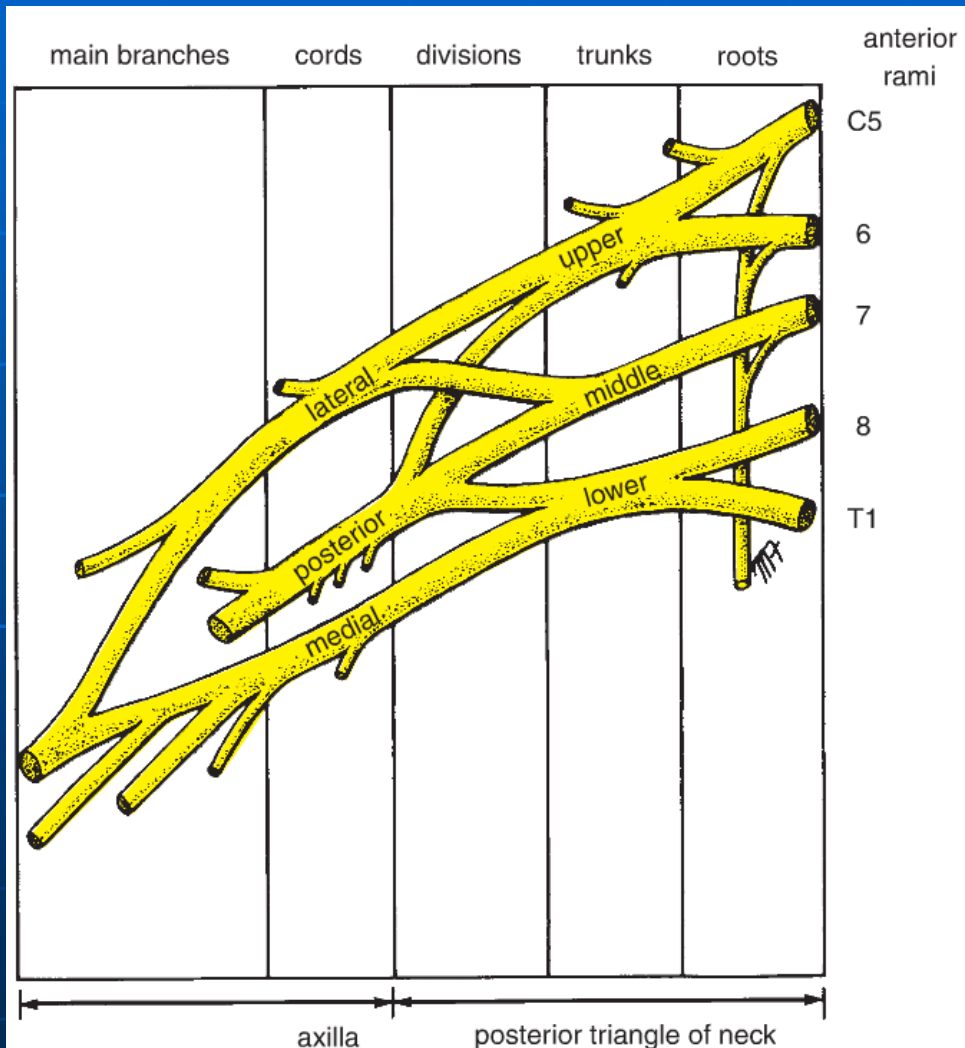
- The plexus is divided into
 - **Roots**
 - **Trunks**
 - **Divisions**
 - **Cords**
 - **Terminal branches**

Trunks



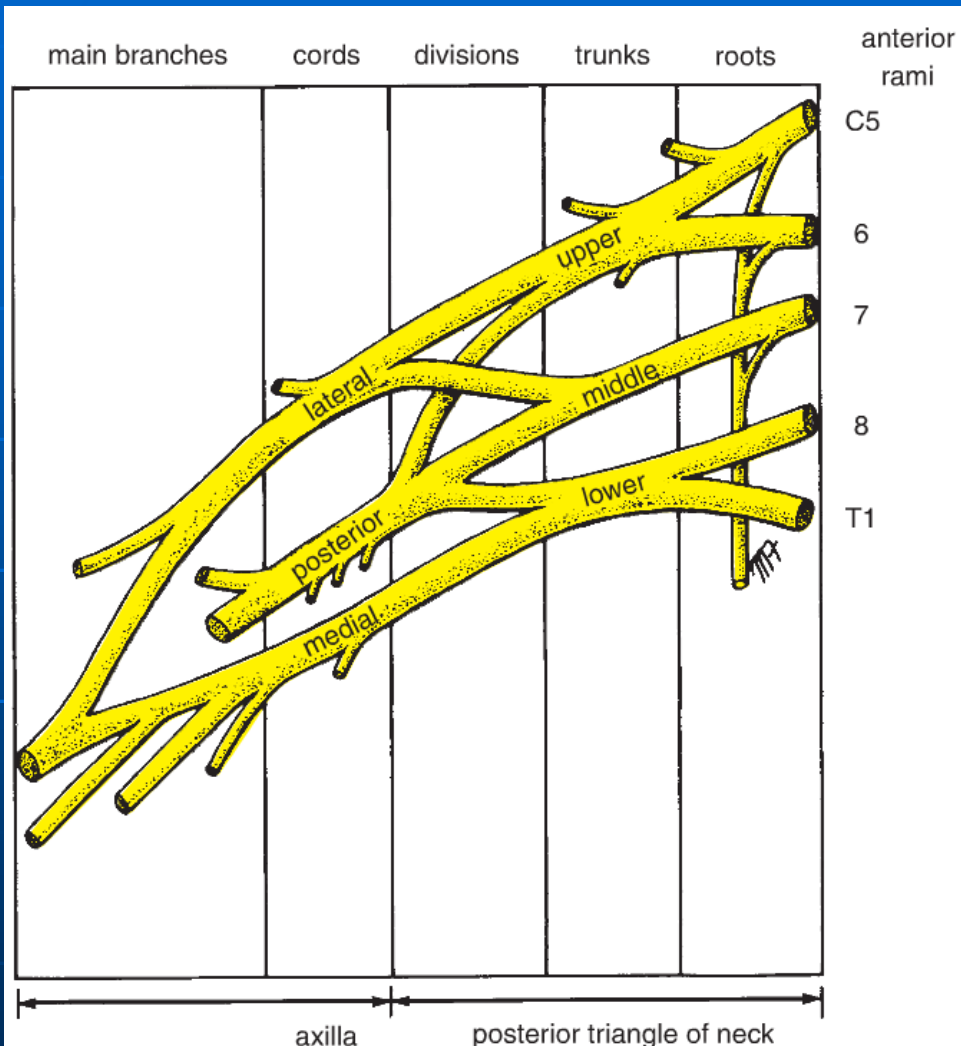
- **Upper trunk**
 - Union of the roots of **C5 & 6**
- **Middle trunk**
 - Continuation of the root of **C7**
- **Lower trunk**
 - Union of the roots of **C8 & T1**

Divisions & Cords



- Each trunk divides into **anterior** and **posterior** division
- **Posterior cord:**
 - From the **three** posterior divisions
- **Lateral cord:**
 - From the **anterior** divisions of the **upper** and **middle** cords

