

ANTERIOR COMPARTMENT OF FOREARM

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Deep fascia of the forearm

The forearm is enclosed in a sheath of deep fascia, which is attached to the posterior border of the ulna. It forms a sheath for each muscle and for each group of muscles.

This fascial sheath, together with the interosseous membrane and fibrous intermuscular septa, divides the forearm into several compartments, each having its own muscles, nerves and blood supply.

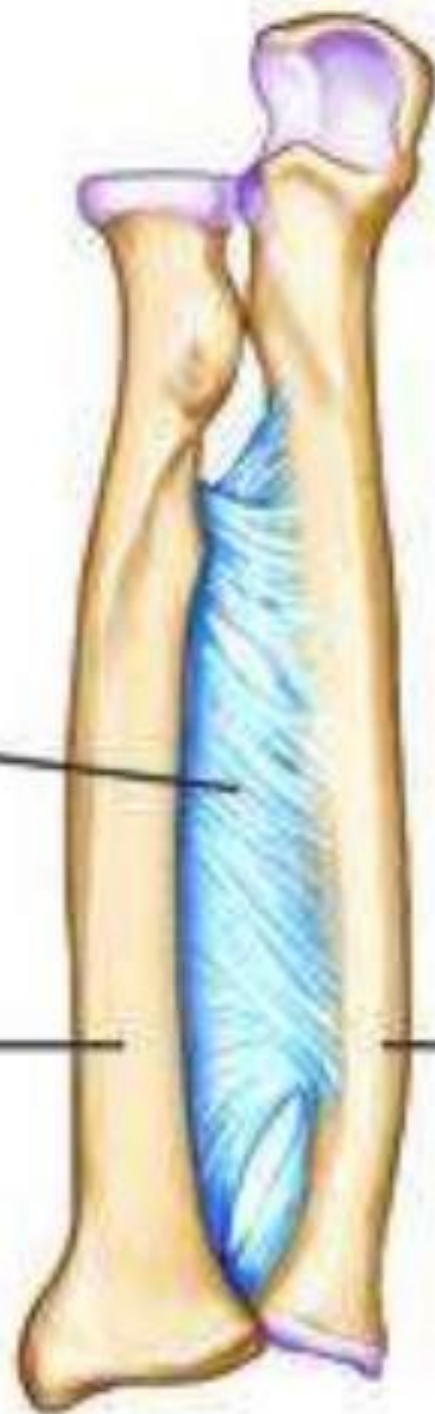
Interosseous Membrane

- The interosseous membrane is a strong membrane that unites the shafts of the radius and the ulna; it is attached to their interosseous borders.
- Its fibers run obliquely downward and medially
- Its fibers are taut when the forearm is in the midprone position that is, the position of function.
- The interosseous membrane provides attachment for neighboring muscles.

Interosseous
membrane

Radius

Ulna



Contents of the Anterior Compartment of the Forearm

- **Muscles:**
- **A superficial group**, consisting of the pronator teres, the flexor digitorum superficialis, the flexor carpi radialis, the palmaris longus, and the flexor carpi ulnaris.
- **A deep group** consisting of the flexor pollicis longus, the flexor digitorum profundus, and the pronator quadratus
- **Blood supply :**
- **Ulnar and radial arteries**

- **Blood supply to the muscles:** Ulnar and radial arteries
- **Nerve supply to the muscles:**
- All the muscles are supplied by the **median** nerve and its branches, **except** the flexor carpi ulnaris and the medial part of the flexor digitorum profundus, which are supplied by the **ulnar** nerve

SUPERFICIAL MUSCLES

- PRONATOR TERES
- BRACHIO RADIALIS
- PALMARIS LONGUS
- FLEXOR CARPI RADIALIS
- FLEXOR CARPI ULNARIS

Pronator teres

Origin:

Humeral head: from the medial epicondyle of the humerus (common flexor origin).

Ulnar head: from the medial border of the coronoid process.

Insertion: Into the rough impression on the middle part of the lateral surface of the shaft of the radius.

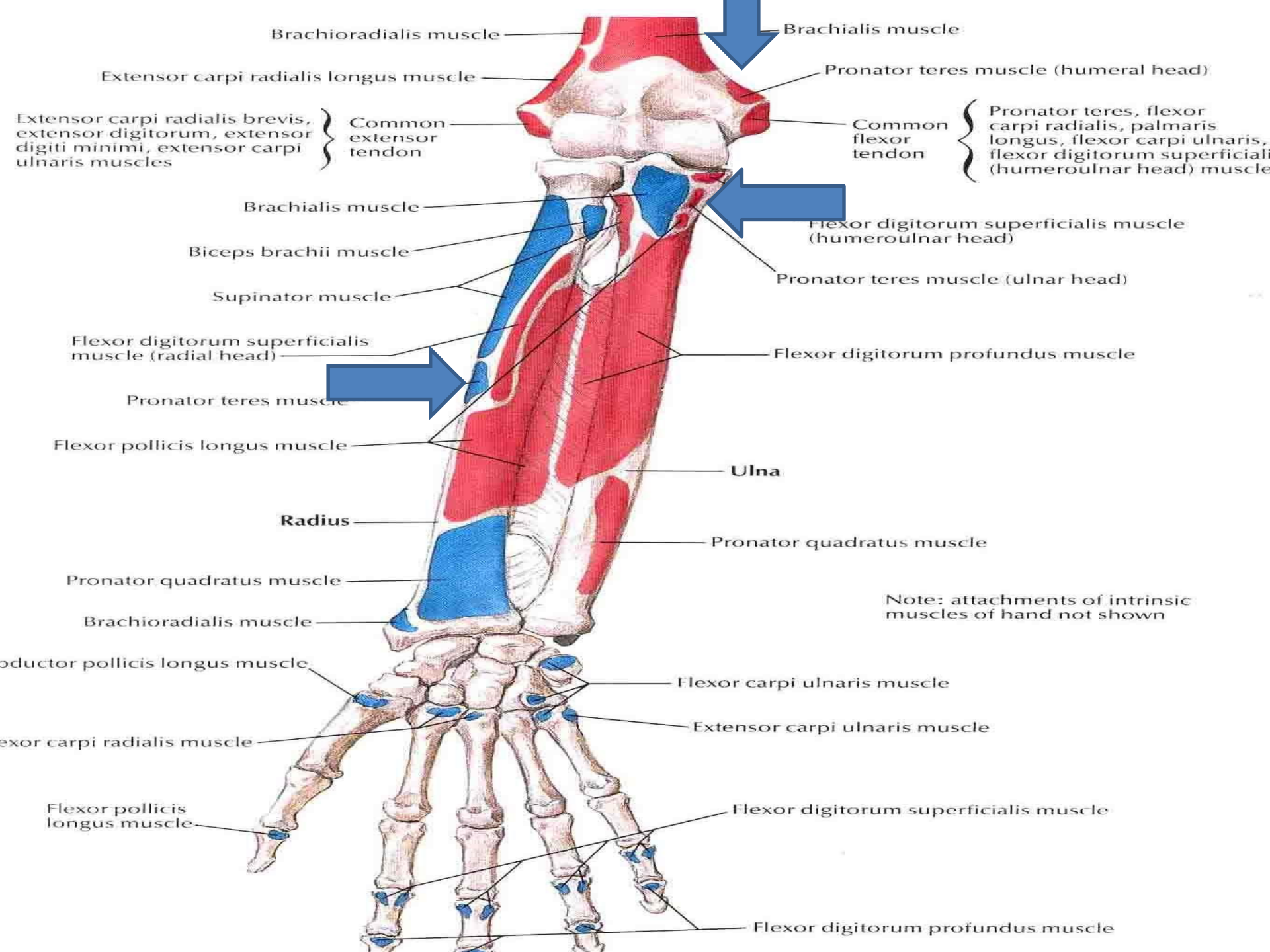
Nerve Supply: From the median nerve.

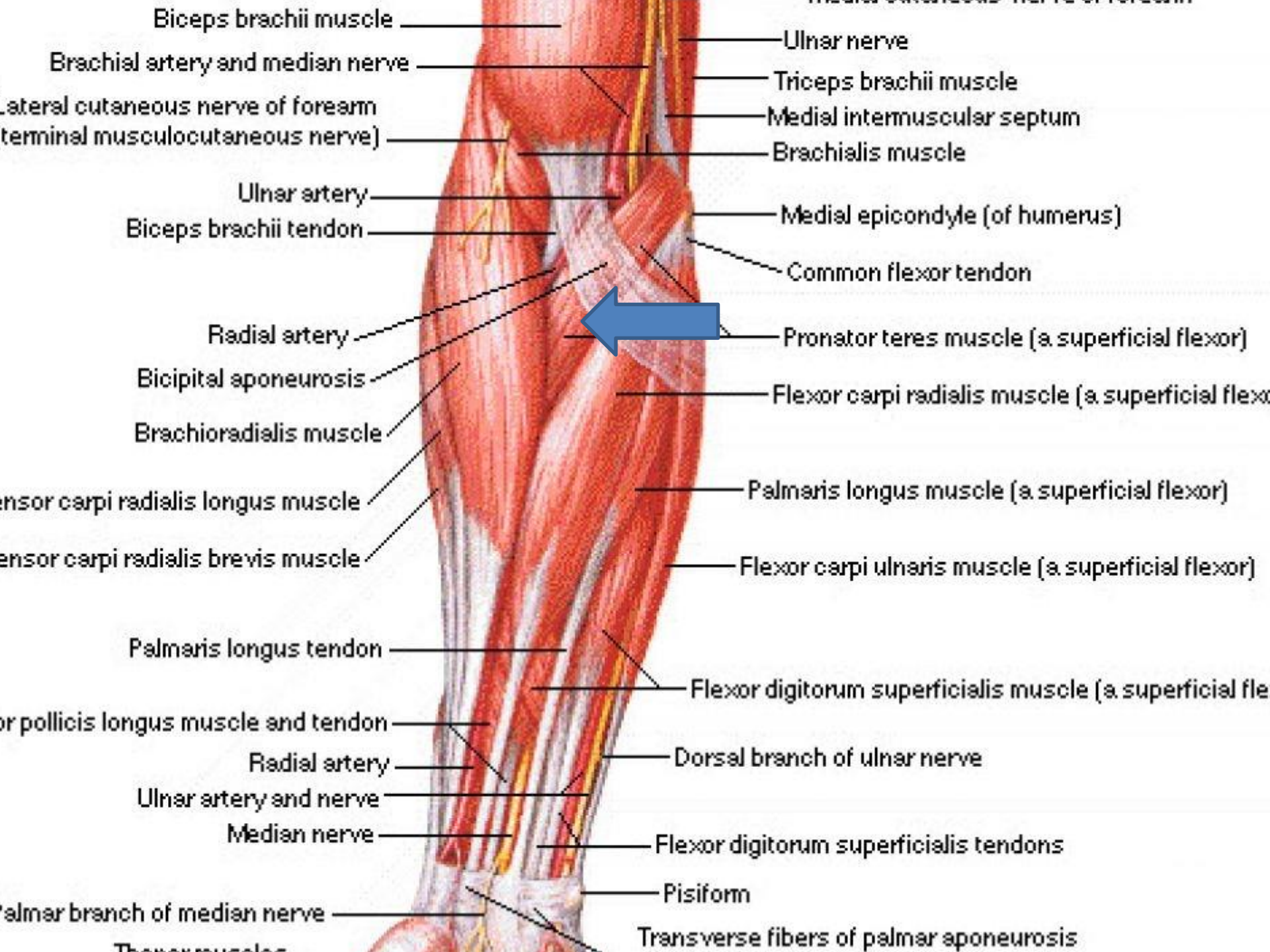
Action: 1. Pronation of the forearm at the radio-ulnar joints.

