

CNS Block

Anatomy Team-430



4th Lecture

Brachial Plexus and Radial Nerve

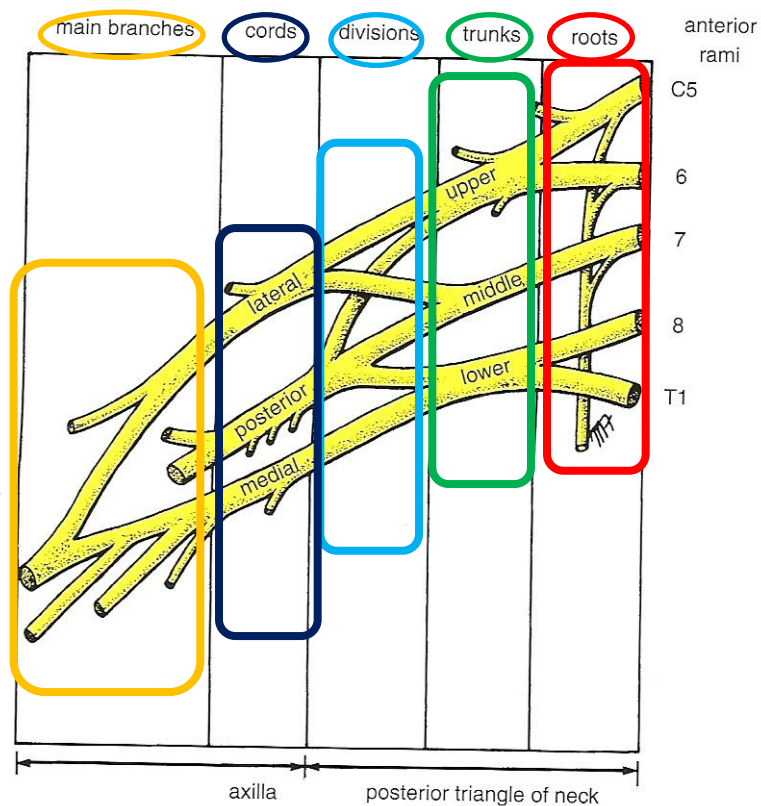
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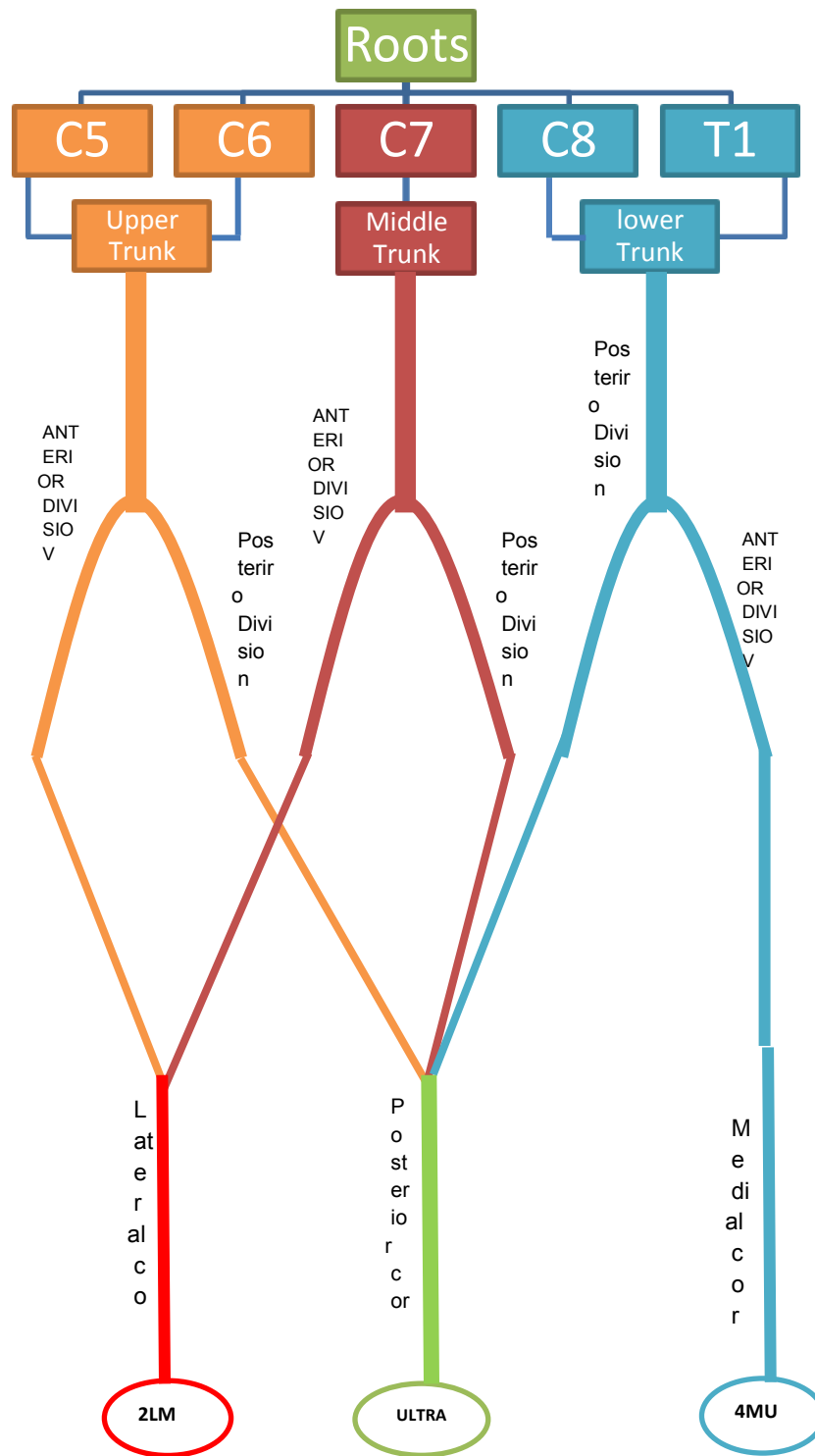
Marwah Bafadel

