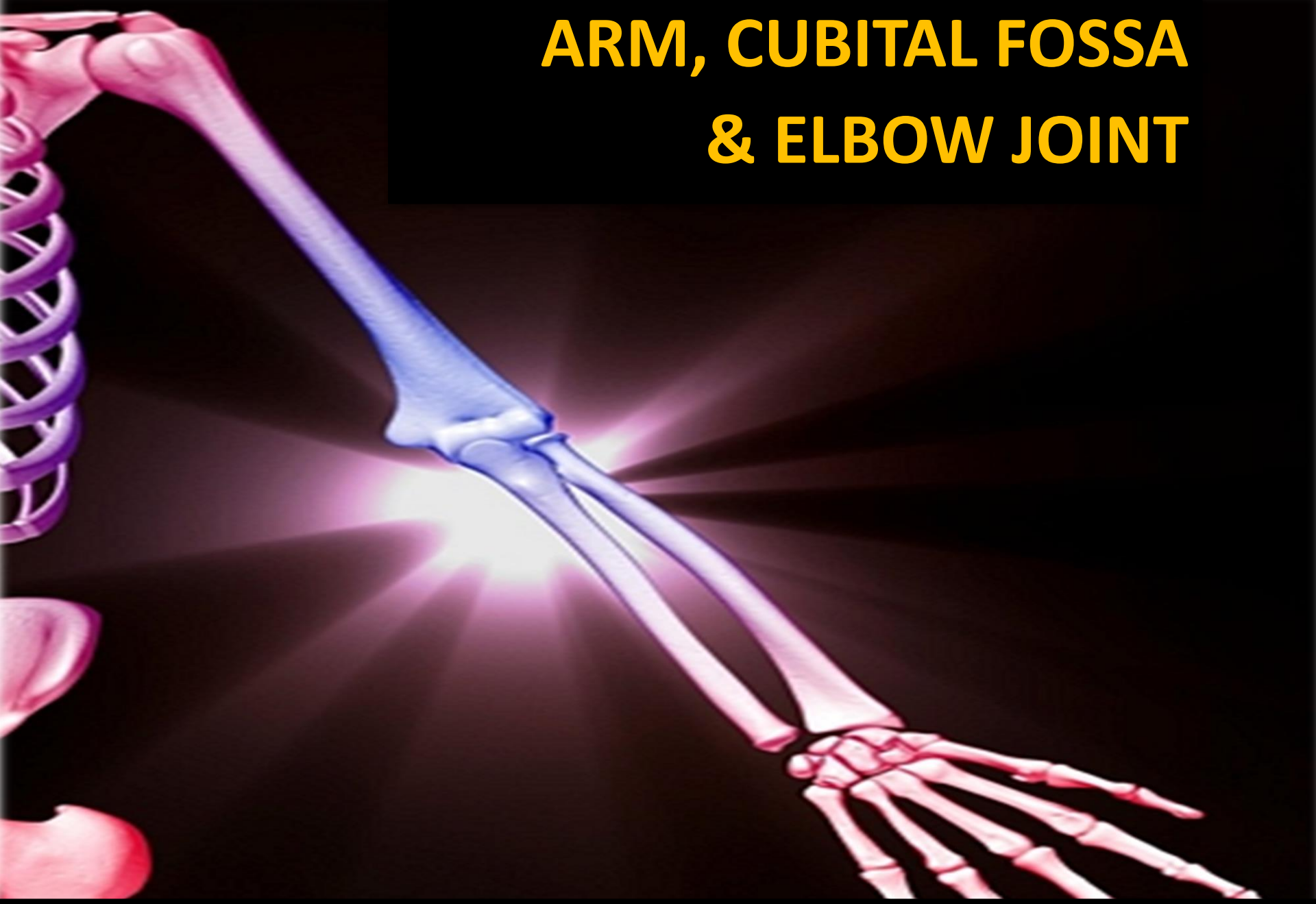
ARM, CUBITAL FOSSA & ELBOW JOINT



Drs. Sanaa Alshaarawy & Khaleel Alyahya

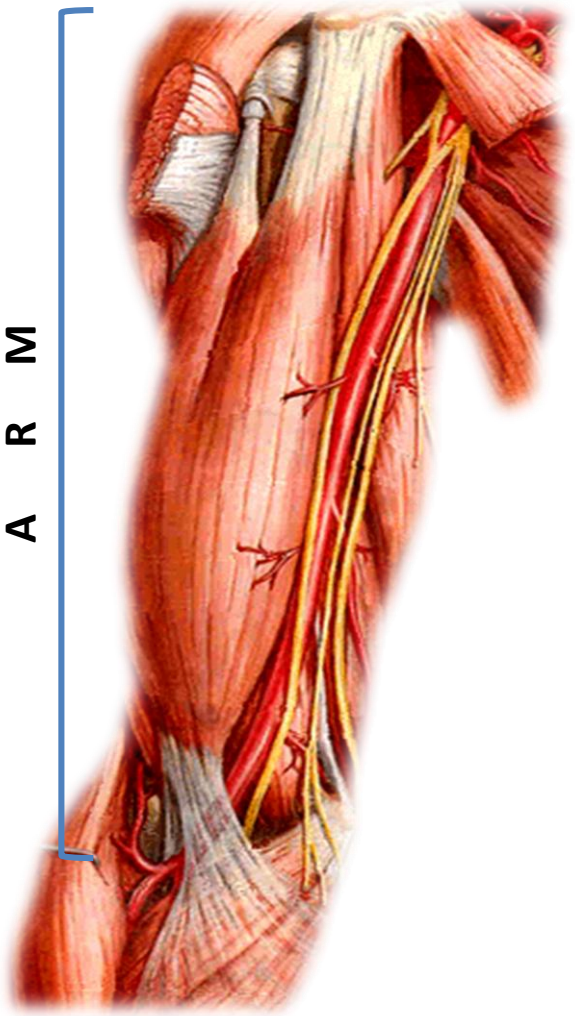
OBJECTIVES

- At the end of the lecture, students should:
  - Describe the attachments, actions and innervations of:
    - ✓ Biceps brachii
    - ✓ Coracobrachialis
    - ✓ Brachialis
    - ✓ Triceps brachii
  - Demonstrate the following features of the elbow joint:
    - ✓ Articulating bones
    - ✓ Capsule
    - ✓ Lateral & medial collateral ligaments
    - ✓ Synovial membrane
  - Demonstrate the **movements** : **flexion** and **extension** of the elbow.
  - List the **main muscles** producing the above movements.
  - Define the **boundaries of the cubital fossa** and enumerate **its contents.**

