



MED437
KING SAUD UNIVERSITY



Radial and Ulnar Nerves

Lecture 14



Please check our [Editing File](#).

هذا العمل لا يغني عن المصدر الأساسي للمذاكرة

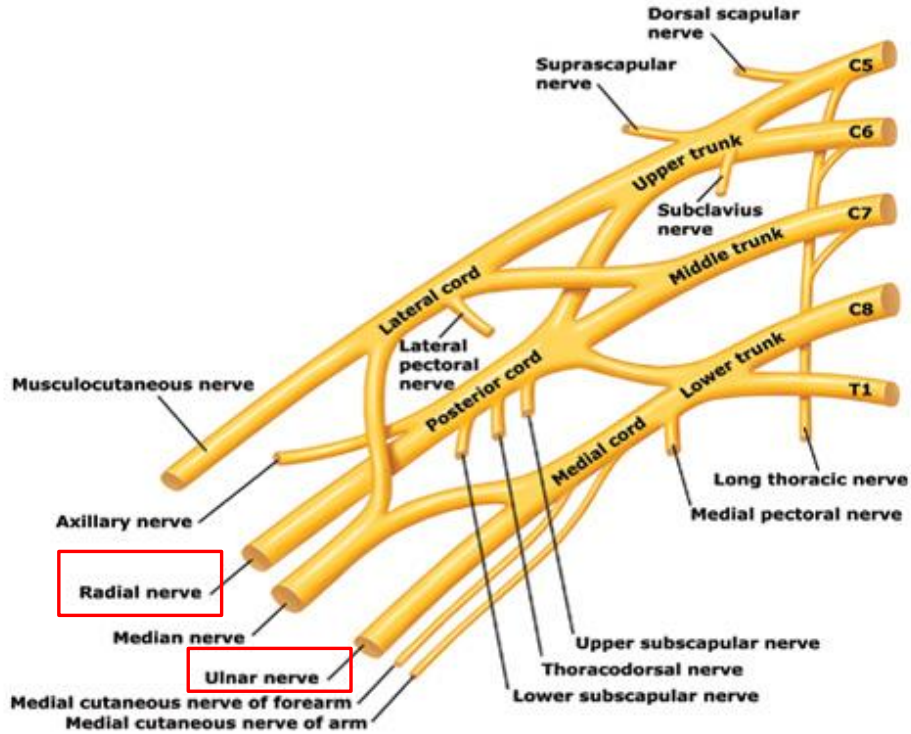
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Objectives

- Describe the anatomy of the radial & ulnar nerves regarding: origin, course & distribution.
- List the branches of the nerves.
- Describe the causes and manifestations of nerve injury

- Text in **BLUE** was found only in the boys' slides
- Text in **PINK** was found only in the girls' slides
- **Text in RED is considered important**
- Text in **GREY** is considered extra notes

Recall

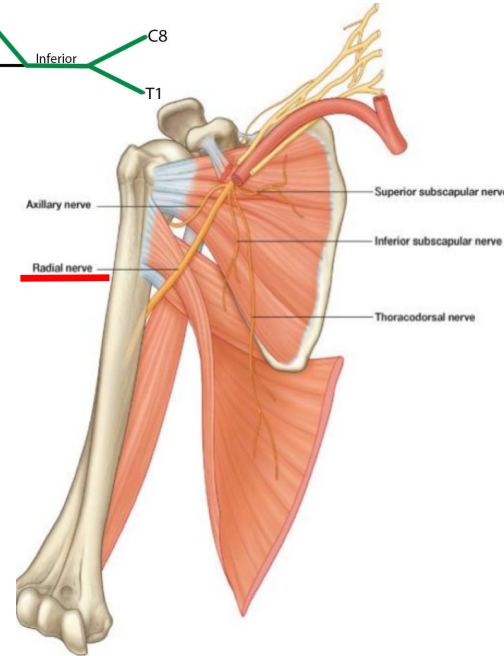
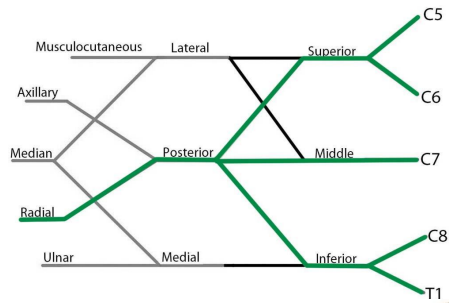


Radial Nerve

Origin: Posterior cord of the brachial plexus in the axilla
(the largest branch of nerves in the upper limb)

Supplies: All muscles of the posterior compartment of the arm (triceps) & forearm (3 groups)

*No muscle supplied by the radial nerve in the hand

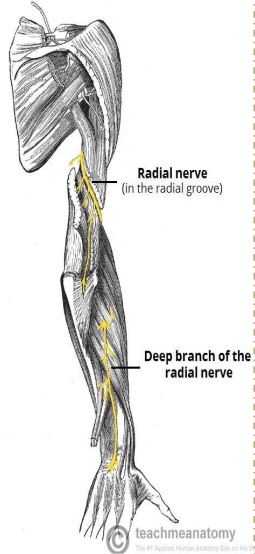


Radial Nerve, Course & Distribution

In the Arm

It winds (يلف) around the back of the arm in the **Spiral Groove (radial groove)** on the back of the humerus between the heads of the triceps. In the spiral groove, the nerve is accompanied by the **Profunda Vessels**, and it lies directly in contact with the shaft of the humerus (**Dangerous Position**).