2. Flexion of the forearm at the elbow joint.

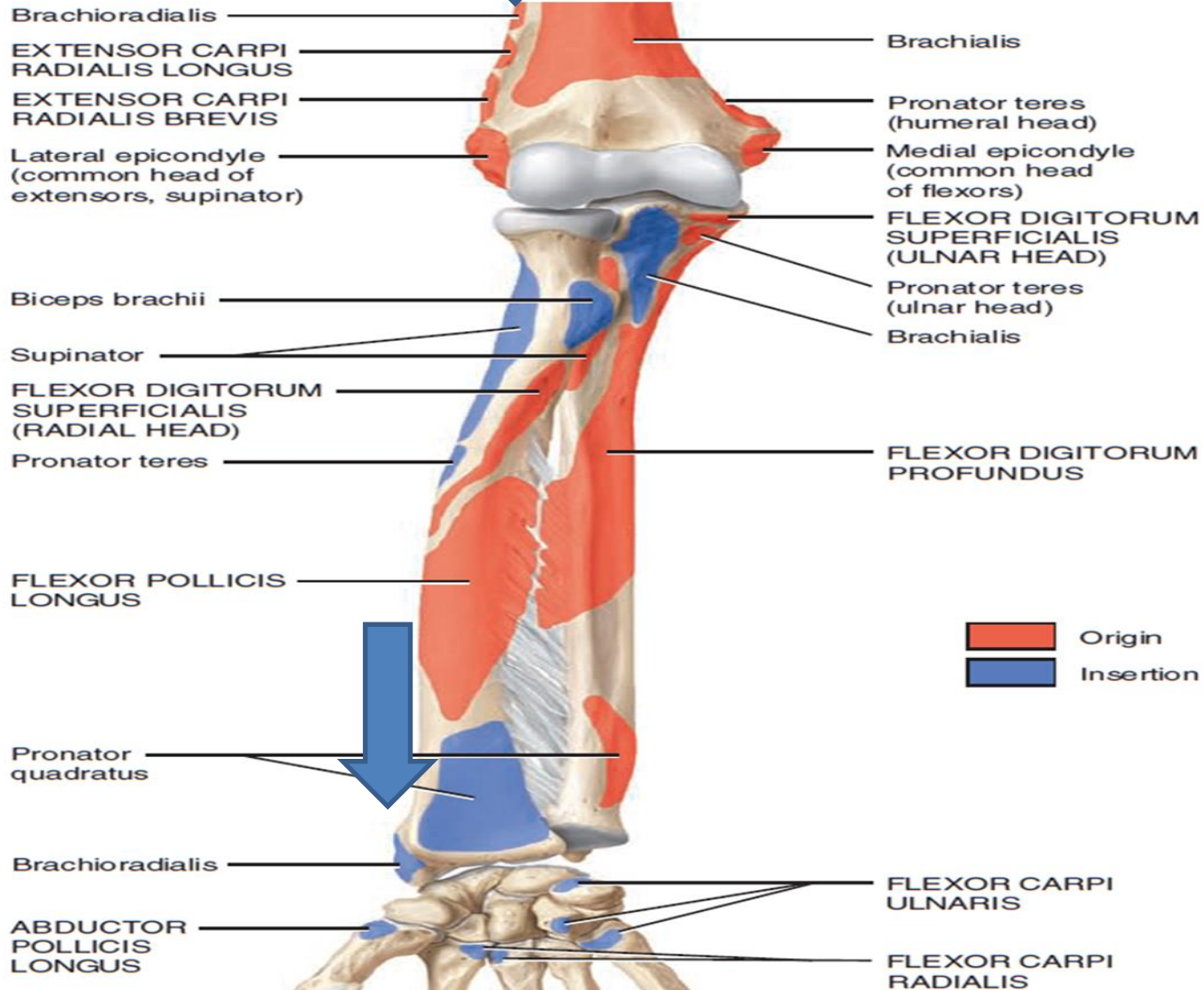








BRACHIORADIALIS MUSCLE

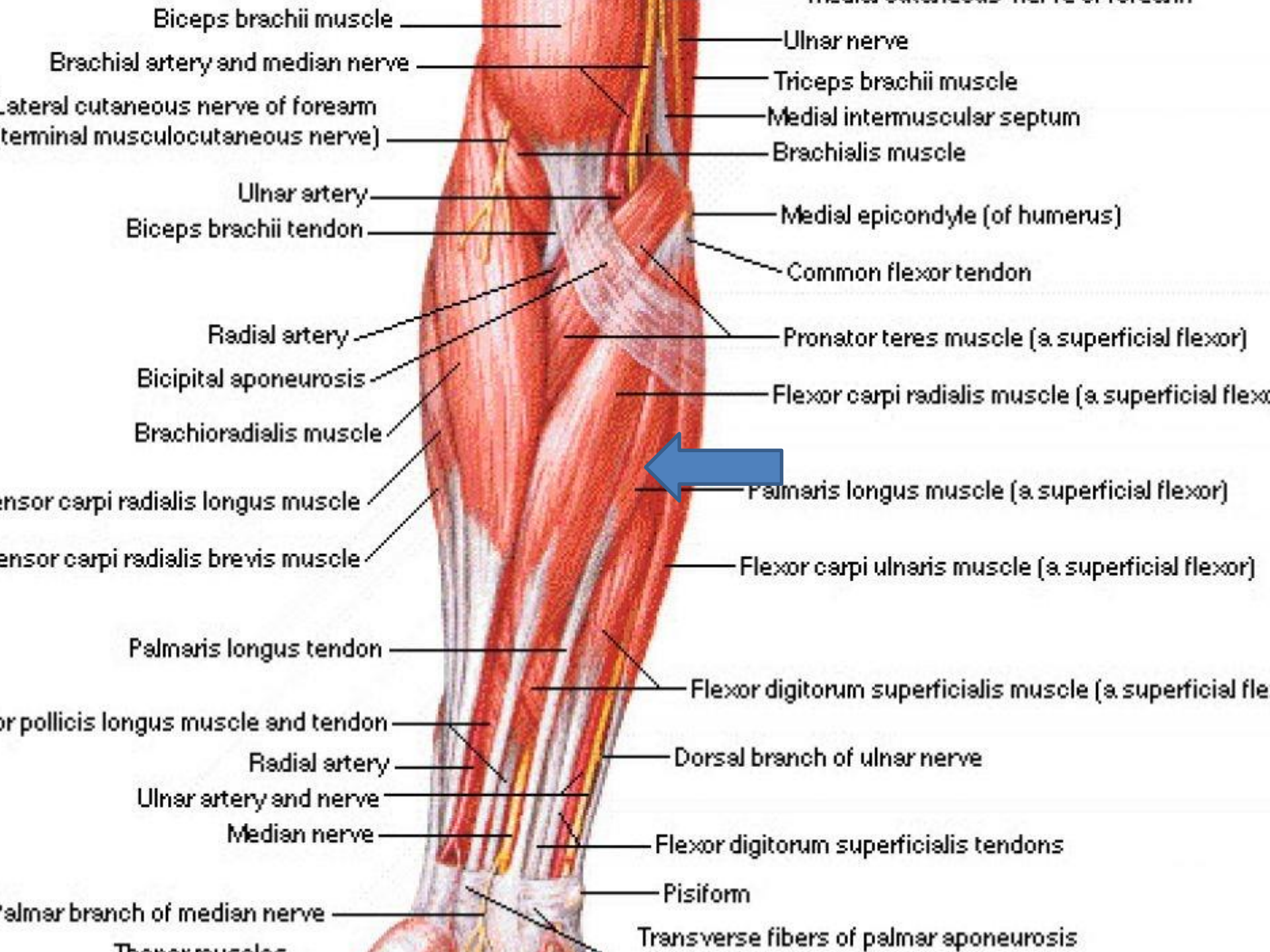


Palmaris longus

- **Origin:** From the medial epicondyle of the humerus (common flexor origin).
- **Insertion:** Into the palmar aponeurosis and flexor retinaculum.
- **Nerve Supply** From the median nerve.
- **Action:** Flexion of the hand at the wrist joint.







Flexor carpi radialis

- **Origin:**

From the medial epicondyle of the humerus (common flexor origin).

- **Insertion:**

The bases of the 2nd and 3rd metacarpal bones.

- **Nerve Supply:**

From the median nerve.

- **Action:**

Flexion of the hand at the wrist joint.

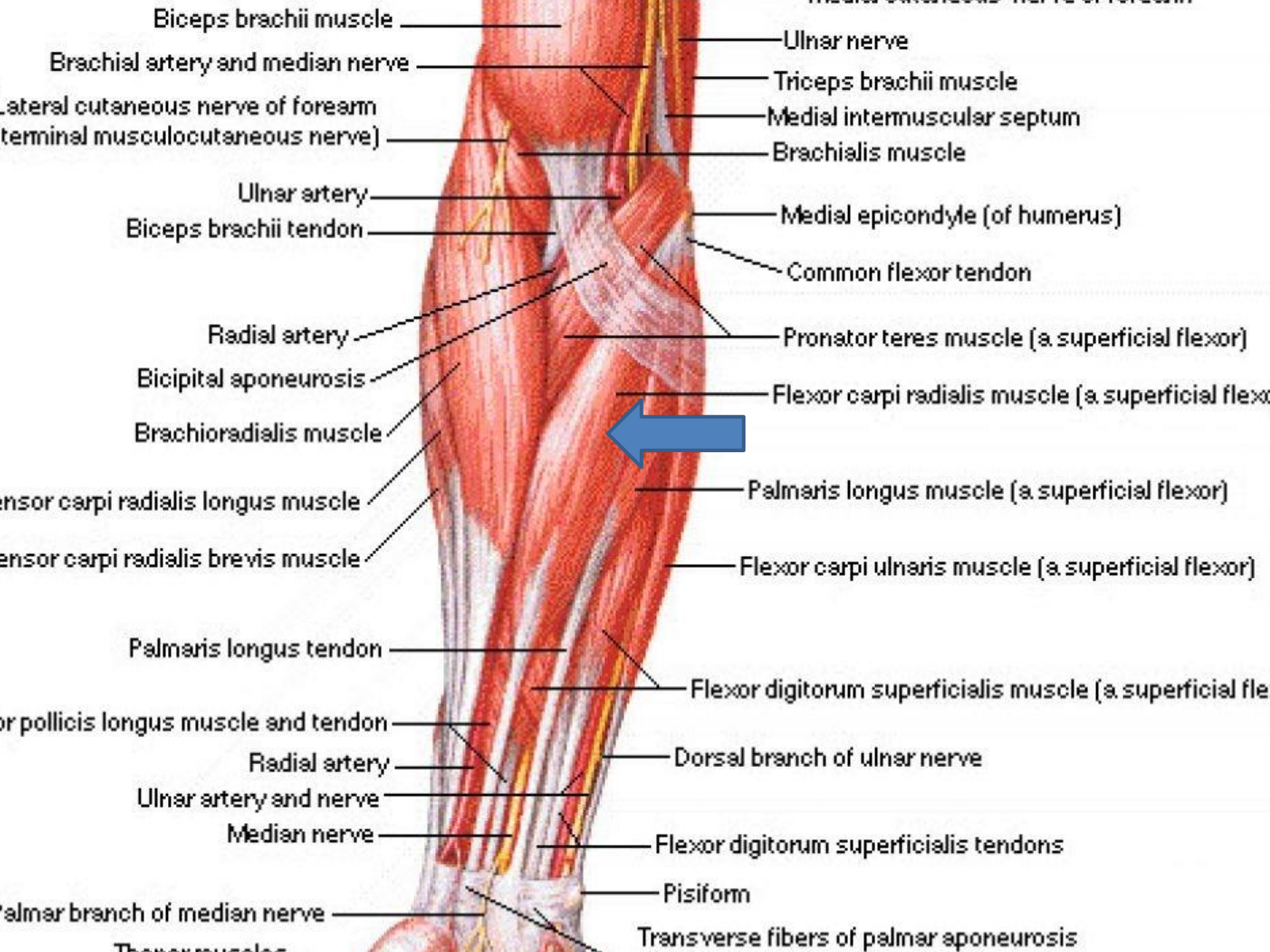
Abduction of the hand at the wrist joint.