Brachial Plexus and Radial Nerve

Brachial plexus

Formation	Site	Divided in to
It is the union of the anterior rami of the 5 th , 6 th , 7 th , 8 th cervical and the 1 st thoracic spinal nerves	It is formed in the posterior triangle of the neck.	<ul style="list-style-type: none"> • Roots • Trunks • Divisions • Cords • Terminal branches





Upper trunk	Middle trunk	Lower trunk
Union of the roots of C5&C6	Continuation of the root of C7	Union of the roots of C8&T1



Posterior cord	Lateral cord	Medial cord
From the three posterior divisions	From the anterior divisions of the upper and middle cords	It is the continuation of the anterior division of the lower trunk



Upper subscapular n
Lower subscapular n
Thoracodorsal n
Radial n
Axillary n



Lateral pectoral n
Lateral root to median n
Musculocutaneous



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

RELATION TO AXILLARY ARTERY

TO (1 ST Part):	TO (2ND Part):	TO (3RD Part):
The three cords are above and lateral	The cords are given names according to their relations with axillary artery. Medial cord: medial Lateral cord: lateral Posterior cord: behind	Has the same relationship with the terminal branches of the brachial plexus.

BRANCHES

From Trunk (upper trunk):	From Roots:
Nerve to subclavius	C5: Nerve to rhomboids (dorsal scapular nerve)
Suprascapular nerve (<i>supplies supraspinatus & infraspinatus</i>)	C5,6&7: Long thoracic nerve

