

**THE ARM**

- The arm extends from the shoulder to the elbow.
- Two types of movement occur between the arm and forearm at the elbow joint:
- flexion-extension and pronation-supination.
- The muscles performing these movements are clearly divided into anterior and posterior groups.

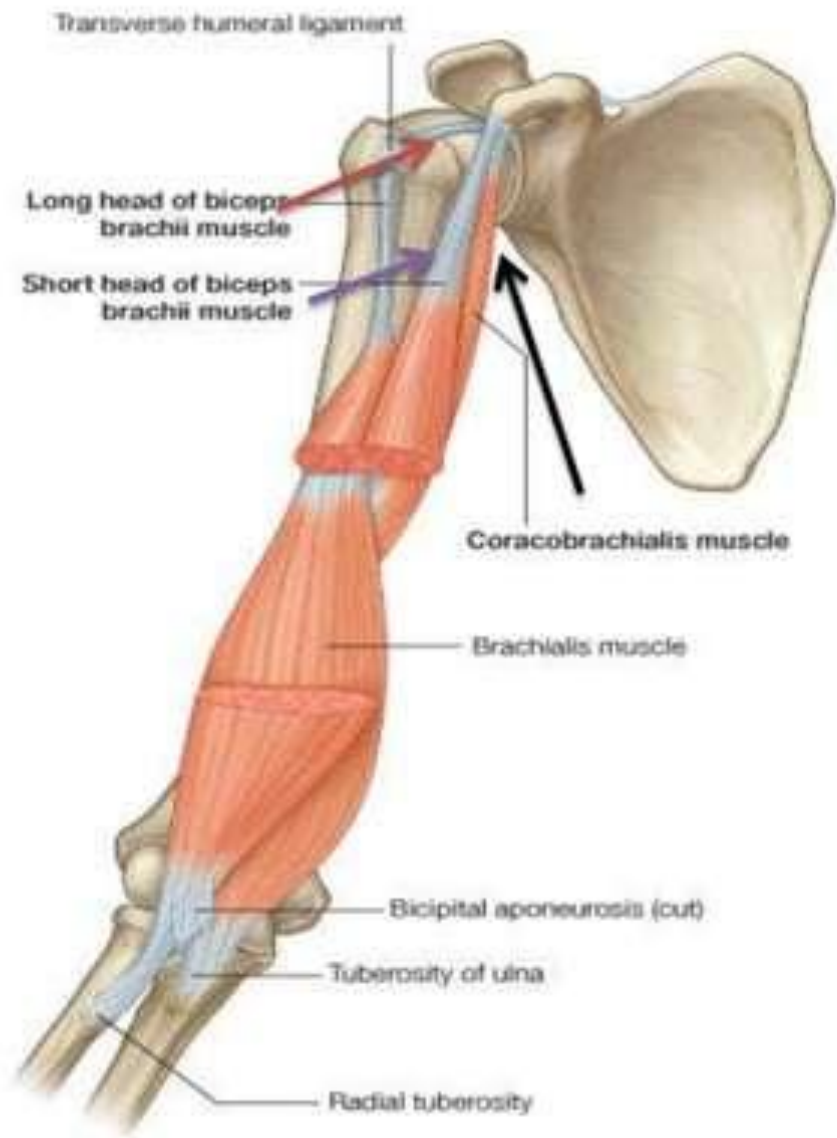
- ❖ The skeletal support for the arm is the humerus .
- ❖ Most of the large muscles of the arm insert into the proximal ends of the two bones of the forearm, the radius and the ulna, and flex and extend the forearm at the elbow joint.
- ❖ In addition, the muscles predominantly situated in the forearm that move the hand originate at the distal end of the humerus.

# Muscles of the Arm

- The **anterior compartment** of the arm contains three muscles-
  - the coracobrachialis,
  - brachialis,
  - and biceps brachii muscles-
- The **posterior compartment** contains one muscle-the triceps brachii muscle.