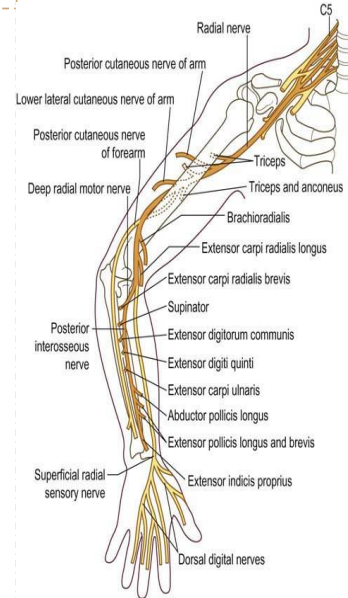
*Team436: Any fracture of humerus specifically the spiral groove leads to injury of the radial nerve



In the Forearm

It pierces the **Lateral Intermuscular septum**. (The nerve runs posterior to the humerus in the arm, يتقب the intermuscular septum so it can reach the cubital fossa)

Descends in front of the **Lateral Epicondyle**. Passes forward into the **Cubital Fossa**:
Divides into **Superficial & Deep** branches. (Here radial nerve ends.)



Branches

Picture
From team 436



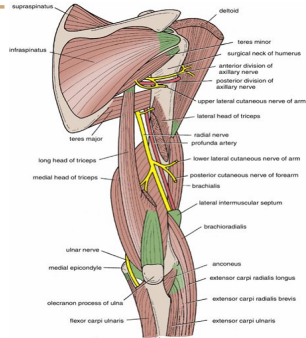
Arising In The Axilla:

Cutaneous:

Posterior cutaneous nerve of arm.

Muscular to:

Long & Medial Heads of Triceps



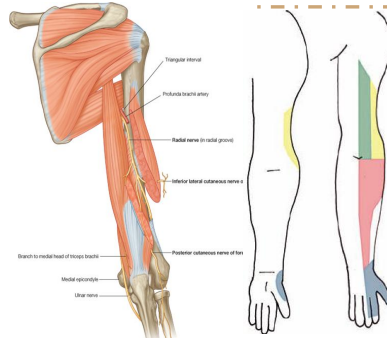
Arising In the Spiral Groove:

Cutaneous:

1. Lower lateral cutaneous nerve of arm.
2. Posterior cutaneous nerve of forearm.

Muscular to:

1. Lateral & Medial heads of triceps.
2. Anconeus.



- Lower lateral cutaneous nerve to the arm
- Posterior cutaneous nerve to the arm
- Posterior cutaneous nerve to the forearm
- Superficial sensory radial nerve

Arising Close to Lateral Epicondyle:

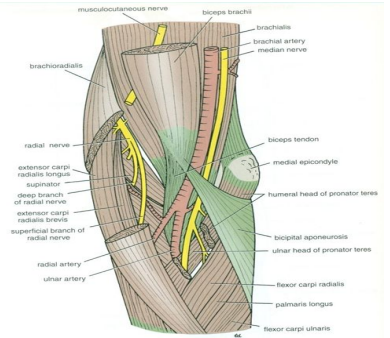
Articular to:

Elbow joint

No Cutaneous Branches

Muscular to :

1. Brachioradialis.
2. Extensor carpi radialis longus.
3. Brachialis.



Sensory nerve
only

.. Superficial branch of the radial nerve

Course:

- 1- It descends under cover (tendon) of Brachioradialis.
- 2-Lateral to radial artery
- 3-It emerges beneath the brachioradialis tendon.

