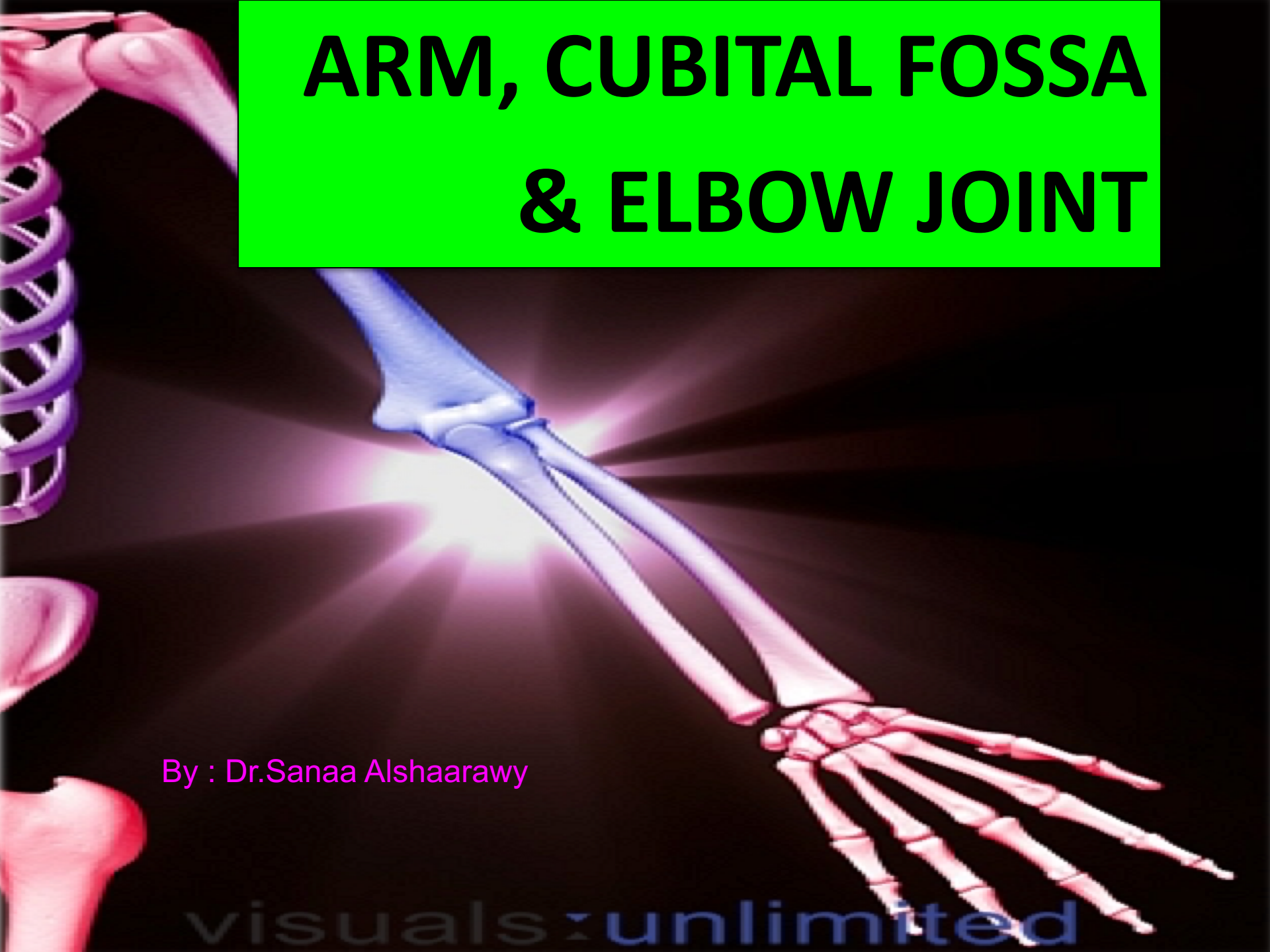
ARM, CUBITAL FOSSA & ELBOW JOINT



By : Dr.Sanaa Alshaarawy

OBJECTIVES

❖ **At the end of the lecture, students should:**

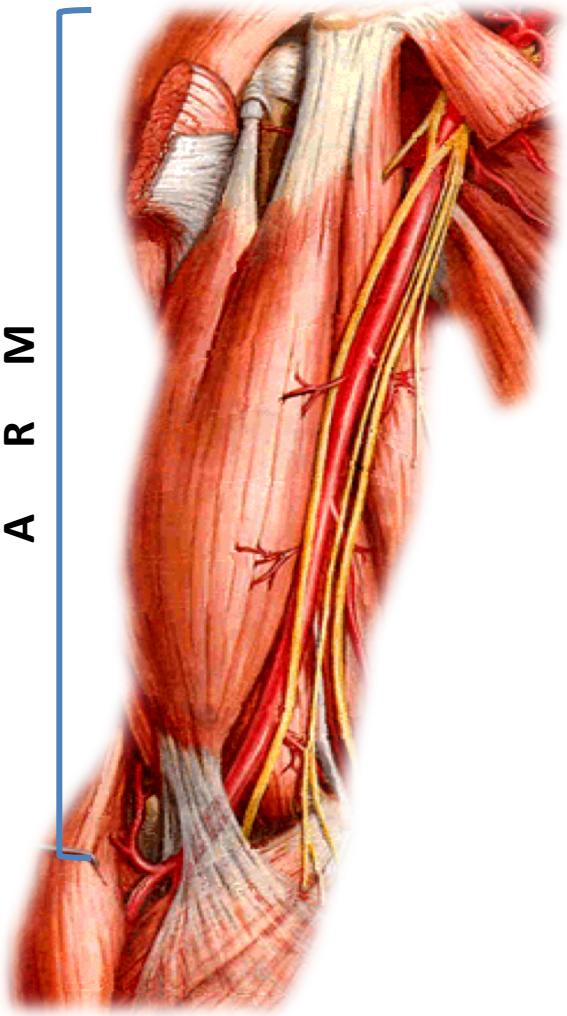
- **Describe the attachments, actions and innervations of:**
  - ✓ Biceps brachii
  - ✓ Coracobrachialis
  - ✓ Brachialis
  - ✓ Triceps brachii
- **Define** the **boundaries of the cubital fossa** and enumerate **its contents.**
- **Demonstrate the following features of the elbow joint:**
  - ✓ Articulating 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.

