

Brachial Plexus & Lumbosacral Plexus

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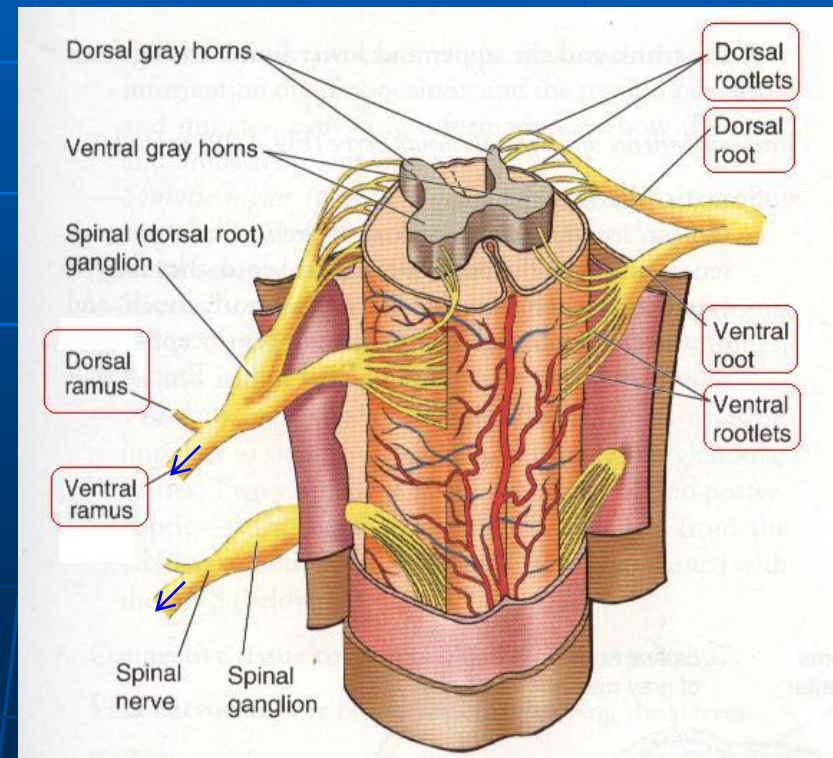
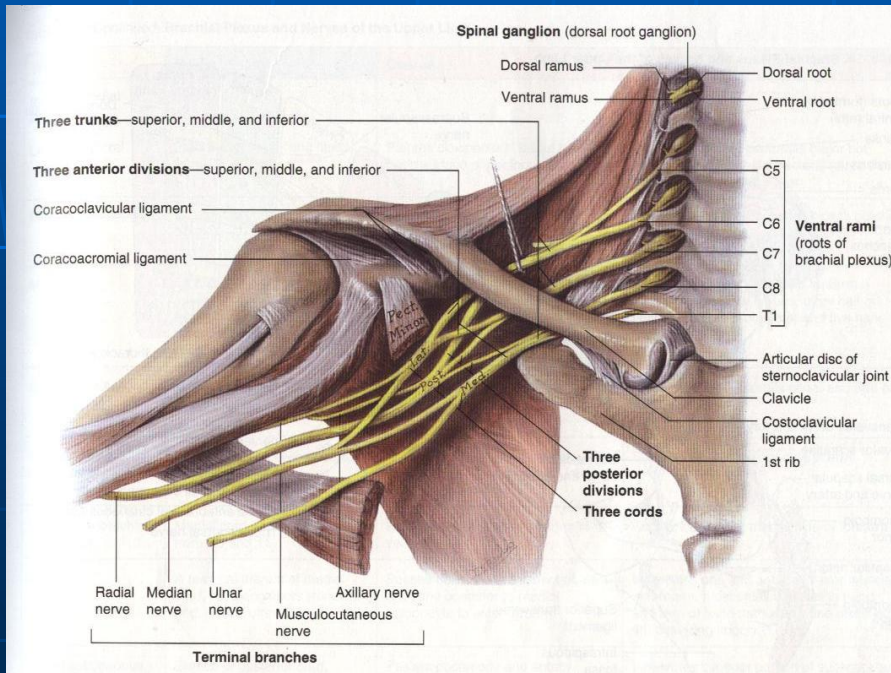
Dr. Saeed Vohra

Objectives

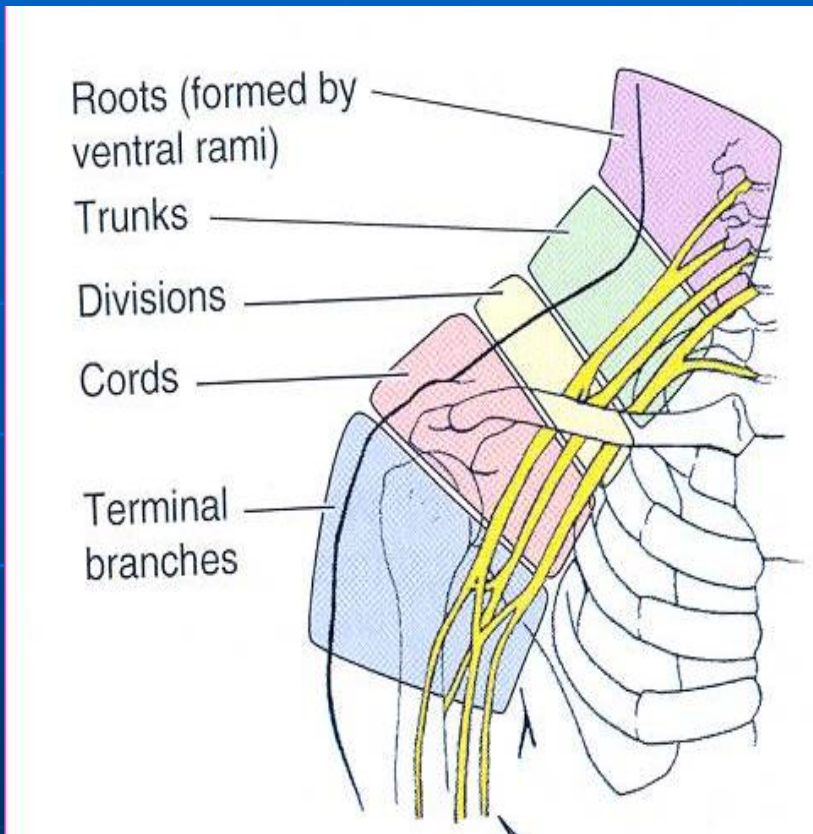
- At the end of this lecture, the students should be able to :
- Describe **the formation** of brachial plexus (site, roots)
- List the **main branches** of brachial plexus
- Describe **the formation** of lumbosacral plexus (site, roots)
- List the **main branches** of lumbosacral plexus
- Describe the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