علشان يعدي من الـ Anatomical Snuff Box

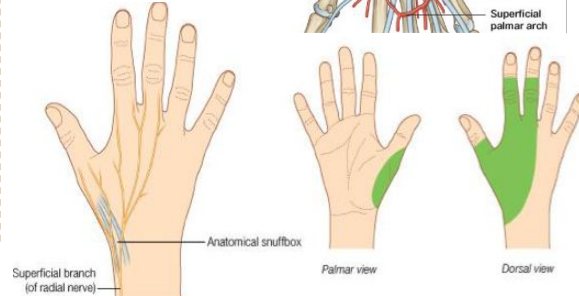
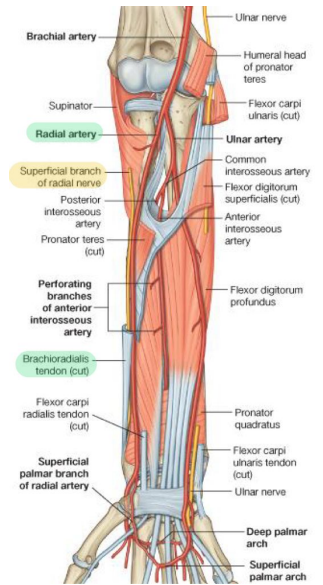
Termination:

It reaches the posterior surface of the wrist, where it divides into terminal branches that supply the skin:

- on the lateral two thirds of the posterior surface (dorsum) of the hand
- the posterior surface over the proximal phalanges of the **lateral three and half fingers. (All finger except distal phalanges “nail beds”)**

The area of skin supplied by the nerve on the dorsum of the hand is variable.

“cutaneous supply”
The medial and lateral cutaneous of the arm and forearm is supplied by the medial cutaneous nerve of the arm and medial cutaneous nerve of the forearm



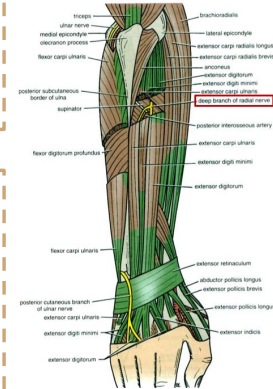
Deep branch of the radial nerve

Deep branch of radial nerve = posterior interosseous nerve

It winds around the neck of the radius, within the supinator muscle, and enters the posterior compartment of the forearm.

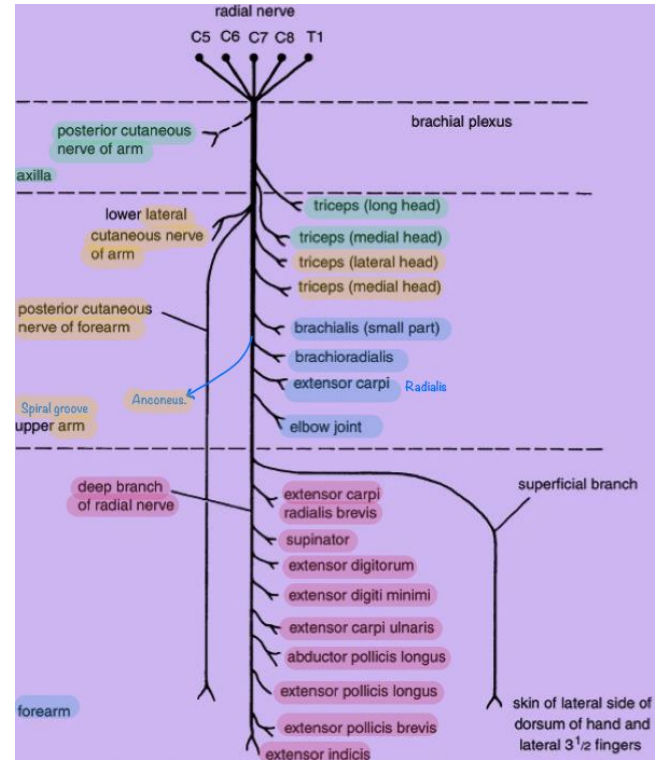
It supplies: (9 muscles out of 12 in the posterior compartment)

- Extensor carpi radialis brevis.
- Extensor carpi ulnaris.
- Supinator.
- Abductor pollicis longus.
- Extensor pollicis brevis.
- Extensor pollicis longus.
- Extensor indicis.
- Extensor digitorum.
- Extensor digiti minimi.

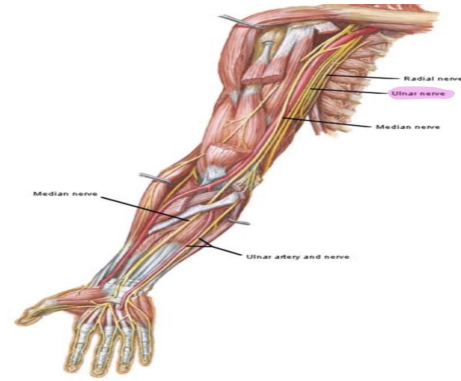
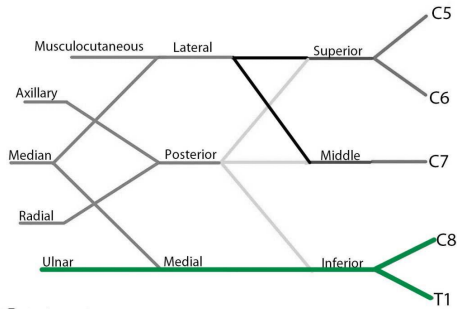


