

# ARM, CUBITAL FOSSA & ELBOW JOINT

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visuals:unlimited

# 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

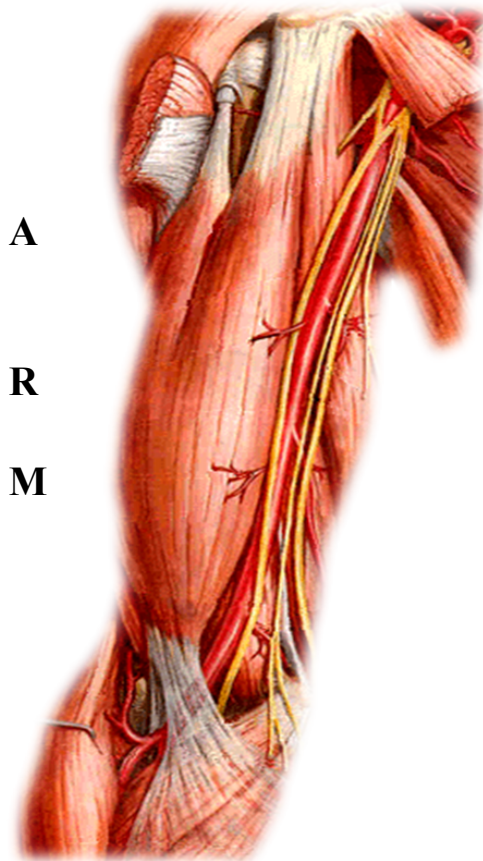
Synovial membrane

**Demonstrate the movements**: **flexion** and **extension** of the elbow.

List the **main muscles** producing the above movements.

# The ARM

Shoulder



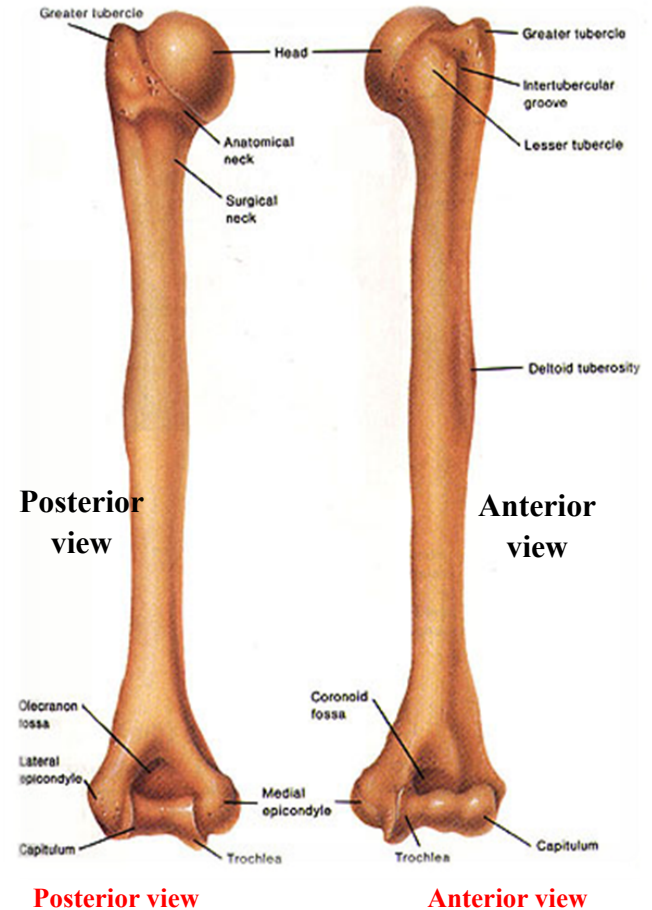
A

R

M

Elbow

**Arm**



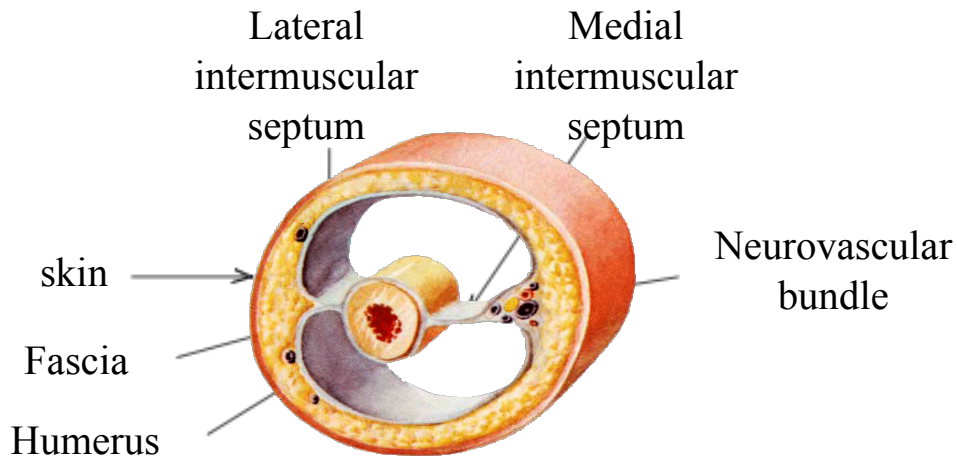
**Humerus**

# The ARM

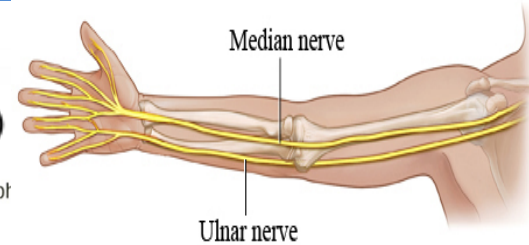
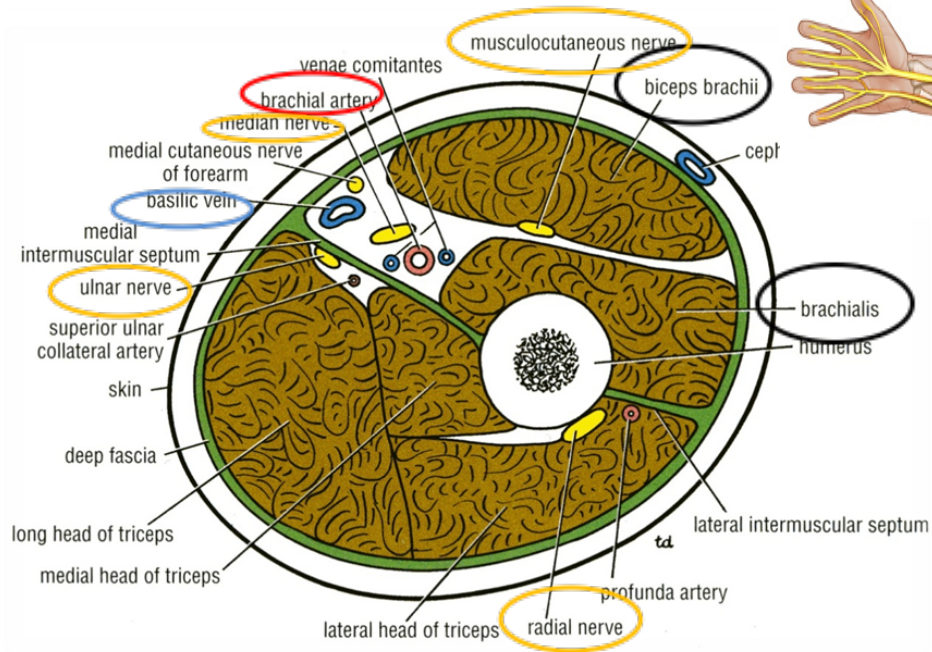
The lateral and medial intermuscular septa divide the arm into two compartments:

Anterior

Posterior

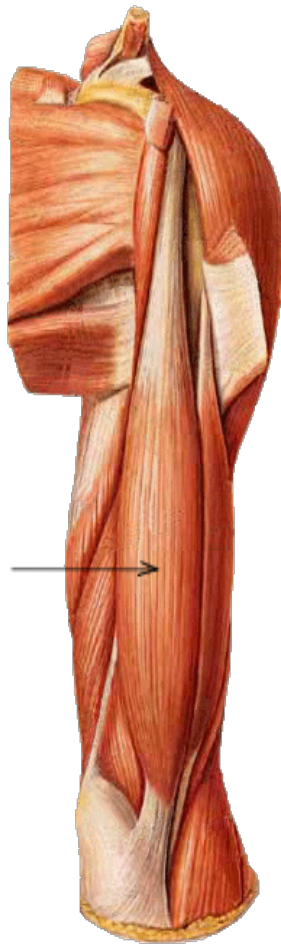


# Contents

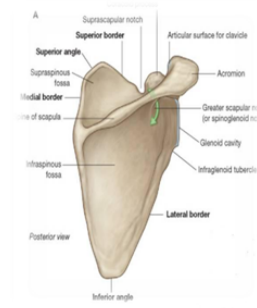


- **Muscles:** Biceps brachii, Coracobrachialis & Brachialis.
- **Blood Vessels:** Brachial artery & Basilic vein.
- **Nerves :** Musculocutaneous, Median, Radial & Ulnar.

