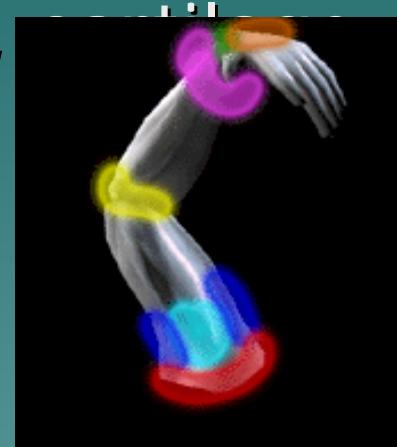


# UPPER LIMB

- ◆ What is a limb?
- ◆ Sensory to upper limb
- ◆ Making it move
  - Bones and joints
  - Muscles and nerves
- ◆ Vascular supply
- ◆ Surface anatomy
- ◆ (muscle study hint)

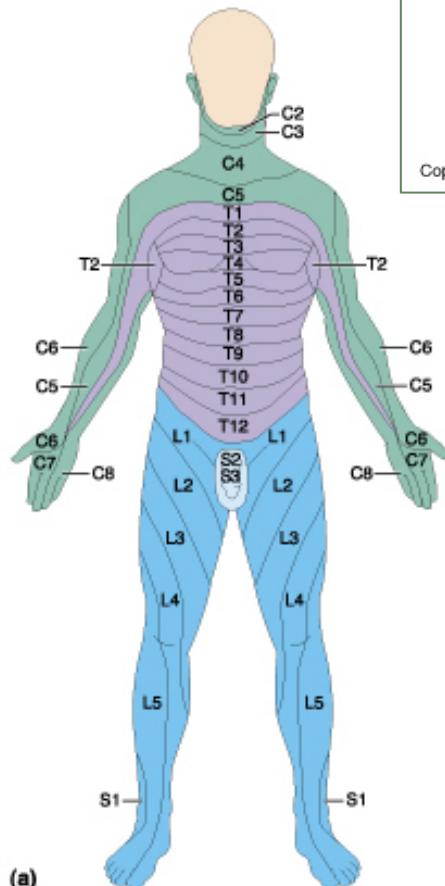
# What is a limb?

- ◆ Ventral somatic outgrowth of outer tube
  - Bones (with bone, NAV, etc.)
  - Joints
  - Muscle
  - Nerves
  - Vascular supply
- ◆ No viscera--all innervation is somatic (motor or sensory) from ventral ramus of spinal nerve (except autonomies to blood vessels)

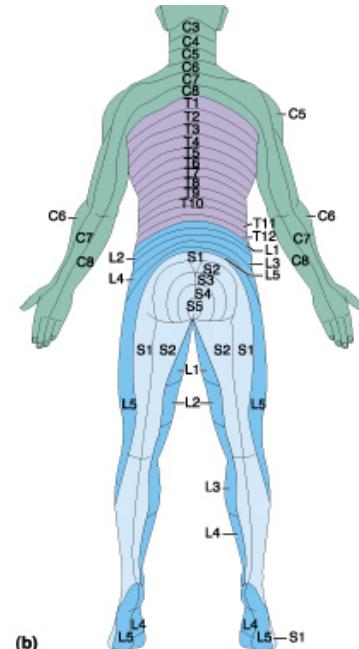


# Sensory from limb (dermatomes/sensory skin segments from spine)

- ◆ Dermatomes extend over limbs
- ◆ Twisted orientation reflects twisting of limb during development
- ◆ Named nerves generally innervate skin over muscles that they innervate



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(b)

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# Sensory territory of nerves