All the extensors except ABE

Summary of branches of radial nerve



Ulnar nerve

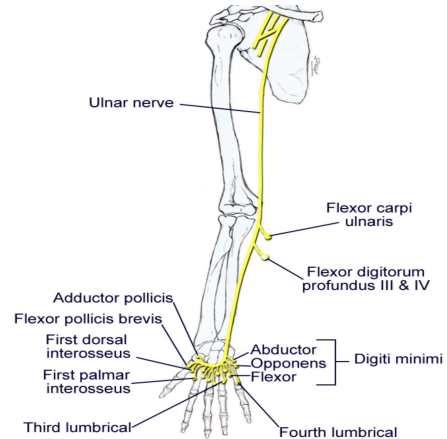


Origin: medial cord of brachial plexus

Course: descends along the **medial side** of **axillary artery** and **brachial artery**.

3- Pierces the **medial intermuscular septum**.

4- passes **behind** the **medial epicondyle** of the humerus.



Ulnar nerve

[It has no branches in the arm.]

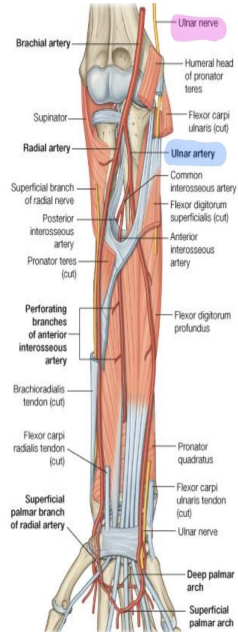
Course in the forearm:

Enters the anterior compartment through: flexor carpi ulnaris

Descends:

1- behind the **flexor carpi ulnaris**

2- Medial to **ulnar artery**



Course at the wrist:

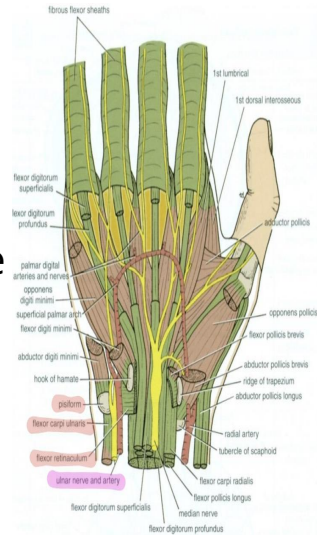
Passes:

Anterior to flexor retinaculum*

Lateral to pisiform bone

Medial to ulnar artery

Divides into: superficial and deep branches

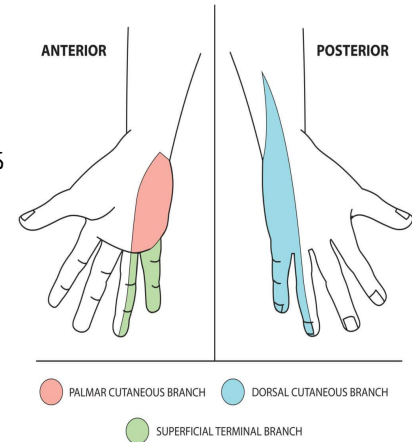
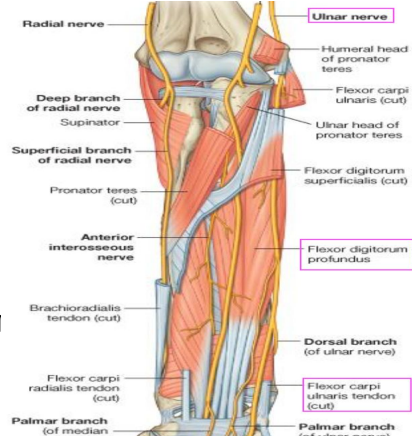
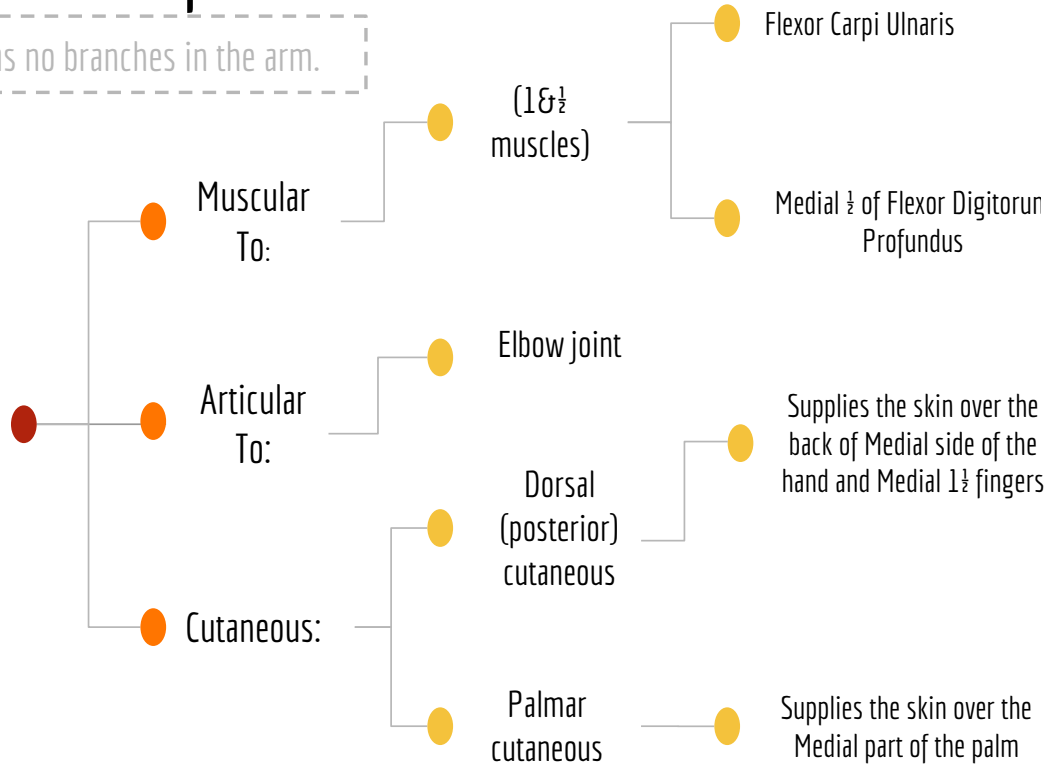


