

The Human Hand - Precision & The Art of Anatomy

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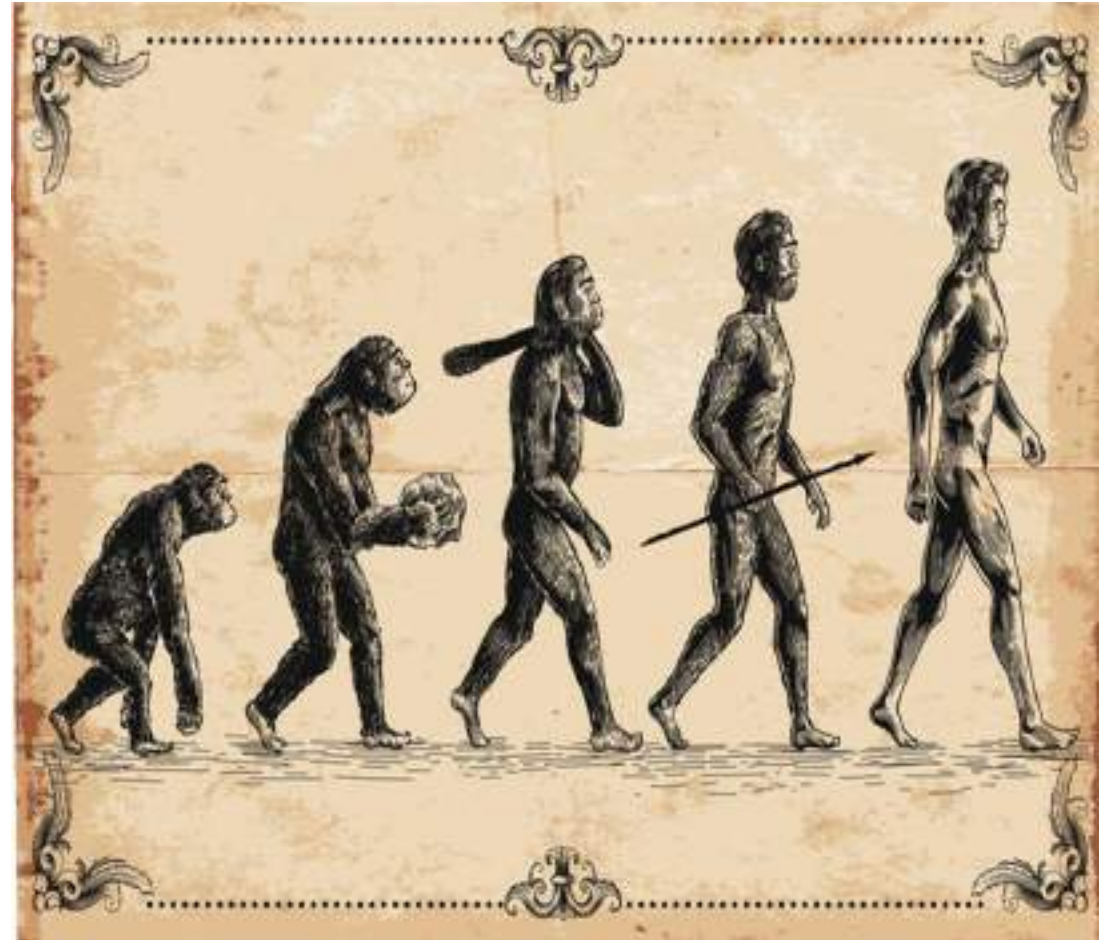




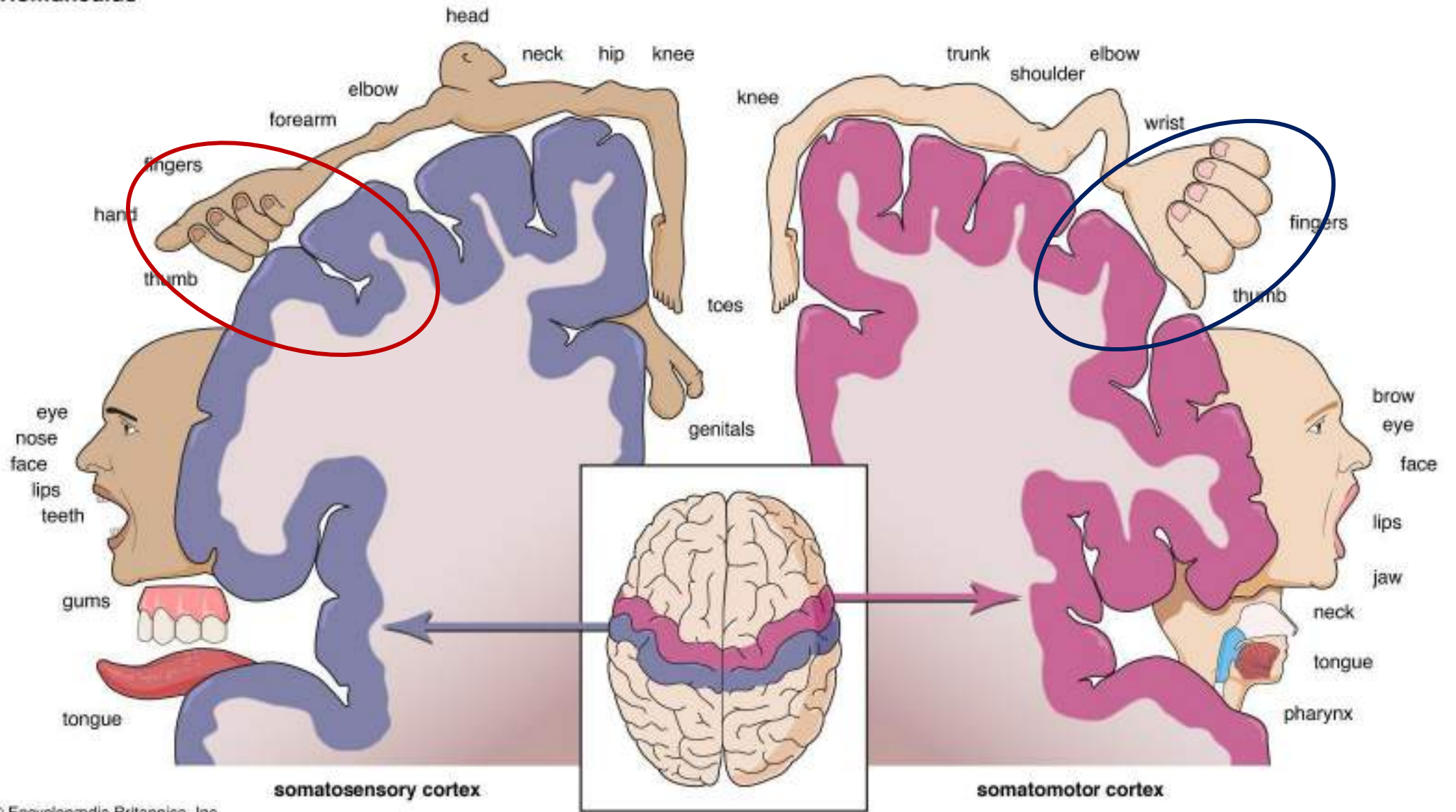


Evolutionary anchor

- **Bipedalism freed the upper limb**
- **The thumb rotated and the evolution of opposition**
- **Cortical expansion followed by the fine motor control**

