

POSTERIOR COMPARTMENT OF FOREARM

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Muscles of posterior compartment of forearm

Superficial Layer : from lateral to medial

- (1) Brachioradialis,**
- (2) Extensor carpi radialis longus,**
- (3) Extensor carpi radialis brevis,**
- (4) Extensor digitorum,**
- (5) Extensor digiti minimi,**
- (6) Extensor carpi ulnaris**
- (7) Anconeus.**

Deep Layer: from lateral to medial

- (1) Supinator,**
- (2) Abductor pollicis longus,**
- (3) Extensor pollicis brevis,**
- (4) Extensor pollicis longus**
- (5) Extensor indicis.**



-  **Brachioradialis**
-  **Extensor carpi radialis longus and brevis**
-  **Extensor digitorum**
-  **Extensor digit minimi**
-  **Extensor carpi ulnaris**
-  **Anconeus**

Deep layer of muscles in the posterior compartment of the forearm



Supinator



Abductor pollicis longus



Extensor pollicis longus
and brevis



Extensor indicis

Brachioradialis

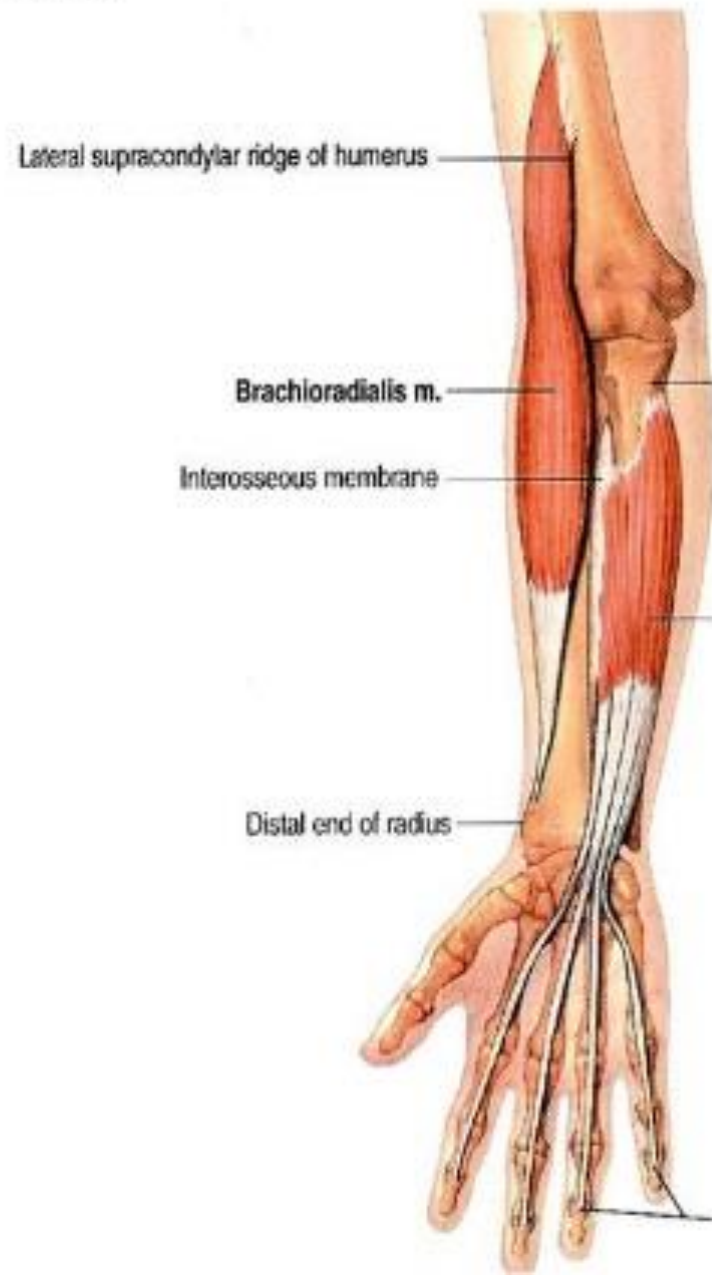
Origin: from the upper 2/3rd of the lateral supracondylar ridge of the humerus.

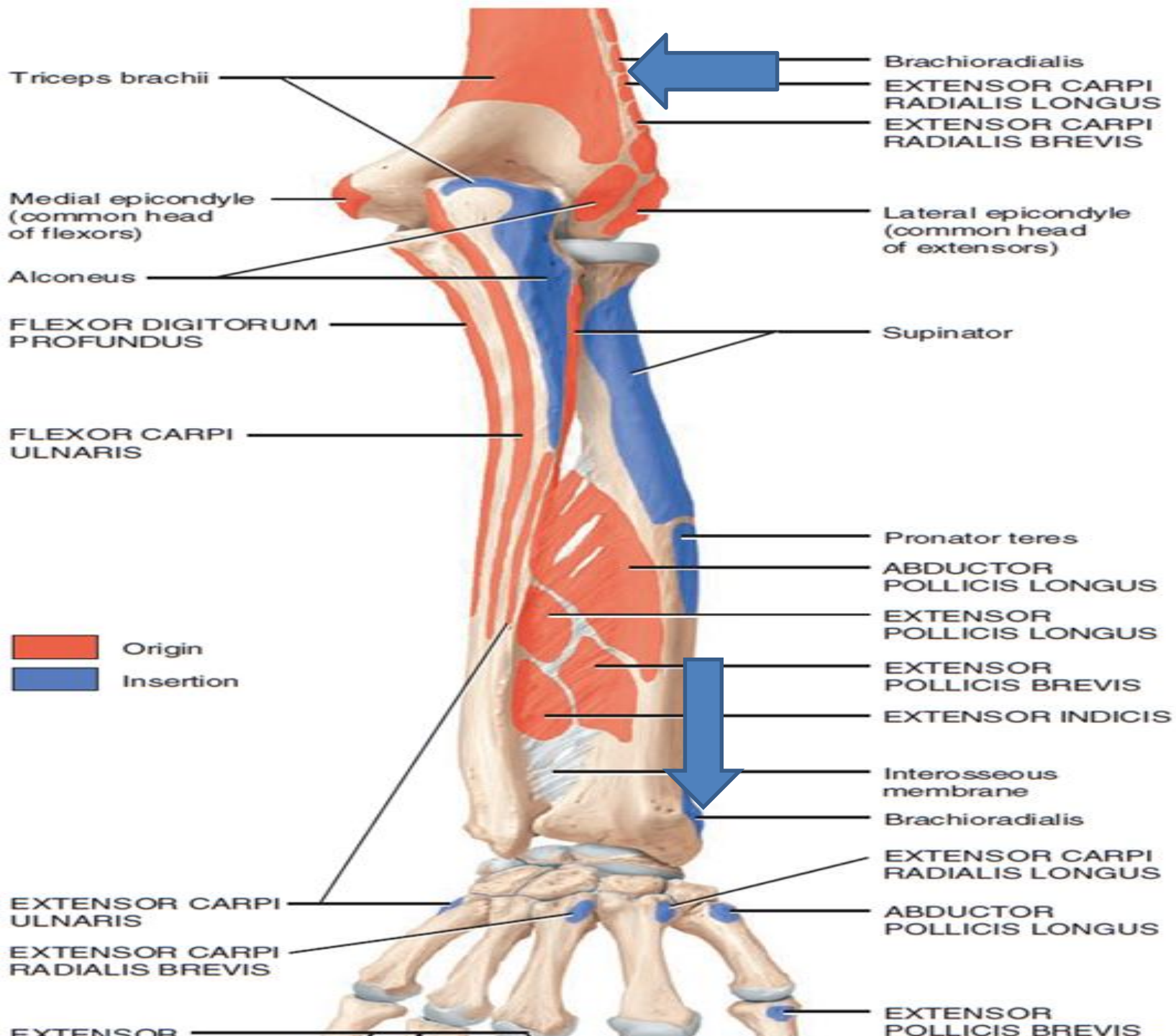
Insertion: Into the base of the styloid process of the radius.

Nerve Supply: From the radial nerve.

Action: Flexion of the forearm (specially in midprone position).

Restoration of the forearm into the midprone position.

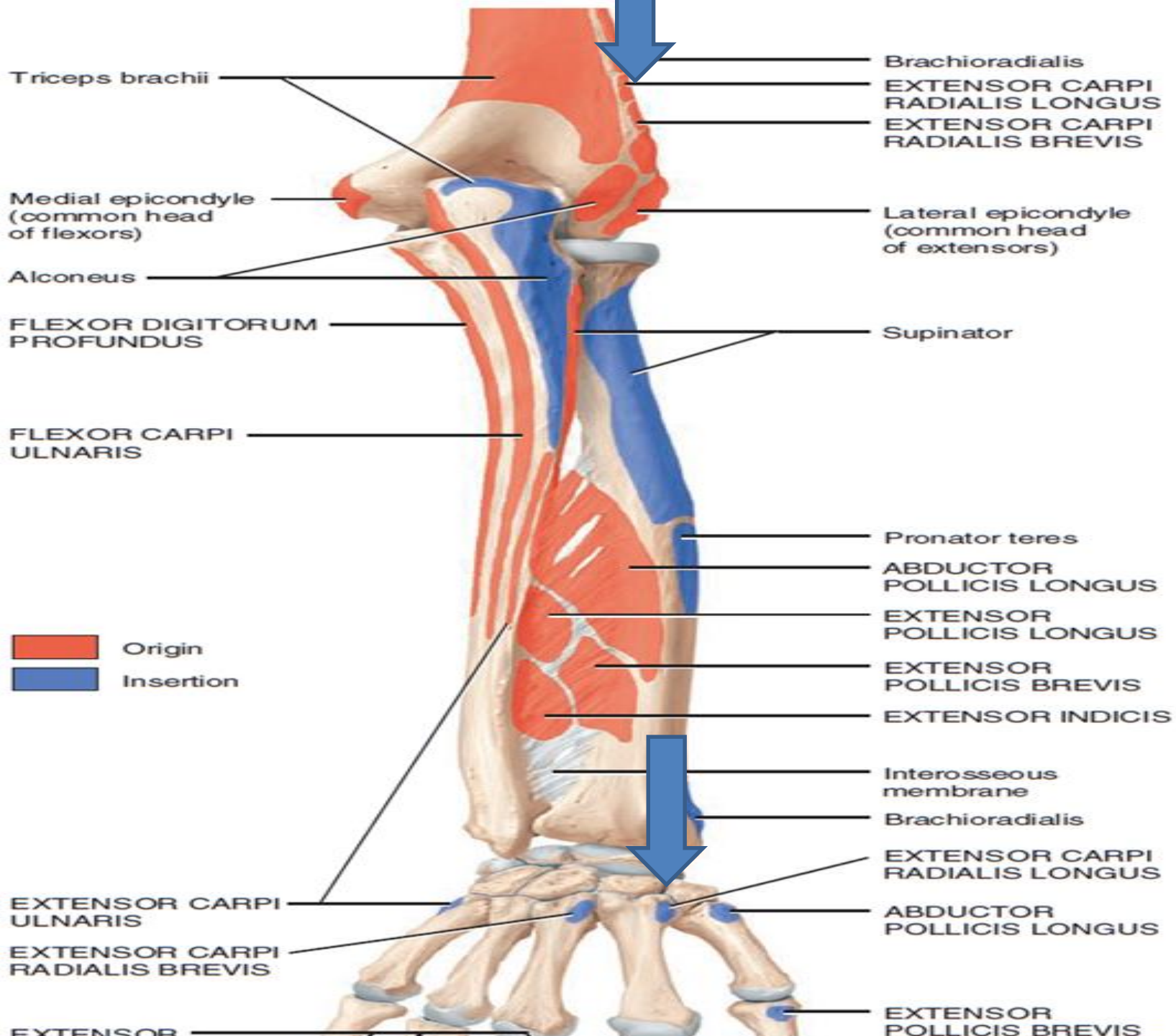




Extensor carpi radialis longus

- **Origin:** From the lower 1/3rd of the lateral supracondylar ridge of the humerus.
- **Insertion:** Into the posterior surface of the base of the 2nd metacarpal bone.
- **Nerve Supply:** From the radial nerve.
- **Action:**
Extension of the hand at wrist joint.
Abduction of the hand at wrist joint.