CORDS & BRANCHES



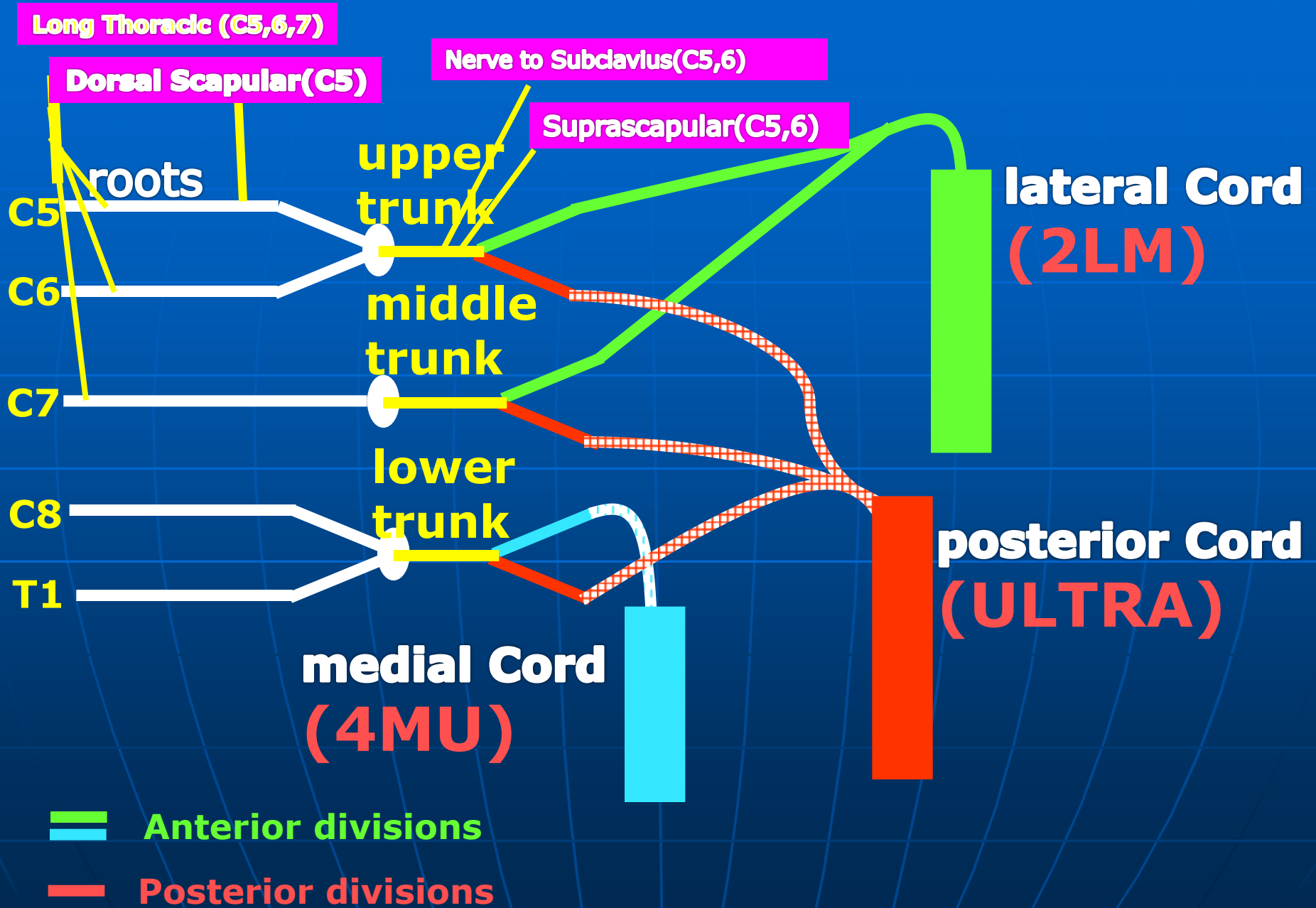
■ Medial cord

- It is the continuation of the anterior division of the lower trunk

■ Branches

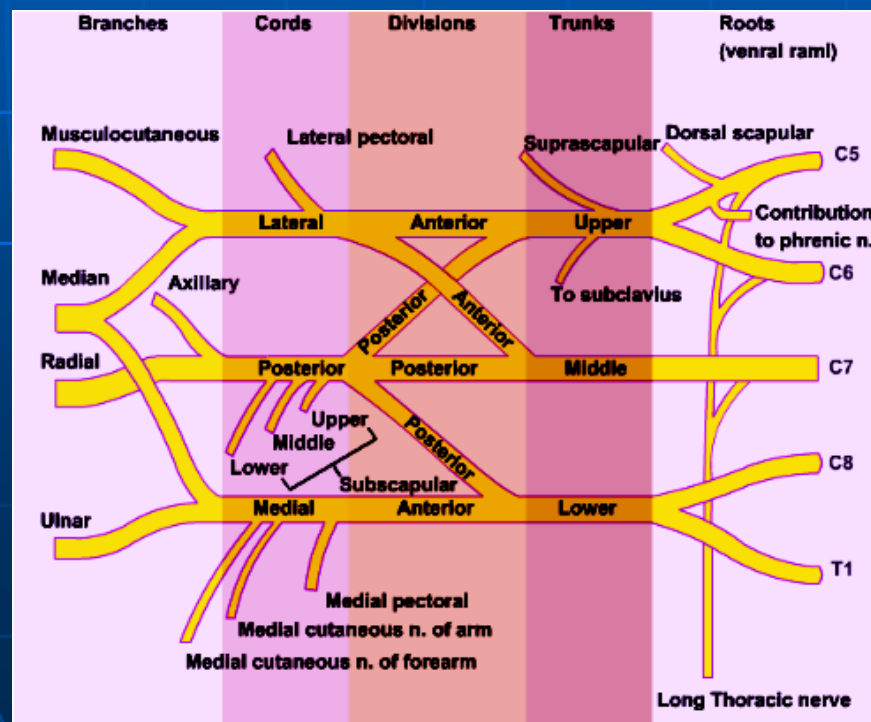
- All three cords will give branches, those will supply their respective regions