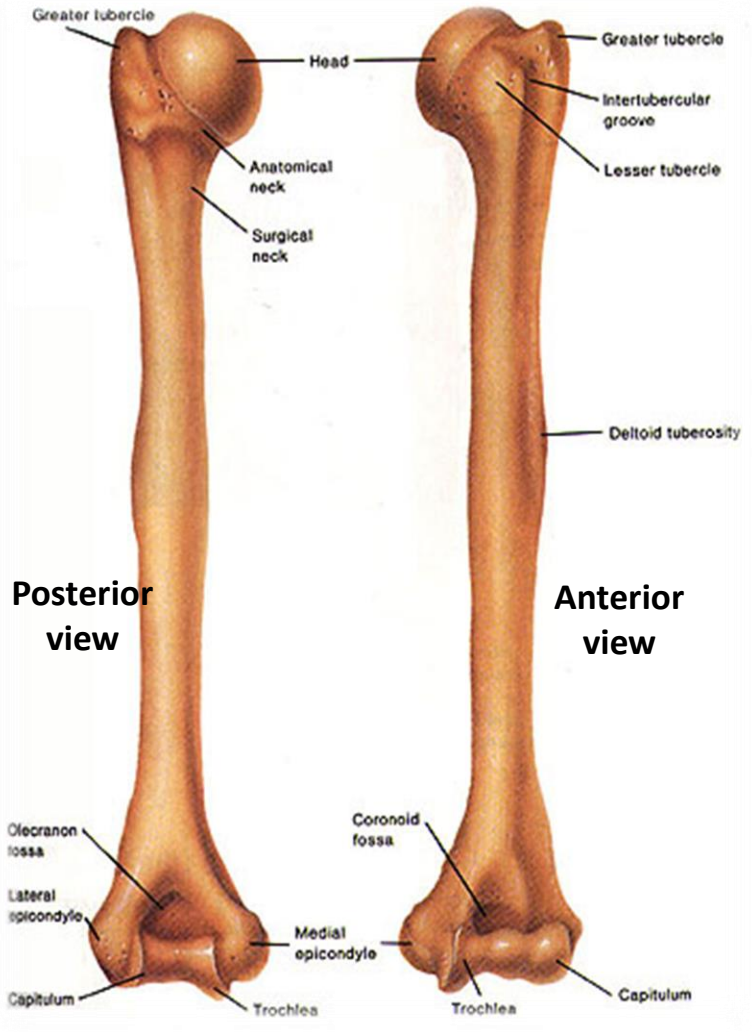
The ARM

Shoulder

Elbow



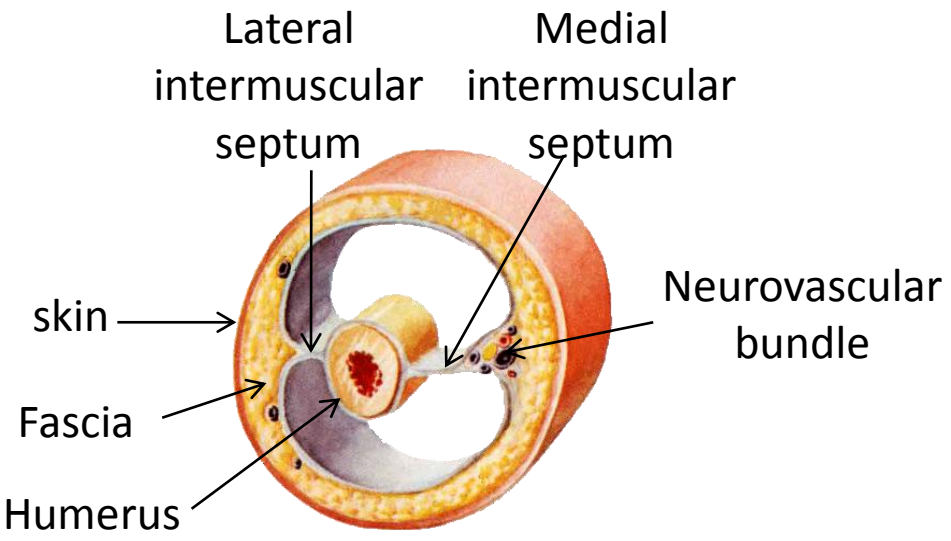
Arm



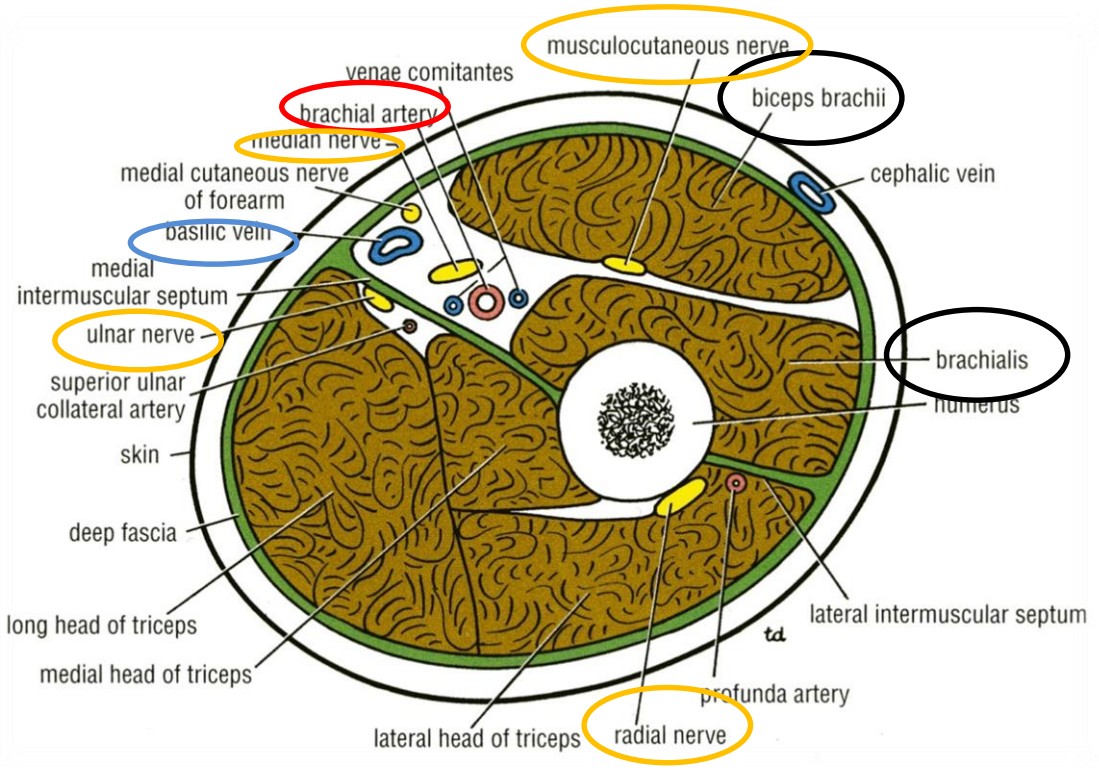
Humerus

The ARM

- The lateral and medial intermuscular septa divide the distal part of the arm into two compartments:
  - Anterior
  - Posterior

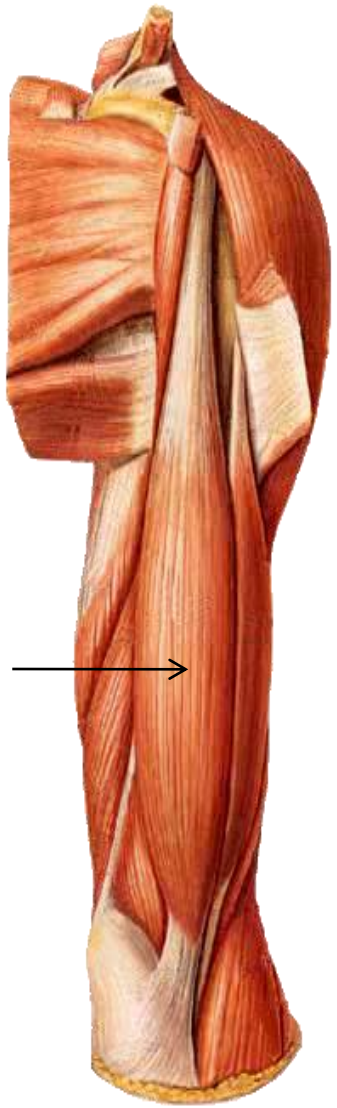


Anterior Fascial Compartment Contents

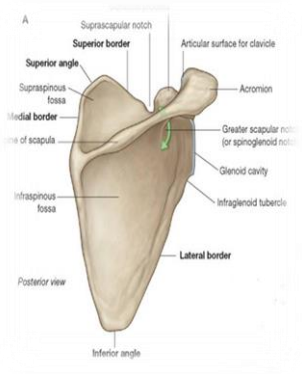


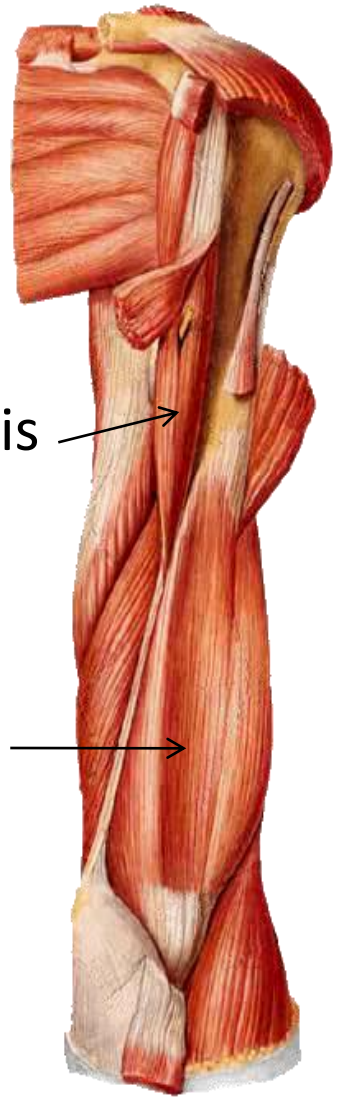
- **Muscles**: Biceps brachii, Coracobrachialis &Brachialis.
- **Blood Vessels**: Brachial artery & Basilic vein.
- **Nerves** : Musculocutaneous, Median, Radial & Ulnar.

Muscles of the Anterior Compartment



Biceps brachii



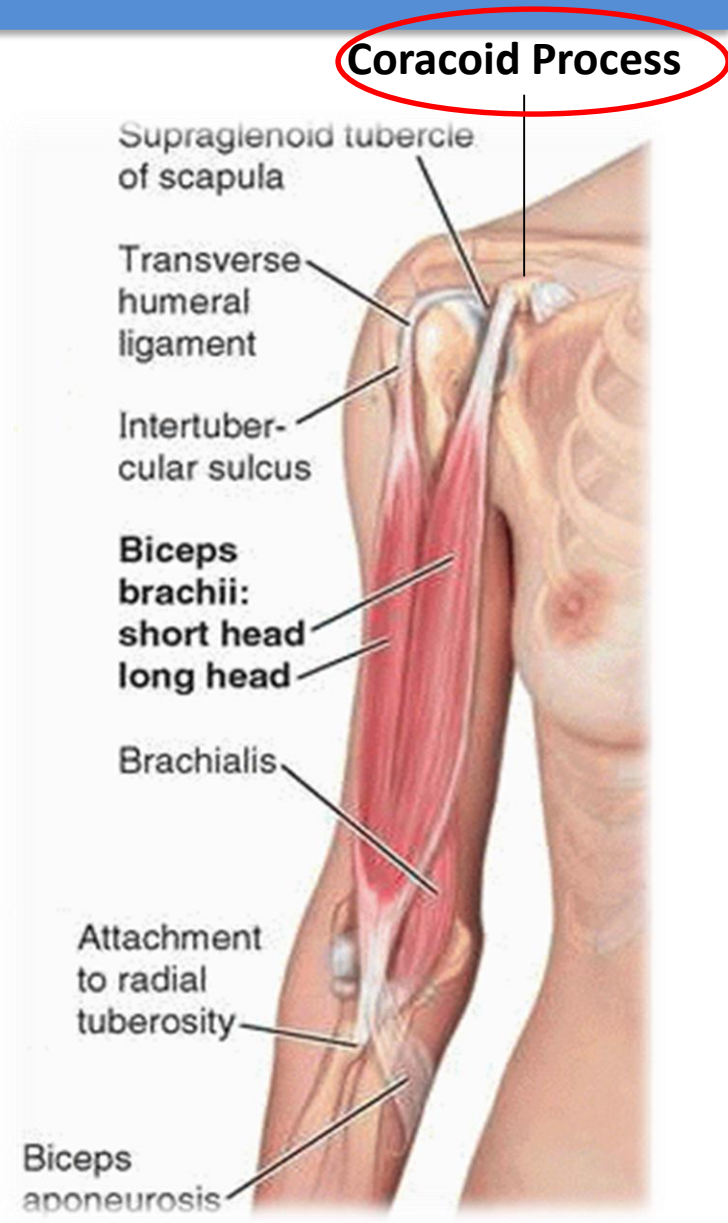


Coracobrachialis

Brachialis

Biceps Brachii

- **Origin:** Two heads:
  - **Long Head (lateral head)** from **supraglenoid tubercle** of **scapula (intracapsular)**
  - **Short Head** from the tip of **coracoid process** of **scapula.**
- The two heads join in the middle of the arm