*the ulnar nerve & ulnar artery does not pass through the carpal tunnel

Branches of Ulnar Nerve

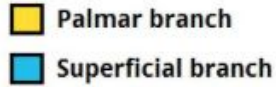
It has no branches in the arm.

the Forearm



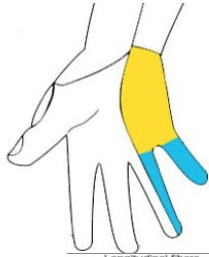
Branches of Ulnar Nerve

Superficial Terminal Branch:



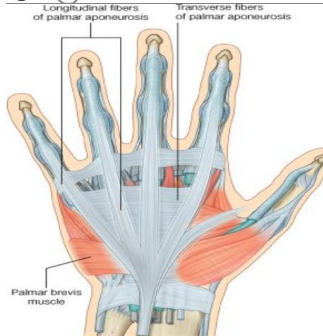
1- Muscular:

- Palmaris Brevis



2- Cutaneous:

- Skin over the Palmar aspect of the medial 1½ fingers (including nail beds).



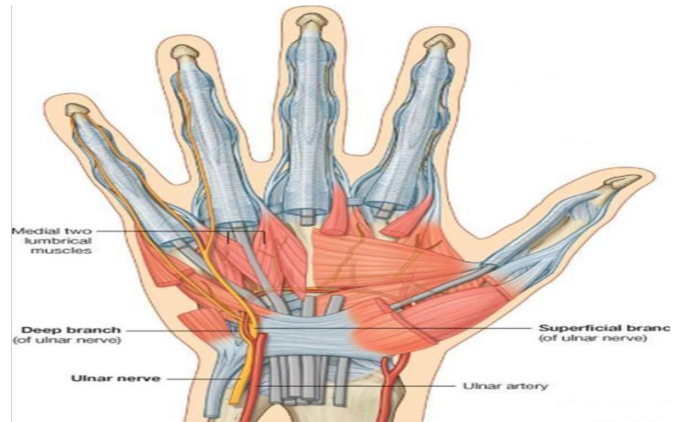
Branches of Deep Terminal Branch:

1- Muscular:

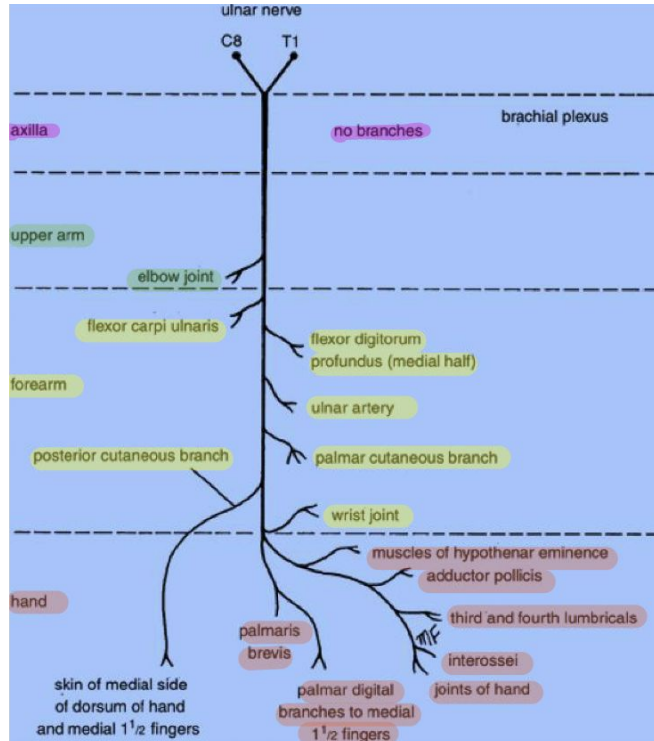
- Hypothenar Eminence
- All Interossei (Palmar & Dorsal)
- 3rd & 4th Lumbricals
- Adductor pollicis