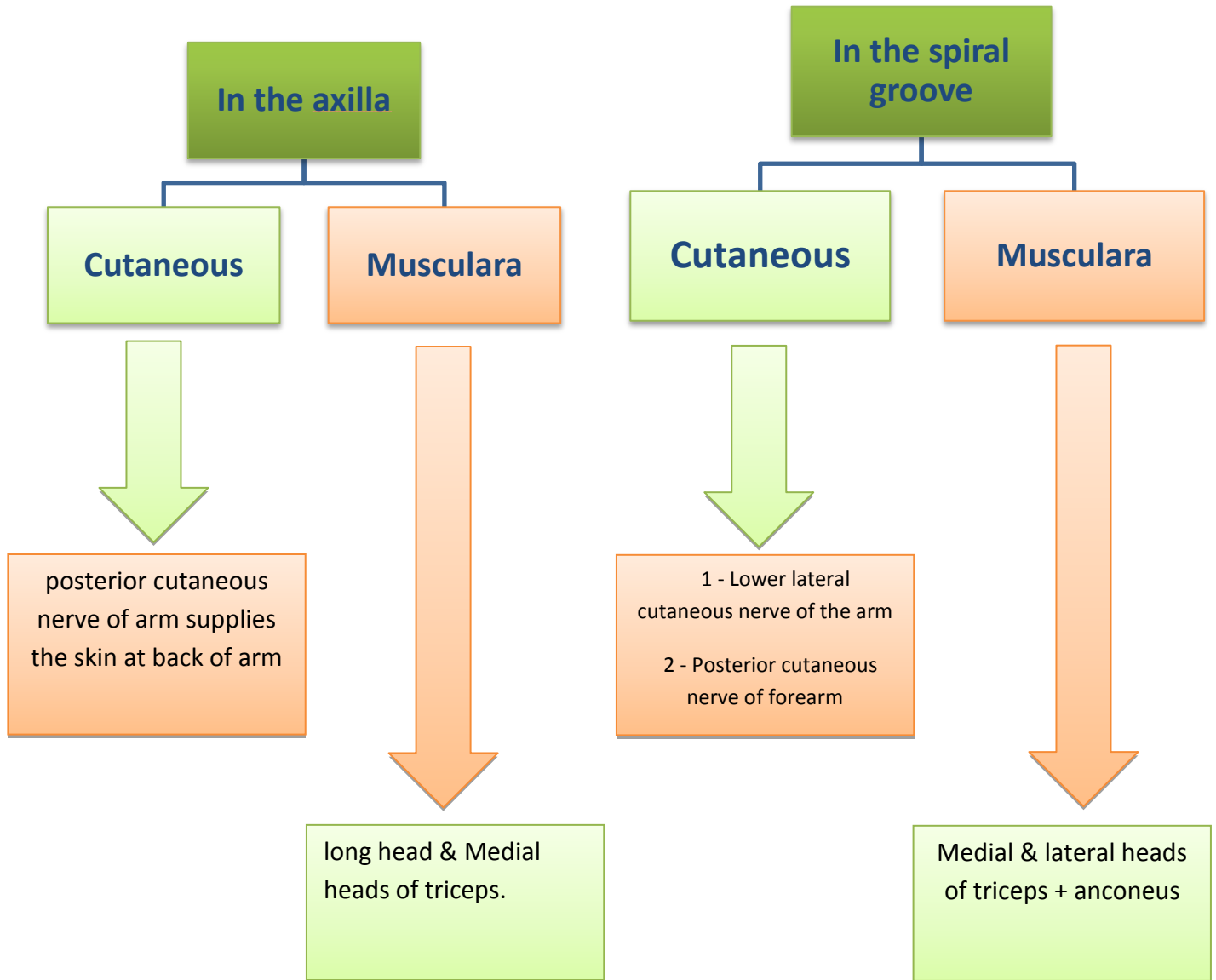
The plexus can be divided into 5 stages :-

- Roots :- **in the posterior triangle**
- Trunks :- **in the posterior triangle**
- Divisions :- **behind the clavicle**
- Cords :- **in the axilla**
- Branches :- **in the axilla**

Radial Nerve (C5, 6, 7, 8, & T1)

