
The upper limb

Muscles That Move the Pectoral Girdle

- Originate on the axial skeleton and insert on the clavicle and scapula.
 - Stabilize the scapula and move it to increase the arm's angle of movements.
 - Some of the superficial muscles of the thorax are grouped together according to the scapular movement they direct.
 - elevation, depression, protraction, or retraction
-

The muscles of back

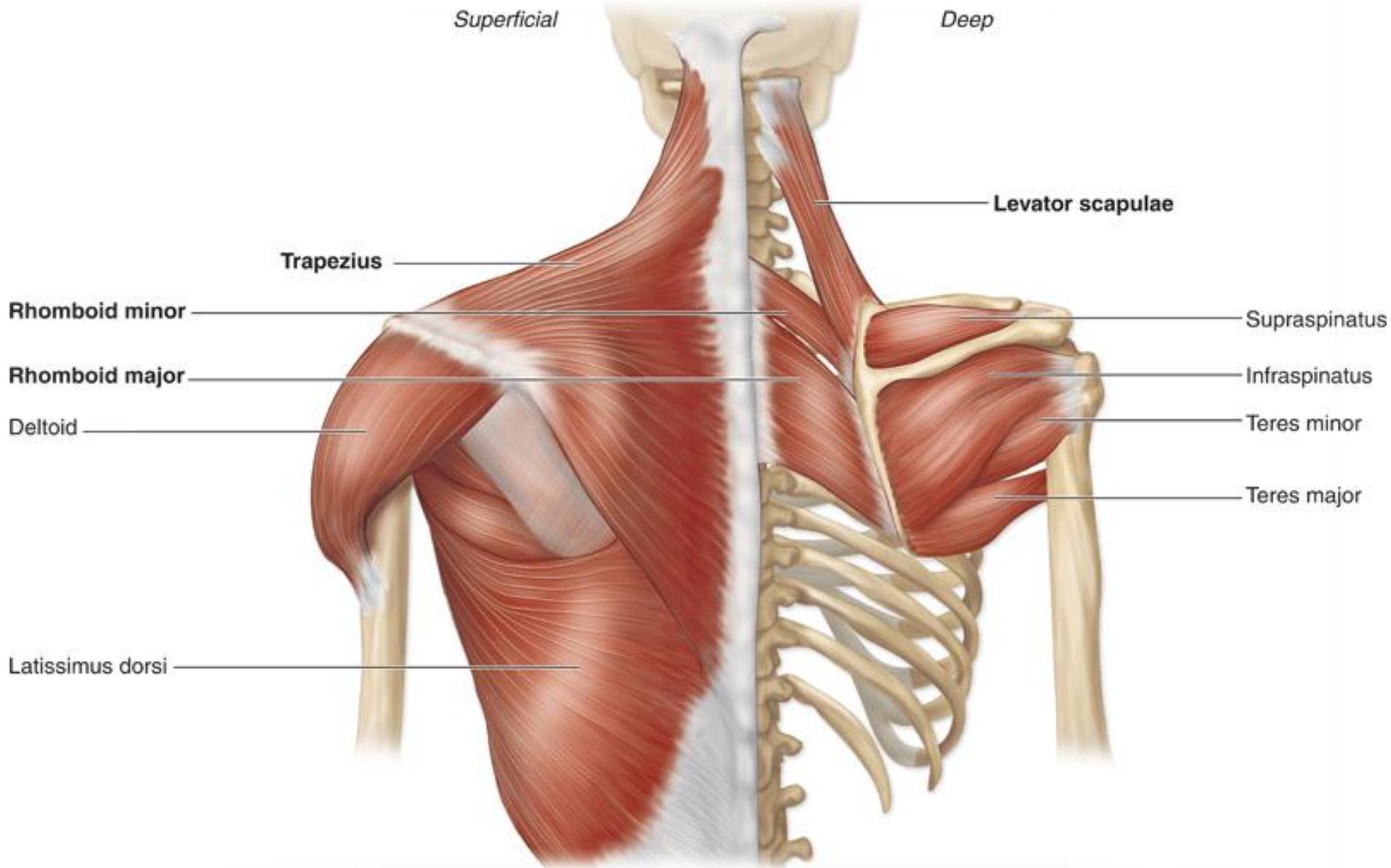
Superficial group

- Trapezius
- Latissimus dorsi
- Levator scapulae
- Rhomboideus

Deep group

- Erector spinae
- Splenius
- Thoracolumbar fascia





The muscles of thorax

Extrinsic muscles

- Pectoralis major
- Pectoralis minor
- Serratus anterior

Intrinsic muscles

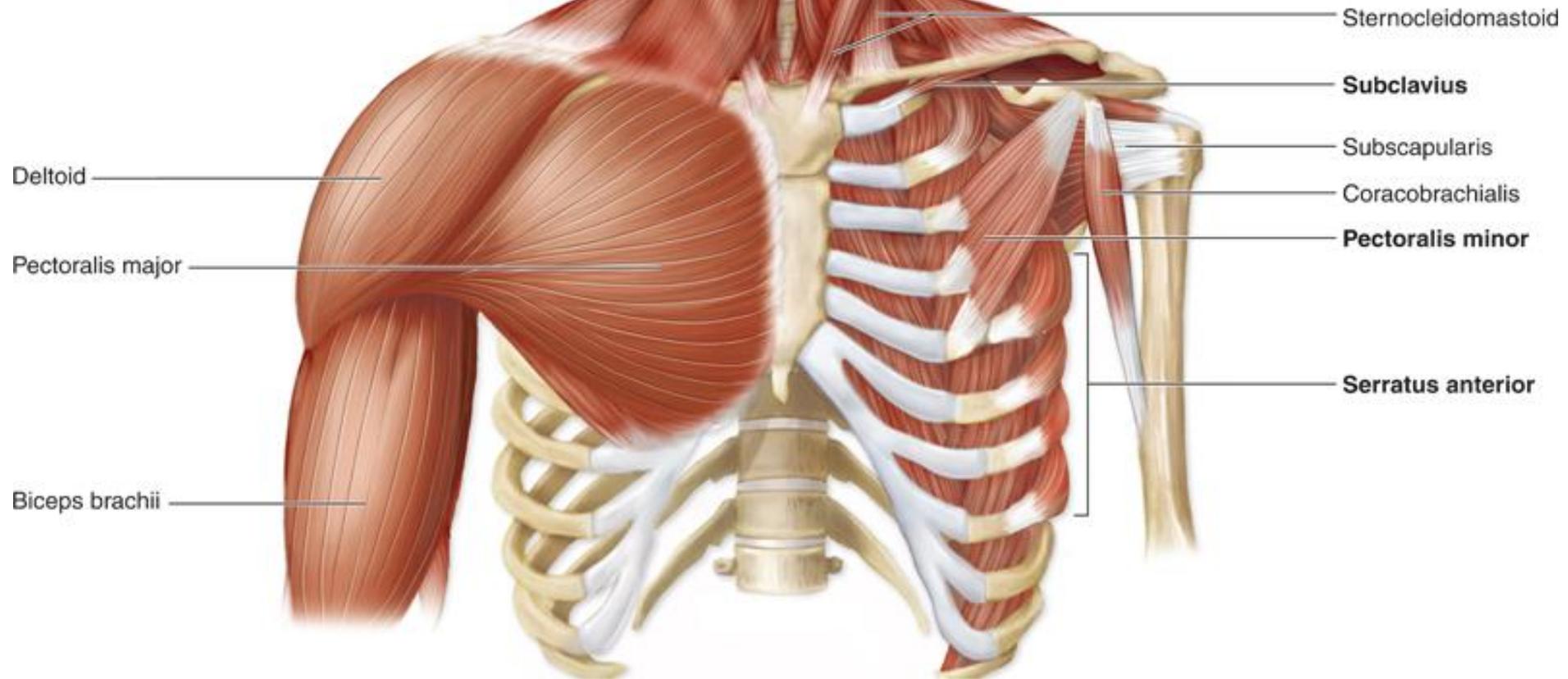
- Intercostales externi
- Intercostales interni
- Intercostales intimi



Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

Superficial

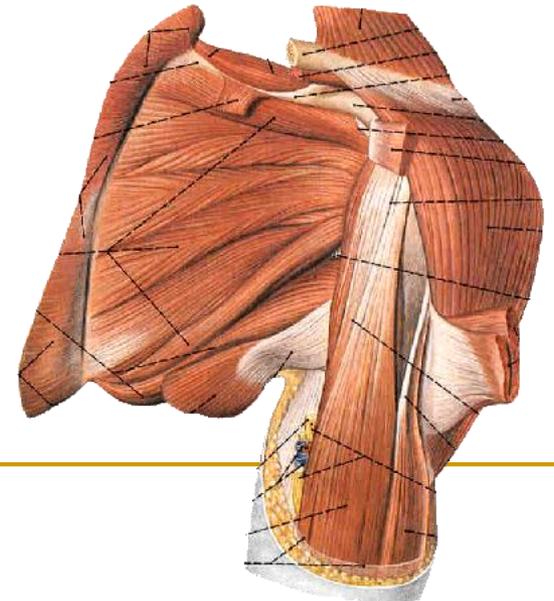
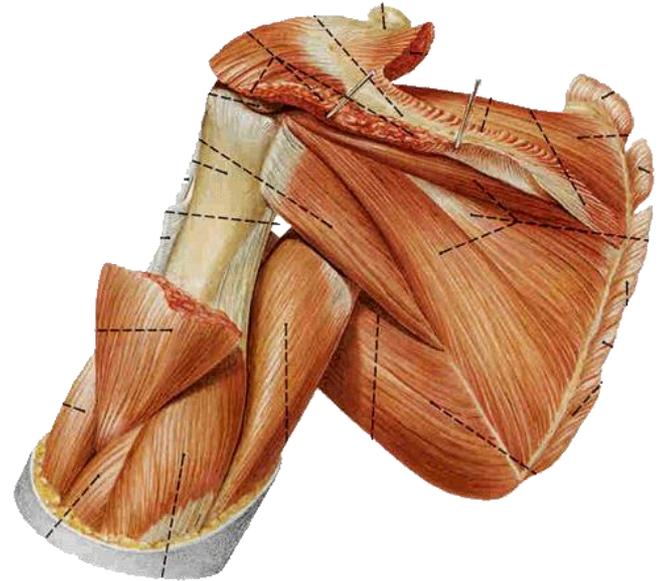
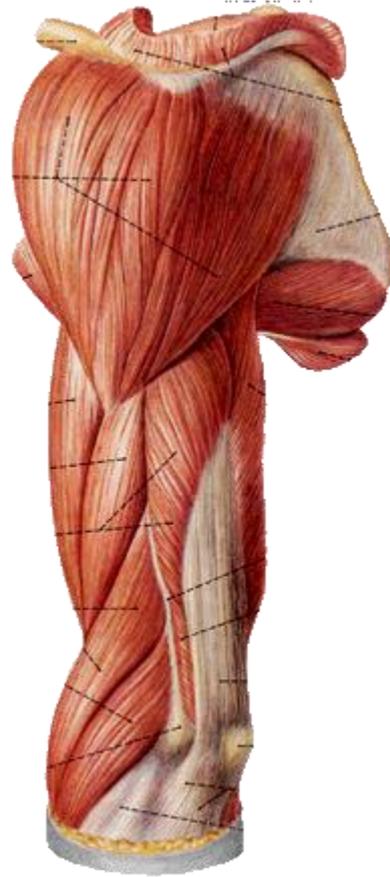
Deep



The Muscles of Upper Limb

Muscles of shoulder

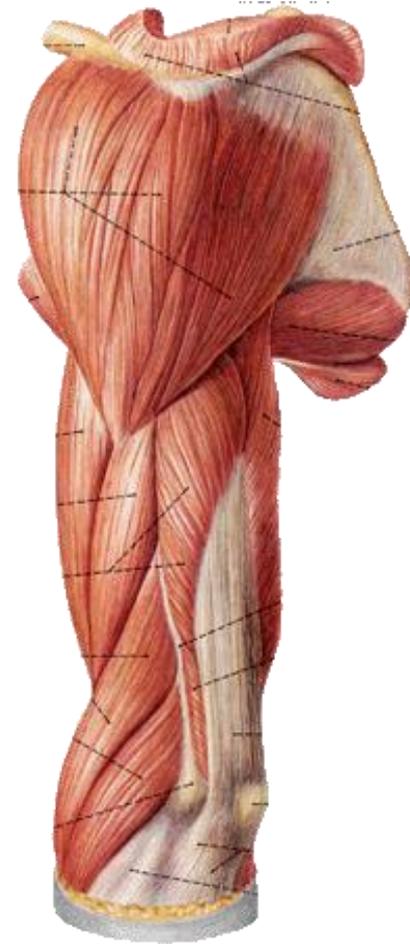
- Deltoid
- Supraspinatus
- Infraspinatus
- Teres minor
- Teres major
- Subscapularis



Major muscles of shoulder

Deltoid

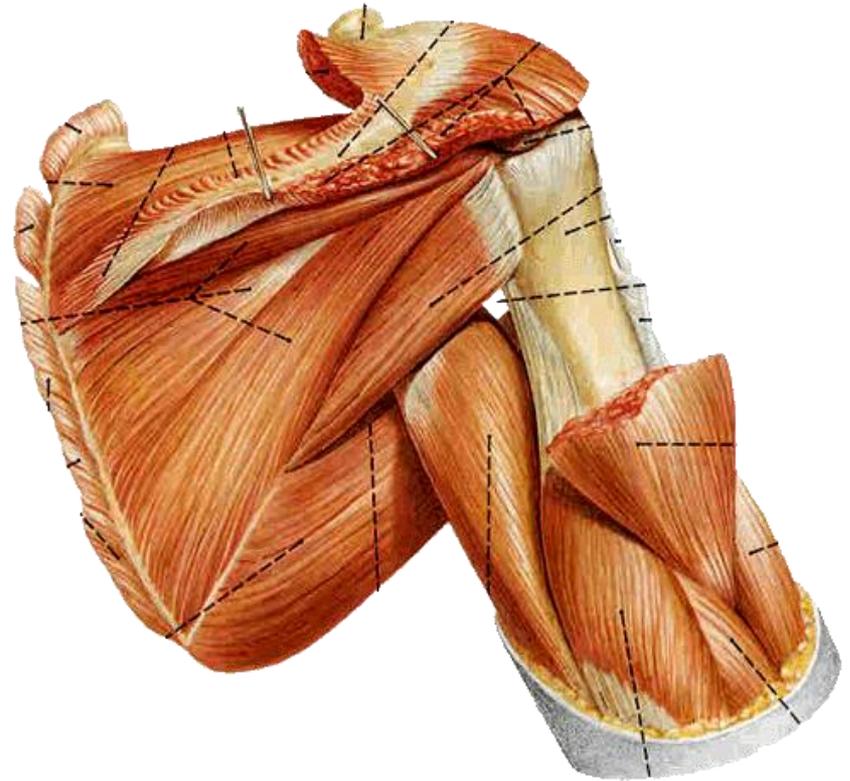
- **Origin:** lateral third of clavicle, acromion, and spine of scapula
- **Insertion:** deltoid tuberosity of humerus
- **Action:** abduction, flexion and extension, medial and lateral rotation of arm



Major muscles of shoulder

Teres major

- **Origin:** dorsal surface of inferior angle of scapula
- **Insertion:** crest of lesser tubercle of humerus
- **Action:** medially rotates and adducts arm



Arm and Forearm Muscles That Move the Elbow Joint/Forearm

- Anterior (flexor) compartment
 - Posterior (extensor) compartment
 - Anterior compartment
 - primarily contains **elbow flexors**
 - Posterior compartment contains **elbow extensors**
 - the principal **flexors**
 - biceps brachii, brachialis, and brachioradialis
 - muscles that **extend** the elbow joint
 - triceps brachii and anconeus
-