2- Articular:

- Carpal joints.



Summary of Branches of Ulnar Nerve



Injuries to the Radial nerve



In the axilla The nerve can be injured by:

- A drunkard falling asleep with one arm over the back of a chair**.
- By fractures and dislocations of the proximal end of the humerus*.

The triceps, the anconeus, and the long extensors of the wrist are paralyzed.

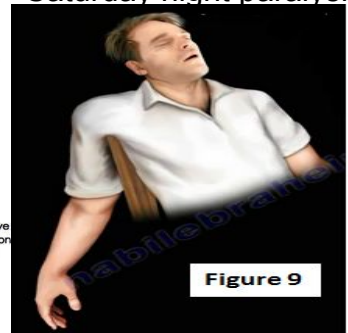
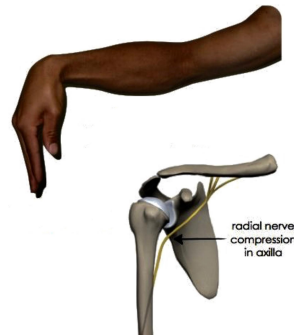
The patient is unable to extend the elbow & the wrist joints, and the fingers (**Wrist Drop**)

*a dislocation of the shoulder joint will cause the head of humerus to descend to the axilla (because of the presence of the rotator cuff) and press on the radial nerve.

In the Spiral Groove:

Injury or fracture of the spiral groove of the humerus, the patient is unable to extend the wrist and the fingers (**Wrist Drop**).

**Saturday night paralysis



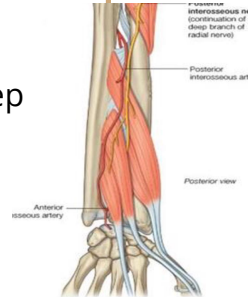
Injuries to the deep branch of the radial nerve

The deep branch of the radial nerve is **purely Motor** (It supplies the extensor muscles in the posterior compartment of the forearm).

- It can be damaged in fractures of the proximal end of the radius or during dislocation of the radial head.
- The nerve that supply the supinator and the extensor carpi radialis longus will be **undamaged**.

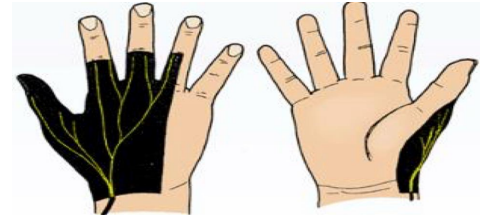
and because the latter muscle is powerful, it will keep the wrist joint extended,

- **(No wrist Drop)** ABE muscles are still working
- **No sensory loss**



Injuries to the superficial branch of the radial nerve

- Superficial radial nerve, is a **Sensory** nerve.
- Injury like a stab wound, results in a variable small area of anesthesia over the dorsum of the hand and lateral three and half fingers up to the base of their distal phalanges.



Ulnar nerve Injury

*Partial: only 2 fingers are affected (complete in case of injury to both median & ulnar nerves)
** Claw Hand: is characterized deformity of ulnar nerve injury, it causes extension of metacarpophalangeal joint and flexion of interphalangeal joints. Opposite to writing position.

Different deformities of Nerve injury

At the Elbow:

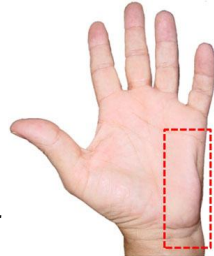
- Atrophy of Ulnar side of forearm.
- Flexion of the wrist with Abduction.
- Partial* **Claw hand.****
- Wasting of Hypothenar Eminence.



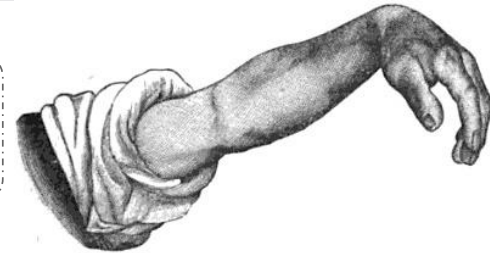
Claw Hand
Ulnar Nerve

At the wrist:

- Partial **Claw Hand.**
- Wasting of Hypothenar Eminence.



