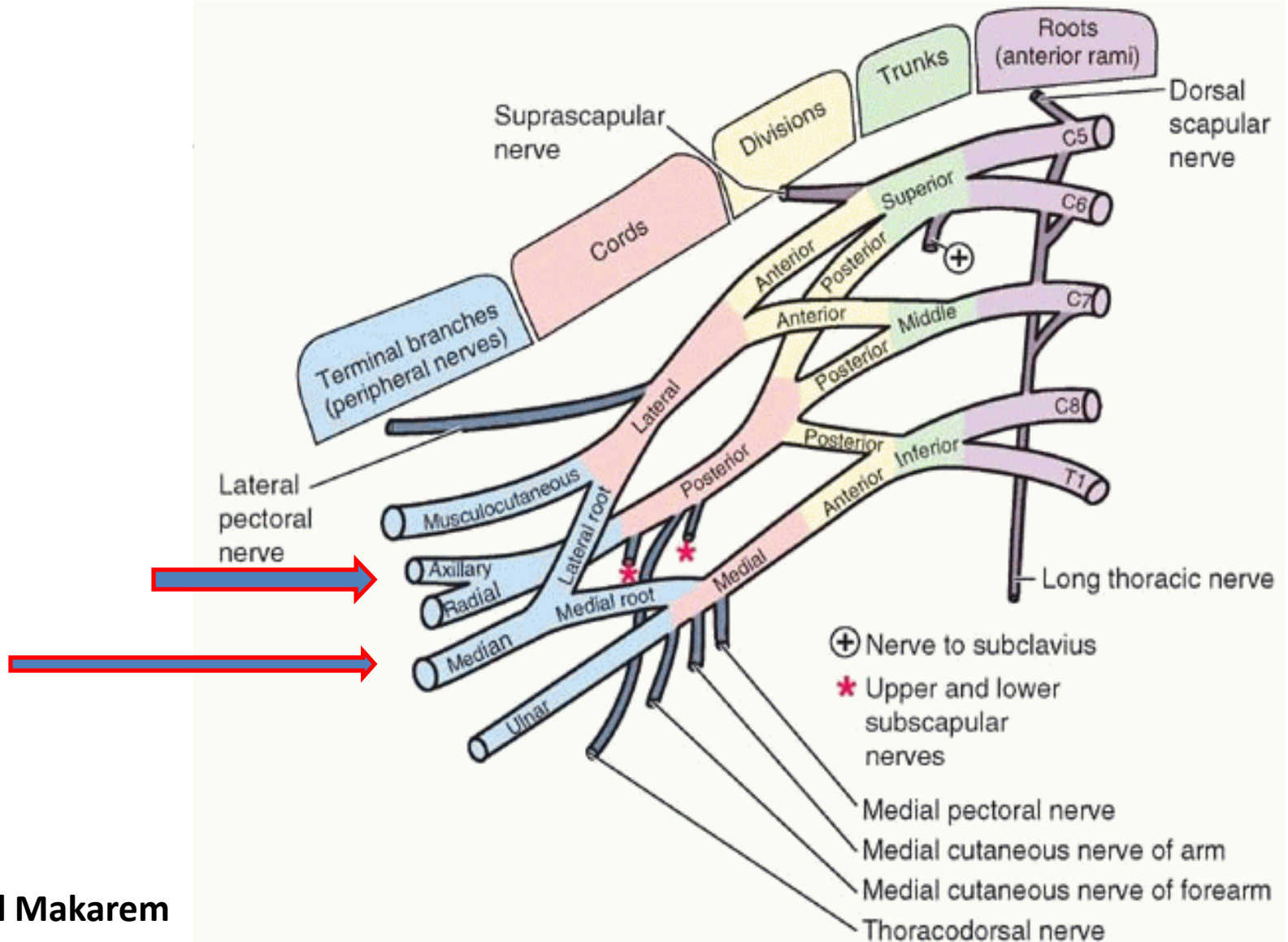


AXILLARY & MEDIAN NERVES



Prof.
Saeed Abuel Makarem

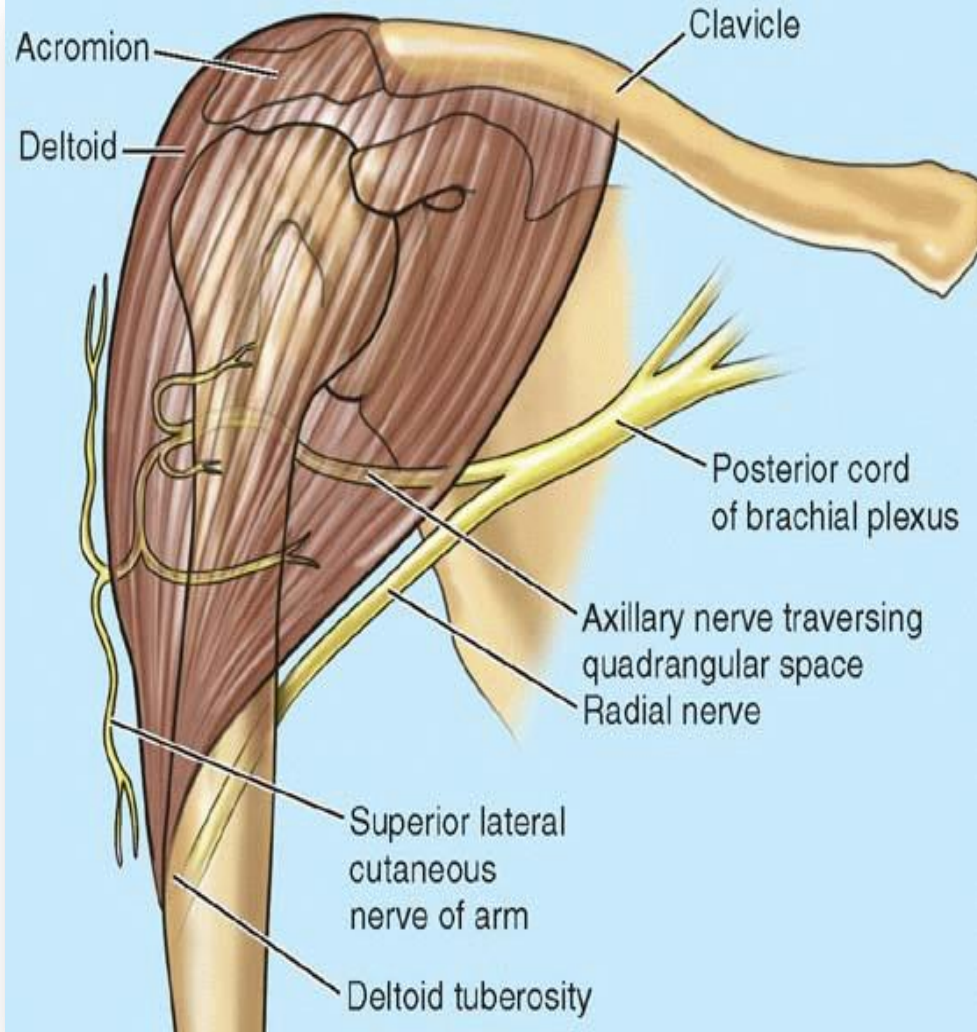
Objectives

By the end of the lecture, you should be able to:

- Describe the origin, course, relations, branches and distribution of the axillary & median nerves.
- Describe the common causes, signs and effect of lesion to the **axillary** and **median** nerves.

Axillary Nerve

- **Origin:** (C 5 & 6).
- Posterior cord of **brachial plexus**.
- **Course:**
- It passes inferiorly and laterally along the posterior wall of the axilla, then it exit the axilla.