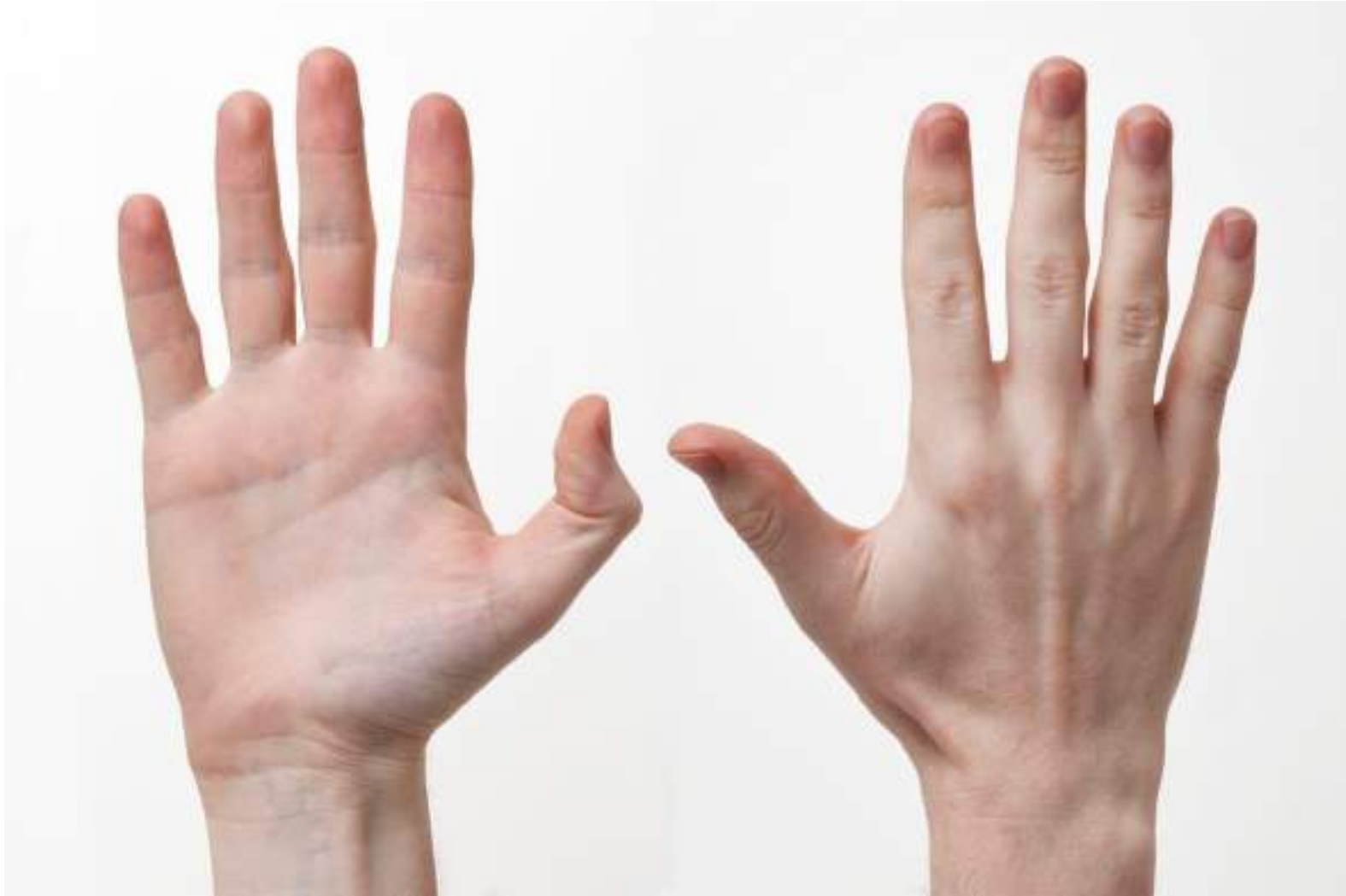


Homunculus



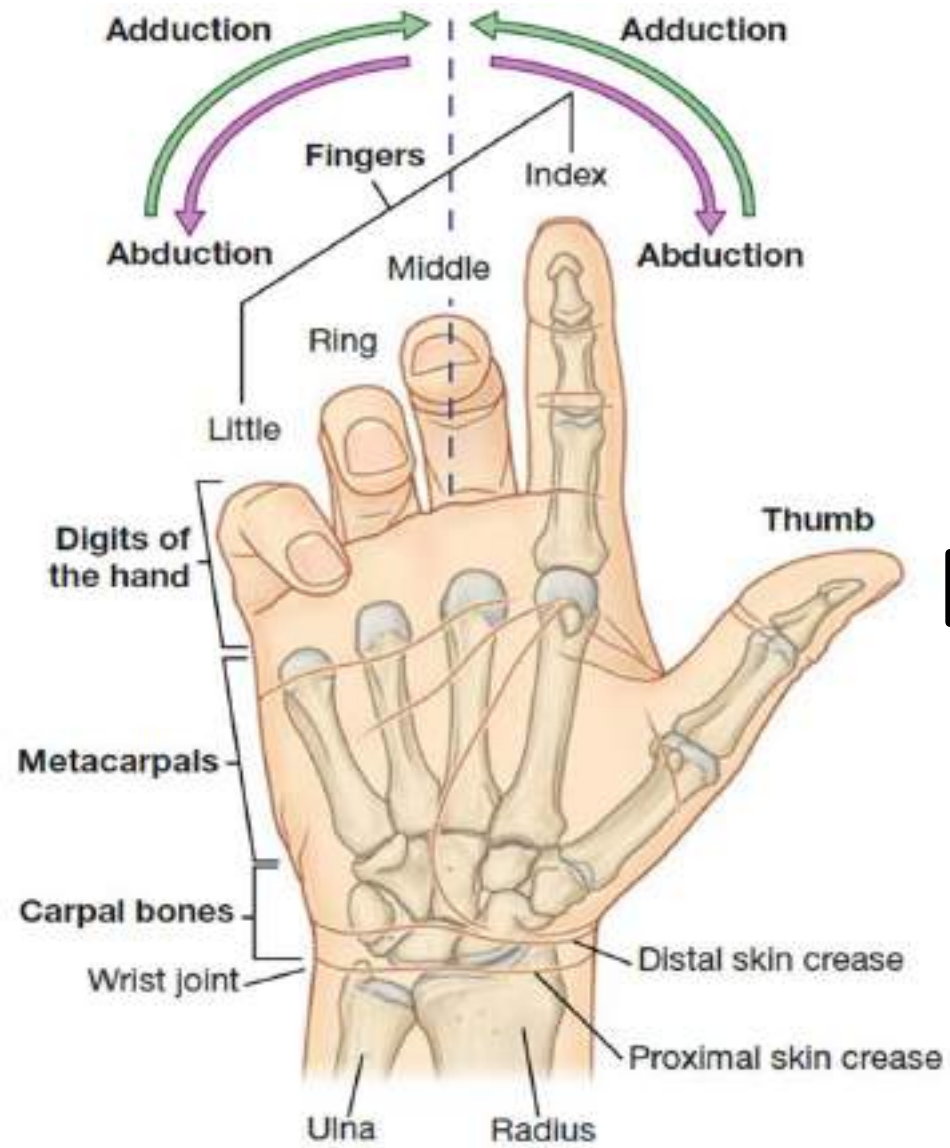
ANATOMY OF HAND

*"If the brain is the organ of thought,
the hand is the organ of execution."*



Palmar surface

Dorsal surface



Bones Of the Hand



“Almost ¼ of all the bones in the human body are in the hands”