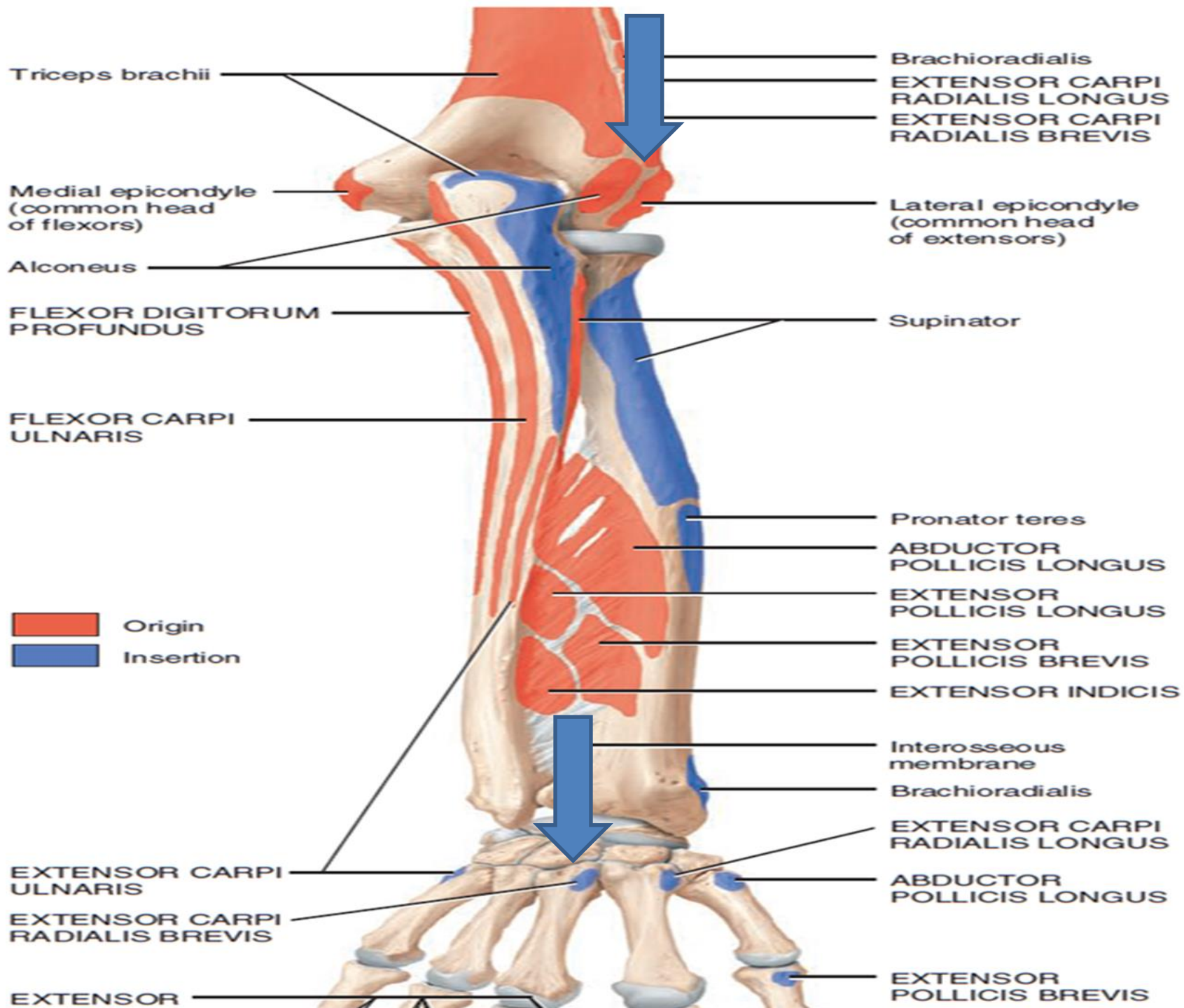




Extensor carpi radialis brevis

- **Origin:** from the lateral epicondyle of the humerus (common extensor origin).
- **Insertion:** Into the posterior surface of the base of the 3rd metacarpal bone.
- **Nerve Supply:** From the deep branch of radial nerve (posterior interosseous nerve).
- **Action:**
 - Extension of the hand at wrist joint.
 - Abduction of the hand at wrist joint.





Triceps brachii

Medial epicondyle
(common head
of flexors)

Alconeus

FLEXOR DIGITORUM
PROFUNDUS

FLEXOR CARPI
ULNARIS

Origin
Insertion

EXTENSOR CARPI
ULNARIS

EXTENSOR CARPI
RADIALIS BREVIS

EXTENSOR

Brachioradialis
EXTENSOR CARPI
RADIALIS LONGUS
EXTENSOR CARPI
RADIALIS BREVIS

Lateral epicondyle
(common head
of extensors)