- Then, it passes posteriorly **around the surgical neck of the humerus**.
- It is accompanied by the **posterior circumflex humeral vessels**.
- **Branches:**
- **Motor** to the **deltoid and teres minor muscles**.
- **Sensory:** **superior lateral cutaneous nerve of arm** that loops around the posterior margin of the deltoid muscle to innervate the skin over that region.



Axillary Nerve Lesion

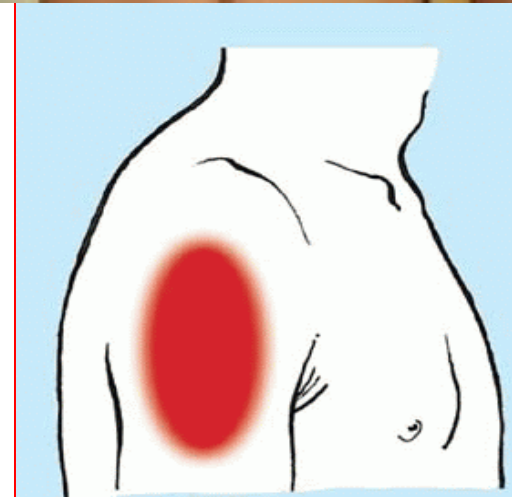
- The axillary nerve is commonly injured due to:
 1. Fracture of surgical neck of the humerus.
 2. Downward dislocation of the shoulder joint.
 3. Compression from the incorrect use of crutches.