Biceps Brachii

❖ **Insertion:**

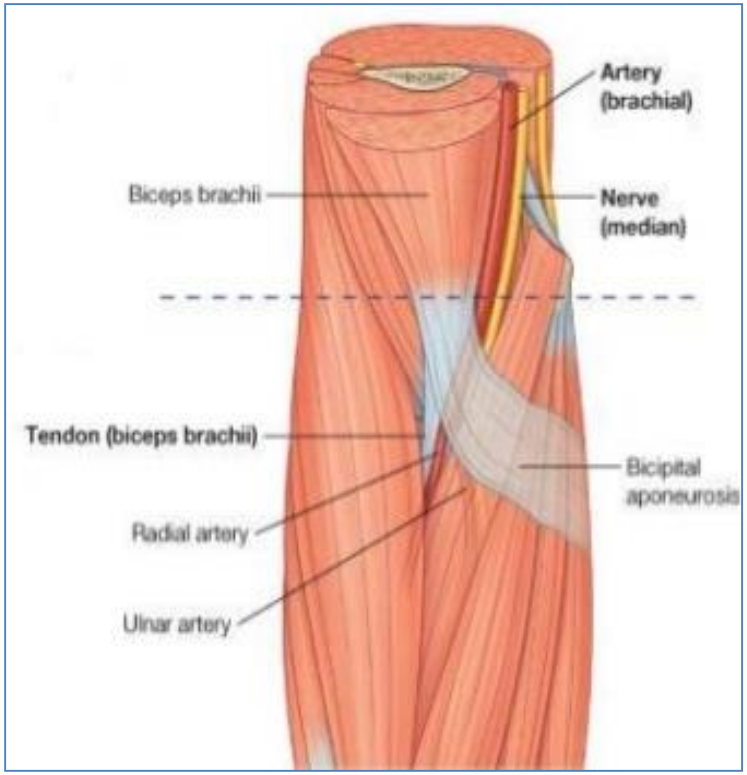
- ➢ into the posterior part of the **radial tuberosity.**
- ➢ into the deep fascia of the medial aspect of forearm **through bicipital aponeurosis.**

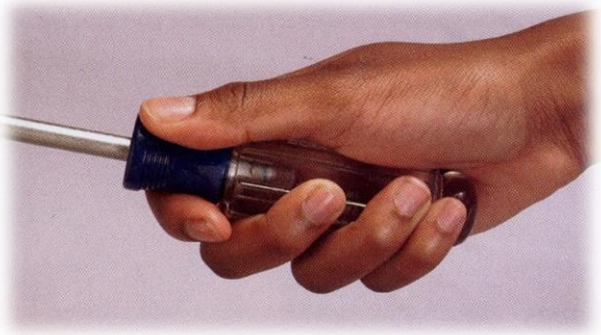
❖ **Nerve supply:**

- ➢ **Musculocutaneous**

❖ **Action:**

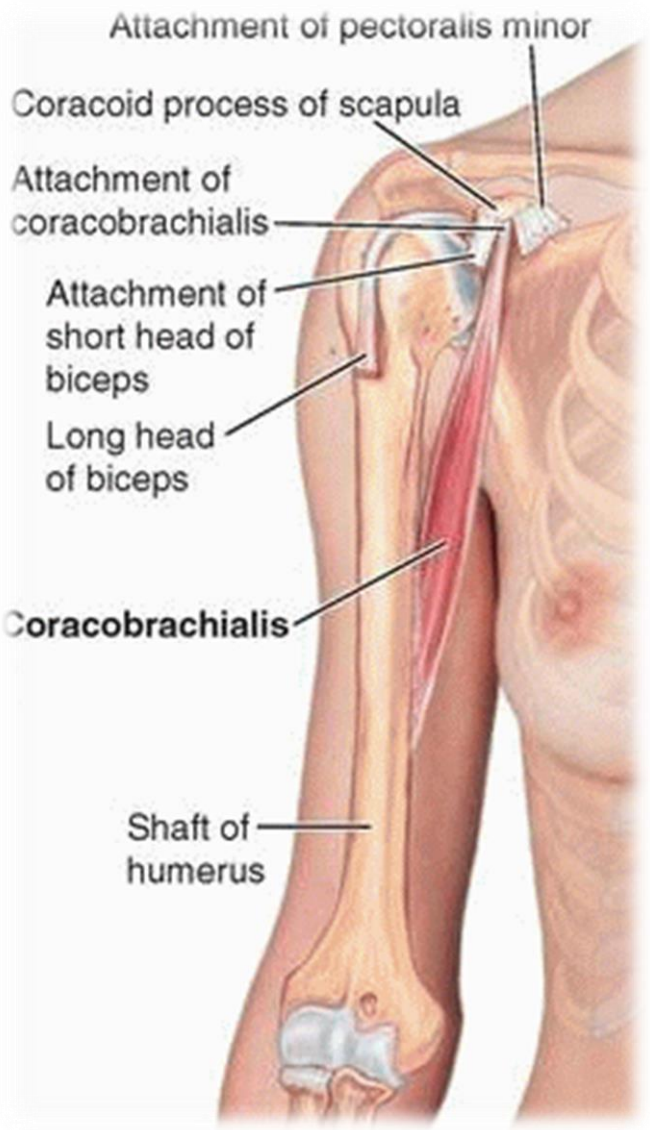
- ➢ **Strong supinator** of the forearm
  - ✓ used in screwing.
- ➢ **Powerful flexor** of elbow
- ➢ Weak flexor of shoulder





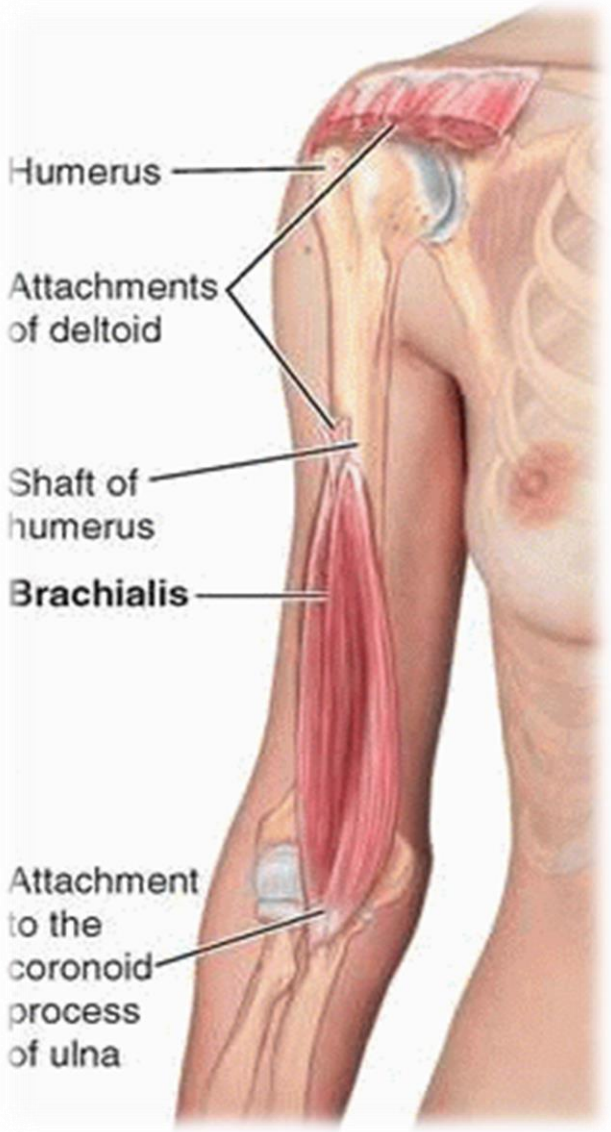
Coracobrachialis

- **Origin:**
  - Tip of the **coracoid process of scapula** (with short head of bicepes brachii).
- **Insertion:**
  - **Middle** of the medial side of the **shaft of the humerus**
- **Nerve supply:**
  - **Musculocutaneous**
- **Action:**
  - **Flexor** & a weak adductor of the **arm**

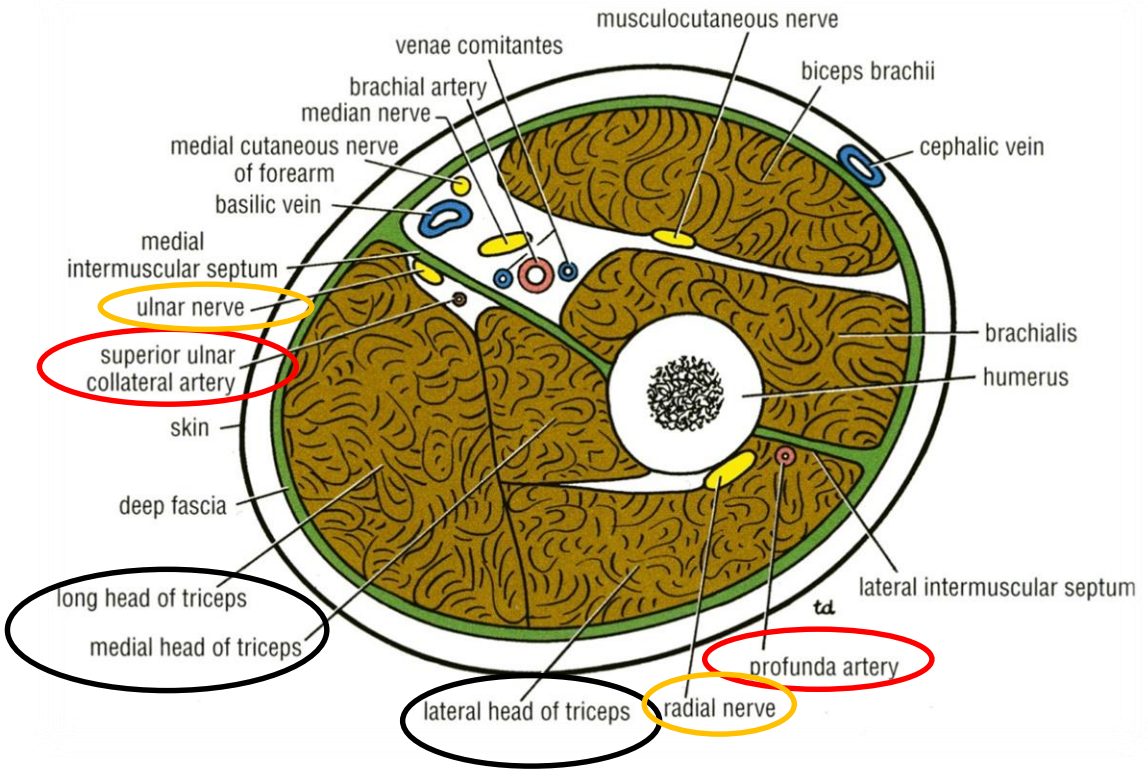


Brachialis

- **Origin:**
  - Front of the **lower half** of **humerus**
- **Insertion:**
  - Anterior surface of **coronoid process of ulna**
- **Nerve supply:**
  - **Musculocutaneous & Radial**
- **Action:**
  - **Strong flexor** of the **forearm**



