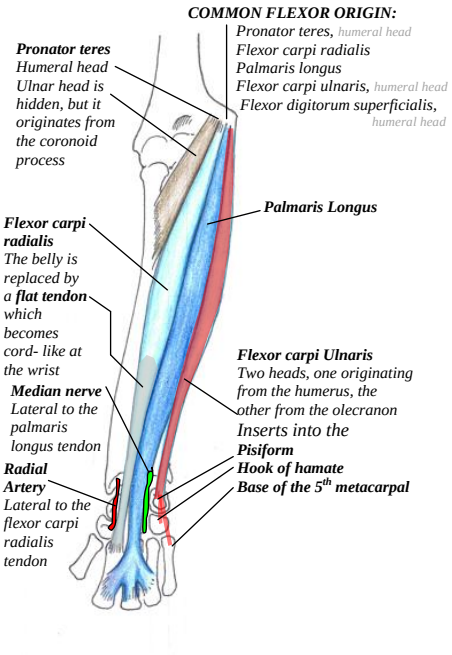
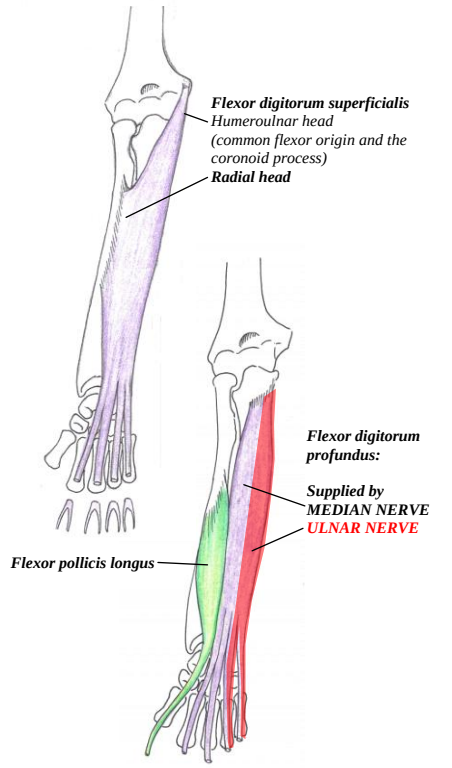
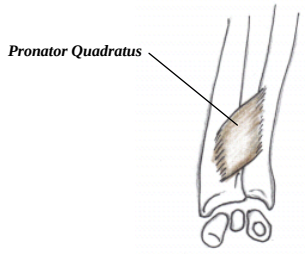
The Flexor Compartment of the Forearm





The flexors digitorum profundus and superficialis are WEAKER when the wrist is flexed, the tendons aren't tense



All supplied by the MEDIAN NERVE, ...except:
Flexor Digitorum Profundis, ulnar half
Flexor Carpi Ulnaris, whole

The flexor compartment has 4 discrete layers:

LAYER 1:

All of these, except the ulnar head of pronator quadratus, attach to the medial humeral epicondyle at the COMMON FLEXOR ORIGIN

Median nerve: mainly Layers 1 and 2
- Pronator teres
- Flexor carpi radialis
- Palmaris longus
- Flexor digitorum superficialis

Anterior Interosseous nerve: mainly layer 3
- Flexor digitorum profundus, lateral half
- Flexor pollicis longus
- Pronator quadratus

Ulnar nerve:
- flexor digitorum profundus, medial half
- flexor carpi ulnaris

- PRONATOR TERES
- Forms the medial border of the cubital fossa; it's the most lateral of the first layer of muscles
- Has an ulnar head and a humeral head
- The humeral head originates from the COMMON FLEXOR ORIGIN
- The ulnar head originates from the coronoid process
- Pronates and flexes the elbow

- FLEXOR CARPI RADIALIS
- Originates from the COMMON FLEXOR ORIGIN
- Inserts into the base of the 2nd metacarpal
- Flexes and abducts the wrist
- About half-way down the forearm, its belly is replaced by a flat tendon which becomes cord-like at the wrist
- It travels in the lateral carpal tunnel inside its own synovial sheath (it doesn't share)
- The radial artery is just lateral to this tendon

- PALMARIS LONGUS
- Originates from the COMMON FLEXOR ORIGIN
- Inserts into the distal flexor retinaculum, and palmar aponeurosis.
- Flexes and abducts the wrist, tenses the palmar aponeurosis
- Its actually absent in 14% of people (usually on the left side). Those people don't miss it being gone.
- The tendon of palmaris longus is a marker for where the median nerve is – the tendon passes medially to it, and then deep to it in the flexor retinaculum

- FLEXOR CARPI ULNARIS *Ulnar nerve*
- Has an ulnar and a humeral head
- Humeral head originates from the COMMON FLEXOR ORIGIN; Ulnar head originates from the olecranon, and posterior border of ulna
- Inserts into the pisiform, hook of hamate and the 5th metacarpal.
- Flexes and abducts the wrist; has its own synovial sheath
- The tendon of flexor carpi ulnaris is a marker for the ulnar artery, which passes laterally to it at the wrist

LAYER 2

- FLEXOR DIGITORUM SUPERFICIALIS
- The fast flexor of the fingers. Has two heads: humeroulnar head and radial head
- The humeroulnar head originates from BOTH the COMMON FLEXOR ORIGIN and the coronoid process of ulna; the radial head originates the proximal half of the radius
- It inserts into shafts of the middle phalanges
- It flexes the metacarpophalangeal joints and the proximal interphalangeal joints; **it can flex each joint independently of the others.**
- Its tendons are enclosed in the COMMON FLEXOR SHEATH together with the tendons of flexor digitorum profundus

LAYER 3

- FLEXOR DIGITORUM PROFUNDUS
- The slow flexor of the fingers
- Originates from the interosseous membrane, and from the proximal three quarters of the anterior surface of the ulna. It has two parts: medial and lateral parts;
- The medial part is innervated by the ulnar nerve *Ulnar nerve*
- The medial part flexes the distal interphalangeal joints of the 4th and 5th digits
- The lateral part flexes the distal interphalangeal joints of the 2nd and 3rd digits
- All parts can flex the wrist joint as well as the fingers
- The lateral part is innervated by the ANTERIOR INTEROSSEOUS NERVE (a branch of the median nerve).
- The tendon to the index finger tends to separate early; it's the only one which can operate independently. Unlike the flexor digitorum superficialis, the profundus flexes all the DIPs together.

- FLEXOR POLLICIS LONGUS
- Originates from the anterior surface of the radius and the nearby interosseous membrane
- Inserts into the base of the distal phalanx of thumb. It has its own synovial sheal in the carpal tunnel
- Also innervated by the ANTERIOR INTEROSSEOUS NERVE
- It flexes the phalanges of the thumb; mainly the distal interphalangeal joint (it's the only muscle that flexes the DIP of the thumb)

LAYER 4

- PRONATOR QUADRATUS
- It originates from the distal quarter of the ulna, and inserts into the distal quarter of the radius
- It is innervated by the ANTERIOR INTEROSSEOUS NERVE
- It pronates the forearm (it's the PRIMARY PRONATOR of the forearm) and its fibers hold the radius and ulna together. When speed is needed, it is assisted by the Pronator Teres.