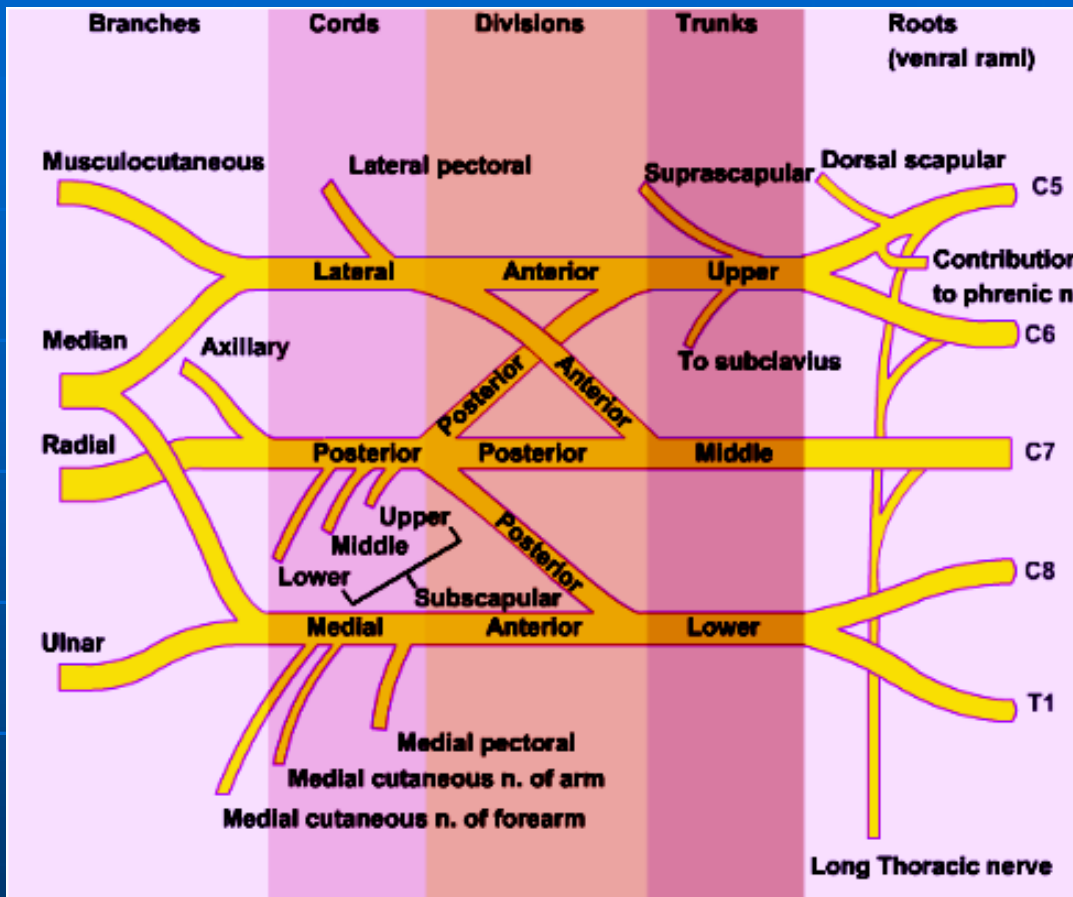
The Brachial Plexus



The Plexus can be divided into 5 stages:

- **Roots:** in the posterior Δ of the neck
- **Trunks:** in the posterior Δ of the neck
- **Divisions:** behind the clavicle
- **Cords:** in the axilla
- **Branches:** in the axilla
- **The first 2 stages lie in the posterior triangle, while the last 2 stages lie in the axilla.**





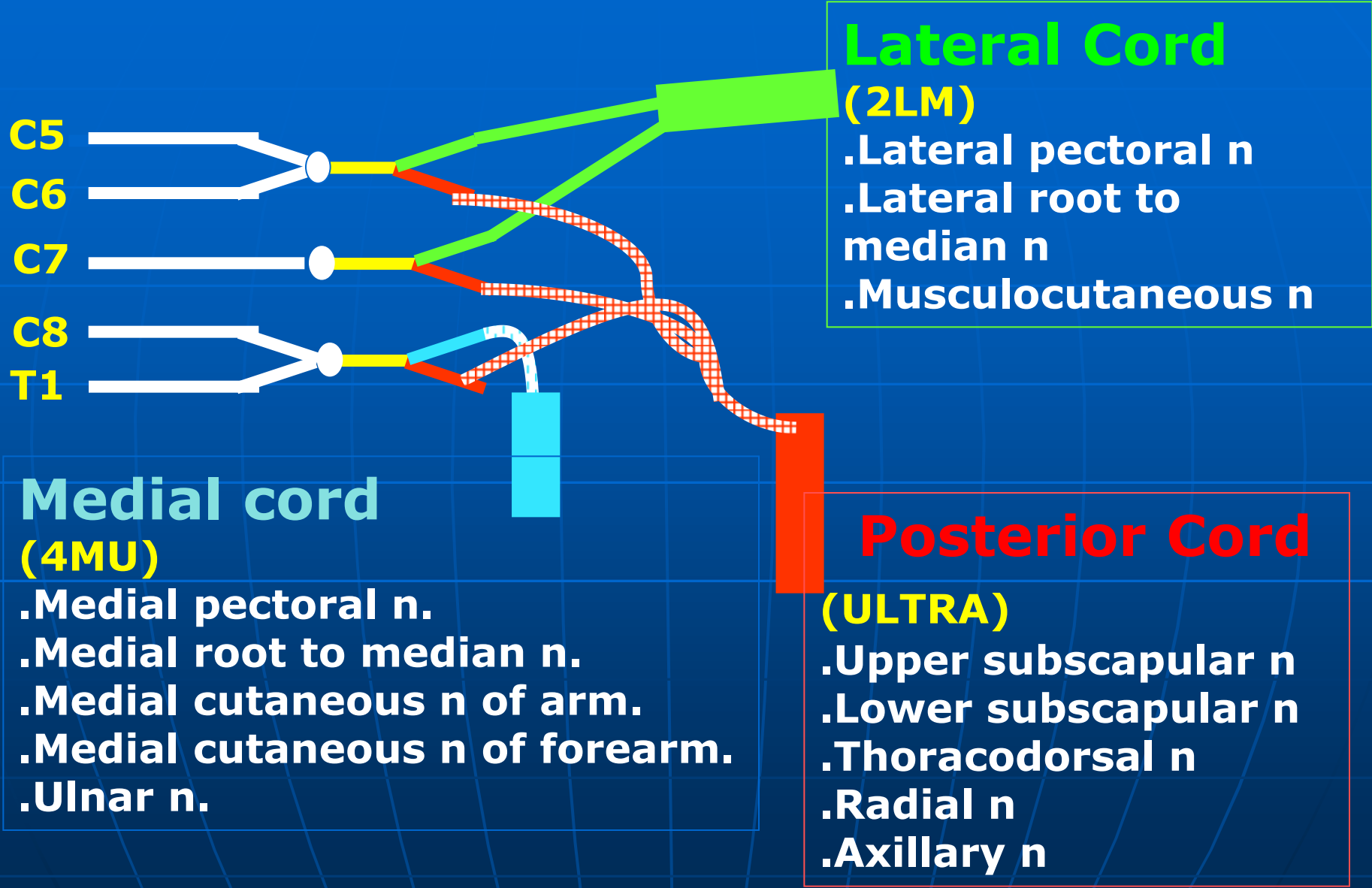
A. Branches from Roots

- **1. Nerve to rhomboids (dorsal scapular nerve) C5**
- **2. Long thoracic nerve C5, 6 & 7**

B. Branches from Trunk

- 1. Nerve to subclavius**
- 2. Suprascapular nerve**
(supplies supraspinatus & infraspinatus)

(C) Branches from Cords



Lateral Cord

(2LM)

- .Lateral pectoral n
- .Lateral root to median n
- .Musculocutaneous n

Medial cord

(4MU)

- .Medial pectoral n.
- .Medial root to median n.
- .Medial cutaneous n of arm.
- .Medial cutaneous n of forearm.
- .Ulnar n.