Supinator

Pronator teres
ABDUCTOR
POLLICIS LONGUS
EXTENSOR
POLLICIS LONGUS
EXTENSOR
POLLICIS BREVIS
EXTENSOR INDICIS

Interosseous
membrane
Brachioradialis

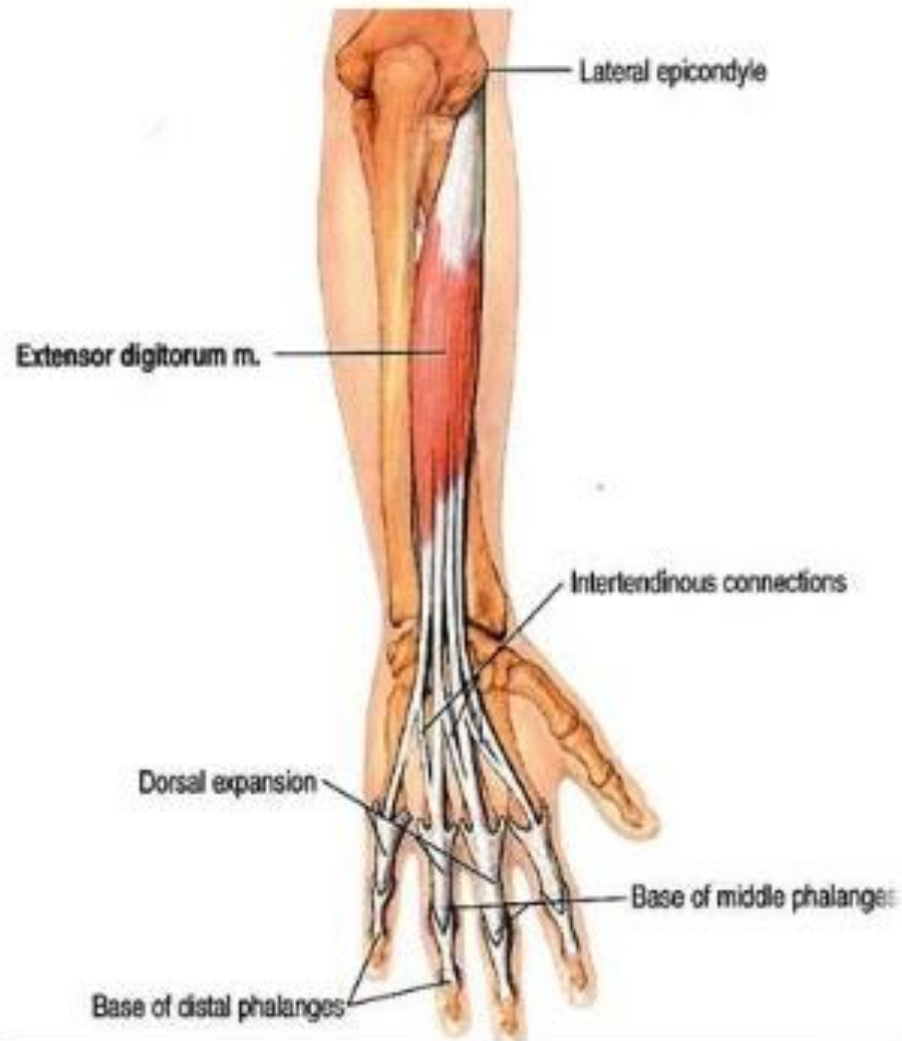
EXTENSOR CARPI
RADIALIS LONGUS

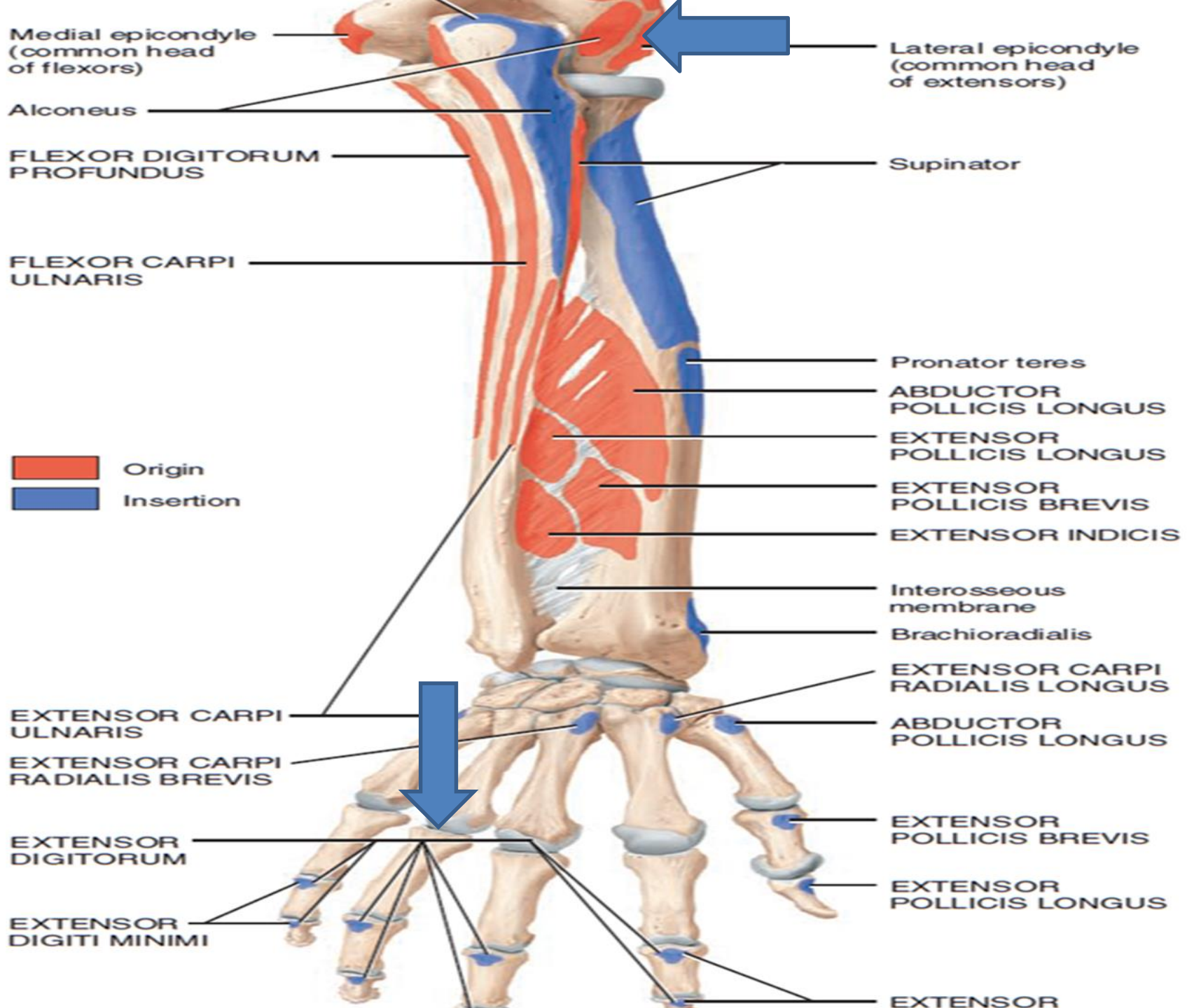
ABDUCTOR
POLLICIS LONGUS

EXTENSOR
POLLICIS BREVIS

Extensor digitorum

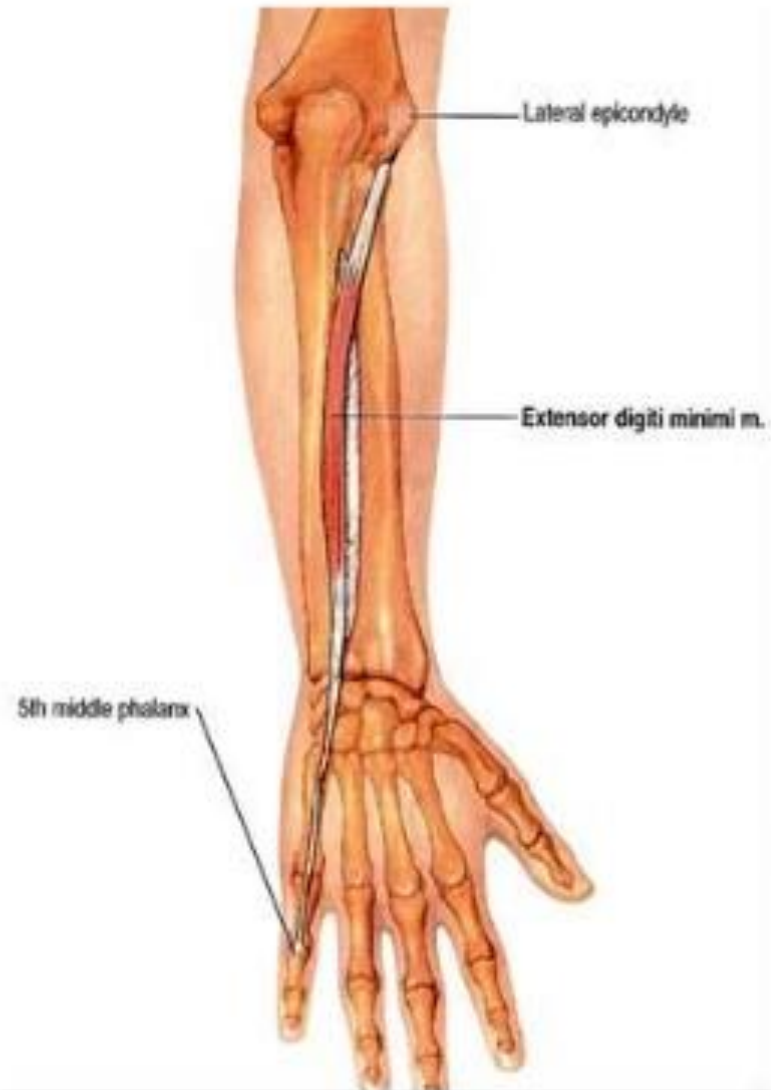
- **Origin:** From the lateral epicondyle of the humerus (common extensor origin).
- **Insertion:** Into the extensor expansion of the medial 4 fingers.
- **Nerve Supply:** From the deep branch of radial nerve.
- **Action:** Extension of metacarpophalangeal and interphalangeal joints of the medial 4 fingers.
- Extension of the hand at wrist joint.

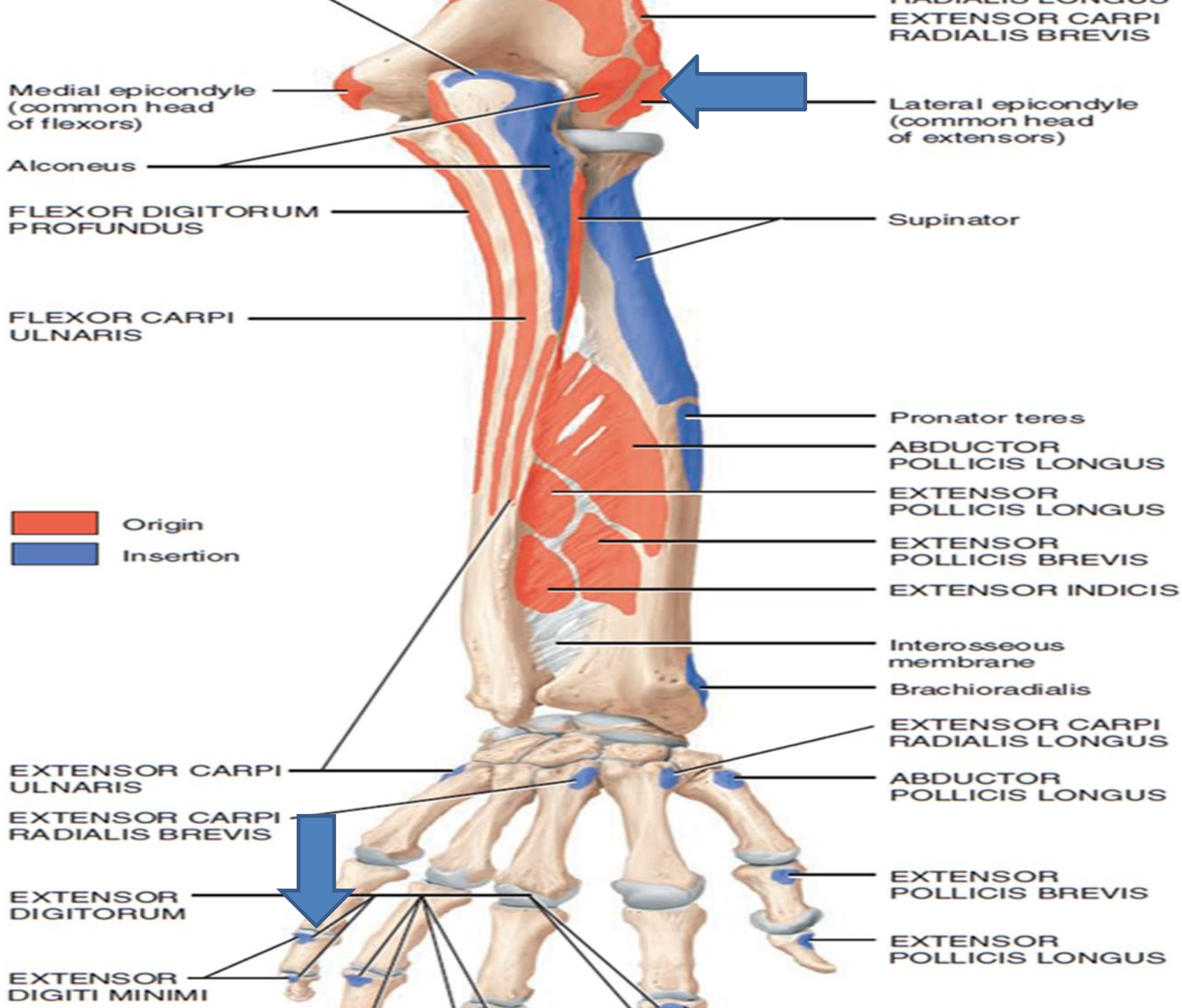




Extensor digiti minimi

- **Origin:** from the lateral epicondyle of the humerus (common extensor origin).
- **Insertion:** Into the extensor expansion of the little finger.
- **Nerve Supply:** From the deep branch of radial nerve (posterior interosseous nerve).
- **Action:** Extension of metacarpophalangeal and interphalangeal joints of the little finger.
- Helps in extension of the hand at wrist joint.

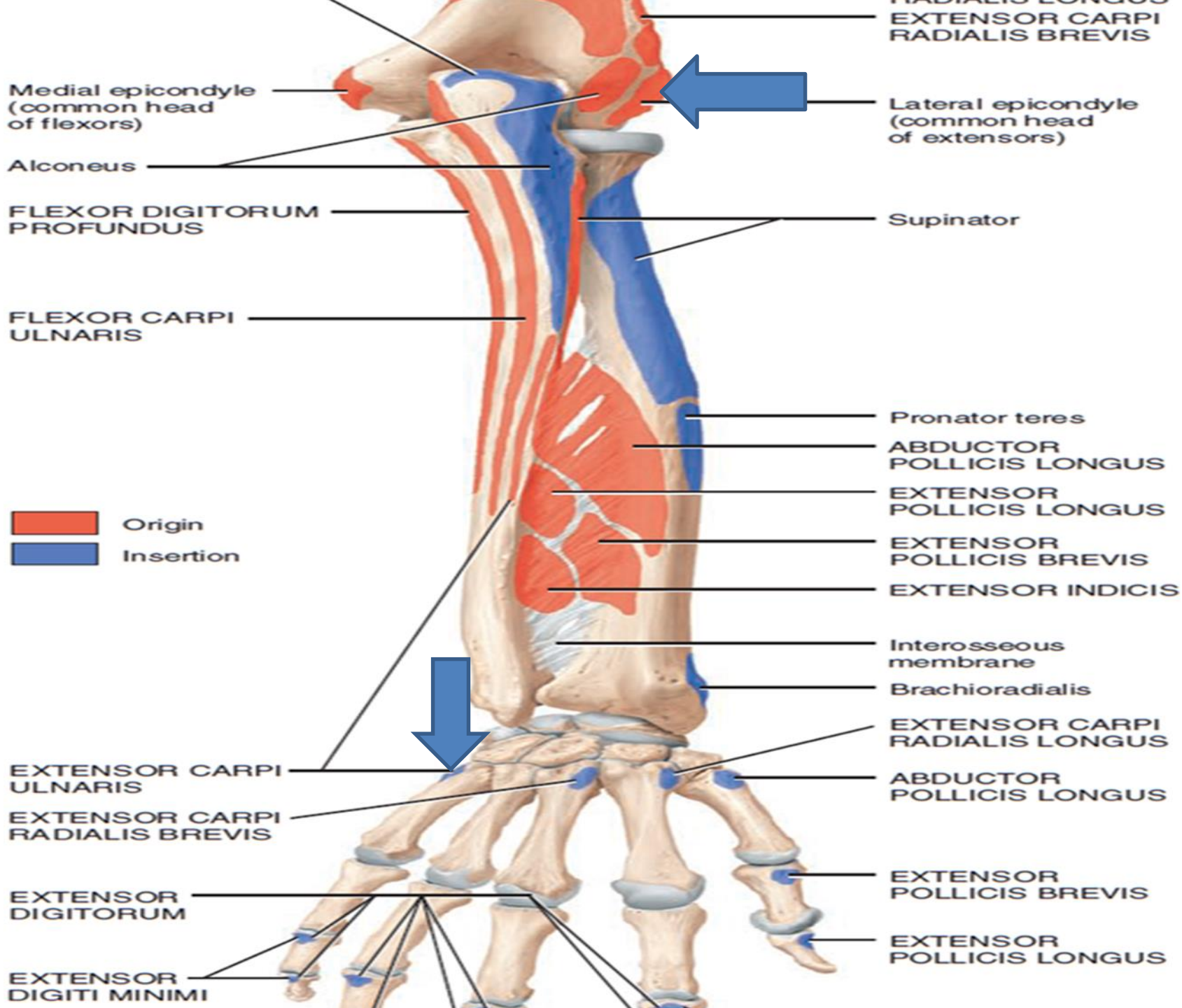




Extensor carpi ulnaris

- **Origin:** From the lateral epicondyle of the humerus (common extensor origin).
- **Insertion:** Into the posterior surface of the base of the 5th metacarpal bone.
- **Nerve Supply:** From the deep branch of radial nerve.
- **Action:** Extension of the hand at wrist joint.
- Adduction of the hand at wrist joint.