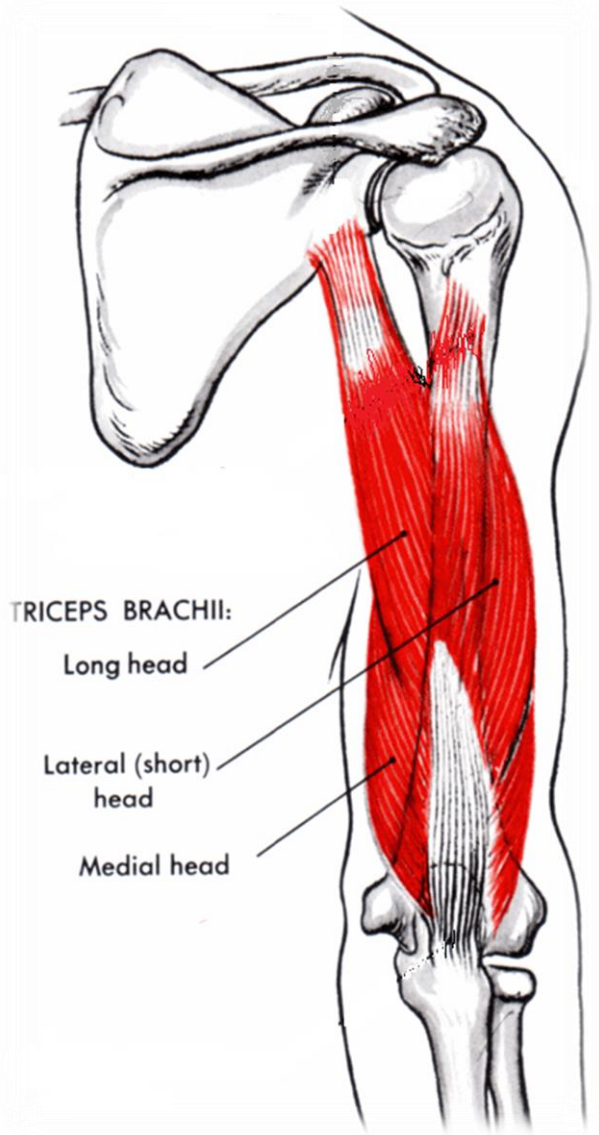
Posterior Fascial Compartment Contents



- **Muscles:** Triceps
- **Vessels:** Profunda brachii & Ulnar collateral arteries
- **Nerves:** Radial & Ulnar

Muscles of the Posterior Compartment

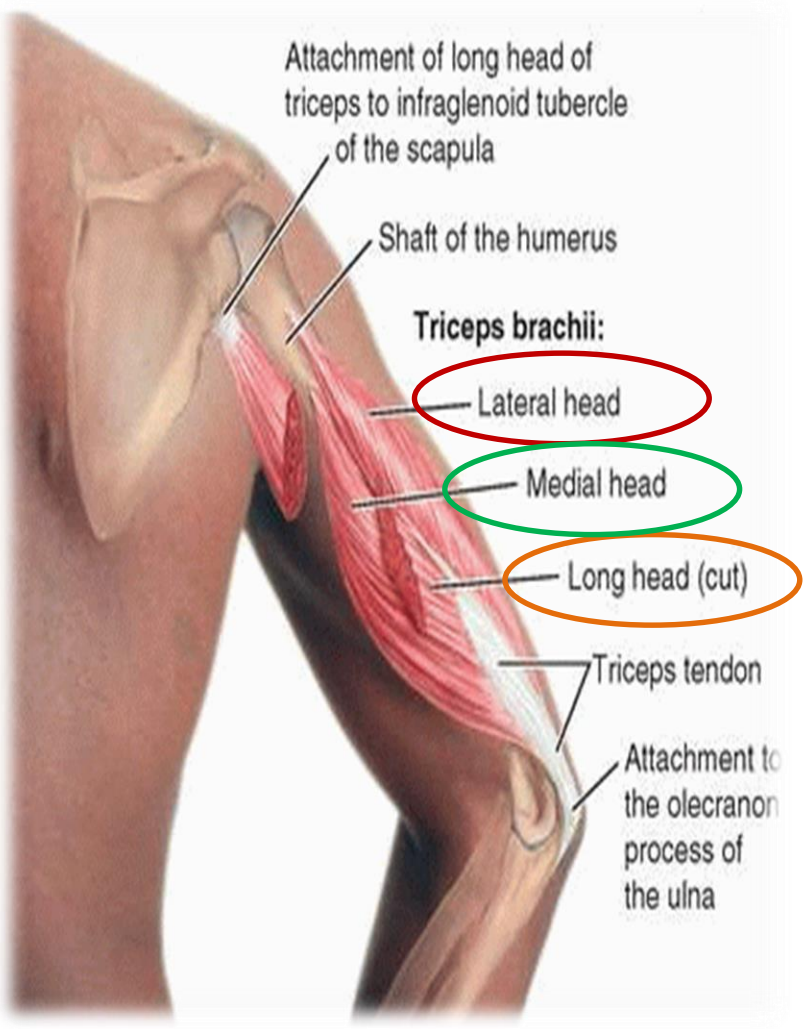
Triceps brachii



Triceps

Origin: Three heads:

- **Long Head** from **infrglenoid tubercle** of the scapula
- **Lateral Head** from the upper half of the **posterior surface** of the shaft of **humerus above** the **spiral groove**
- **Medial Head** from the lower half of the **posterior surface** of the shaft of **humerus below** the **spiral groove**



Triceps

❖ **Insertion:**

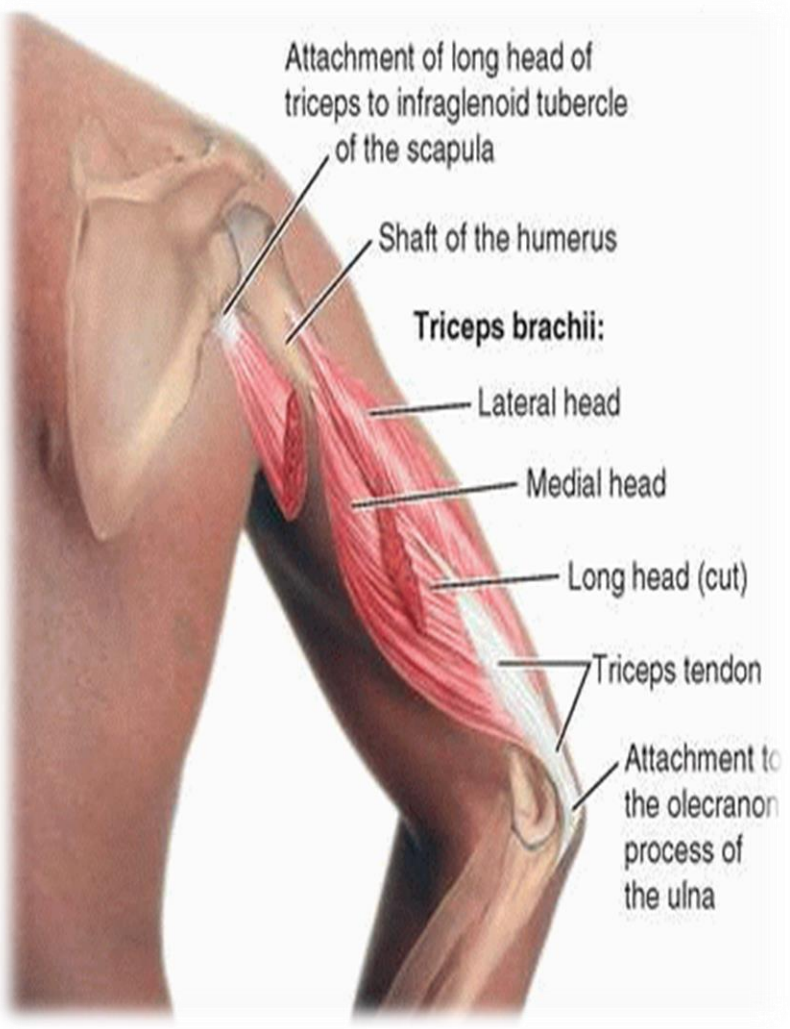
➢ **Common tendon** inserted into the upper surface of the **olecranon process** of **ulna**