Extrinsic Muscles

(a) Anterior superficial view

(b) Posterior superficial view

Intrinsic Muscles

Thenar compartment

- Abductor pollicis brevis
- Flexor pollicis brevis
- Opponens pollicis

Adductor compartment

- Adductor pollicis

Hypothenar compartment

- Abductor digiti minimi
- Flexor digiti minimi brevis
- Opponens digiti minimi

Central compartment

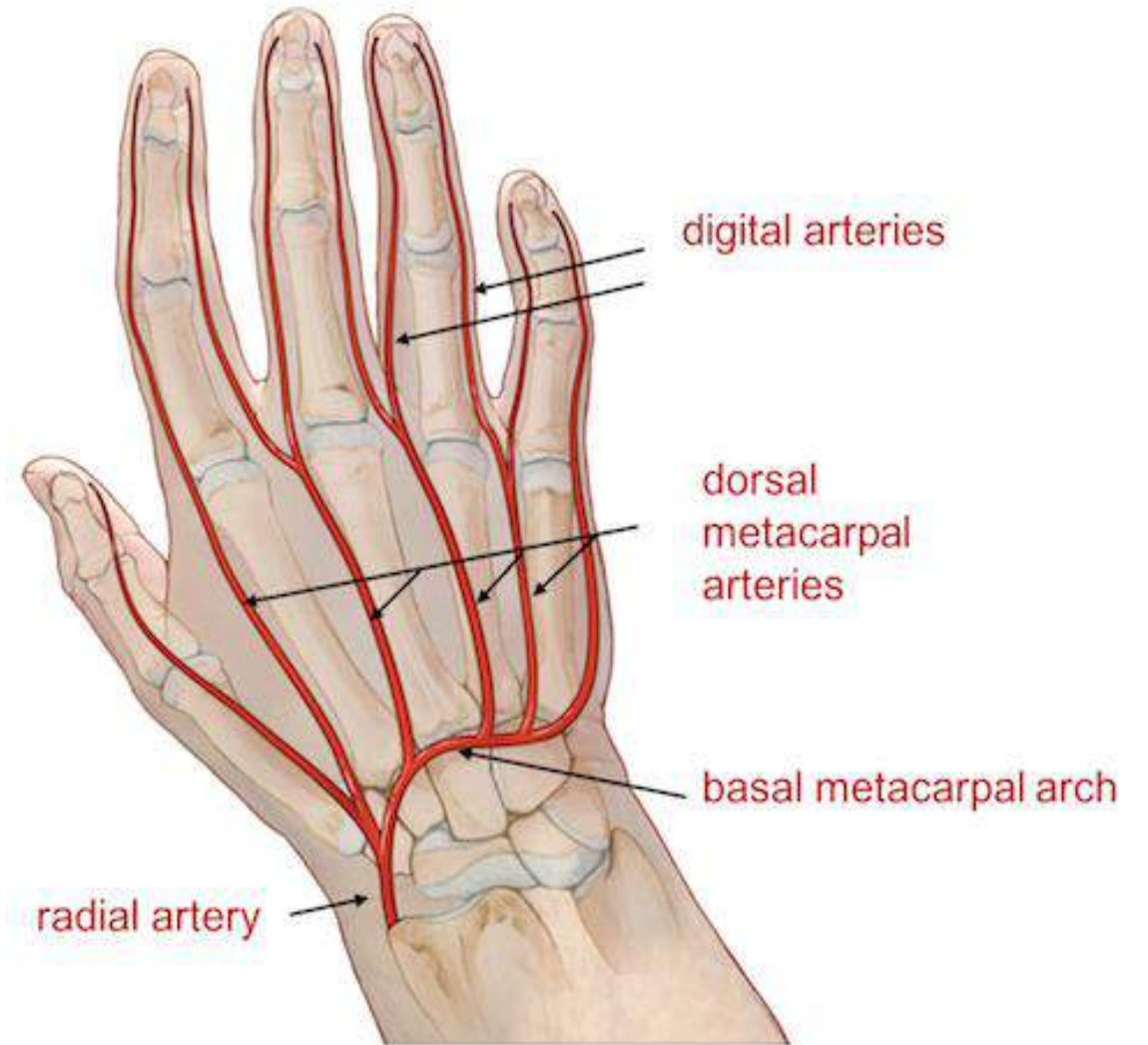
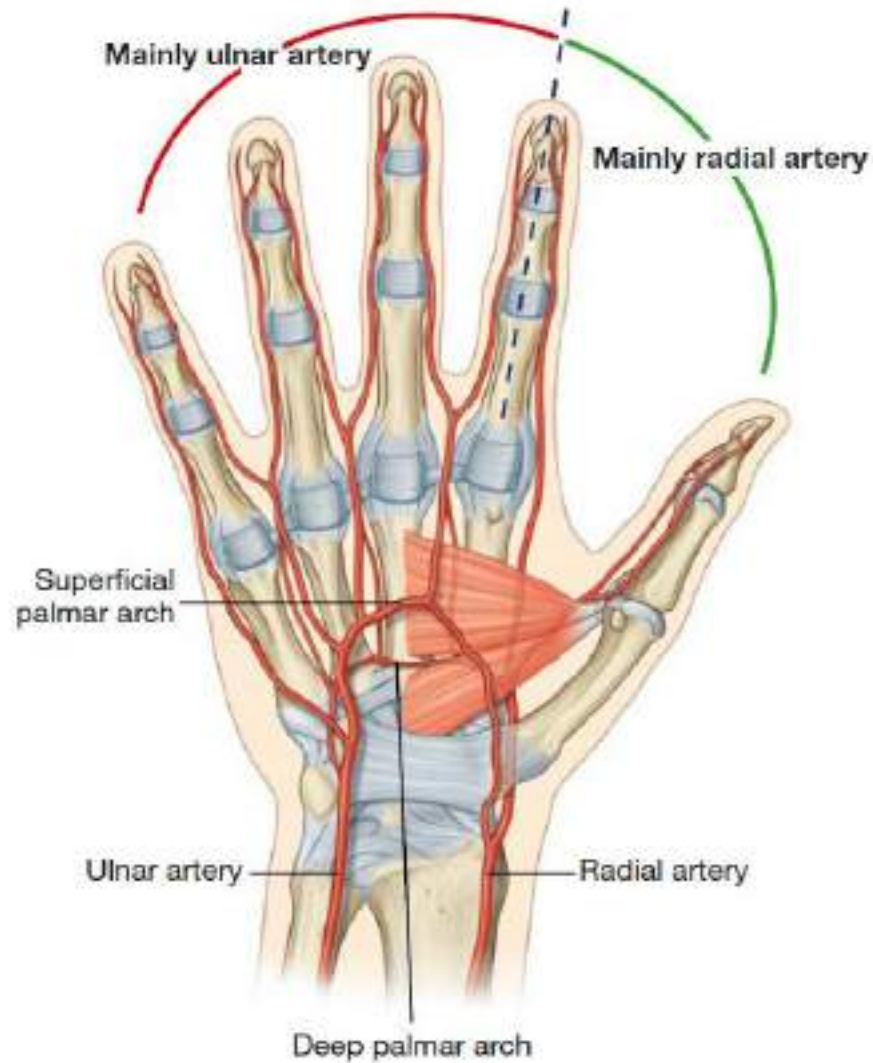
- Lumbricals (4)

