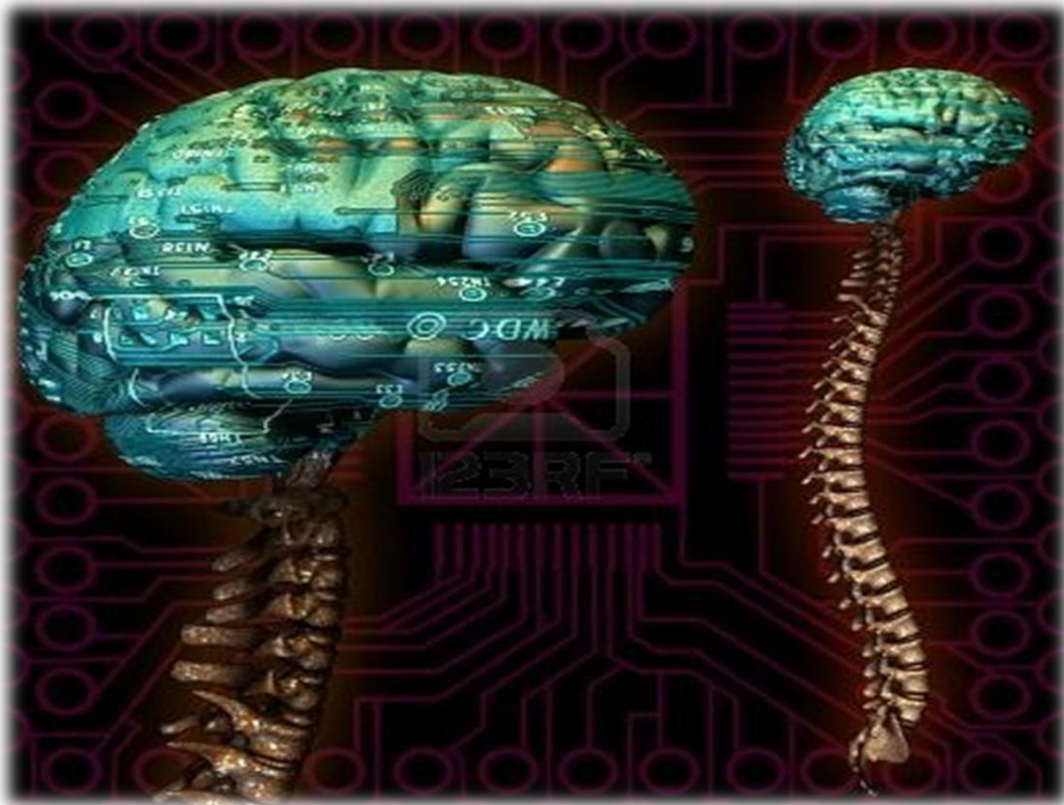




CNS Block



LECTURE (BRACHIAL PLEXUS AND RADIAL NERVE)

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Reviewed by: Raghad Almisfer

تنويه : هذا العمل لا يعتبر مصدر رئيسي للمذاكرة وإنما هو للمراجعة فقط

[If there is any mistake please feel free to contact us:](#)

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Both - Black

Male Notes - BLUE

Female Notes - GREEN

Explanation and additional notes - ORANGE

Very Important note - Red





Objectives:

- Describe the formation of brachial plexus (site, roots & stages).
- List the main branches of brachial plexus
- Describe the course of radial nerve
- List the motor & sensory distribution of radial nerve
- Describe the effects in cases of lesion of the brachial plexus & radial nerve