Anterior Forearm Muscles (4)



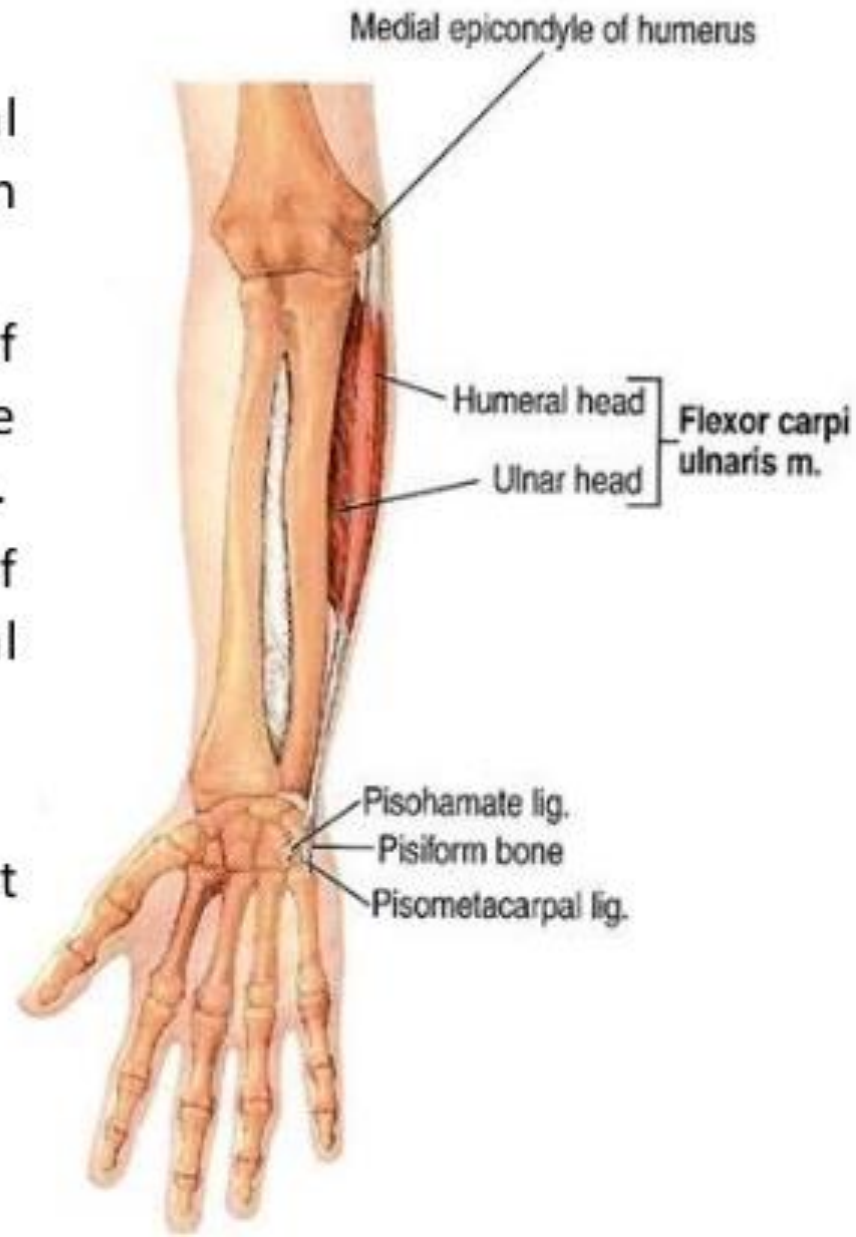
**Flexor
carpi
radialis**

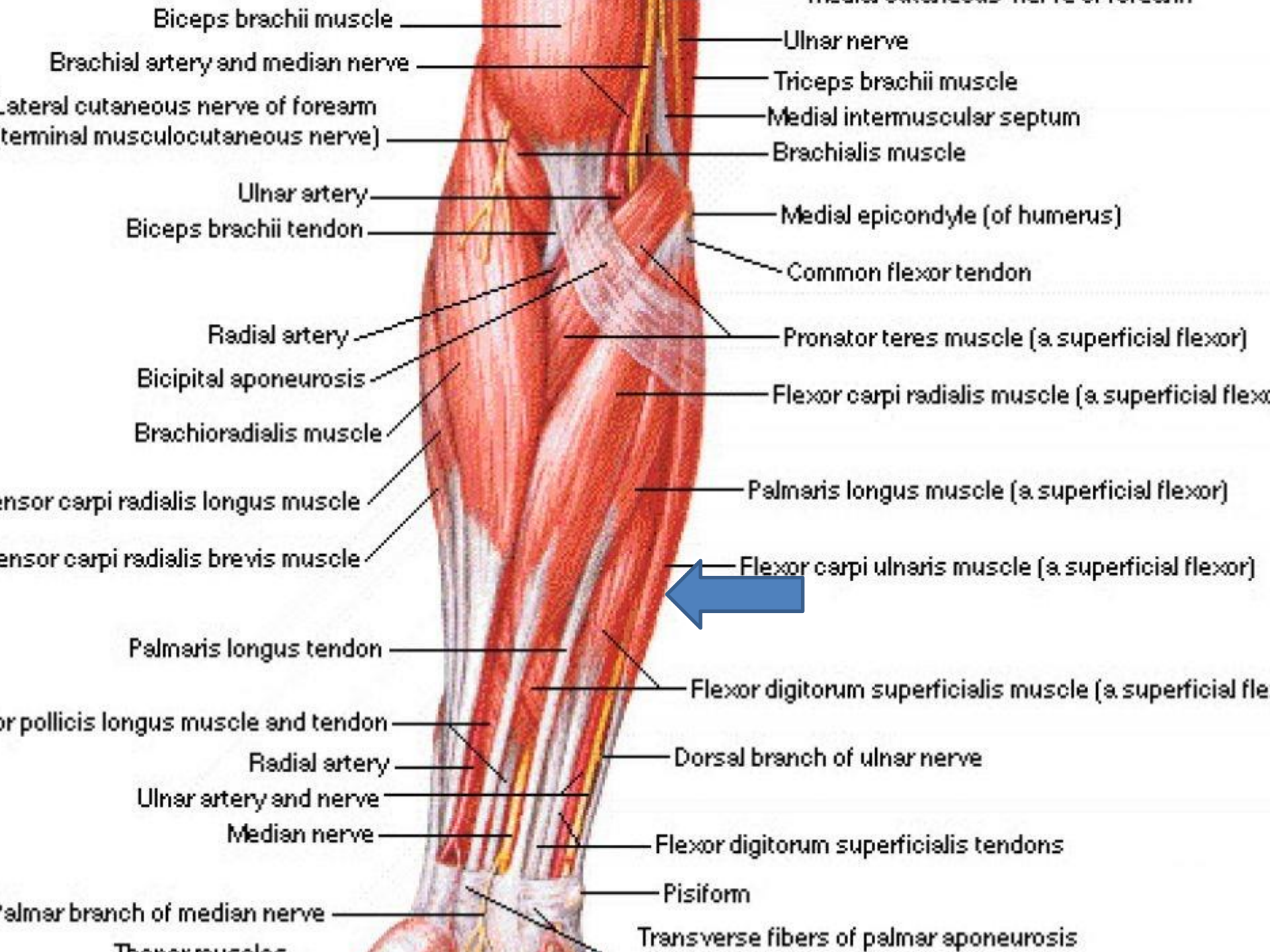


Flexor carpi ulnaris

- **Origin:**
- **Humeral head:** from the medial epicondyle of the humerus (common flexor origin).
- **Ulnar head:** from the medial aspect of the olecranon process and form the posterior border of the shaft of the ulna.
- **Insertion:** Into the pisiform, hook of hamate and base of the 5th metacarpal bone.
- **Nerve Supply:** From the ulnar nerve.
- **Action:** Flexion of the hand at the wrist joint.