Interosseous compartment

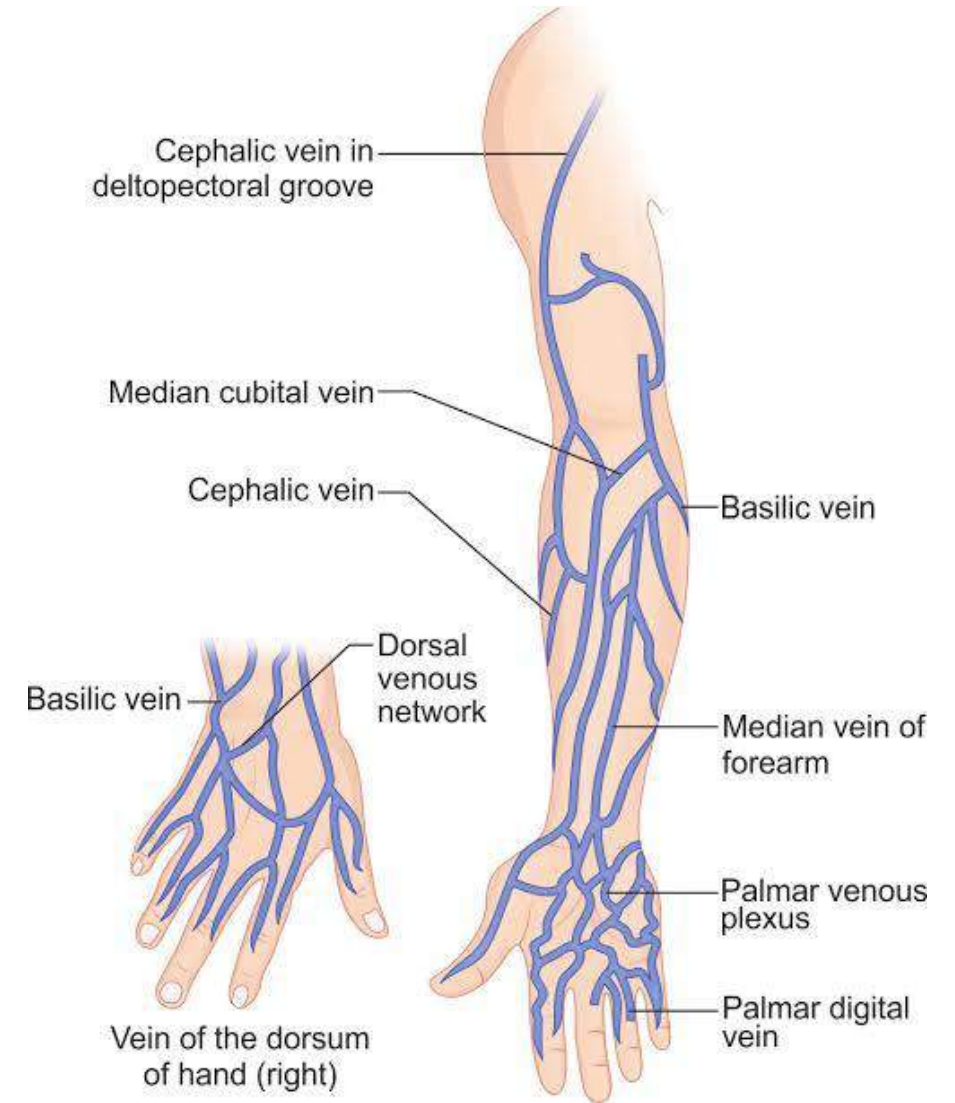
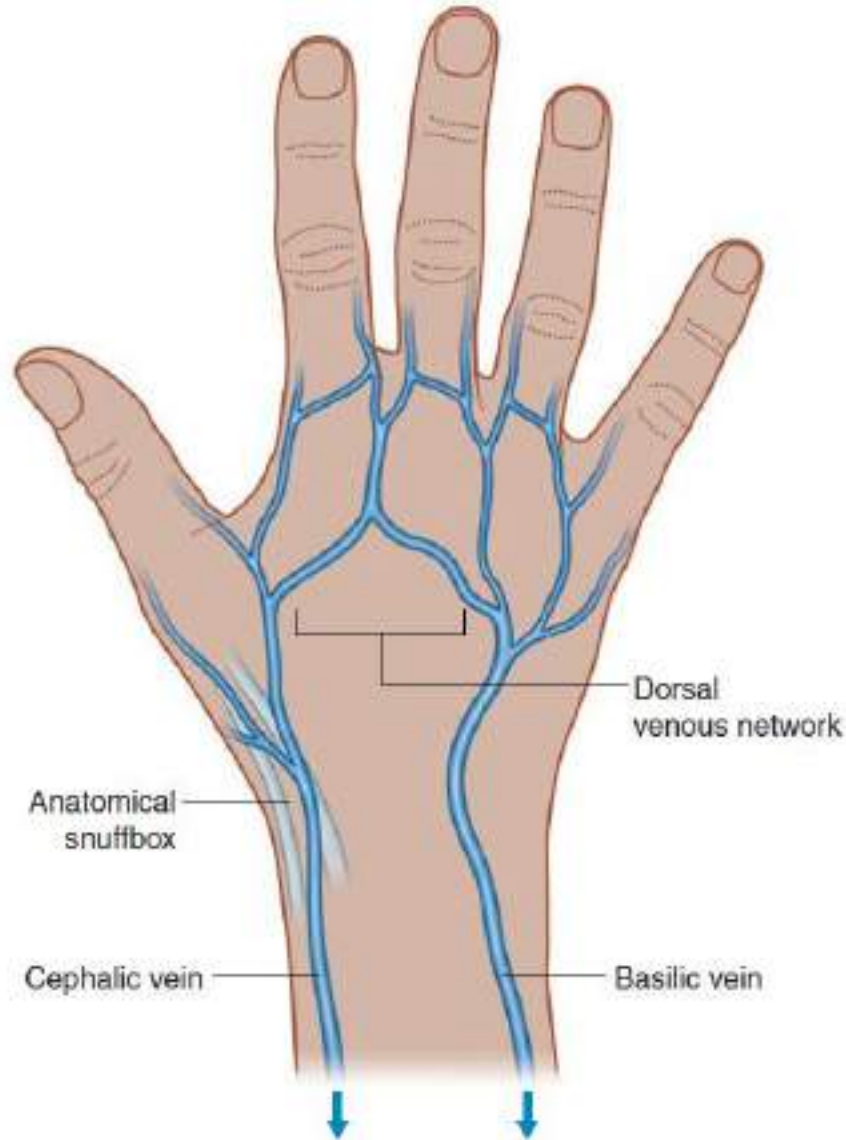
- Dorsal interossei (4)
- Palmar interossei (3)