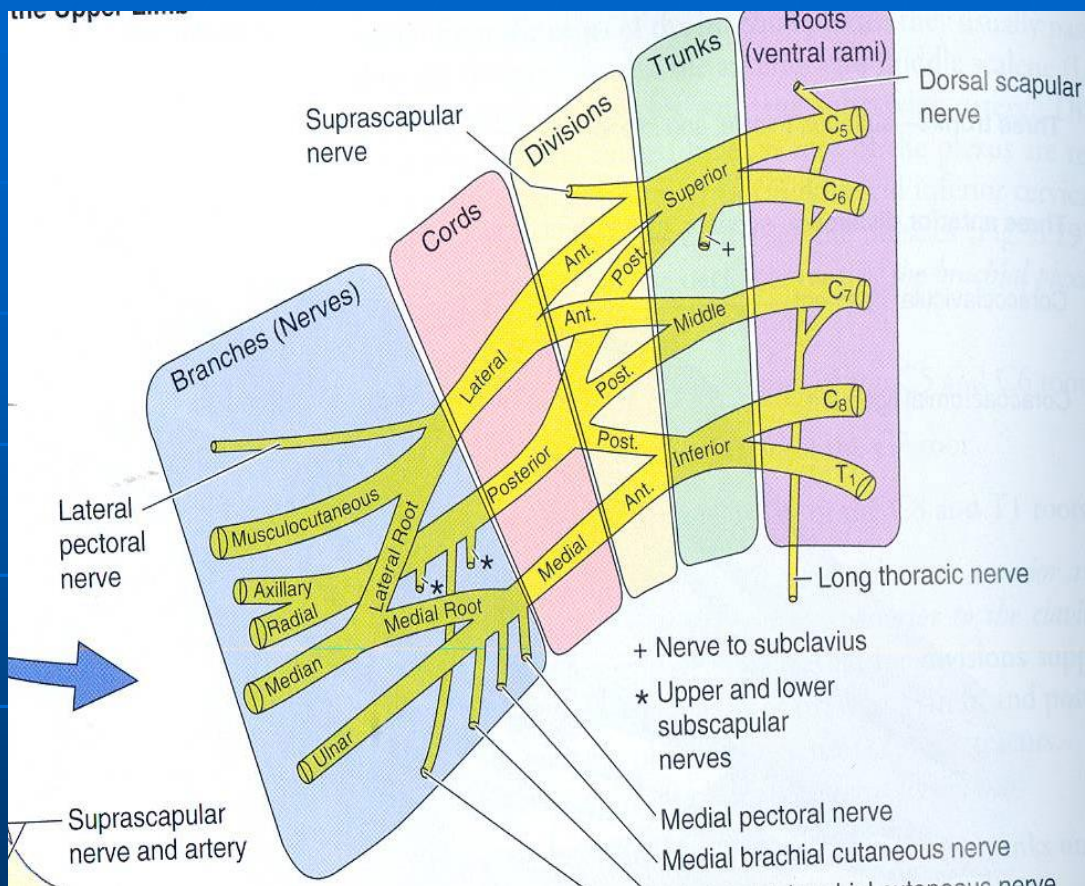


DIVISIONS



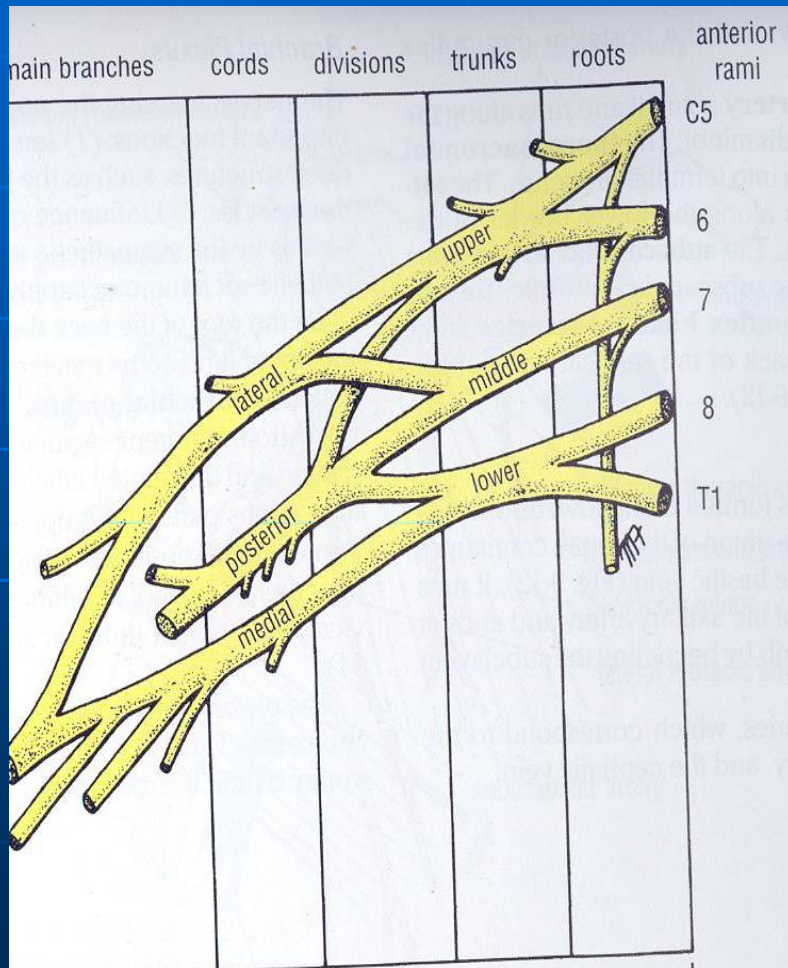
- The plexus is divided into :
 - **Roots**
 - **Trunks**
 - **Divisions**
 - **Cords**
 - **Terminal branches**

TRUNKS



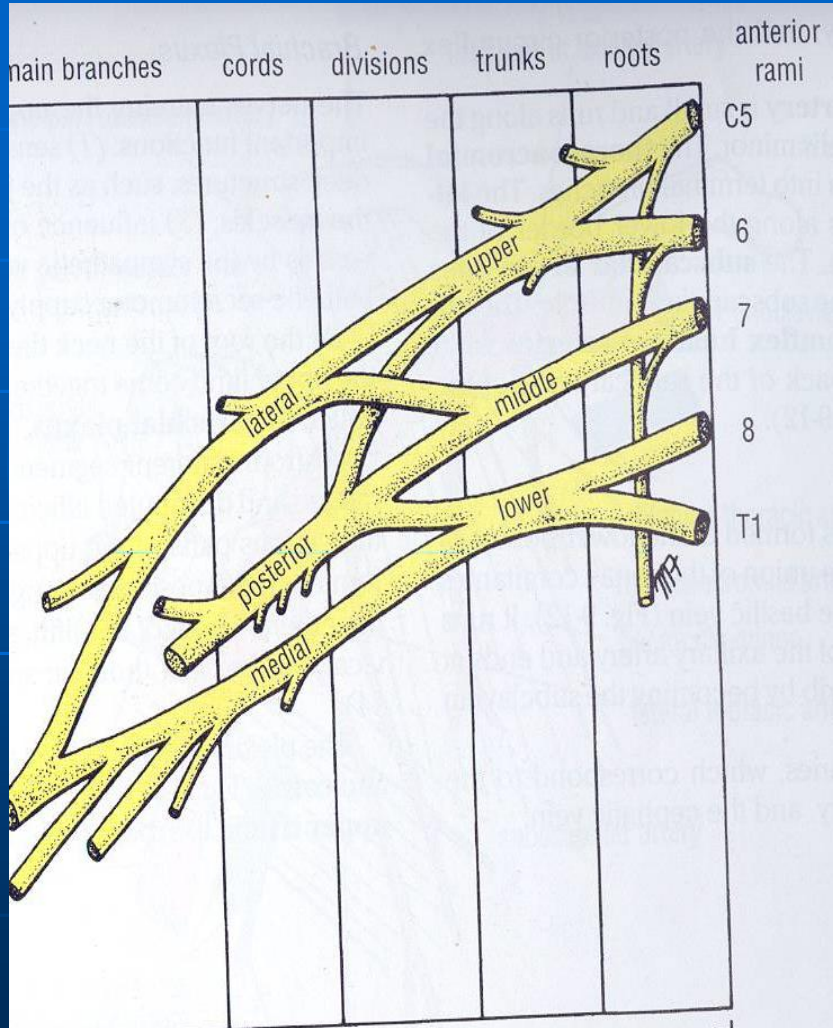
- **Upper trunk**
 - Union of the roots of **C5 & 6**
- **Middle trunk**
 - Continuation of the root of **C7**
- **Lower trunk**
 - Union of the roots of **C8 & T1**