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

Anterior



Anterior compartment of arm

Lateral

Medial

Humerus

Medial head

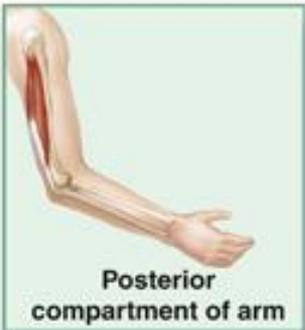
Lateral head

Long head

Triceps brachii

Biceps brachii

Brachialis



Posterior compartment of arm

Posterior

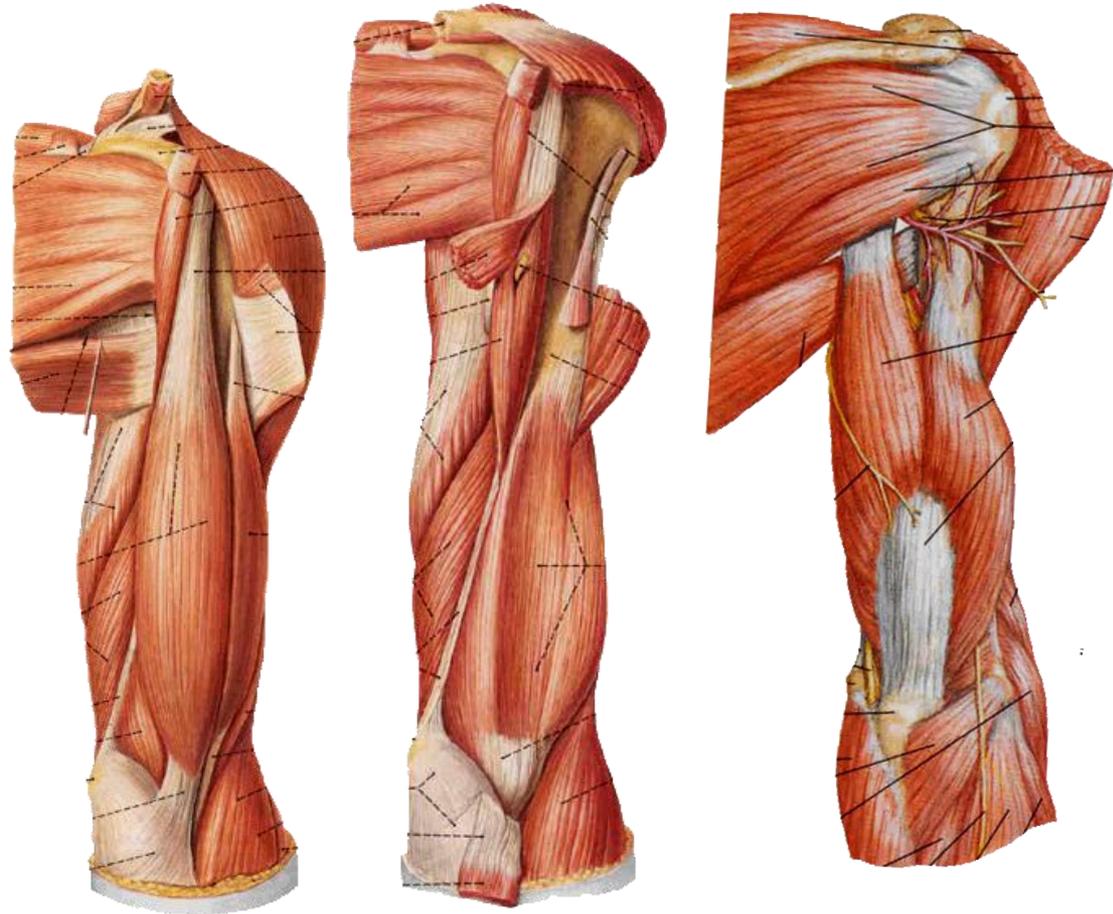
Muscles of arm

- **Anterior group**

- Biceps brachii
- Coracobrachialis
- Brachialis

- **Posterior group**

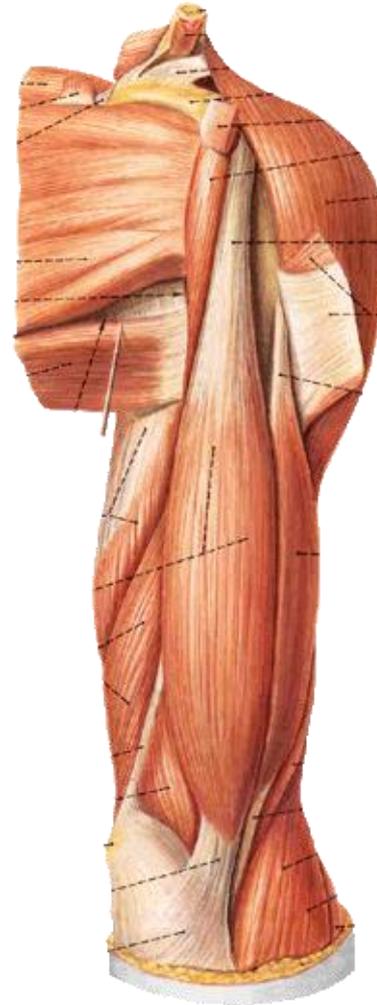
- triceps brachii
- anconeus



Muscles of arm

Biceps brachii

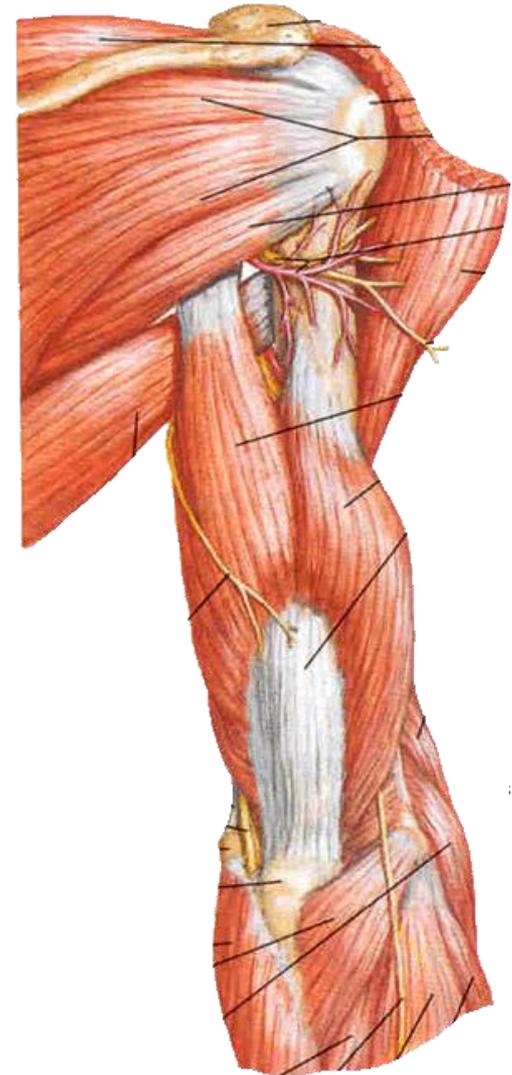
- **Origin:** long head, supraglenoid tubercle; short head, coracoid process
- **Insertion:** radial tuberosity
- **Action:** supinator of forearm, flexor of elbow joint, weak flexor of shoulder joint



Muscles of arm

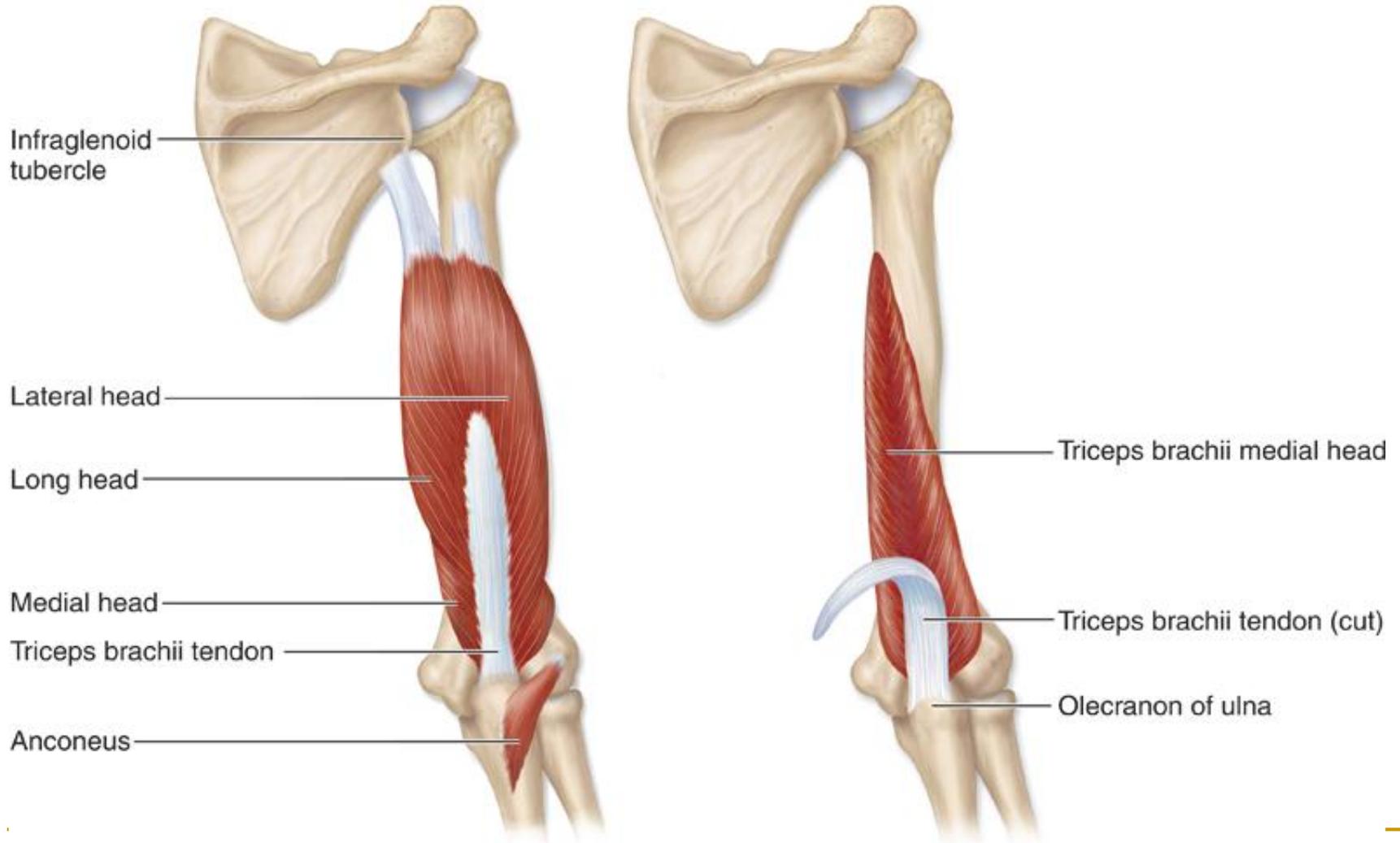
Triceps brachii

- **Origin:**
 - **long head**, infraglenoid tubercle
 - **lateral head**, above groove for radial nerve
 - **medial head**, below groove for radial nerve
- **Insertion:** olecranon of ulna
- **Action:** extends elbow joint, long head extends and adducts shoulder joint