Artery supply of hand

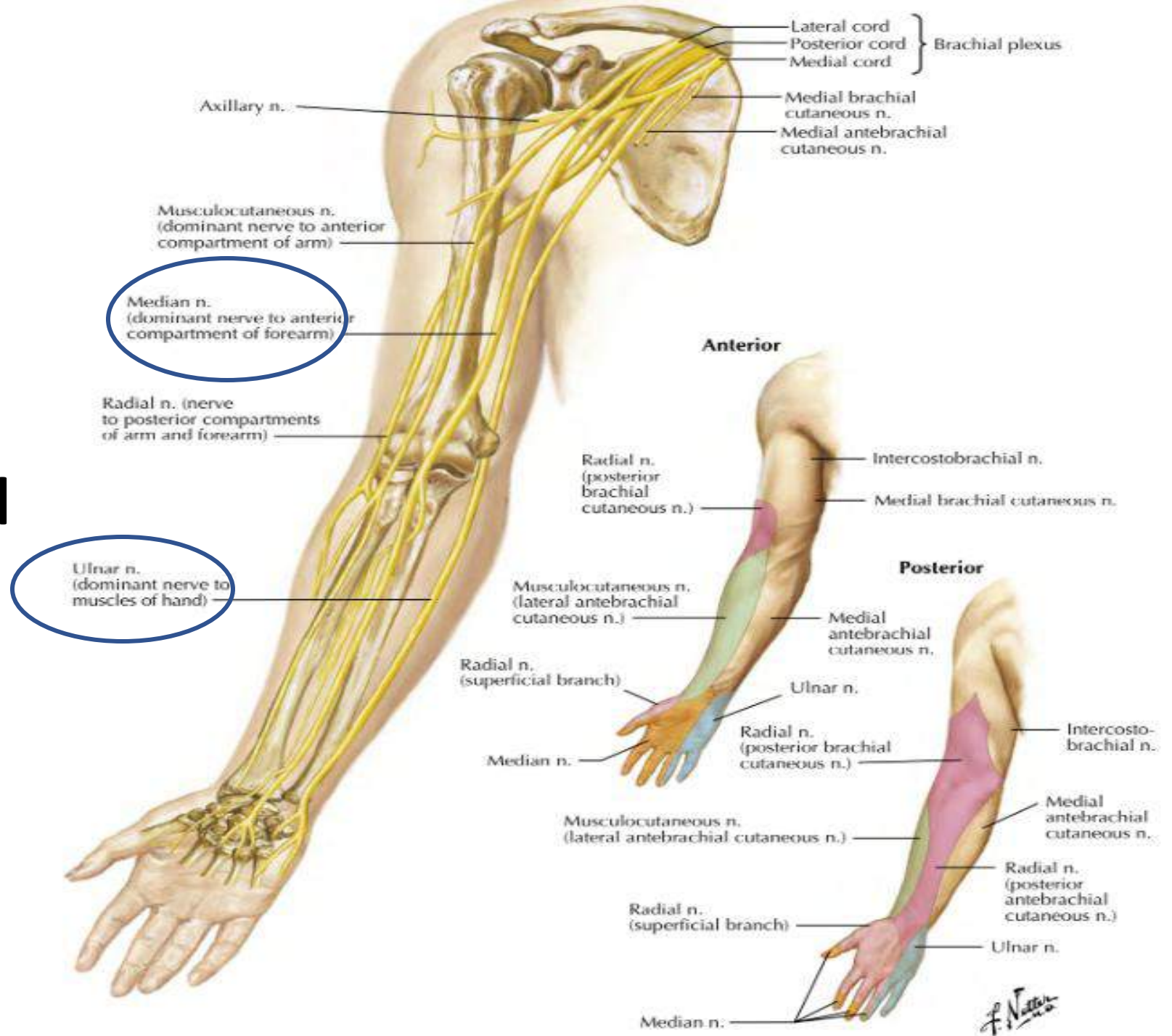


Venous drainage of hand

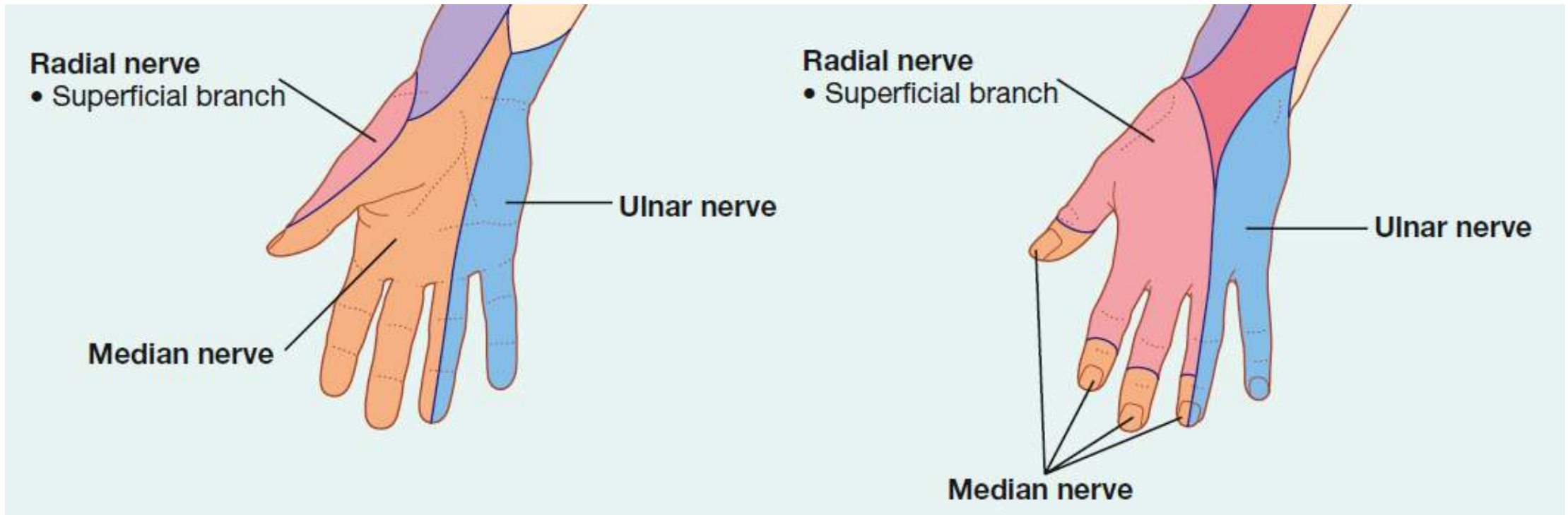


NERVE SUPPLY OF HAND

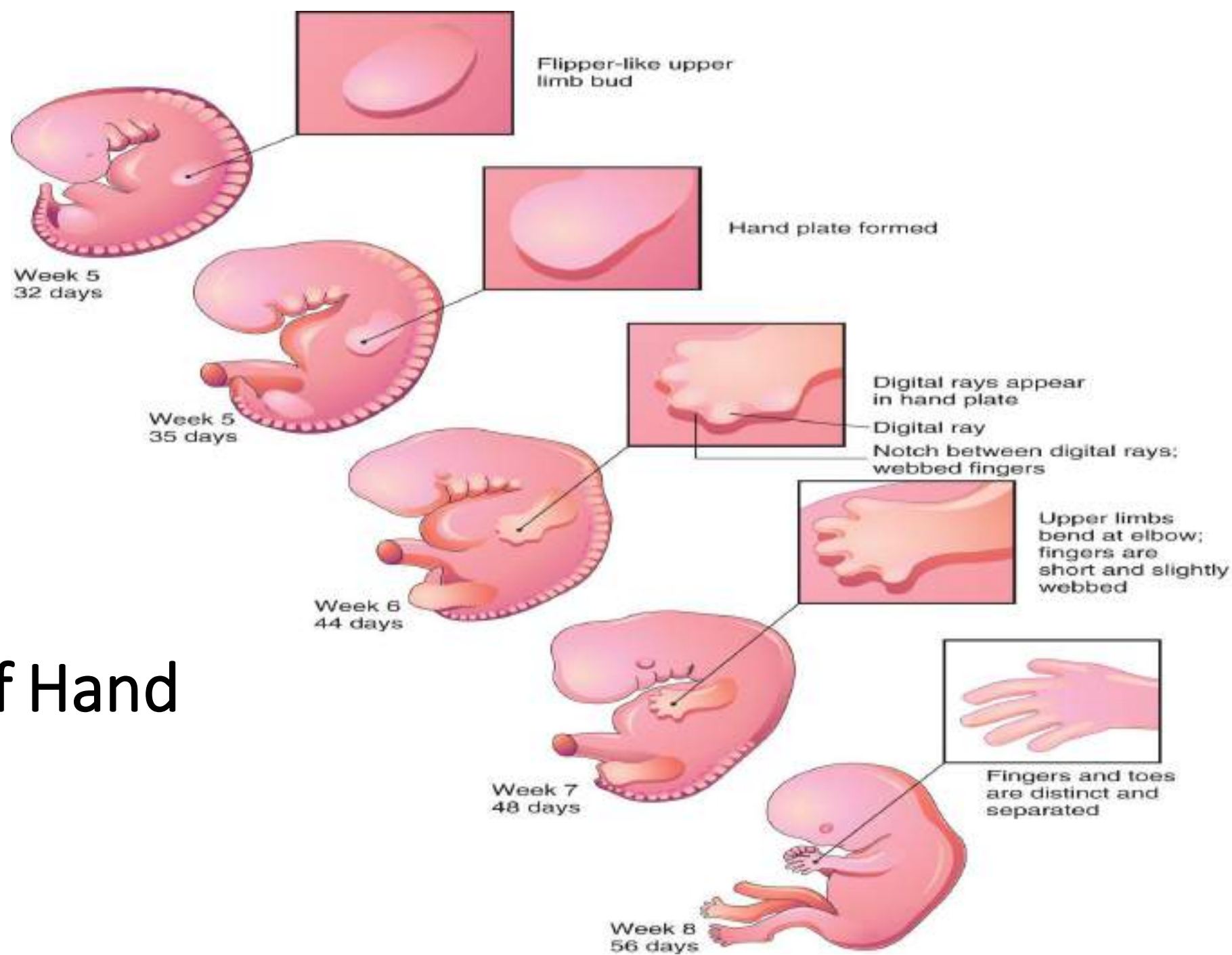
Motor supply of hand



Cutaneous supply of hand



Development of Hand



Developmental Defects



A. Brachydactyly



B. Syndactyly



C. Polydactyly

Functions of the Hand

- Physiological processes during our daily life activities
(writing, combing, climbing, punching, push up, pull up etc)
- Sensation
- Clinical Examination
- Communication & Expression
- Dermatoglyphics
- Grasping or Gripping



Power Grip:

Involves the **long flexor muscles** to the digits, the **intrinsic muscles** in the palm, and the **extensors** of the wrist.



(A) Lateral view; Power grip



(G) Anterior view; Loose grip



(H) Anterior view; Firm grip

Hook Grip:

It involving mainly the **long flexors & extensor muscles** of the digits, which are flexed to a varying degree, depending on the size of the object that is grasped.



(B) Anteromedial view; Hook grip

Precision Handling Grip:

In a precision grip, the wrist and digits are held firmly by the **long flexor** and **extensor** muscles, and the **intrinsic hand** muscles perform fine movements of the digits.



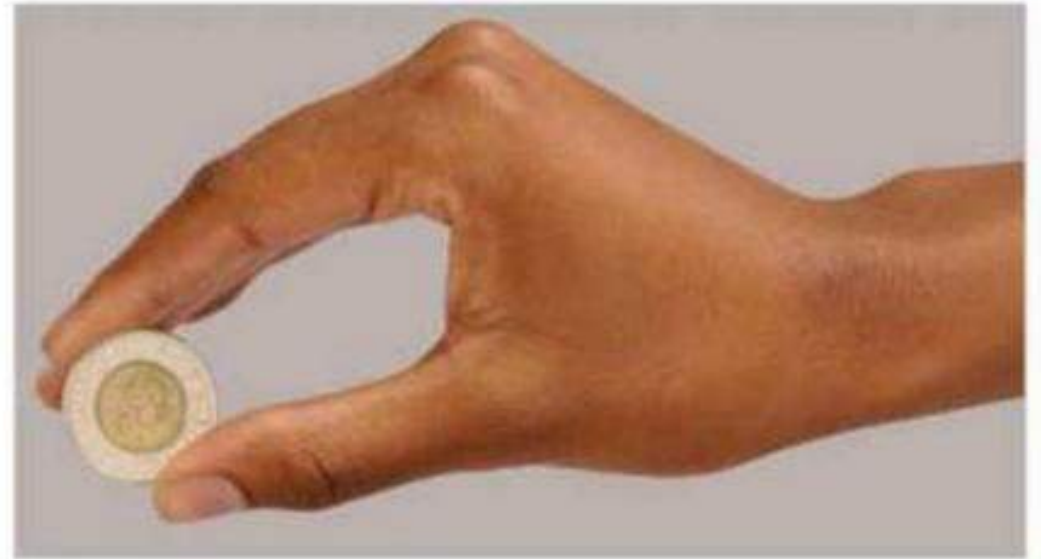
(C) Medial view; Precision handling grip