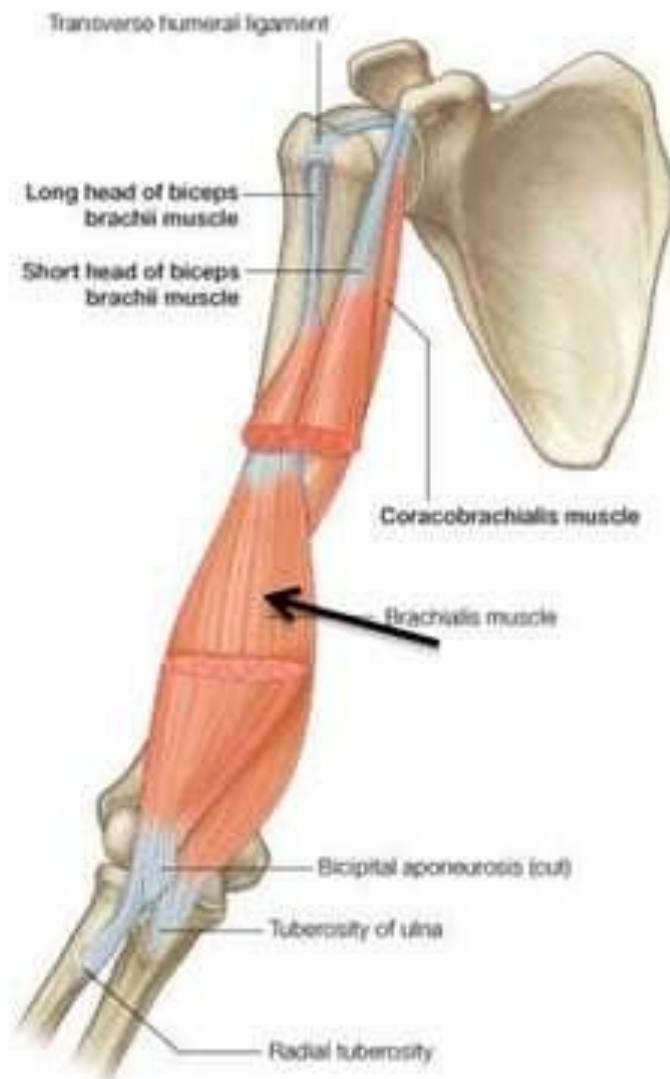
# Anterior compartment muscle

MUSCLE	ORIGIN	INSERTION	INNERVATION	ACTION
<b>Coracobrachialis</b>	Tip of the coracoid process of the scapular bone	Linear roughening on mid-shaft of humerus on medial side	Musculocutaneous nerve [C5,C6,C7]	Flexor of the arm at the gleno-humeral joint
<b>Biceps brachii</b>	<b>Long head</b> -supraglenoid tubercle of scapula; <b>short head</b> -apex of coracoid process	Radial tuberosity	Musculocutaneous nerve [C5,C6,C7]	Powerful flexor of the forearm at the elbow joint and supinator of the forearm; accessory flexor of the arm at the glenohumeral joint



# Anterior compartment muscle

MUSCLE	ORIGIN	INSERTION	INNERVATION	ACTION
<b>Brachialis</b>	Anterior aspect of humerus (medial and lateral surfaces) and adjacent intermuscular septae	Tuberosity of the ulna	Musculocutaneous nerve [C5,C6, C7]; A small portion of its lateral part may be innervated by the radial nerve	Powerful flexor of the forearm at the elbow joint





# Posterior compartment

MUSCLE	ORIGIN	INSERTION	INNERVATION	ACTION
<b>Triceps brachii</b>	<b>Long head</b> - infraglenoid tubercle of scapula; <b>medial head</b> - posterior surface of humerus; <b>lateral head</b> - posterior surface of humerus	Superior surface of the Olecranon of the ulna bone	Radial nerve [C6,C7,C8]	Extension of the forearm at the elbow joint. Long head can also extend and adduct the arm at the shoulder joint