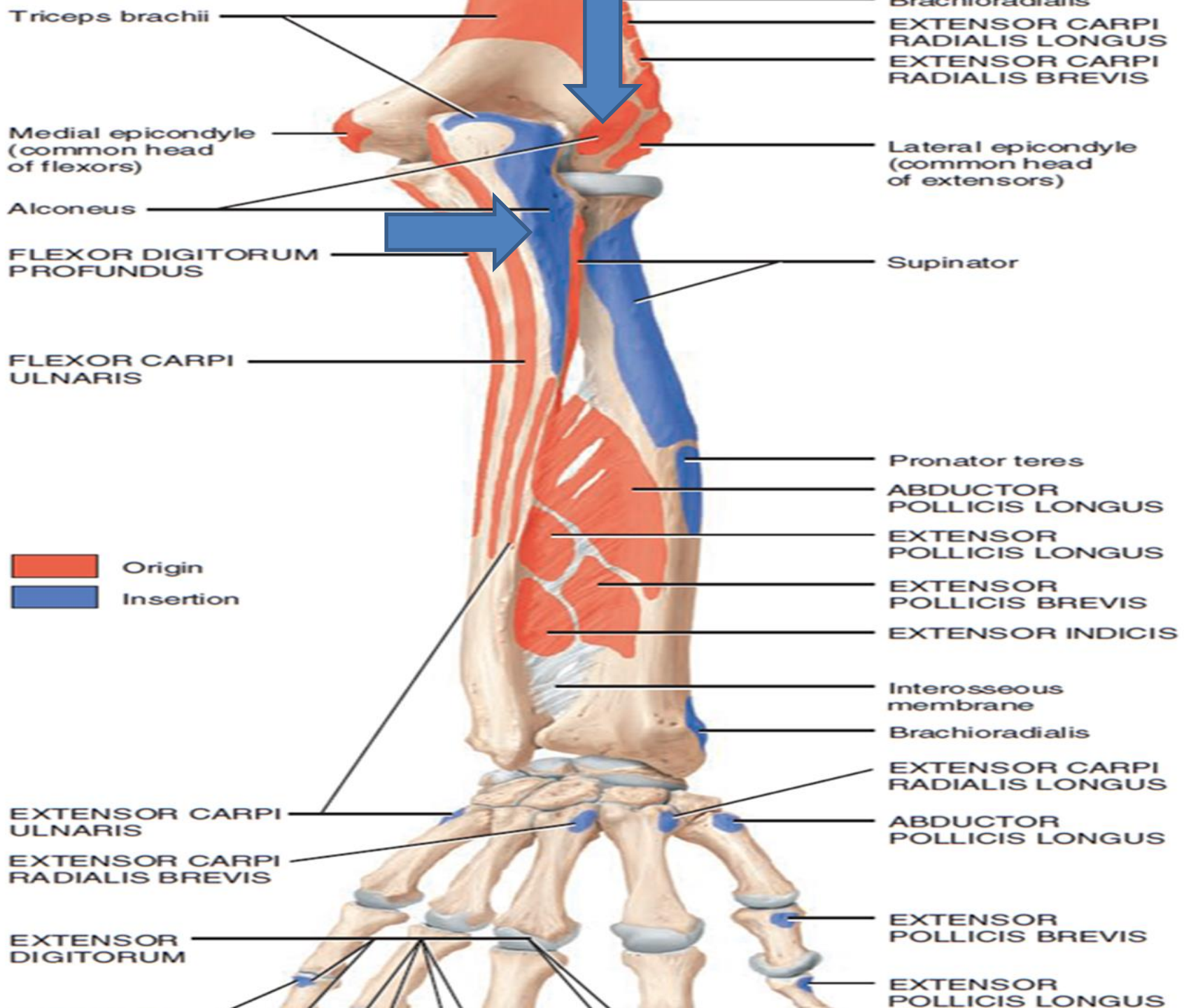




Anconeus

- **Origin:** From the posterior aspect of the lateral epicondyle of the humerus.
- **Insertion:** Into the lateral surface of the olecranon process of the ulna.
- **Nerve Supply:** From the radial nerve.
- **Action:** It helps the triceps in extension of the elbow joint.





Triceps brachii

Medial epicondyle
(common head
of flexors)

Alconeus

FLEXOR DIGITORUM
PROFUNDUS

FLEXOR CARPI
ULNARIS

Origin
Insertion

EXTENSOR CARPI
ULNARIS

EXTENSOR CARPI
RADIALIS BREVIS

EXTENSOR
DIGITORUM

Brachioradialis
EXTENSOR CARPI
RADIALIS LONGUS
EXTENSOR CARPI
RADIALIS BREVIS

Lateral epicondyle
(common head
of extensors)

Supinator

Pronator teres

ABDUCTOR
POLLICIS LONGUS

EXTENSOR
POLLICIS LONGUS

EXTENSOR
POLLICIS BREVIS

EXTENSOR INDICIS

Interosseous
membrane

Brachioradialis

EXTENSOR CARPI
RADIALIS LONGUS

ABDUCTOR
POLLICIS LONGUS

EXTENSOR
POLLICIS BREVIS

EXTENSOR
POLLICIS LONGUS

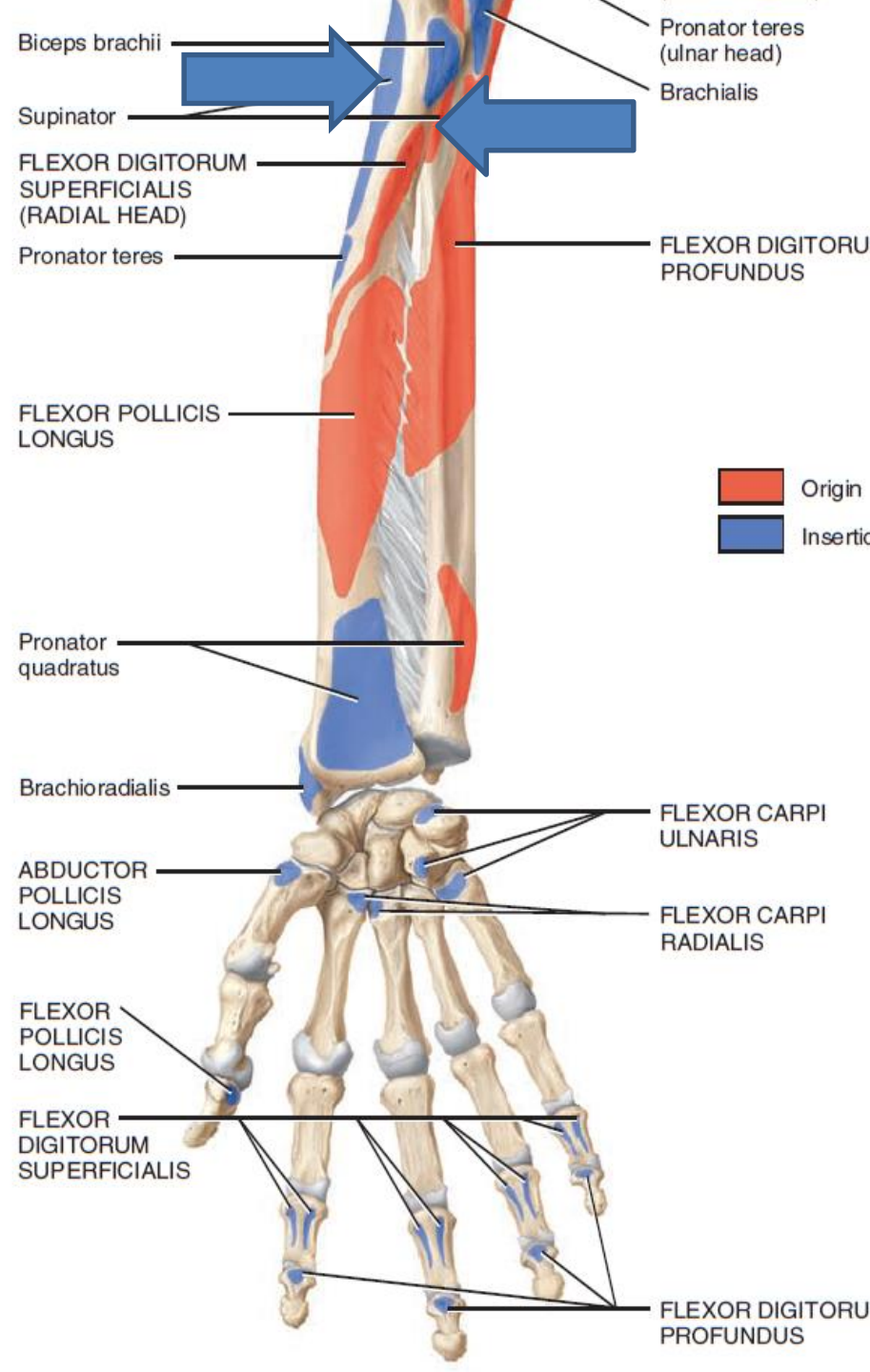
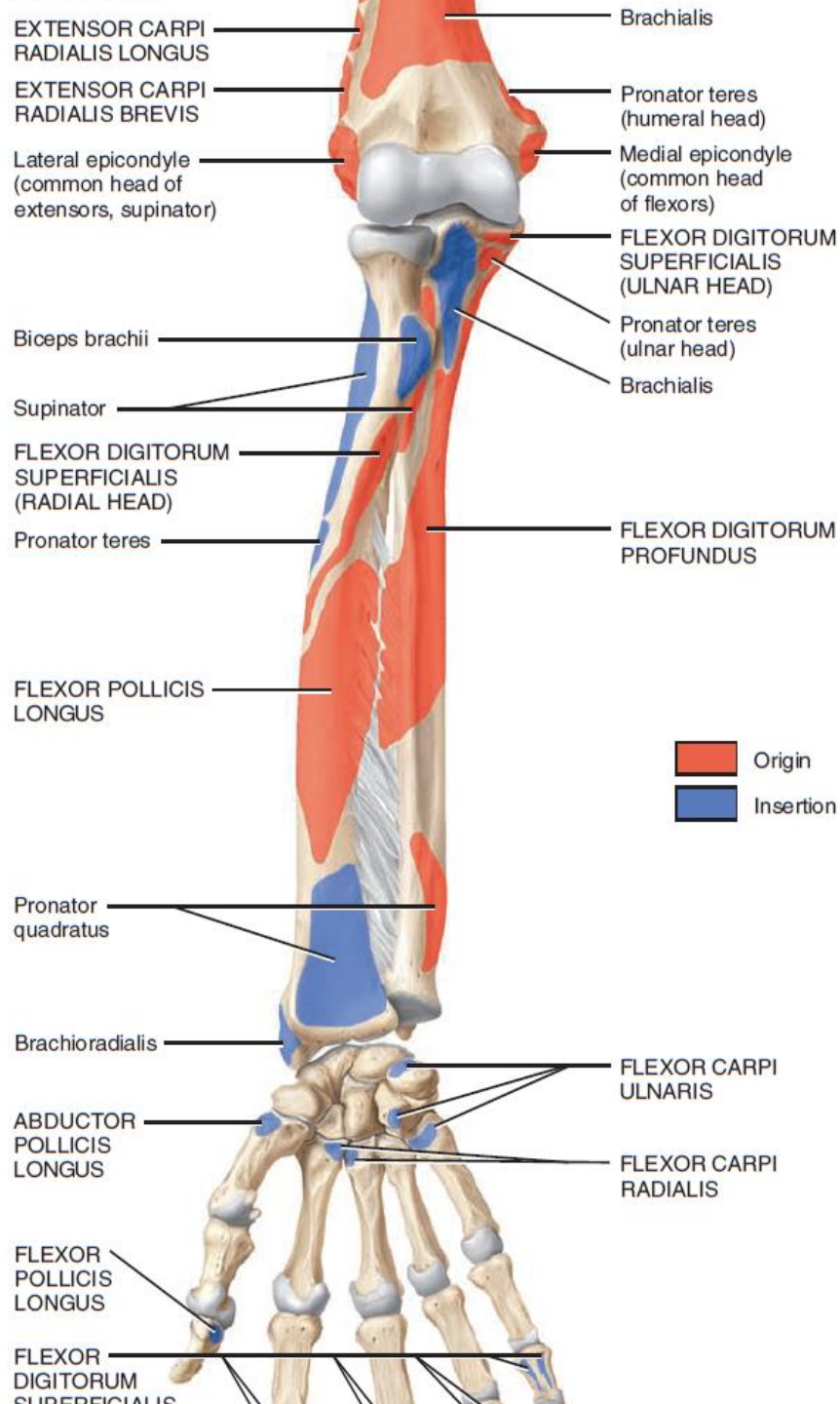
Deep Layer:

- (1) Supinator.**
- (2) Abductor pollicis longus.**
- (3) Extensor pollicis brevis.**
- (4) Extensor pollicis longus.**
- (5) Extensor indicis.**

Supinator

- **Origin:**
 - (1) The lateral epicondyle of the humerus,
 - (2) Annular ligament of the superior radio-ulnar joint
 - (3) Supinator fossa and crest of the ulna.
- **Insertion:** Into the upper 1/3rd of the lateral surface of the shaft of the radius.
- **Nerve Supply:** From the deep branch of the radial nerve (posterior interosseous nerve).
- **Action:** supination of the forearm at the radio-ulnar joints.





Abductor pollicis longus

- **Origin:** From the middle of the posterior surface of radius and ulna and the interosseus membrane.
- **Insertion:** Into the posterior surface of the base of the 1st metacarpal bone.
- **Nerve Supply:** posterior interosseous nerve of the radial nerve.
- **Action:** Abduction and extension of the thumb at the carpo-metacarpal joint.



PROFUNDUS

Supinator

FLEXOR CARPI
ULNARIS

Pronator teres

ABDUCTOR
POLLICIS LONGUS

EXTENSOR
POLLICIS LONGUS

EXTENSOR
POLLICIS BREVIS

EXTENSOR INDICIS

Interosseous
membrane

Brachioradialis

EXTENSOR CARPI
RADIALIS LONGUS

ABDUCTOR
POLLICIS LONGUS

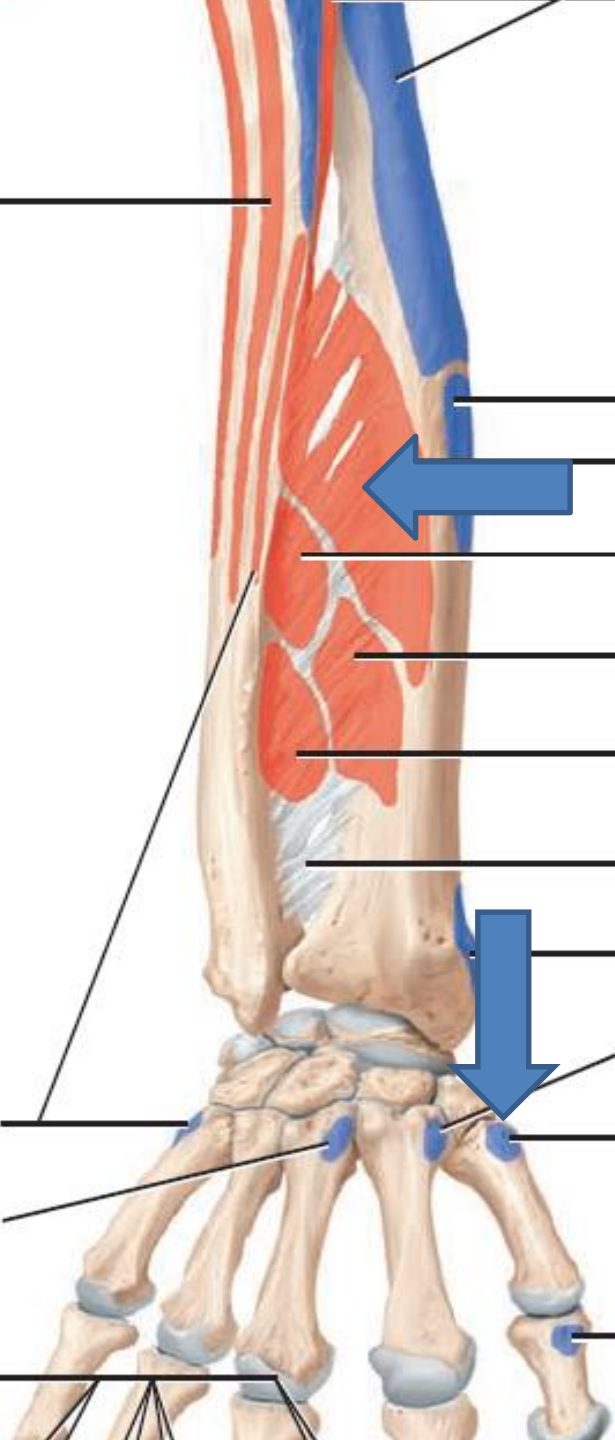
EXTENSOR
POLLICIS BREVIS

Origin
Insertion

EXTENSOR CARPI
ULNARIS

EXTENSOR CARPI
RADIALIS BREVIS

EXTENSOR
DIGITORUM

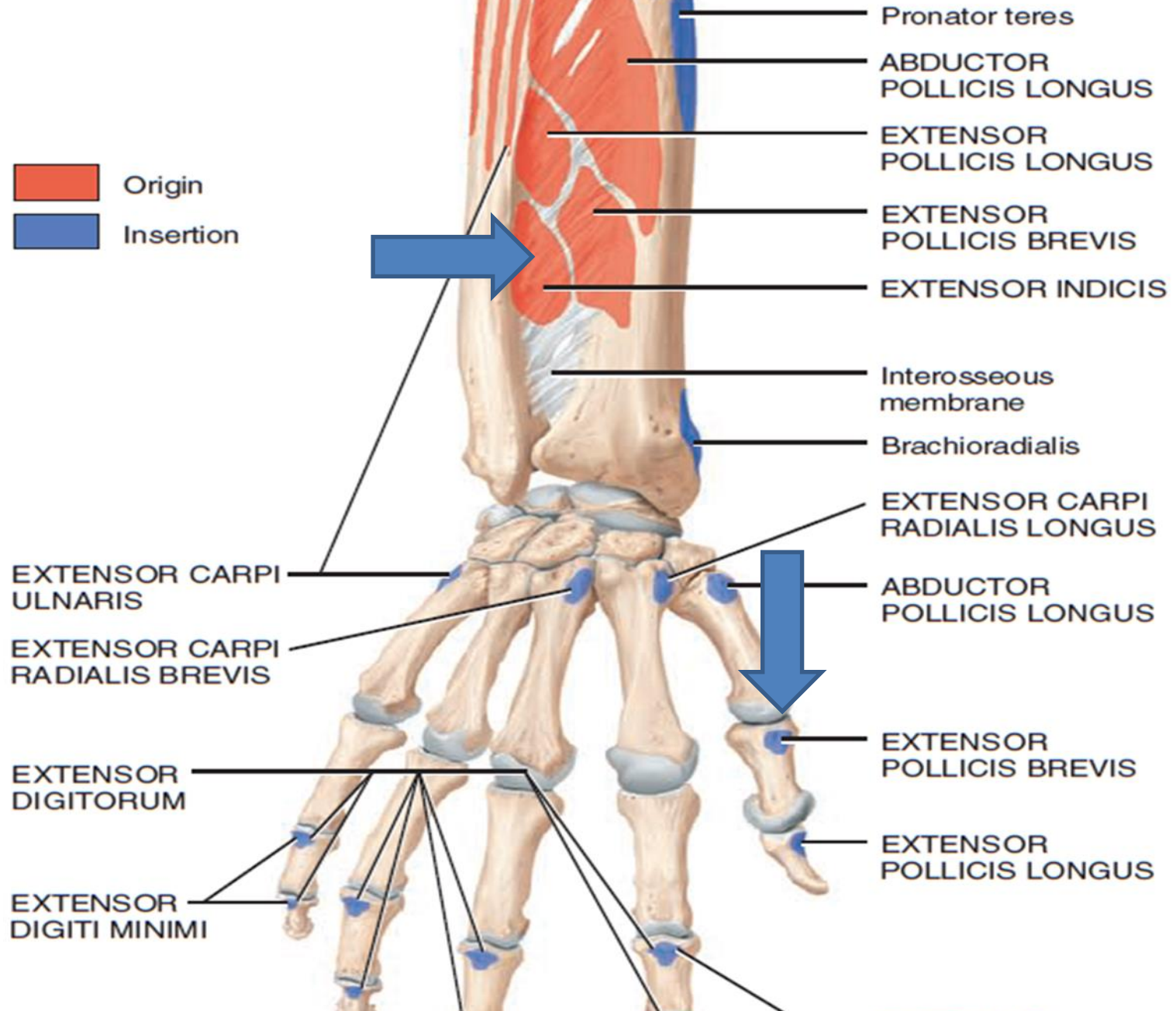


Extensor pollicis brevis

- **Origin:** From the posterior surface of the shaft of radius (below abductor pollicis longus)
- **Insertion:** Into the posterior surface of the base of the proximal phalanx of the thumb.
- **Nerve Supply:** posterior interosseous nerve of the radial nerve.
- **Action:**
 - Extension of the metacarpophalangeal joint of the thumb.