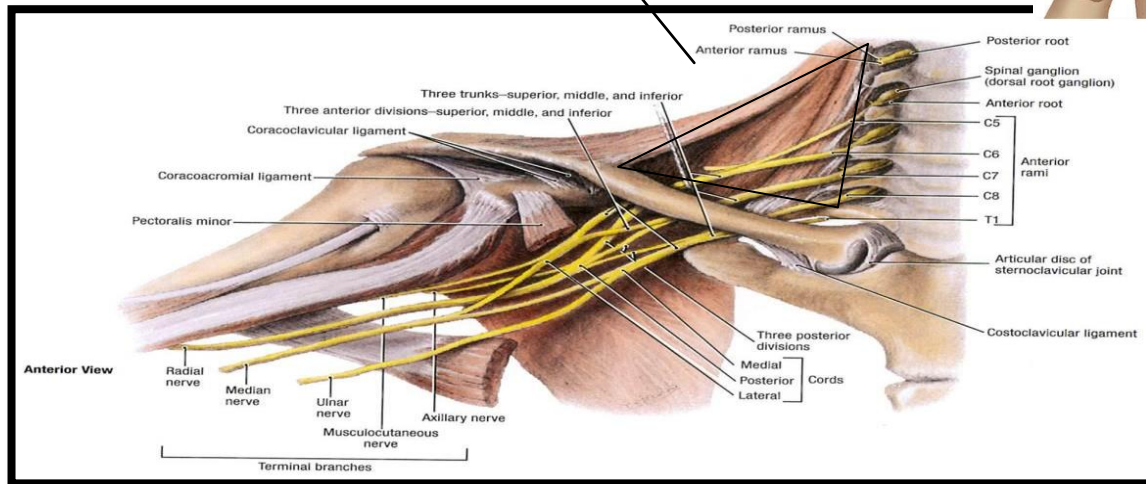
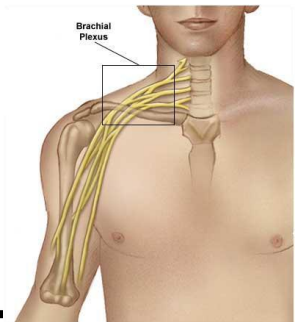


BRACHIAL PLEXUSES and radial nerve

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.



The plexus is divided into: Roots (in the posteriorΔ) > Trunks (in the posteriorΔ) > Divisions (behind the clavicle) > Cords (in the axilla) > Terminal branches (in the axilla).

The first 2 stages lie in the posterior triangle, while the last 2 stages lie in the axilla.

From Roots: C5 > Nerve to rhomboids (dorsal scapular nerve), C5,6 & 7 > Long thoracic nerve supply serratus anterior muscle

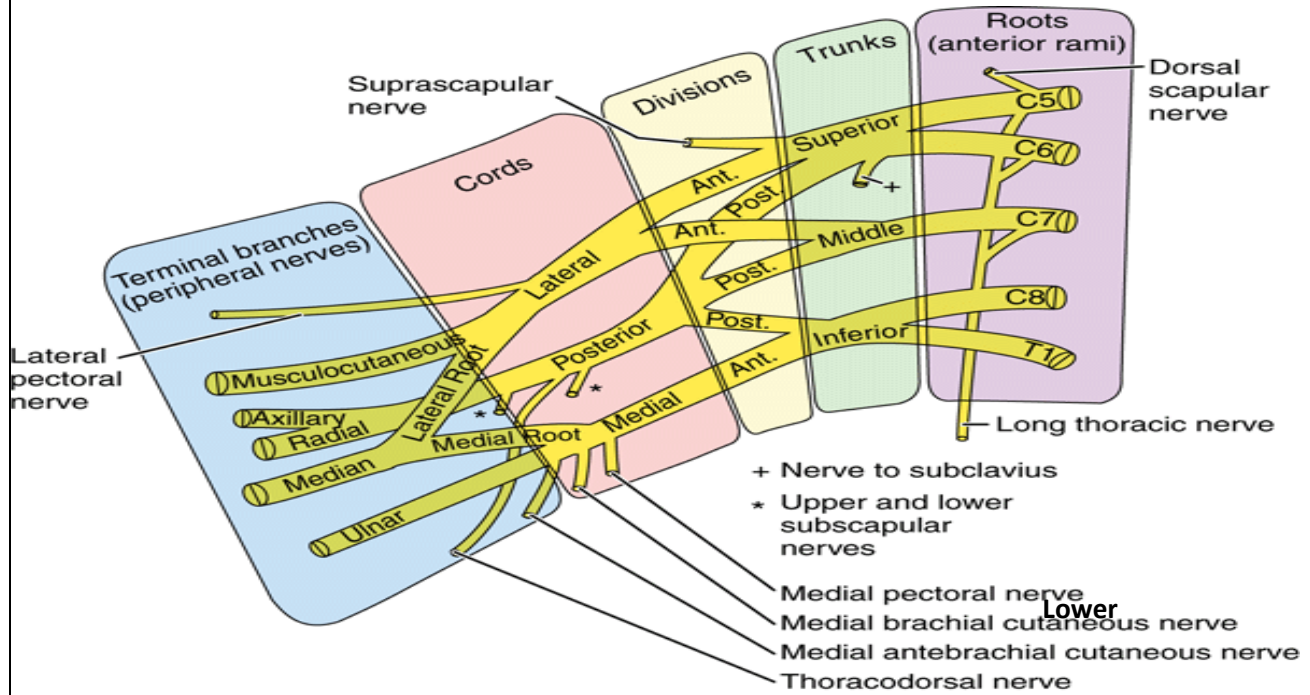
Lateral Cord (2LM)	Posterior Cord (ULTRA)	Medial cord (4MU)
Lateral pectoral n	Upper subscapular n	Medial pectoral n.
Lateral root to median n	Lower subscapular n	Medial root to median n.
Musculocutaneous n	Thoracodorsal n	Medial cutaneous n of arm.
	Radial n	Medial cutaneous n of forearm.
	Axillary n	Ulnar n.