Posterior Cord

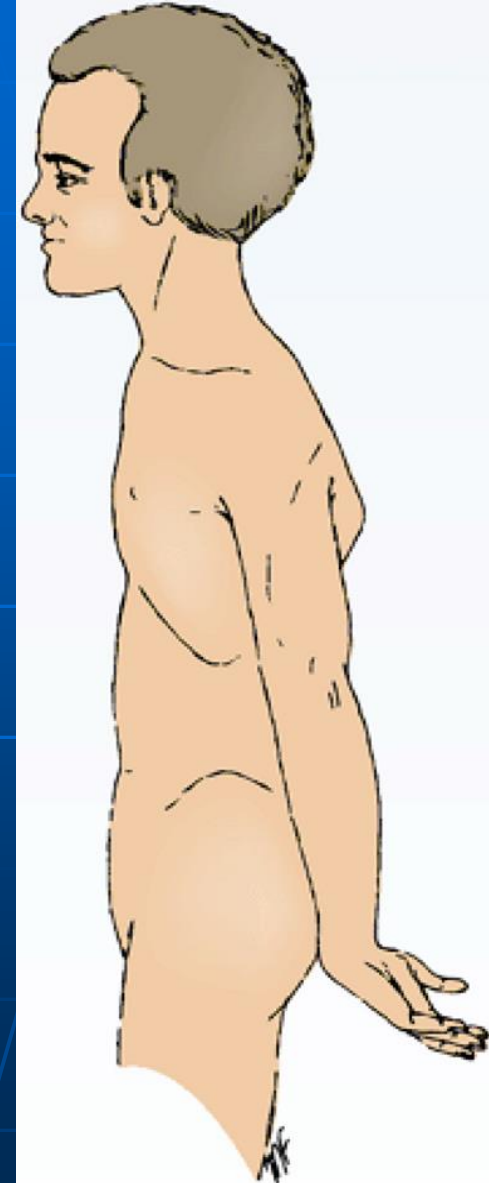
(ULTRA)

- .Upper subscapular n
- .Lower subscapular n
- .Thoracodorsal n
- .Radial n
- .Axillary n

Brachial Plexus Injuries

Upper Lesions of the Brachial Plexus Upper Trunk C5,6 (Erb-Duchenne Palsy "waiter's tip position").

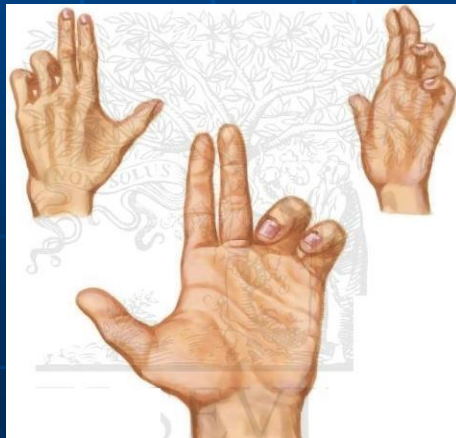
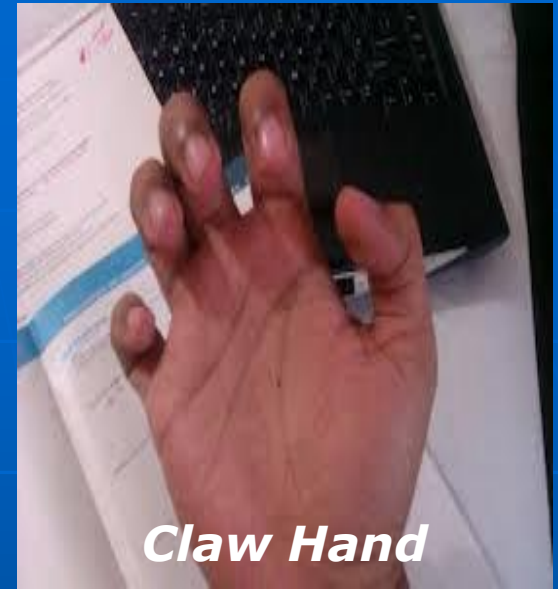
- Resulting from traumatic injury to the upper part of the brachial plexus resulting from excessive displacement of the head to the opposite side and depression of the shoulder on the same side (a blow or fall on shoulder).
- The position of the upper limb in this condition has been compared to that of a porter or waiter hinting for a tip or policeman's tip hand.
- The arm hangs by the side and is rotated medially. The forearm is extended and pronated



Brachial Plexus Injuries

Lower Lesions of the Brachial Plexus, (Klumpke Palsy)/Lower Trunk (C8,T1) Lesion

- Lower lesions of the brachial plexus are usually traction injuries caused by a person falling from a height clutching at an object to save himself. The first thoracic nerve is usually torn.
- The nerve fibers from this segment run in the **ulnar and median nerves** to supply all the small muscles of the hand. **The hand has a clawed appearance due to ulnar nerve injury**



Hand of Benediction or Pop's Blessings (APE HAND) will result from median nerve injury.



LUMBAR PLEXUS

Formation:

By ventral rami of L1, 2, 3 and most of L4

Site:

In the substance of psoas major muscle

Main branches:

Iliohypogastric & ilioinguinal (L1)

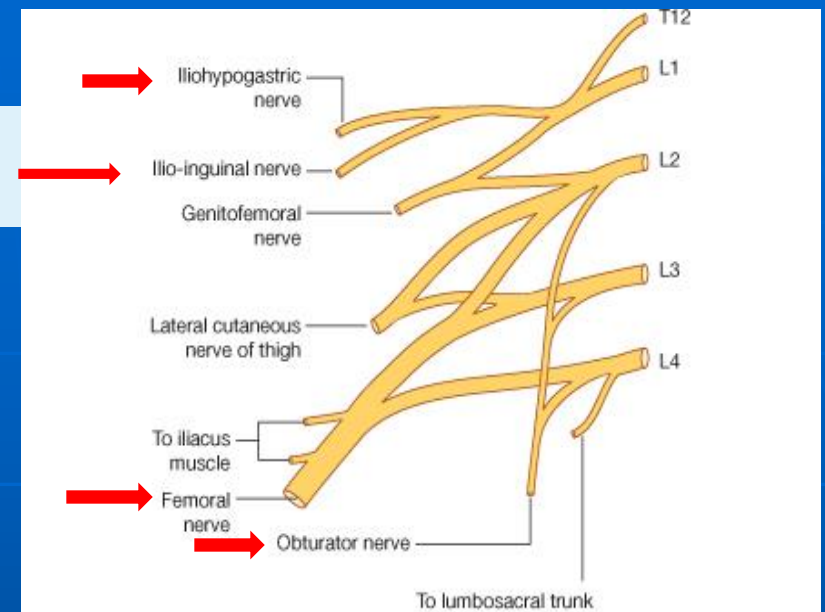
to anterior abdominal wall

Obturator (L2-L4)

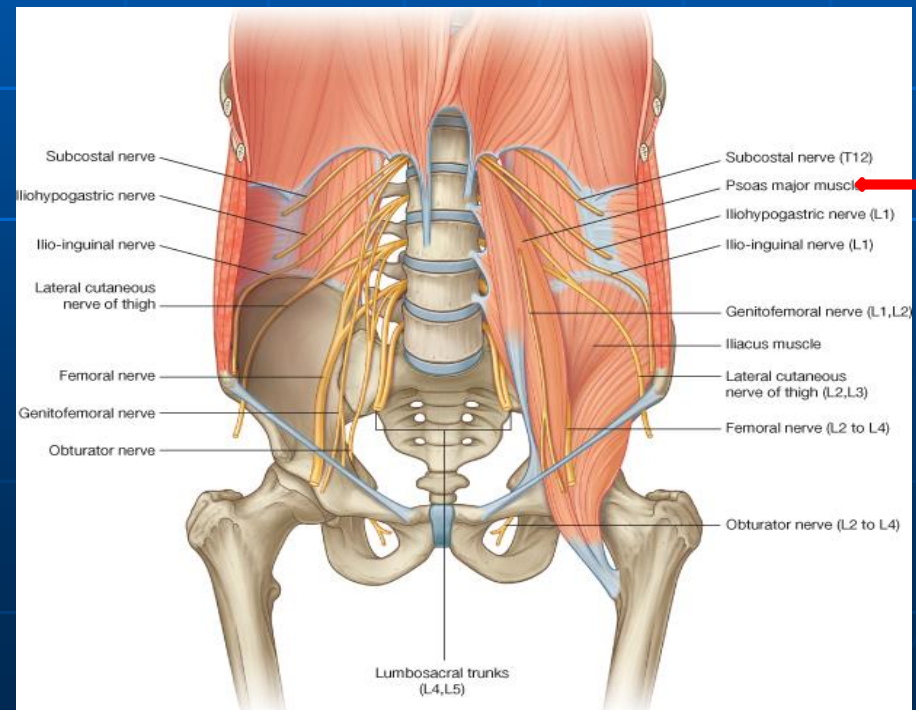
to medial compartment of thigh

Femoral (L2-L4)