Triceps brachii

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.
Superficial *Deep*



(b) Posterior muscles

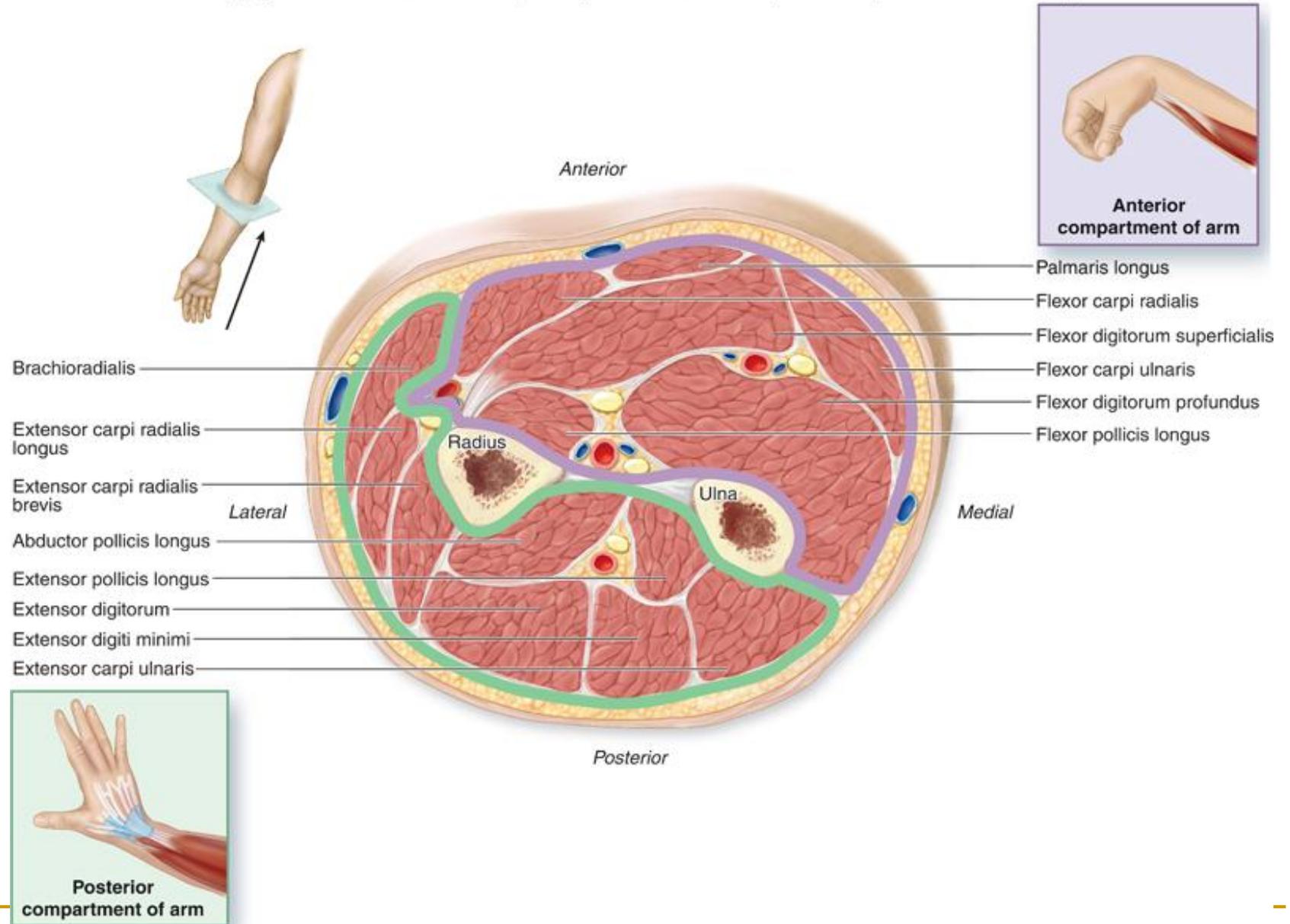
Forearm Muscles

Supinate and Pronate

- **Supinator muscle** supinates the forearm.
- **Biceps brachii** supinates the forearm.
- **Pronator teres** and **pronator quadratus** pronate the forearm.

Move the Wrist Joint, Hand, and Fingers

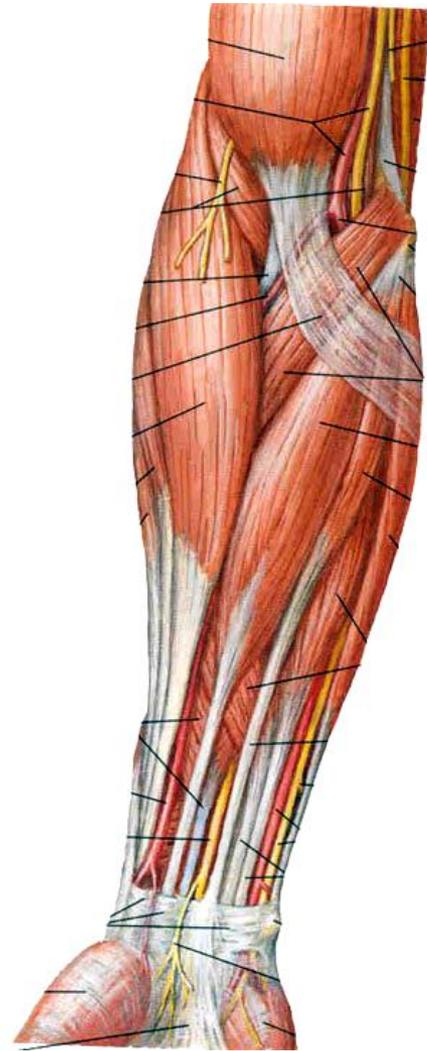
- Muscles in the forearm move the hand at the wrist and/or the fingers.
 - Extrinsic muscles of the wrist and hand originate on the forearm, not the wrist or hand.
 - Tendons of forearm muscles typically are surrounded by tendon (synovial) sheaths and held adjacent to the skeletal elements by strong fascial structures.
 - At the wrist, the deep fascia of the forearm forms thickened, fibrous bands termed **retinacula**.
-



Muscles of forearm

■ Superficial layer

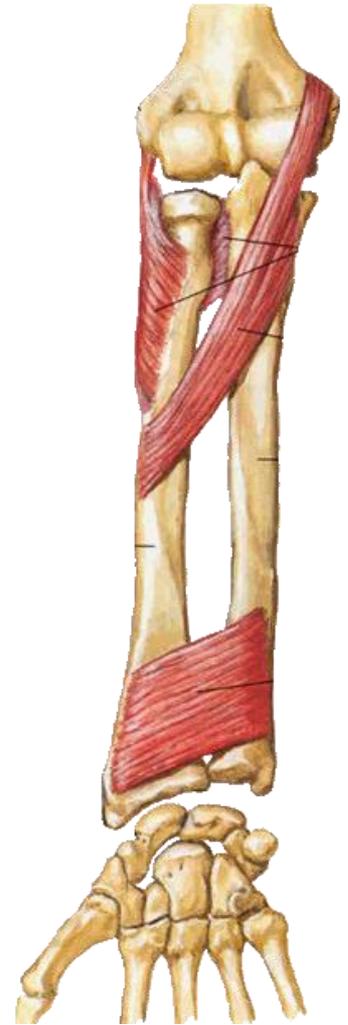
- Pronator teres
- Flexor carpi radialis
- Palmaris longus
- Flexor carpi ulnaris



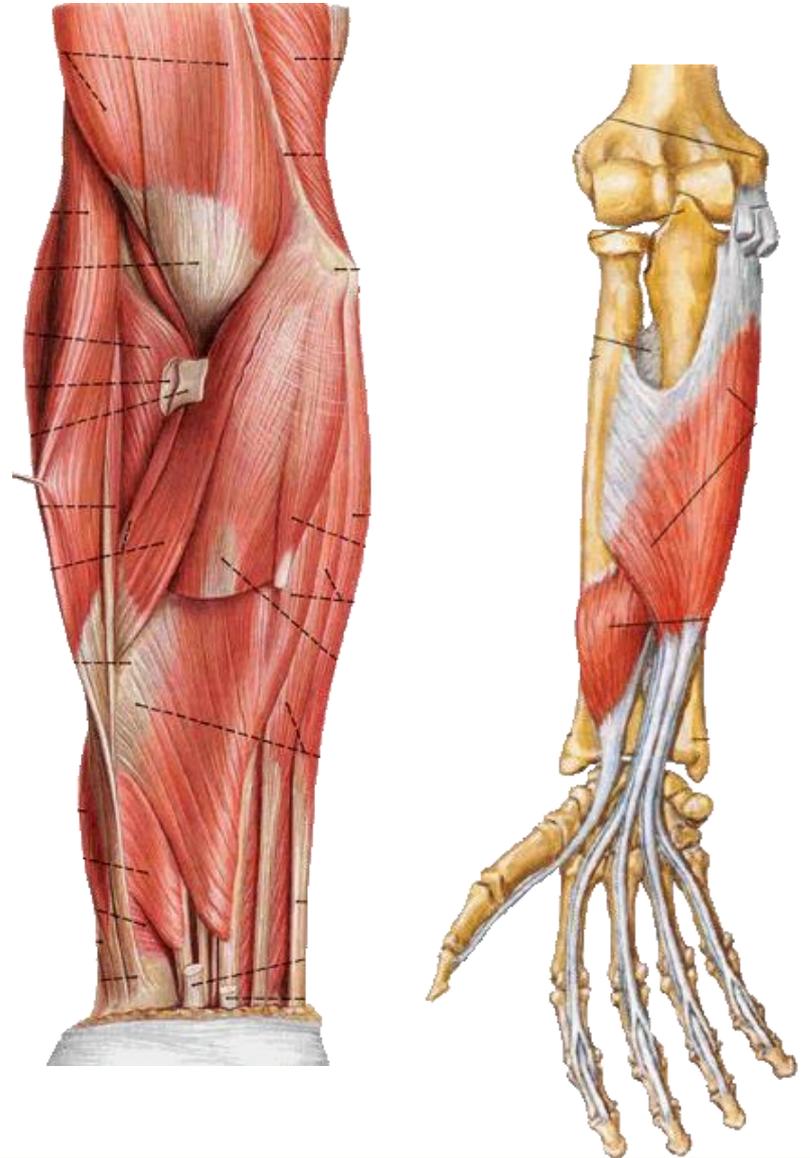
Muscles of forearm

Pronator teres

- **Origin:** medical epicondyle of humerus and deep fascia of forearm
- **Insertion:** middle of lateral surface of radius
- **Action:** pronation of forearm and flexion of elbow