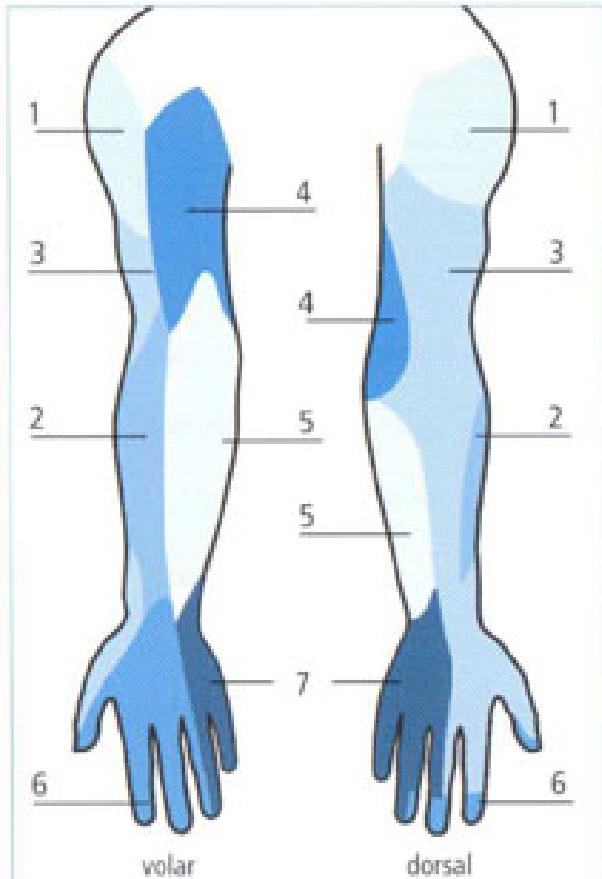


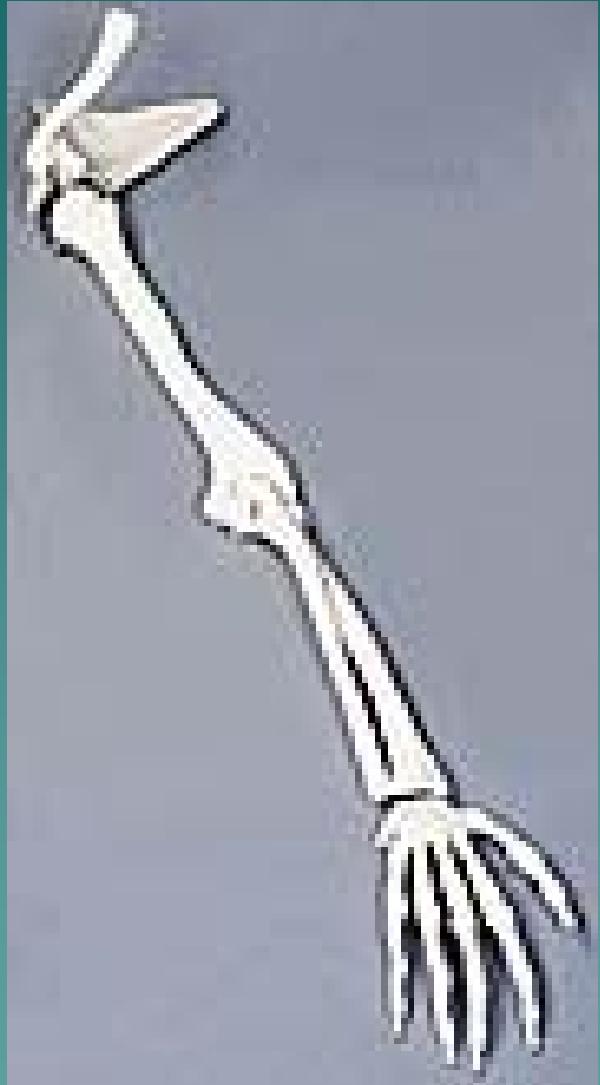
Fig. 2: Sensory supply areas of the brachial plexus

Brachial plexus serves to redirect spinal routes into named nerves covering certain territory

- 1 Axillary nerve
- 2 Musculocutaneous nerve
- 3 Radial nerve
- 4 Medial cutaneous nerve of the arm
- 5 Medial cutaneous nerve of the forearm
- 6 Median nerve
- 7 Ulnar nerve

Cutaneous branches of medial cord/ulnar nerve

# Upper Limb Skeleton (old hat?)

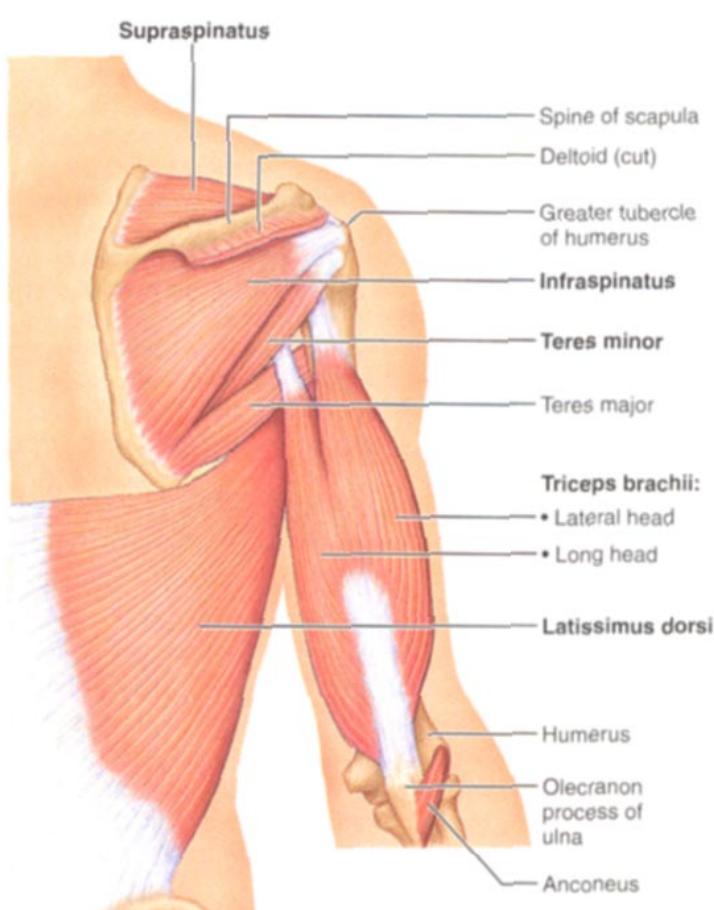


- ◆ Scapula
- ◆ Humerus
- ◆ Radius, ulna
- ◆ Carpals--proximal,  
distal
- ◆ Digits
  - Metacarpals
  - Phalanges

# Joints

JOINT	BETWEEN	MOVEMENT	TYPE

# of Scapula



- ◆ If **INSERTION** on scapula = Move scapula
  - Rhomboids
  - Trapezius
  - Pectoralis Minor
  - Serratus Ventralis
  - Levator Scapulae

If **ORIGIN** on scapula = Move Arm

- **Subscapularis**
- **Supraspinatus**
- **Infraspinatus**
- **Teres Minor**
- Teres Major
- Latissimus Dorsi (partial O on scap)