Axillary Nerve Lesion

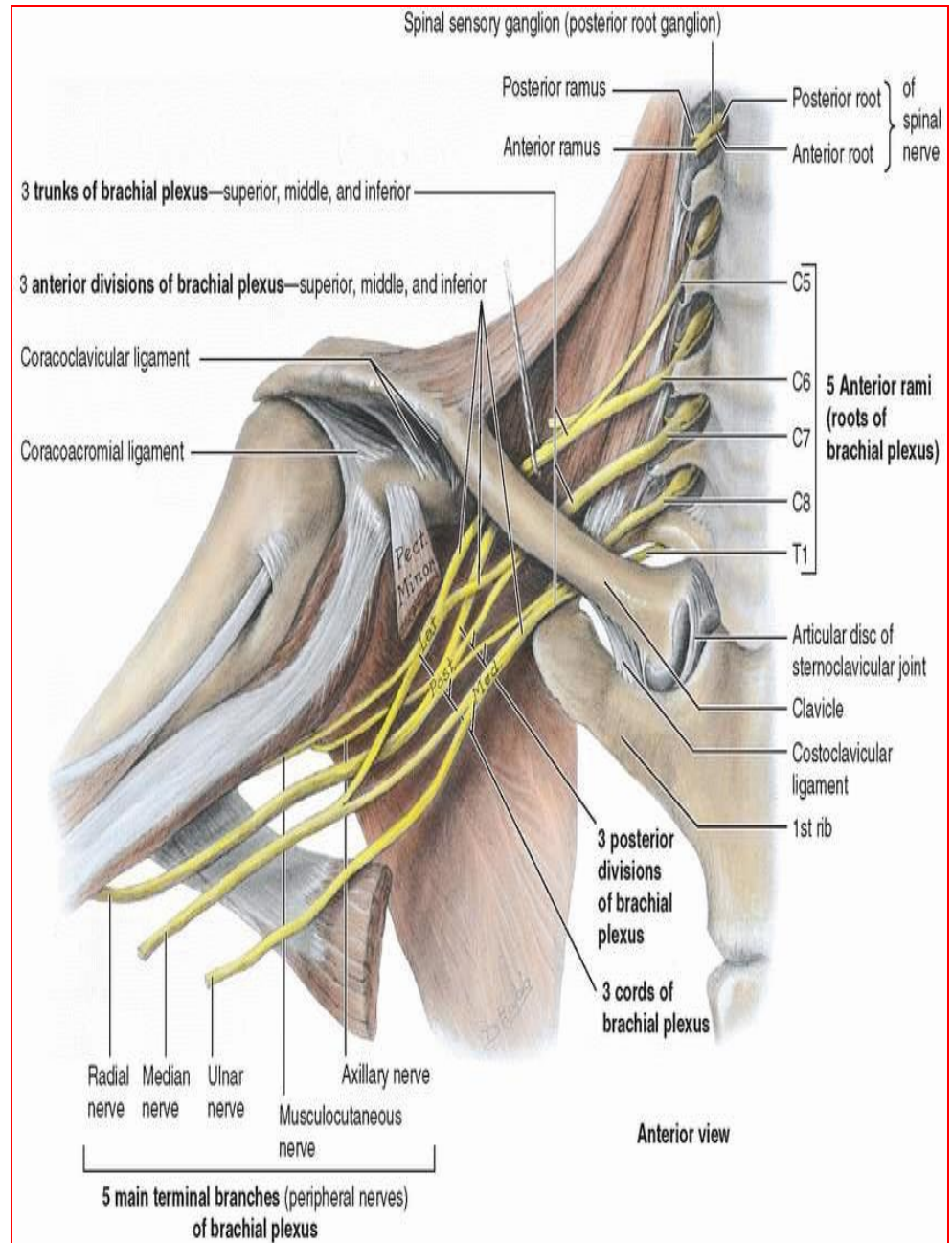
Affects:

- **Motor:**
 - Paralysis of the deltoid and teres minor muscles.
 - Impaired abduction of the shoulder (20-90°).
 - The paralyzed deltoid wastes rapidly.
 - As the deltoid atrophies, the rounded contour of the shoulder is lost and becomes flattened compared to the uninjured side.
- **Sensory:** Loss of sensation over the lateral side of the proximal part of the arm.