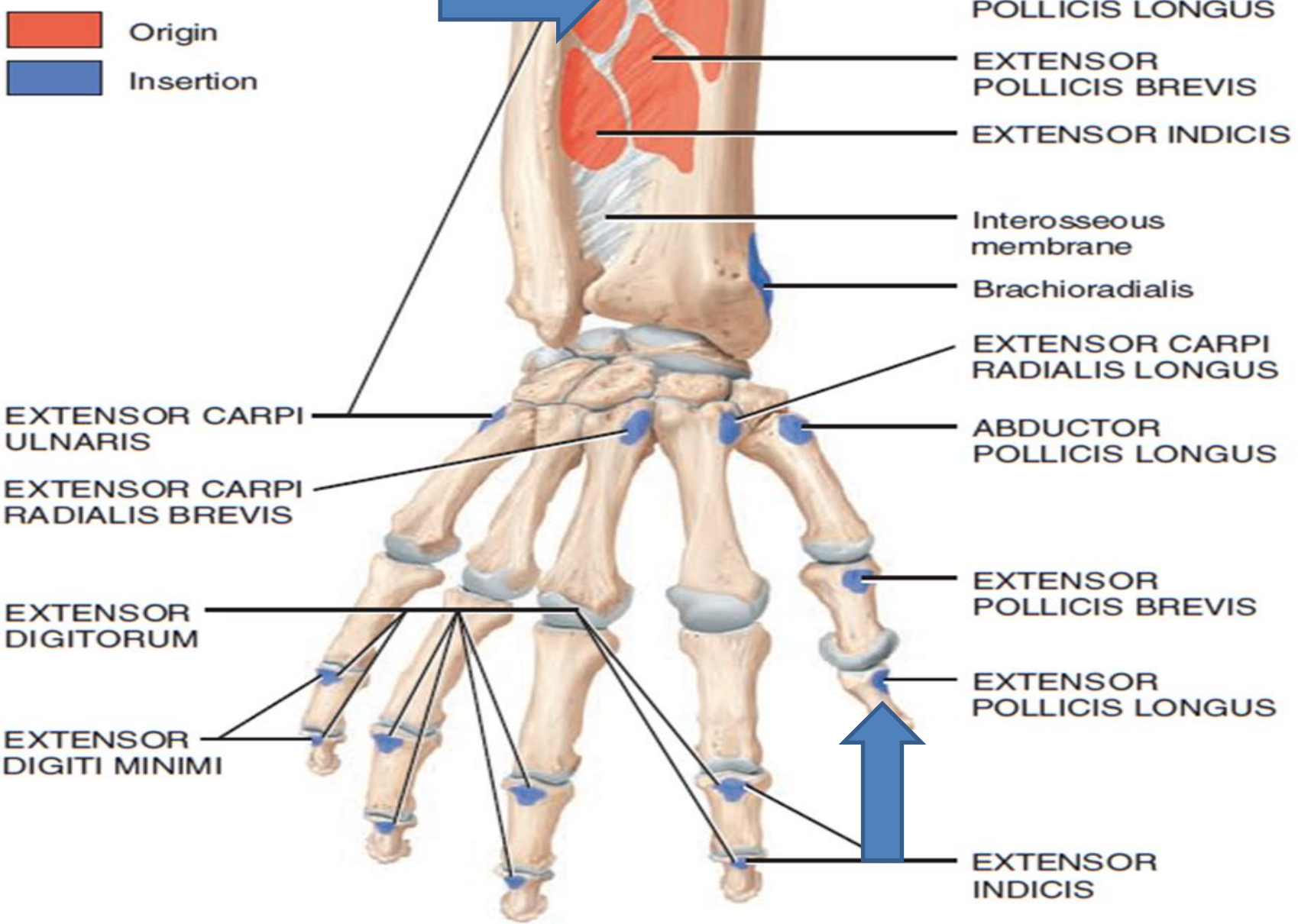
 Origin
 Insertion



Extensor pollicis longus

- **Origin:** From the posterior surface of ulna (below abductor pollicis longus)
- **Insertion:** Into the posterior surface of the base of the distal phalanx of the thumb.
- **Nerve supply:** posterior interosseous nerve of the radial nerve.
- **Action:** Extension of the interphalangeal joints of the thumb.

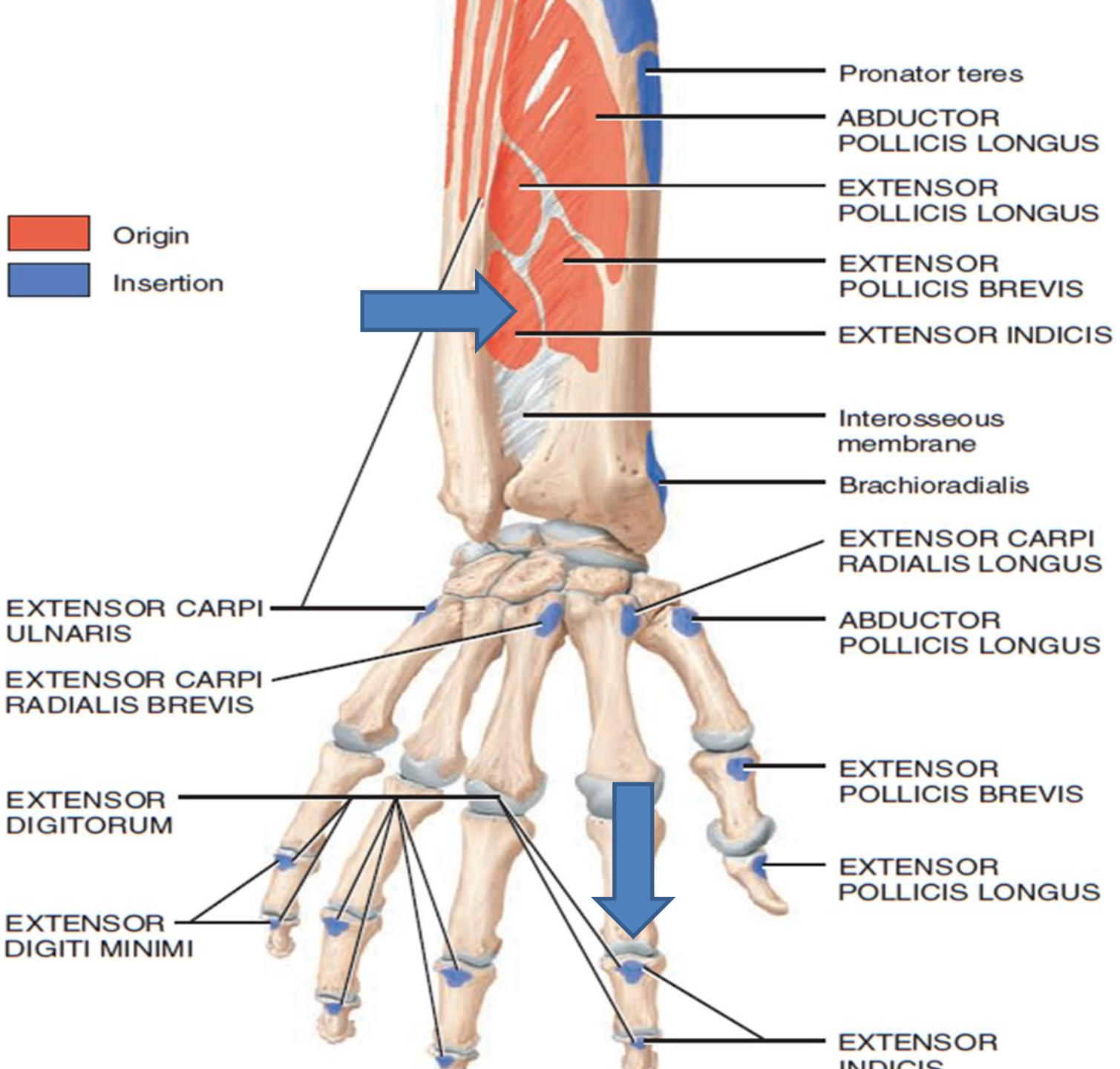




Extensor indicis

- **Origin:** From the posterior surface of ulna (below extensor pollicis longus)
- **Insertion:** Into the extensor expansion of the index finger.
- **Nerve supply:** posterior interosseous nerve of the radial nerve C6,7,8
- **Action:** Extension of all joints of the index finger.
- It helps in extension of the wrist joint.



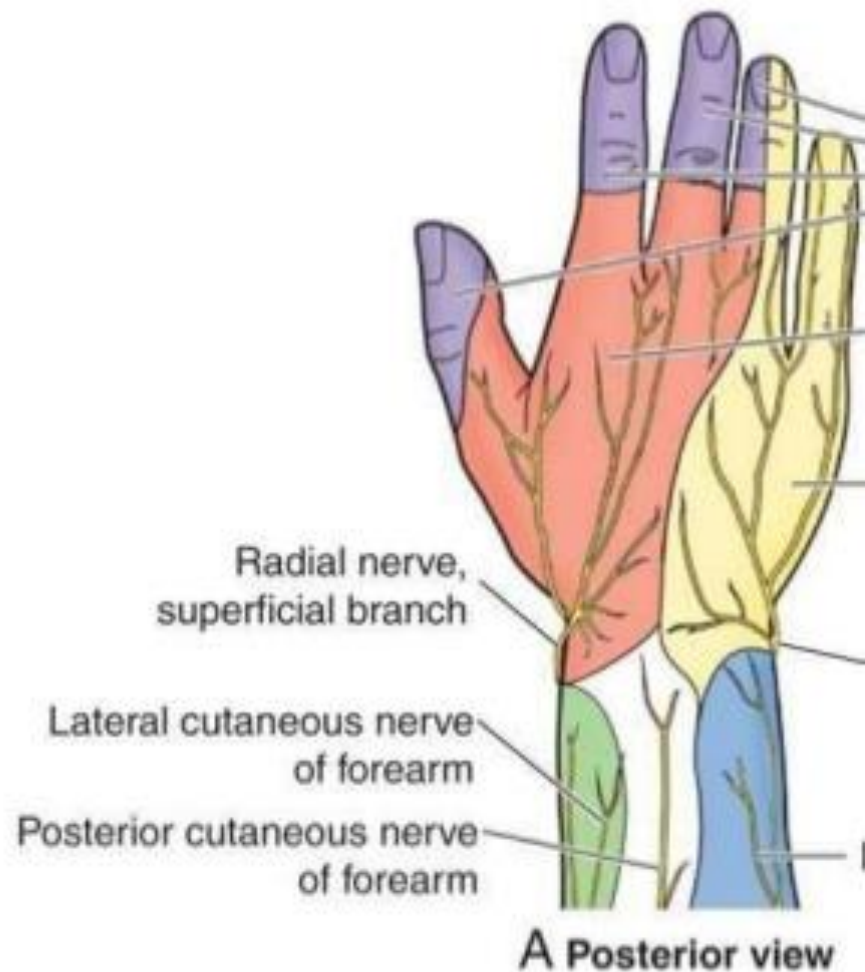


Radial Nerve

- The radial nerve pierces the lateral intermuscular septum in the lower part of the arm and passes forward into the cubital fossa.
- It then passes downward in front of the lateral epicondyle of the humerus, lying between the brachialis on the medial side and the brachioradialis on the lateral side.
- At the level of the lateral epicondyle, it divides into superficial and deep branches
- **Branches:**
- **Muscular branches** to the brachioradialis, to the extensor carpi radialis longus, and a small branch to the lateral part of the brachialis muscle
- **Articular branches** to the elbow joint
- **Superficial branch of the radial nerve**
- **Deep branch of the radial nerve (posterior interosseous nerve)** enters the posterior compartment of the forearm.