Rotator Cuff

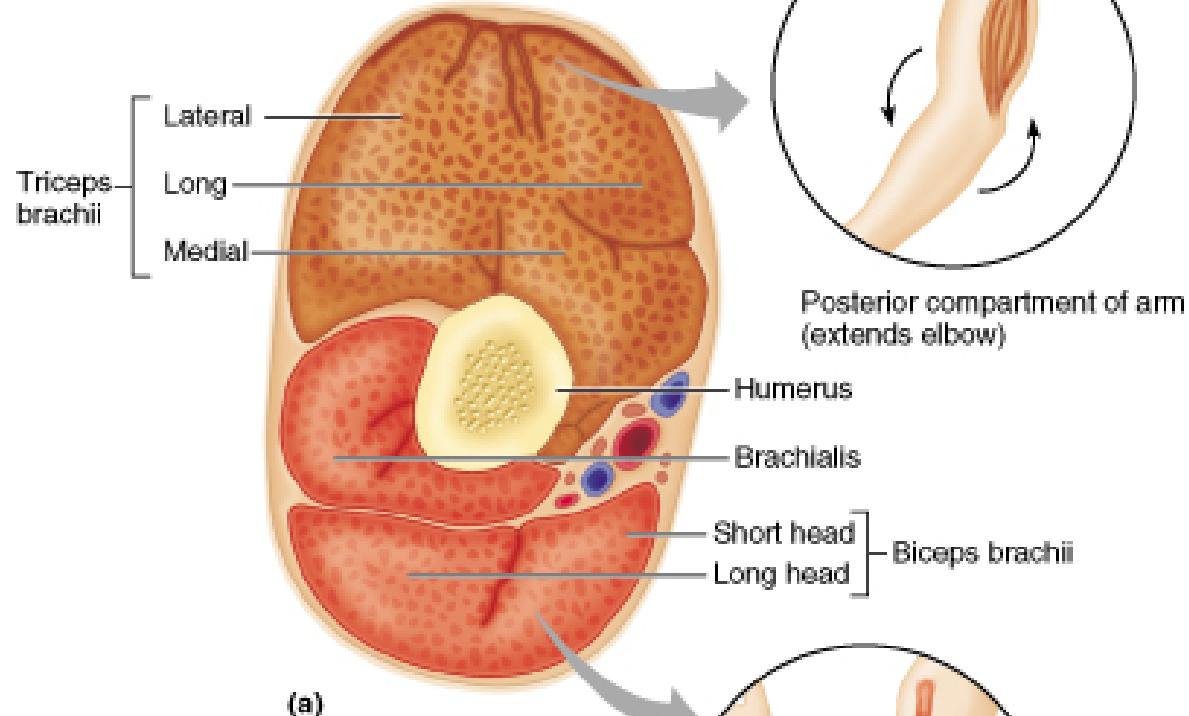
# POSTERIOR AND ANTERIOR COMPARTMENTS

**Key:**

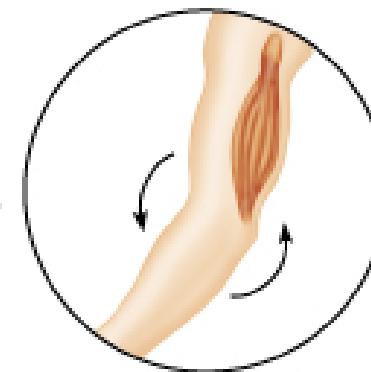
- = Flexors
- = Extensors
- = Others



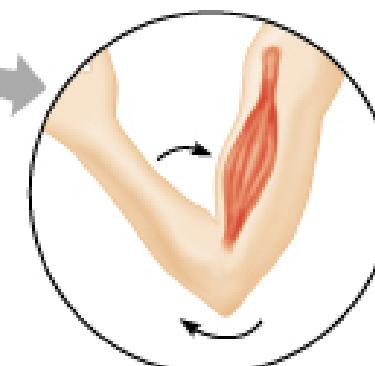
(a)