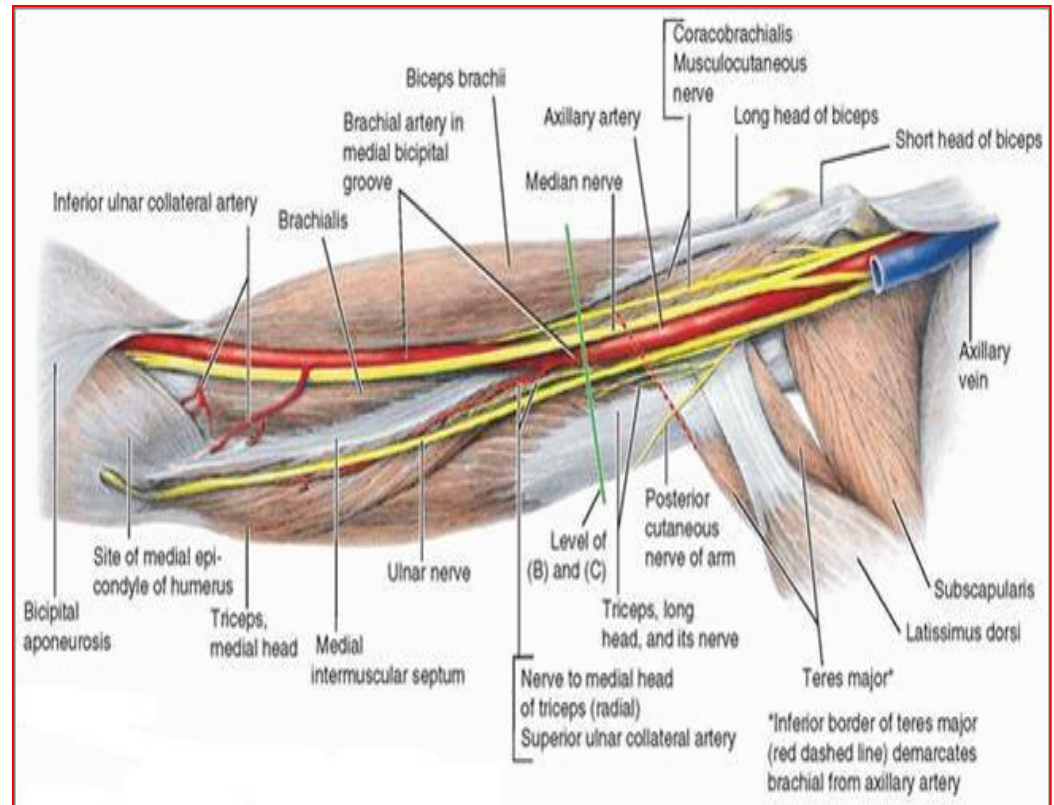
Median Nerve

- **Root value:**
- **(C5, 6, 7, 8, and T1)**
- The median nerve is formed **anterior to the third part of the axillary artery** by the **union of lateral and medial roots**.
- The lateral root (C5,6&7), arises from the lateral cord of the brachial plexus.
- The medial root (C8&T1), arises from the lateral cord of brachial plexus.