- **Second layer**
Flexor digitorum superficialis



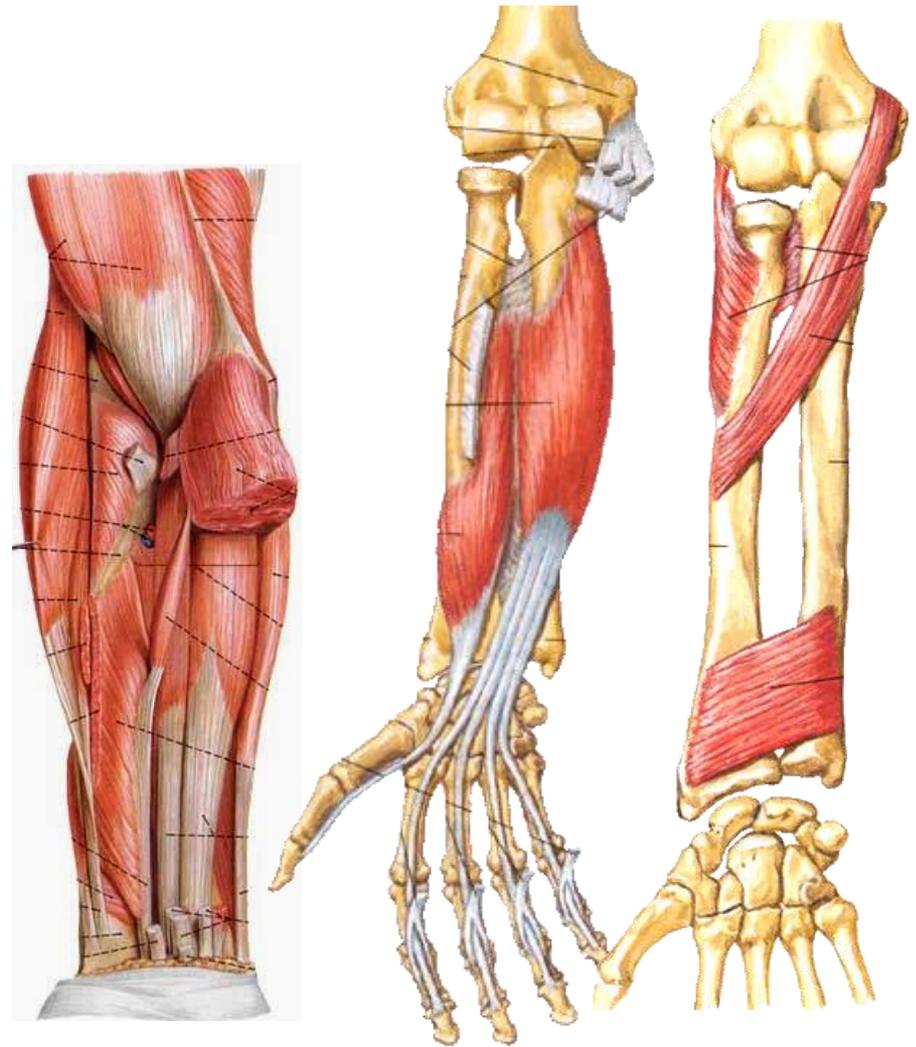
- **Third layer**

- Flexor digitorum profundus
- Flexor pollicis longus

- **Fourth layer**

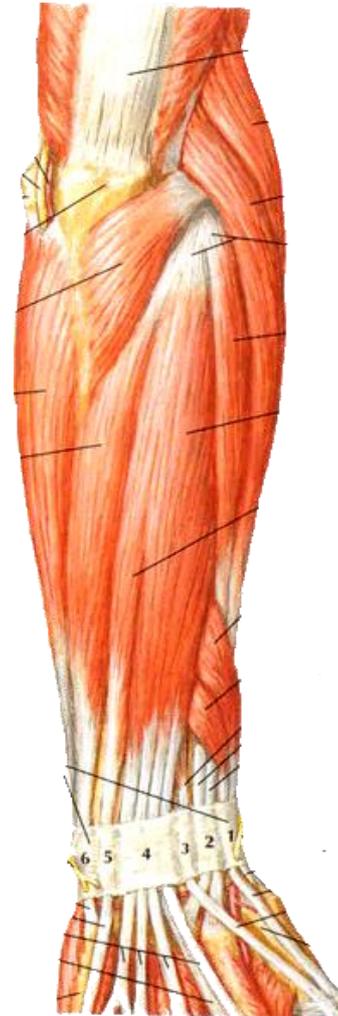
- Pronator quadratus

Action: flex radiocarpal joint and fingers, pronate forearm



Lateral group (3)

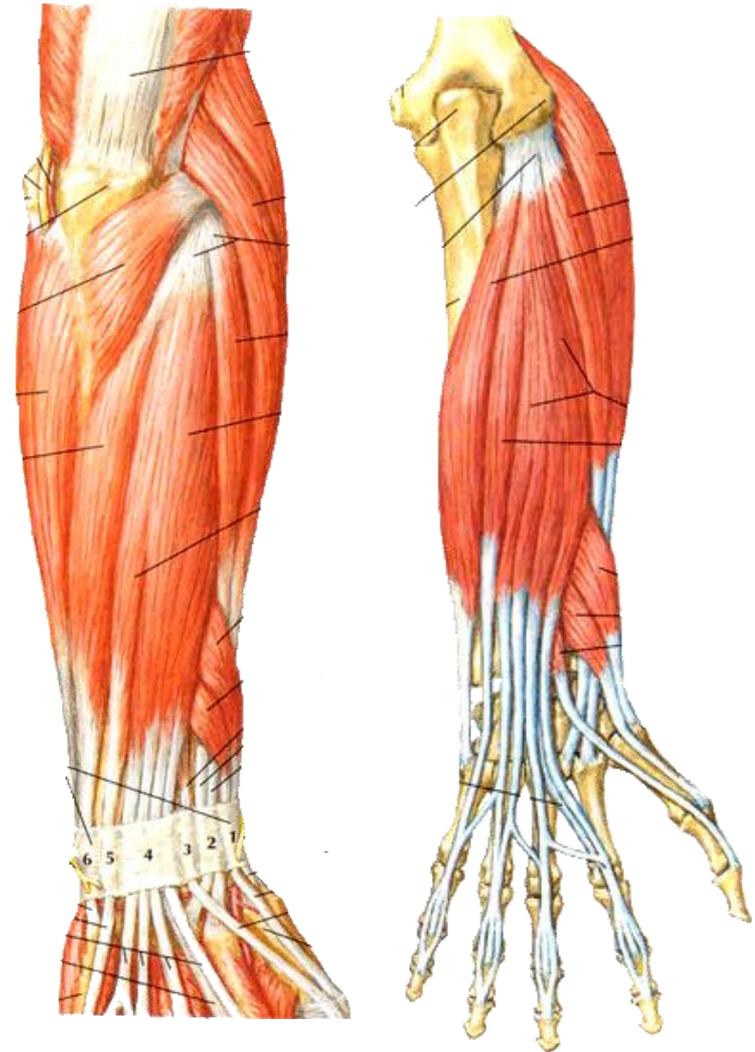
- ❑ Brachioradialis
- ❑ Extensor carpi radialis longus
- ❑ Extensor carpi radialis brevis



Posterior group (8)

■ Superficial layer (3)

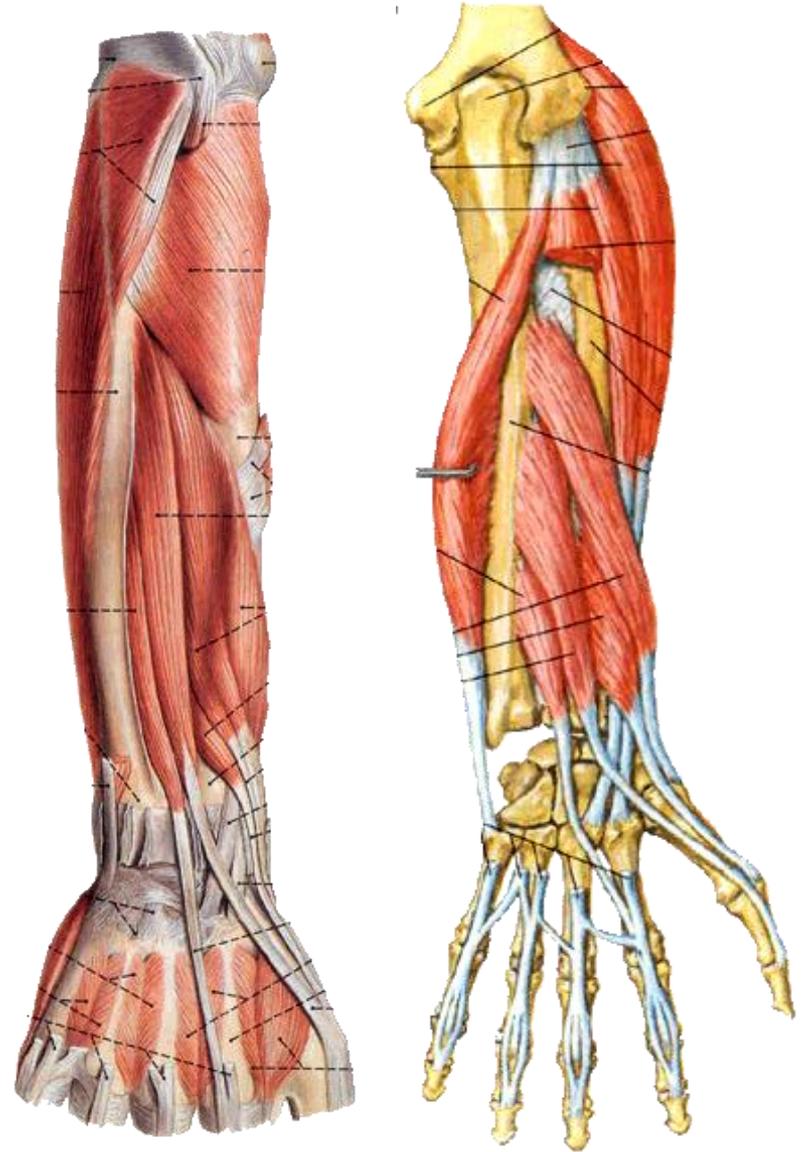
- ❑ Extensor digitorum
Extensor digiti minimi
- ❑ Extensor carpi ulnaris
- ❑ Action: extension at wrist joint