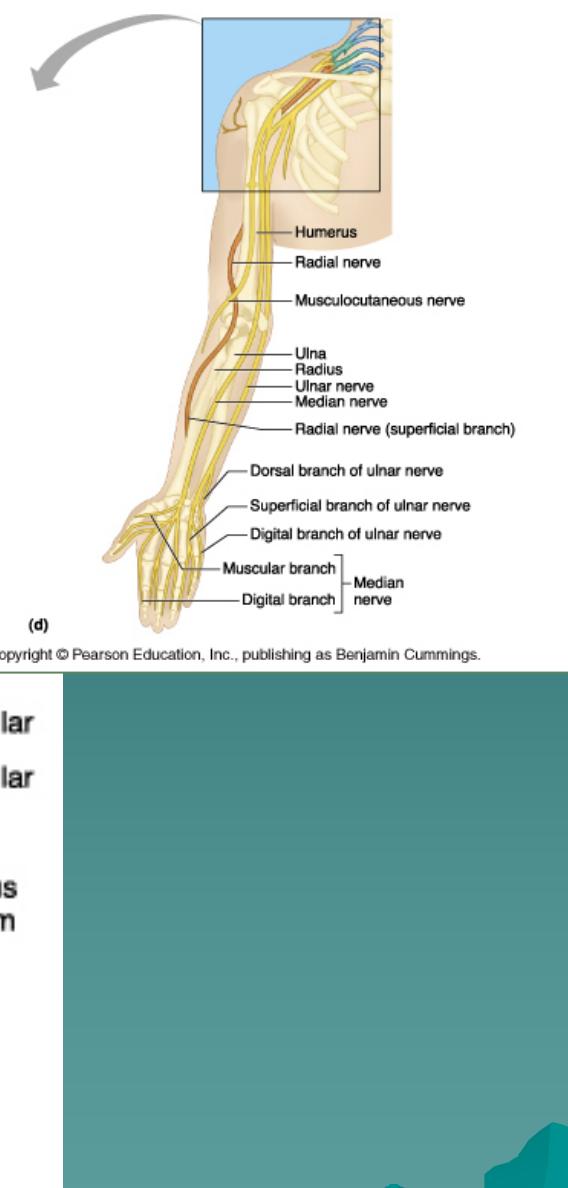
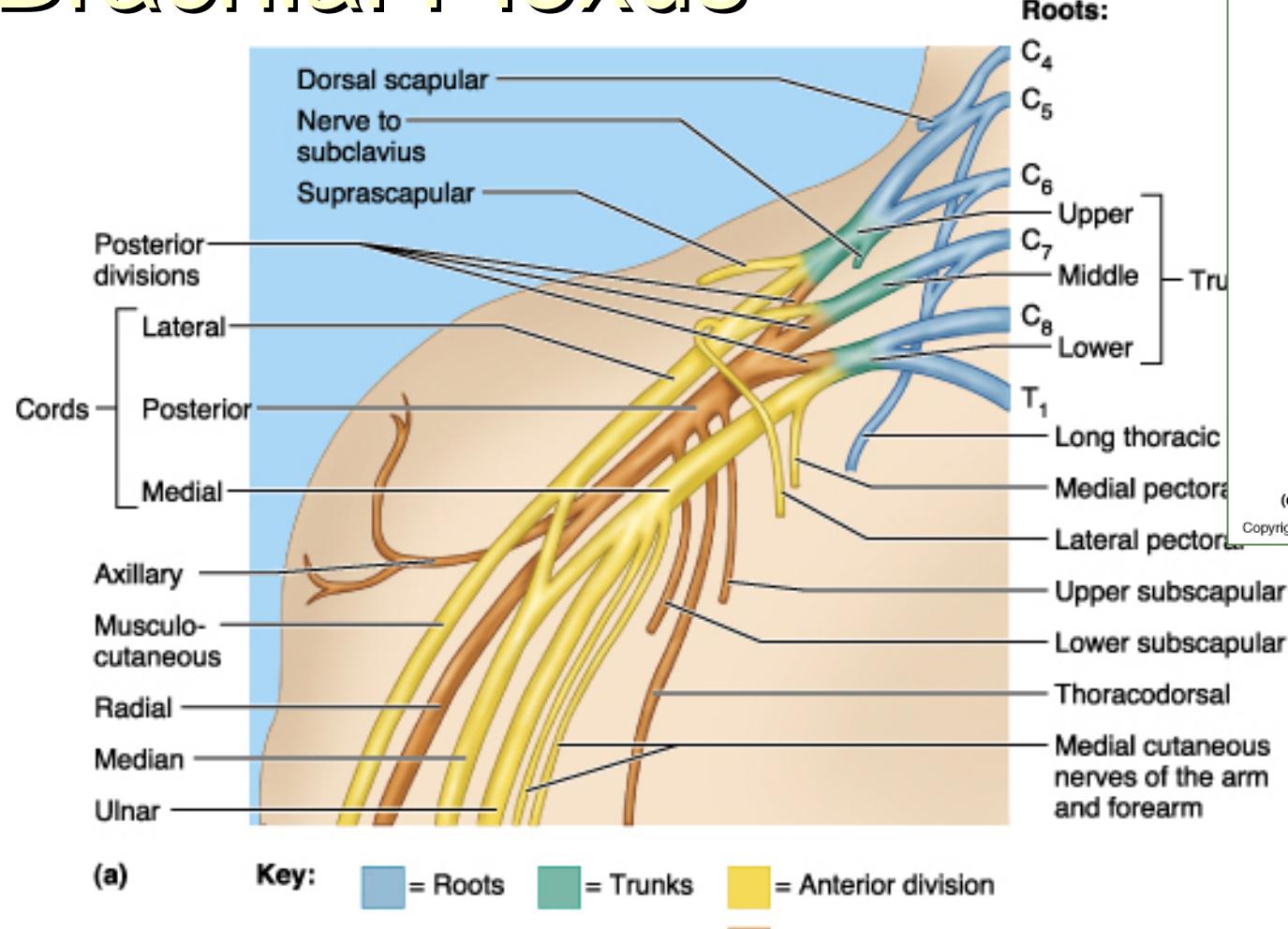
(a)



Posterior compartment of arm  
(extends elbow)



# Brachial Plexus



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M&M, Fig. 14.11

- Posterior Compartment—posterior cord
- Anterior compartment—medial, lateral cords
- Name of cord is relative to axillary artery

## ANTERIOR MUSCLES

- ◆ M-C
  - Biceps
  - brachialis
- ◆ Median
  - Forearm flexors
  - Thumb intrinsics (1M\$ nerve)
- ◆ Ulnar
  - Flexor carpi ulnaris
  - Hand intrinsics

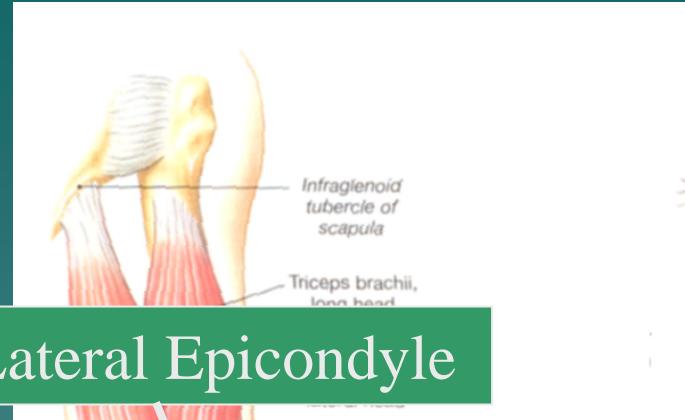
## POSTERIOR MUSCLES

- ◆ Muscles (radial nerve)
  - Triceps
  - Anconeus
  - Brachioradialis
  - Carpal, digit extensors