Adduction of the hand at the wrist joint





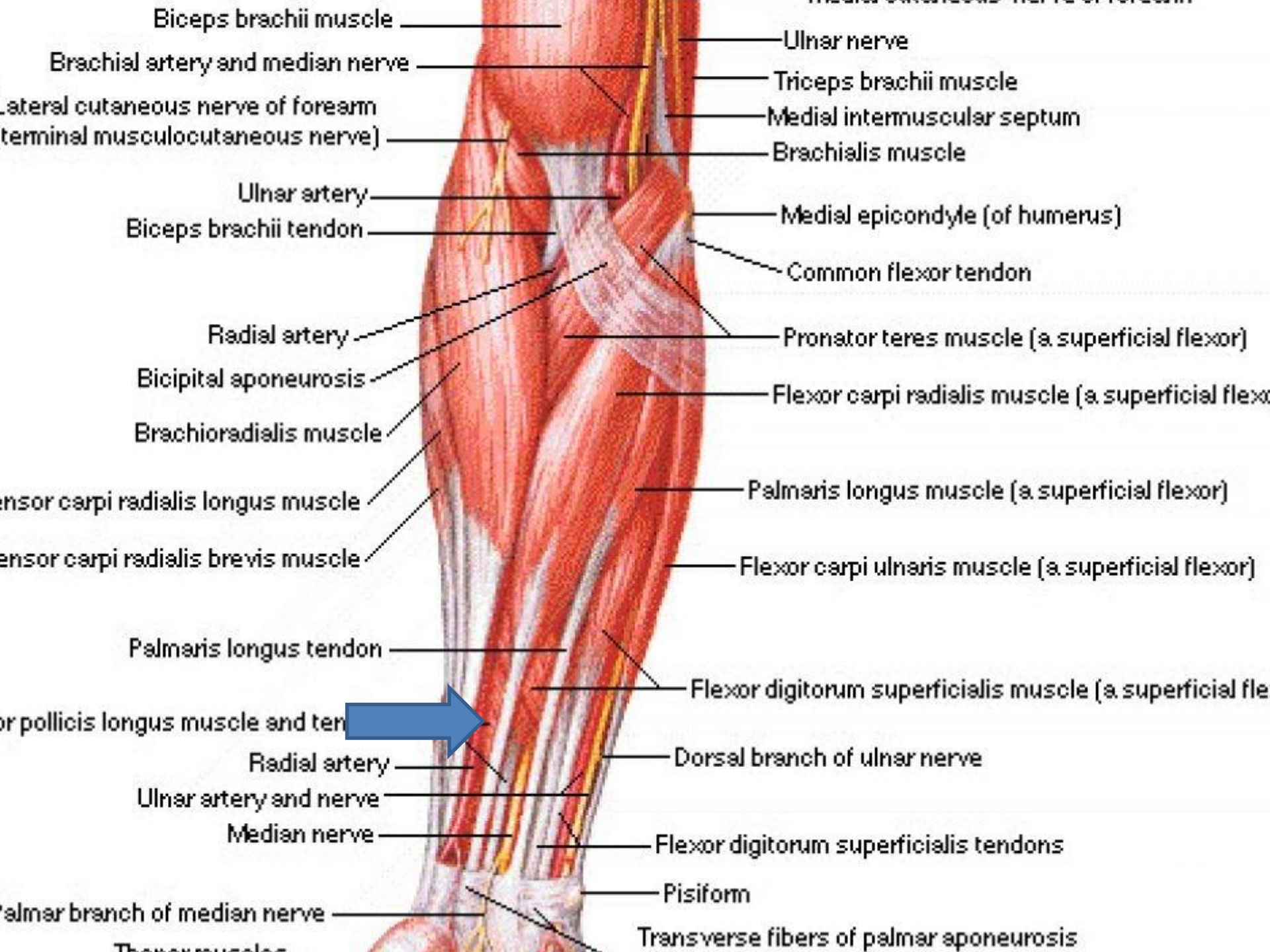
DEEP MUSCLES OF ANT. FOREARM

- FLEXOR POLLICIS LONGUS
- FLEXOR DIGITORUM SUPERFICIALIS
- FLEXOR DIGITORUM PROFUNDUS
- PRONATOR QUADRATUS

Flexor pollicis longus

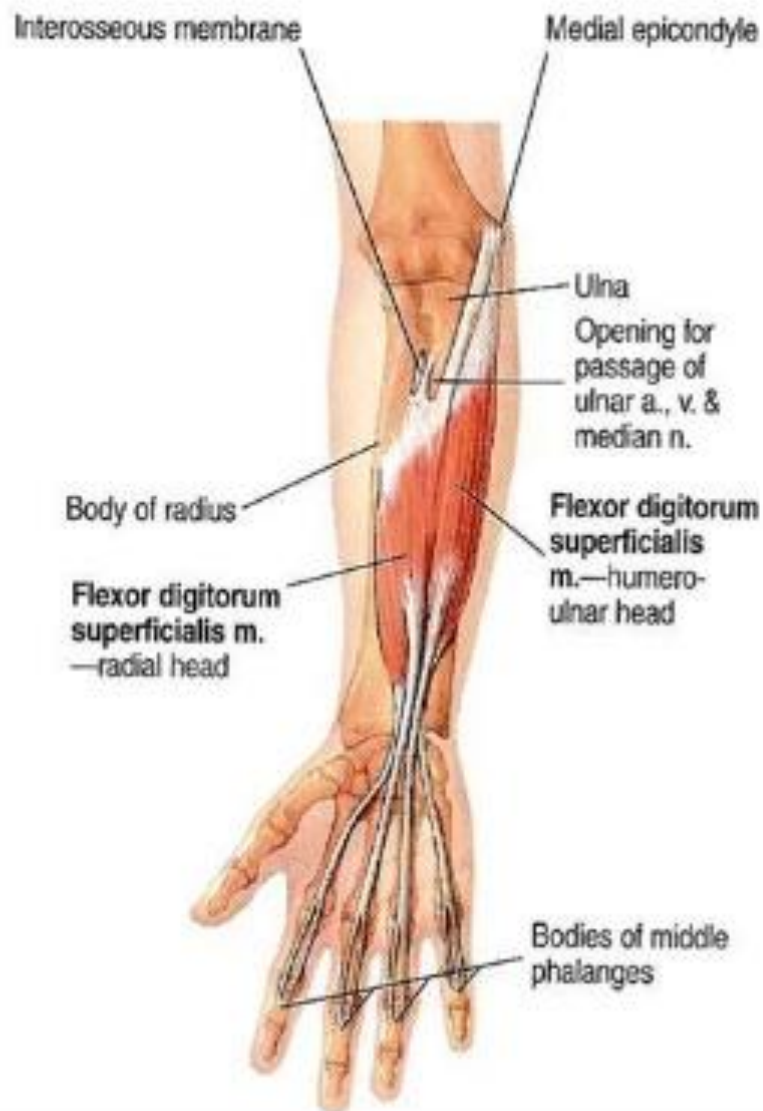
- **Origin:** From the anterior surface of the shaft of the radius
- **Insertion:** The base of the distal phalanx of the thumb.
- **Nerve Supply:** From the anterior interosseus nerve (branch of the median nerve).
- **Action:** Flexion of the thumb.

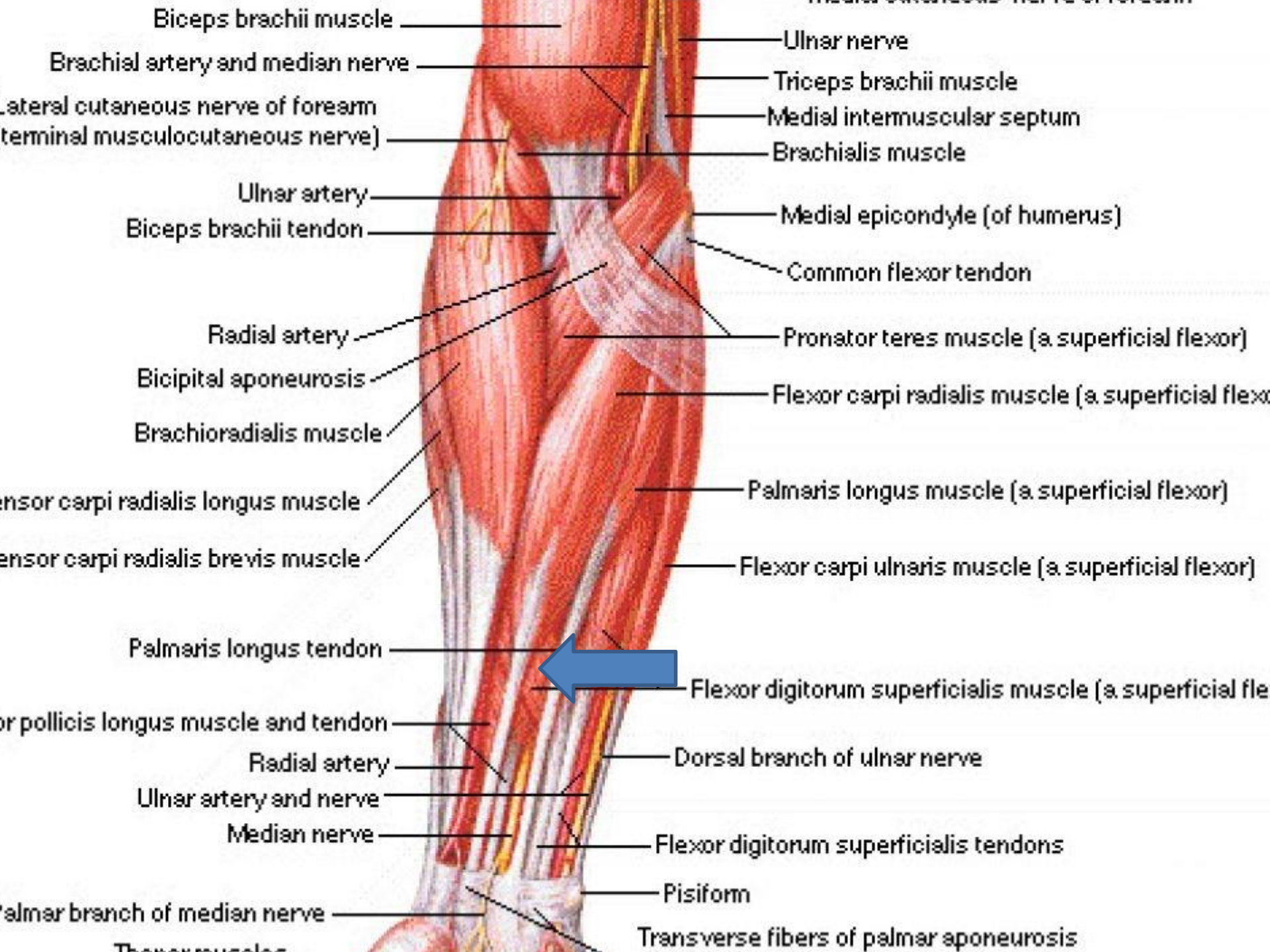




Flexor digitorum superficialis

- **Origin:**
- **Humero-ulnar head:** from the medial epicondyle of the humerus (common flexor origin) and from the medial border of the coronoid process of the ulna.
- **Radial head:** from the oblique line on the anterior surface of the shaft of the radius.
- **Insertion:** Its tendon divides into 4 tendons which are inserted into the middle phalanges of the medial 4 fingers.
- **Nerve Supply:** From the median nerve.
- **Action:** Flexion of the proximal interphalangeal joints and metacarpophalangeal joints of the medial 4 fingers.
- Helps of flexion of the hand at the wrist joint.