Median Nerve in the Arm

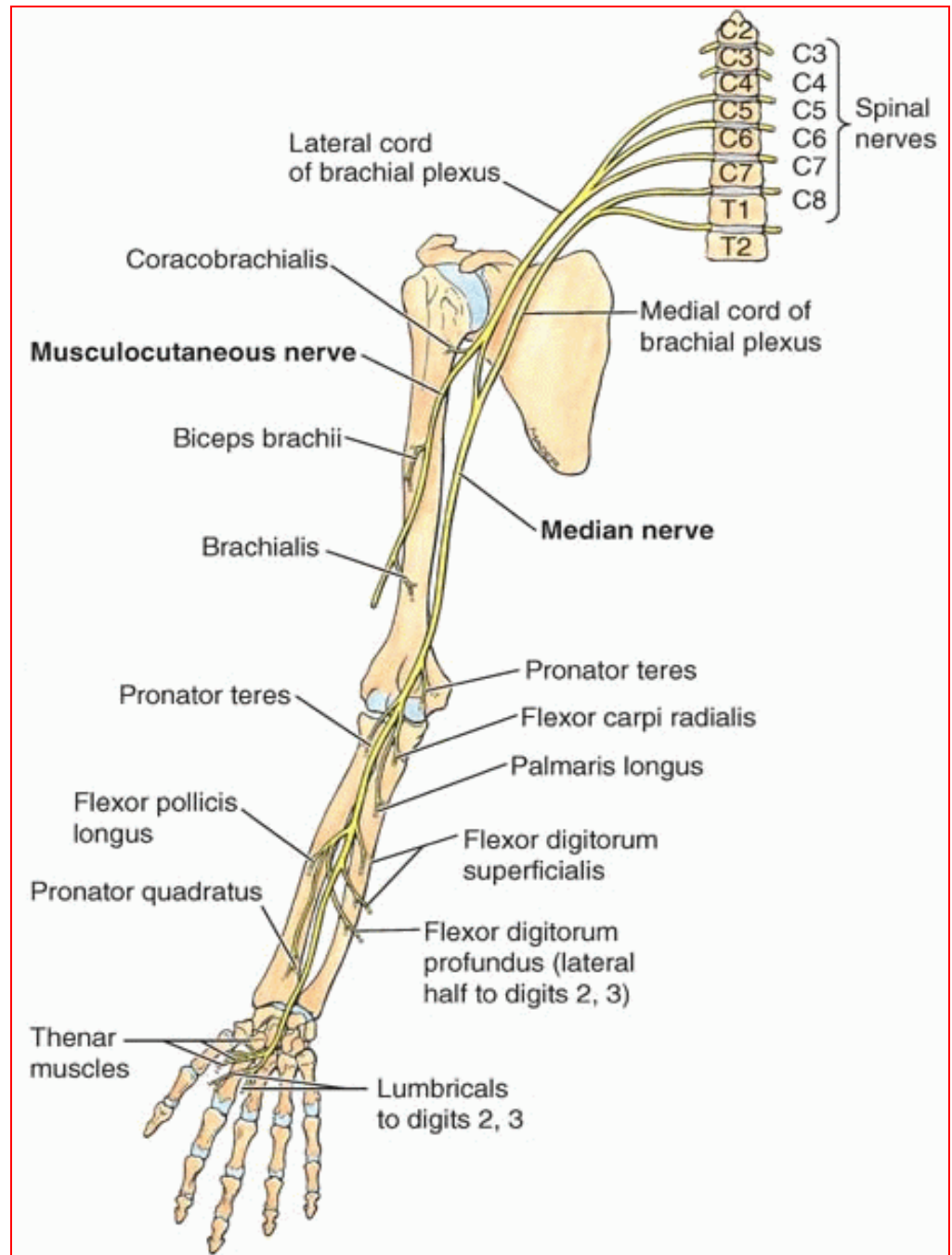
- It enters the arm from the axilla at the inferior margin of the teres major muscle.
- It passes vertically along the medial side of the arm in the lateral compartment and is related to the **brachial artery** throughout its course:
 - In upper ½ of the arm, it lies lateral to the brachial artery;
 - In the middle of the arm, it crosses the artery and descends on its medial side, then descends anterior to the elbow joint.



The median nerve has **no major branches in the arm**, but a branch to one of the muscles of the forearm, the **pronator teres** muscle, may originate from the nerve immediately proximal to the elbow joint.