❖ **Nerve supply:**

➢ **Radial nerve**

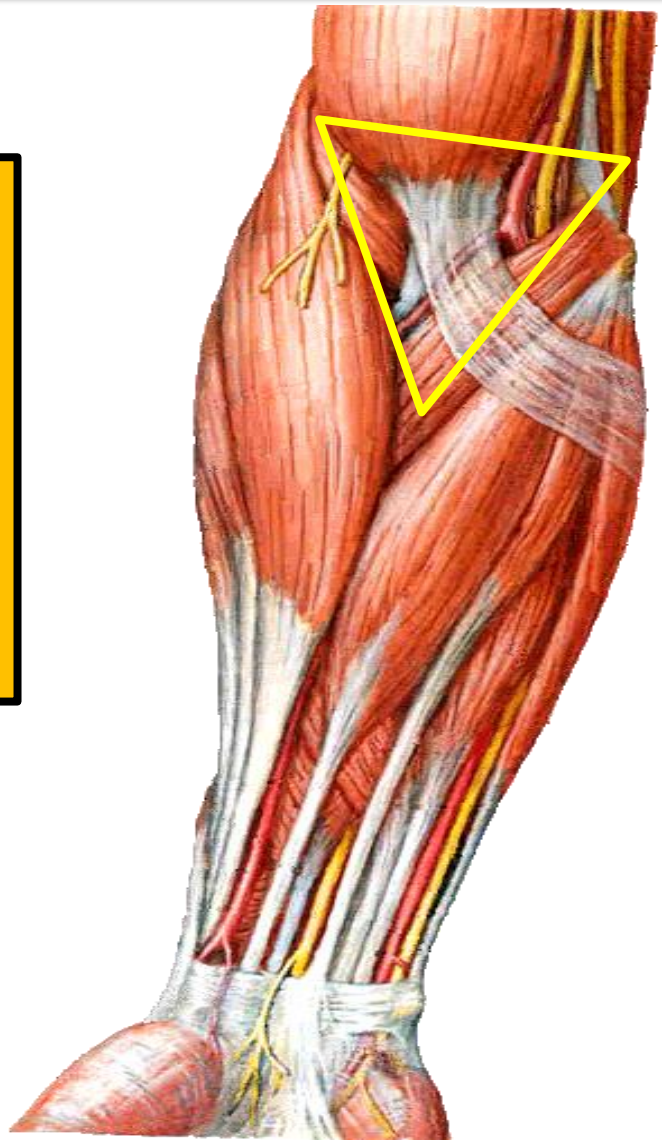
❖ **Action:**

➢ **Strong extensor** of the **elbow joint**



Cubital Fossa

is a **triangular depression** that **lies** in **front** of the **elbow**



Boundaries of Cubital Fossa

❖ **Base:**

- Line drawn through the two epicondyles of humerus

❖ **Laterally:**

- Brachioradialis

❖ **Medially:**

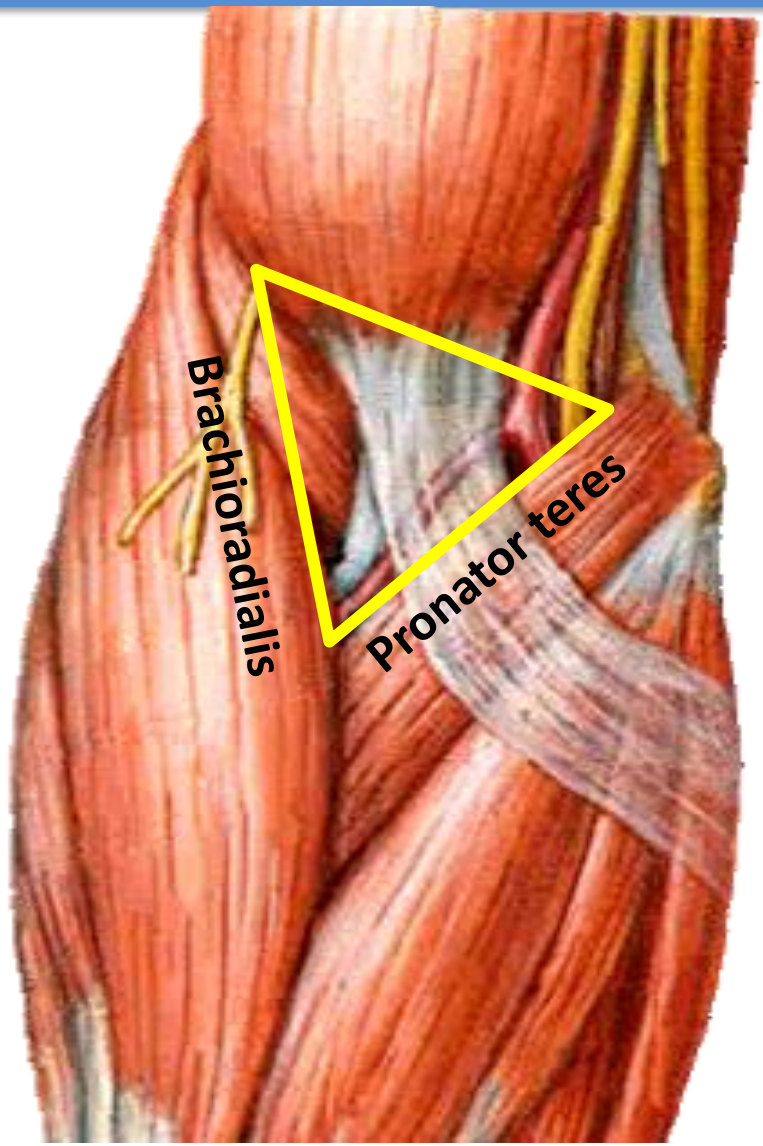
- Pronator teres

❖ **Roof:**

- Skin, superficial & deep fascia and bicipital aponeurosis

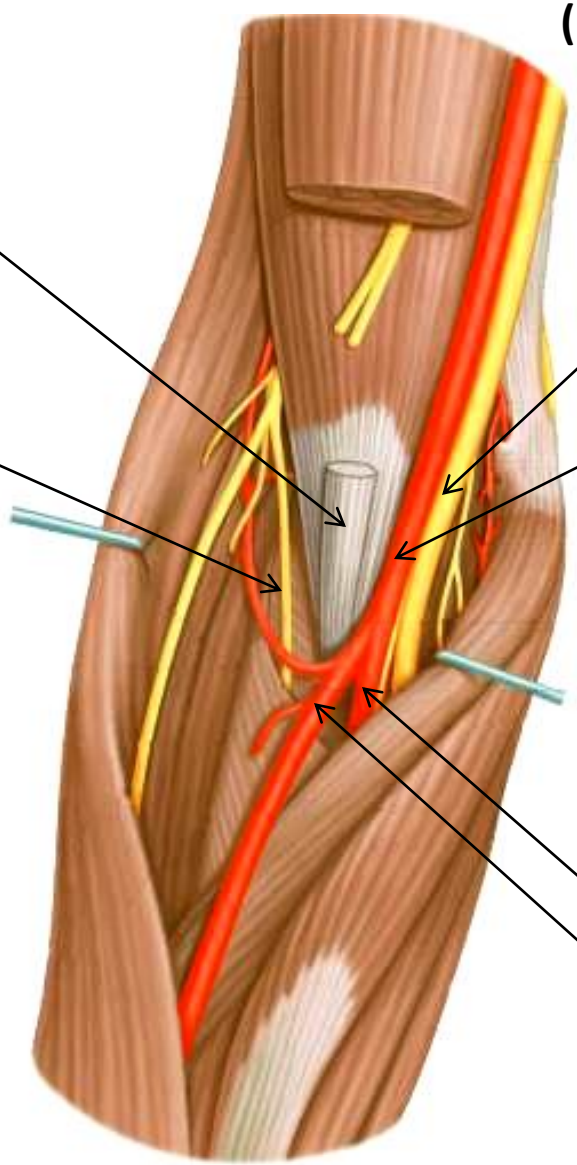
❖ **Floor:**

- **Brachialis** medially and **supinator** laterally.



Contents of Cubital Fossa

(From medial to lateral side)



3. Biceps brachii tendon

4. Deep branch of radial nerve

1. Median nerve

2. Brachial artery divides into radial & ulnar arteries.

Ulnar artery

Radial artery

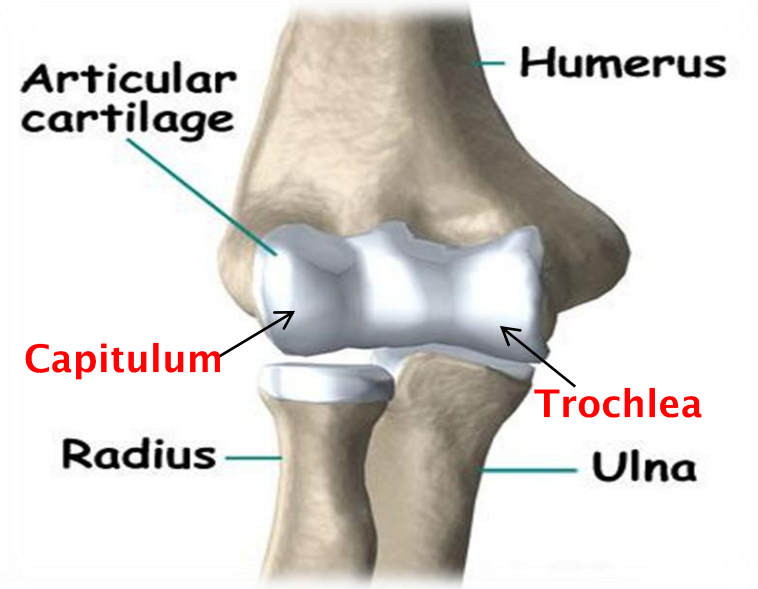
ELBOW Joint

Uniaxial, Synovial Hinge joint

Articulation

- Trochlea and capitulum of the **humerus above**
- Trochlear notch of **ulna** and the head of **radius below**

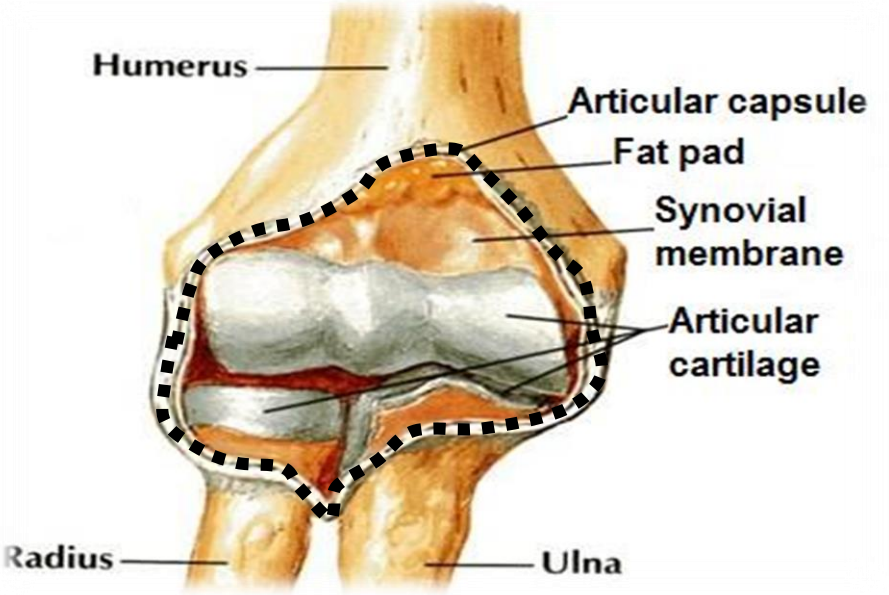
❖ The articular surfaces are covered with articular (hyaline) cartilage.