From Trunk: (upper trunk) 1) Nerve to subclavius 2) Suprascapular nerve
(supplies supraspinatus & infraspinatus)

Branche from cords





RELATION TO AXILARY ARTERY

TO (1ST Part): The three cords are **above and lateral**

Their relations with axillary artery

Medial cord: medial, Lateral cord: lateral, Posterior cord: behind

TO (3RD Part): Has the same relationship

with the terminal branches of the brachial plexus.

Median nerve and musculocutaneous nerve are lateral to third part, radial nerve is posterior to third part, ulnar nerve is medial to third part

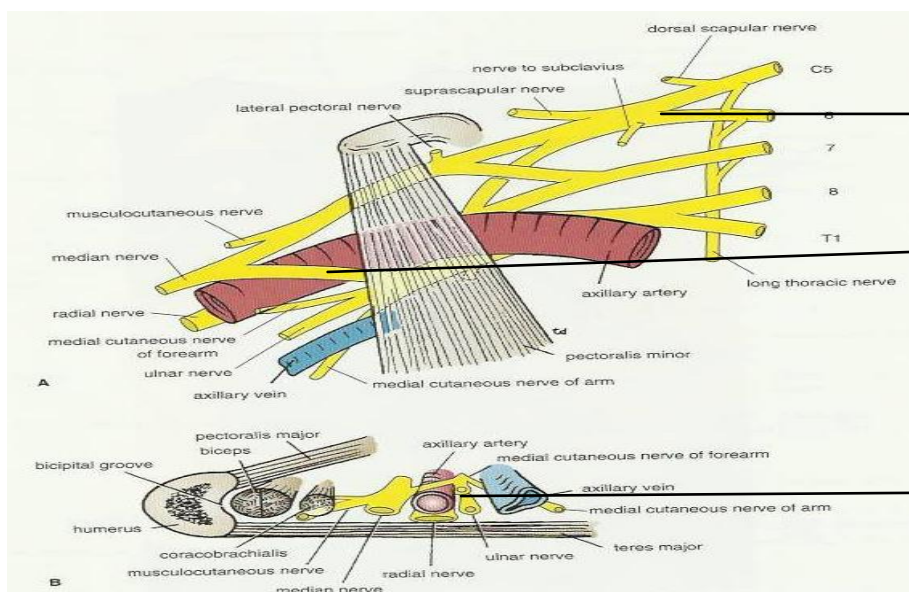
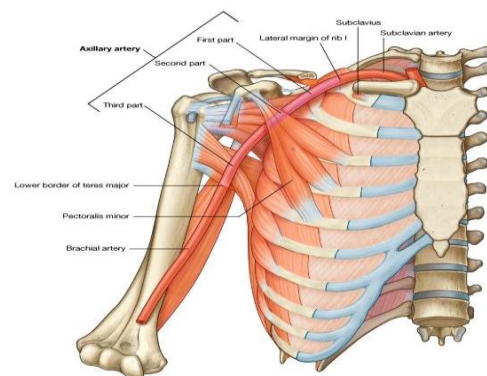
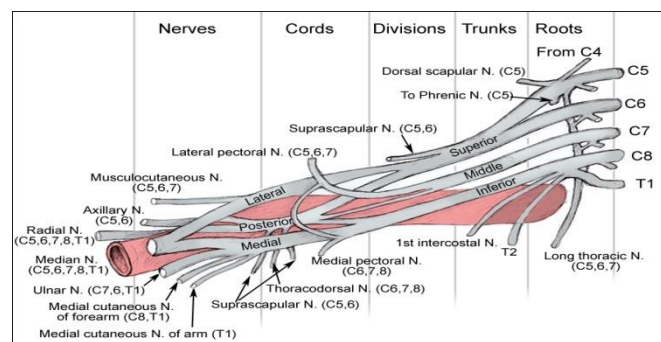
the pectoralis minor muscle divid axillary artery to three parts