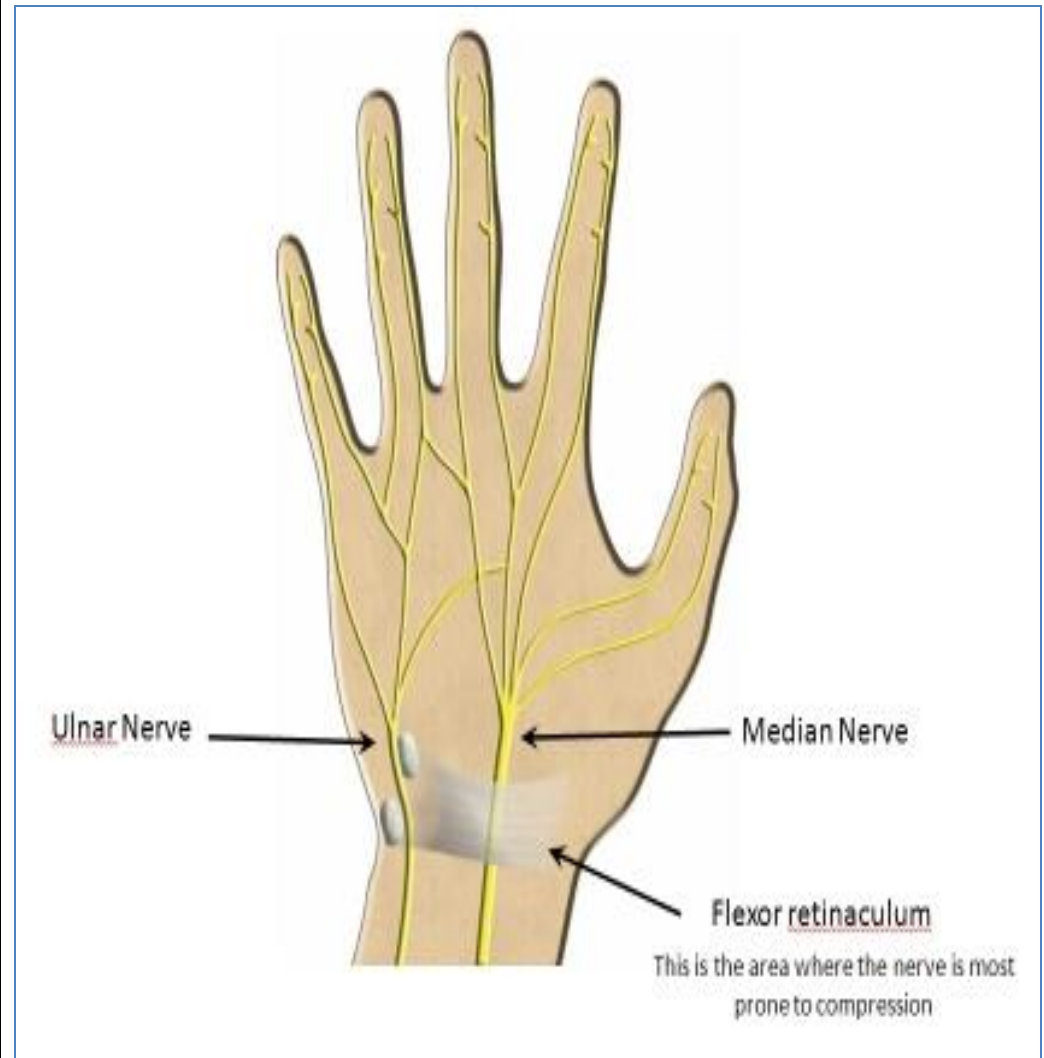
Median Nerve in the Forearm

- Median nerve passes into the forearm anterior to elbow joint, between the 2 heads of pronator teres.
- Its branches innervate **most of the muscles** in the anterior compartment of the forearm, (6.5 muscles).
- (Except the flexor carpi ulnaris, and medial half of the flexor digitorum profundus, which are supplied by the **ulnar nerve**).



Median Nerve in the Hand

- The median nerve continues into the hand by passing deep to the **flexor retinaculum**.
- It innervates:
 - **The 3** thenar eminence muscles associated with the thumb.
 - **Lateral 2** lumbrical muscles associated with movement of the index and middle fingers; and
 - Skin over the palmar surface of the lateral three and one-half fingers.
 - The lateral 2/3rd of the palm of the hand.



Median Nerve Lesion

- Injury of median nerve at different levels cause different syndromes.
- In the arm and forearm the median nerve is usually not injured by trauma because of its relatively deep position.
- **Median nerve can be damaged:**
 - In the elbow region.
 - At the wrist above the flexor retinaculum.
 - In the carpal tunnel.

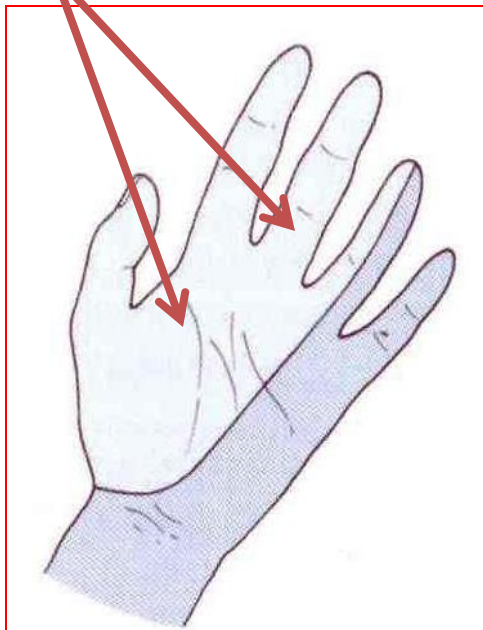


- The most serious disability of median nerve injuries is:

- **Loss of opposition of the thumb.**

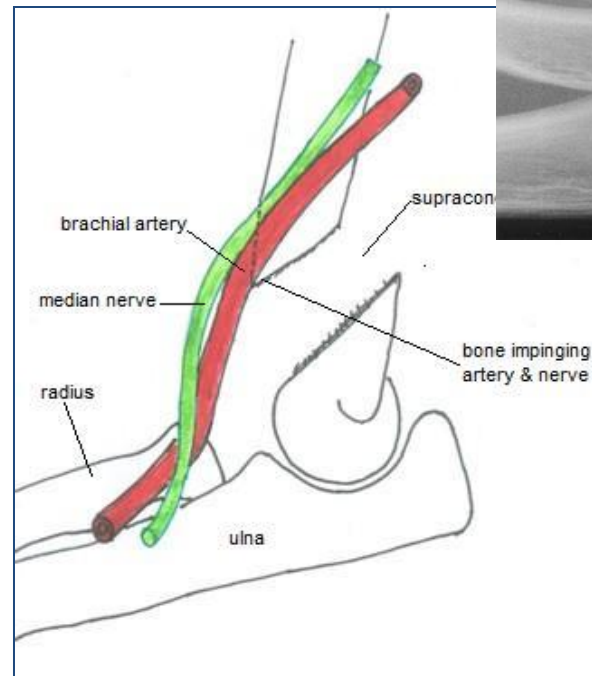
The delicate pincer-like action is not possible

- **Loss of sensation from lateral 3 ½ fingers & lateral ⅔ of the palm.**



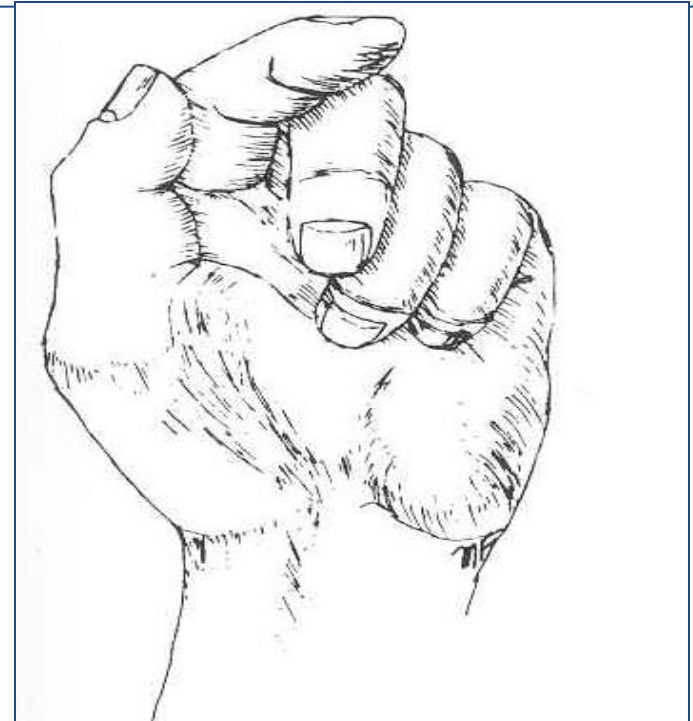
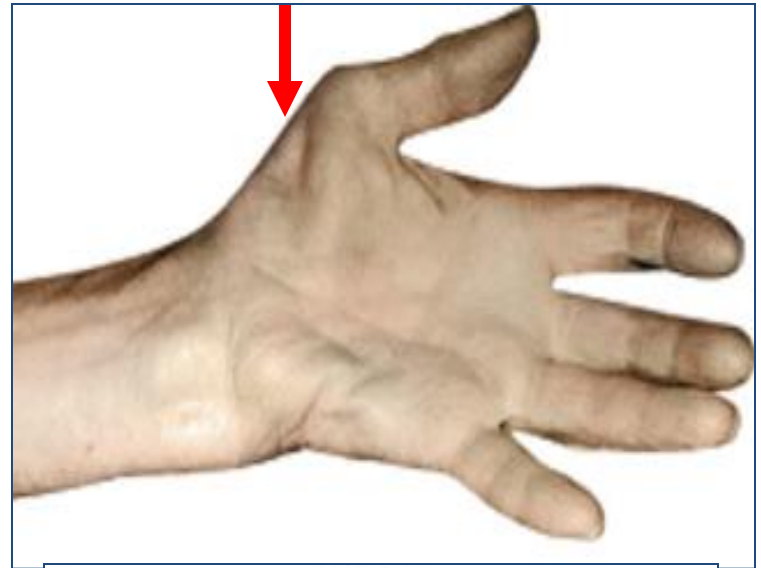
Median Nerve Lesion in the Elbow Region

- Damaged in **supracondylar fracture** of humerus.
- **Muscles affected are:**
 - Pronator muscles of the forearm.
 - All long flexors of the wrist and fingers except flexor carpi ulnaris and medial half of flexor digitorum profundus.