# Muscles of the Anterior Compartment

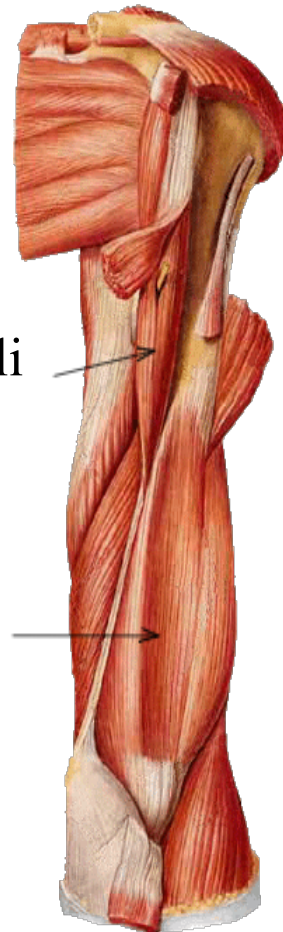


Biceps  
brachii



Coracobrachiali

S

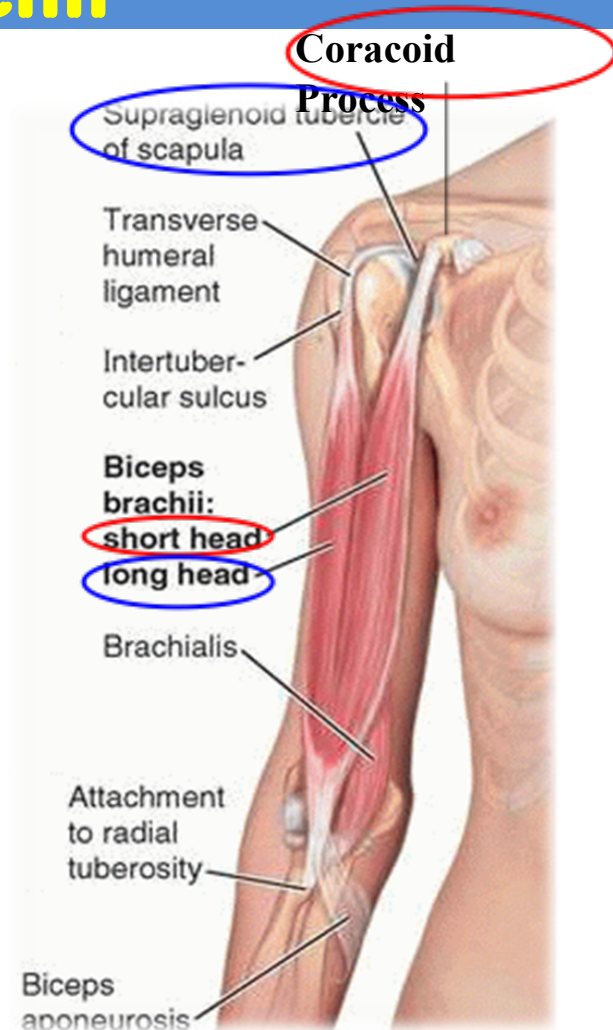


Brachiali

S

# 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:**

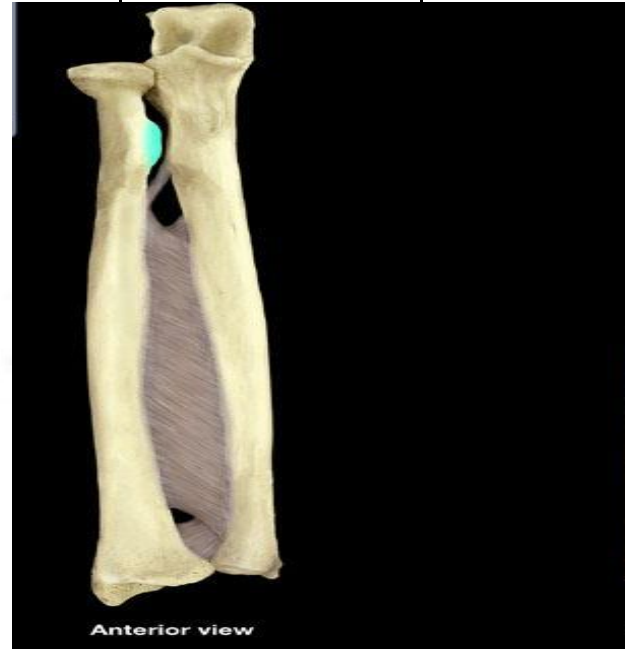
**Musculocutaneous**

## **Action:**

**Strong supinator** of the forearm  
used in screwing.

**Powerful flexor** of elbow  
**(the main elbow flexor)**.

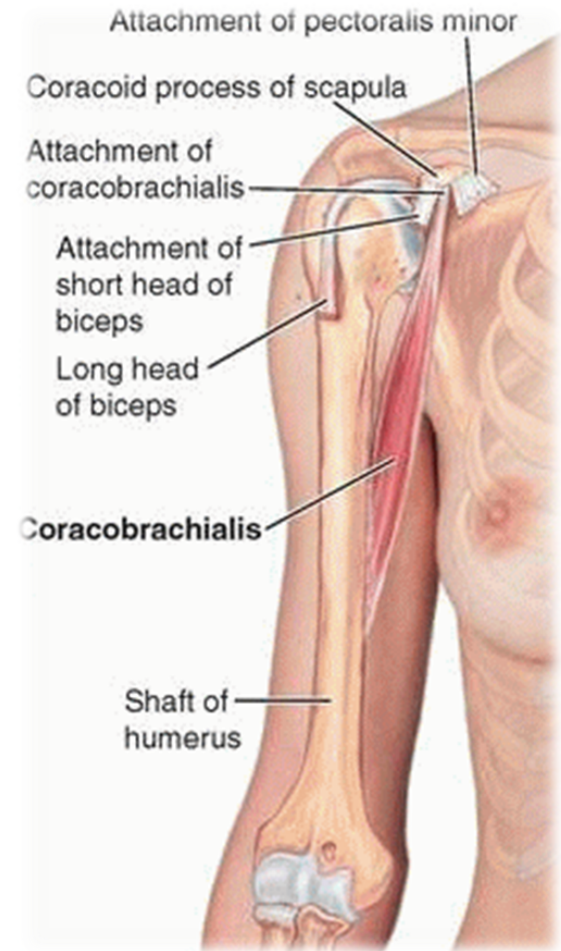