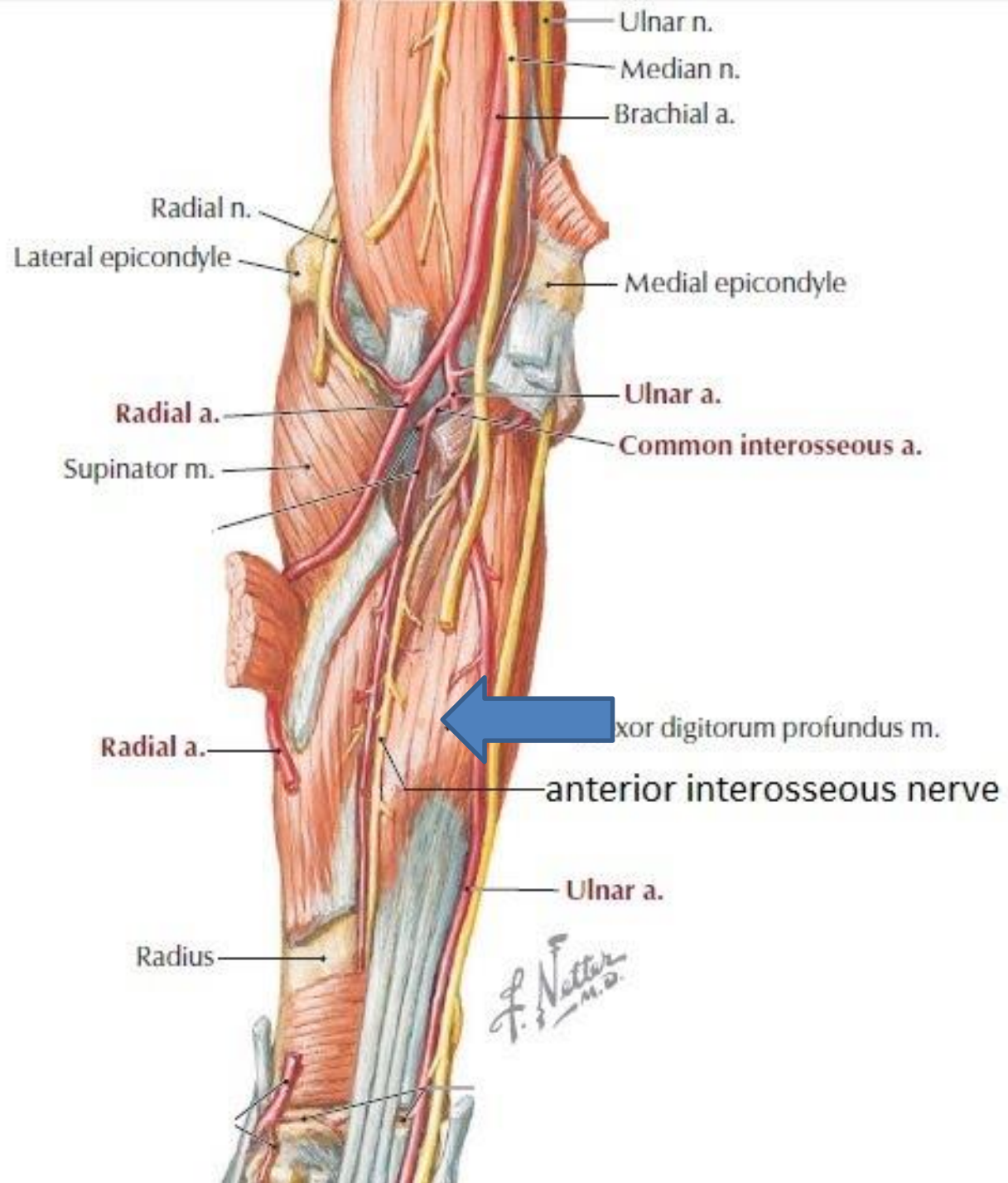


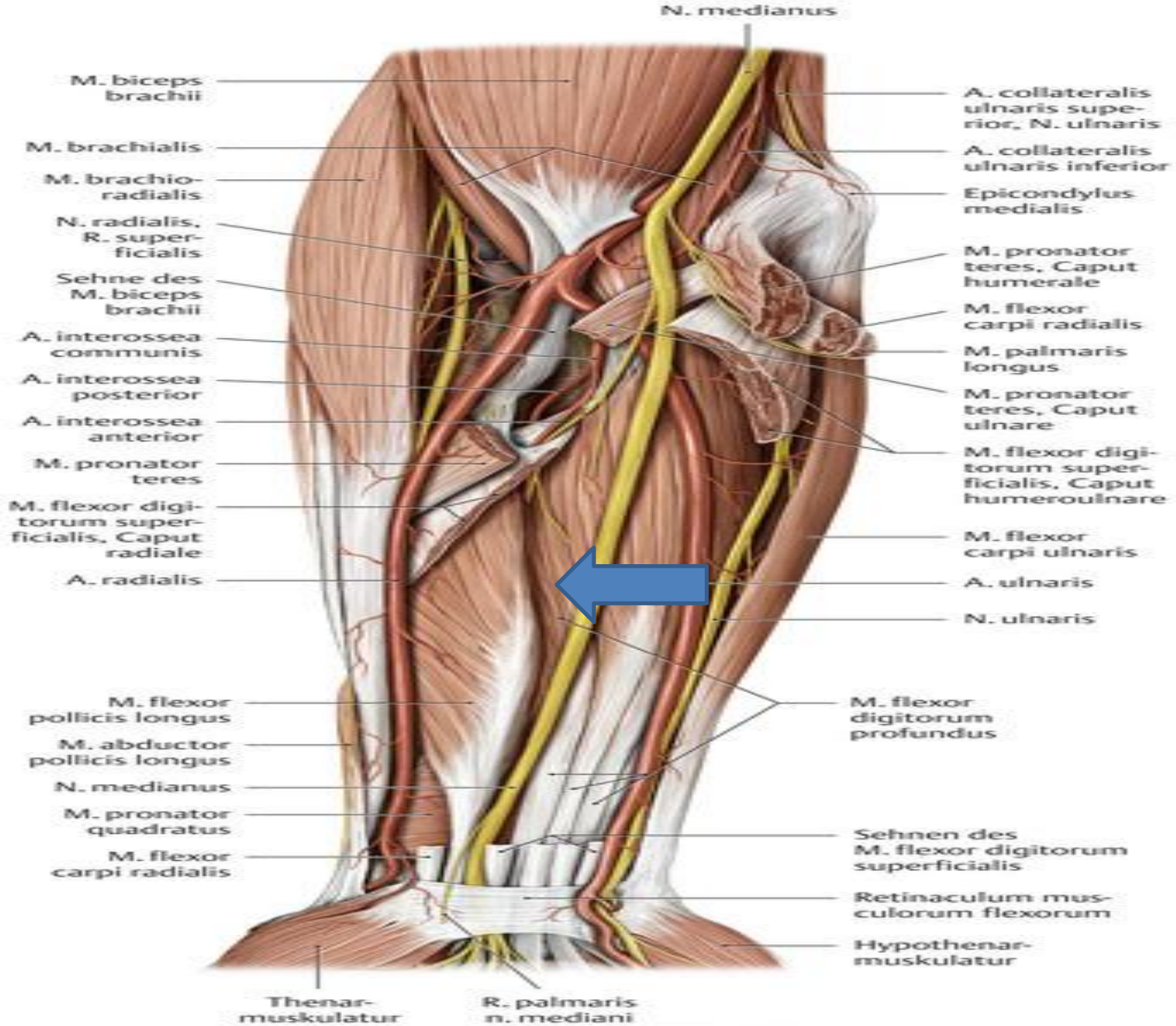


Flexor digitorum profundus

- **Origin:**
- From the upper 3/4th of the anterior surface of the shaft of the ulna
- **Insertion:**
- The muscle divides into 4 tendons which pierce the tendons of the flexor digitorum superficialis and are inserted into the bases of the distal phalanges of the medial 4 fingers.
- **Nerve Supply:**
- Its lateral half: from the anterior interosseus nerve (branch of the median nerve).
- Its medial half: from the ulnar nerve.
- **Action:**
- Flexion of the distal interphalangeal joints of the medial 4 fingers.
- Helps in flexion of the proximal interphalangeal joints and metacarpophalangeal joints of the medial 4 fingers.
- Helps of flexion of the hand at the wrist joint.