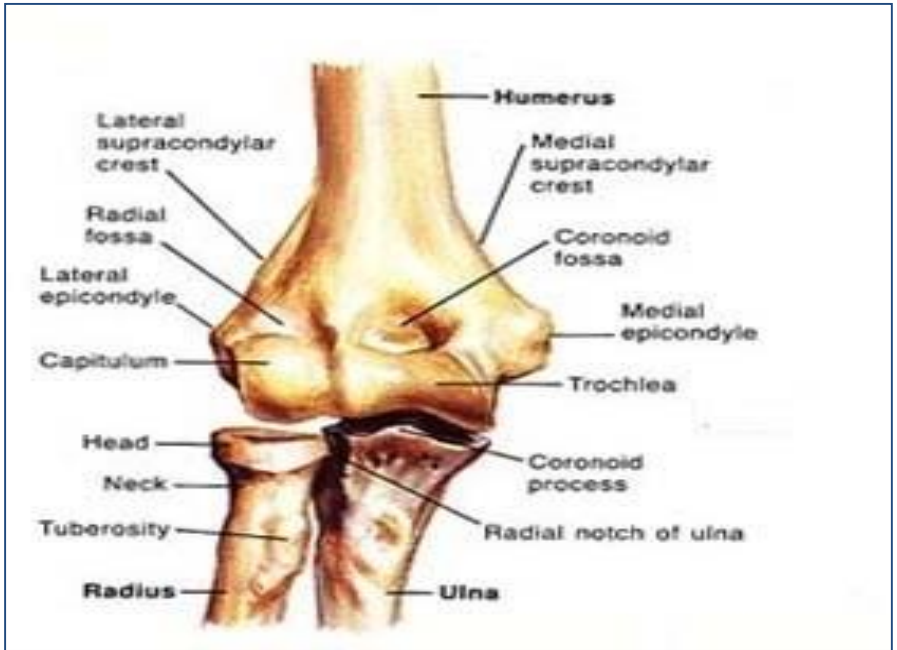


Capsule

Anteriorly: attached

- **Above**
  - ✓ To the **humerus** along the **upper margins** of the **coronoid** and **radial fossa** and to the **front** of the **medial** and **lateral epicondyles.**
- **Below**
  - ✓ To the **margin** of the **coronoid process** of the **ulna** and to the **anular ligament,** which **surrounds the head** of the **radius.**

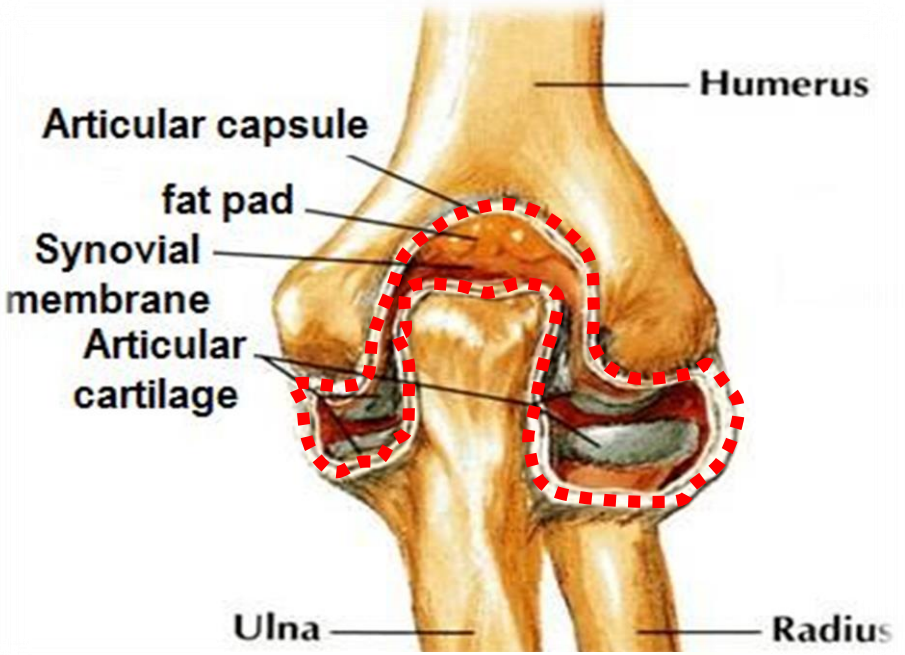




Capsule

Posteriorly: attached

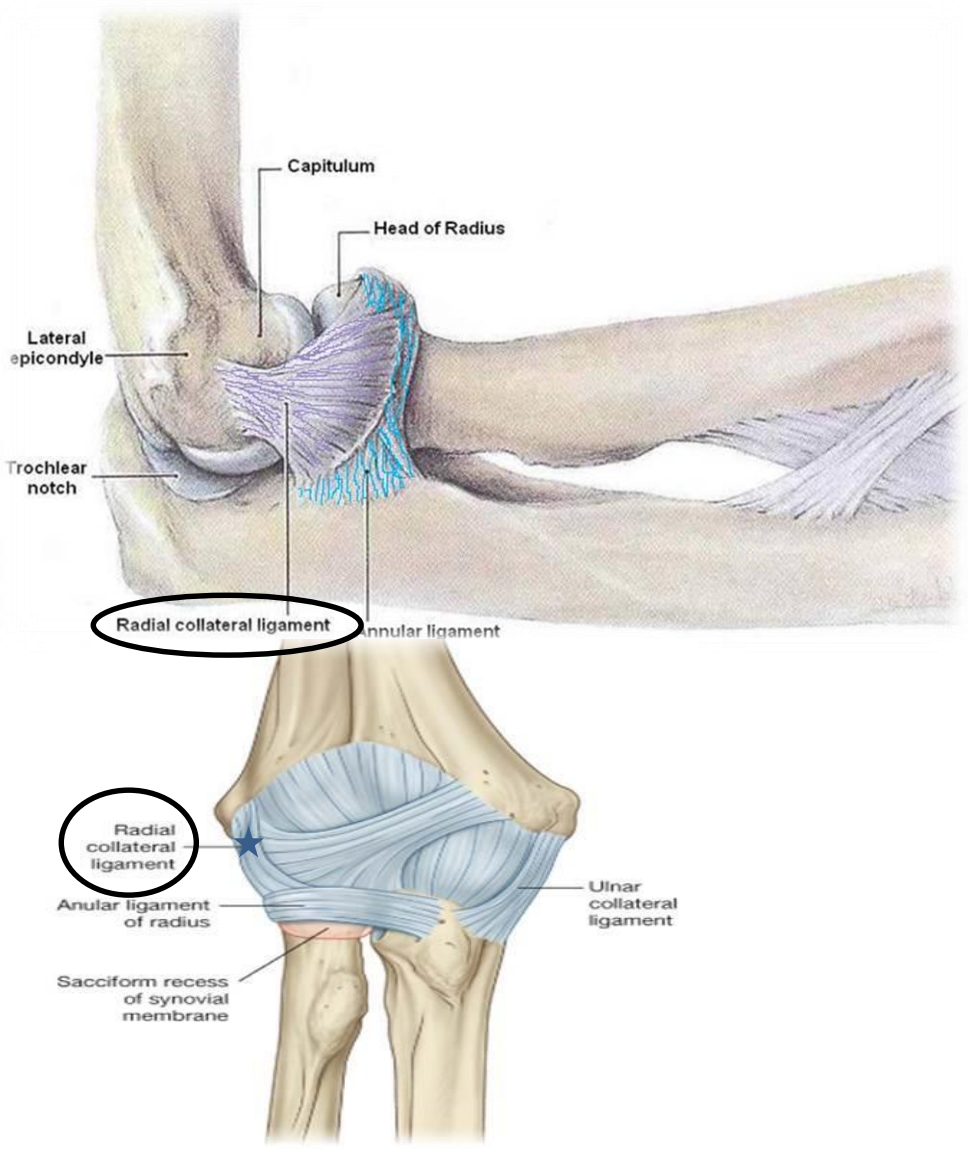
- **Above**
  - ✓ To the **margins** of the **olecranon fossa** of the **humerus.**
- **Below**
  - ✓ To the **upper margin** and **sides** of the **olecranon process** of the **ulna** and to the **anular ligament.**