Weak flexor of shoulder





# Coracobrachialis

- **Origin:**
  - Tip of the **coracoid process of scapula** (with short head of biceps 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:**

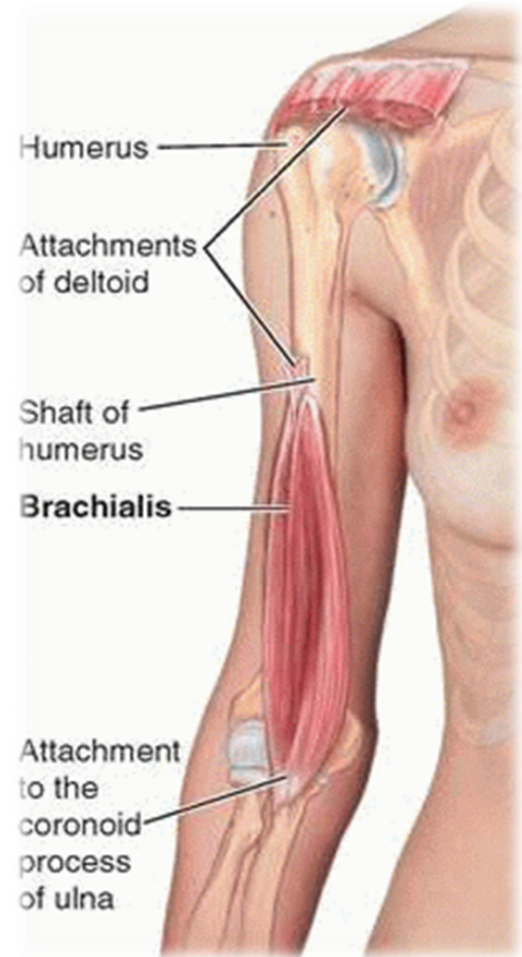
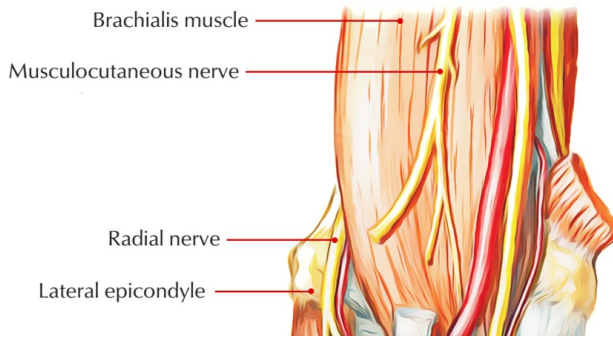
- **Anterior surface of coronoid process of ulna**

- **Nerve supply:**

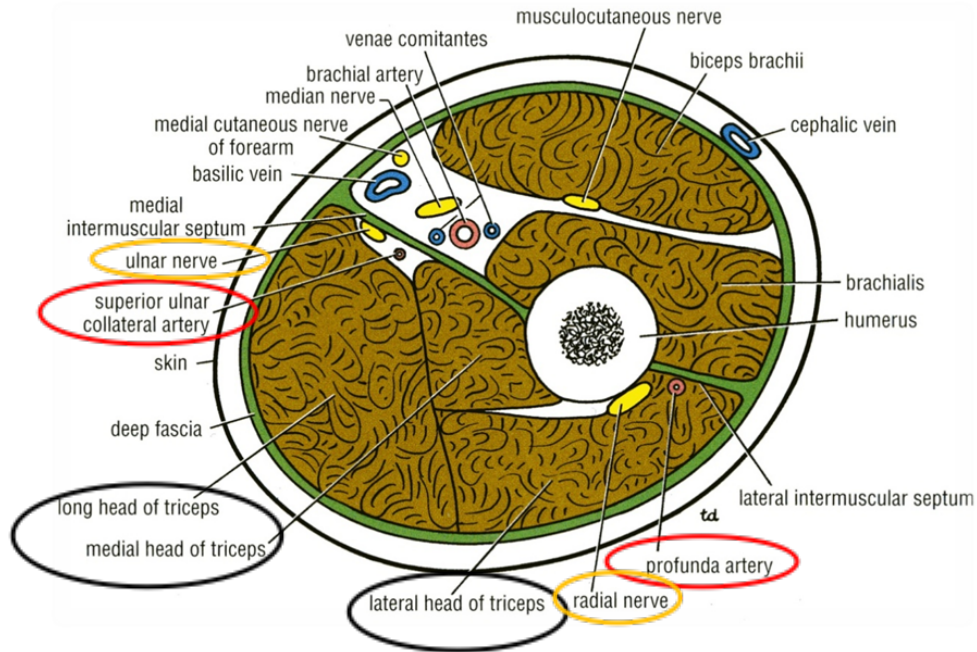
- **Musculocutaneous** (medial part) & **Radial** (lateral part).