Lateral head of triceps brachii

Radial groove of humerus

Long head of triceps brachii

Medial head of triceps brachii

Lateral head of triceps brachii

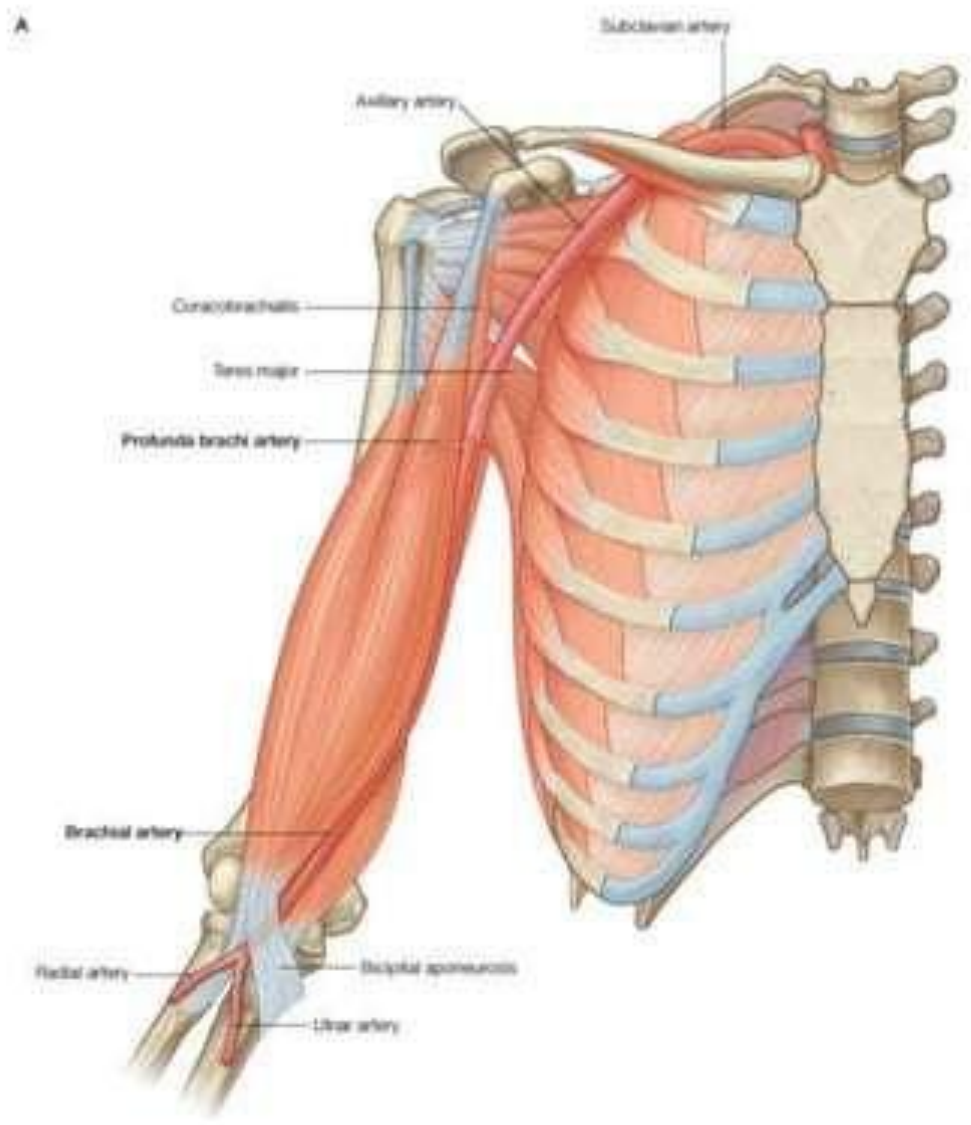
Olecranon

# Arteries and veins of the arm

- **Brachial artery**
- The major artery of the arm, is found in the anterior compartment .
- It begins as a continuation of the axillary artery at the lower border of the teres major muscle, it terminates just distal to the elbow joint where it divides into the radial and ulnar arteries.

- In the proximal arm, the brachial artery lies on the medial side.
- In the distal arm, it moves laterally to assume a position midway between the lateral epicondyle and the medial epicondyle of the humerus.
- It crosses anteriorly to the elbow joint where it lies immediately medial to the tendon of the biceps brachii muscle.