Origin	Course & relation
It is a continuation of the posterior cord of brachial plexus.	<p>1- In the axilla it lies behind 3rd part of axillary artery</p> <p>2- in the Arm</p> <ul style="list-style-type: none">➤ In anterior compartment of the arm in the groove between brachialis & brachioradialis:➤ Muscular:➤ Lateral fibres of brachialis➤ Nerve to brachioradialis➤ Nerve to extensor carpi radialis longus.➤ Terminal branches: <p>-Superficial branch</p> <p>-Deep branch (posterior interosseous nerve)</p> <ul style="list-style-type: none">➤ In the posterior compartment of the arm. It runs in the spiral groove of humerus, deep to lateral head of triceps.➤ At the lateral end of the spiral groove it turns forwards and pierces the lateral intermuscular septum to enter the anterior compartment of the arm in groove between brachialis medially & brachioradialis laterally <p>3- in the Forearm In the cubital fossa, it lies in front of lateral epicondyle, then under cover of brachioradialis,</p> <p>**It terminates by dividing into 2 terminal branches:</p> <ul style="list-style-type: none">-Superficial branch.-Deep branch (posterior interosseous nerve).

Branches of Radial Nerve



**Deep branch of Radial nerve
(posterior interosseous nerve)**

- It pierces the **supinator muscle** & turns around the neck of radius to reach back of forearm, descending between **superficial & deep muscles of the back of the forearm**
- It **supplies** the muscles of **posterior** compartment the of forearm

**Terminal
branches**

Superficial Terminal branch of Radial Nerve

- It is a continuation of the radial nerve
- It descends in front of lateral side of forearm to reach the dorsum of the hand
- It has **No branches in the forearm**

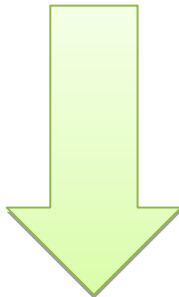
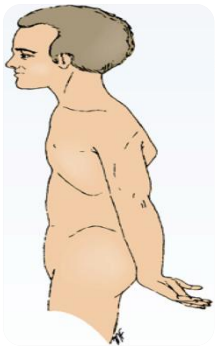
****Above wrist:**

- It turns posterior to pass superficial to extensor retinaculum to supply:
- skin of lateral **2/3 of back of hand.**
- Skin over the back of **proximal phalanges of lateral 3 ½ fingers.**

Brachial Plexus Injuries

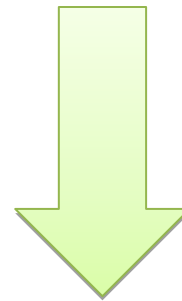
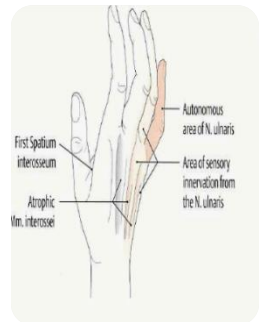
Upper Lesions of the Brachial Plexus (Erb-Duchenne Palsy "waiter's tip")

Lower Lesions of the Brachial Plexus (Klumpke Palsy)



-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.



-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 nerve fibers supply all the small muscles of the hand are damaged.

-The hand has a clawed appearance due to ulnar nerve lesion.

- Hand of Benediction or Pop's Blessings (Ape hand) will result from median nerve injury.

Radial nerve Lesion

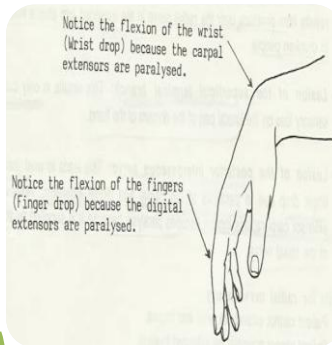
Motor :-

- Loss of extension of elbow due to paralysis of **triceps**, it may occur passively by the effect of gravity.
- Loss of **supination** due to paralysis of **supinator**.
- The characteristic deformity is "hand or wrist drop" due to paralysis of **carpal extensors**.
- There is also, 'finger drop' due to paralysis of **extensors of fingers**
- There is loss of extension of wrist and **metacarpophalangeal joints**, but extension of **inter-phalangeal joints** can be done by **lumbricals & interossei**.

Lesion in axilla

Sensory:-

- Loss of cutaneous sensations on **lateral 2/3** of dorsum of hand + dorsum of proximal parts of **lateral 3 ½ fingers**.