The ARM

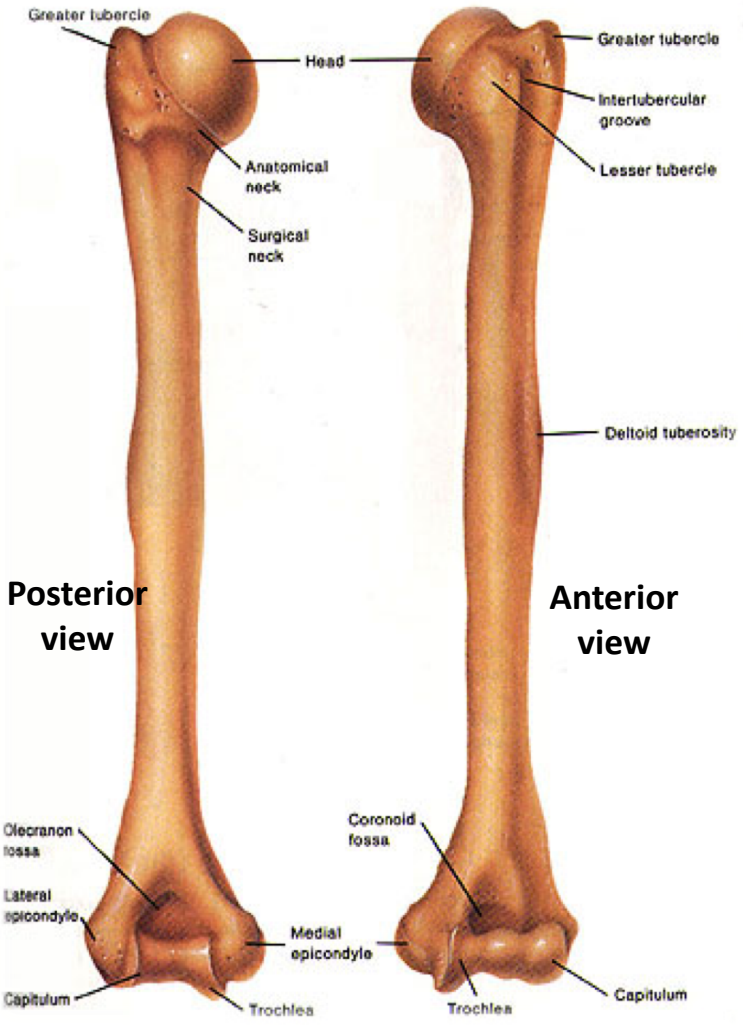
Shoulder

A R M

Elbow



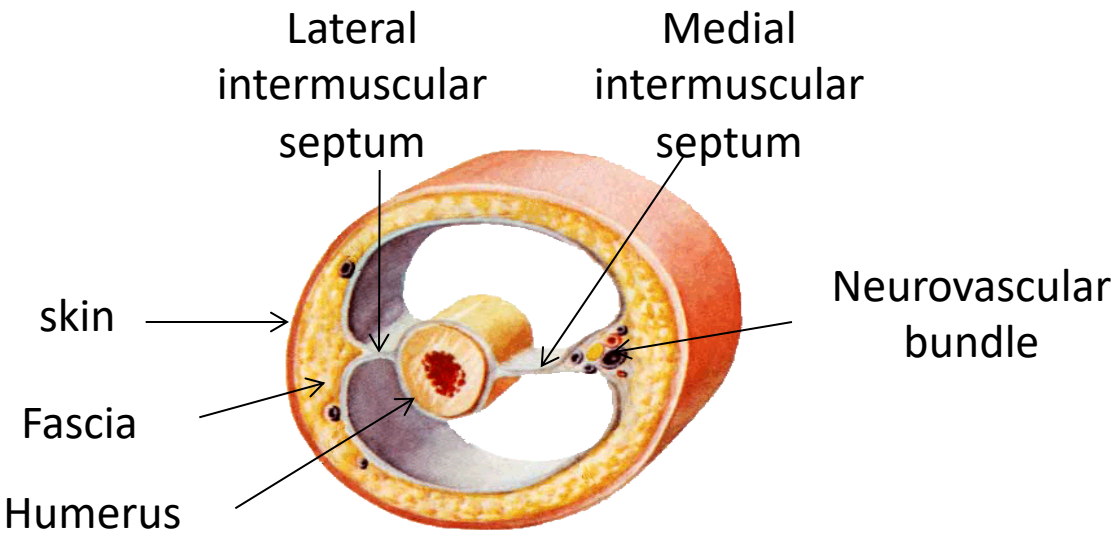
Arm



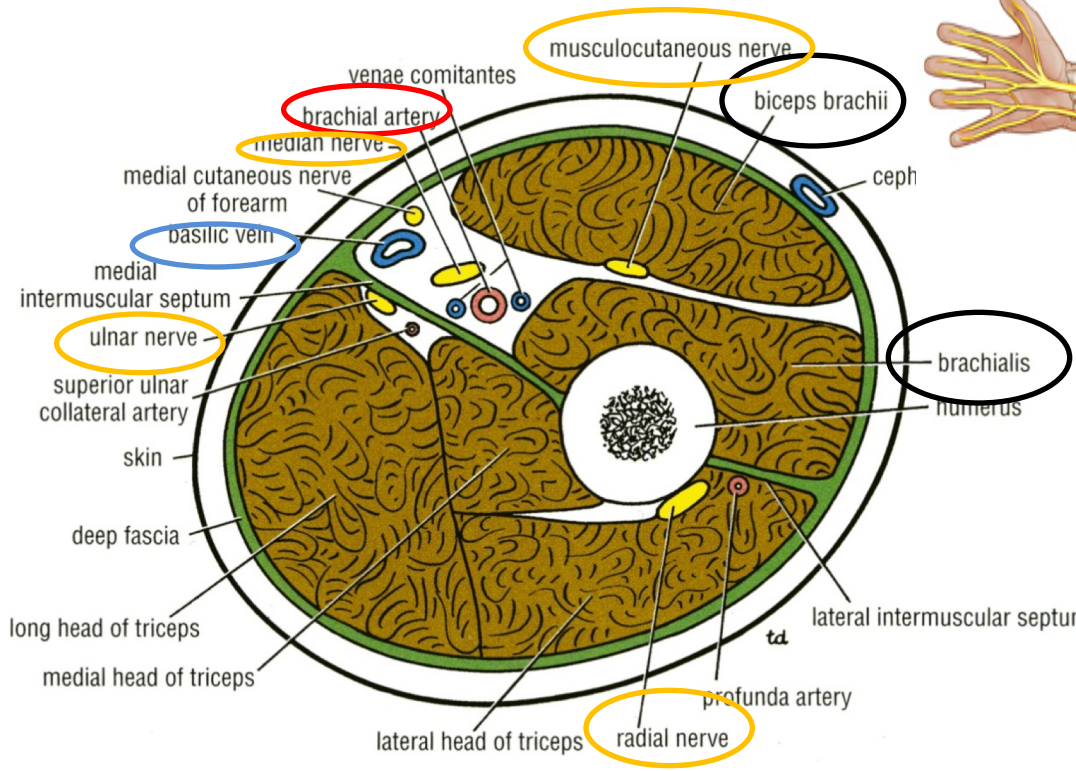
Humerus

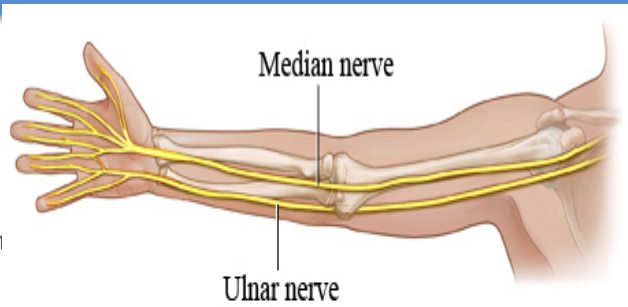
The ARM

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



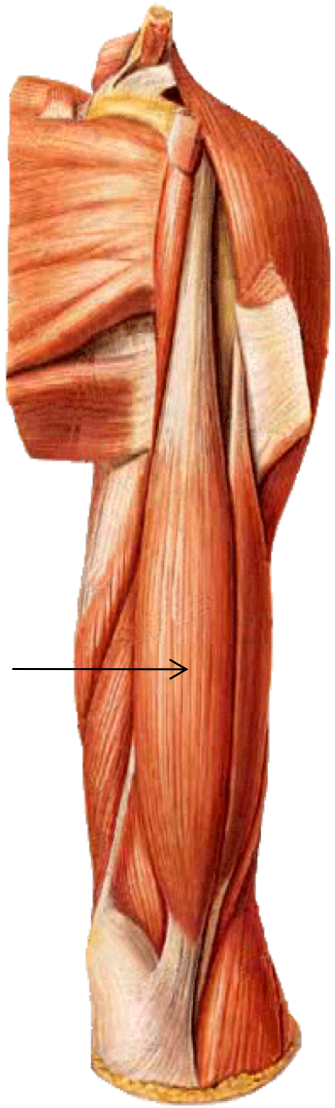
Anterior Fascial Compartment Contents



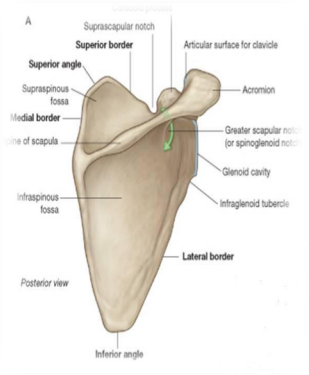


- **Muscles**: Biceps brachii, Coracobrachialis &Brachialis.
- **Blood Vessels**: Brachial artery & Basilic vein.
- **Nerves** : Musculocutaneous, Median, Radial & Ulnar.