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



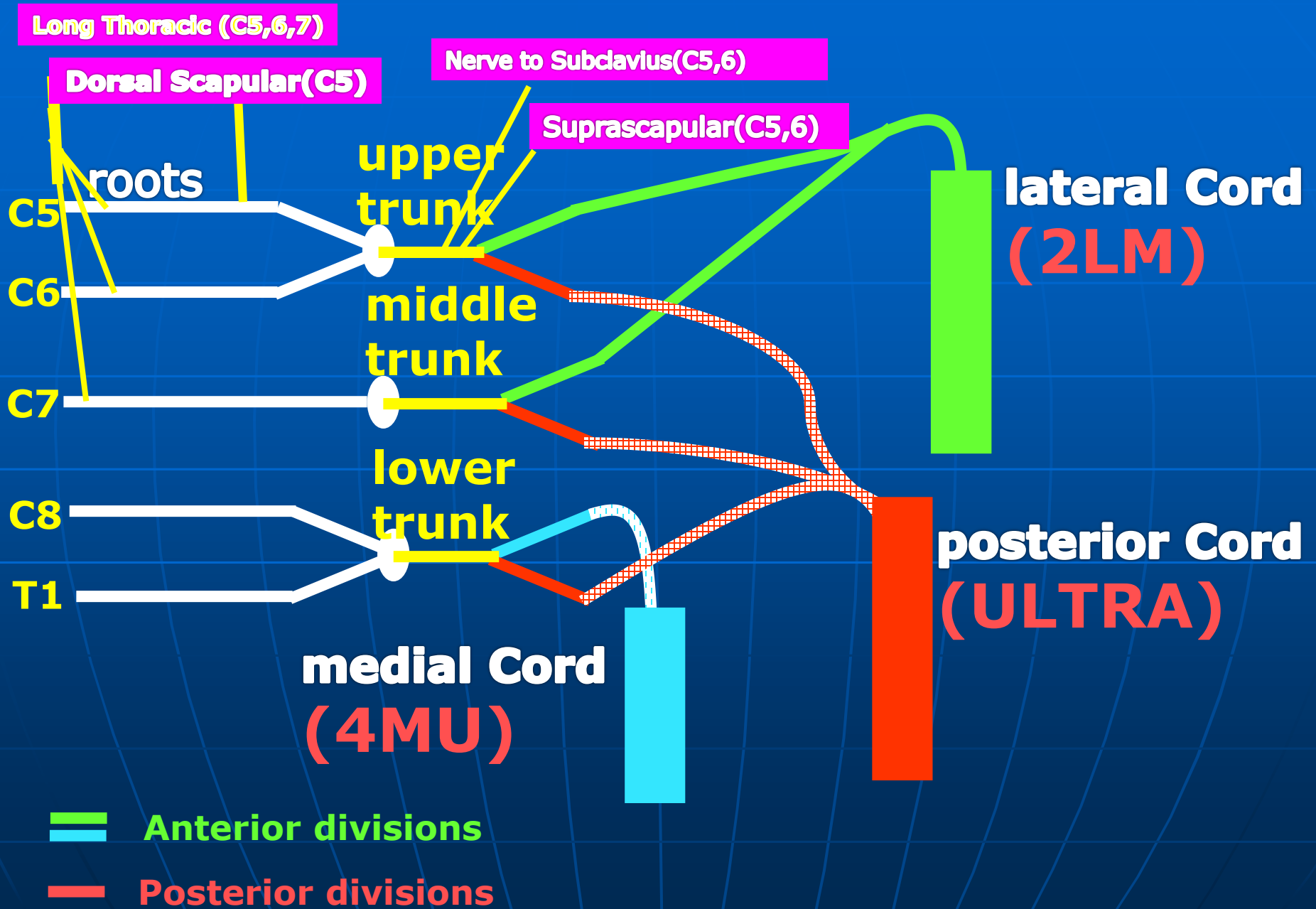
- **Medial cord**

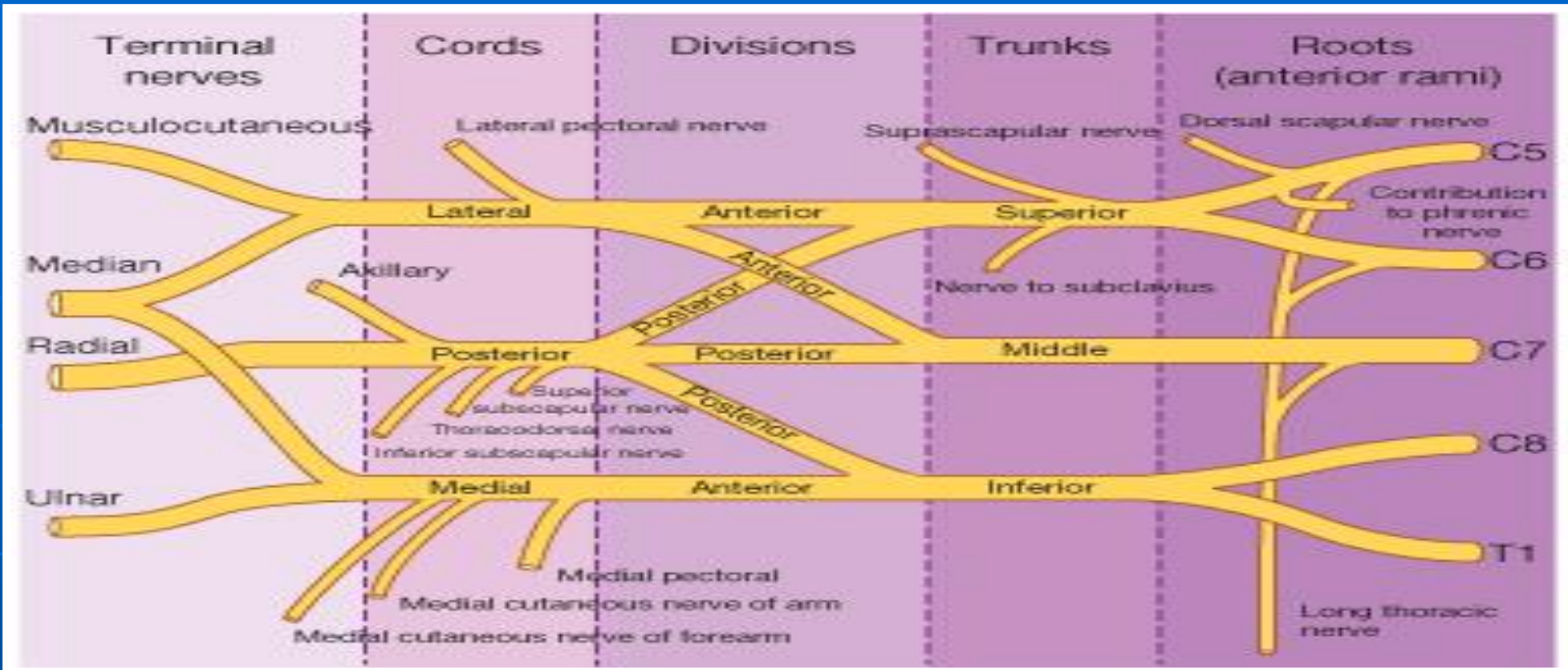
- It is the continuation of the **anterior division** of the **lower trunk**

- **Branches**

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

The Brachial Plexus





The Plexus can be divided into 5 stages:

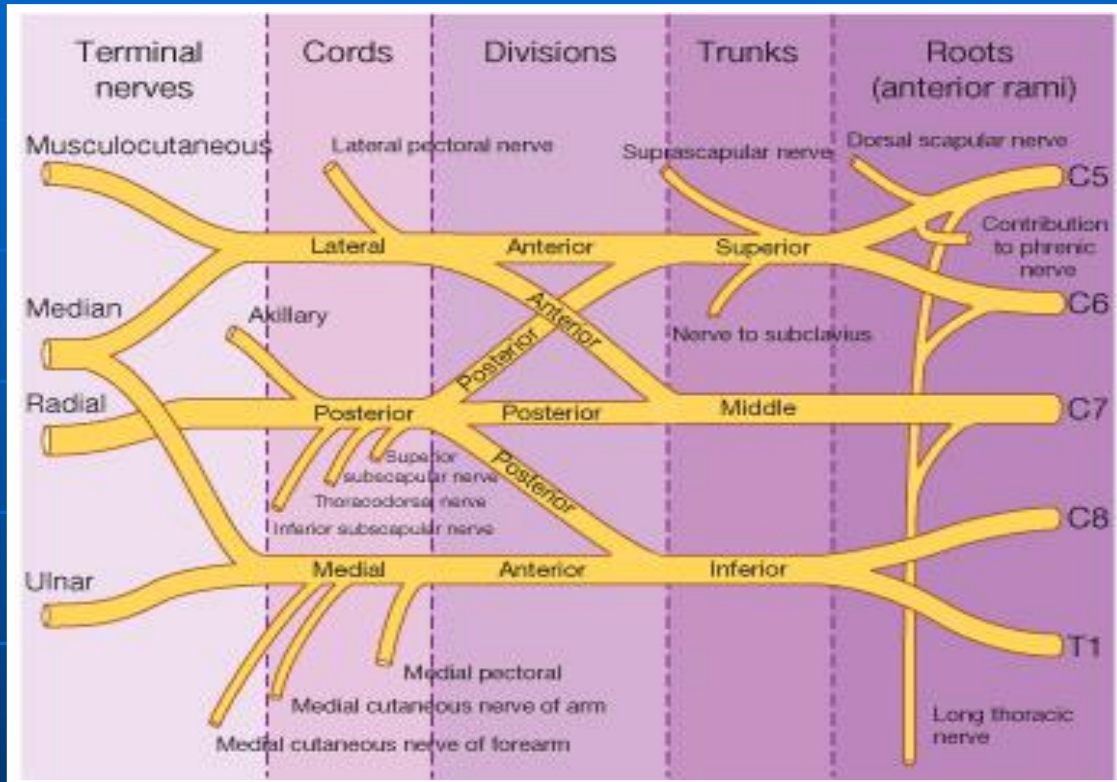
- **Roots:** in the posterior Δ
- **Trunks:** in the posterior Δ
- **Divisions:** behind the clavicle
- **Cords:** in the axilla
- **Branches:** in the axilla
- The first 2 stages lie in the posterior triangle, while the last 2 stages lie in the axilla.

BRANCHES

■ (A) From Roots:

1. **C5:** Nerve to rhomboids (**dorsal scapular nerve**).

2. **C5,6 &7:** **Long thoracic nerve** (supplies serratus anterior).

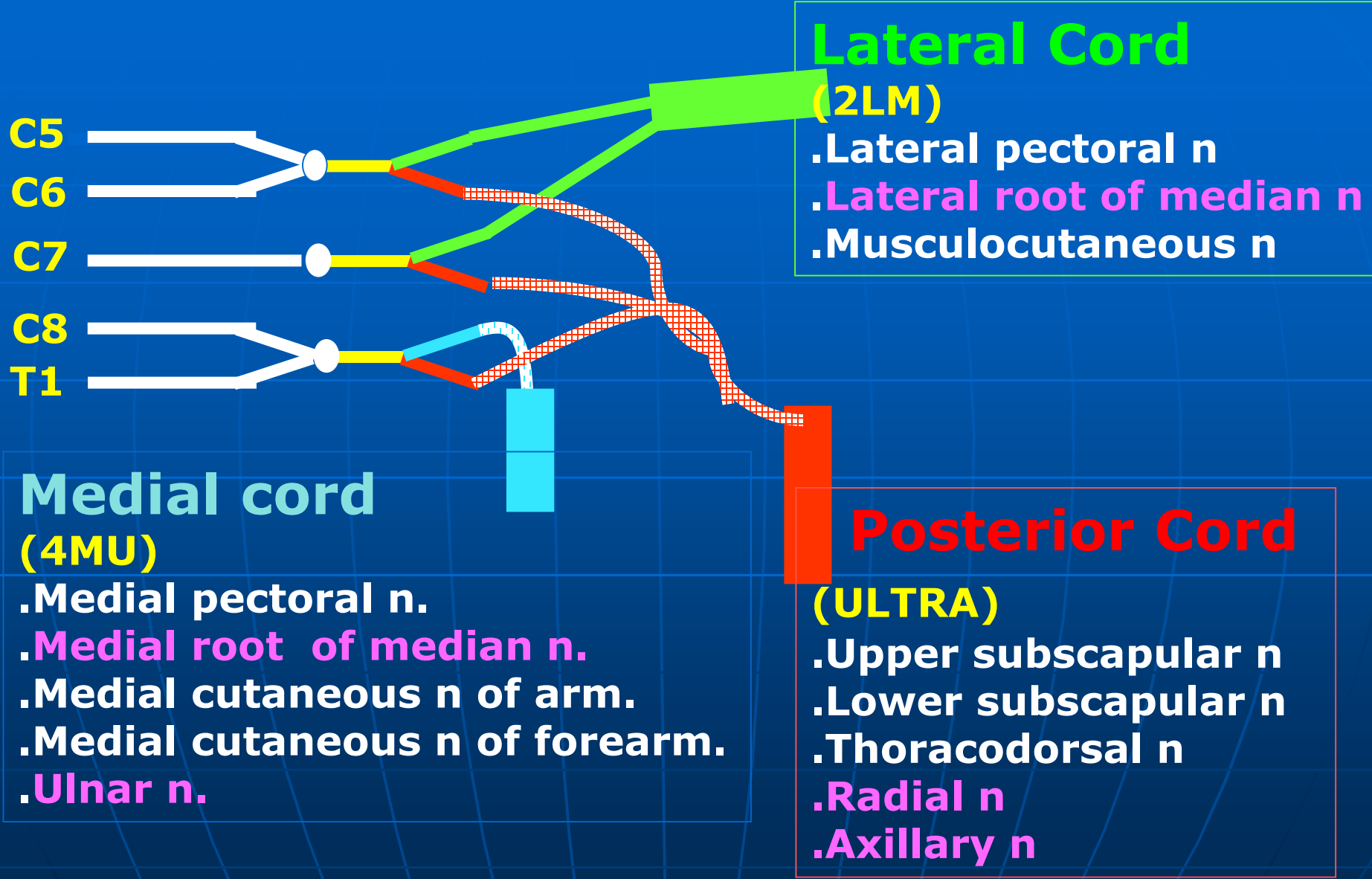


(B) From Trunk (upper trunk):

1. **Nerve to subclavius**

2. **Suprascapular nerve** (supplies supraspinatus & infraspinatus)

(C) BRANCHES From Cords



Lateral Cord
(2LM)
.Lateral pectoral n
.Lateral root of median n
.Musculocutaneous n

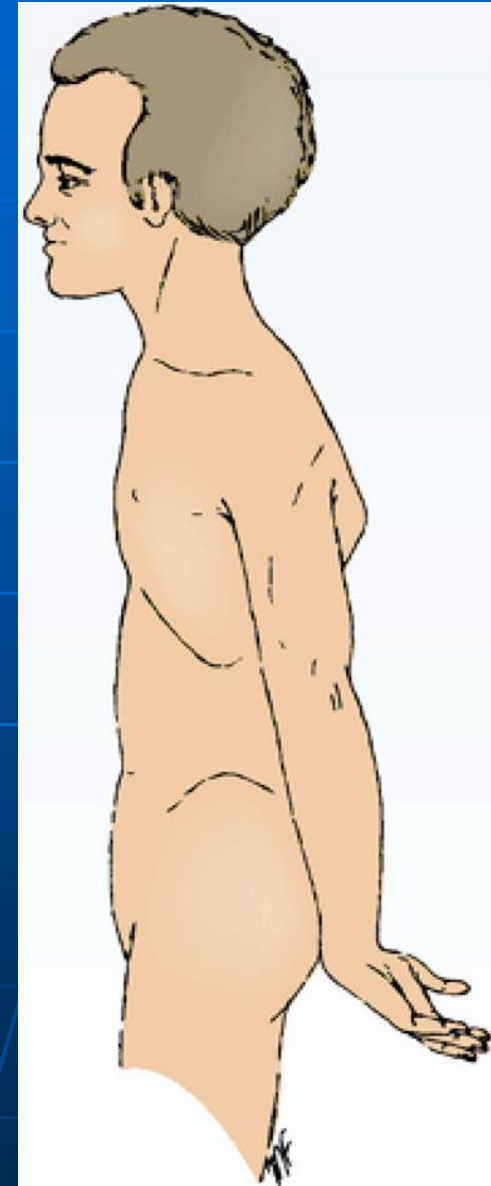
Medial cord
(4MU)
.Medial pectoral n.
.Medial root of median n.
.Medial cutaneous n of arm.
.Medial cutaneous n of forearm.
.Ulnar n.