- **Action:**

- **Strong flexor of the forearm**



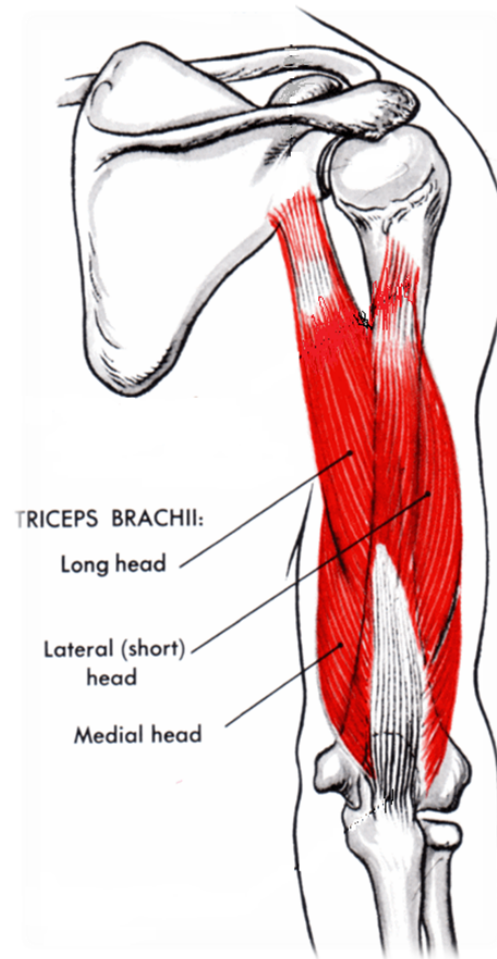
# Posterior Fascial Compartment Contents



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

# Muscles of the Posterior Compartment

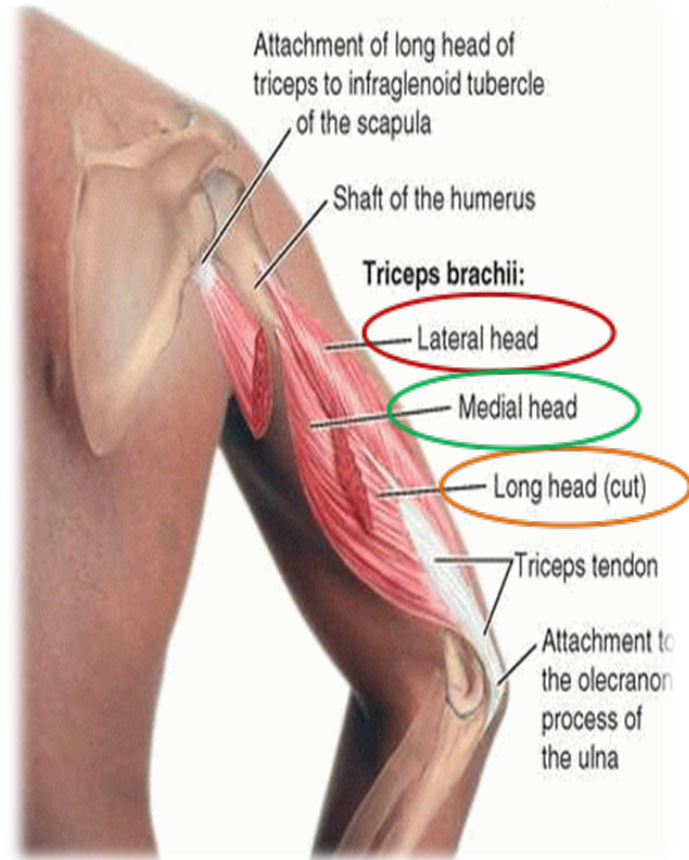
## Triceps brachii



# Triceps

**Origin:** Three heads:

- **Long Head** from **infraglenoid 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:**

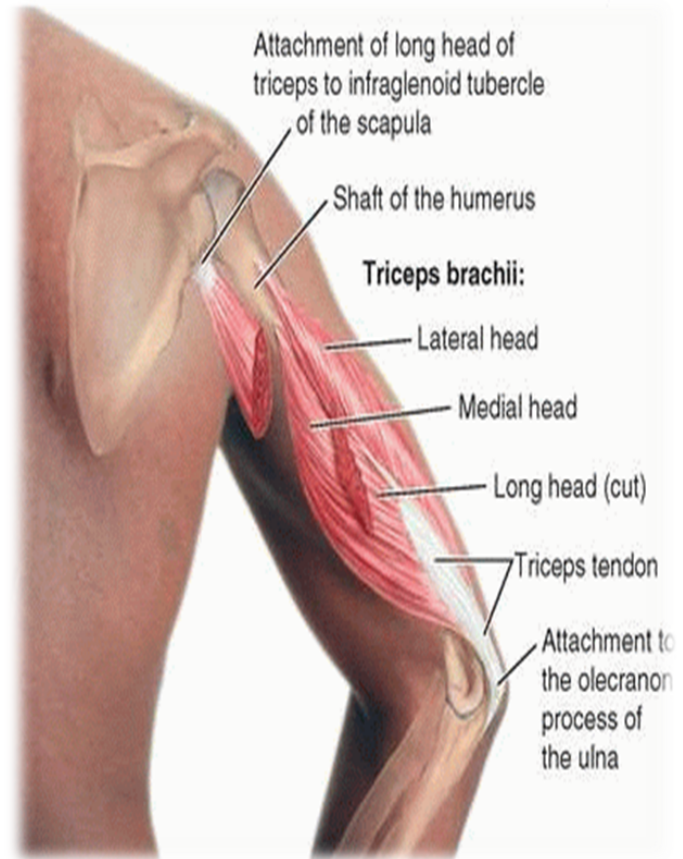
- **Common tendon** inserted into the upper surface of the **olecranon process of ulna**