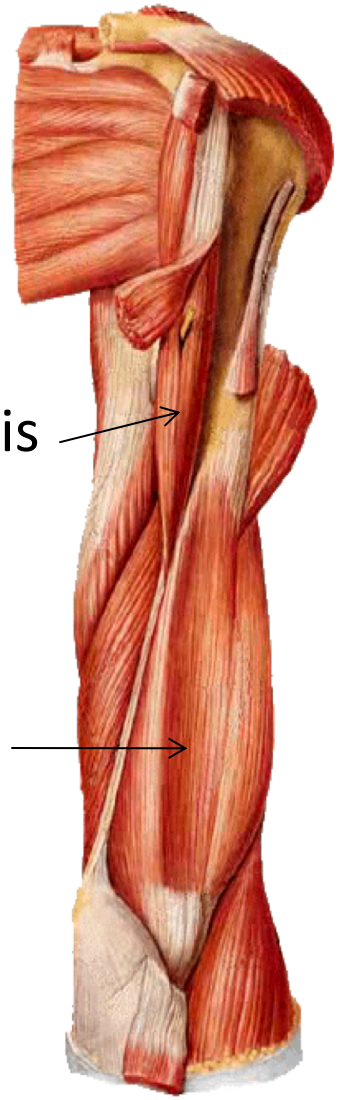
Muscles of the Anterior Compartment



Biceps brachii



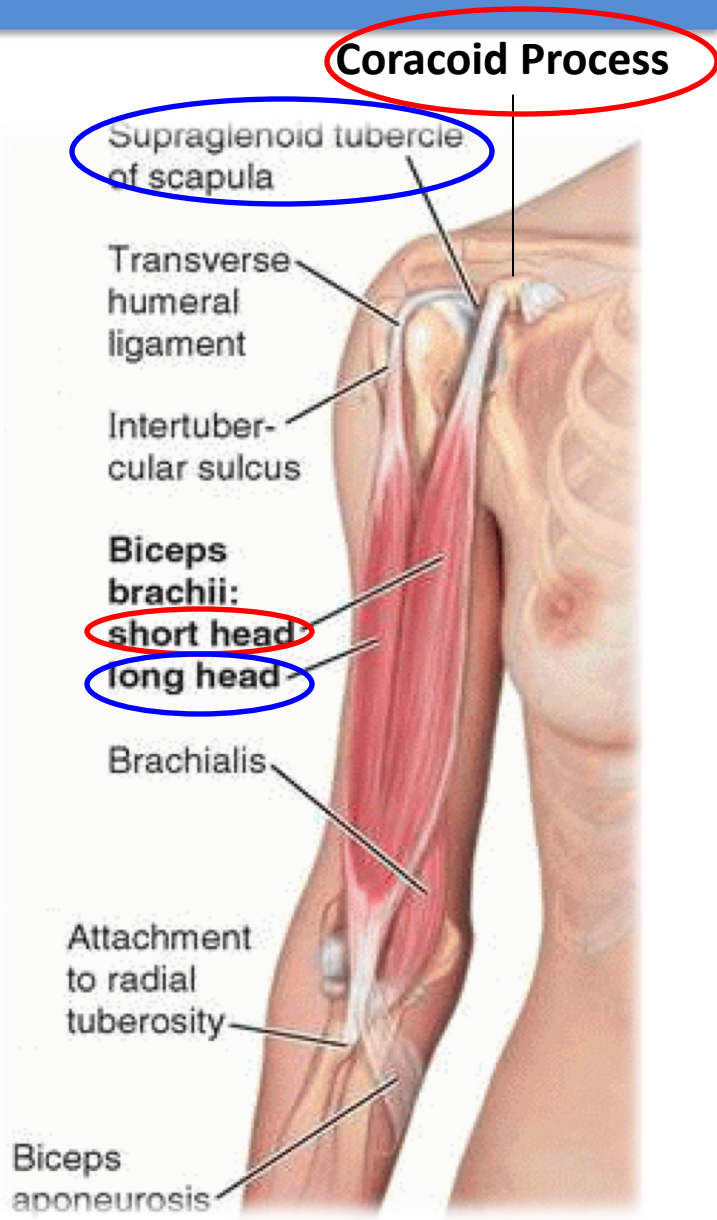
Coracobrachialis



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:**

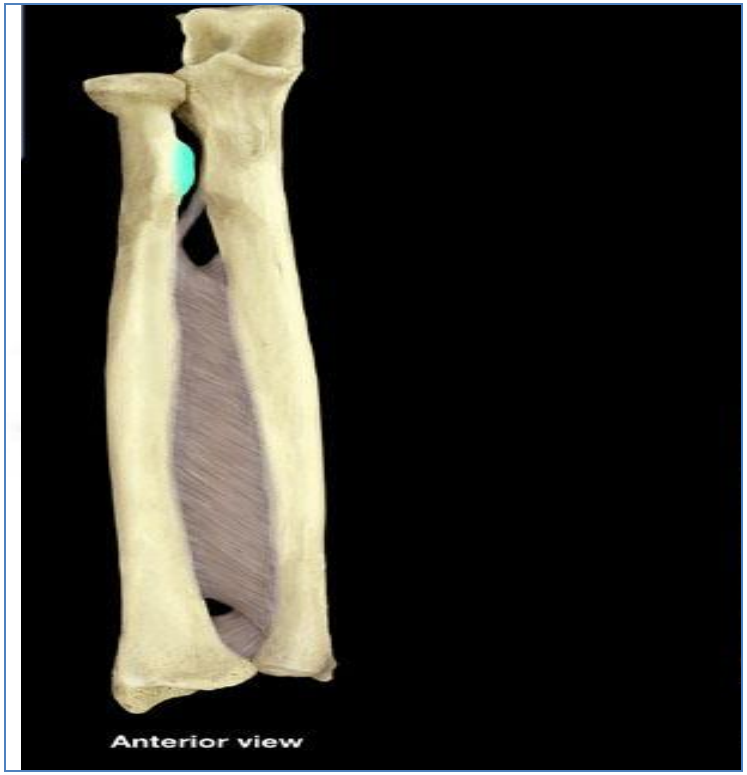
- ➢ into the posterior part of the **radial tuberosity.**
- ➢ into the deep fascia of the medial aspect of forearm **through bicipital aponeurosis.**

❖ **Nerve supply:**

- ➢ **Musculocutaneous**

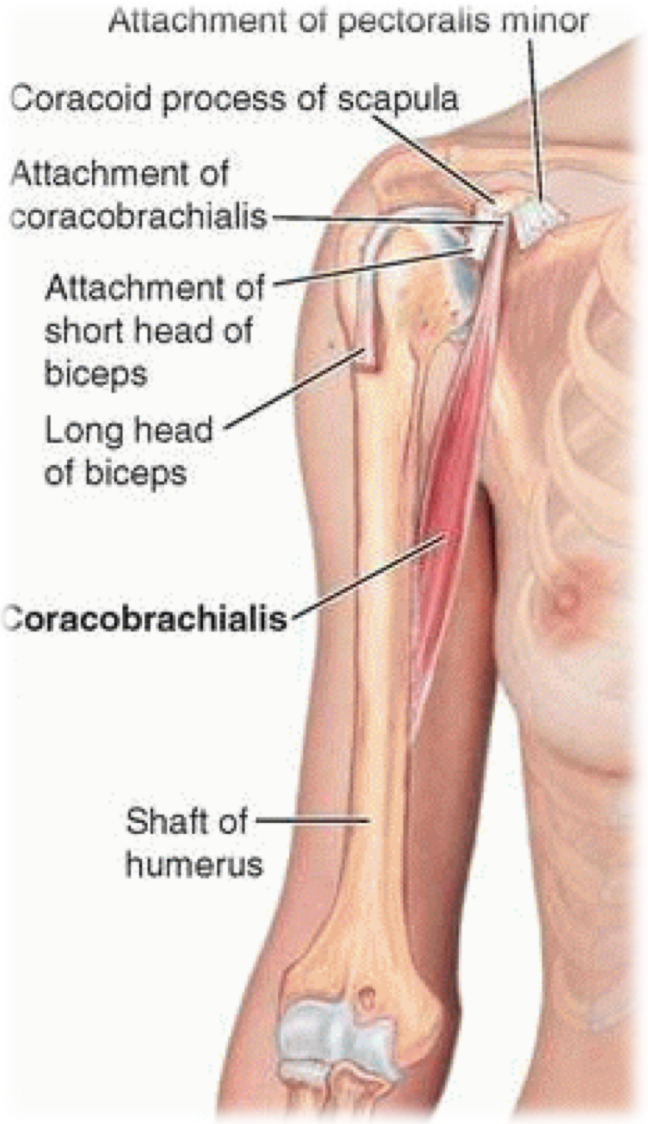
❖ **Action:**

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



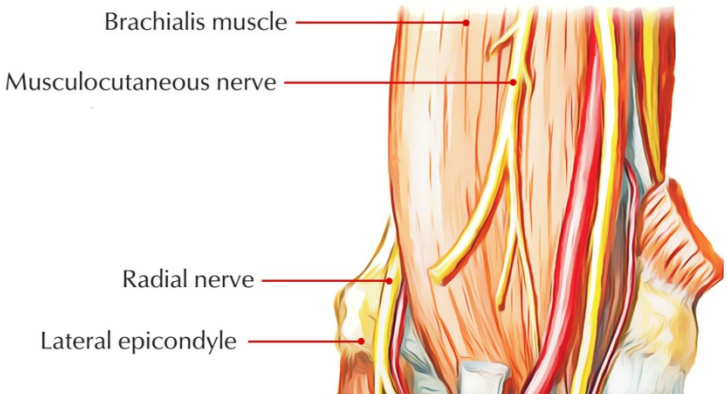
Coracobrachialis

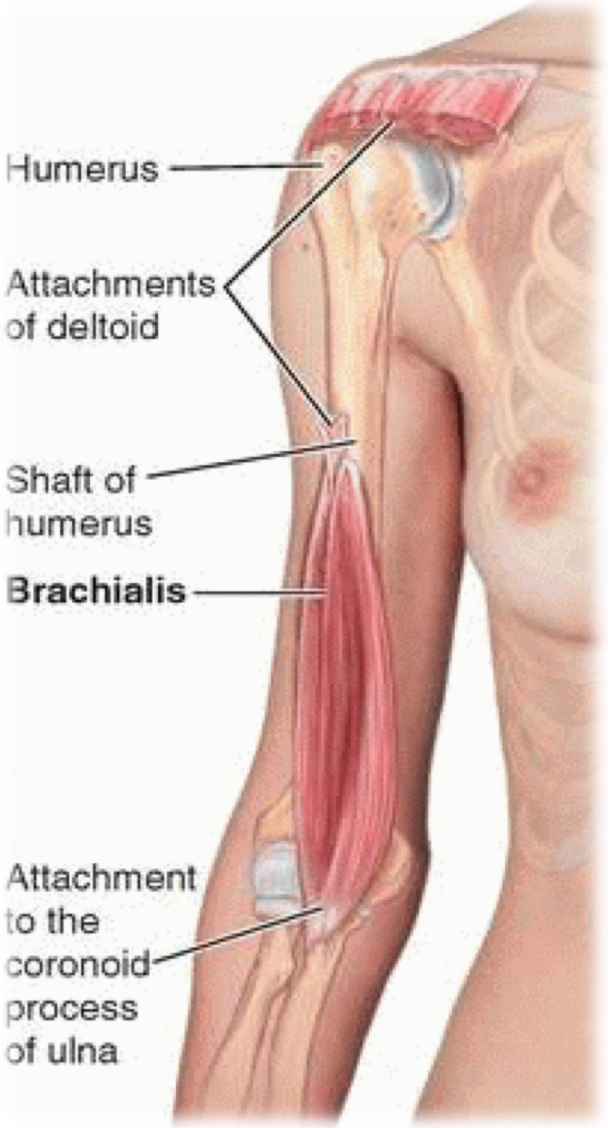
- **Origin:**
  - Tip of the **coracoid process of scapula** (with short head of bicepes brachii).
- **Insertion:**
  - **Middle** of the medial side of the **shaft of the humerus**
- **Nerve supply:**
  - **Musculocutaneous**
- **Action:**
  - **Flexor** & a weak adductor of the **arm.**