Wrist Drop
Radial Nerve

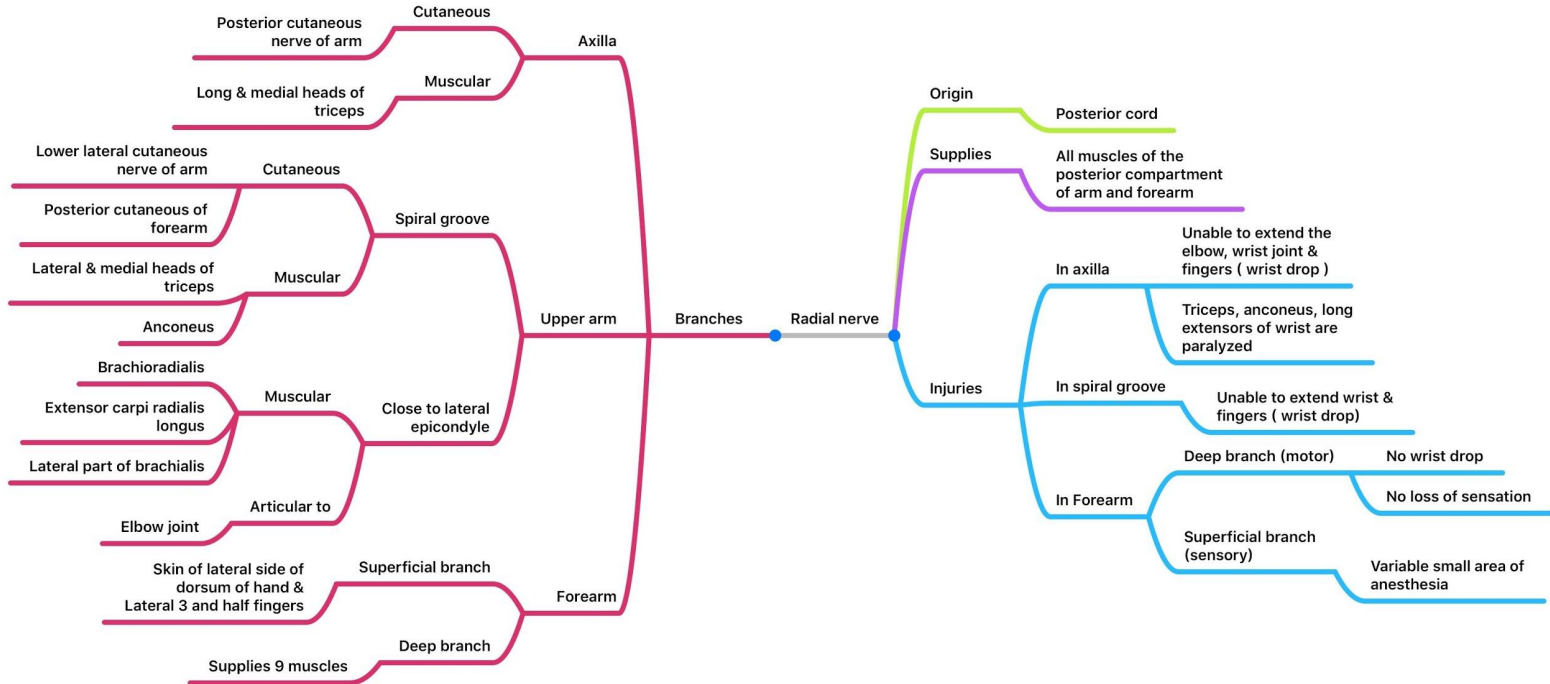


Ape Hand
Median Nerve

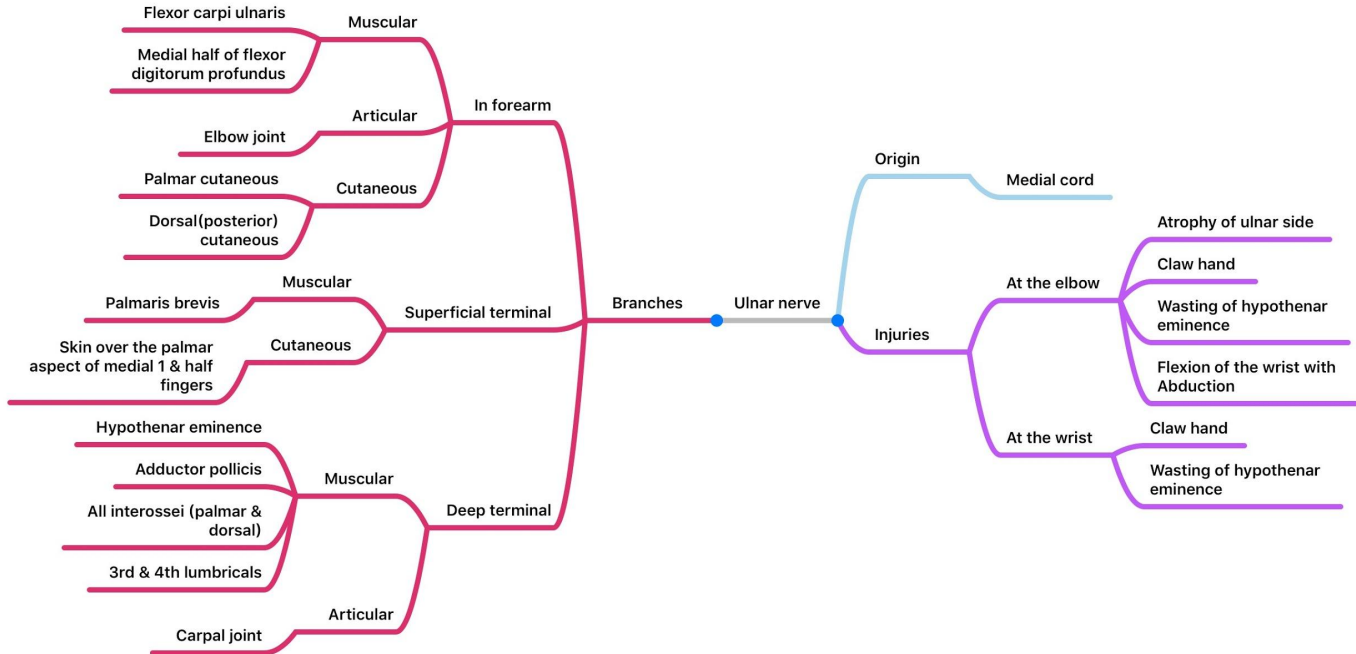


"Hand of benediction"
(a) Median nerve injury Or ape hand

Summary



Summary



Questions

1. The roots contributing to the radial nerve are
 - a) Posterior cord C8,T1
 - b) Posterior cord C5,6,7,8,T1
 - c) Medial cord C5,6,7,8,T1

2. The radial nerve divides into deep and superficial branches where?

- a) In the axilla
- b) Close to the lateral condyle
- c) At the cubital fossa

3. The shaft of the humerus is directly in contact with which of the following nerves?

- a) Radial nerve
- b) Ulnar nerve
- c) Musculocutaneous nerve

4. The neck of the humerus is directly in contact with which of the following nerves?

- a) Axillary nerve
- b) Radial nerve
- c) Medial nerve

5. A man with injury of the radial nerve at the spiral groove will be able to:

- a) Extend wrist
- b) Extend elbow
- c) Extend fingers

SAQ

6. Describe the characteristics of ulnar nerve injury at the wrist.

7. Name 5 muscles innervated by the deep branch of the radial nerve.

8. Which part of the humerus is directly in contact with the ulnar nerve?

Answers: 1. B 2. C 3. A 4. A 5. B

6. Hypothenar eminence wasting, claw hand