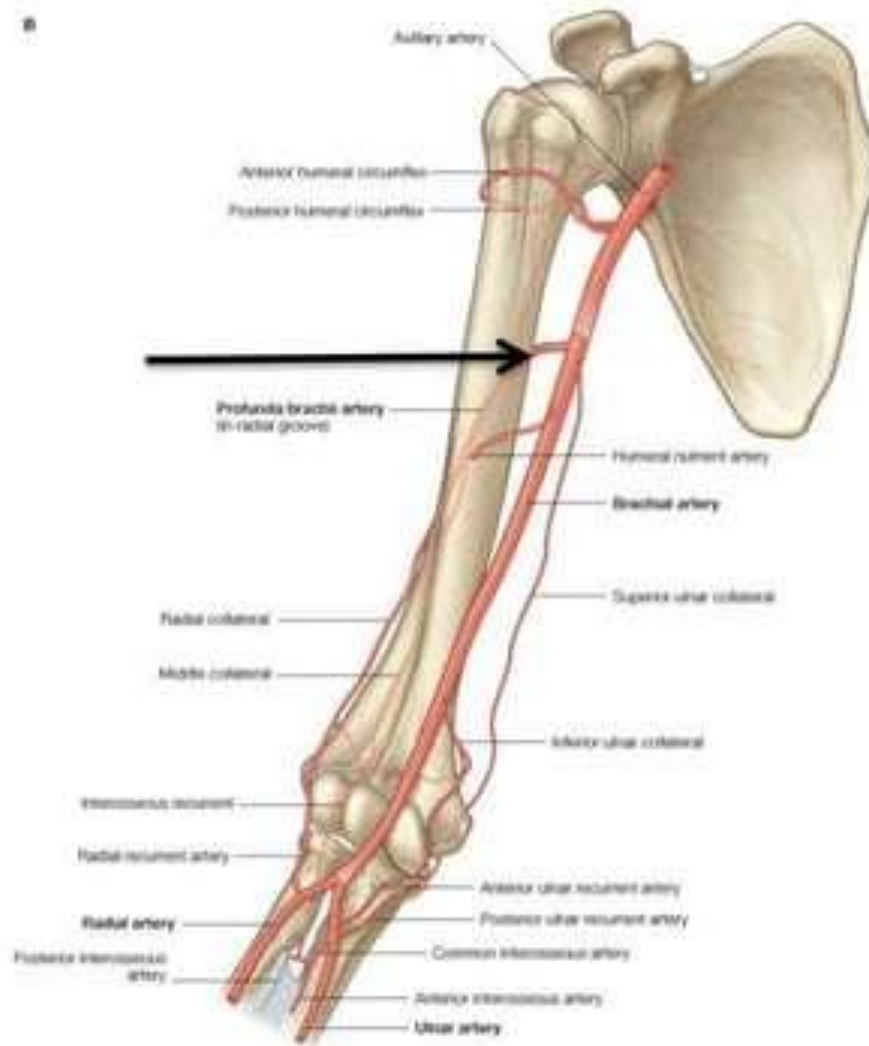
- Branches of the brachial artery in the arm include those to adjacent muscles and **two ulnar collateral vessels**, which contribute to a network of arteries around the elbow joint.
- Additional branches are the **profunda brachii artery** and **nutrient arteries to the humerus**, which passes through a foramen in the anteromedial surface of the humeral shaft.



# Profunda brachii artery

- The largest branch of the brachial artery, passes into and supplies the posterior compartment of the arm.
- It enters the posterior compartment with the radial nerve and together they pass through the triangular interval, which is formed by the shaft of the humerus, the inferior margin of the teres major muscle, and the lateral margin of the long head of the triceps muscle.
- They then pass along the radial groove on the posterior surface of the humerus deep to the lateral head of the triceps brachii muscle.