- **Nerve supply:**

- **Radial nerve**

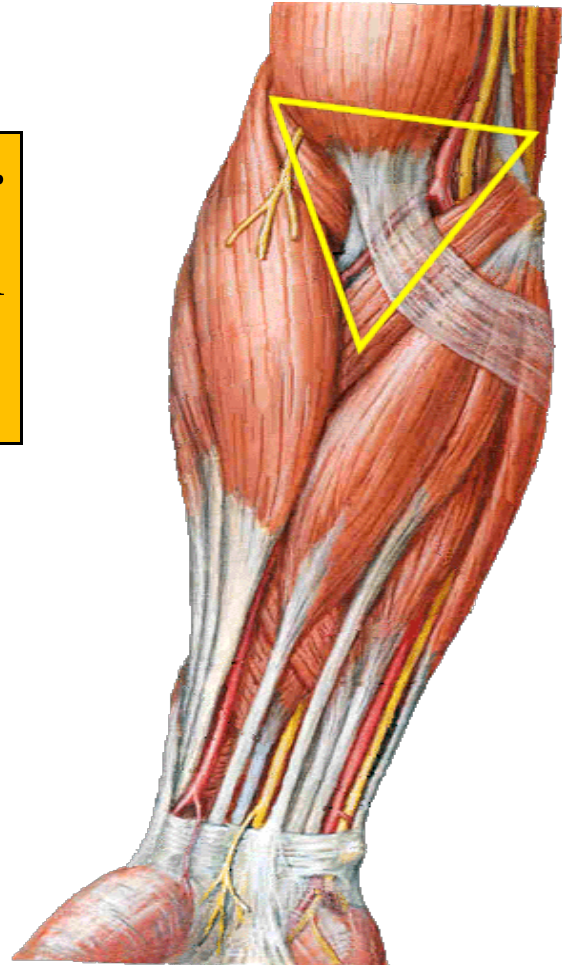
- **Action:**

- **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:**

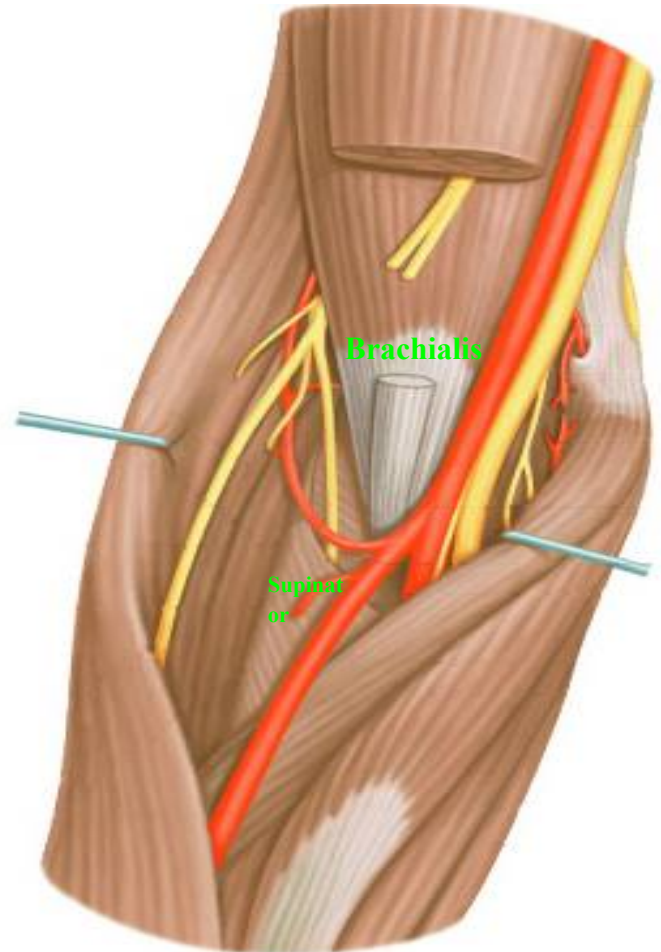
- Pronator teres

- **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

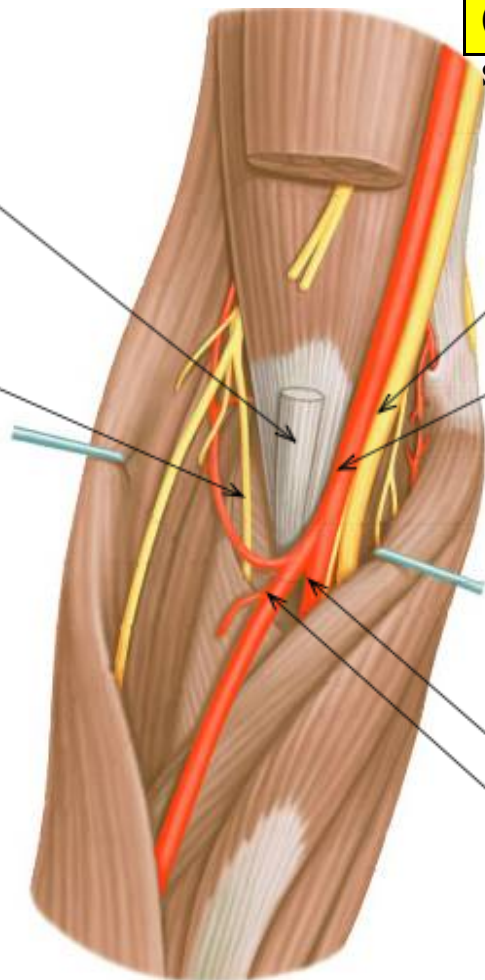
4. Deep branch of radial nerve

1. Median nerve

2. Brachial artery divides into radial & ulnar arteries.

Ulnar artery

Radial artery



# ELBOW Joint

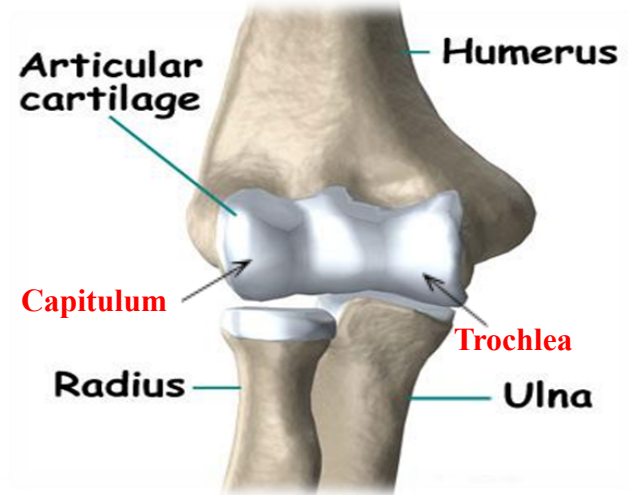
## Uniaxial, Synovial Hinge joint

### 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

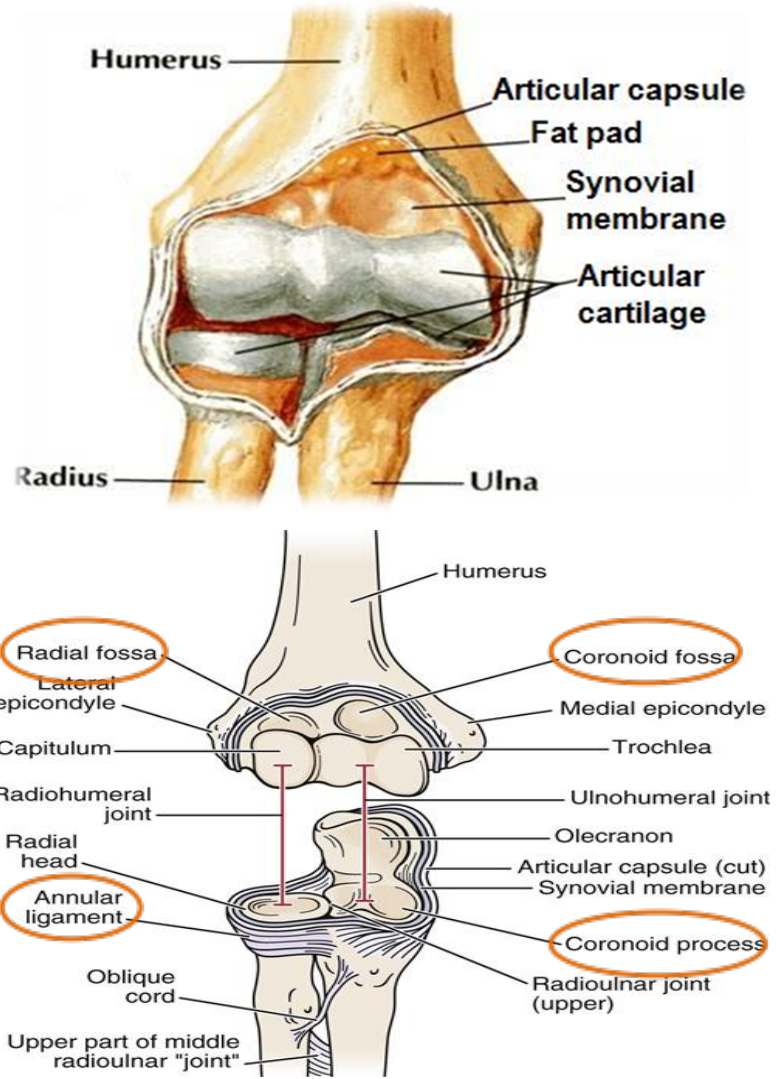
## Anteriorly: attached

### ➤ 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

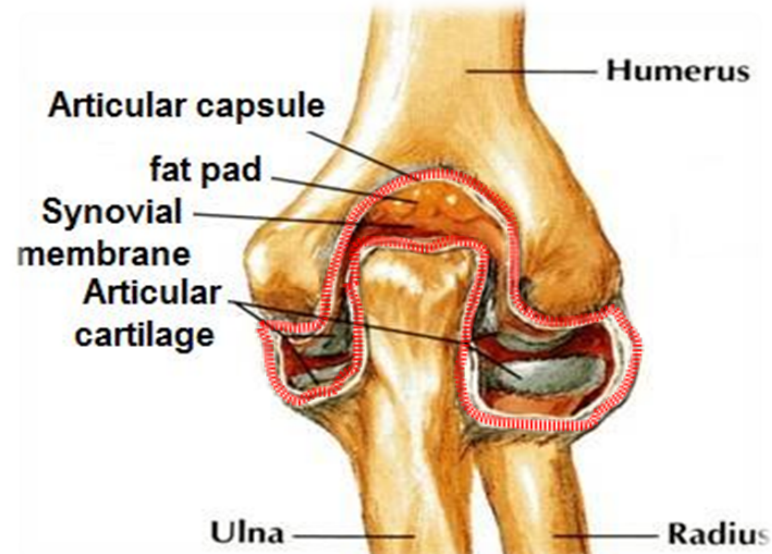
- To the **margin** of the **coronoid process** of the **ulna** and to the **anular ligament**, which surrounds the **head** of the **radius**.