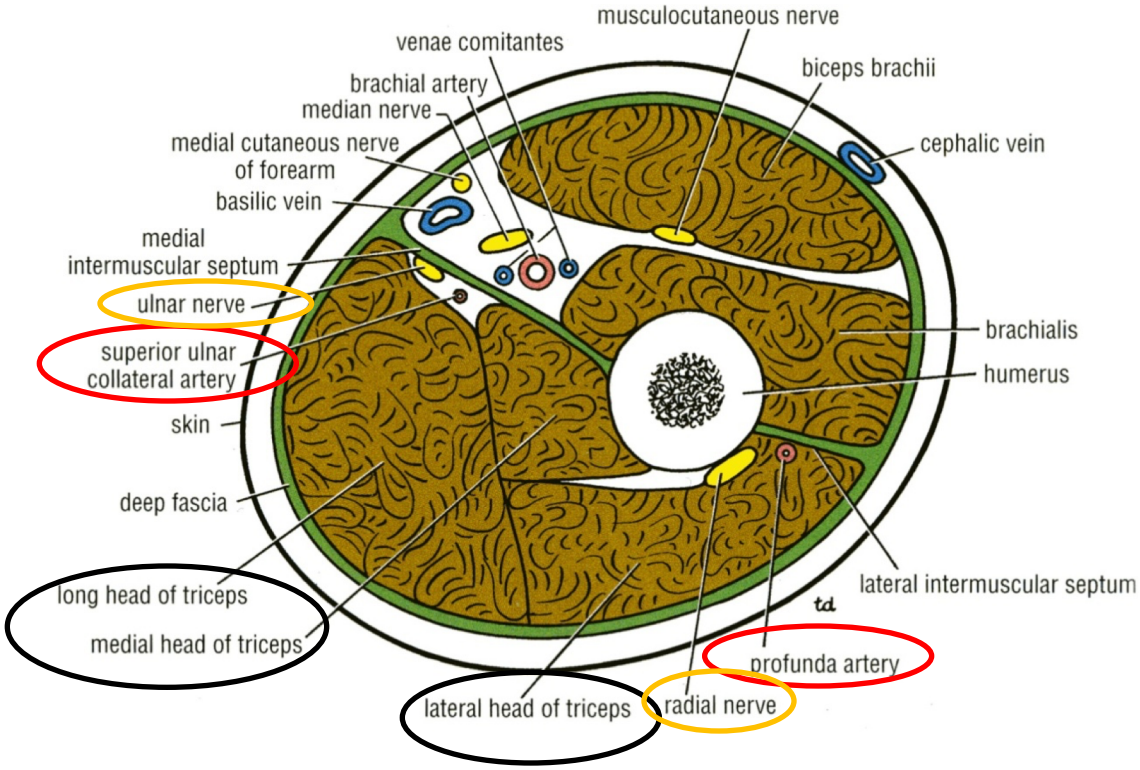
Brachialis

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





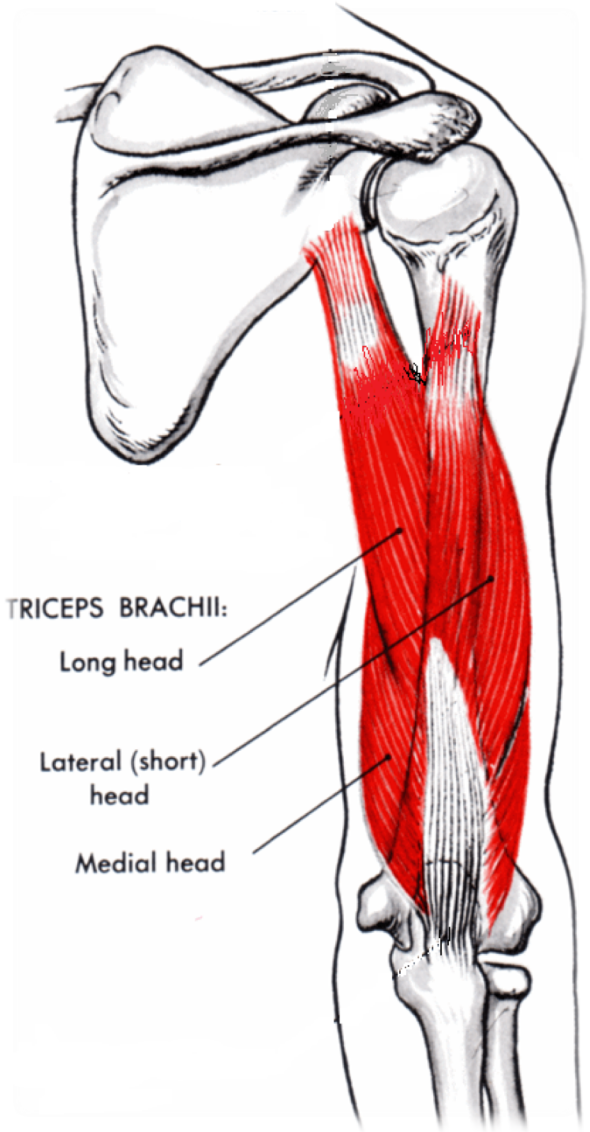
Posterior Fascial Compartment Contents



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

Muscles of the Posterior Compartment

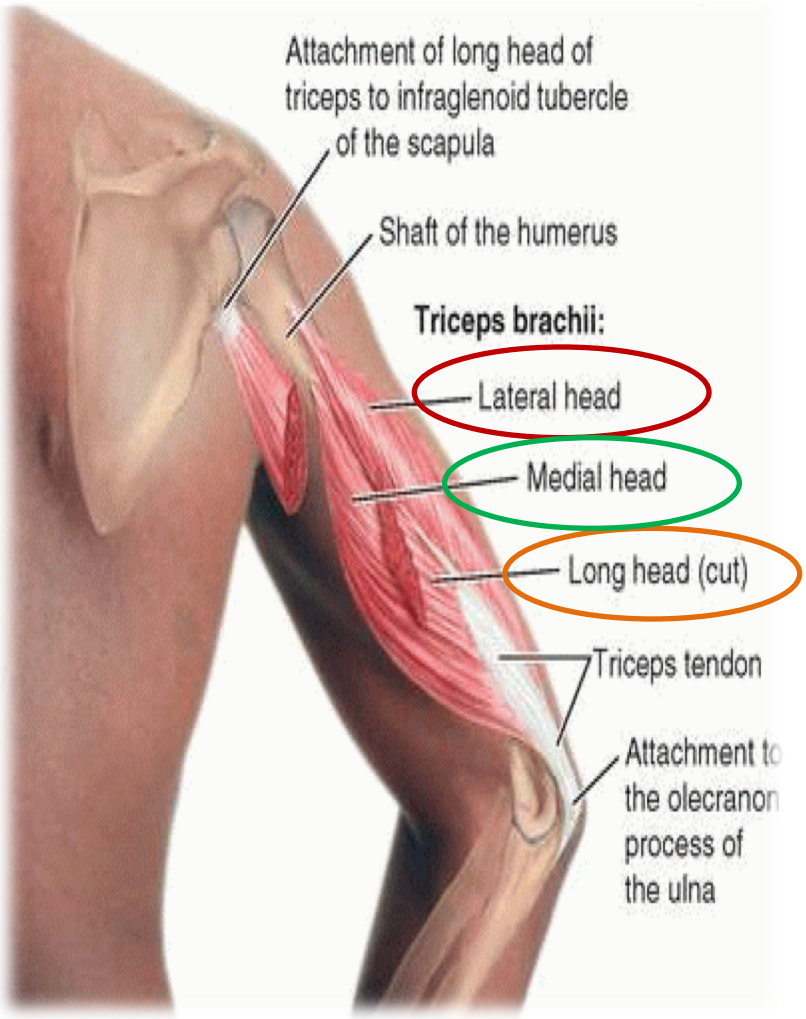
Triceps brachii



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:**

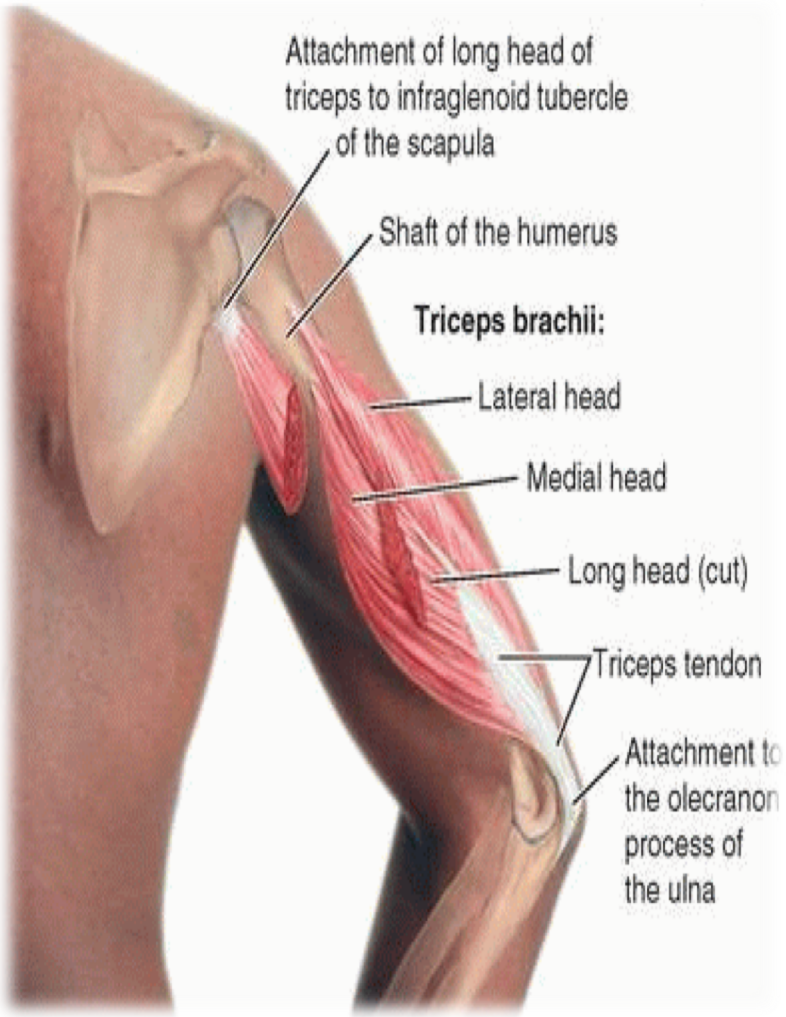
➢ **Common tendon** inserted into the upper surface of the **olecranon process** of **ulna**