(D) Medial view; Precision grip

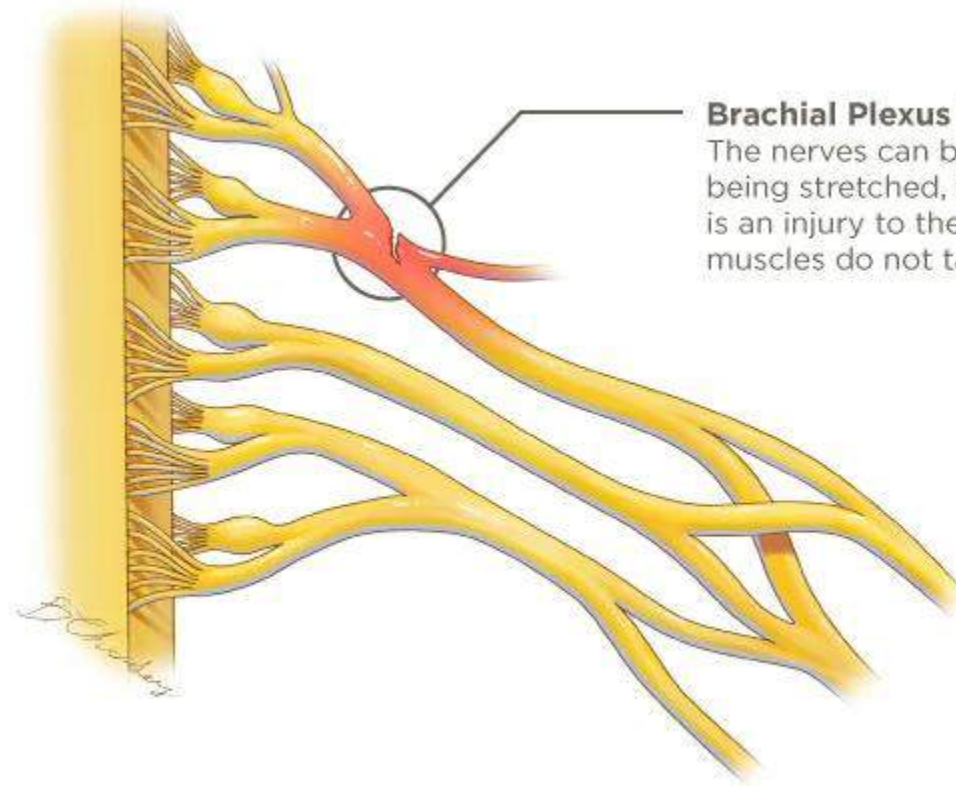
Pinching Grip:

Pinching is a complex motion that requires the coordination of **intrinsic and extrinsic** muscles within the hand.



(E) Medial view; Fingertip pinch

Common Clinical Conditions related to Hand



Brachial Plexus Injury

The nerves can be damaged by pressure, being stretched, torn, or even cut. When there is an injury to the nerve, the brain and the muscles do not talk to each other normally.

Nerve Lesions

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Claw hand

partial:

- Involving only ulnar 2 digits as in isolated ulnar nerve palsy



Complete

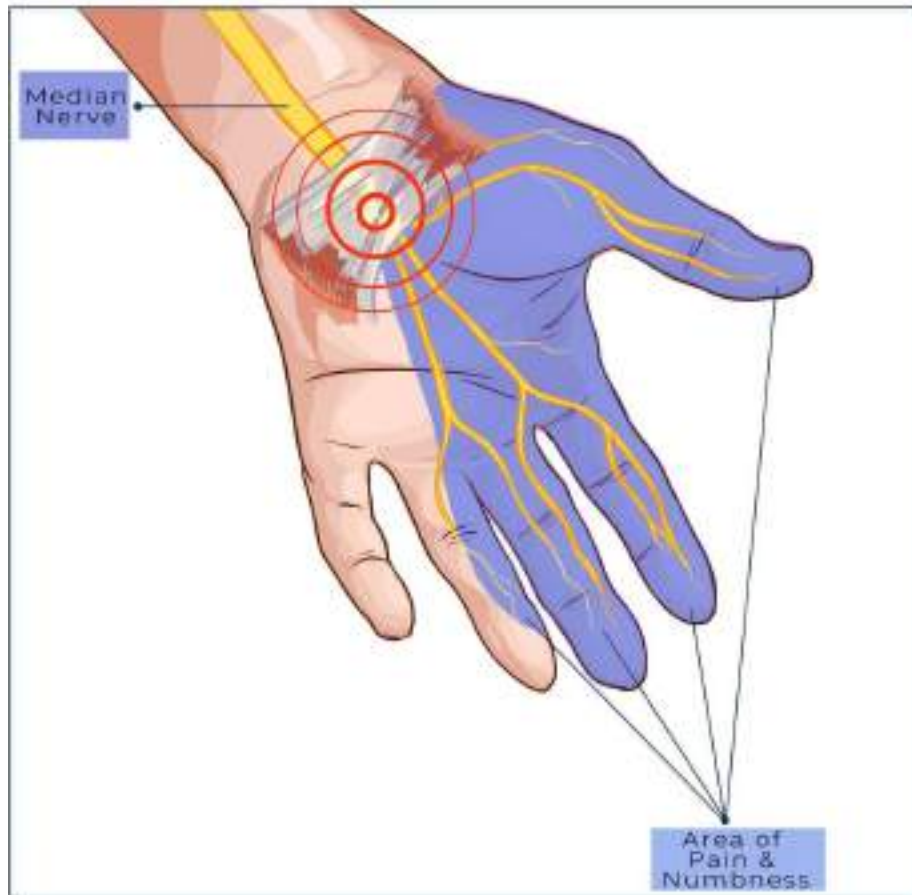
- Involving all digits and resulting from combined ulnar and median nerve palsy