to anterior compartment of thigh



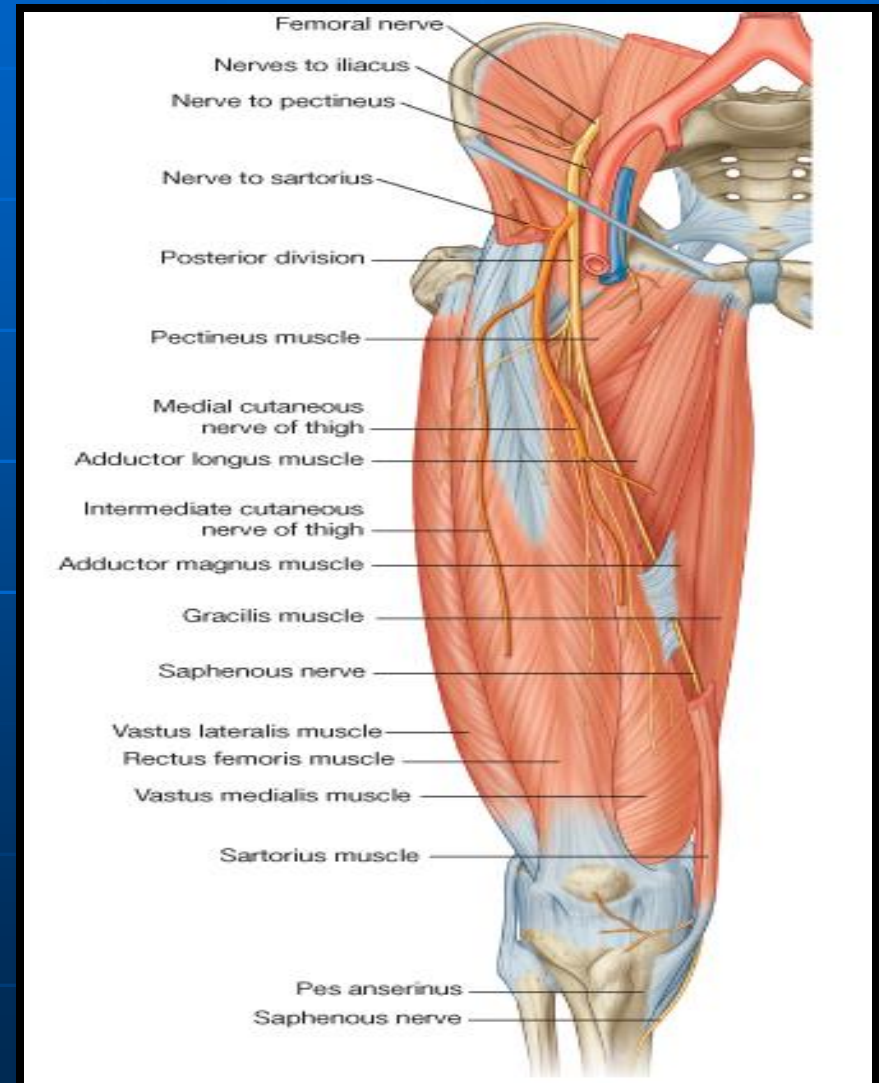
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FEMORAL NERVE

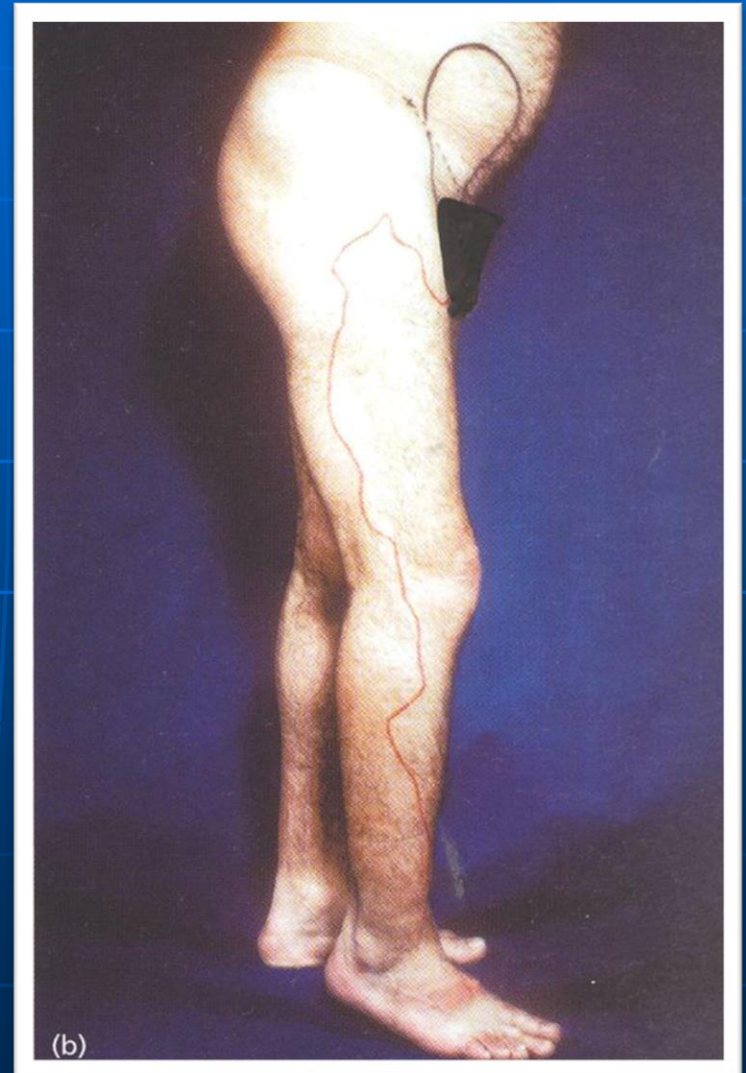
- **Origin:**
 - A branch from lumbar plexus (L2,3,4)
- **Course:**
 - Descends lateral to psoas major & enters the thigh behind the inguinal ligament
 - Passes lateral to femoral artery & divides into anterior & posterior divisions.