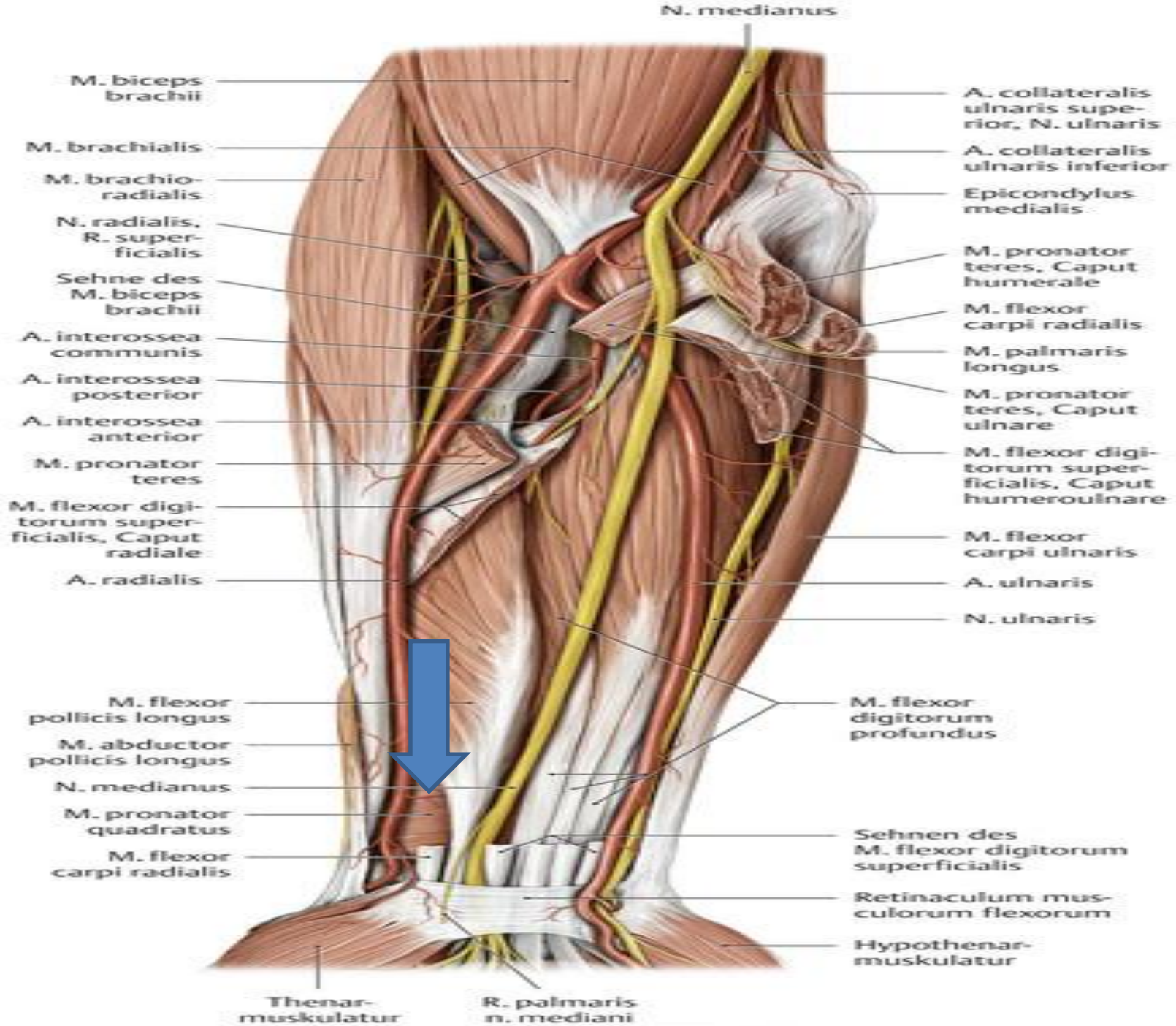


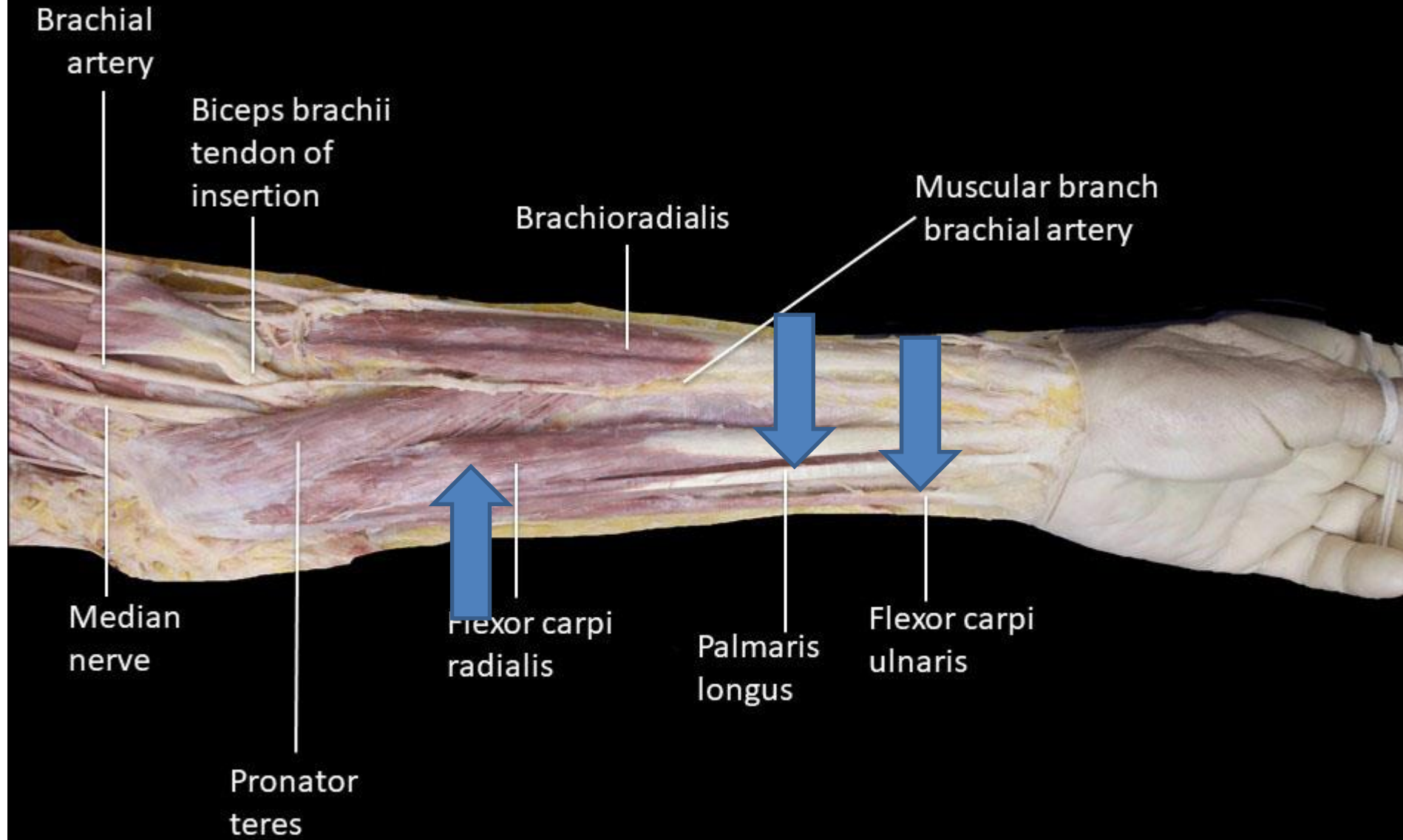


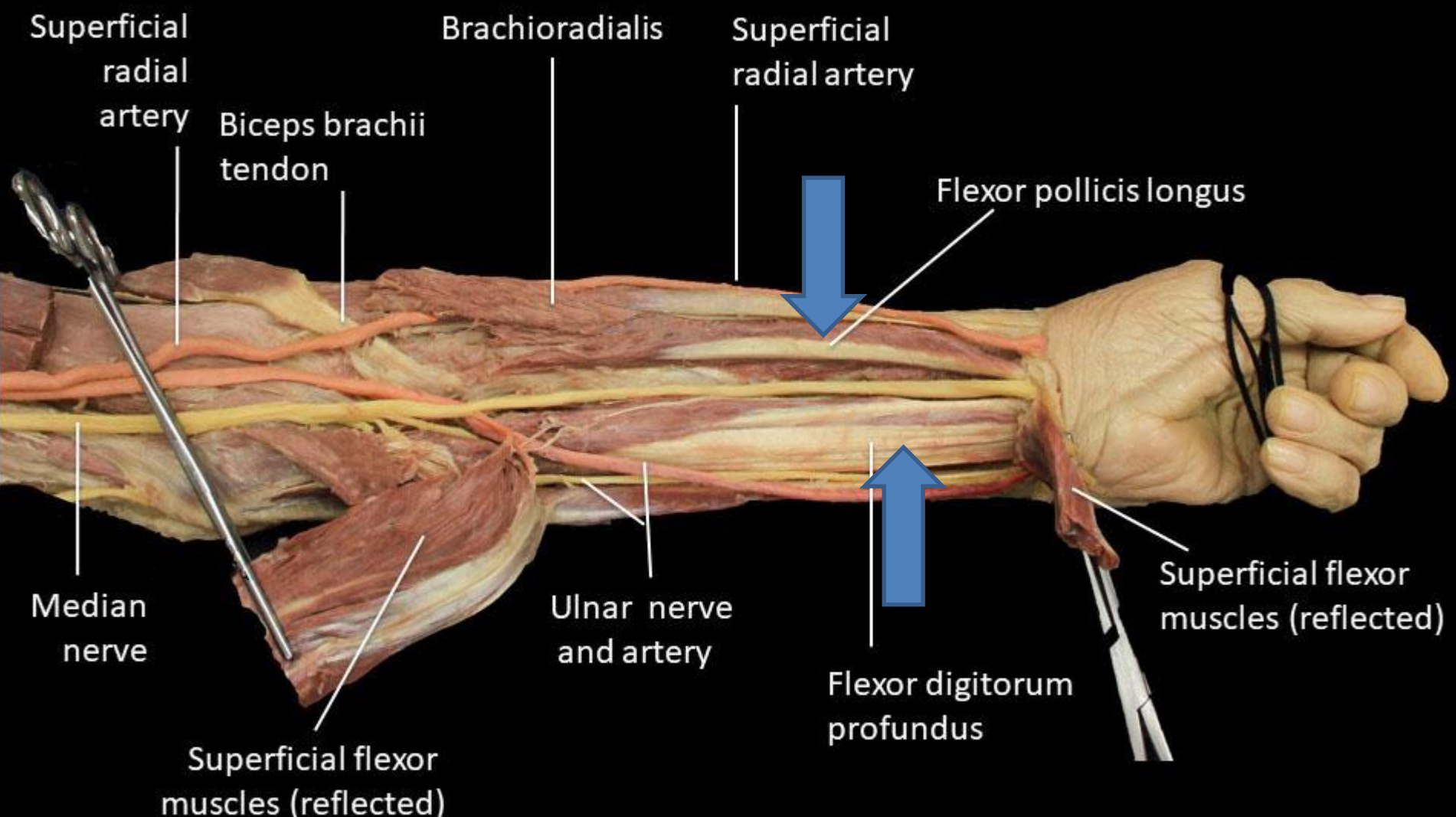
Pronator quadratus

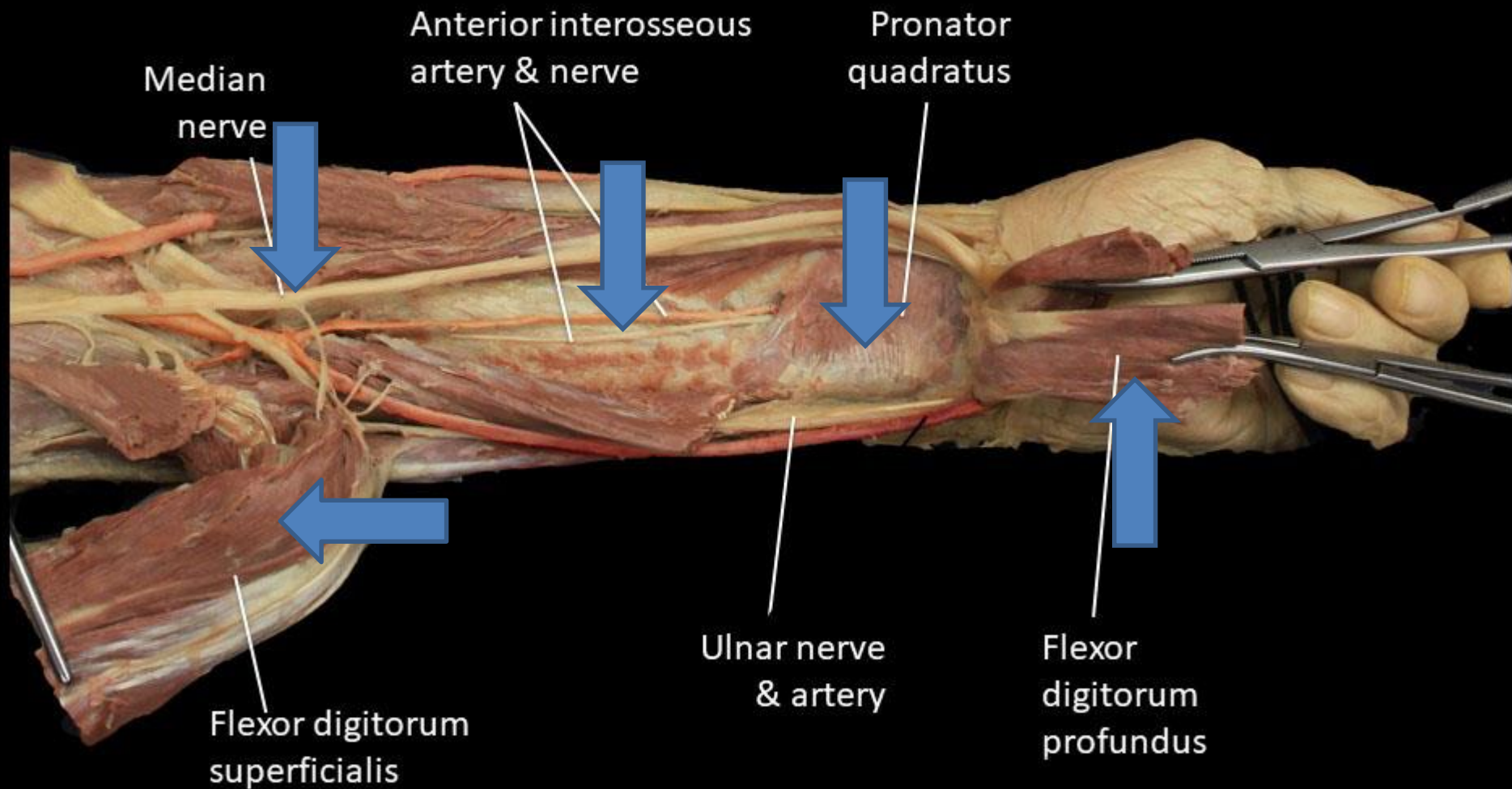
- **Origin:**
- From the lower $\frac{1}{4}$ of the anterior surface of the shaft of the ulna.
- **Insertion:**
- Into the lower $\frac{1}{4}$ of the anterior surface of the shaft of the radius.
- **Nerve Supply:**
- From the anterior interosseus nerve (branch of the median nerve).
- **Action:**
- Pronation of the forearm at the radio-ulnar joints.











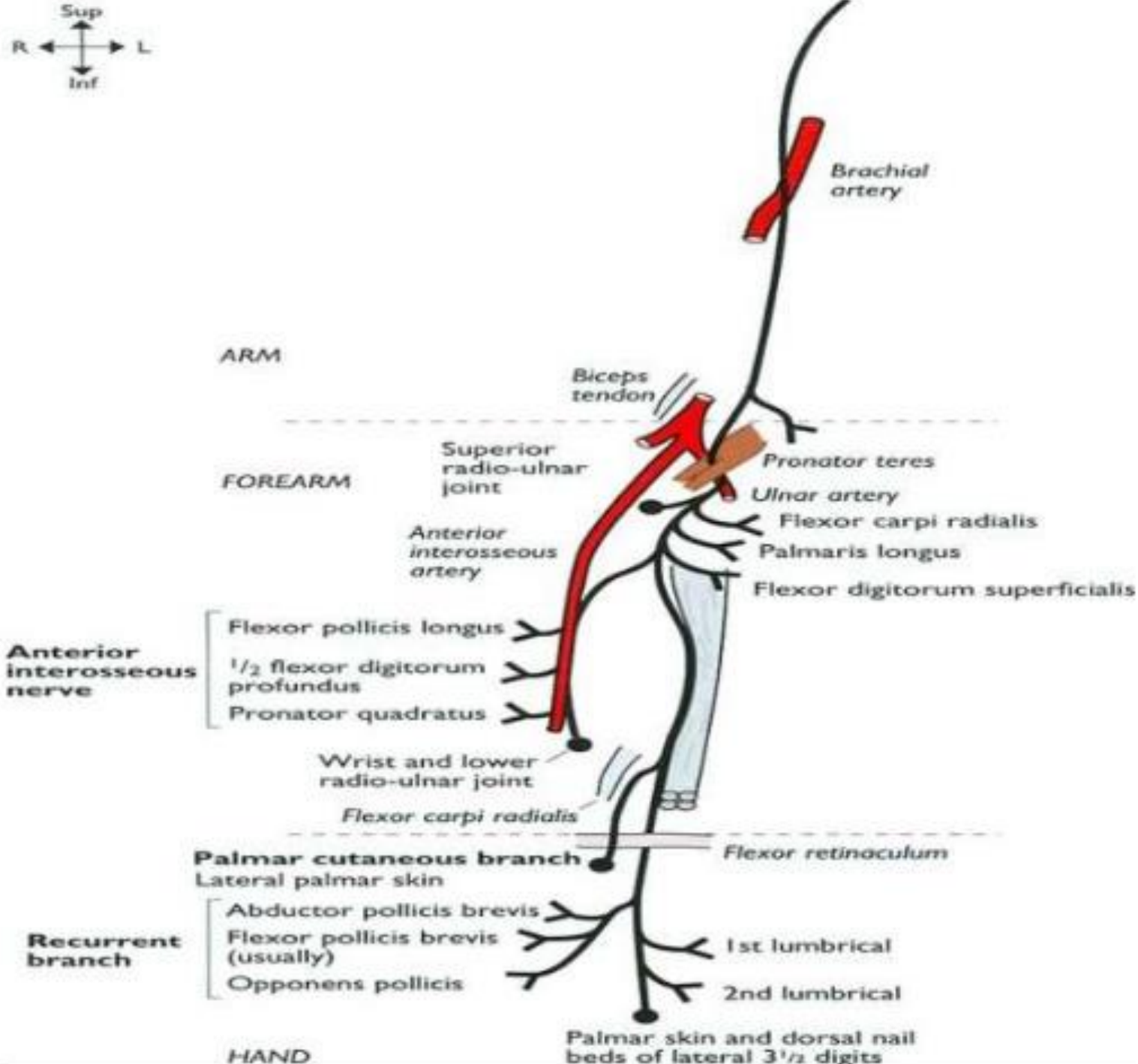
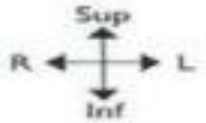
Nerves of the Anterior Fascial Compartment of the Forearm