Parts of axillary artery :

1st part of axillary artery: It lies between the lateral border of the first rib and the medial border of the pectoralis minor muscle

2nd part of the axillary artery: It lies under the pectoralis minor muscle

3rd part of axillary artery: It lies between the lateral border of pectoralis minor and the lower border of the teres major muscle



relationship to fist part

relationship to second part

relationship to third part

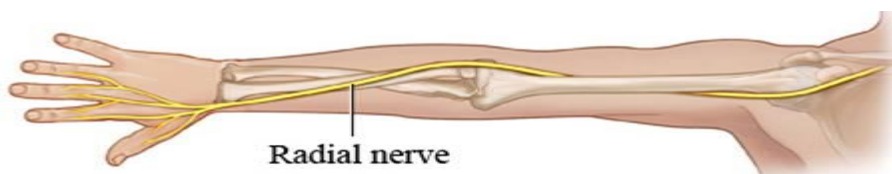
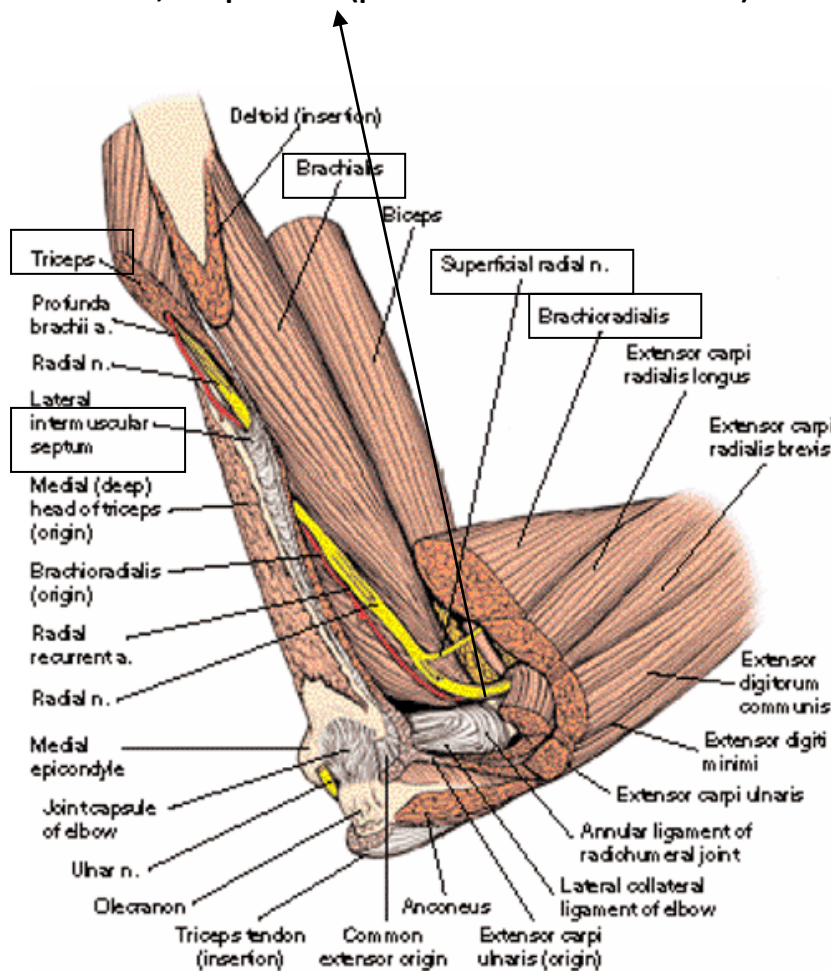
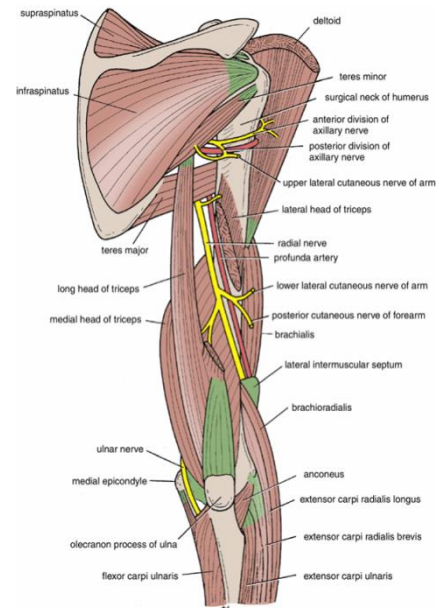