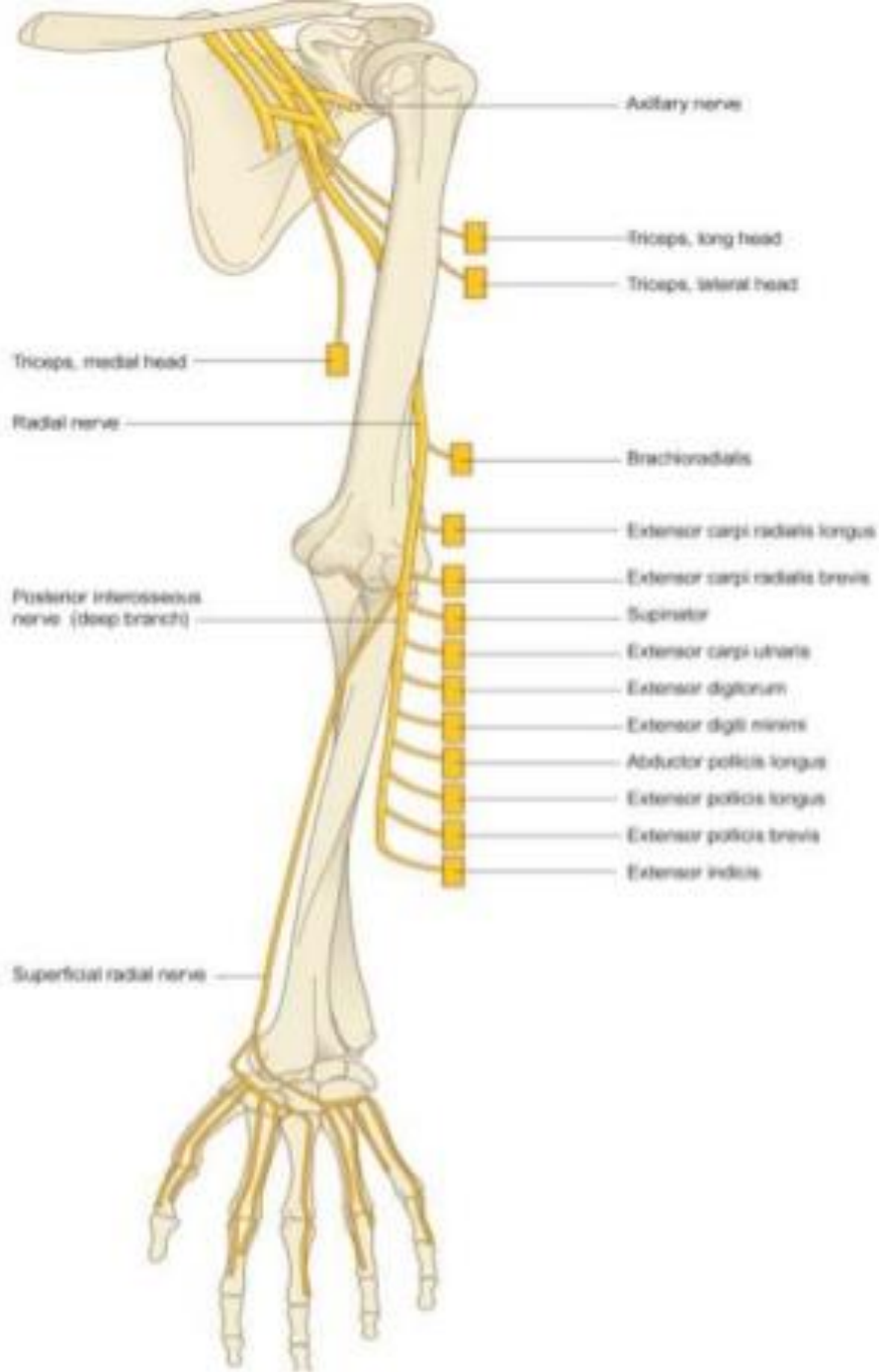
Superficial Branch of the Radial Nerve

- It is the direct continuation of the radial nerve.
- It runs down under cover of the brachioradialis muscle on the lateral side of the radial artery.
- 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 of the hand and the posterior surface over the proximal phalanges of the lateral three and a half fingers.



Deep Branch of the Radial Nerve (posterior interosseous nerve)

- The deep branch arises from the radial nerve in front of the lateral epicondyle of the humerus in the cubital fossa .
- It pierces the supinator to reach the posterior compartment of the forearm.
- The nerve descends in the interval between the superficial and deep groups of muscles.
- **Branches**
- **(1) Muscular branches** to:
 - the extensor carpi radialis brevis ,
 - the extensor digitorum,
 - the extensor digiti minimi,
 - the extensor carpi ulnaris,,
 - the supinator,
 - the abductor pollicis longus,
 - the extensor pollicis brevis
 - the extensor pollicis longus,
 - the extensor indicis
- **(2) Articular branches** to the wrist and carpal joints



Radial Nerve in Forearm Posterior View

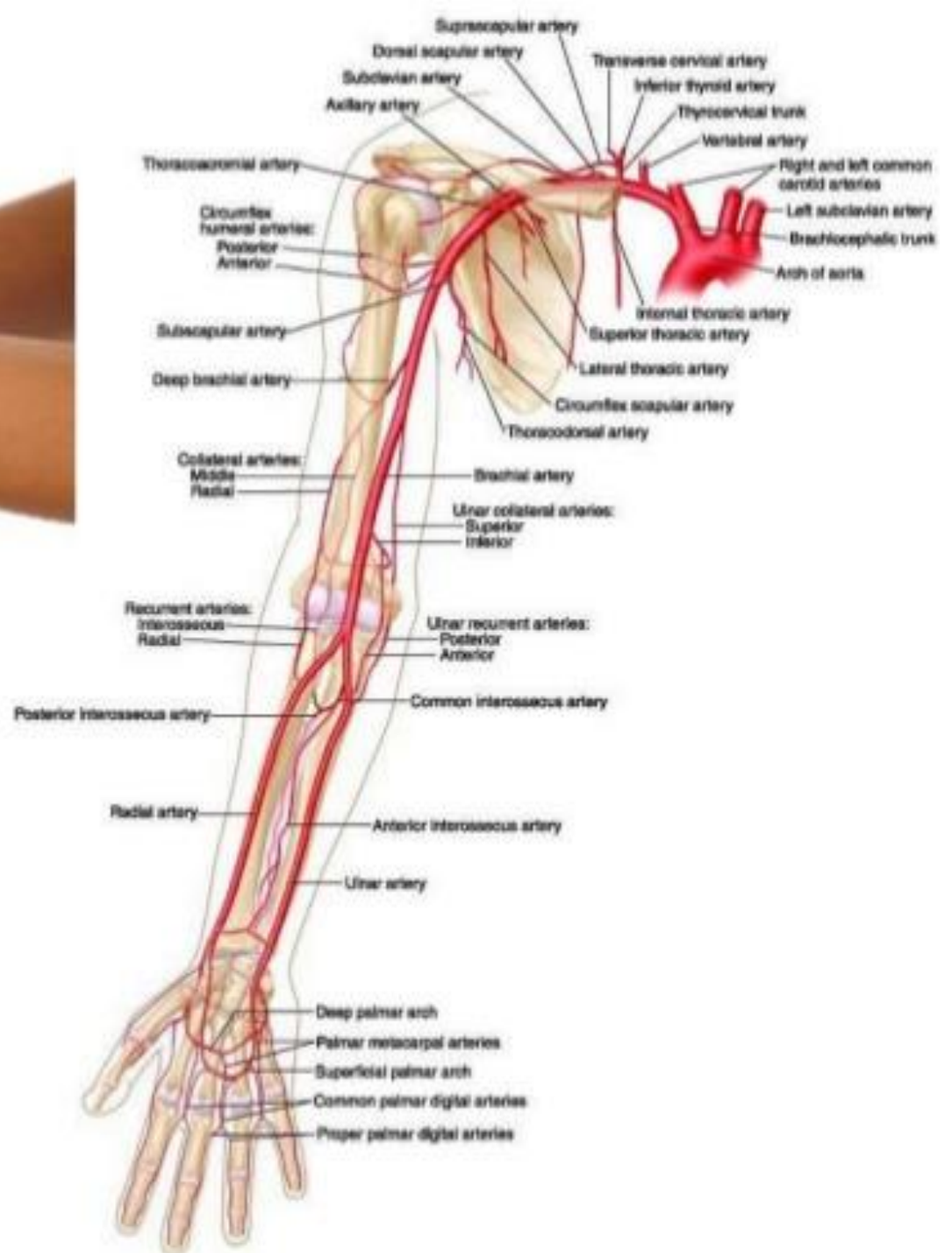


Radial Artery

- **Origin** The radial artery is the smaller of the terminal branches of the brachial artery.
- **Course** It begins in the cubital fossa at the level of the neck of the radius.
- It passes downward and laterally and resting on the deep muscles of the forearm.
- In the middle third of its course, the superficial branch of the radial nerve lies on its lateral side
- In the distal part of the forearm, the radial artery is covered only by skin and fascia. Here, the tendon of brachioradialis on its lateral side and the tendon of flexor carpi radialis on its medial side (site for taking the radial pulse).
- The radial artery leaves the forearm by winding around the lateral aspect of the wrist to reach the posterior surface of the hand

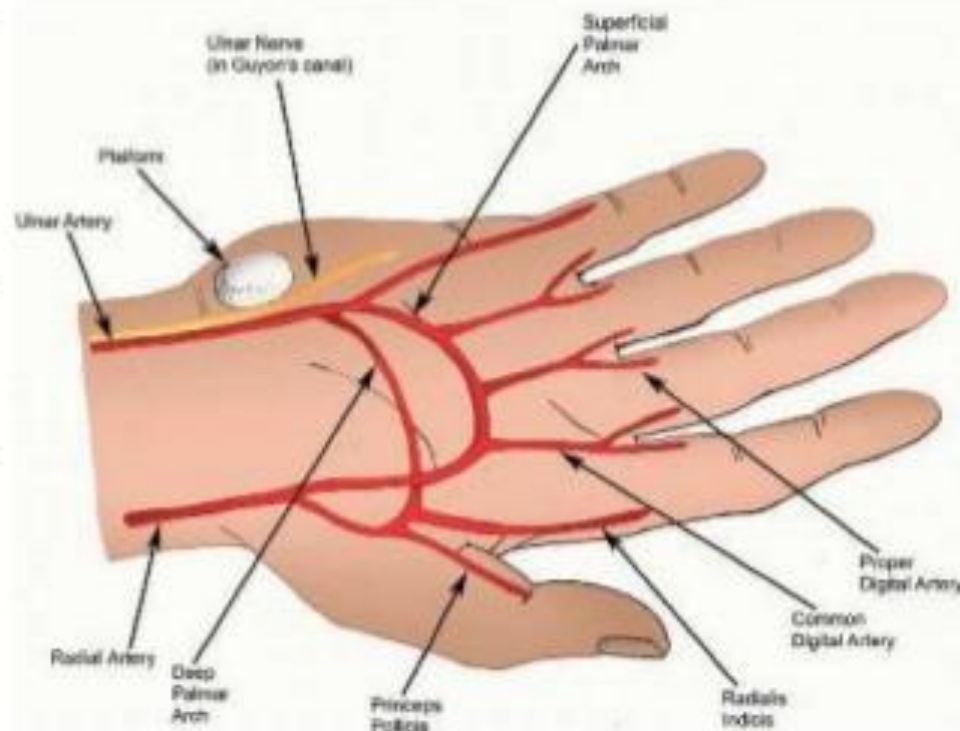
Branches in the Forearm

- **Muscular branches** to neighboring muscles
- **Radial recurrent artery**, which takes part in the arterial anastomosis around the elbow joint
- **Superficial palmar branch**, which arises just above the wrist, enters the palm of the hand, and frequently joins the ulnar artery to form the superficial palmar arch



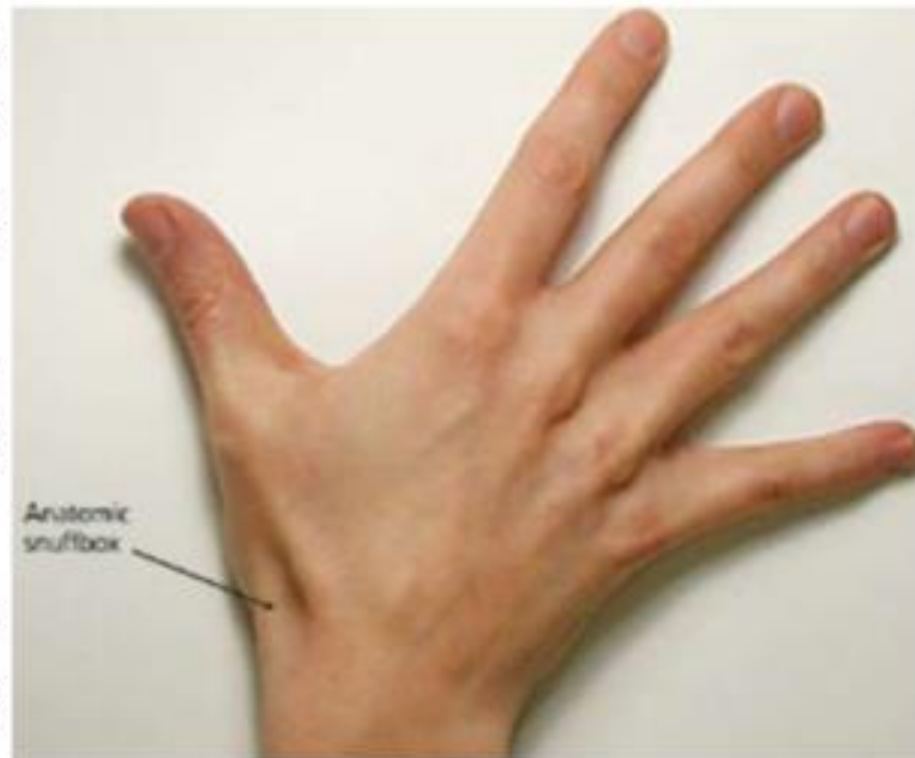
The Radial artery on the dorsum of the hand