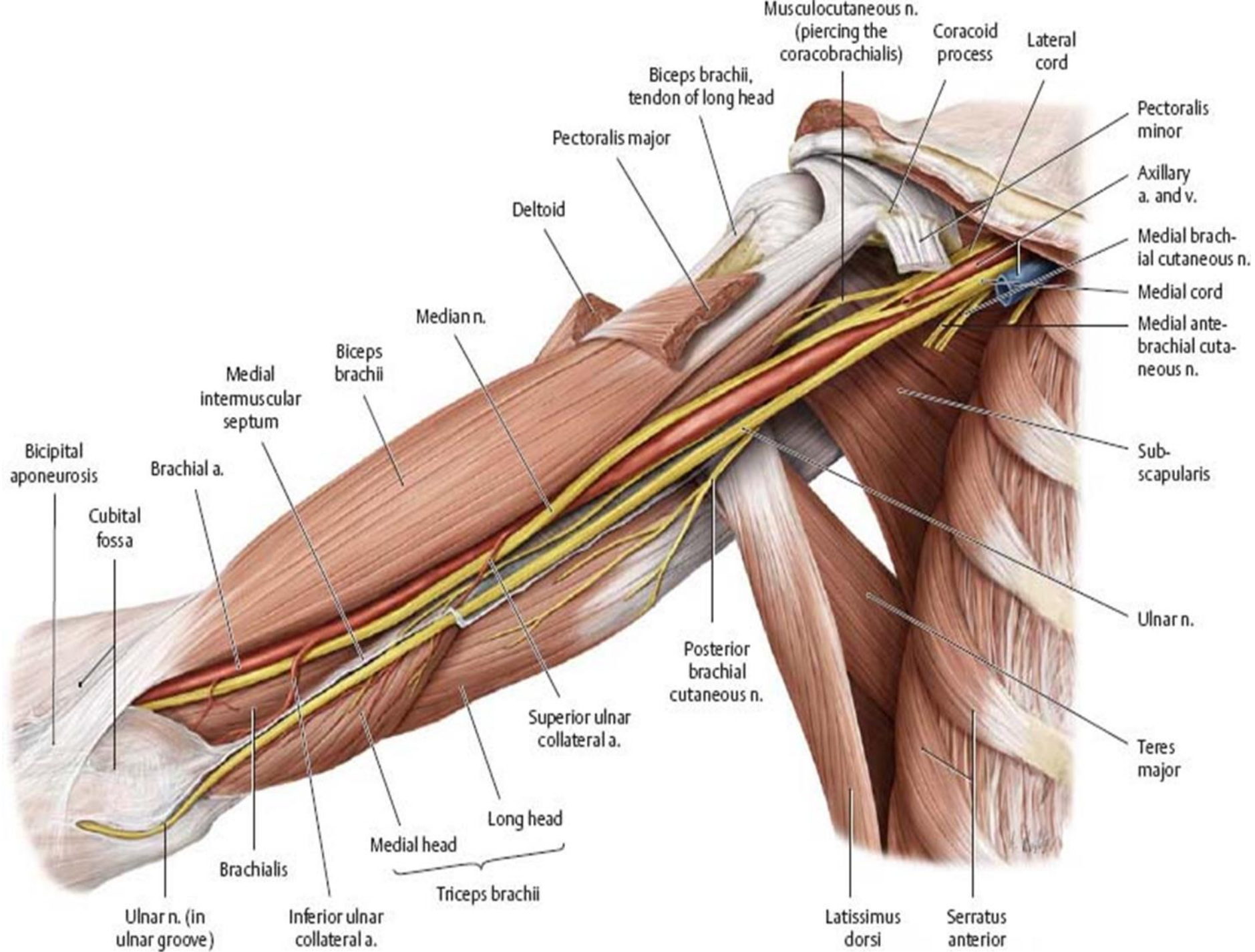
Median Nerve

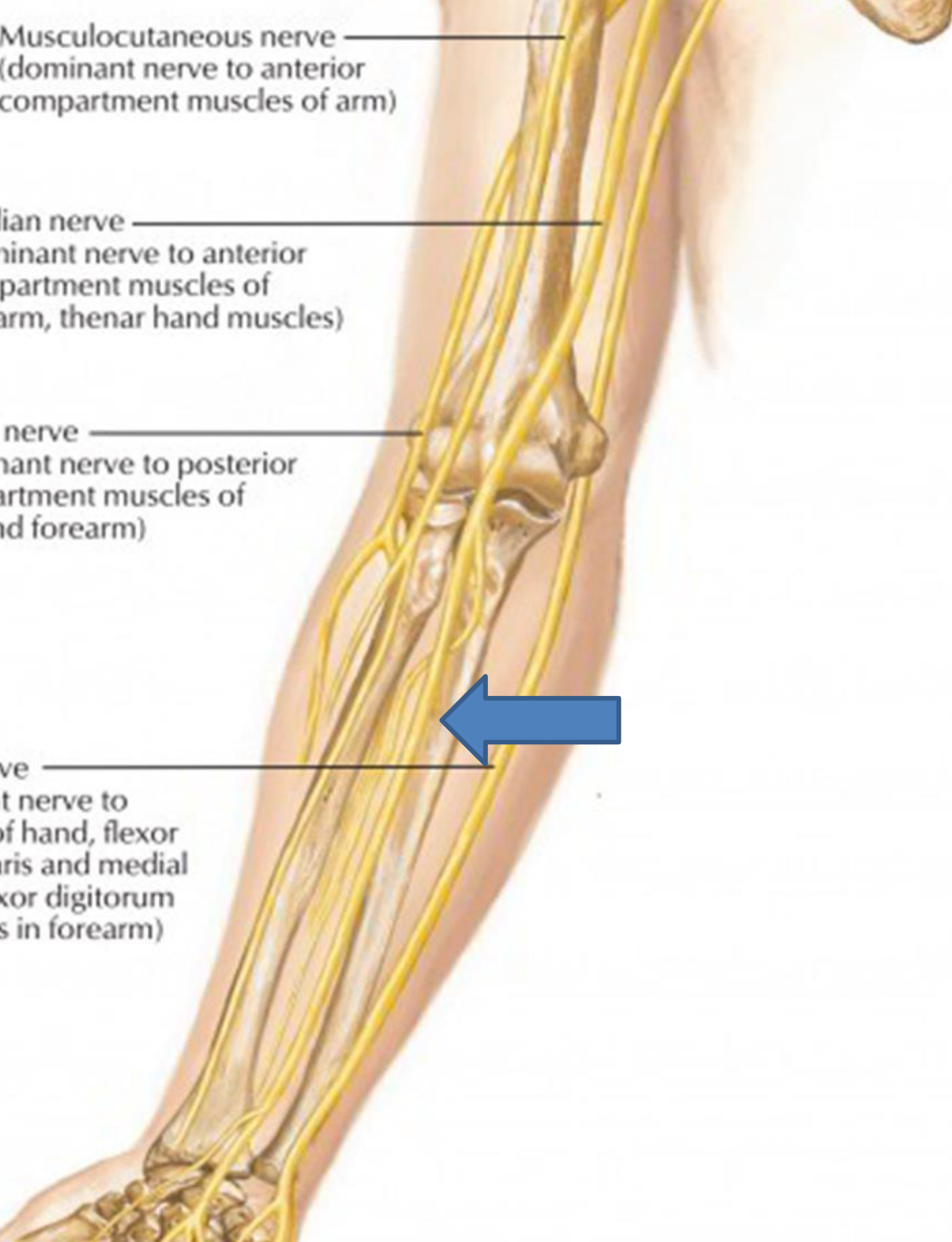
- The median nerve leaves the cubital fossa by passing between the two heads of the pronator teres.
- It continues downward behind the flexor digitorum superficialis and rests posteriorly on the flexor digitorum profundus.
- At the wrist, the median nerve emerges from the lateral border of the flexor digitorum superficialis muscle and lies behind the tendon of the palmaris longus.
- It enters the palm by passing behind the flexor retinaculum

Branches

- **Muscular branches** to the pronator teres, the flexor carpi radialis, the palmaris longus, and the flexor digitorum superficialis.
- **Articular branches** to the elbow joint
- **Anterior interosseous nerve**
- **Palmar cutaneous branch**; this arises in the lower part of the forearm and is distributed to the skin over the lateral part of the palm





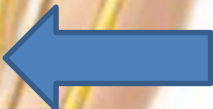


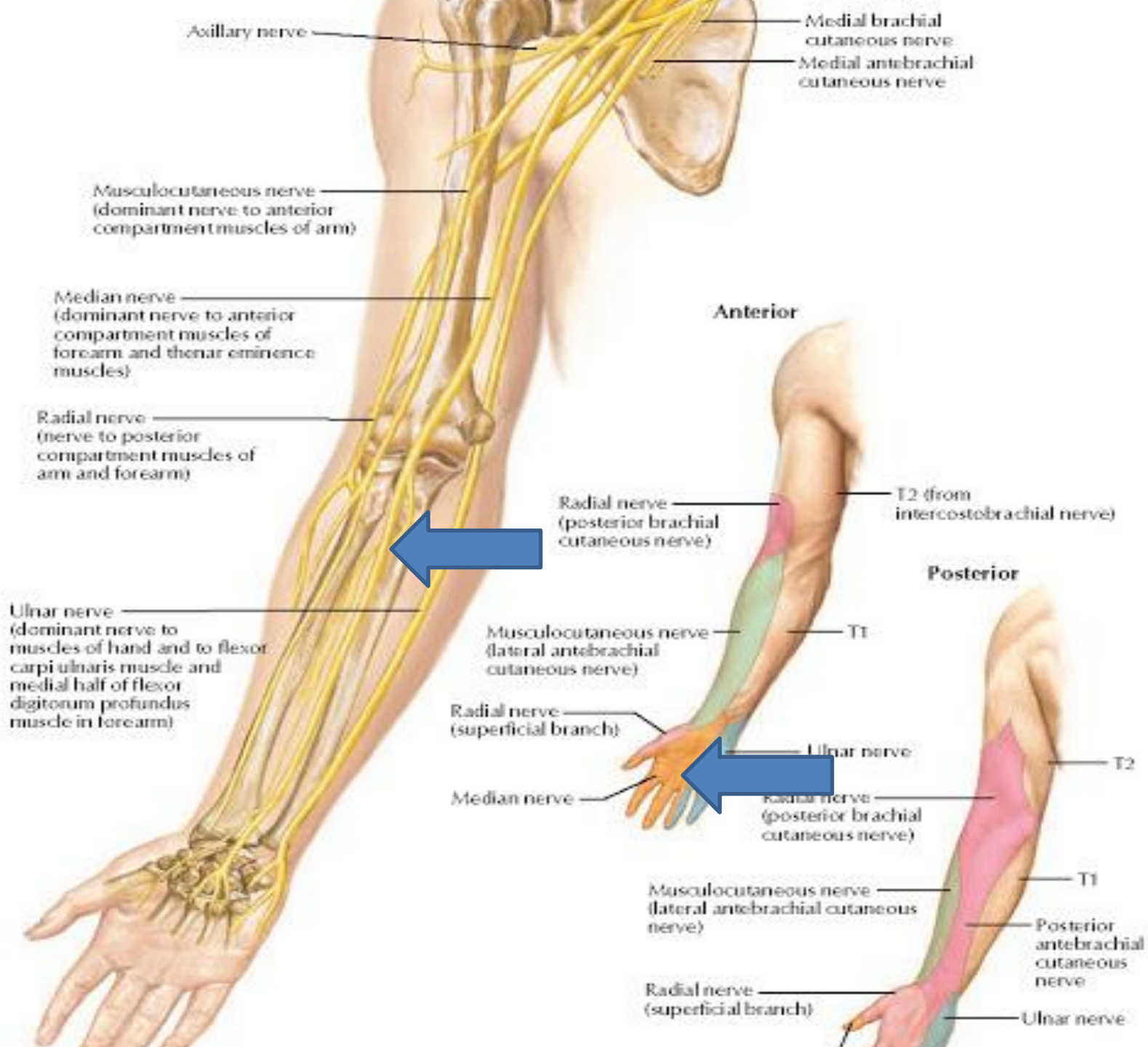
Musculocutaneous nerve
(dominant nerve to anterior
compartment muscles of arm)