Ape hand deformity



Carpal tunnel syndrome



Wrist drop

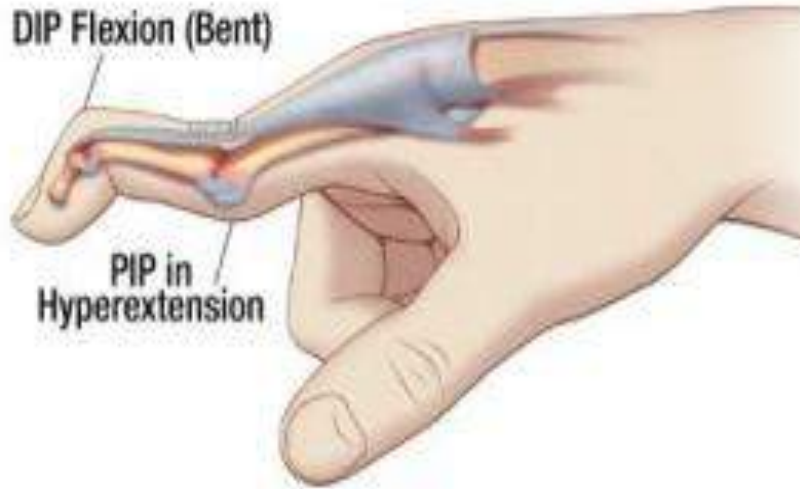




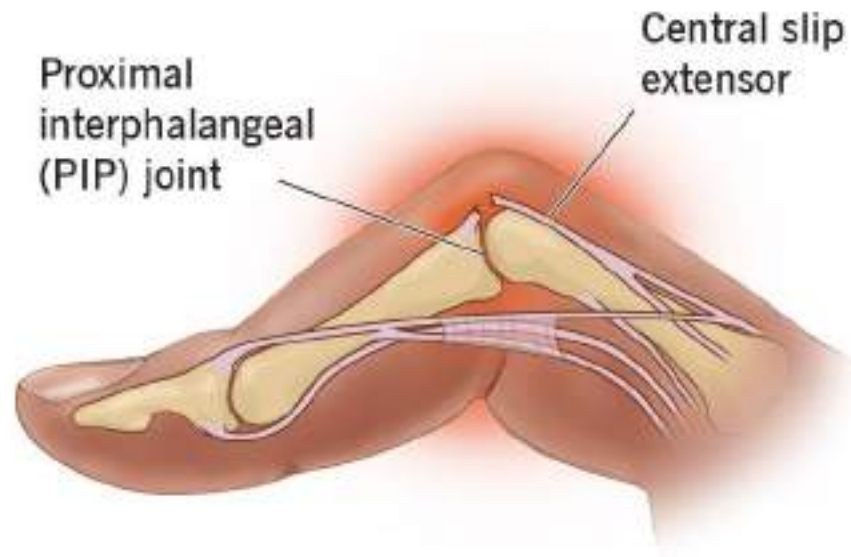
Joint Disorders

Deformities related to Rheumatoid Arthritis

Swan Neck Deformity



Boutonnière deformity

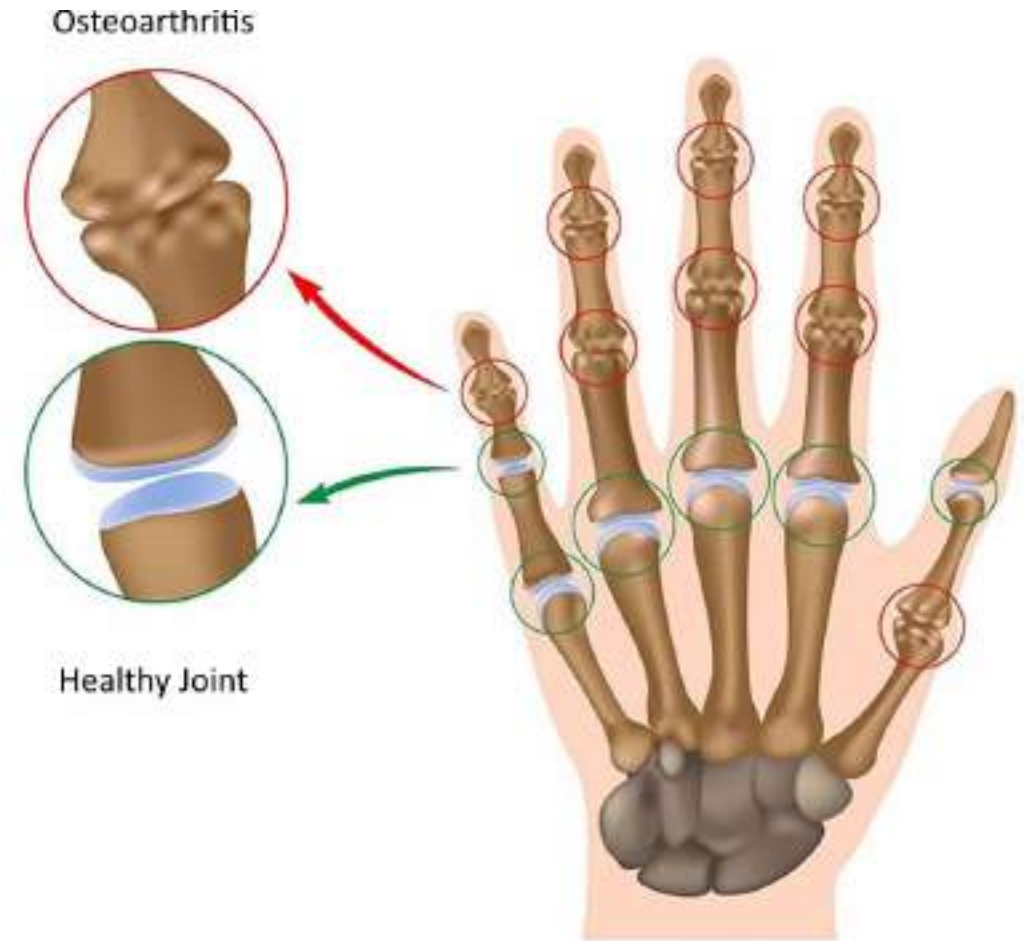


MP Ulnar Deviation



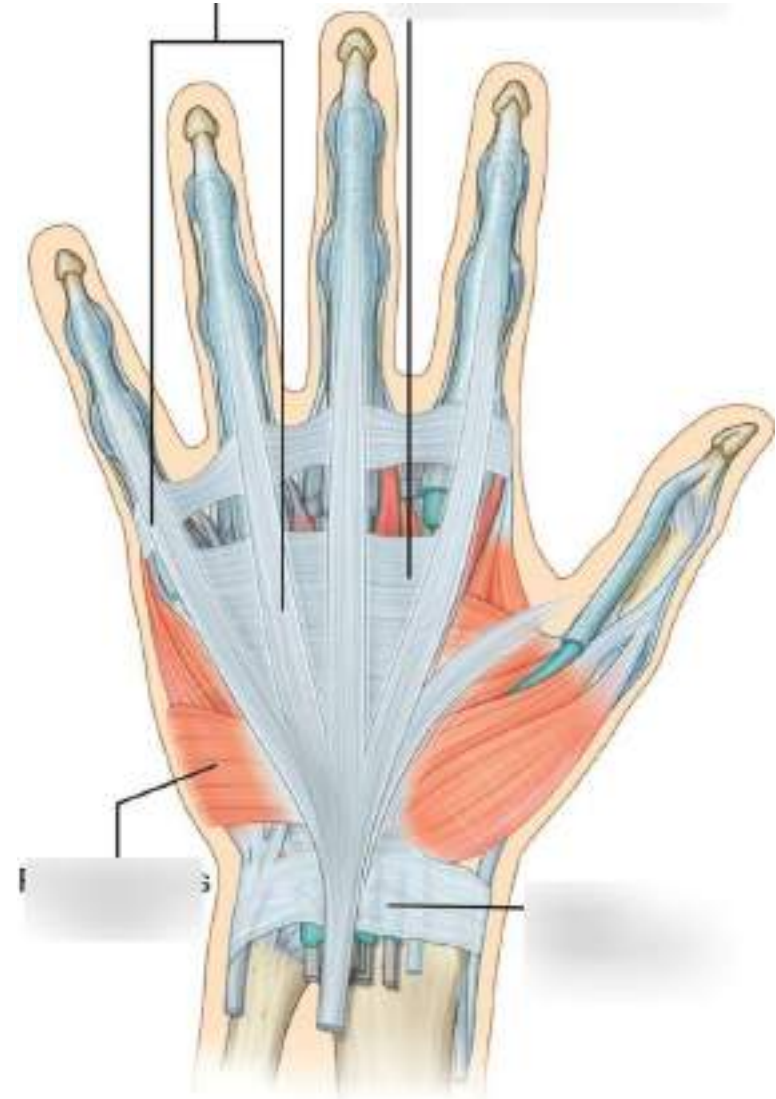
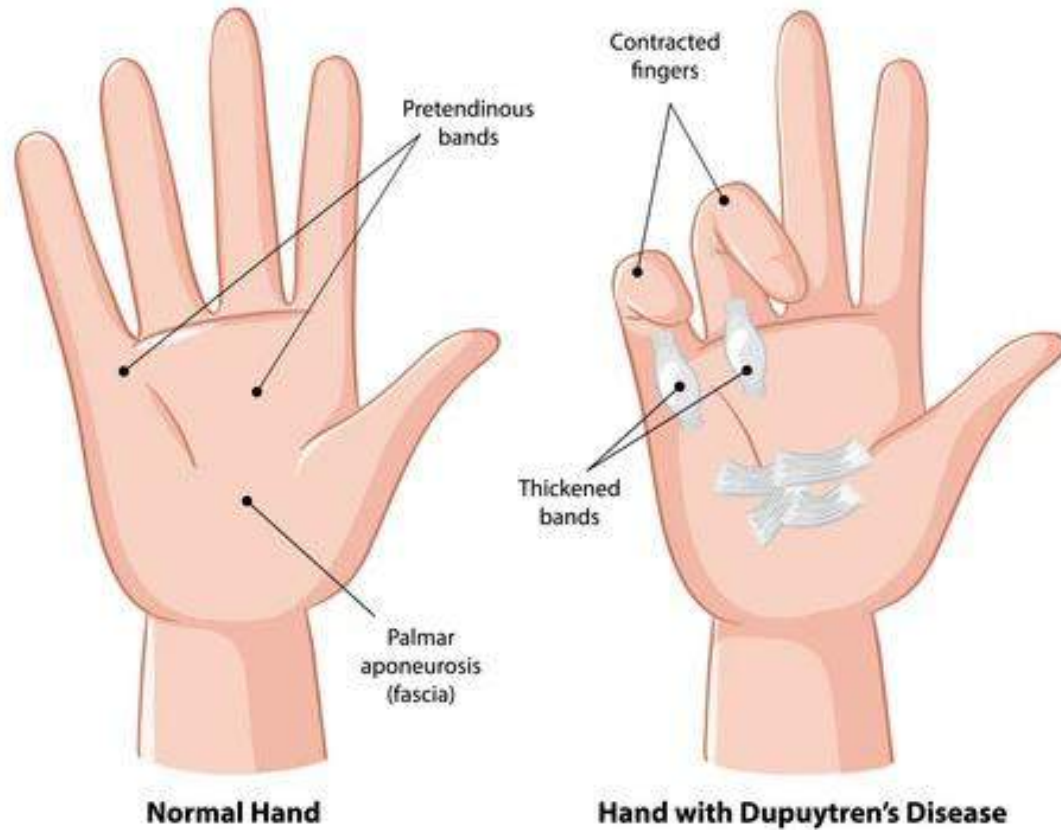