# 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

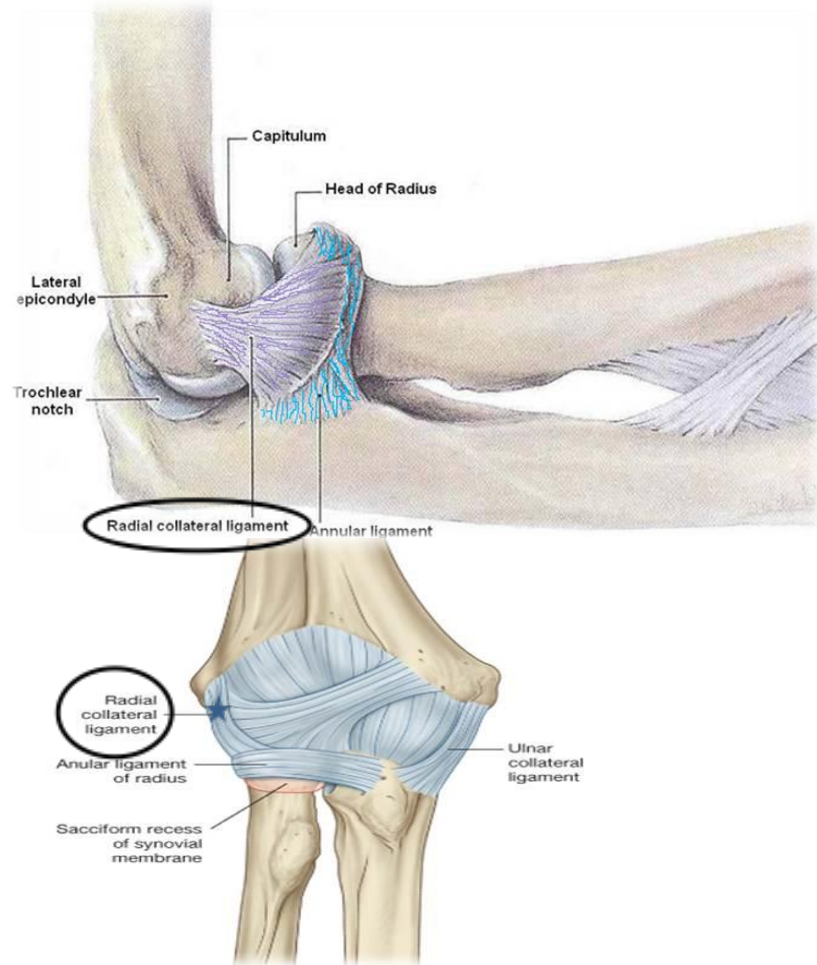
**Triangular in shape:**

**Apex**

Attached to the **lateral epicondyle of humerus**

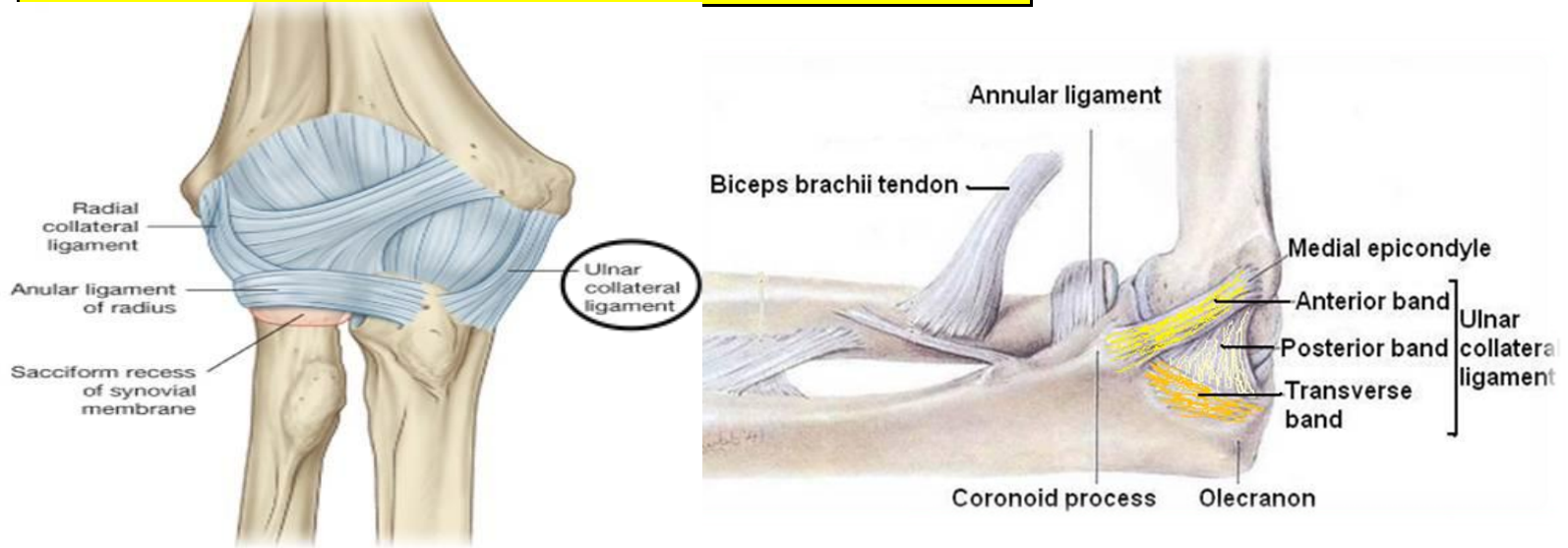
**Base**

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

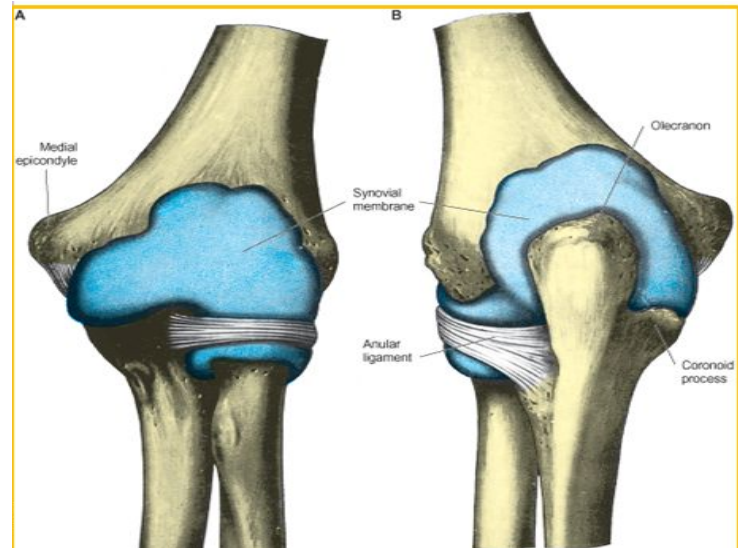
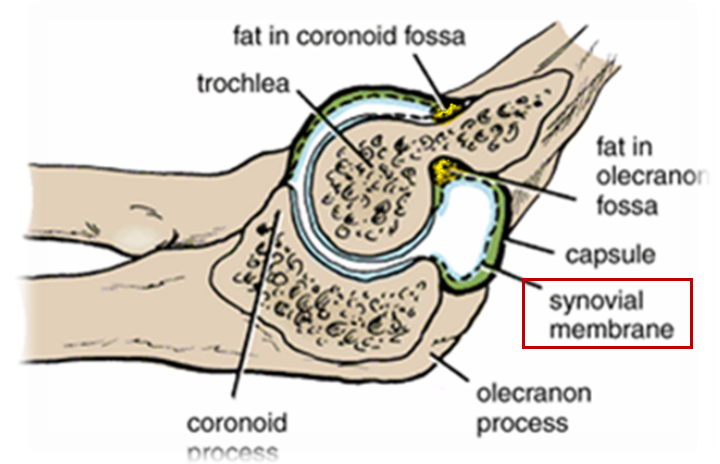
### **Transverse band:**

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

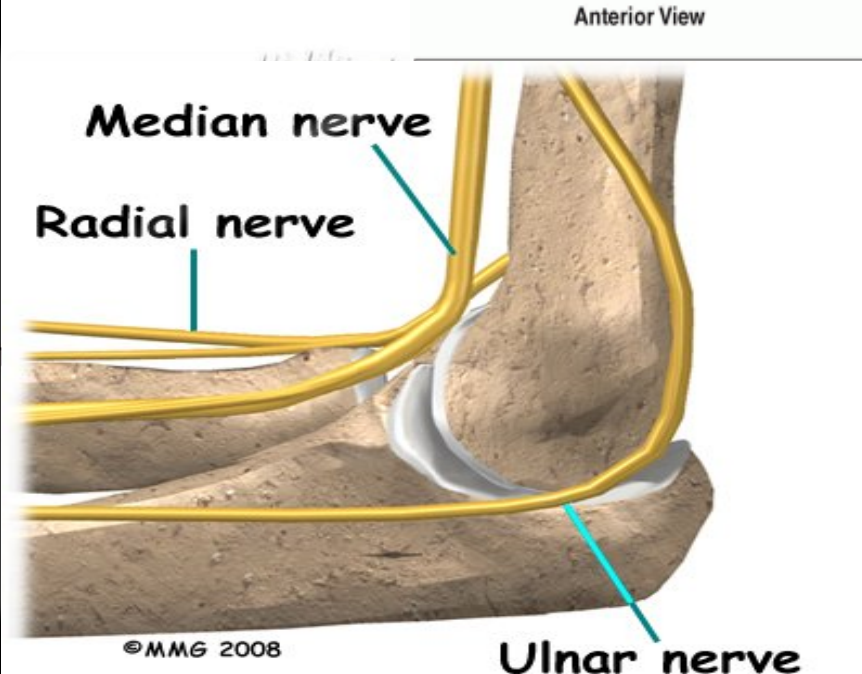
## Lateral:

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).