# Muscles and nerves by compartment

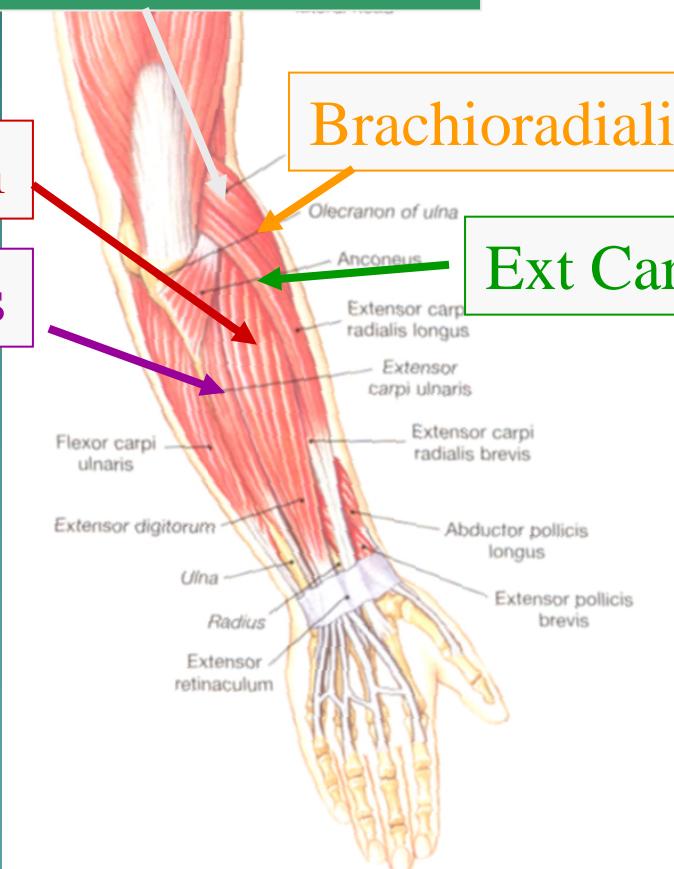
	ANTERIOR	POSTERIOR
NERVES	M-C, ulnar, median	Radial
MOVEMENT	Flexion	Extension
MUSCLES	Biceps, flexors	Triceps, extensors
TWIST	Flexors from medial epicondyle	Extensors from lateral epicondyle