# Profunda brachii artery

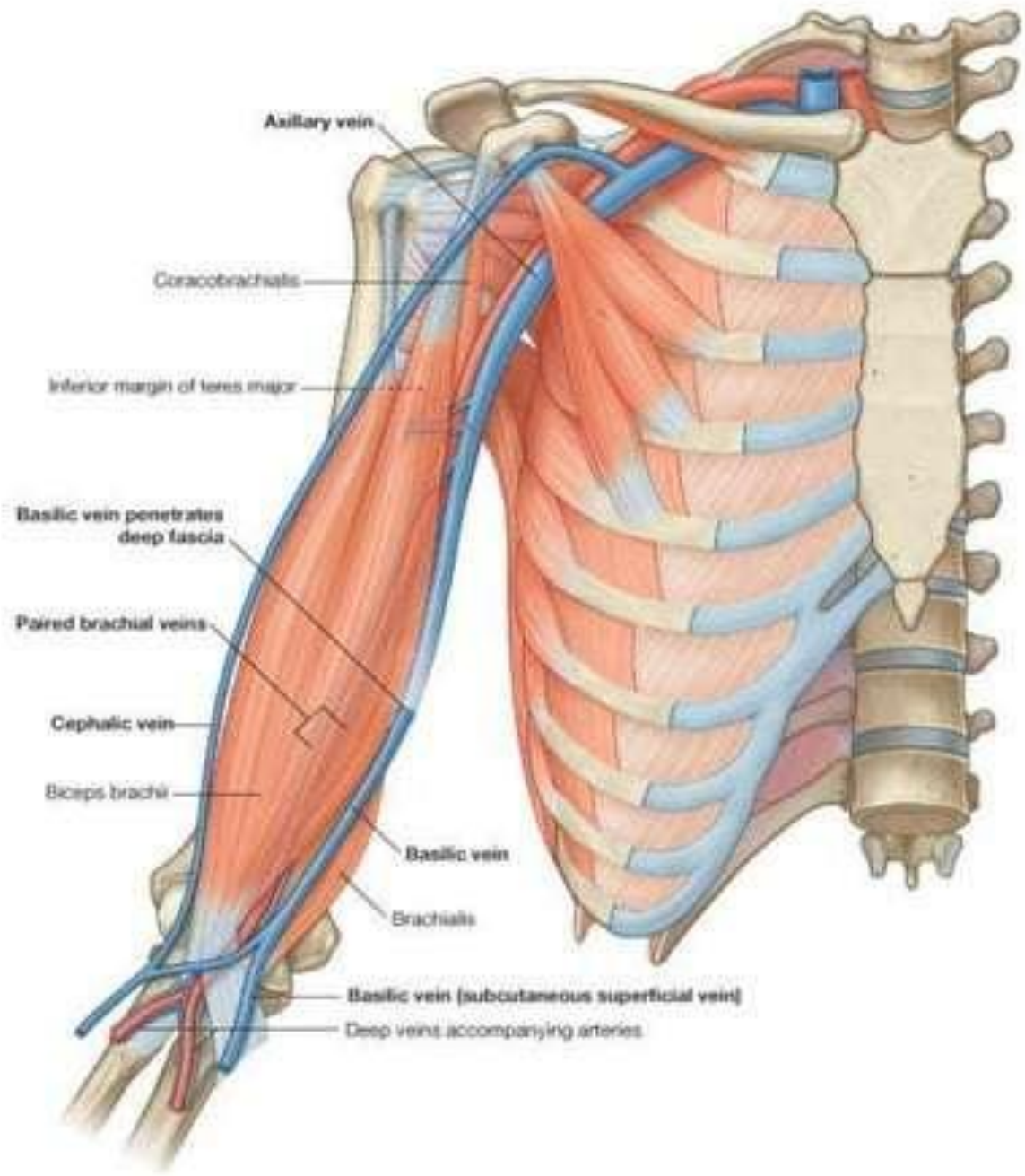




# Veins

- **Paired brachial veins** pass along the medial and lateral sides of the brachial artery, receiving tributaries that accompany branches of the artery.
- In addition to these deep veins, two large subcutaneous veins, the **basilic vein** and the **cephalic vein**, are located in the arm.

- **The basilic vein** passes vertically in the distal half of the arm, penetrates deep fascia to assume a position medial to the brachial artery, and then becomes the axillary vein at the lower border of the teres major muscle. The brachial veins join the basilic, or axillary, vein.
- **The cephalic vein** passes superiorly on the anterolateral aspect of the arm and through the anterior wall of the axilla to reach the axillary vein.