Medial relation

## 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.

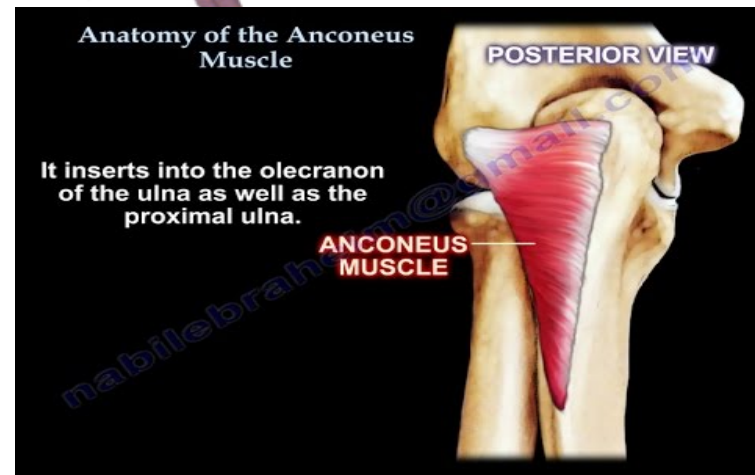
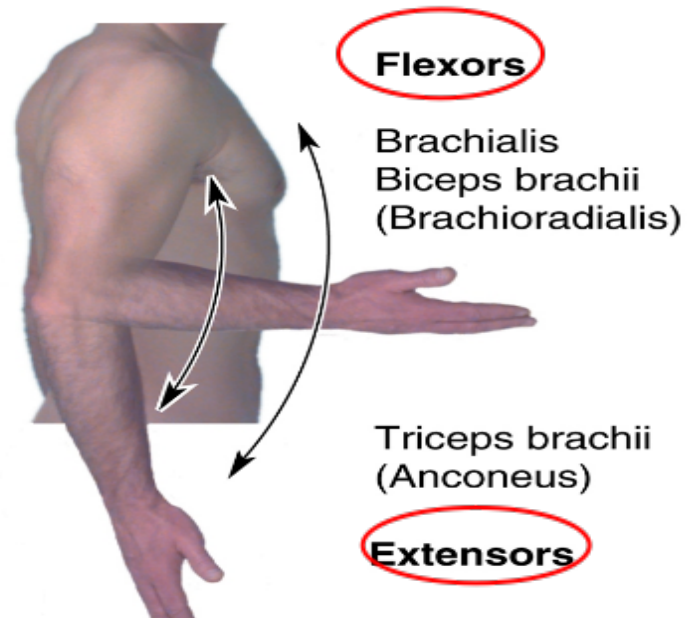
The joint is supplied by branches from the:

**Median**

**Ulnar**

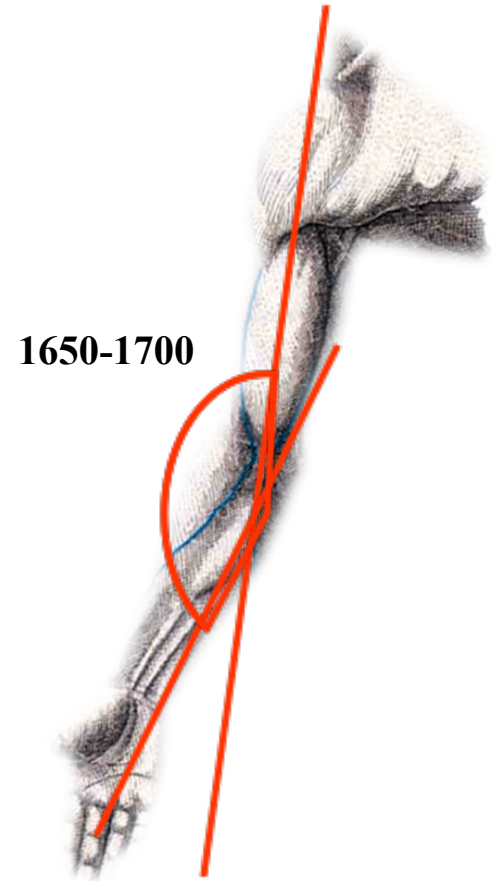
**Musculocutaneous**

**Radial nerves**



# Carrying Angle

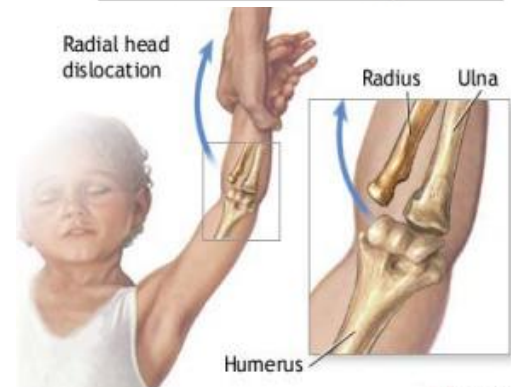
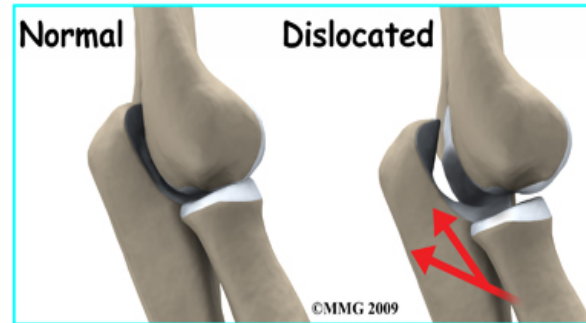
- **Angle**
  - **Between the long axis of the extended forearm and the long axis of the arm**
- **Opens**
  - **Laterally**
- **About**
  - **170 degrees in male and 167 degrees in females**
- **Disappears**
  - **When the elbow joint is flexed**
- **Permits**
  - **The forearms to clear the hips in 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 Dislocation

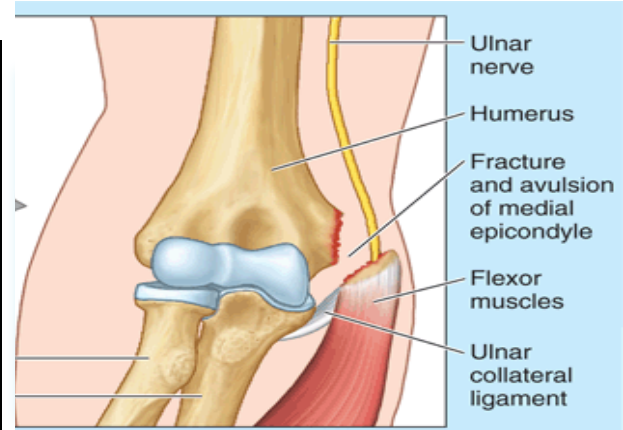


# ELBOW Joint

● **Avulsion fracture 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**

# ***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. Biceps 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