Ligaments

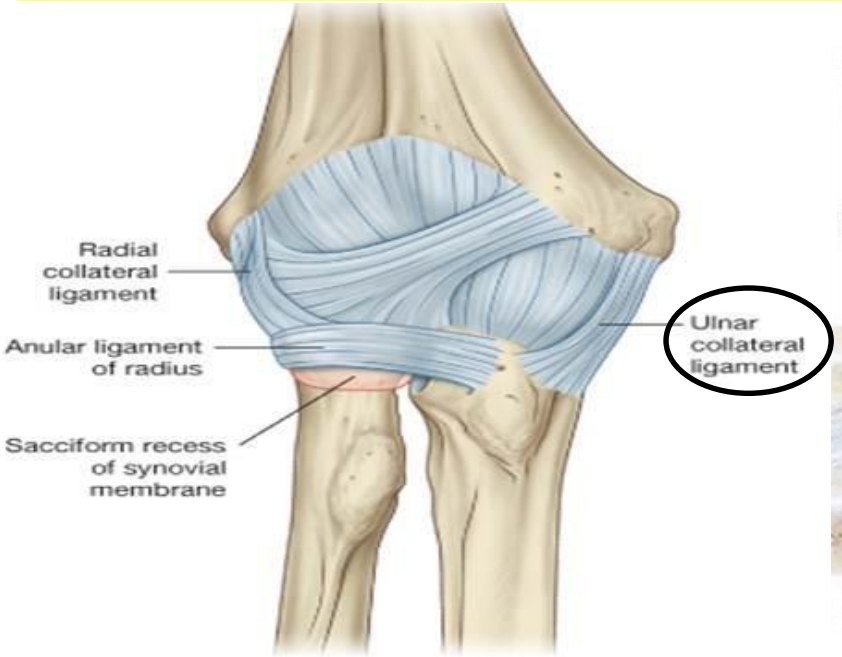
Lateral (radial collateral) ligament

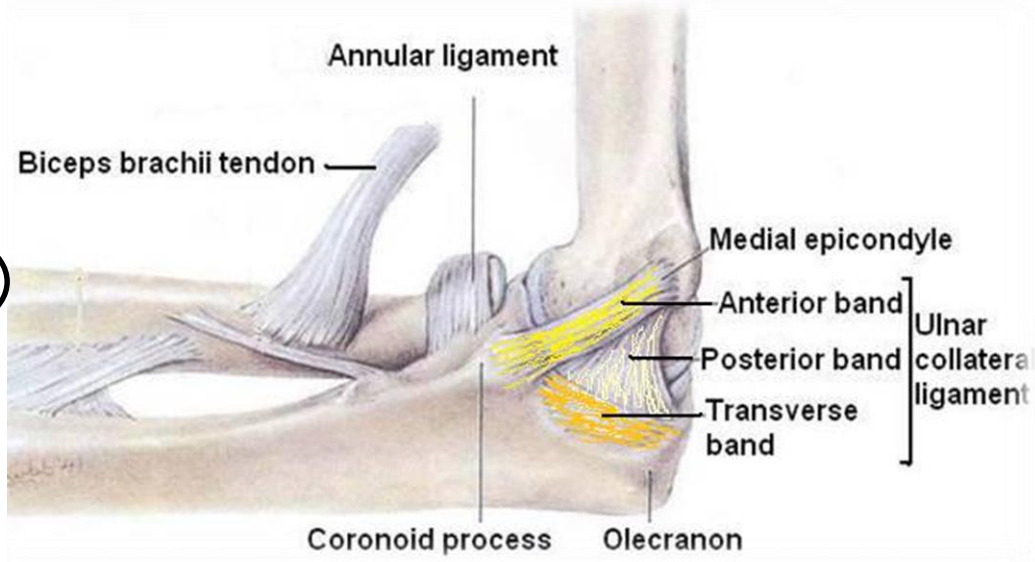
- ❖ **Triangular in shape:**
- ❖ **Apex**
  - ➢ Attached to the **lateral epicondyle of humerus**
- ❖ **Base**
  - ➢ Attached to the upper margin of **annular ligament.**



Ligaments

Medial (ulnar collateral) ligament



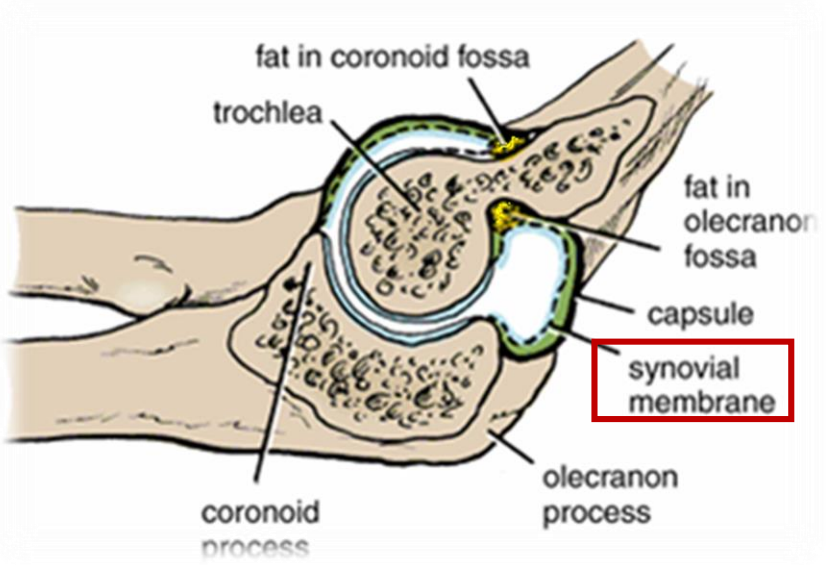


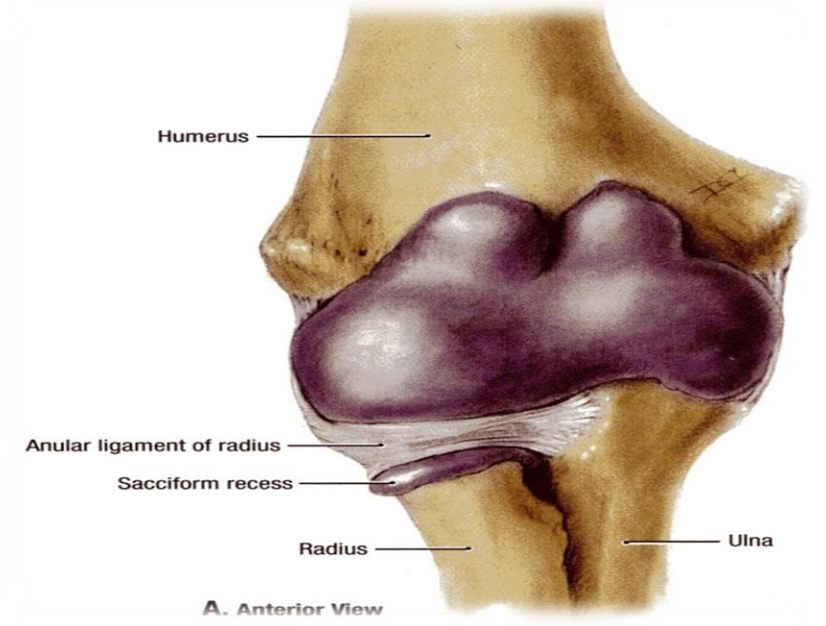
- **Anterior strong cord-like band:**
  - Between **medial epicondyle** and the **coronoid process** of ulna
- **Posterior weaker fan-like band:**
  - Between **medial epicondyle** and the **olecranon process** of ulna
- **Transverse band:**
  - Passes **between** the **anterior** and **posterior bands**

Synovial Membrane

- This **lines the inner surface of the capsule** and covers fatty pads in the floors of the coronoid, radial, and olecranon fossa.

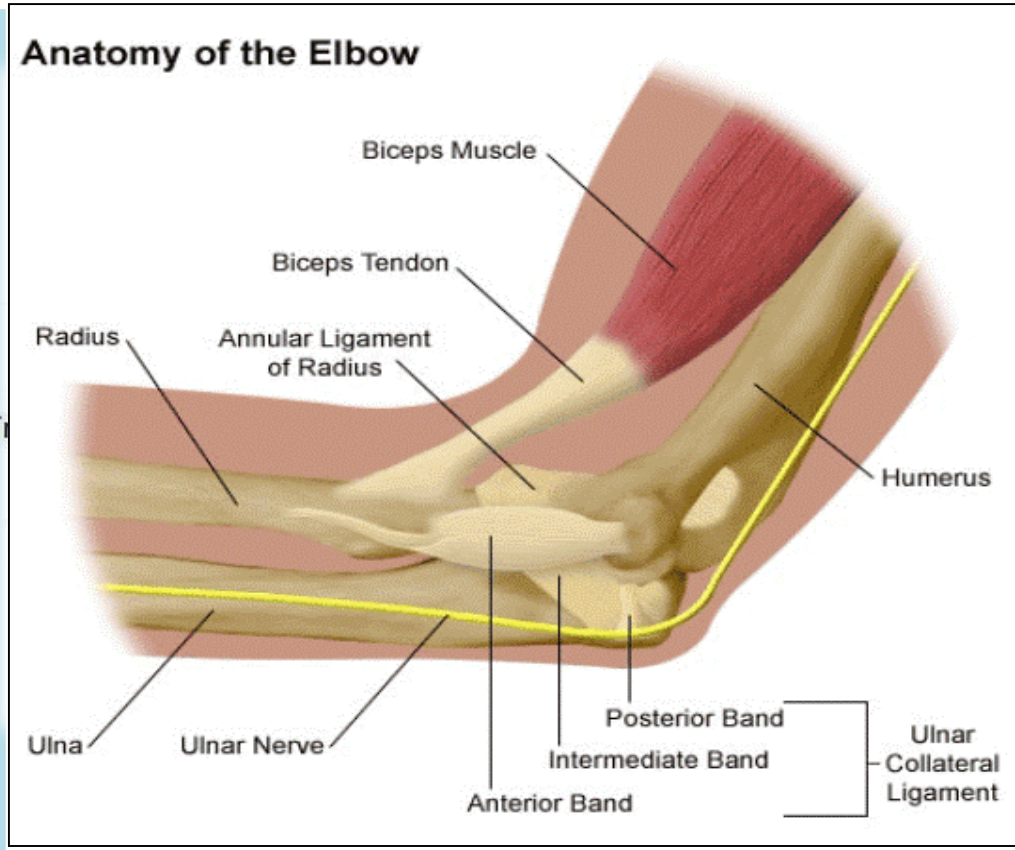
- Is **continuous <u>below</u> with synovial membrane** of the **superior radioulnar joint**





Relations

- **Anterior**:
  - **Brachialis, tendon of biceps, median nerve, brachial artery**
- **Posterior**:
  - **Triceps muscle**, small bursa intervening
- **Lateral**:
  - **Common extensor tendon** & the **supinator**
- **Medial**:
  - **Ulnar nerve**
    - Considered the largest unprotected nerve by muscle or bone.