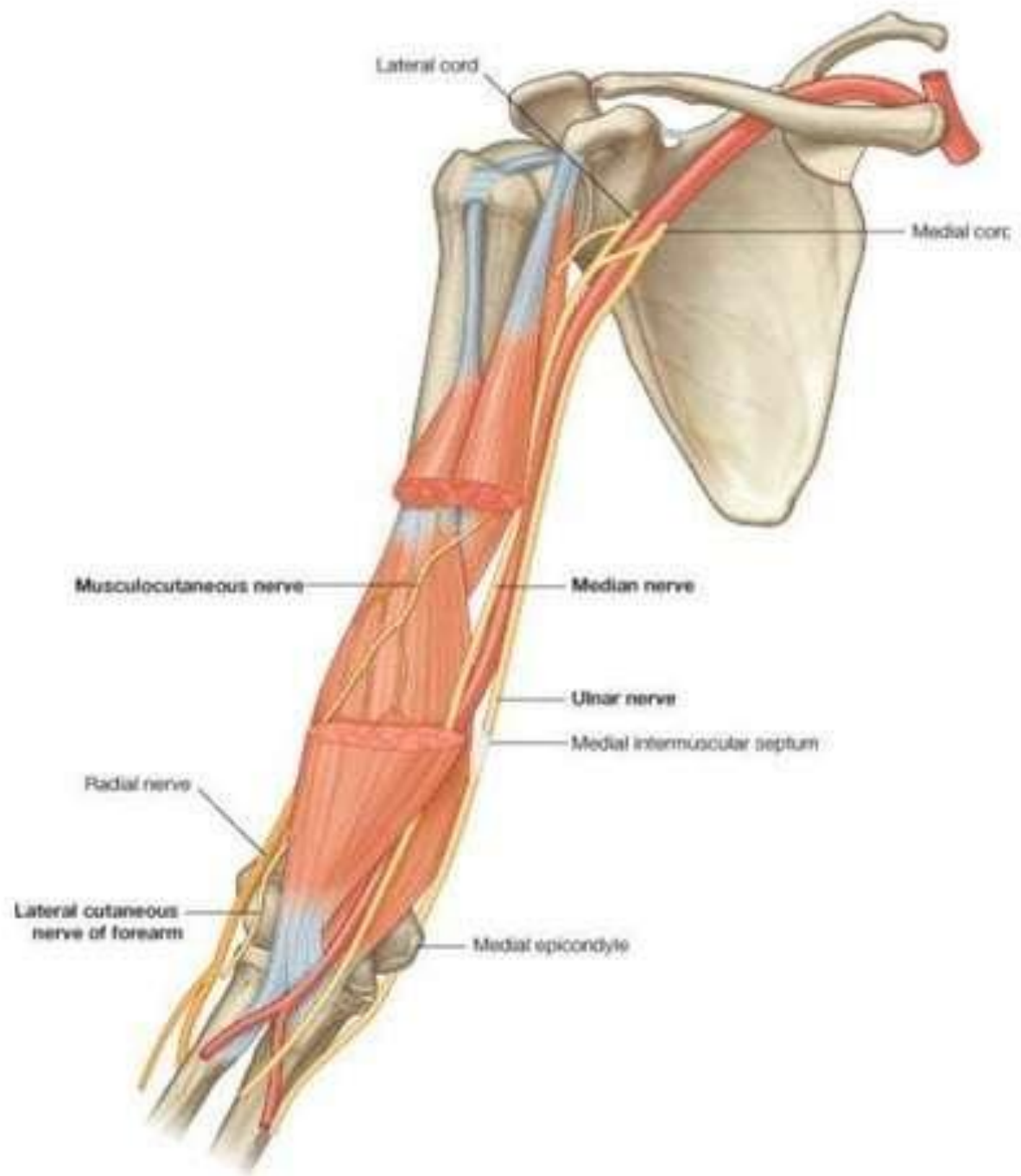


# Nerves of the arm

- These four nerves are found within the anterior and posterior compartments of the arm;