# Forearm



Lateral Epicondyle

Extensor digitorum  
Extensor carpi ulnaris



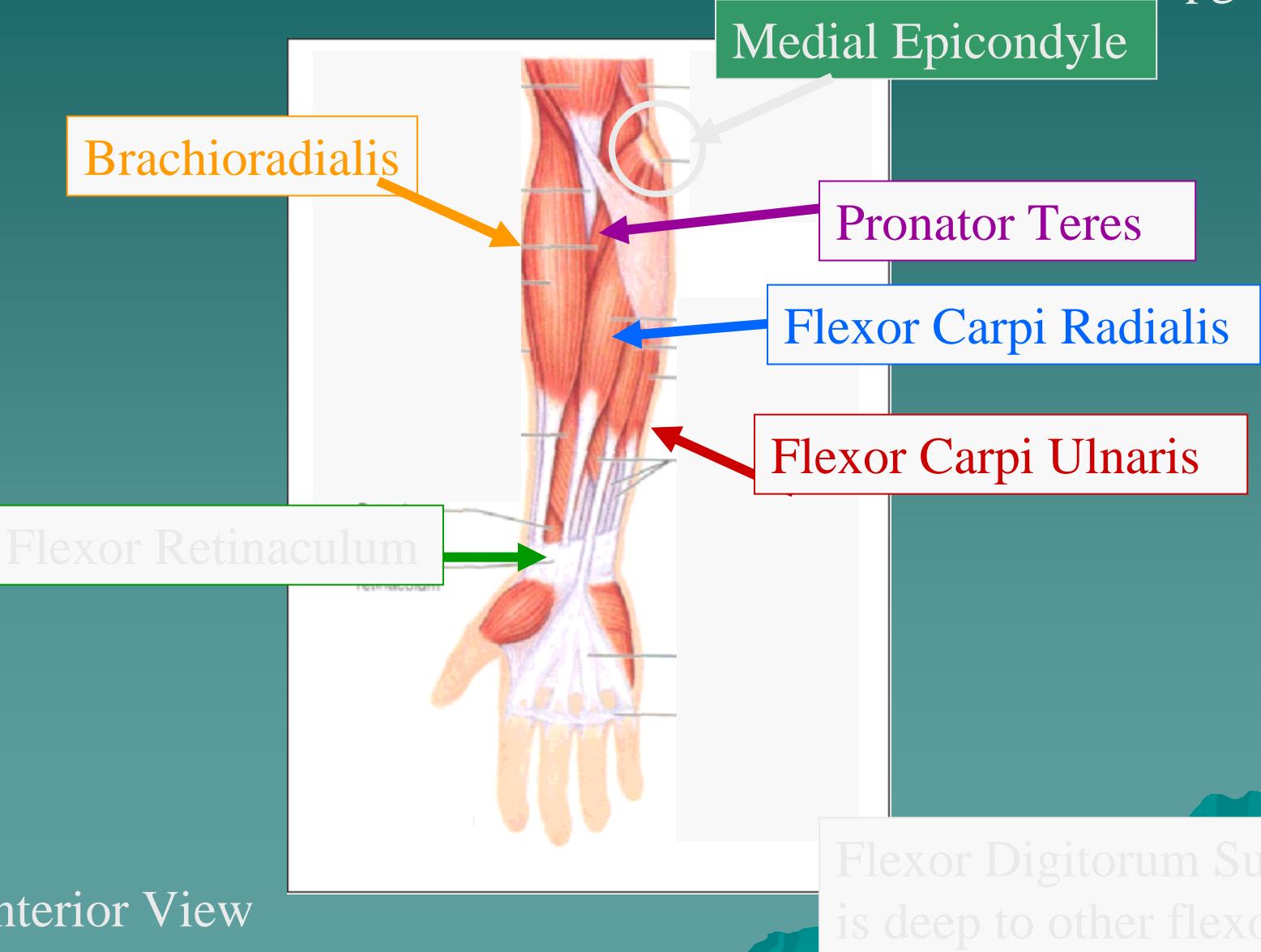
Brachioradialis

Ext Carpi Radialis Longus

Posterior View

# Anterior Compartment Forearm

pg 302

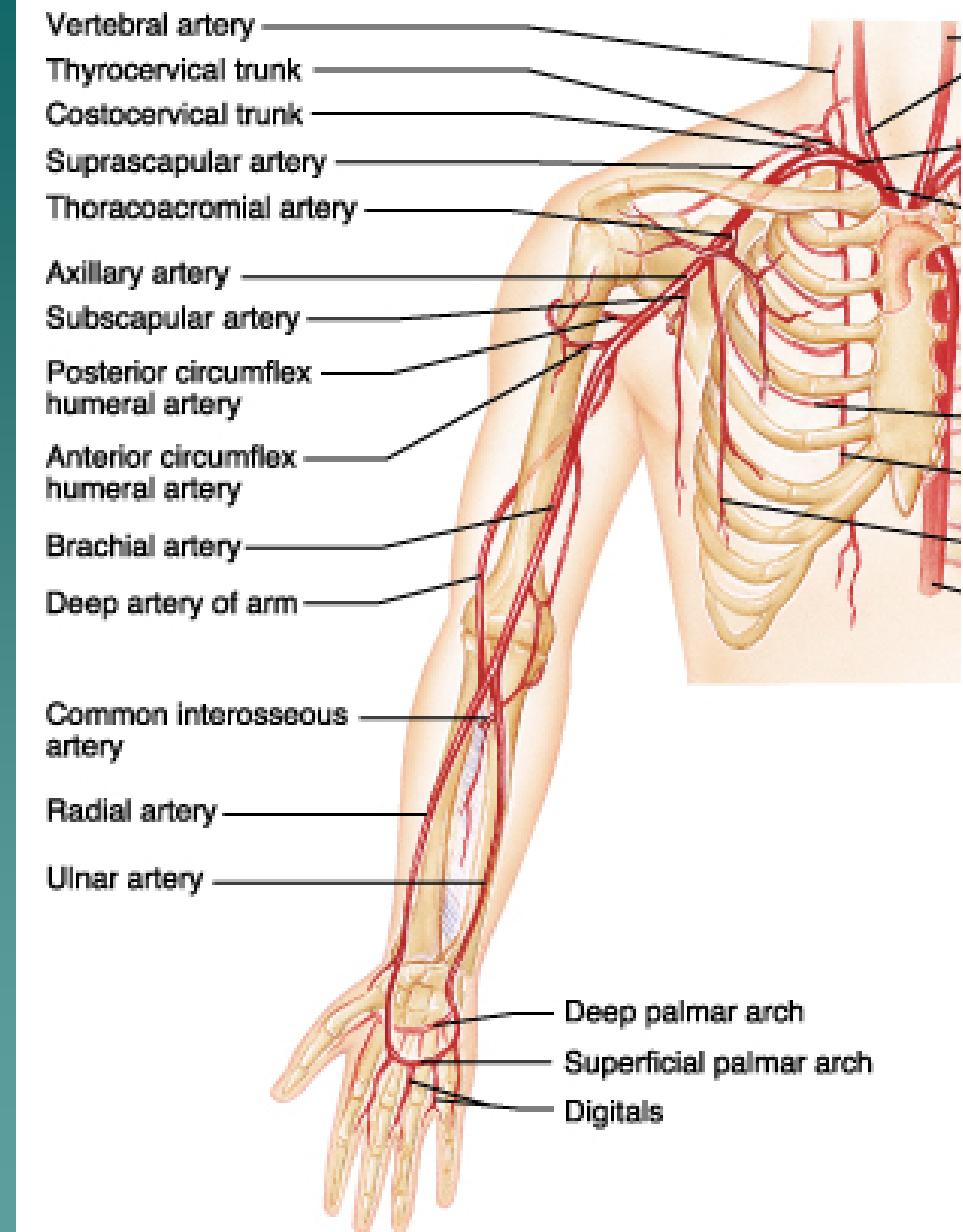


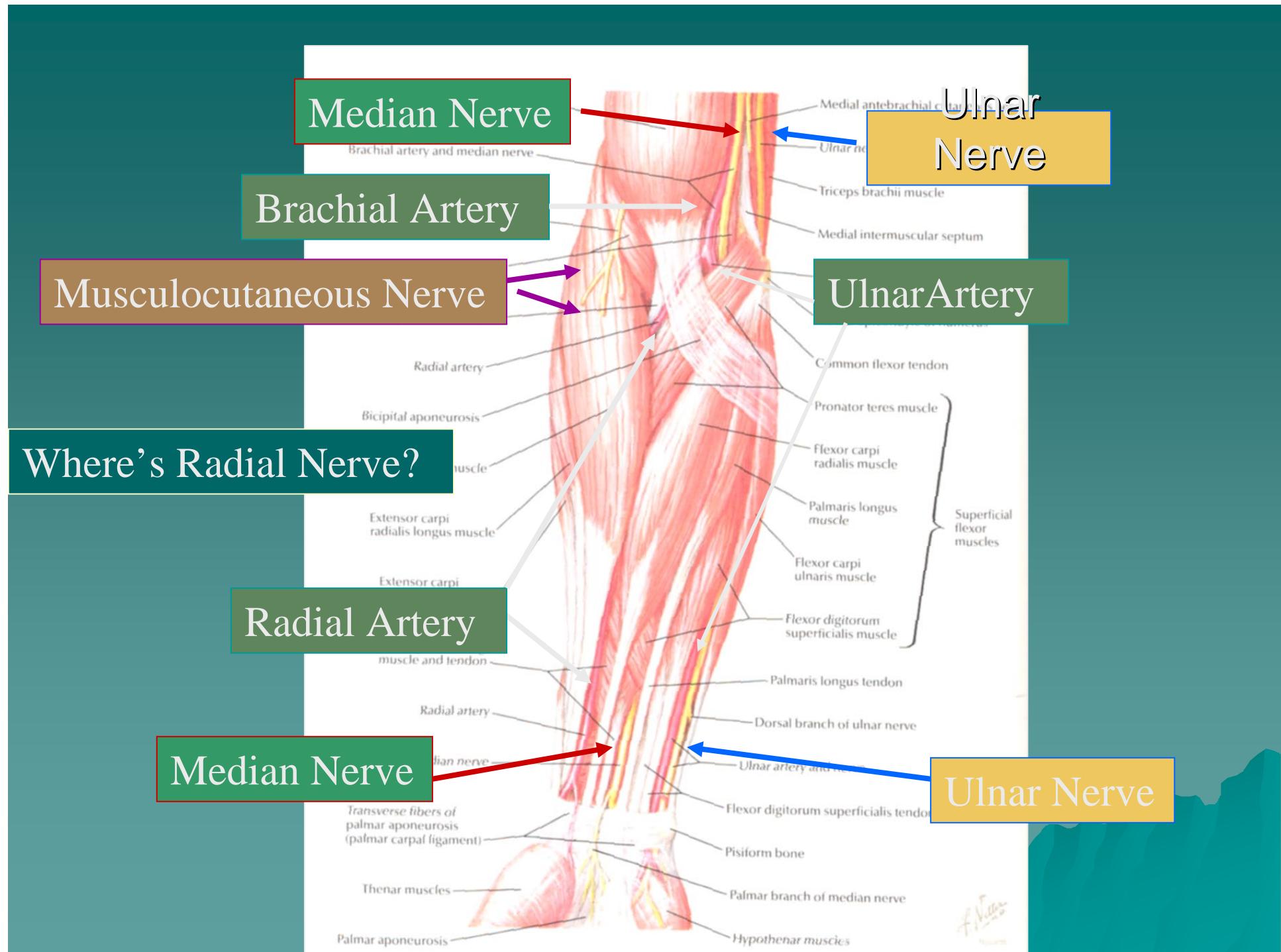
# Routes of nerves (in human)

- ◆ M-C: between biceps brachii and brachialis
- ◆ Median: medial/posterior to biceps, branches into forearm flexors at elbow then to hand through carpal tunnel
  - Recurrent median (1M\$) superficial at wrist to thumb over thenar eminence) deficit - ape's hand
- ◆ Ulnar: medial in arm, posterior to medial epicondyle of humerus (funny bone) down medial forearm medial to carpal tunnel into palm