FEMORAL NERVE INJURY

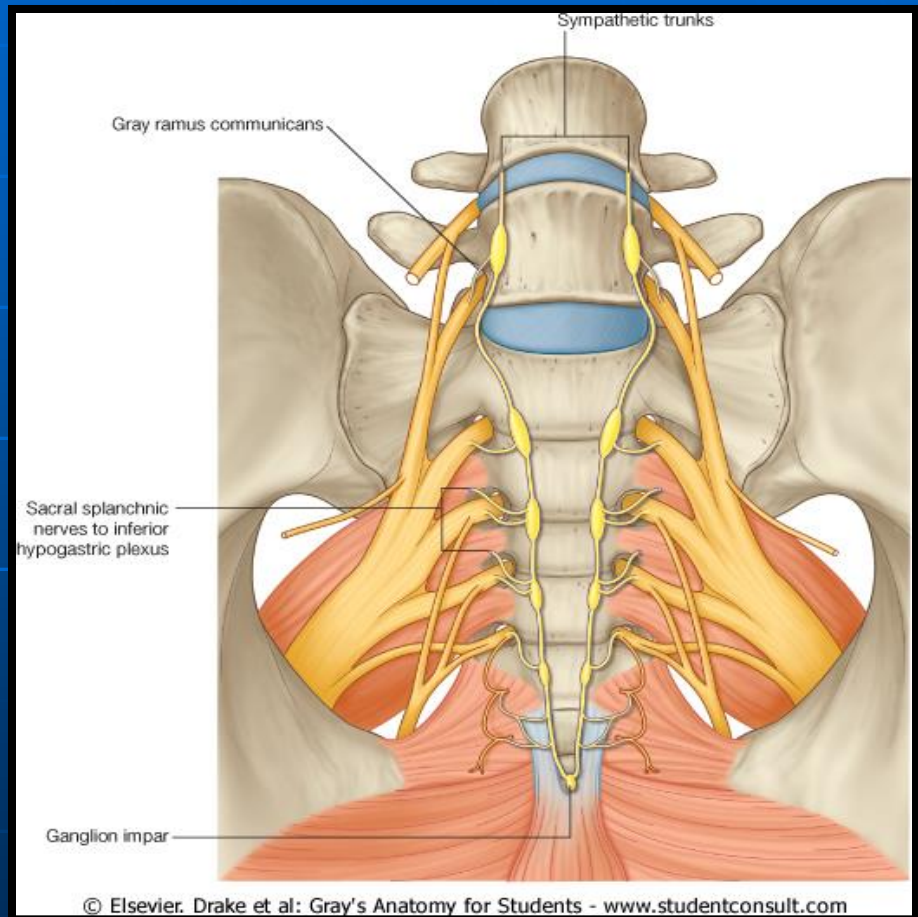
- **Motor effect:**
 - Wasting of quadriceps femoris
 - Loss of extension of knee
 - Weak flexion of hip (psoas major is intact)

- **Sensory effect:**
 - loss of sensation over areas supplied antero-medial aspect of thigh & medial side of leg & foot



SACRAL PLEXUS

- **Formation:**
By ventral rami of a part of L4 & whole L5 (lumbosacral trunk) + S1, 2, 3 and most of the S4
- **Site:**
In front of piriformis muscle