Posterior group (8)

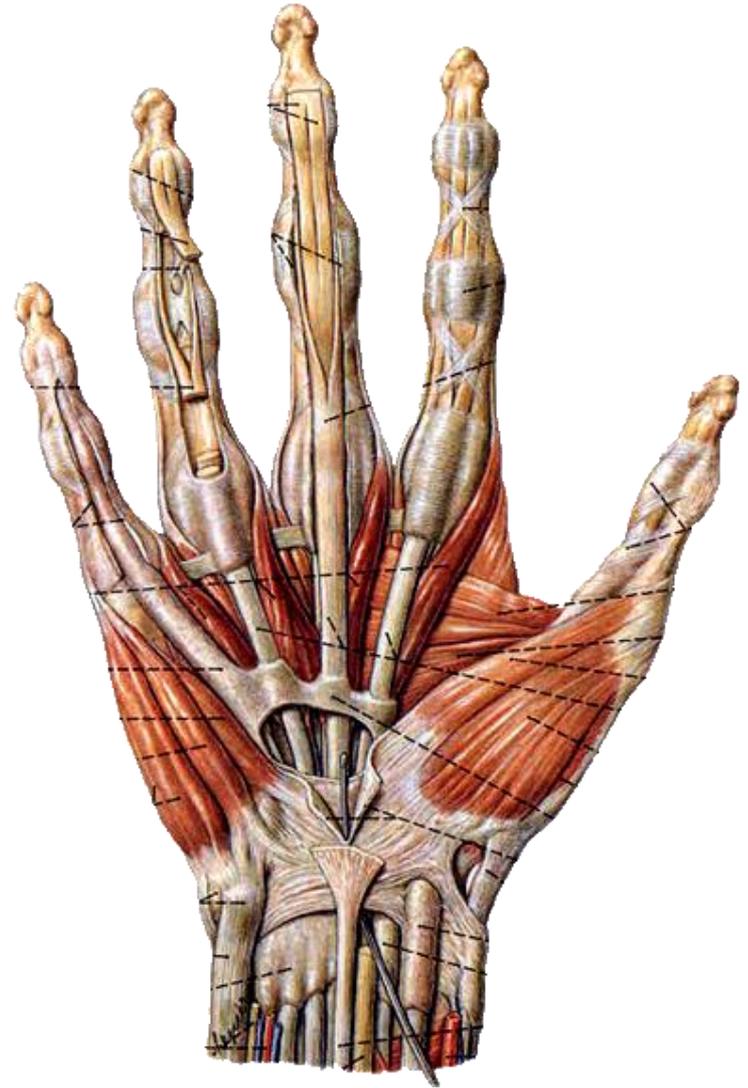
Deep layer (5)

- Supinator
- Abductor pollicis longus
- Extensor pollicis brevis
- Extensor pollicis longus
- Extensor indicis
- Action: extend at wrist joint and fingers, and supinate forearm



Muscles of hand

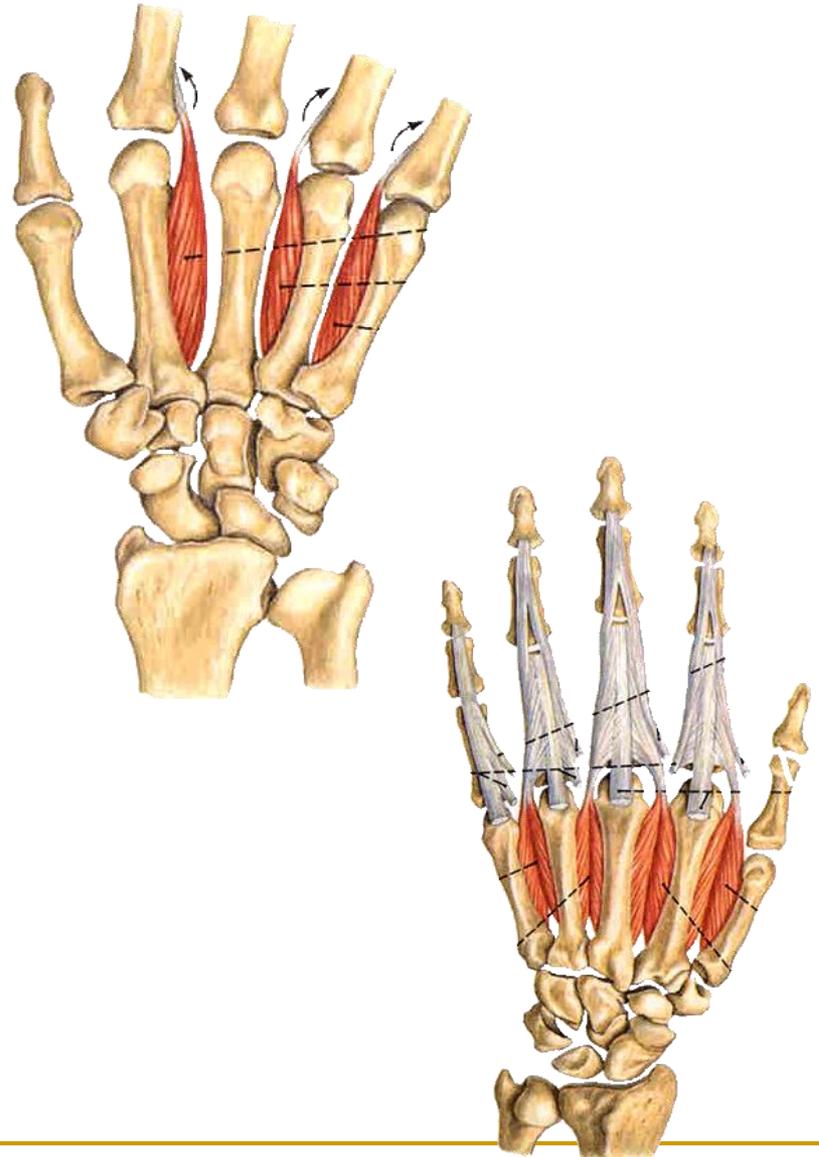
- **Lateral group thenar (4)**
 - Abductor pollicis brevis
 - Flexor pollicis brevis
 - Opponens pollicis
 - Adductor pollicis
- Action: flex, abduct, adduct and oppose thumb
- **Medial group hypothenar (3)**
 - Abductor digiti minimi
 - Flexor digiti minimi brevis
 - Opponens digiti minimi
- Action: flex, abduct , and oppose little finger



Muscles of hand

Intermedial group

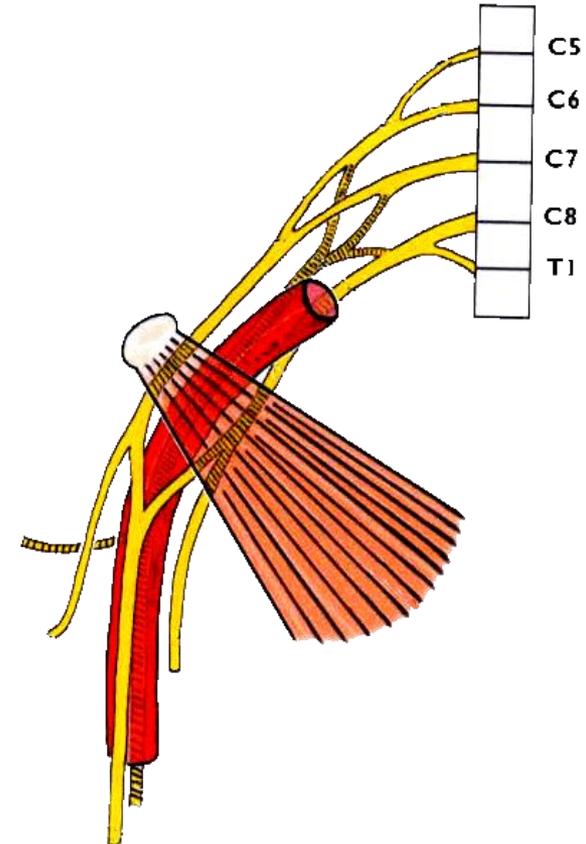
- **Lumbricales** (4) flex fingers at MP joints; extend fingers at IP joints
- **Palmar interossei** (3) adduct fingers towards middle finger at MP joints
- **Dorsal interossei** (3) abduct fingers away from middle finger at MP joints



Brachial plexus

Formation:

- Five roots: formed by anterior rami of C5-C8 and T1 spinal nerves, roots C5-C7 give rise to **long thoracic n.**
- Three trunks
 - The upper trunk is formed by the joining of root C4, C5, C6.
 - The middle trunk is the continuation of root C7.
 - The lower trunk is formed by the joining of root C8 and T1.
- Six divisions: above clavicle, trunks form anterior and posterior divisions
- Three cords: below clavicle, divisions form three cords that surround the second portion of axillary a.