- On reaching the dorsum of the hand, the artery descends beneath the tendon of the extensor pollicis longus and turns forward to enter the palm of the hand.
- Branches of the radial artery on the dorsum of the hand take part in the anastomosis around the wrist joint.
- Dorsal digital arteries pass to the thumb and index finger (**The arteria radialis indicis, The arteria princeps pollicis**)

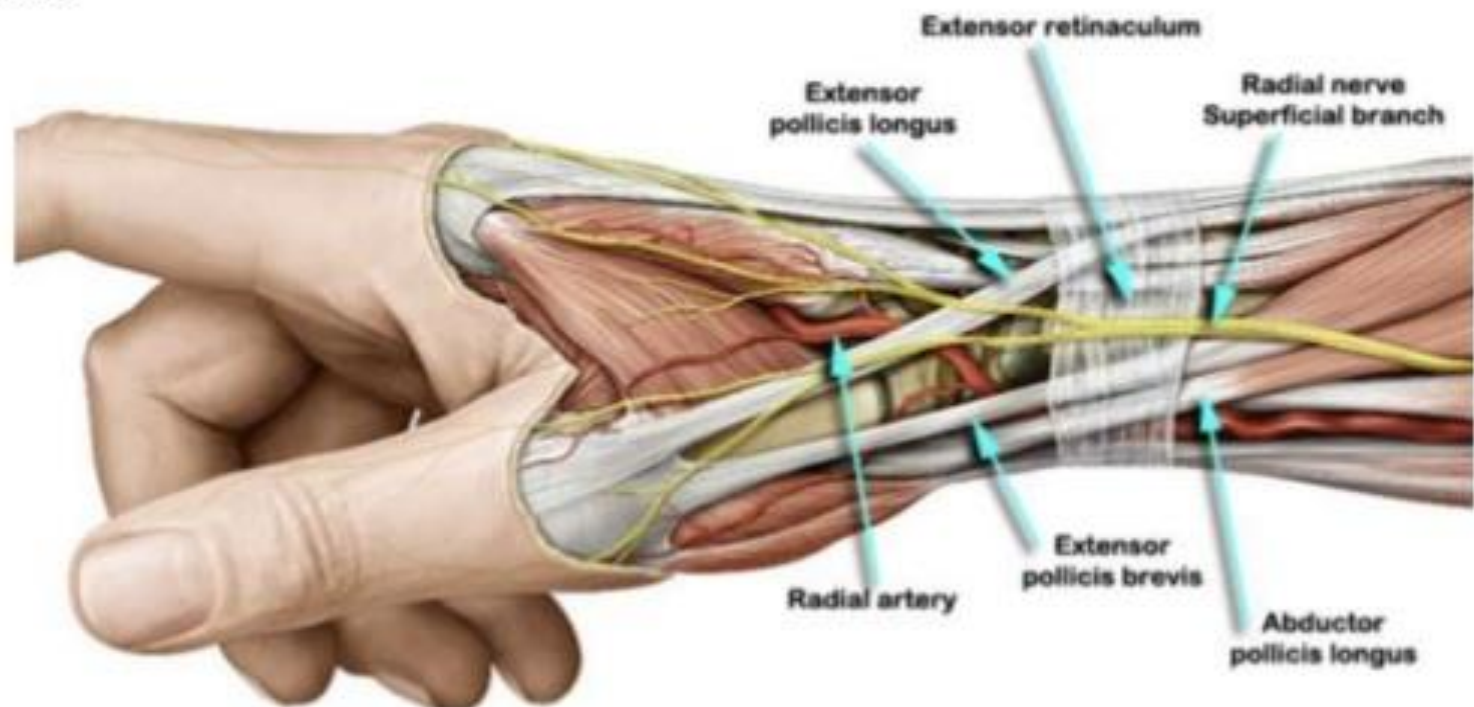


Anatomical snuffbox

- It is a triangular depression formed on the posterolateral side of the wrist by the extensor tendons passing into the thumb.
- Historically, ground tobacco (snuff) was placed in this depression before being inhaled into the nose.
- The base of the triangle is at the wrist and the apex is directed into the thumb. It is most apparent when the thumb is extended.

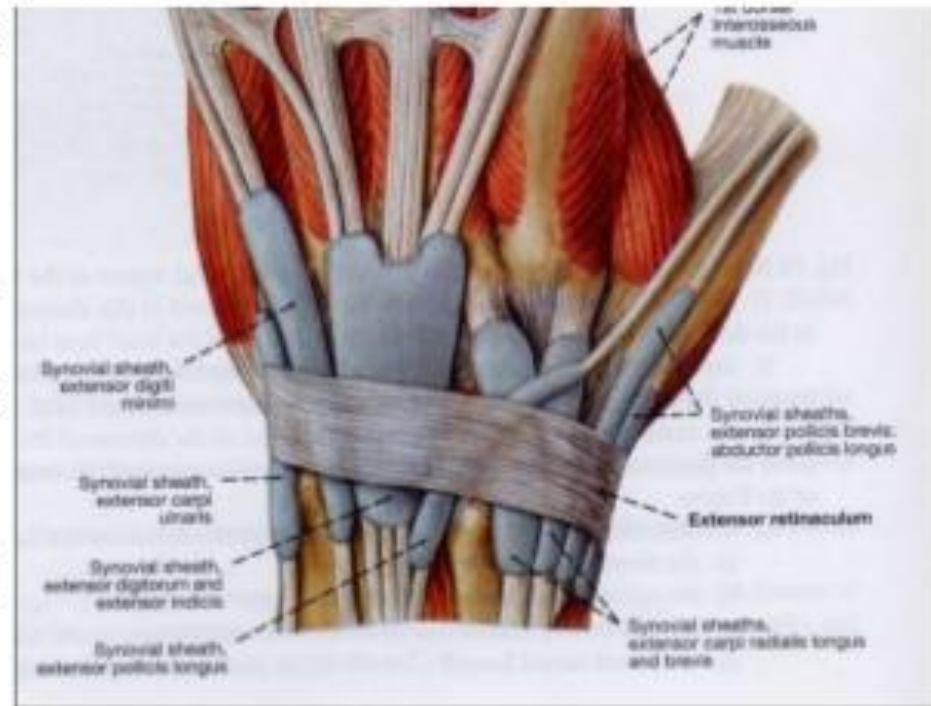


- **Boundaries**
- The lateral border is formed by the tendons of the abductor pollicis longus and extensor pollicis brevis;
- The medial border is formed by the tendon of the extensor pollicis longus;
- The floor is formed by the scaphoid and trapezium.
- **Contents**
- **The radial artery** passes obliquely through the anatomical snuffbox, deep to the extensor tendons of the thumb.
- **Terminal parts of the superficial branch of the radial nerve** pass subcutaneously over the snuffbox.



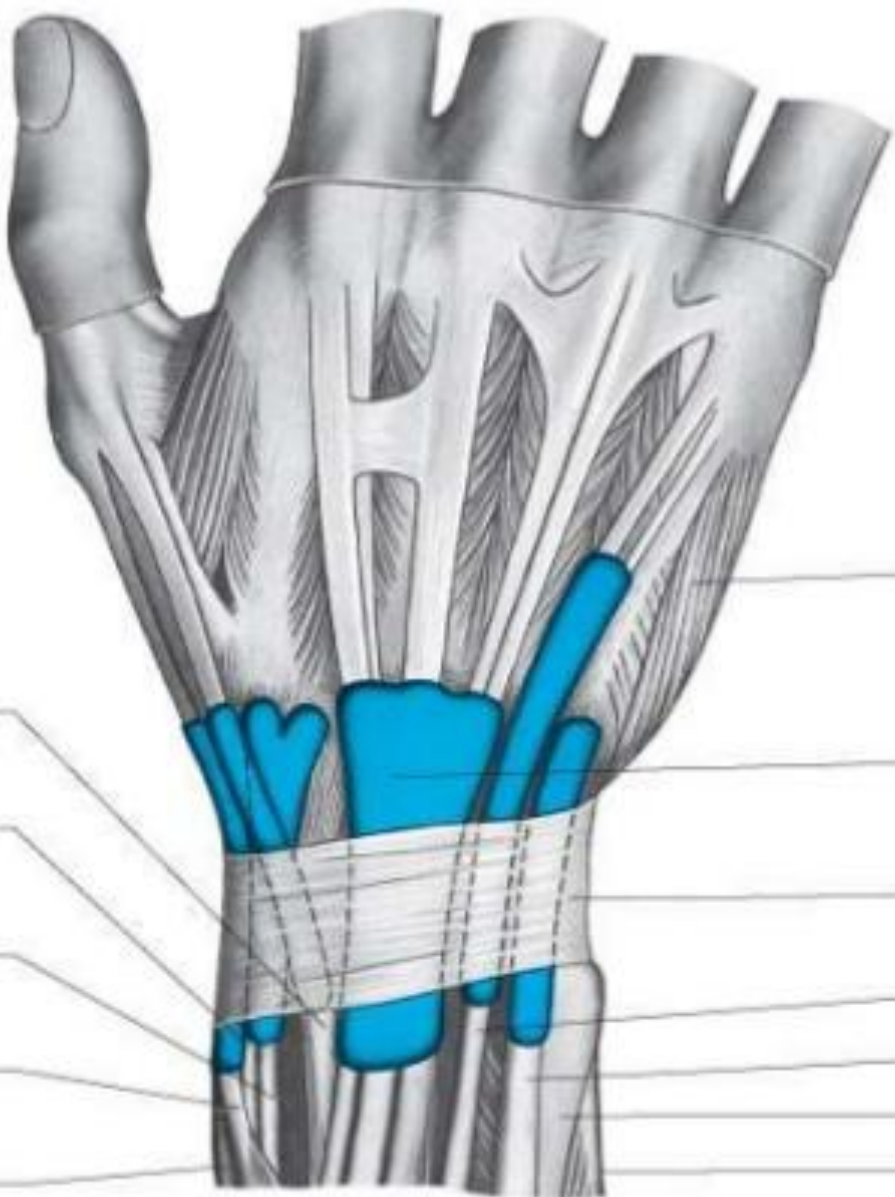
EXTENSOR RETINACULUM

- The extensor retinaculum is a strong, fibrous band which extends obliquely across the back of the wrist.
- **Attachement:**
- Laterally to the anterior border of the distal end of the radius .
- Medially to the triquetral and pisiform bones
- **Function**
- It prevents projection of the tendons across the wrist joint.



Structures passing below the retinaculum

- Six tunnels deep to the extensor retinaculum transmit the extensor tendons, each contains a synovial sheath. Arranged from lateral to medial as follow;
- (1)The first tunnel transmits the tendons of abductor pollicis longus and extensor pollicis brevis
- (2)The second tunnel transmits the tendons of extensor carpi radialis longus and brevis.
- (3)The third tunnel transmits the tendon of extensor pollicis longus
- (4)The fourth tunnel transmits the tendons of extensor digitorum and extensor indicis.
- (5)The fifth tunnel transmit the tendon of extensor digiti minimi
- (6)The sixth tunnel transmits the tendon of extensor carpi ulnaris



Extensor pollicis longus tendon
Extensor carpi radialis longus
Extensor carpi radialis brevis
Extensor pollicis brevis tendon
Abductor pollicis longus tendon

Abductor digiti minimi

Synovial sheath for extensor digitorum and extensor indicis

Extensor retinaculum
Extensor digiti minimi
Extensor carpi ulnaris
Ulna
Flexor carpi ulnaris