❖ **Nerve supply:**

➢ **Radial nerve**

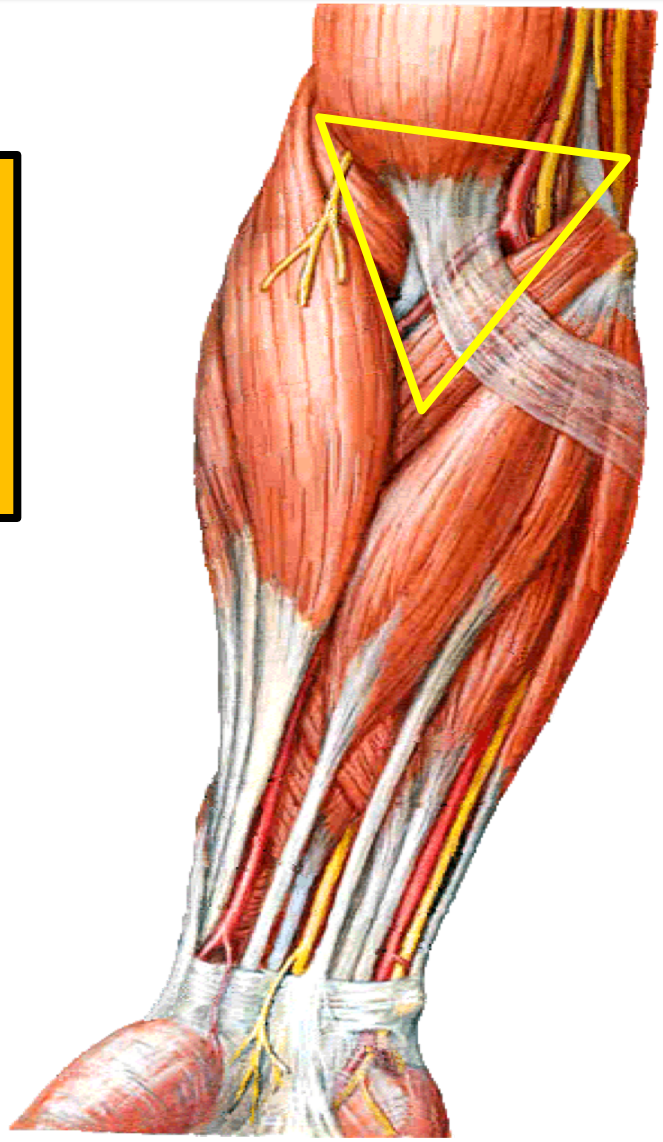
❖ **Action:**

➢ **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:**

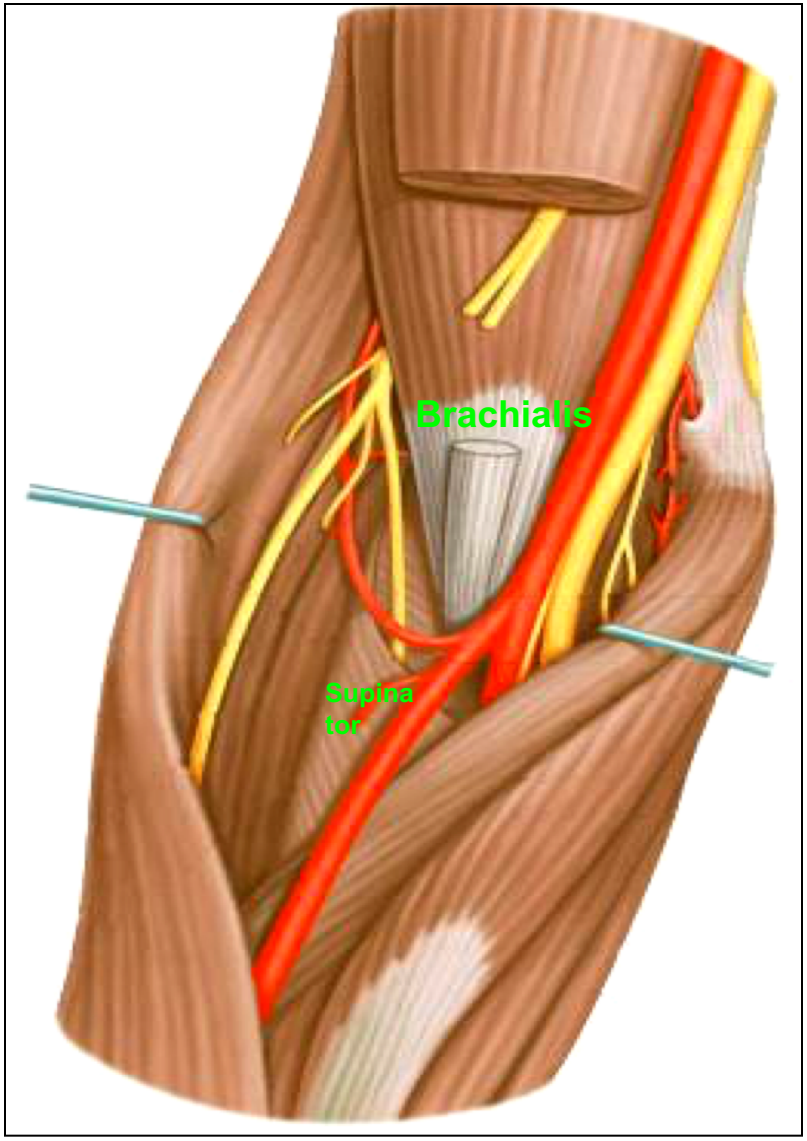
- Pronator teres

❖ **Roof:**

- Skin, superficial & deep fascia and bicipital aponeurosis

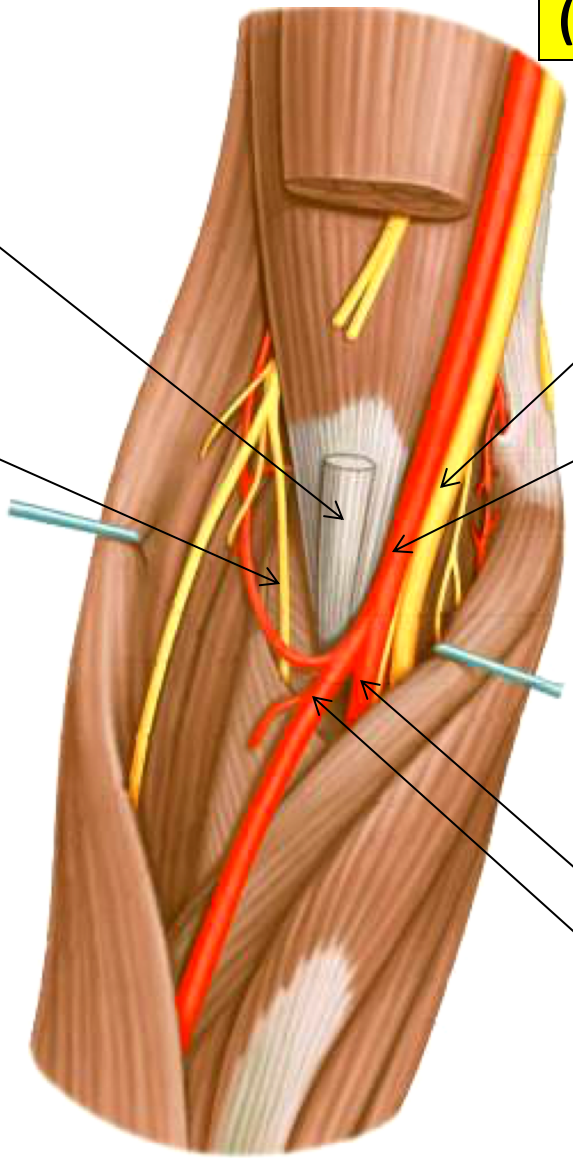
❖ **Floor:**

- **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

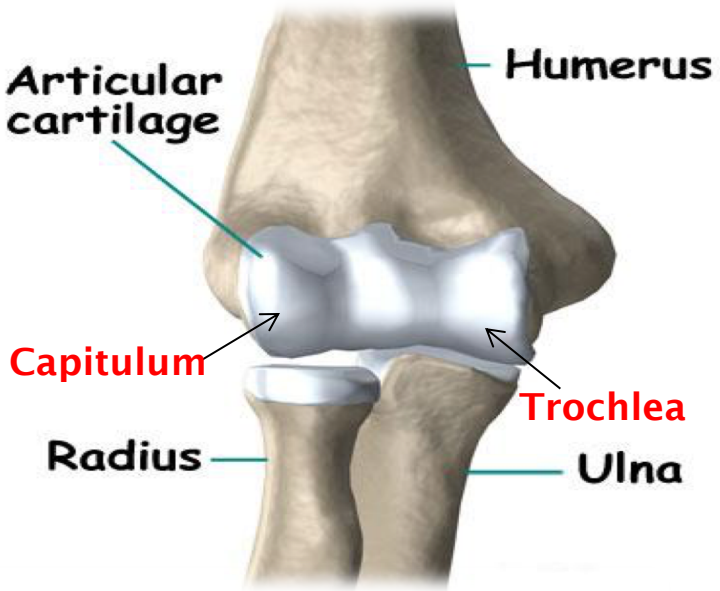
ELBOW Joint

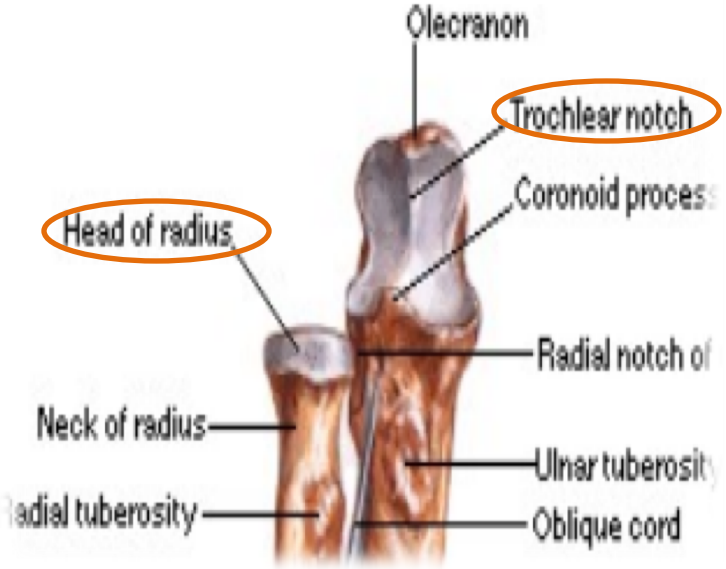
Uniaxial, Synovial Hinge joint

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.