RADIAL NERVE>> Origin: It is a continuation of the **posterior cord of brachial plexus (C5, 6, 7, 8, &T1)**

Course & relation: In the axilla: it lies behind 3rd part of axillary artery

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 intramuscular septum to enter the anterior compartment of the arm in groove between *brachialis* medially and *brachioradialis* laterally. In the cubital fossa, it lies in front of lateral epicondyle, and then under cover of brachioradialis, it terminates by dividing into 2 terminal branches: Superficial branch, Deep branch (posterior interosseous nerve)



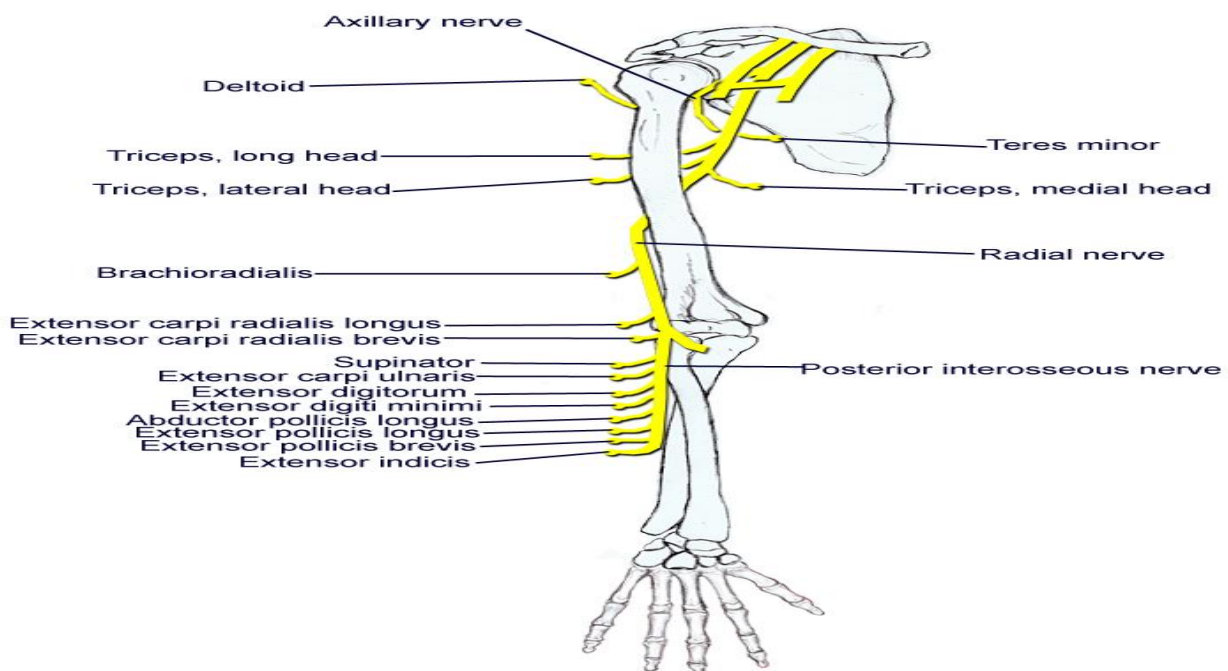


Branches of Radial Nerve

In the axilla:	In the spiral groove:	<u>In anterior compartment of the arm in the groove between brachialis & brachioradialis:</u>
Muscular: long head & Medial heads of <u>triceps</u> .	Muscular: medial & lateral heads of <u>triceps</u> + <u>anconeus</u>	Muscular: <ul style="list-style-type: none"> • <u>Lateral fibres of brachialis</u> <u>Medial half of brachialis</u> supply by <u>and musculocutaneas nerve</u> • Nerve to <u>brachioradialis</u> Nerve to <u>extensor carpi radialis longus</u> (<u>carpi radialis longus is below brachioradialis</u> so, it is supplied by <u>radial nerve</u>)
Cutaneous: posterior cutaneous nerve of arm supplies the skin at back of arm	Cutaneous: <ol style="list-style-type: none"> 1 - Lower lateral cutaneous nerve of the arm 2 - Posterior cutaneous nerve of forearm 	

Terminal branches:

- Superficial branch
- Deep branch (posterior interosseous nerve).