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").

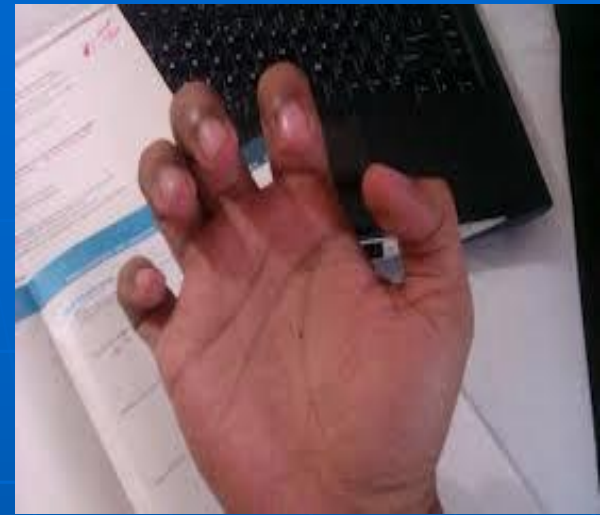
- Resulting from excessive displacement of the head to the opposite side and depression of the shoulder on the same side (a blow or fall on shoulder).
- The position of the upper limb in this condition has been likened to that of a porter or waiter hinting for a tip or policeman's tip hand.
- The arm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



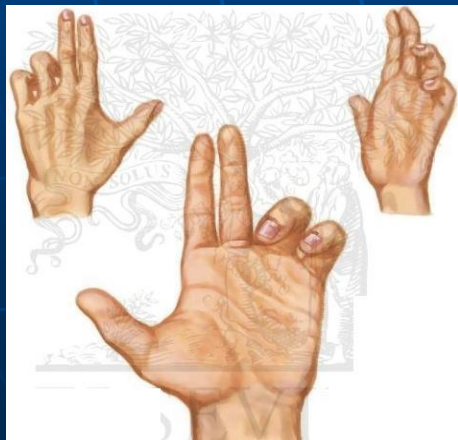
Brachial Plexus Injuries

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**.



Claw Hand



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:

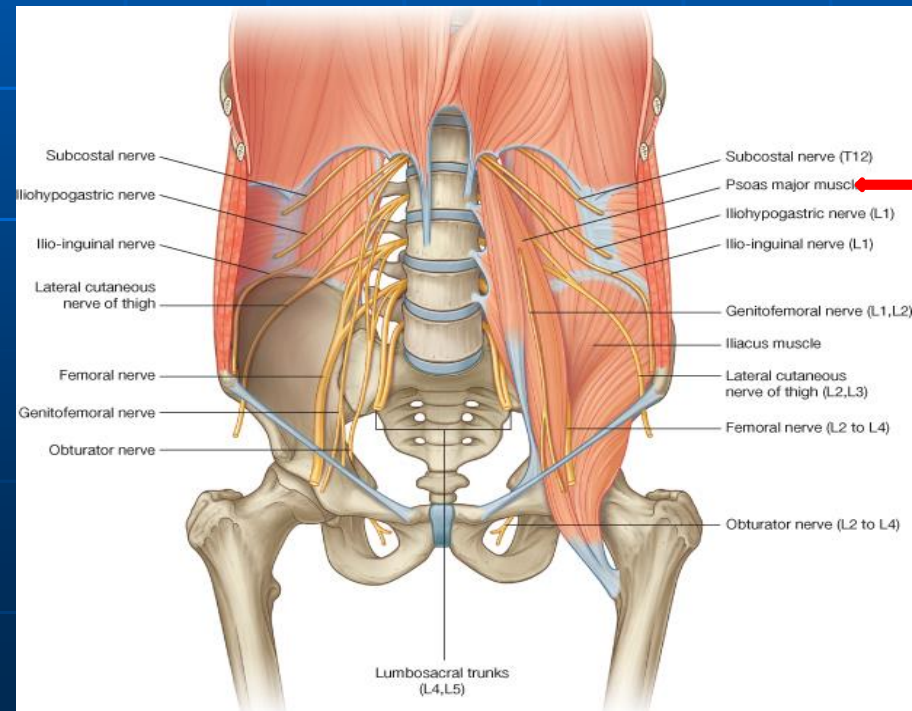
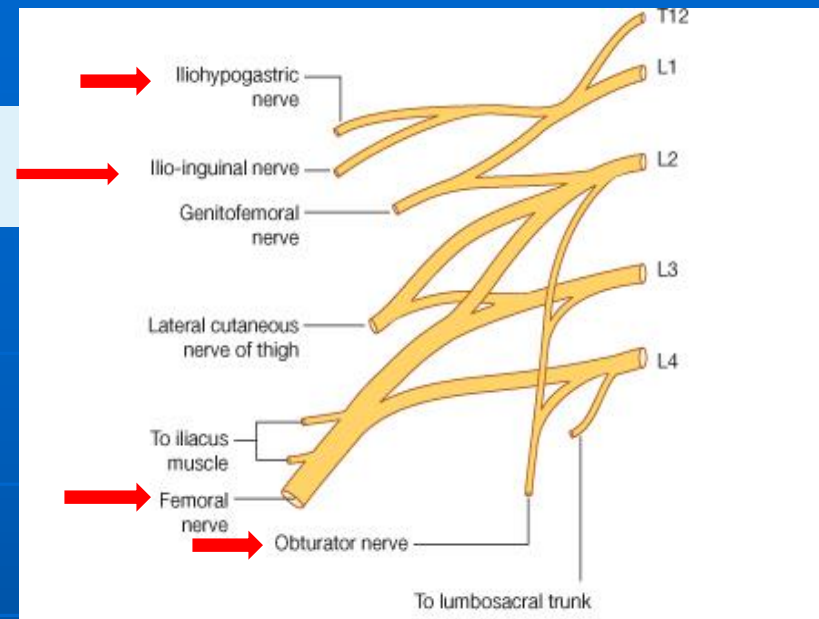
to anterior abdominal wall

Obturator:

to medial compartment of thigh

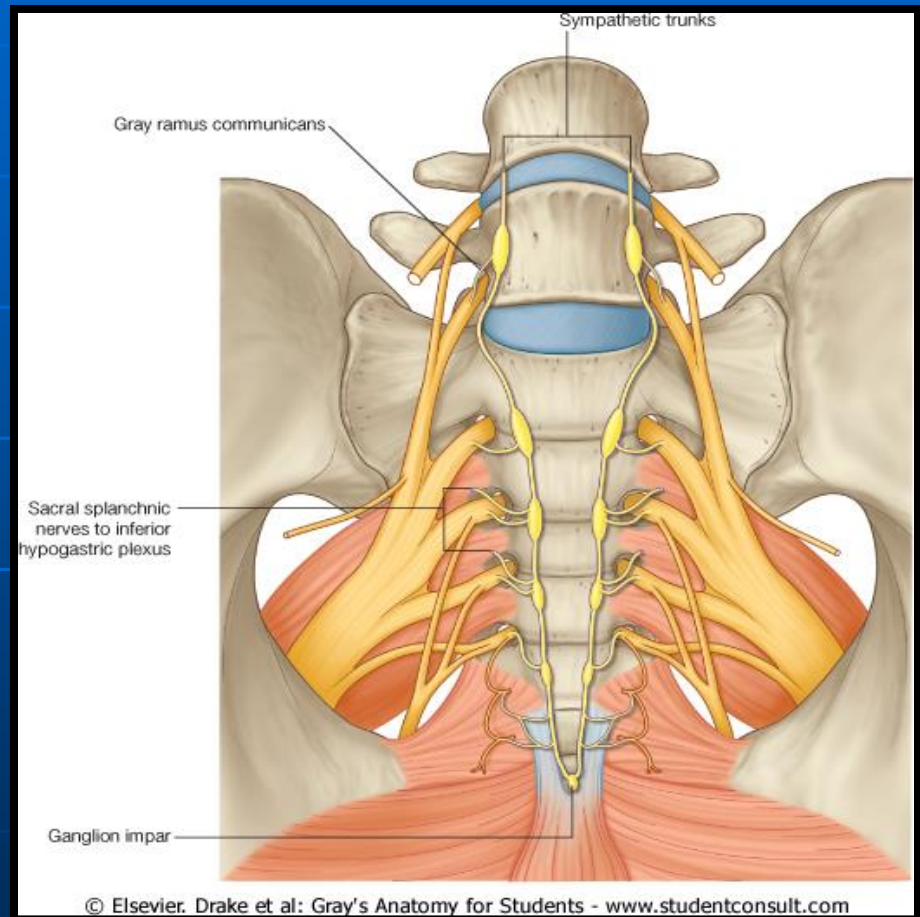
Femoral:

to anterior compartment of thigh



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 msucle

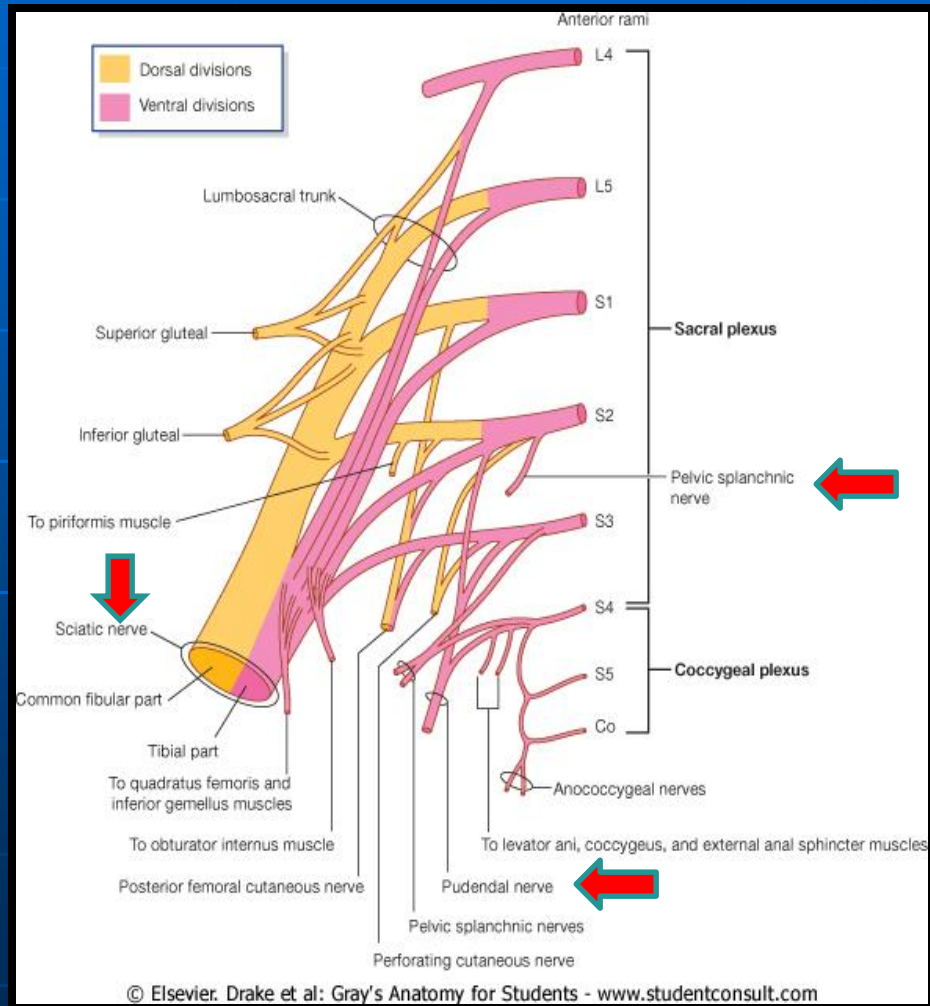


SACRAL PLEXUS

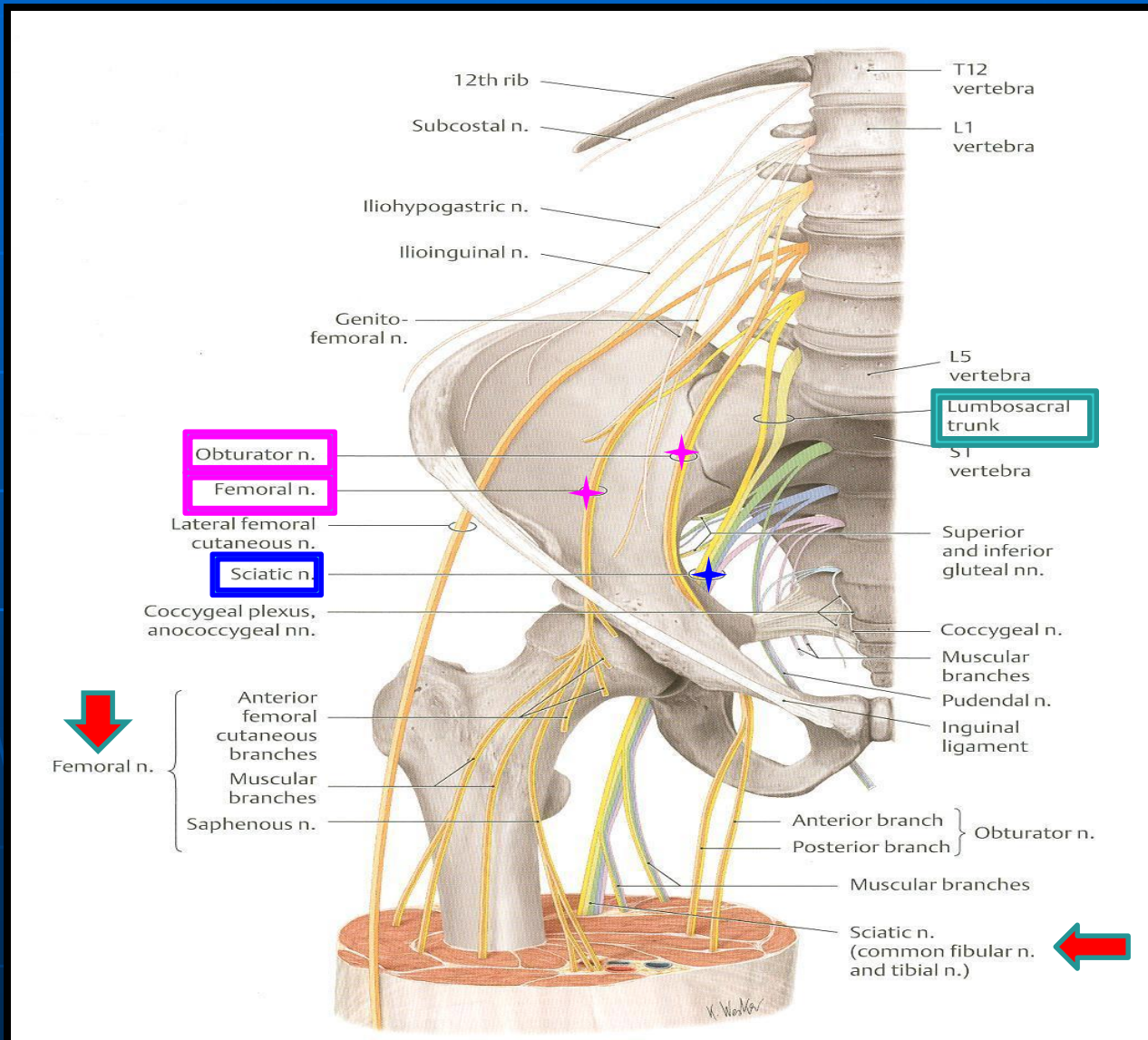
- **Main branches:**
Pelvic splanchnic nerve:
preganglionic
parasympathetic to pelvic
viscera & hindgut