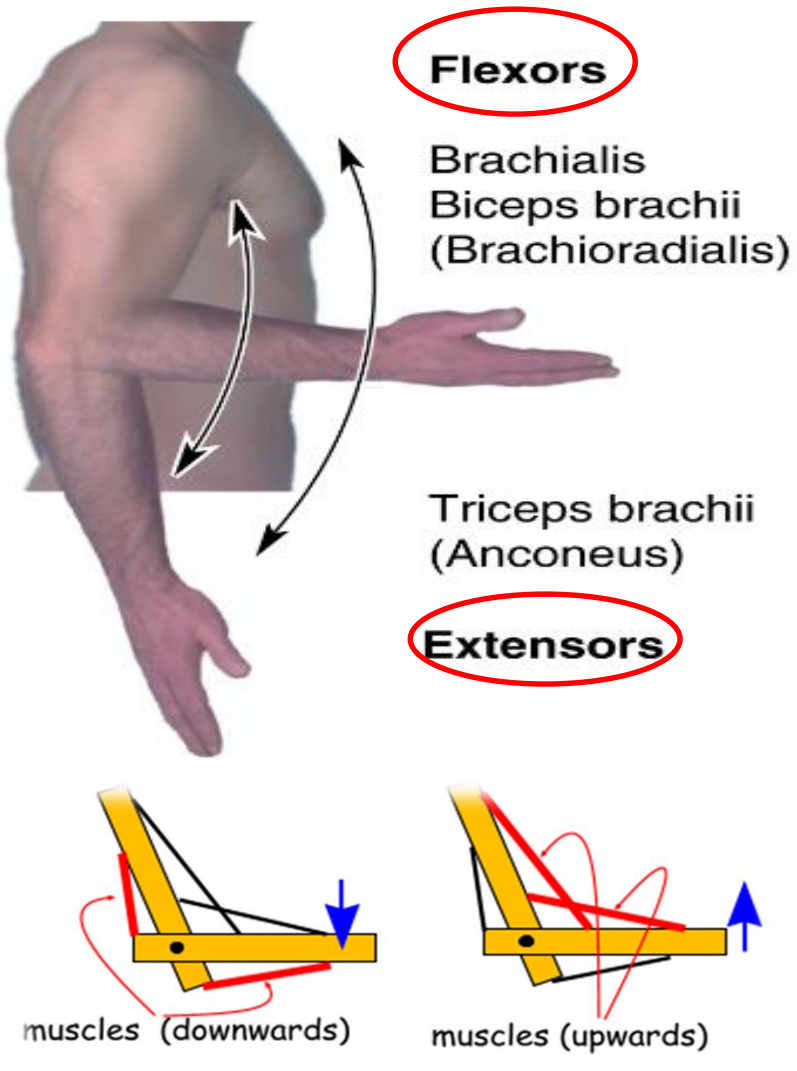


Bursae around the elbow joint:

- **Subcutaneous** olecranon bursa
- **Subtendinous** olecranon bursa

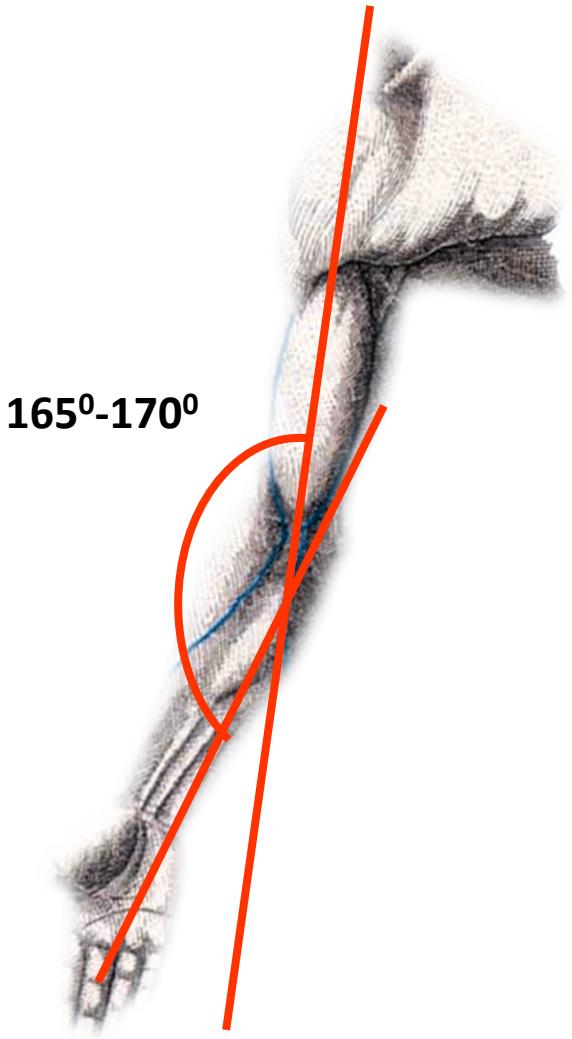
Movements

- **Flexion**
  - Is **limited by** the **anterior surfaces** of the **forearm** and **arm** coming into contact.
- **Extension**
  - Is **limited by** the **tension** of the **anterior ligament** and the **brachialis muscle.**
- The joint is **supplied by** branches from the:
  - **Median**
  - **Ulnar**
  - **Musculocutaneous**
  - **Radial nerves**



Carrying Angle

- Angle
  - **Between** the **long axis** of the **extended forearm** and the **long axis** of the **arm**
- Opens
  - Laterally
- About
  - 170 degrees in **male** and 167 degrees in **females**
- Disappears
  - When the **elbow** joint is **flexed**
- Permits
  - The forearms to clear the hips in **swinging movements** during **walking**, and is important when **carrying objects**



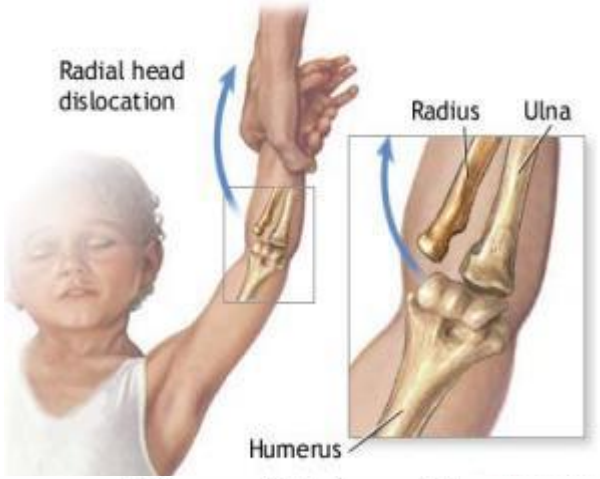
Articulations and applied anatomy

❖ The elbow joint is **stable** because of the:

- ➢ **Wrench-shaped articular surface** of the **olecranon** and the **pulley-shaped trochlea of humerus**
- ➢ **Strong** medial and lateral **ligaments.**

❖ Elbow **dislocations** are **common** & **most** are **posterior.**

- ➢ Posterior dislocation **usually follows falling on the outstretched hand.**
- ➢ **Posterior dislocations** of the joint are **common in children** because the parts of the **bones** that stabilize the joint are **incompletely developed.**



ELBOW Joint

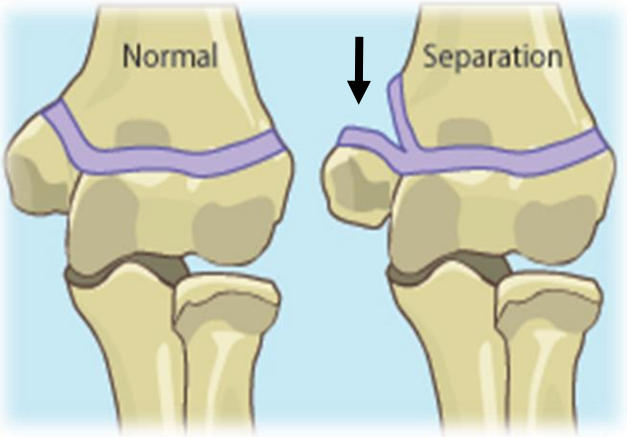
❖ **Avulsion of the epiphysis** of the **medial epicondyle** is also **common in childhood** because the **medial ligament** is **much stronger** than the bond of union between the epiphysis and the diaphysis.

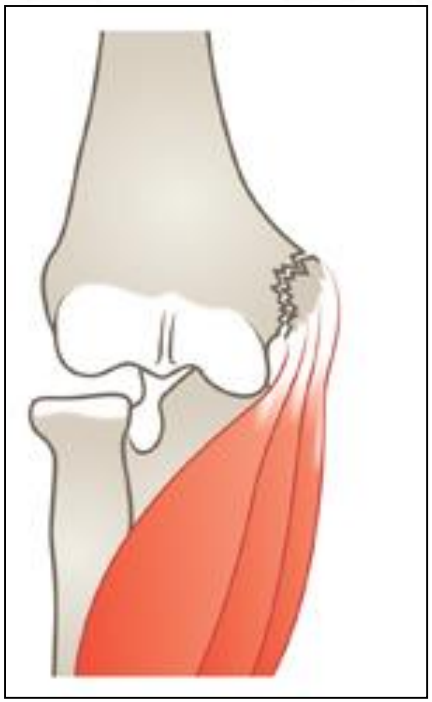
❖They are usually a **result from** an avulsion (pull off) injury caused by a valgus stress at the elbow and contraction of the flexor muscles as in :

✓fall on an outstretched hand with the elbow in full extension

✓posterior elbow dislocation

✓direct blow





THANK YOU