- ◆ Radial: deep posterior arm around lateral epicondyle of humerus to forearm (deep

# Vascular supply

- ◆ Subclavian→axillary  
→radial (same street, new street sign every block)
- ◆ Collateral circulation
  - Posterior/anterior circumflex humeral
  - Deep brachial a.
- ◆ Radial a. (with median n.) →deep palmar arch
- ◆ Ulnar a. (with ulnar n.) →superficial palmar arch





# Axilla = Armpit

◆ Region between arm and chest

◆ Boundaries

- Ventral - pectoral muscles

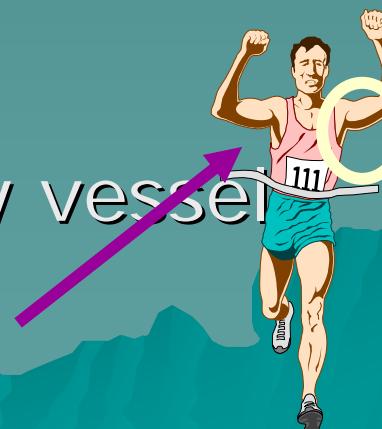
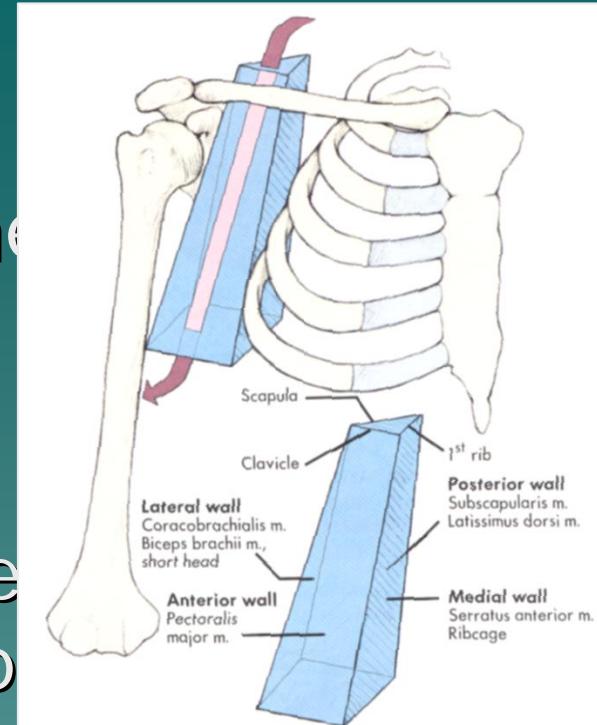
- Dorsal = latissimus dorsi, teres major, subscapularis