Pudendal nerve:
to perineum

Sciatic nerve:
to lower limb



LUMBOSACRAL PLEXUS



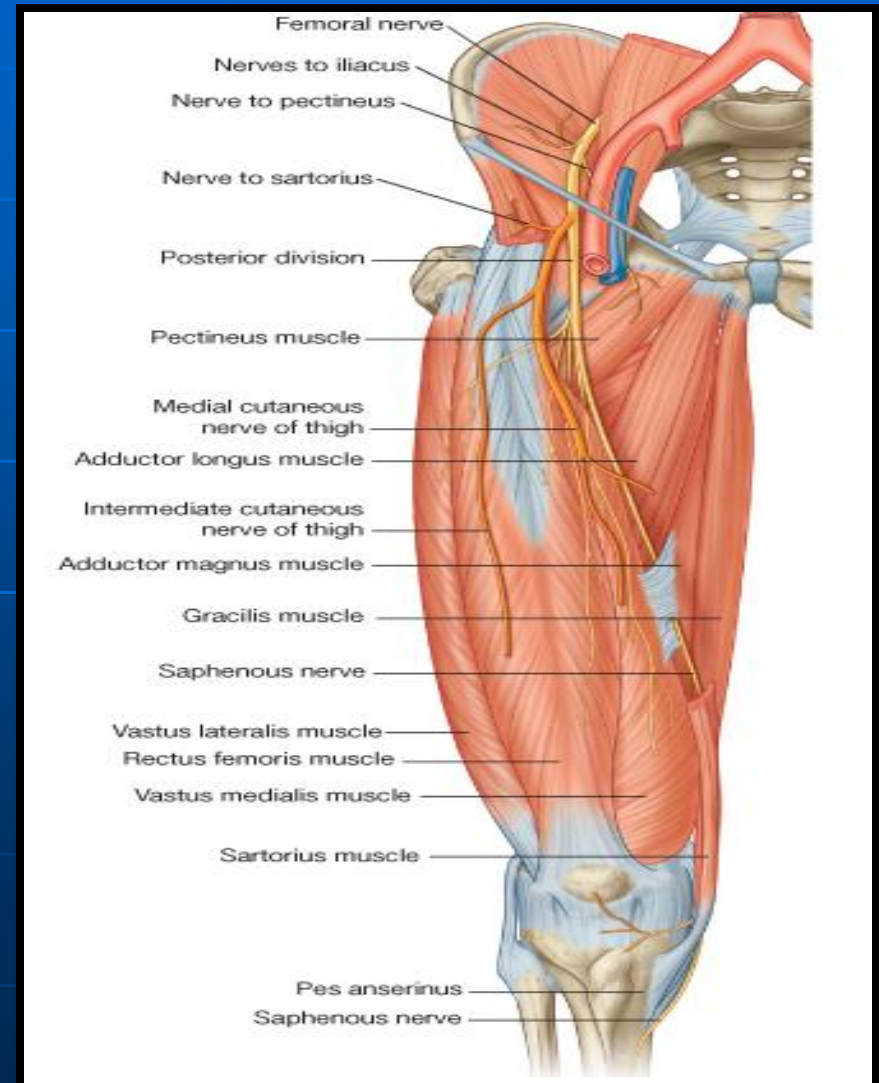
FEMORAL NERVE

□ Origin:

- A branch from lumbar plexus (L2,3,4)

□ Course:

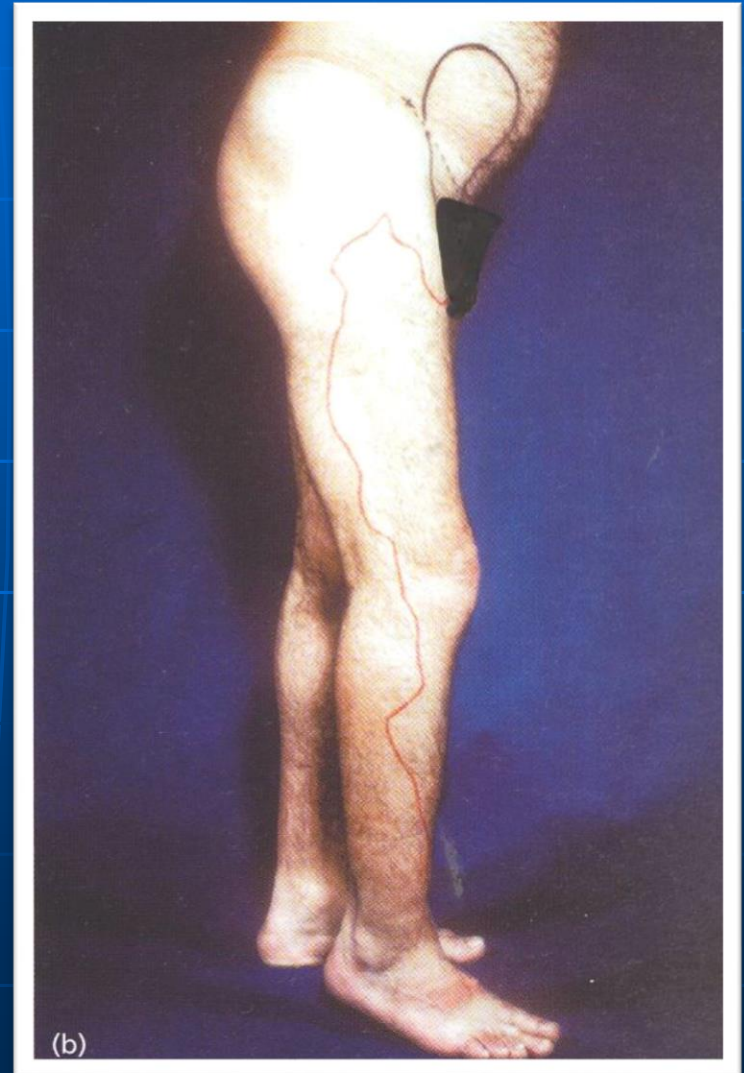
- Descends lateral to psoas major & enters the thigh **behind the inguinal ligament**
- Passes lateral to femoral artery & divides into terminal branches.



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**



SCIATIC NERVE

The largest nerve of the body

□ Origin:

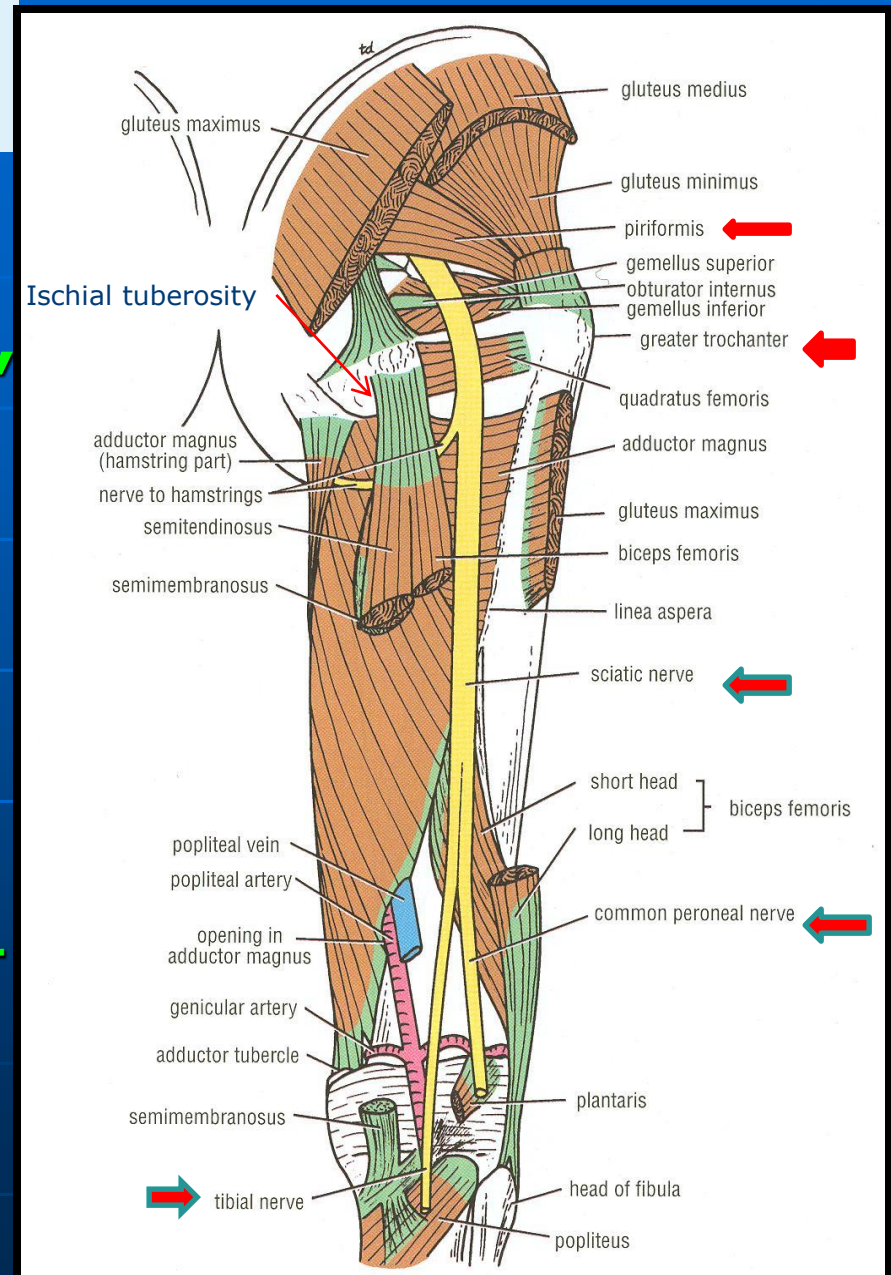
□ from **sacral plexus (L4, 5, S1, 2, & 3)**

□ It is one of the terminal branch of sacral plexus.

□ 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**

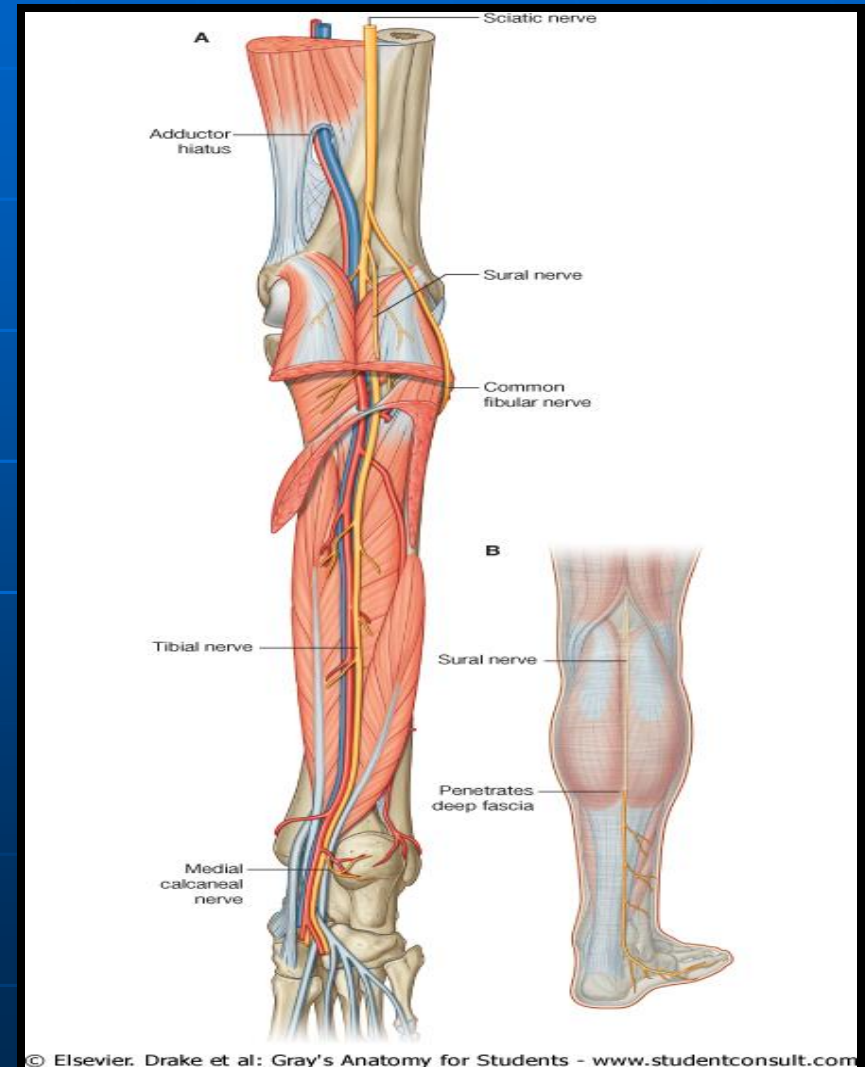
• Divides into **tibial** & **common peroneal** (fibular) nerves



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



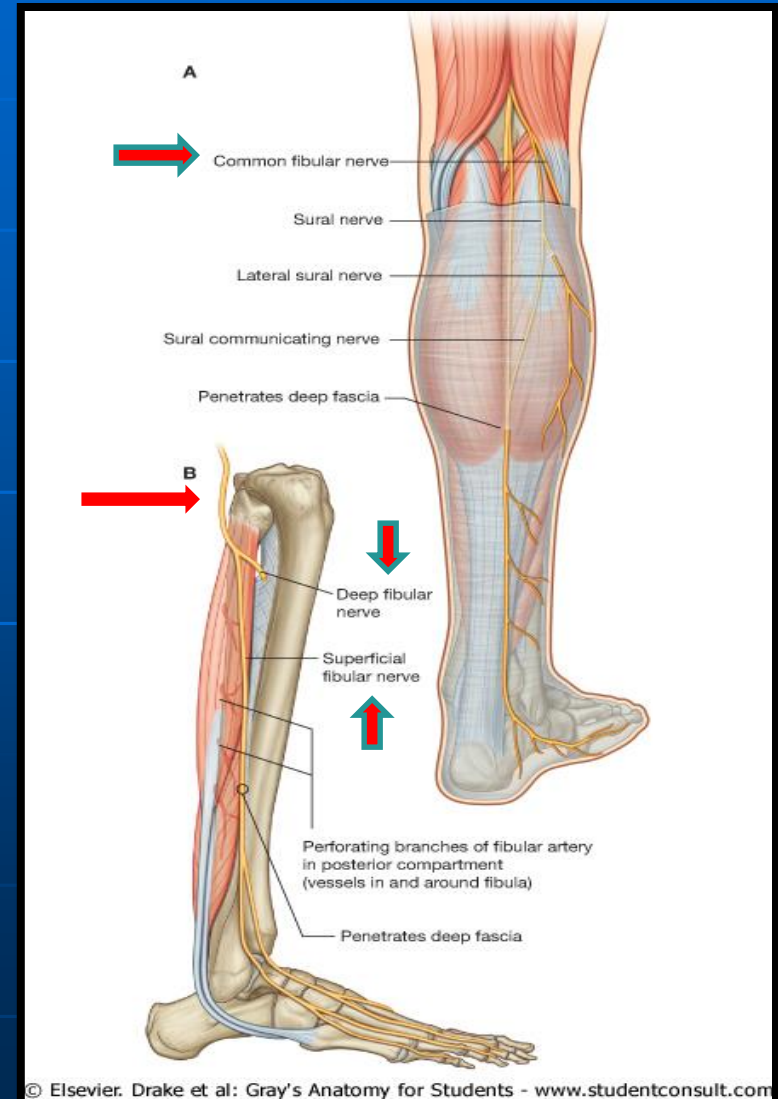
COMMON PERONEAL (FIBULAR) NERVE

□ 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 (Saphenous br.of femoral).
- **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**