7. Supinator, Extensor pollicis brevis, extensor digitorum, extensor digiti minimi, extensor carpi ulnaris

8. Medial epicondyle

Team Members

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Dana Abdulaziz Alrasheed

Dimah Khalid Alaraifi

Ghada Alhaidari

Ghada Almuhanana

Ghaida Alsanad

Hadeel Khalid Awartani

Haifa Alessa

Khulood Alwehabi

Layan Hassan Alwatban

Lojain Azizalrahman

Lujain Tariq AlZaid

Maha Barakah

Majd Khalid AlBarrak

Norah Alharbi

Nouf Alotaibi

Noura Mohammed Alothaim

Rahaf Turki Alshammari

Reham Alhalabi

Rinad Musaed Alghoraiby

Sara Alsultan

Shahad Alzahrani

Wafa Alotaibi

Wejdan Fahad Albadrani

Wjdan AlShamry

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Saad Aloqile

Saleh Almoaiqel

Abdulaziz Alabdulkareem

Abdullah Almeaither

Yazeed Aldossari

Muath Alhumood

Abdulrahman Almotairi

Abdulelah Aldossari

Abdulrahman Alduhayyim

Hamdan Aldossari

Mohammed Alomar

Abdulrahman Aldawood

Saud Alghufaily

Hassan Aloraini

Khalid Almutairi

Abdulmajeed

Alwardi

Abdulrahman Alageel

Rayyan Almousa

Sultan Alfuhaid

Ali Alammari

Fahad alshughaihithry

Fayez Ghiyath

Aldarsouni

Mohammed Alquwayfili

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Sultan Al-nasser

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