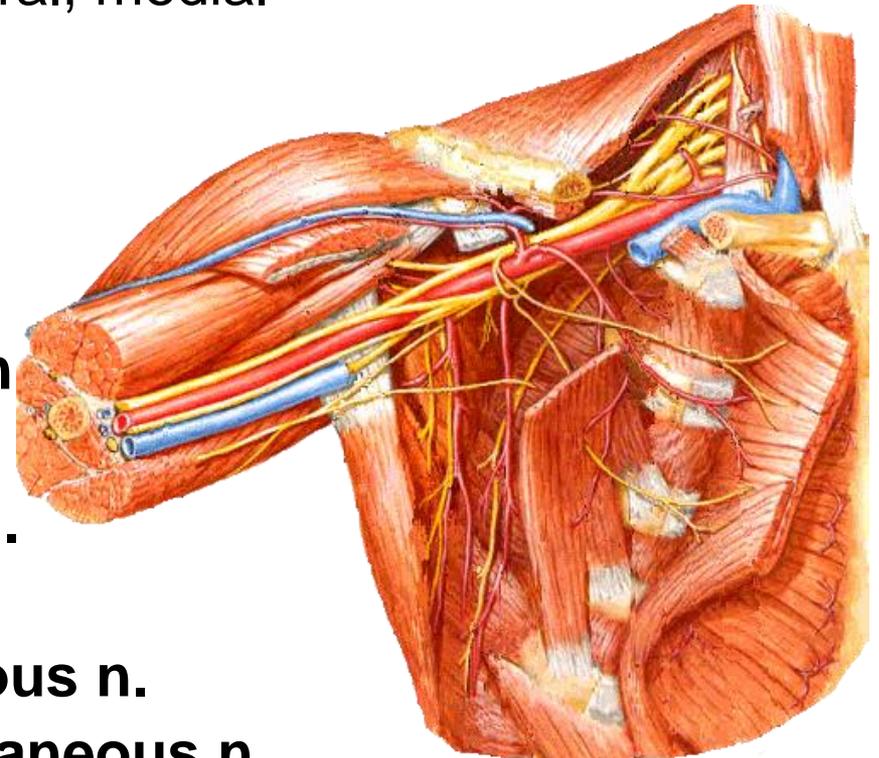


Position:

passes through the scalene fissure to posterosuperior of subclavian artery, then enters the axilla to form lateral, medial and posterior cords

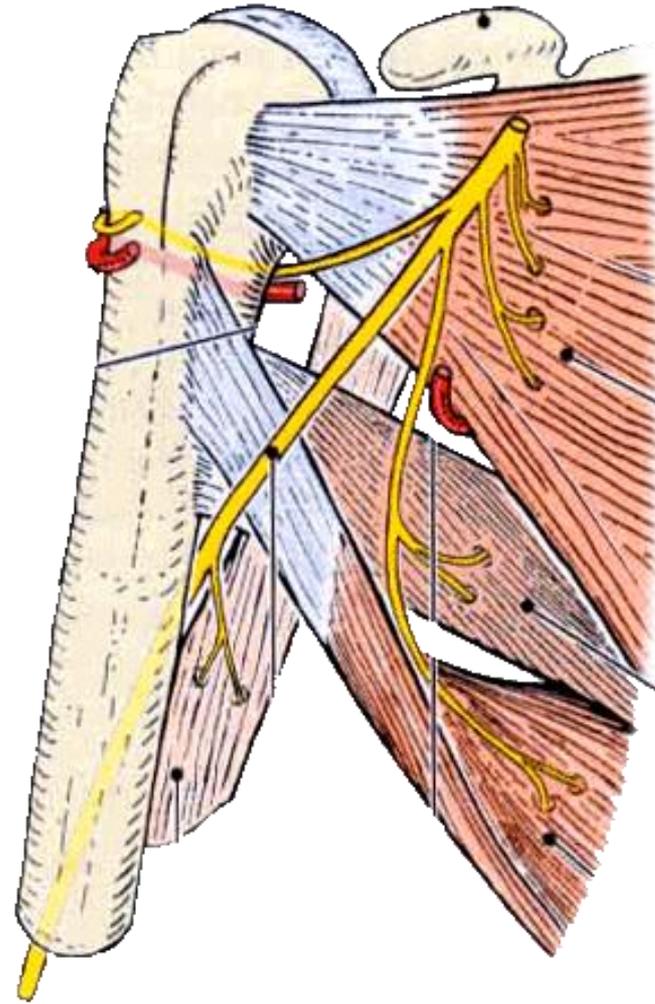
Main branches

- **Lateral cord**
 - Musculocutaneous n.
 - Lateral root to median n.
- **Medial cord**
 - Medial root to median n.
 - Ulnar n.
 - Medial brachial cutaneous n.
 - Medial antebrachial cutaneous n.



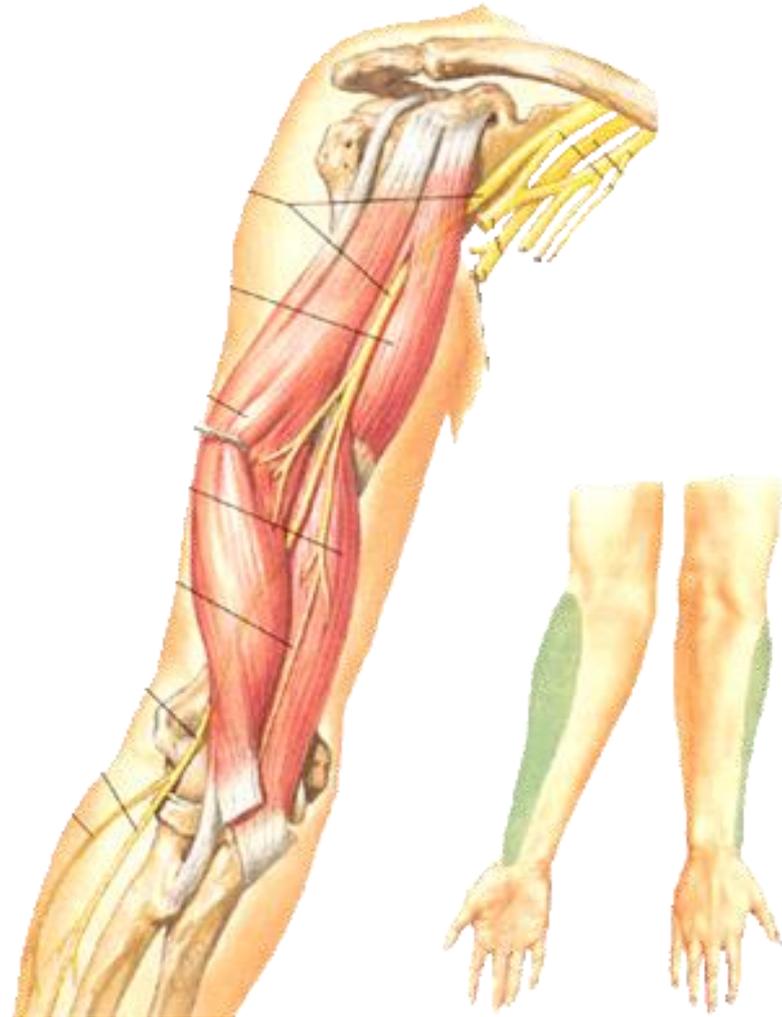
- **Posterior cord**

- radial n.
- axillary n.
- thoracodorsal n.



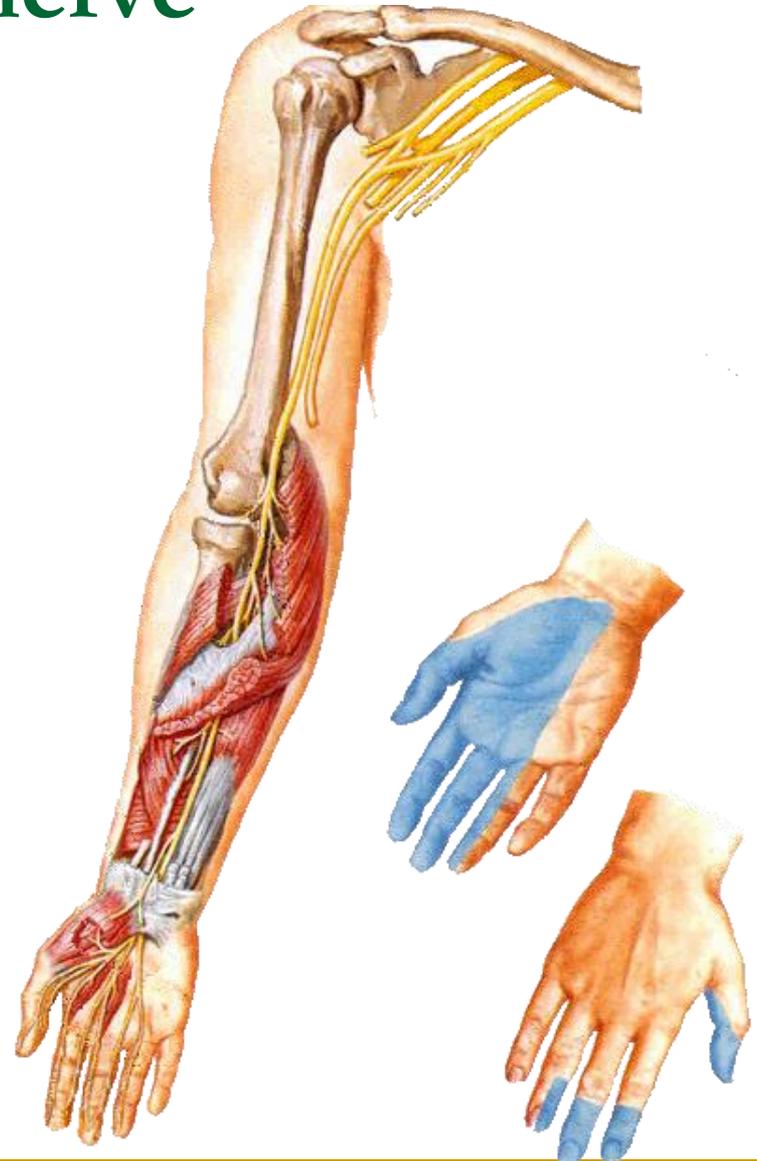
- **Musculocutaneous**

Distribution: Biceps brachii, brachialis and coracobrachialis 'BBC nerve'; skin on anterior aspect of forearm