- **Motor:**
- Loss of **pronation**. Hand is kept in supine position
- Wrist shows weak flexion, and ulnar deviation
- **No** flexion possible on the interphalangeal joints of the index and middle fingers
- **Weak** flexion of ring and little finger.
- **Thumb** is adducted and laterally rotated, with **loss of flexion** of terminal phalanx and loss of opposition
- **Wasting** of thenar eminence
- Hand looks flattened and *“apelike”*, and presents an inability to flex the three most radial digits when asked to make a fist.

Wasting of thenar eminence



- Sensory:
- Loss of sensation from:
 - The radial 2/3rd of the palm
 - Palmer aspect of the lateral 3½ fingers
 - Distal part of the dorsal surface of the lateral 3½ fingers
- Trophic Changes:
 - Dry and scaly skin
 - Easily cracking nails
 - Atrophy of the pulp of the fingers

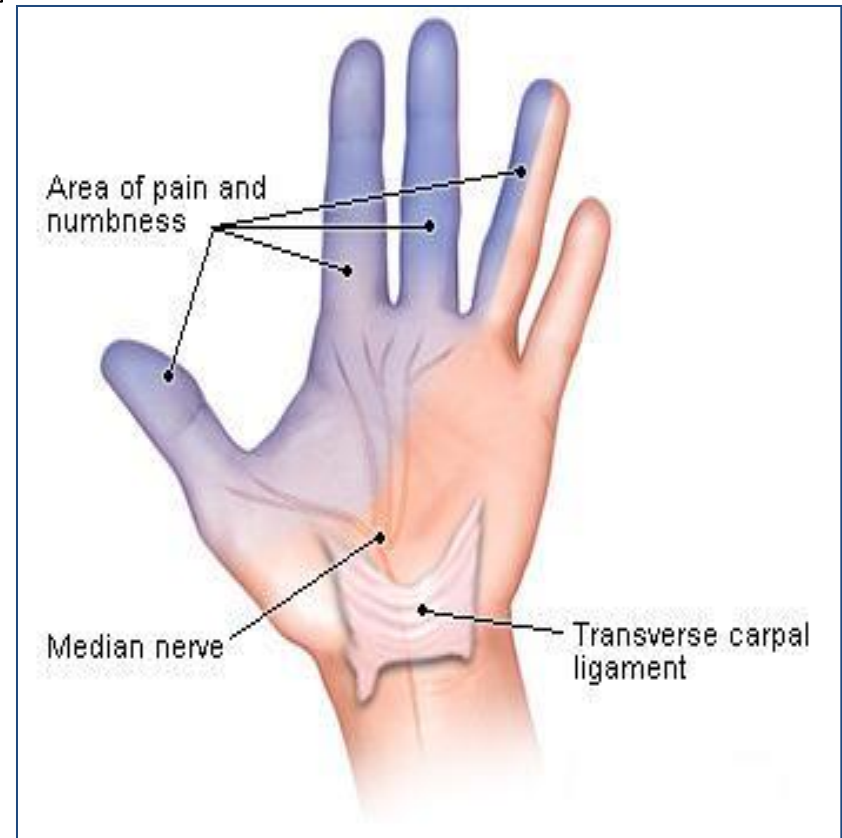


Median Nerve Lesion at the Wrist

- Often injured by penetrating wounds (stab wounds or broken glass) of the forearm.
- Motor:
 - Thenar muscles are paralyzed and atrophy in time so that the thenar eminence becomes flattened
 - Opposition and abduction of thumb are lost, and thumb and lateral two fingers are arrested in adduction and hyperextension position. “**Apelike hand**”
- Sensory & trophic changes are the same as in the elbow region injuries

Carpal Tunnel Syndrome

- The commonest neurological problem associated with the median nerve is compression beneath the flexor retinaculum at the wrist.
- **Motor:** Weak motor function of thumb, index & middle finger.
- **Sensory:** Burning pain or 'pins and needles' along the distribution of median nerve to lateral 3½ fingers.



NB. No sensory changes over the palm as the **palmer cutaneous branch** is given before the median nerve enters the carpal tunnel.

Summary

- **Axillary Nerve**

- **Origin:**

Posterior cord

- Spinal

segments:

- C5, & C6

- **Function:**

- **Motor:**

- Deltoid, teres minor

- **Sensory:**

- Skin over upper lateral part of arm

- **Median Nerve**

- **Origin:** Medial and lateral cords

- Spinal segments: (C5, C6, C7, C8 & T1)

- **Function:**

- **Motor**

All muscles in the anterior compartment of the forearm (except flexor carpi ulnaris and medial half of flexor digitorum profundus), three thenar muscles of the thumb and two lateral lumbrical muscles.

- **Sensory**

Skin over the palmar surface of the lateral three and one-half digits and over the lateral 2/3rds of the palm of the hand.