- Musculocutaneous nerve
- Median nerve
- Ulnar nerve
- Radial nerve

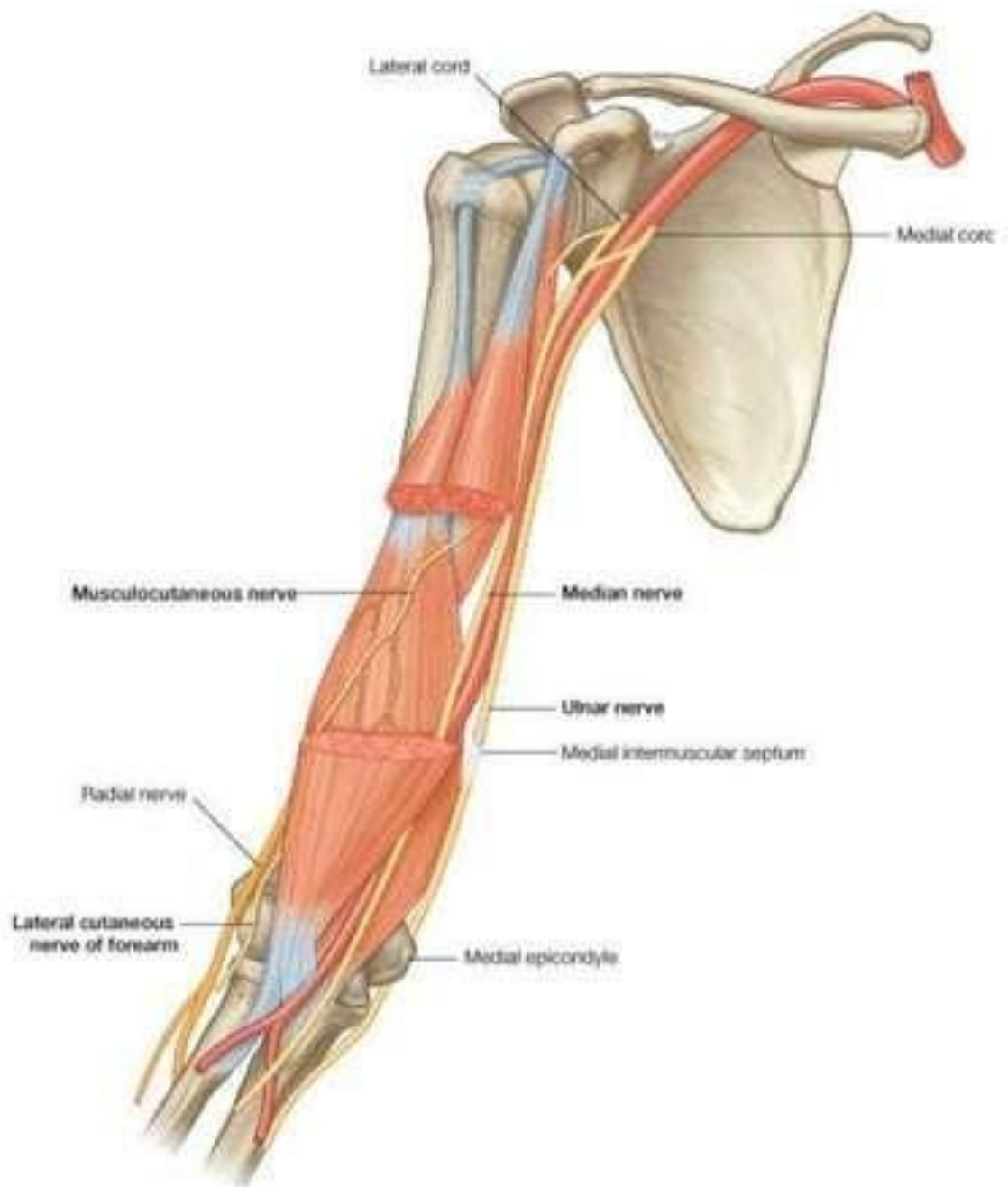
# Musculocutaneous nerve (C5-7)