Median nerve
(dominant nerve to anterior
compartment muscles of
arm, thenar hand muscles)

Ulnar nerve
(dominant nerve to posterior
compartment muscles of
hand and forearm)

Radial nerve
(dominant nerve to
extensor compartment
of hand, flexor
carpi and medial
extensor digitorum
muscles in forearm)





Anterior Interosseous Nerve

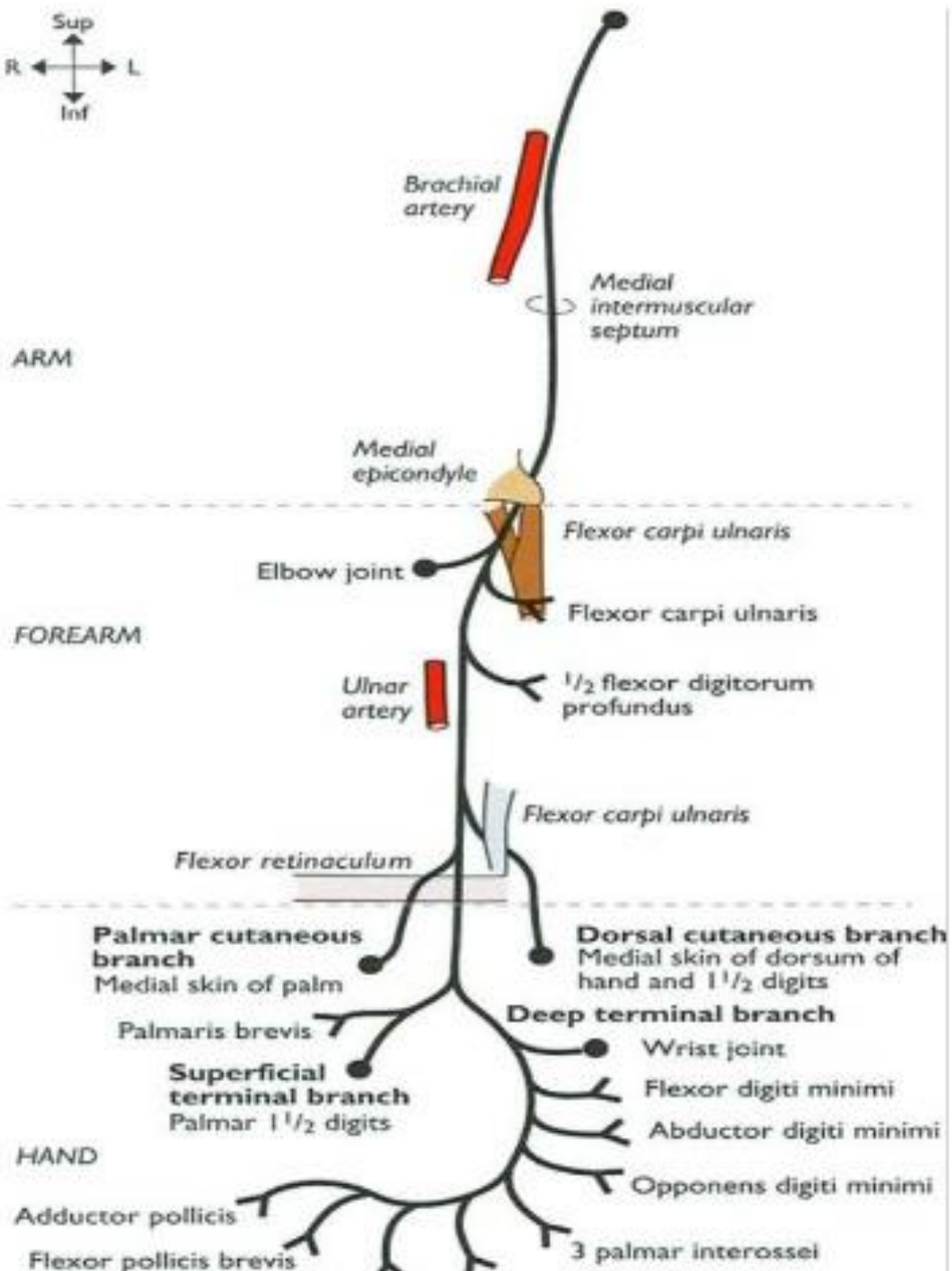
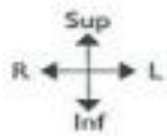
- The anterior interosseous nerve arises from the median nerve.
- It passes downward on the anterior surface of the interosseous membrane, between the flexor pollicis longus and the flexor digitorum profundus.
- It ends on the anterior surface of the carpus.
- **Branches**
- **Muscular branches** to the flexor pollicis longus, the pronator quadratus, and the lateral half of the flexor digitorum profundus
- **Articular branches** to the wrist and distal radioulnar joints. It also supplies the joints of the hand.

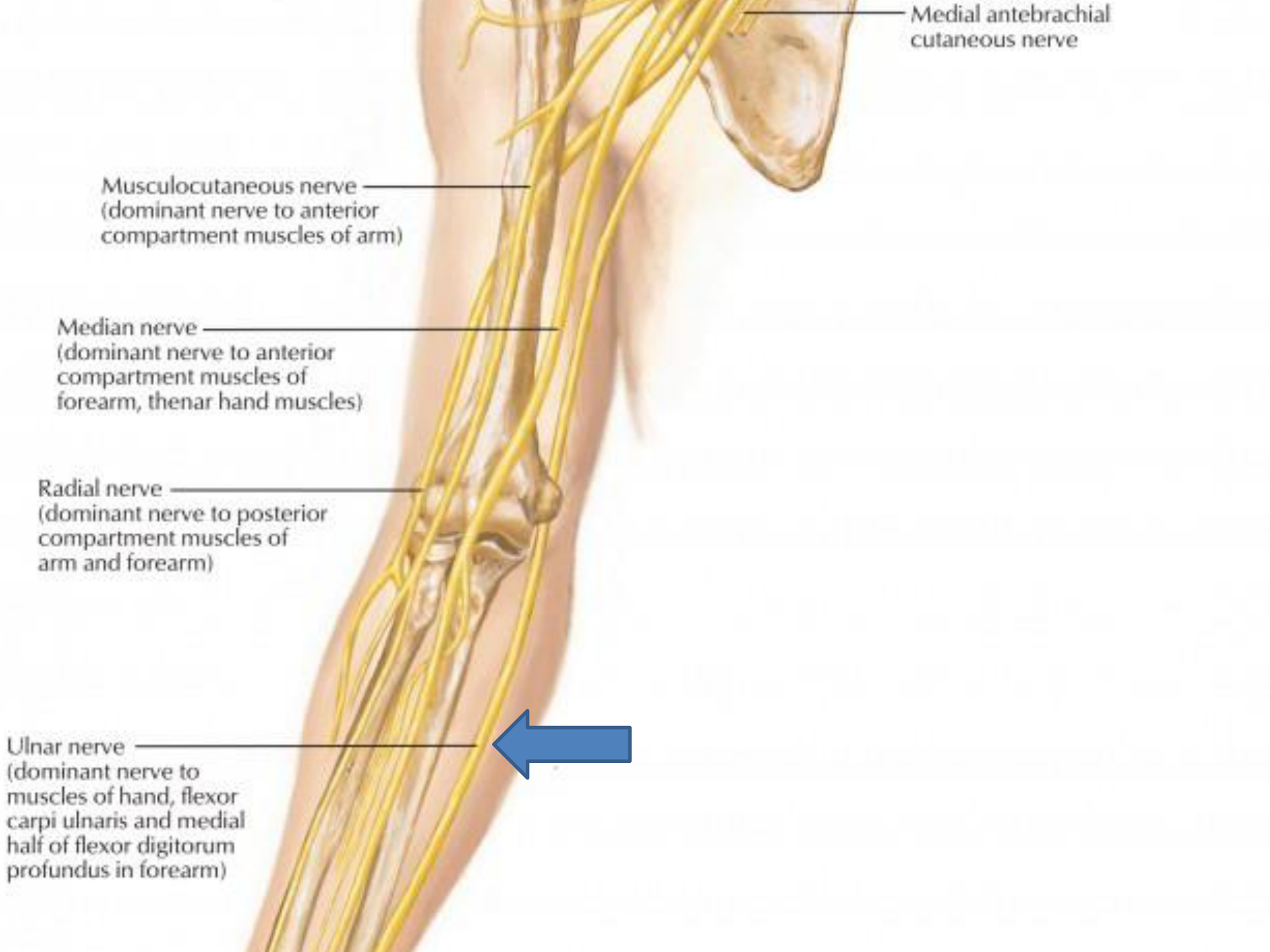
Ulnar Nerve

- The ulnar nerve passes behind the medial epicondyle of the humerus and enters the front of the forearm by passing between the two heads of the flexor carpi ulnaris.
- It then runs down the forearm between the flexor carpi ulnaris and the flexor digitorum profundus muscles.
- In the distal two thirds of the forearm, the ulnar artery lies on the lateral side of the ulnar nerve.
- At the wrist, the ulnar nerve becomes superficial and lies between the tendons of the flexor carpi ulnaris and flexor digitorum superficialis muscles.
- The ulnar nerve enters the palm of the hand by passing in front of the flexor retinaculum and lateral to the pisiform bone.

Branches

- **Muscular branches** to the flexor carpi ulnaris and to the medial half of the flexor digitorum profundus.
- **Articular branches** to the elbow joint
- **The palmar cutaneous branch** is a small branch supplies the skin over the hypothenar eminence.
- **The dorsal cutaneous branch** is a large branch passes medially between the tendon of the flexor carpi ulnaris and the ulna and is distributed on the posterior surface of the hand and fingers.





Medial antebrachial cutaneous nerve

Musculocutaneous nerve
(dominant nerve to anterior compartment muscles of arm)

Median nerve
(dominant nerve to anterior compartment muscles of forearm, thenar hand muscles)

Radial nerve
(dominant nerve to posterior compartment muscles of arm and forearm)

Ulnar nerve
(dominant nerve to muscles of hand, flexor carpi ulnaris and medial half of flexor digitorum profundus in forearm)



Thank You