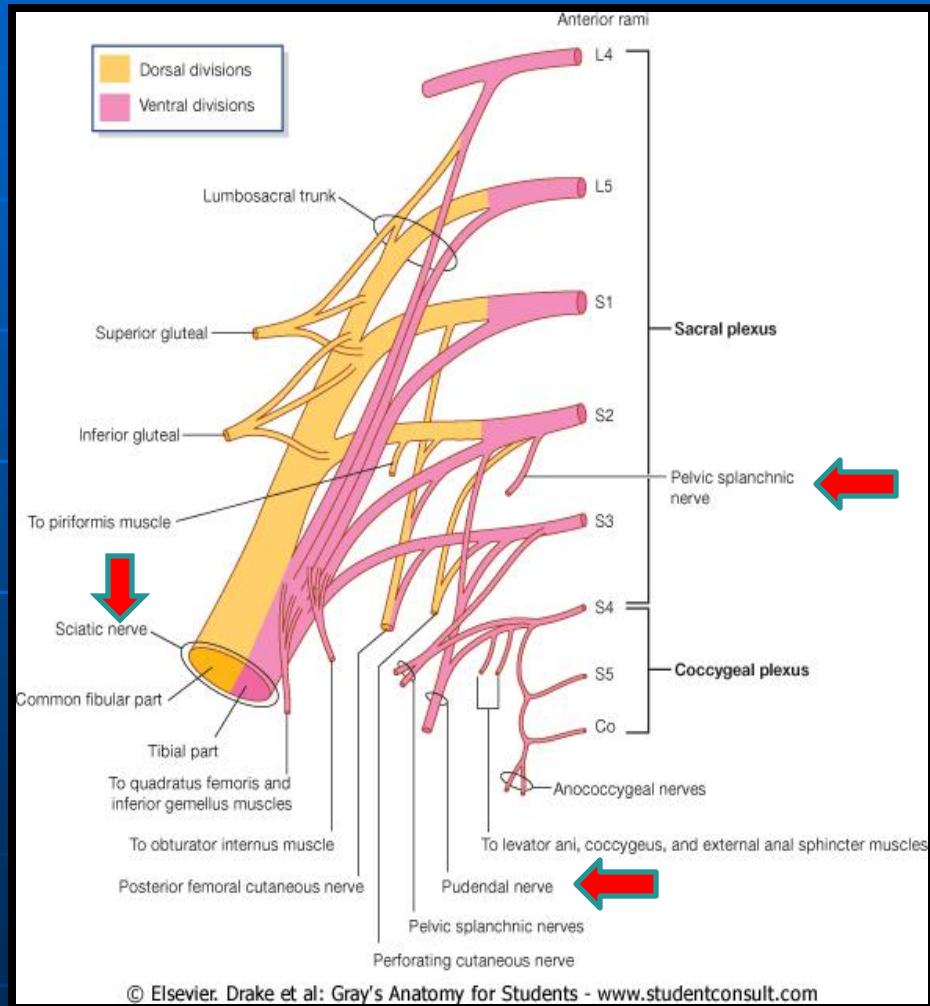


SACRAL PLEXUS

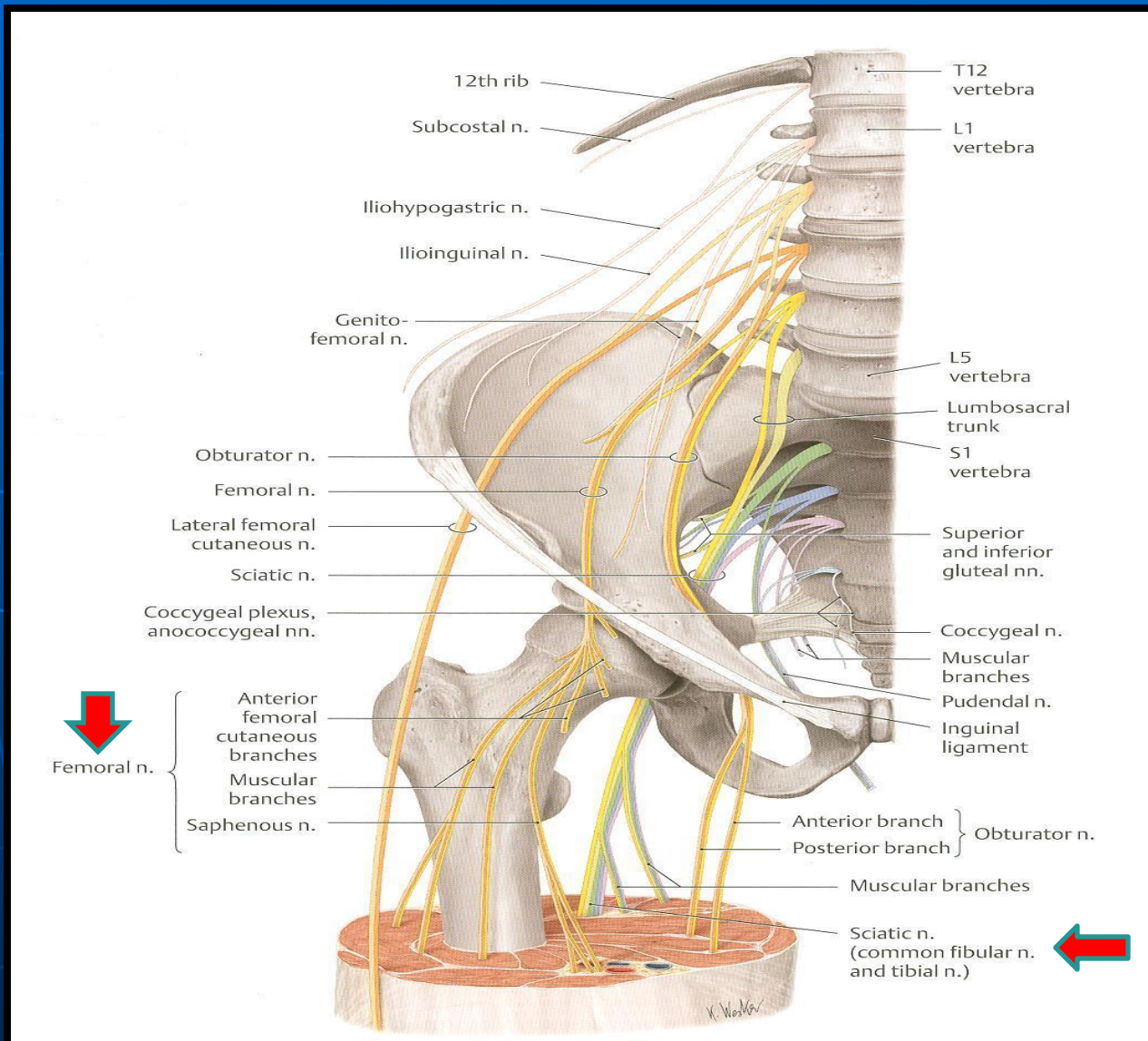
□ **Main branches:**
Pelvic splanchnic nerve
preganglionic
parasympathetic to pelvic
viscera & hindgut