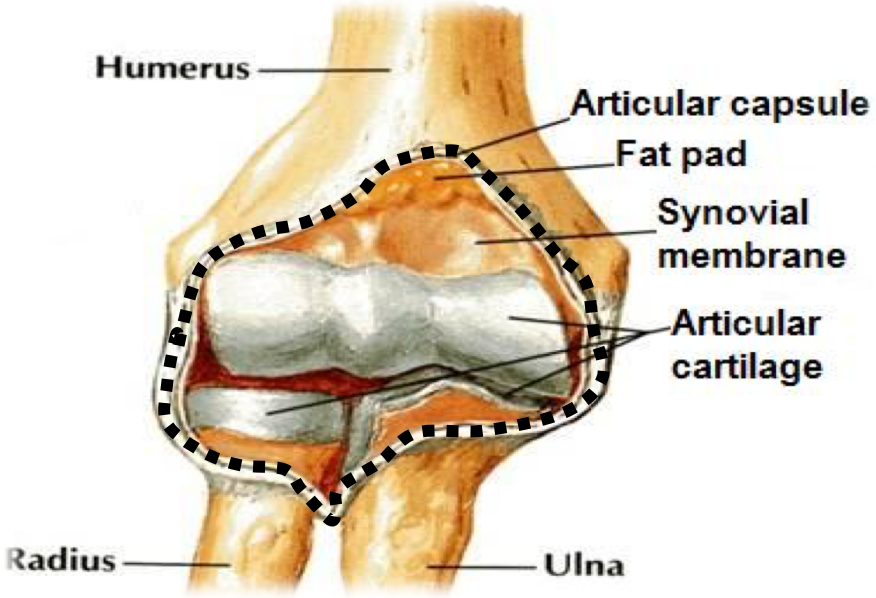


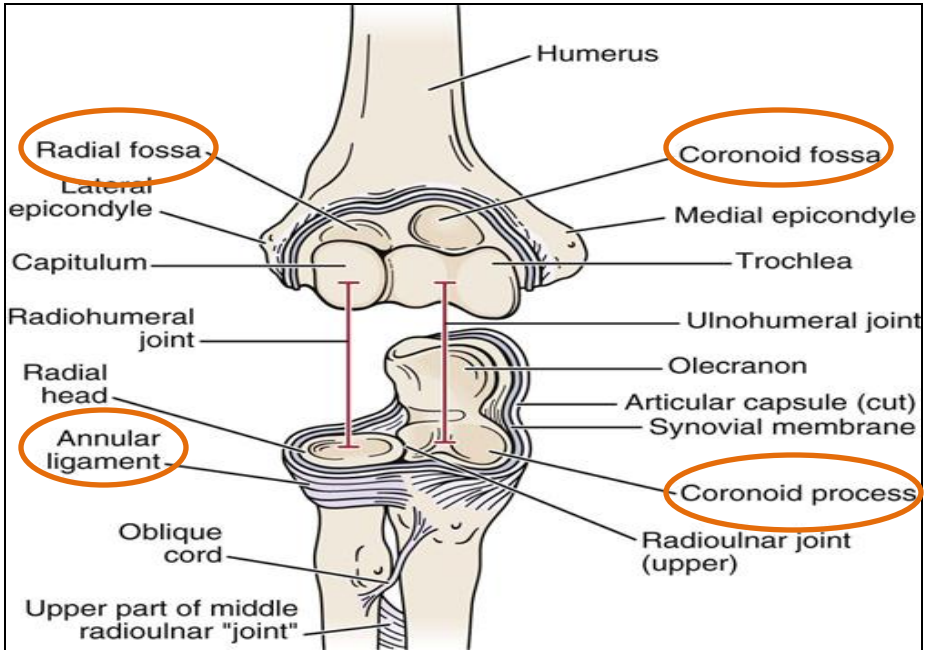


Capsule

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.**

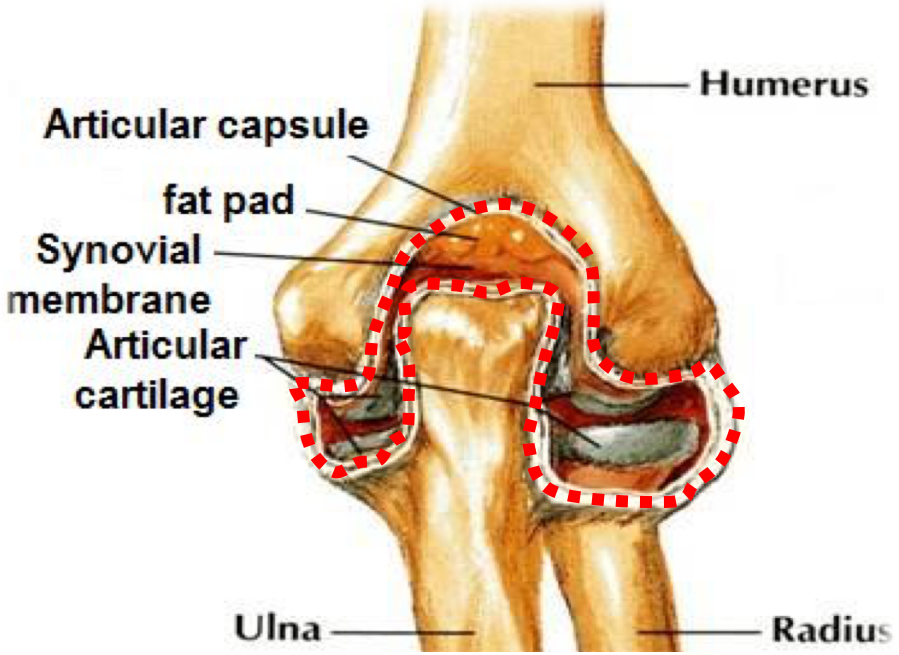




Capsule

Posteriorly: attached

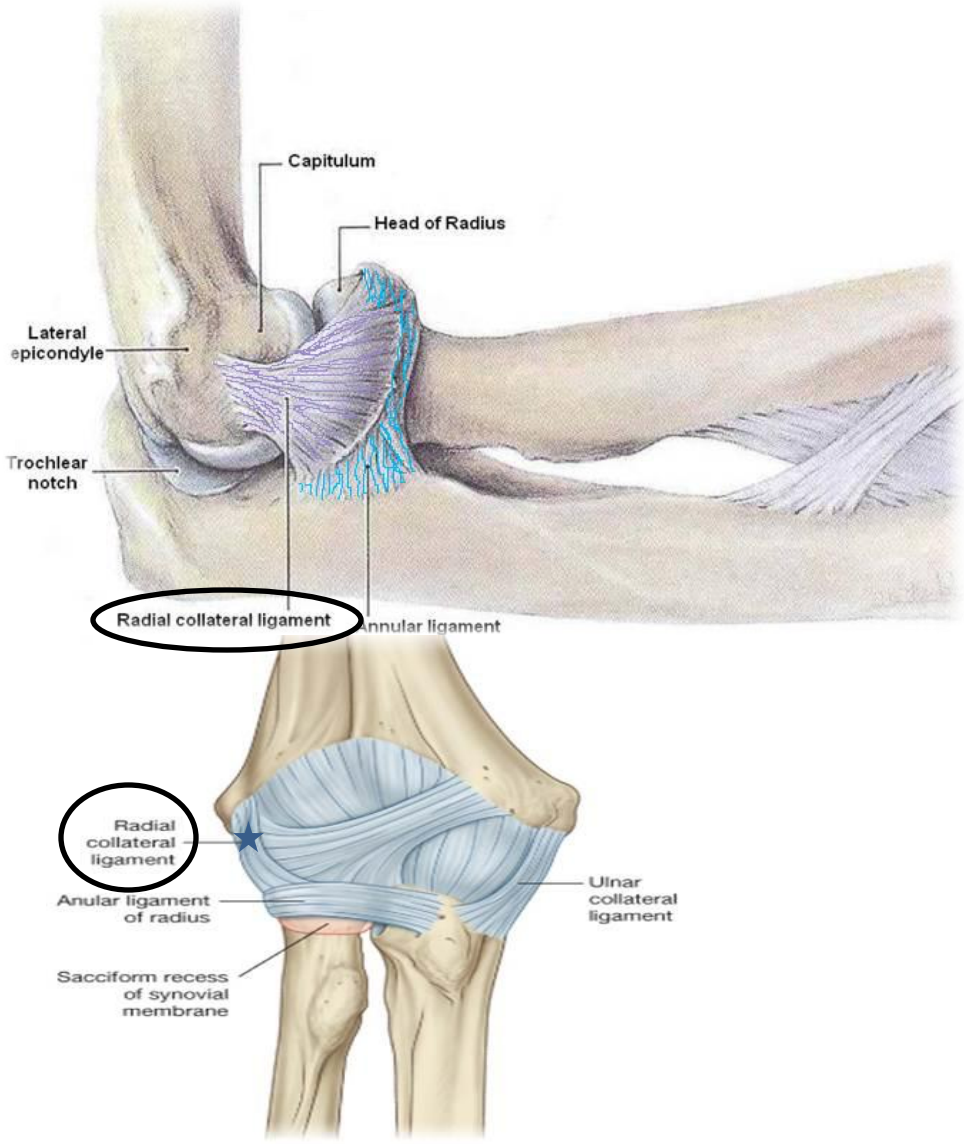
- **Above**
  - ✓ To the **margins** of the **olecranon fossa** of the **humerus.**
- **Below**
  - ✓ To the **upper margin** and **sides** of the **olecranon process** of the **ulna** and to the **anular ligament.**