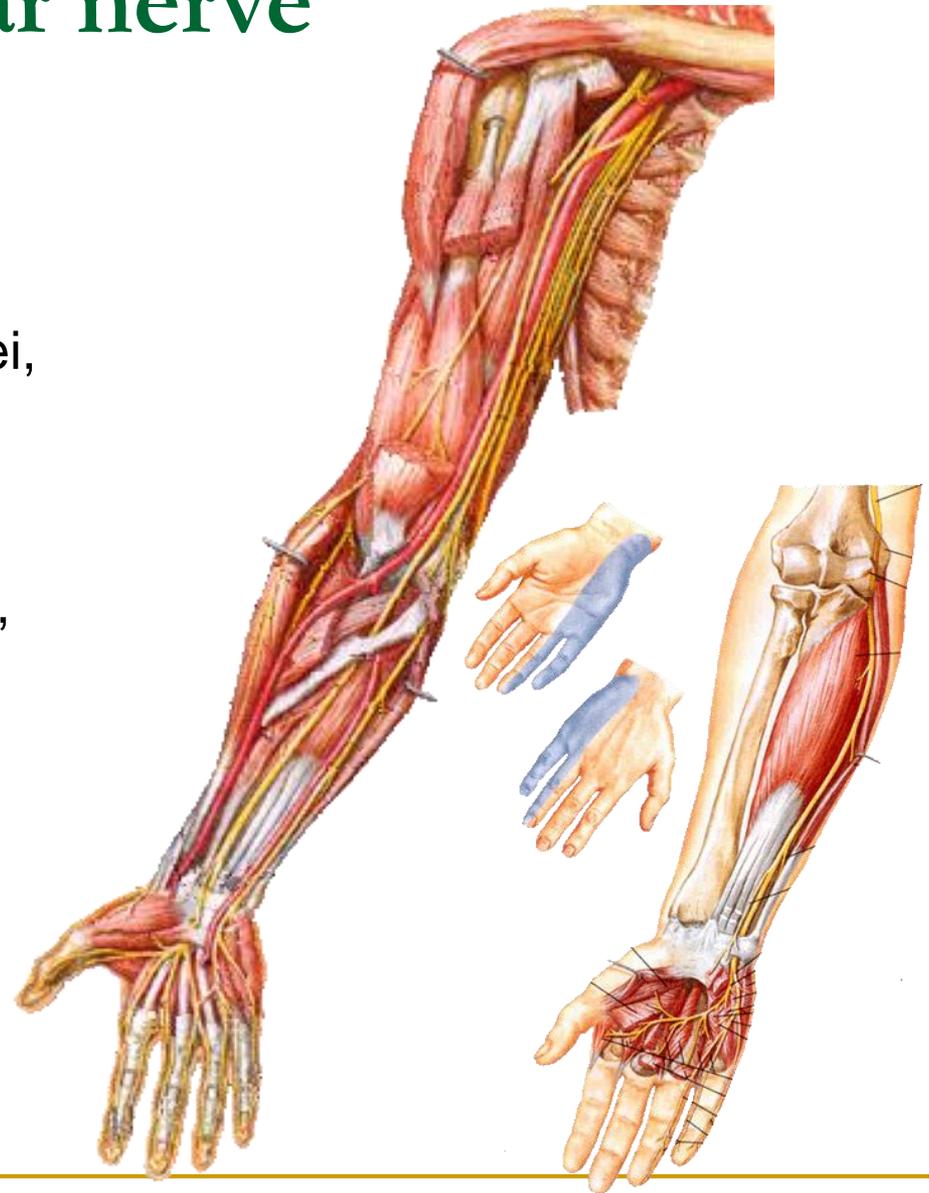
Median nerve

- **Distribution:** Flexors of forearm except brachioradialis, flexor carpi ulnaris and ulnar half of flexor digitorum profundus, thenar except adductor pollicis, first two lumbricals; skin of thenar, central part of palm, palmar aspect of radial three and one-half fingers, including middle and distal fingers on dorsum.
- **Injury:** Apehand produces sign of **benediction**, in which the index and middle fingers cannot be flexed and the thumb cannot be opposed



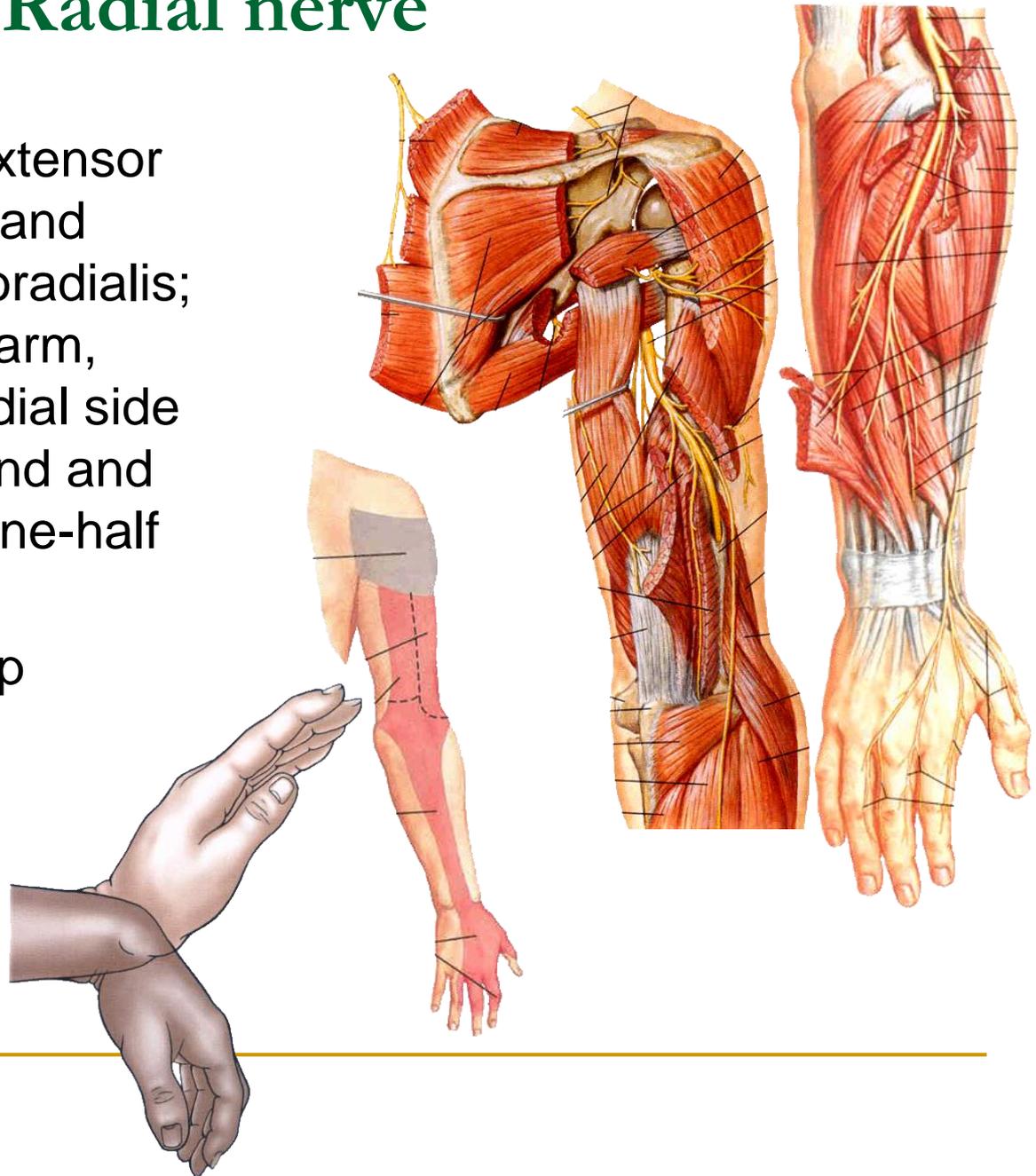
Ulnar nerve

- **Distribution:** Flexor carpi ulnaris, ulnar half of flexor digitorum profundus, hypothenar muscles, interossei, 3rd and 4th lumbricals and adductor pollicis; skin of hypothenar, palmar surface of ulnar one and one-half fingers, ulnar half of dorsum of hand, posterior aspect of ulnar two and one-half fingers
- **Injury:** clawhand



Radial nerve

- ❑ **Distribution:** Extensor muscles of arm and forearm, brachioradialis; skin on back of arm, forearm, and radial side of dorsum of hand and radial two and one-half fingers
- ❑ **Injury:** Wristdrop



■ Axillary

- **Distribution:** Deltoid and teres minor muscle; skin over deltoid and upper posterior aspect of arm
- **Injury:** results in deltoid and teres minor paralysis (loss of shoulder abduction and wheel external rotation) with loss of sensation over the deltoid