Superficial branch

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 1/2 fingers

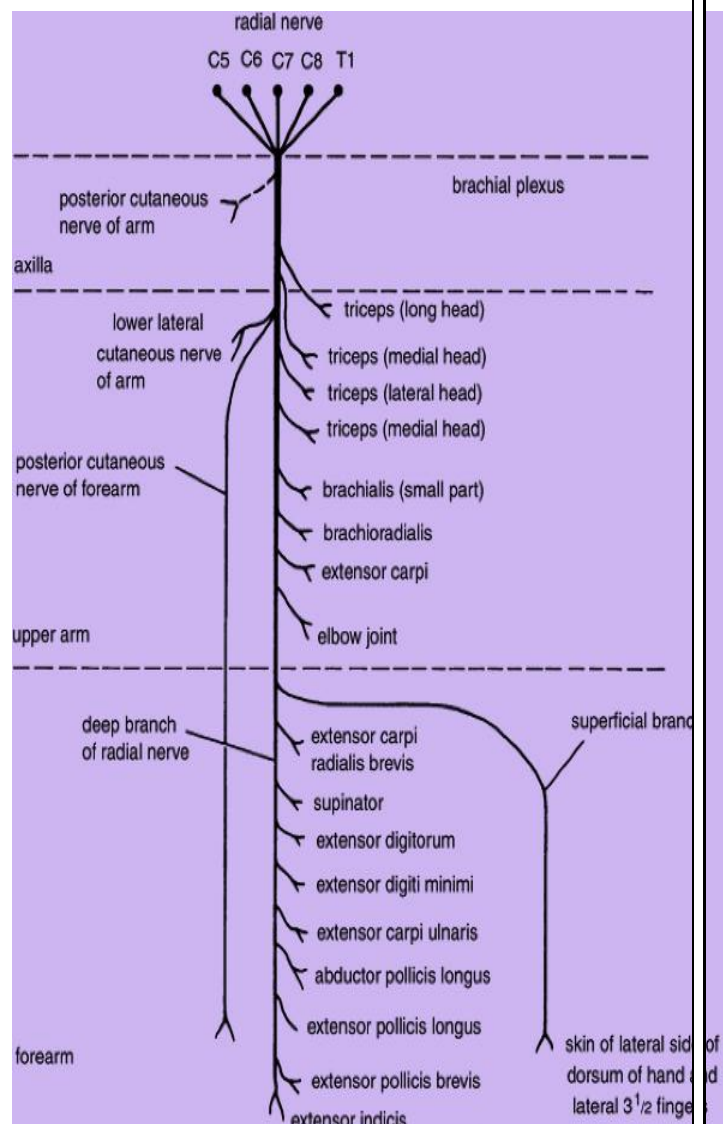
Median supply palm of hand, radial supply back of hand , ulnar supply medial of hand 1 1/2 finger

Deep branch

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

If there is fracture of neck of radius , the extensor of forearm will affect





Ulnar nerve in (write position)

Flexion of metacarpophalange joint and extension of inter phalanges joint

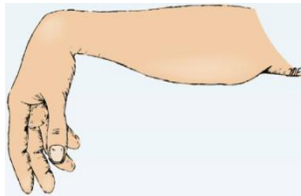
If there is injury the opposite will happened

Extension of metacarpo phalange joint and flexion of inter phalanges joint (**clawed**)

Injuries to the Radial Nerve in the Axilla

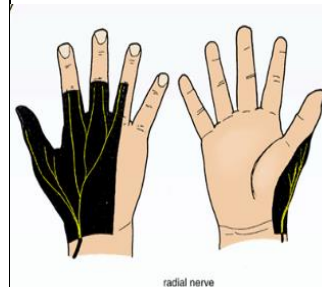
Motor

The **triceps, the anconeus, and the long extensors of the wrist are paralyzed.** The patient is **unable to extend the elbow joint, the wrist joint, and the fingers.** So The characteristic deformity is **Wrist drop**, or flexion of the wrist



Sensory

A small loss of skin sensation in posterior surface of the lower part of the arm and down a narrow strip on the back of the forearm. Sensory loss on the lateral part of the dorsum of the hand and on the dorsal surface of the roots of the lateral 3 ½ fingers.