- Medial = serratus ventralis

- Lateral = bicipital groove of humerus

◆ Contents

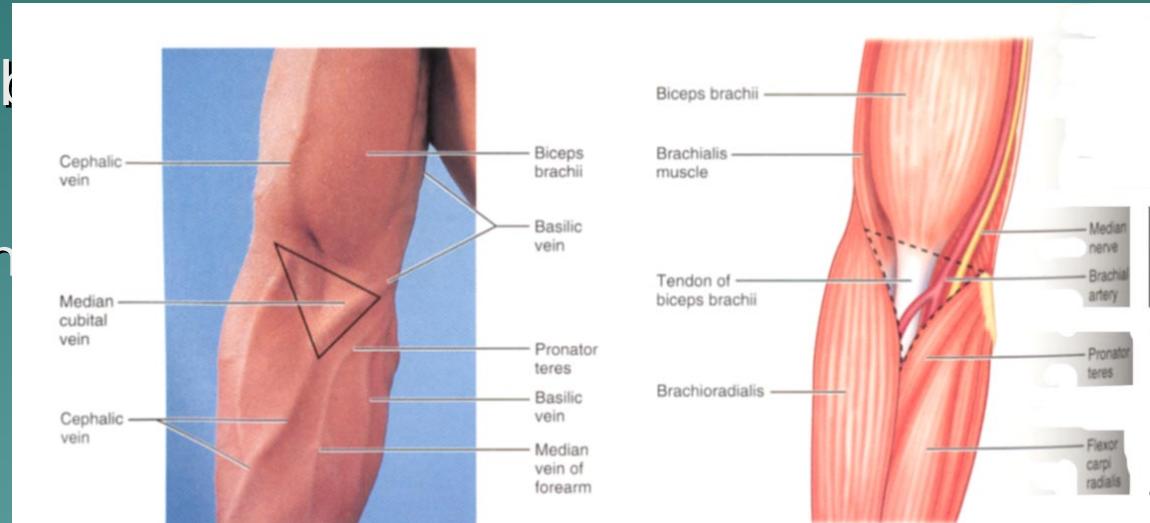
- Axillary lymph nodes, Axillary vessels, Brachial Plexus



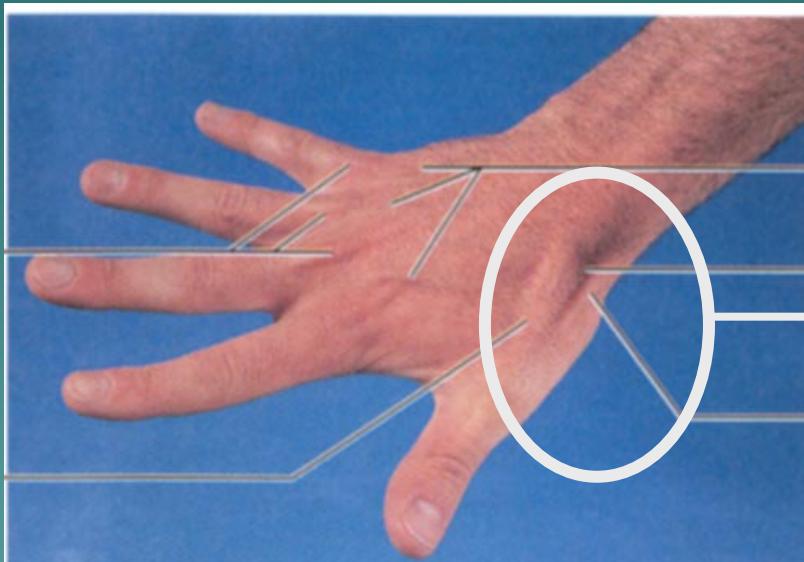
# Surface Anatomy of Upper Limb

- ◆ Biceps + Triceps brachii
- ◆ Olecrown Process
- ◆ Medial Epicondyle
- ◆ Cubital Fossa

- Anterior surface elbow
- Contents
  - ◆ Median Cubital Vein
  - ◆ Brachial Artery
  - ◆ Median Nerve
- Boundaries
  - ◆ Medial= Pronator teres
  - ◆ Lateral= Brachioradialis
  - ◆ Superior= Line between epicondyles



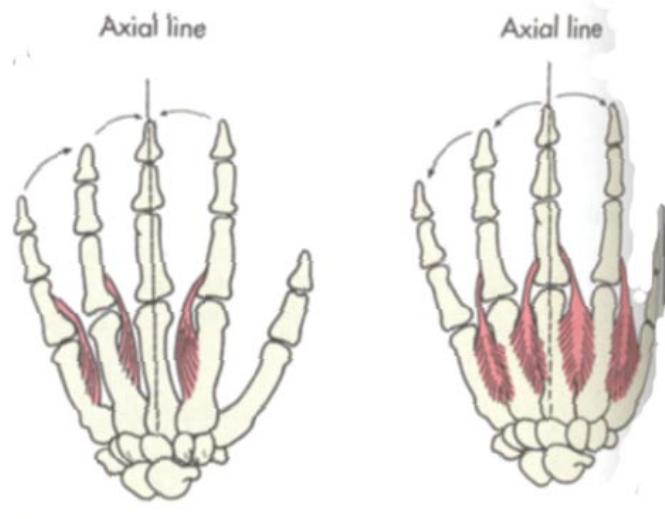
# Surface Anatomy of Upper Limb



pg 306, 788

- ◆ Carpal Tunnel
  - Carpals concave anteriorly
  - Carpal ligament covers it
  - Contains: long tendons, Median nerve
  - Inflammation of tendons = compression of Median nerve

- ◆ Anatomical Snuffbox
  - Lateral = E. pollicis brevis
  - Medial = E. pollicis longus
  - Floor = scaphoid



Suggestion: a muscle table organized by

- Joint crossed?
- Nerve innervating?
- Action?
- Compartments?
- All of the above?

MUSCLE	ACTION	ORIGIN	INSERTION	INNERVATION (cord to nerve)
Biceps	Flex, sup.	Humerus, glenoid	Radial tuberosity	Medial cord—M-C.