Ligaments

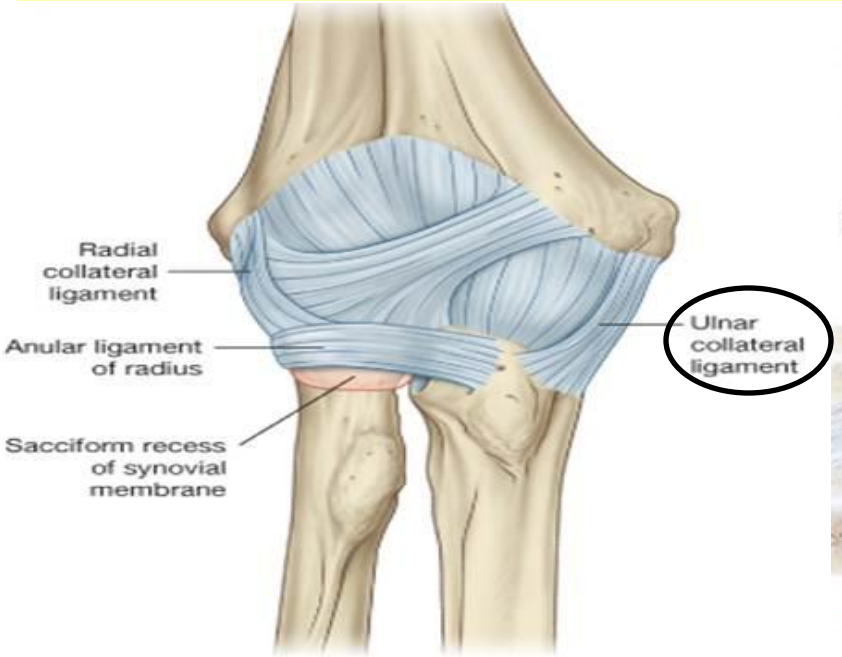
Lateral (radial collateral) ligament

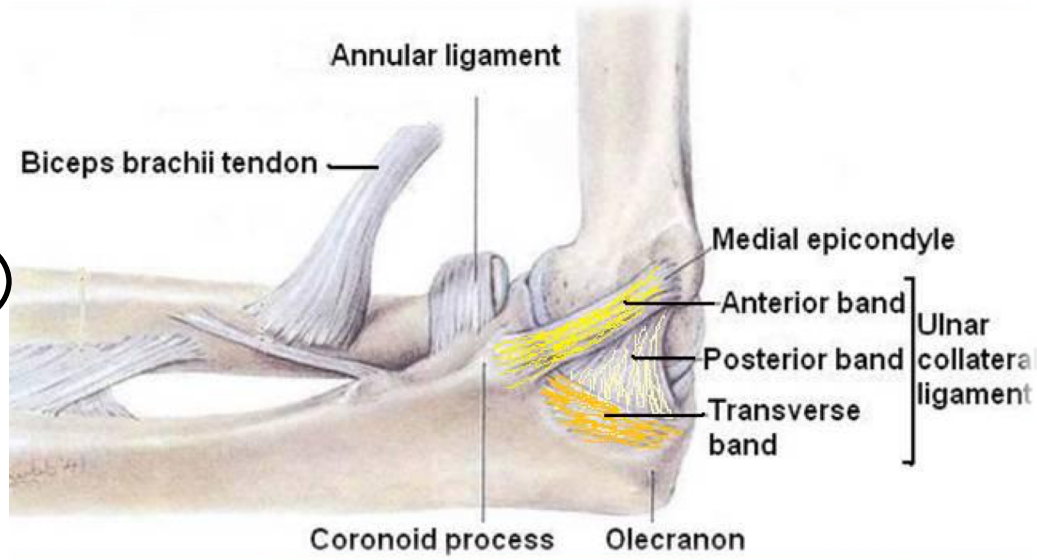
- ❖ **Triangular in shape:**
- ❖ **Apex**
  - ➢ Attached to the **lateral epicondyle of humerus**
- ❖ **Base**
  - ➢ Attached to the upper margin of **annular ligament.**



Ligaments

Medial (ulnar collateral) ligament



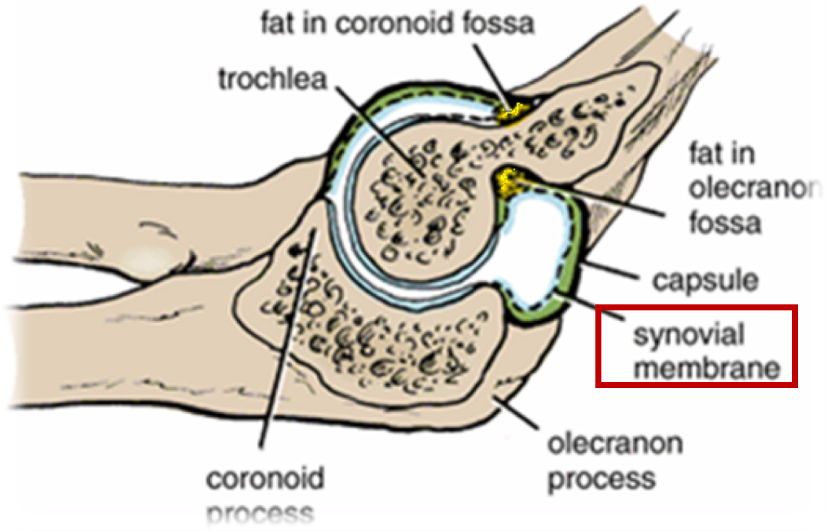


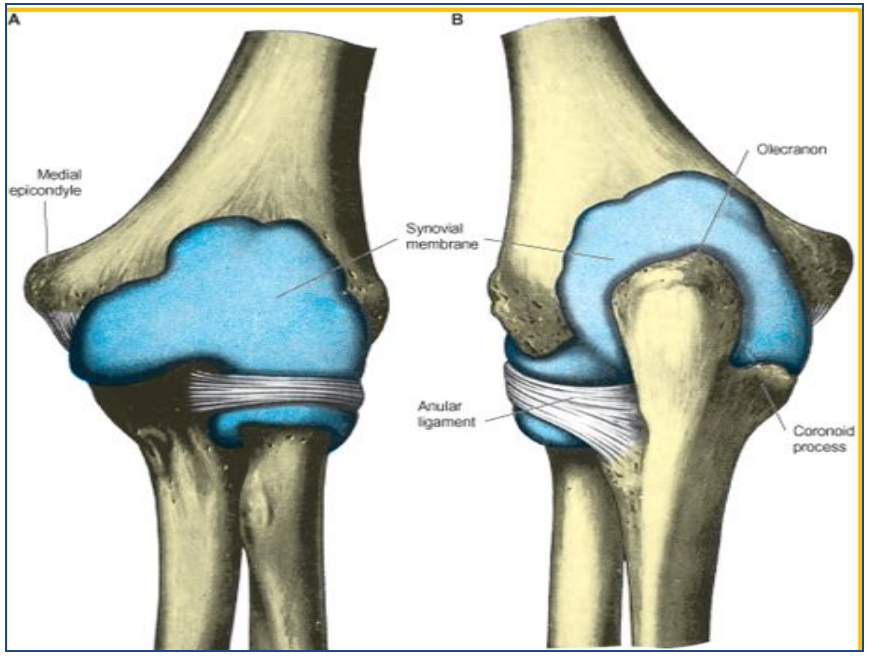
- **Anterior strong cord-like band:**
  - Between **medial epicondyle** and the **coronoid process** of ulna
- **Posterior weaker fan-like band:**
  - Between **medial epicondyle** and the **olecranon process** of ulna
- **Transverse band:**
  - Passes **between** the **anterior** and **posterior bands**

Synovial Membrane

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

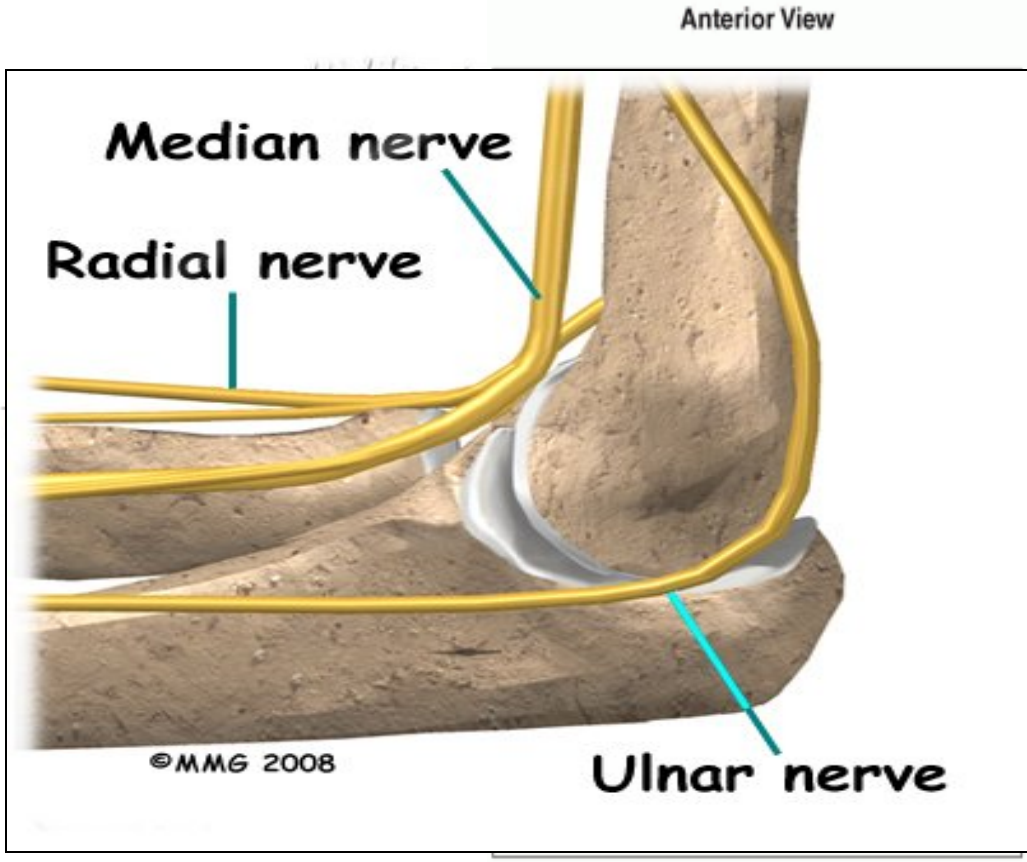
- Is **continuous below with synovial membrane** of the **superior radioulnar joint**





Relations

- **Anterior:**
  - **Brachialis, tendon of biceps, median nerve, brachial artery**
- **Posterior:**
  - **Triceps muscle**, small bursa intervening
- **Lateral:**
  - **Common extensor tendon (attached to lateral epicondyle of the humerus) & supinator**
- **Medial :**
  - **Ulnar nerve**
    - Considered the **largest unprotected nerve** by muscle or bone (lies behind medial epicondyle).