Radial nerve	
Sensory	Motor
	Finger extensors
	Thumb extensors and abductors
	Wrist extensors
	Brachioradialis

Lesion in spiral groove

Lesion in forearm:

Lesion of superficial terminal branch:

- Only cutaneous sensory loss on lateral part of dorsum of hand

-It is the commonest injury of radial nerve usually resulting from fracture of **middle of shaft of humerus** where the radial nerve lies close to bone

-The same manifestations as described but triceps escapes paralysis because it receives its **innervation higher up** than the site of injury

Lesion in forearm:

Lesion of posterior interosseous nerve:

- leads to 'hand or wrist drop' & 'finger drop' due to paralysis of **carpal & digital extensors**

This Diagram Show You All Radial Nerve Branches

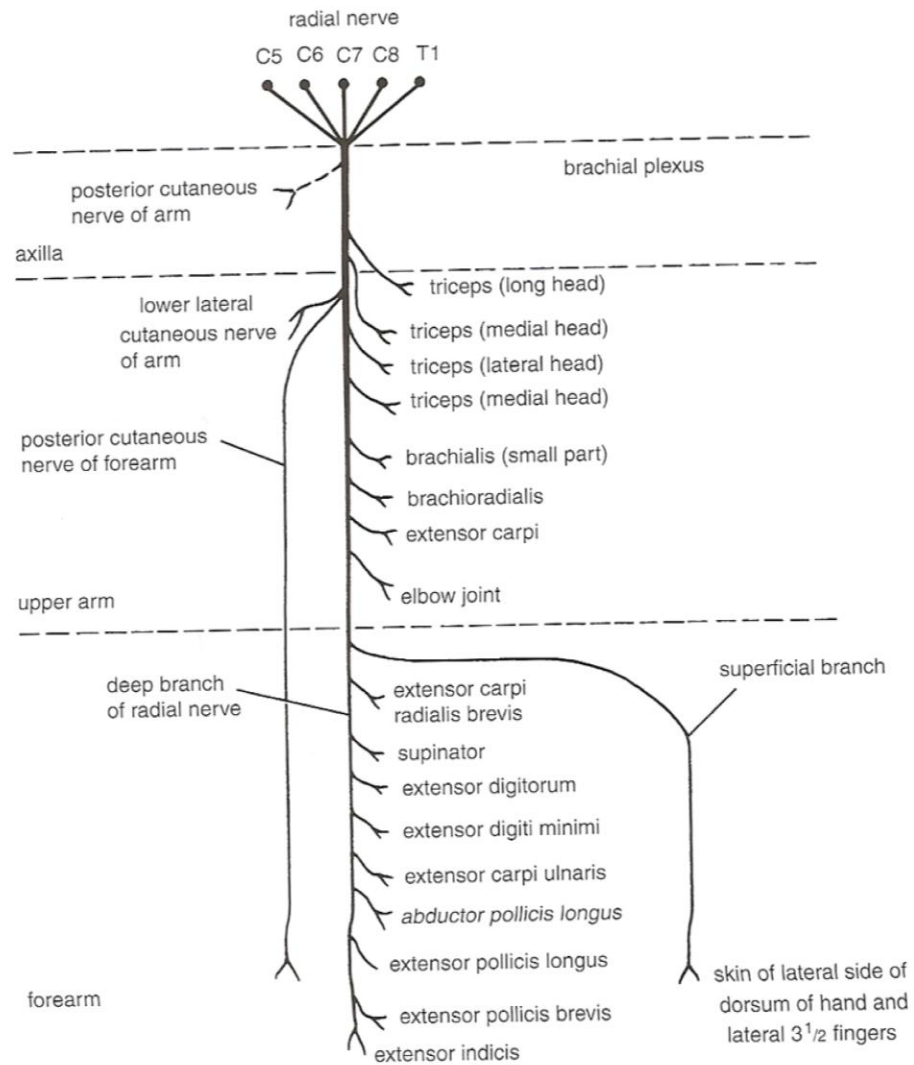


Figure 17-21 Summary of the main branches of the radial nerve.