Pudendal nerve
to perineum

Sciatic nerve
to lower limb



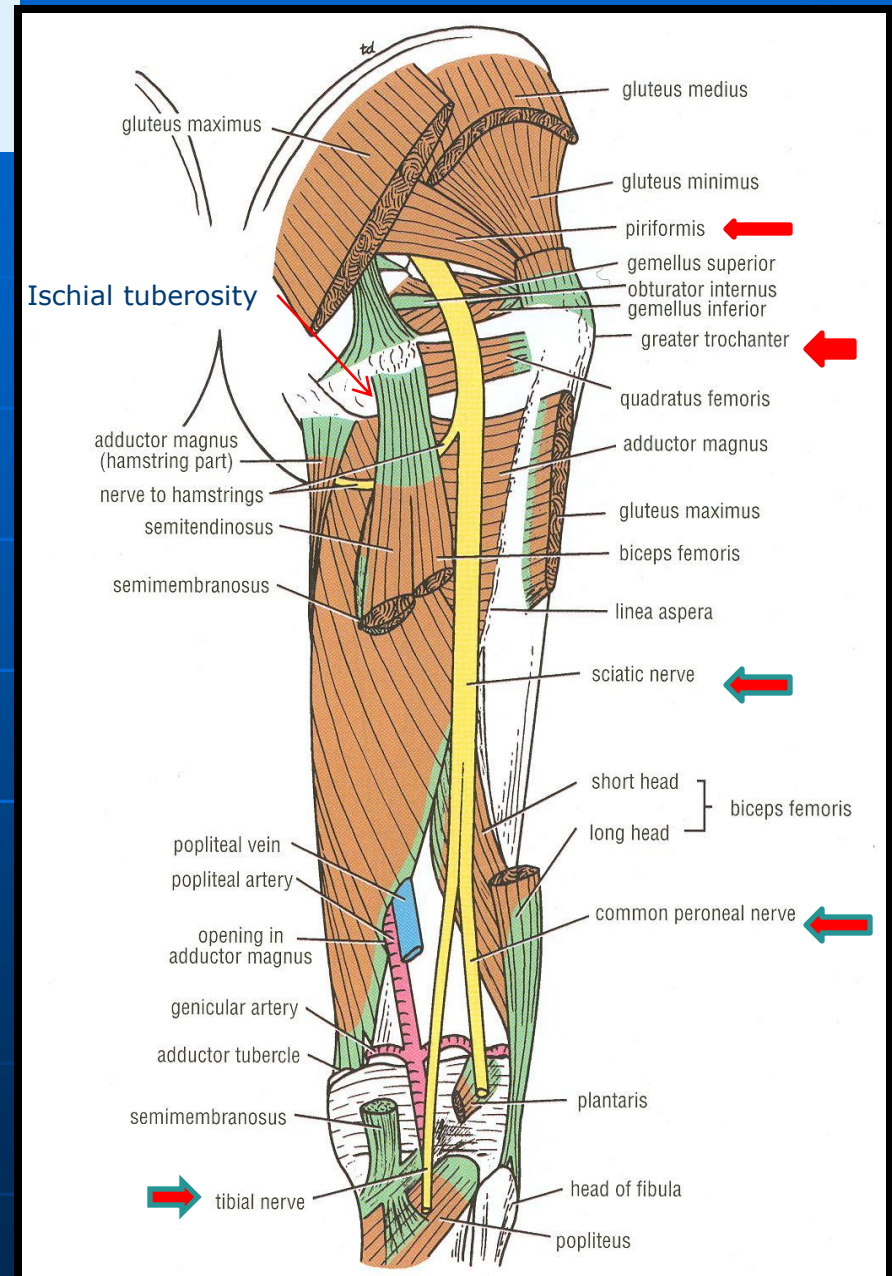
LUMBOSACRAL PLEXUS



SCIATIC NERVE

The largest nerve of the body

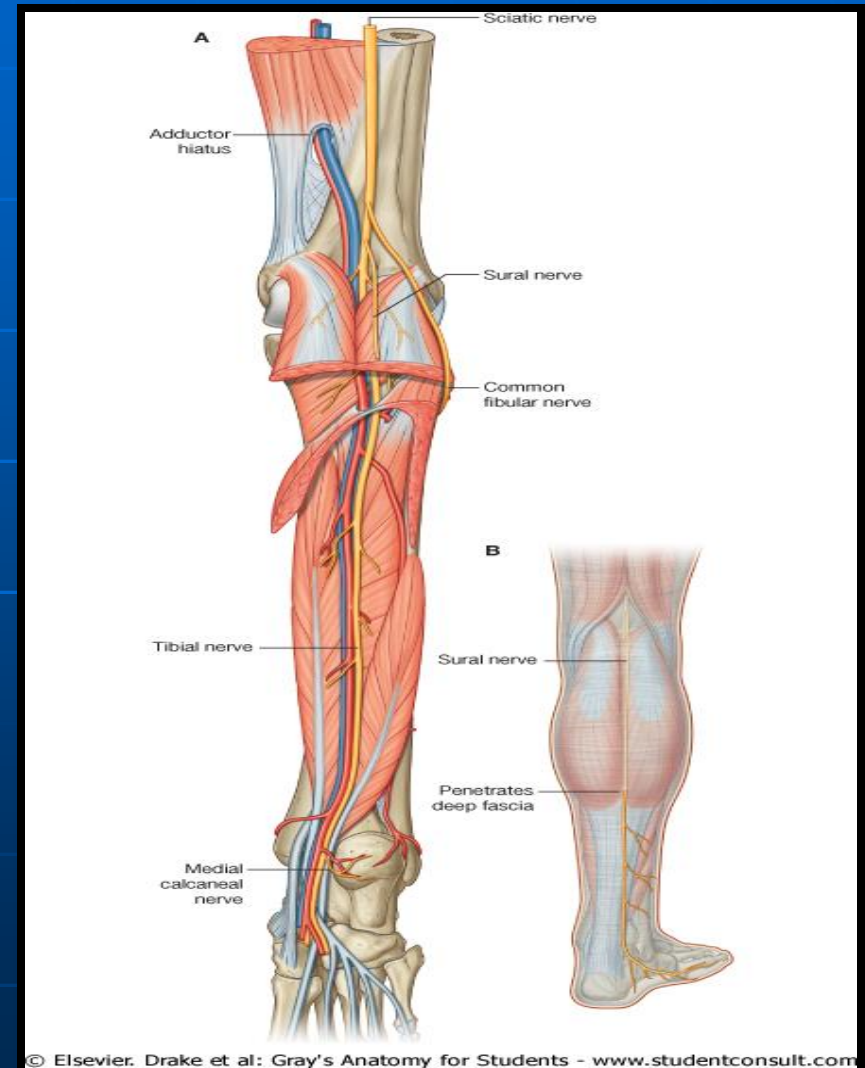
- **Origin:**
 - from sacral plexus (L4, 5, S1, 2, & 3)
- **Course:**
 - Leaves the pelvis through greater sciatic foramen, below piriformis & passes in the gluteal region (between ischial tuberosity & greater trochanter) then to posterior compartment of thigh
 - Divides into tibial & common peroneal (fibular) nerves



TIBIAL NERVE

□ **Course:**

- Descends through popliteal fossa to posterior compartment of leg, accompanied with posterior tibial vessels
- Passes deep to flexor retinaculum to reach the sole of foot where it divides into 2 terminal branches



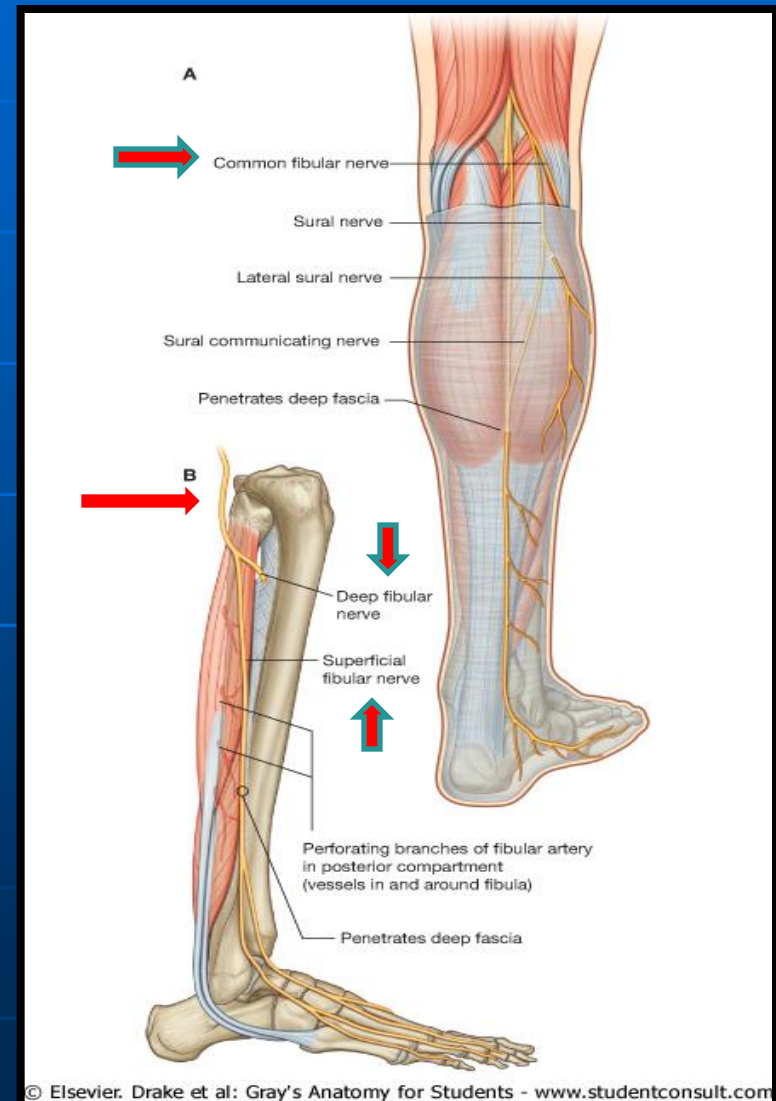
COMMON PERONEAL (FIBULAR) NERVE

□ **Course:**

- **Leaves popliteal fossa & turns around the lateral aspect of neck of fibula**

Then divides into:

1. ***Superficial peroneal:***
descends into lateral compartment of leg
2. ***Deep peroneal:***
descends into anterior compartment of leg



SUMMARY

- **The lumbar plexus is formed by ventral rami of L1,2,3 and most of L4, in substance of psoas major muscle**
- **The sacral plexus is formed by ventral rami of a part of L4 & whole L5 (lumbosacral trunk) plus the S1,2,3 and most of S4, in front of piriformis muscle.**
- **The femoral nerve, a branch of lumbar plexus (L2,3,4).**
 - **Its injury will affect the flexion of hip & extension of knee as well as loss of sensation of skin of anteromedial aspects of the thigh, medial side of knee, leg and foot**
- **The sciatic nerve is a branch of sacral plexus (L4,5, S1,2,3)**
 - **Its injury will affect the flexion of knee, extension of hip, all movements of leg & foot, as well as loss of sensation of skin of leg & foot (except areas supplied by saphenous branch of femoral nerve)**

Thank you

1. Lesion of the upper trunk of the brachial plexus leads to :

- Klumpke palsy.
- Erb-Duchenne palsy
- Drop wrist & hand.
- Ape hand.

2. Which one of the following nerves is a branch of posterior cord of brachial plexus?

- Ulnar
- Radial
- Median
- Musclocutaneous

QUESTION 1

- **The femoral nerve supplies:**
 - a. **Extensors of hip.**
 - b. **Skin of dorsum of foot.**
 - c. **Hamstrings.**
 - d. **Extensors of knee**

QUESTION 2

- **Injury of common peroneal nerve leads to:**
 - a. **Loss of dorsiflexion of ankle**
 - b. **Loss of inversion of foot**
 - c. **Loss of extension of knee**
 - d. **Loss of flexion of toes**