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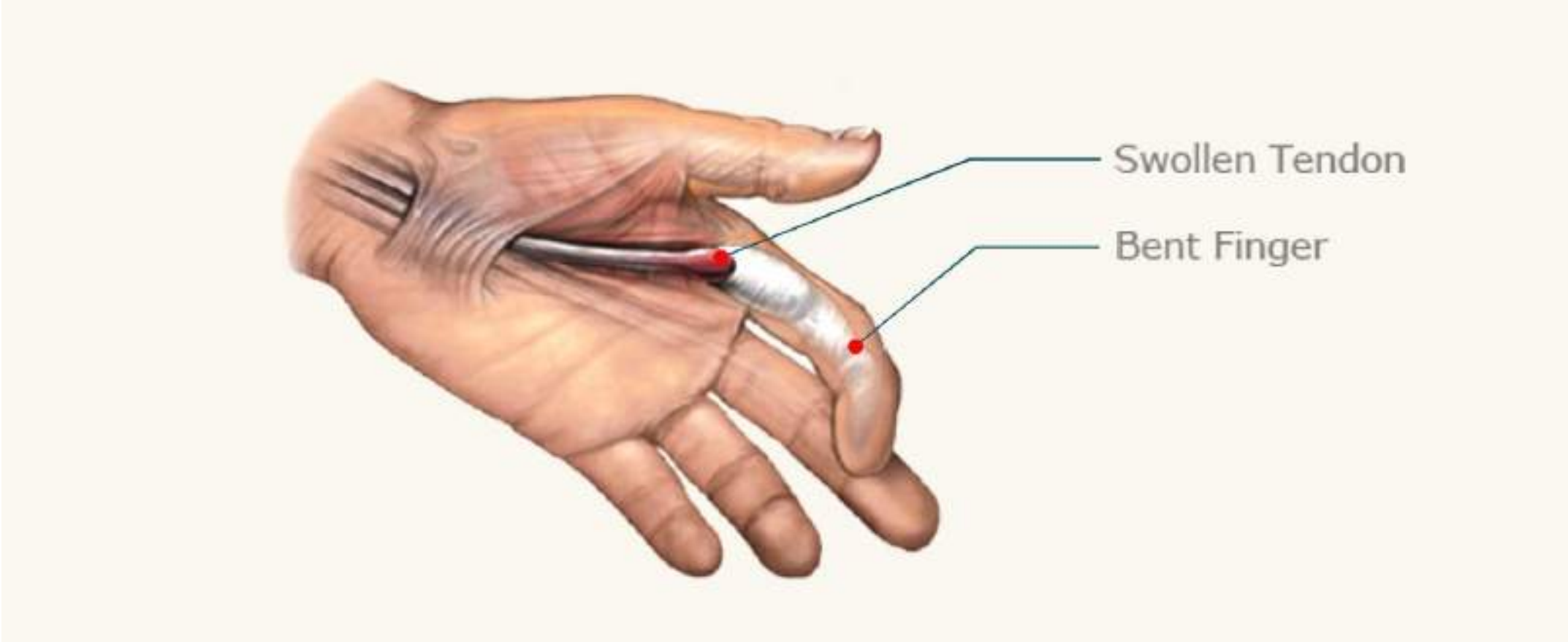


Osteoarthritis

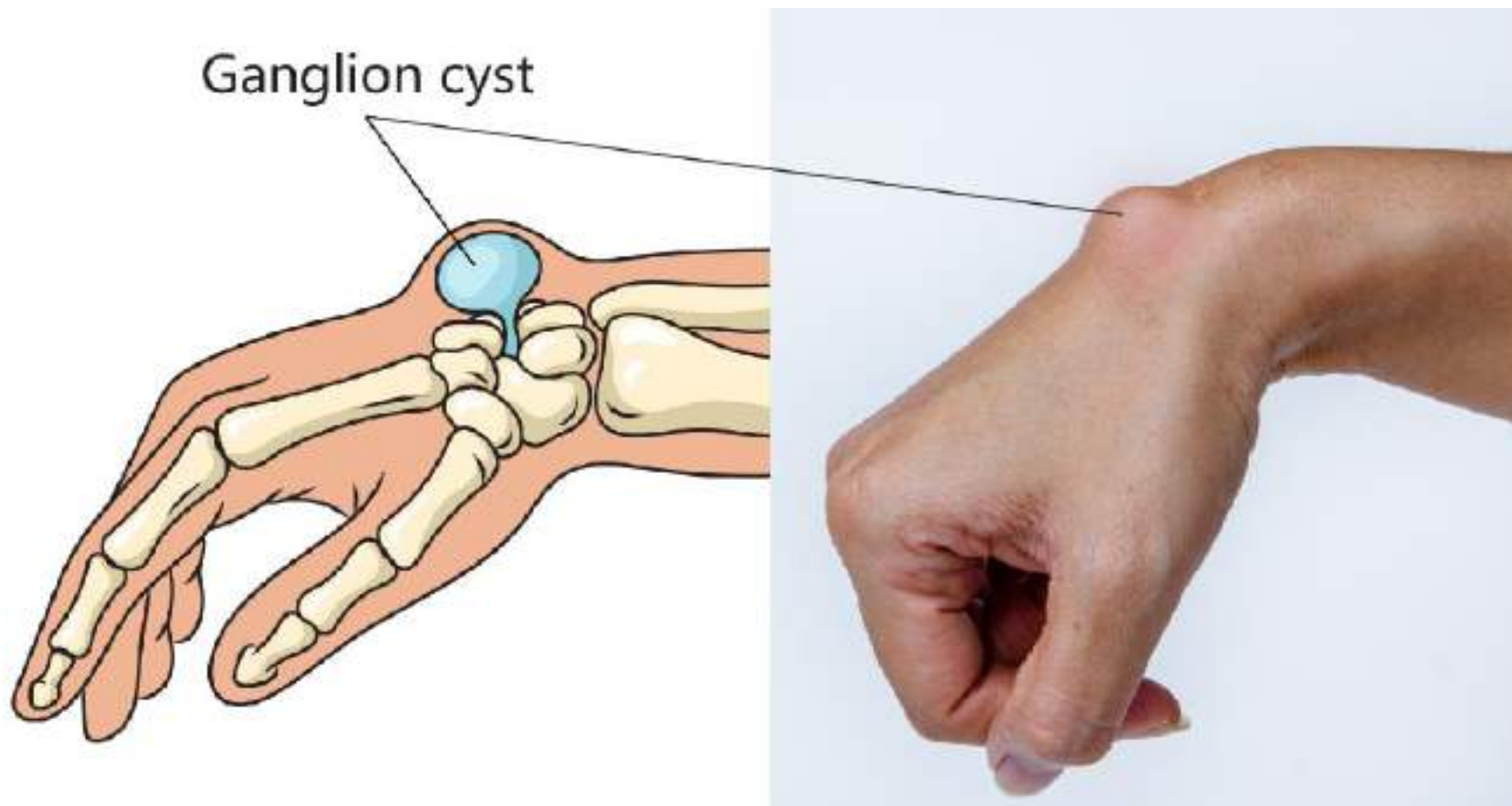
Dupuytren's Contracture



Tenosynovitis



Ganglion cysts in the hand



The physician hand- where knowledge becomes care

- Examination
- Diagnosis
- Intervention
- Healing



The physician's hand is not just a biological structure-it is a professional instrument.

An instrument that must remain skilled, careful, and always used in the service of the patient.

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Thank You



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