Brachial Plexus Injuries:

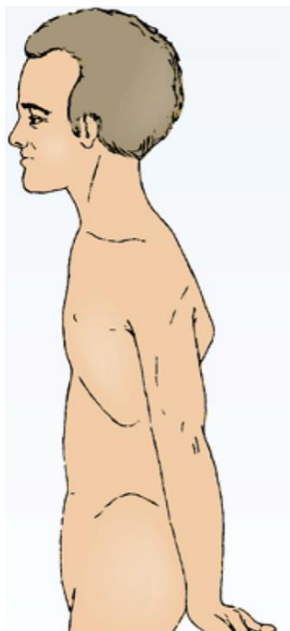
The **roots, trunks, and divisions** of the brachial plexus reside in the lower part of the neck, whereas the **cord and most of the branches** of the plexus lie in the axilla. So, Complete lesions involving all the roots of the plexus are **rare**

Upper Lesions of the Brachial Plexus Upper Trunk C5,C6 (Erb-Duchenne Palsy) "waiter's tip position".

Lower Lesions of the Brachial Plexus Lower Trunk (C8,T1) Lesion, (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. The arm hangs by the side and is rotated medially. The forearm is extended and pronated.

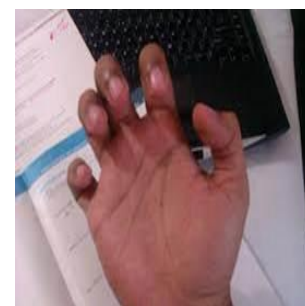


Radial nerve --- Wrist drop because extensor paralyzed

Median nerve ----app hand because thenar muscles are hyper extended

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.

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.





Quiz

Q1: It is formed in the posterior triangle of the neck:

- a- cervical plexus
- b- brachial plexus
- c- lumbar plexus
- d- coccygeal plexus

Q2: brachial plexus formed of union of:

- a- C5,6,7,8
- b- C1,2,3,4,T1
- c- C5,6,7,8,T1
- d- T1-L2

Q3: Lower Trunk of brachial plexus union of:

- a- T1,C8
- b- T1,C5
- c- T1,C7
- d- T1,C6

Q4: Branches of C5,C6,C7 union together to give:

- a- dorsal scapular nerve
- b- Long thoracic nerve
- c- Nerve to subclavius
- d- Suprascapular nerve

Q5: Which one of the following nerve NOT include in the Lateral cord of brachial plexuses:

- a- Lateral pectoral N.
- b- Lateral root to median N.
- c- Radial N.
- d- Musculocutaneous N.

Q6: Which one of the following nerve is one of the posterior cord of brachial plexuses:

- a- Axillary N.
- b- Ulnar N.
- c- median N.
- d- Musculocutaneous N.



Q7: Superficial Terminal branch of Radial Nerve have:

- a- One branche
- b- Two branches
- c- Three branches
- d- No branches

Q8: Wrist drop an injury in:

- a- Radial Nerve
- b- median nerve
- c- ulnar nerve
- d- Axillary nerve

Q9: Lesions of the Brachial Plexus Upper Trunk C5,6 case:

- a- APE HAND
- b- Claw hand
- c- Hand of Benediction
- d- waiter's tip position

Q10: APE HAND will result from:

- a- median nerve injury
- b- ulnar nerve injury
- c- Radial Nerve injury
- d- Axillary nerve injury

Q11: Lesion of the upper trunk of the brachial plexus leads to :

- a. a-Klumpke palsy.
- b. b-Erb-Duchenne palsy.
- c. c-Drop wrist & hand.
- d. Ape hand.

Q12: Which one of the following nerves is a branch of posterior cord of brachial plexus?

- a. Ulnar.
- b. Radial.
- c. Median.
- d. Musclocutanous



Q13 : In spiral groove of humerus which muscle is supplied by radial nerve?

- a. Biceps .
- b. Triceps .
- c. Supinator.
- d. Brachialis.

Question	Answer
1	B
2	C
3	A
4	B
5	C
6	A
7	D
8	A
9	D
10	A
11	B
12	B
13	B

GOOD LUCK

Anatomy Team Leaders:

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