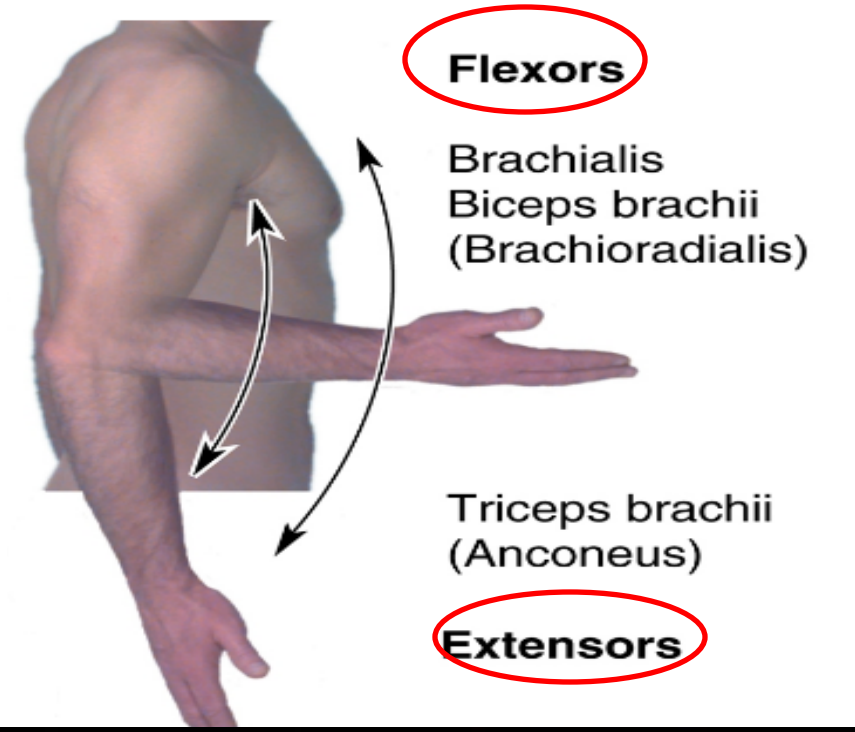


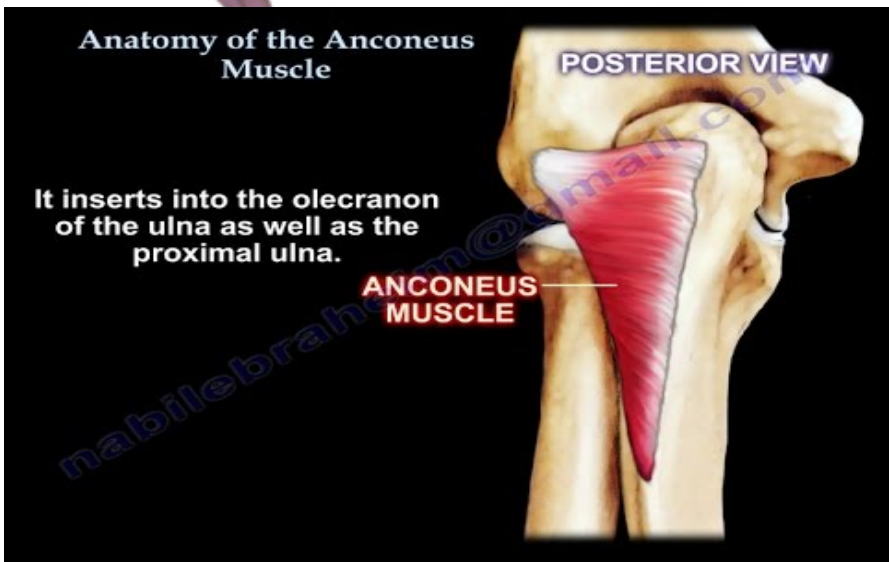
Bursae around the elbow joint:

- **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 (medially)** 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**

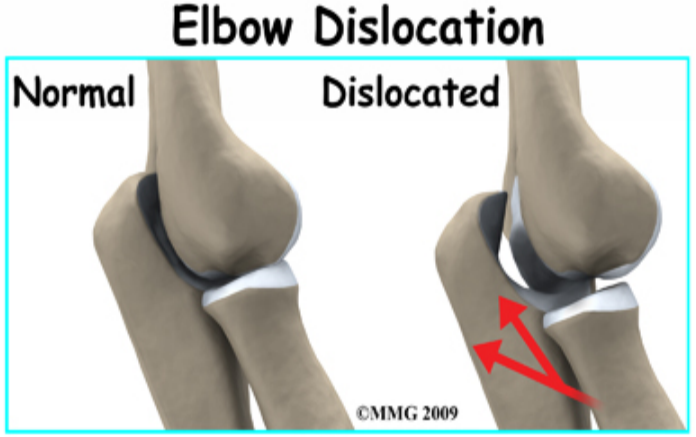
Articulations and applied anatomy

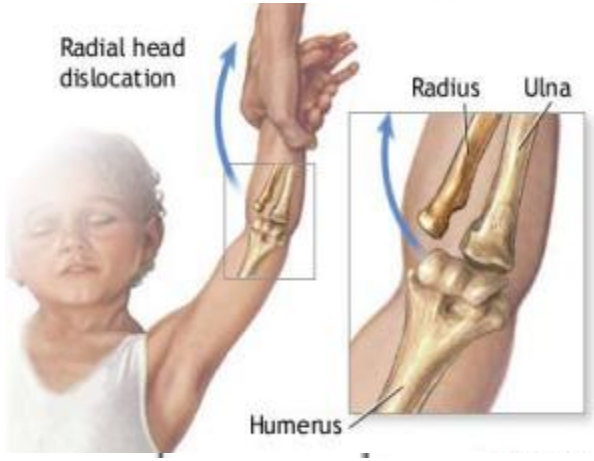
❖ The elbow joint is **stable** because of the:

- ➢ **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

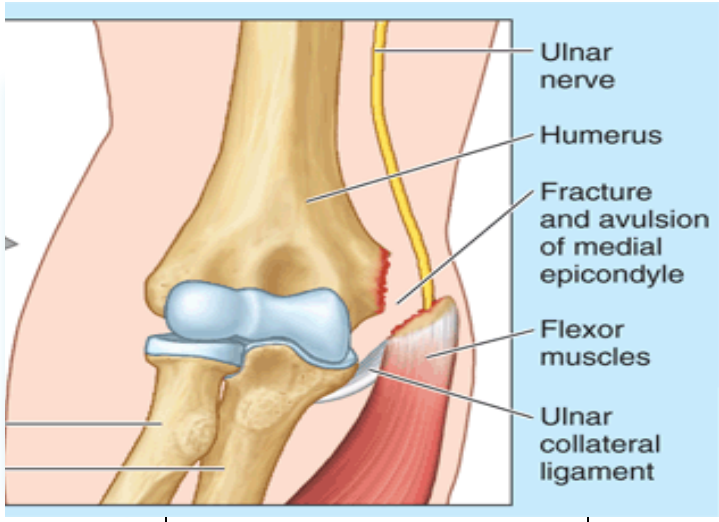
❖ **Avulsion of the epiphysis** of the **medial epicondyle** is also **common in childhood** because the **medial ligament** is **much stronger** than the bond of union between the epiphysis and the diaphysis.

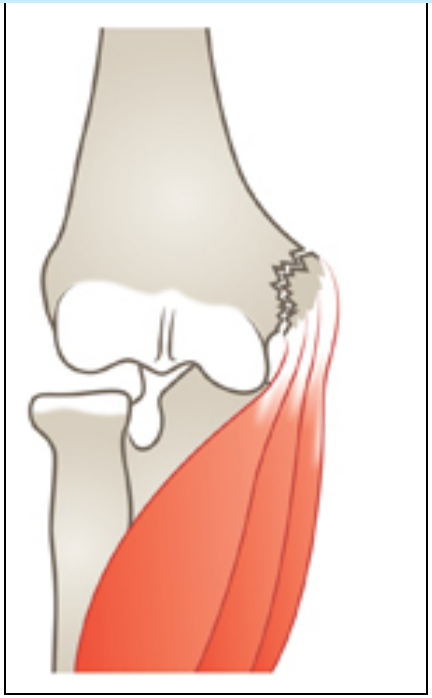
❖They are usually a **result from** an avulsion (pull off) injury caused by : a valgus stress at the elbow and contraction of the flexor muscles as in :

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

✓posterior elbow dislocation

✓direct blow





FOR STUDENTS

1. **Which one of the following muscles forms the medial boundary of the cubital fossa?**

   a. Biceps Brachii.

   b. Pronator teres.

   c. Brachialis.

   d. Brachioradialis.

2. **Which one of the following muscles has double nerve supply?**

a.Brachialis.

b. Bicepes brachii.

c. Coracobrachialis.

d. Deltoid.

3. **Which one of the following muscles is powerful supinator of forearm?**

a. Pronator teres.
b. Biceps brachii.
c. Brachialis.
d. Brachioradialis

THANK YOU