- Is a large terminal branch of the lateral cord.
- Enters the arm by passing through the coracobrachialis muscle.
- It passes diagonally down the arm in the plane between the biceps brachii and brachialis muscles.
- After giving rise to motor branches in the arm, it emerges laterally to the tendon of the biceps brachii muscle at the elbow, penetrates deep fascia, and continues as the **lateral cutaneous nerve of forearm**.

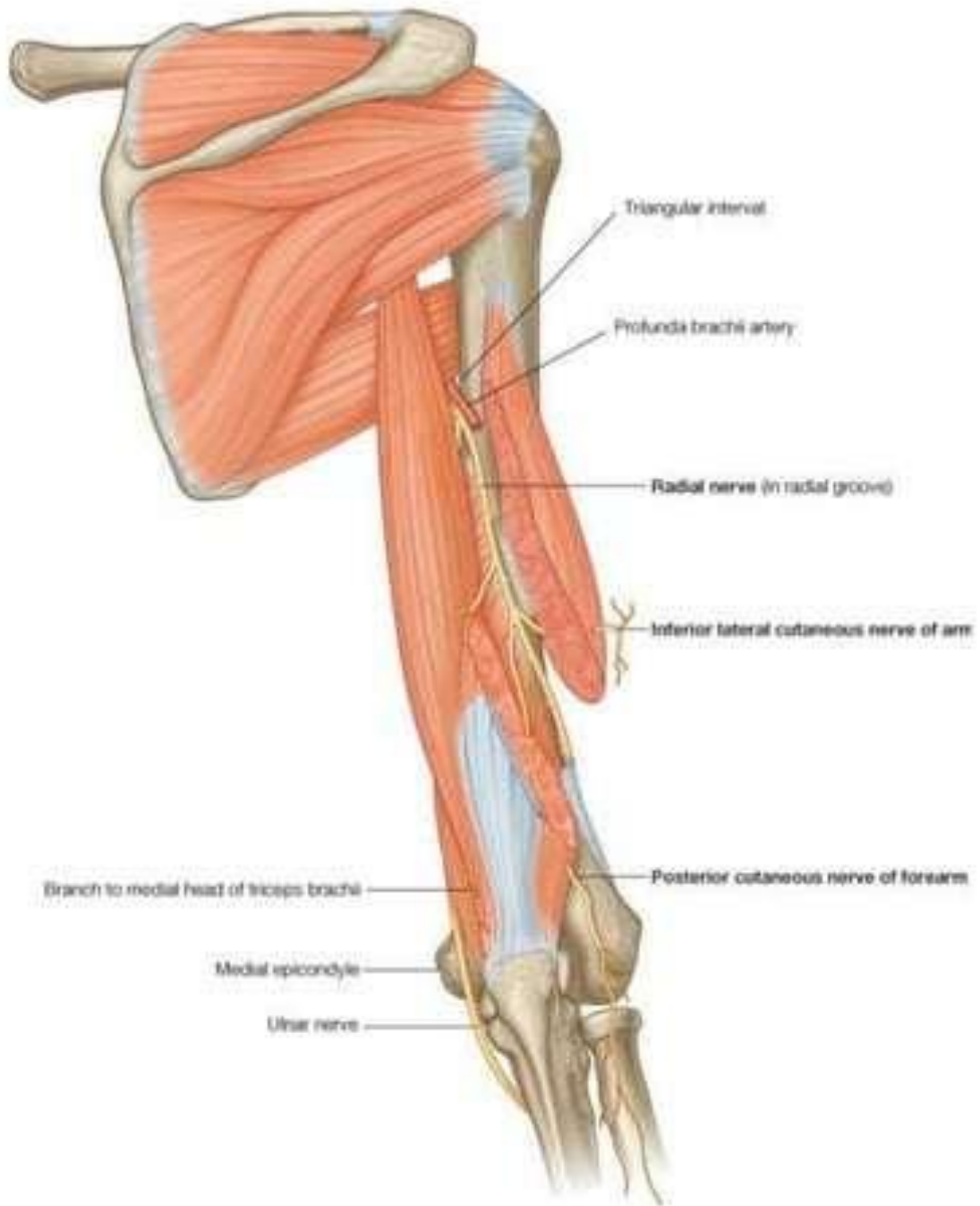


# Median, ulnar nerve & radial nerve

- As discussed in brachial plexus- both the median and ulnar nerve passes through the arm into the forearm with no branches to the arm.
- The radial nerve originate from the posterior cord of the brachial plexus, it enters the arm after crossing the inferior margin of the teres major muscle lying posterior to the brachial artery and accompanied by the profunda brachii artery to the posterior aspect of the arm.









# **THE ELBOW JOINT**

- **Definition;**
- The elbow joint is a complex type of hinge type of synovial joint involving three separate articulations, which share a common synovial cavity
- **Articulation;**
- It involves three separate articulations, which share a common synovial cavity viz;

1. The ***humero-ulnar***, between the trochlea of the humerus and the trochlear notch of the ulna (a hinge joint)
2. The ***humero-radial***, between the capitulum and the upper concave surface of the radial head (a ball and socket joint)
3. The ***the superior radio-ulnar***, between the head of the radius and the radial notch of the ulna, the head being held in place by the tough annular ligament (a pivot joint)

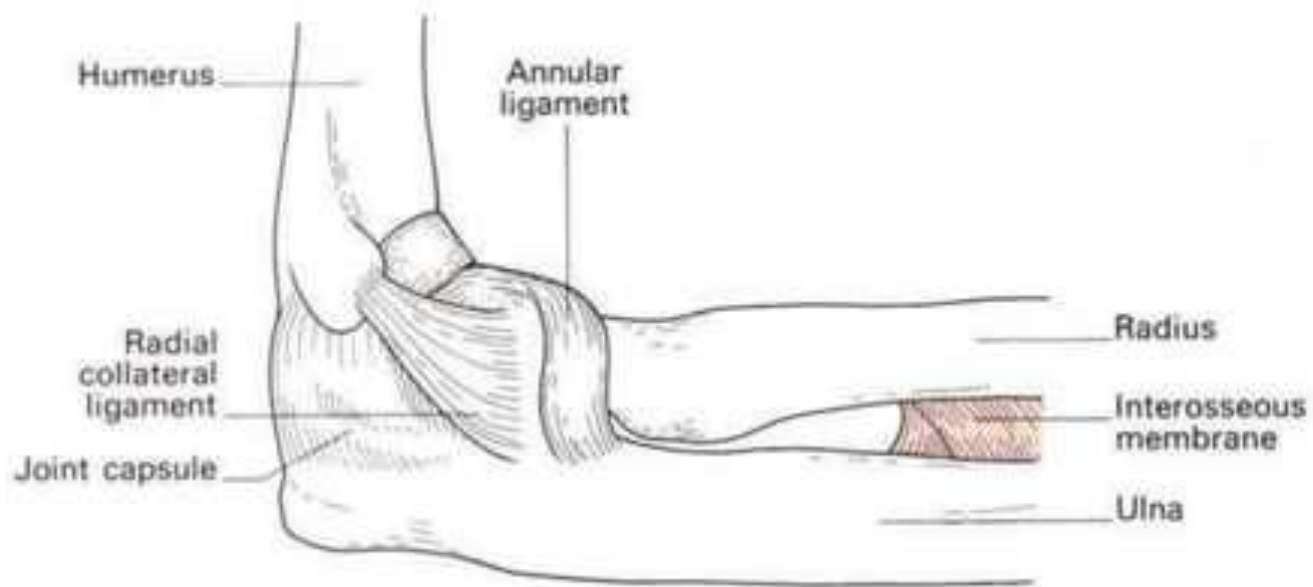


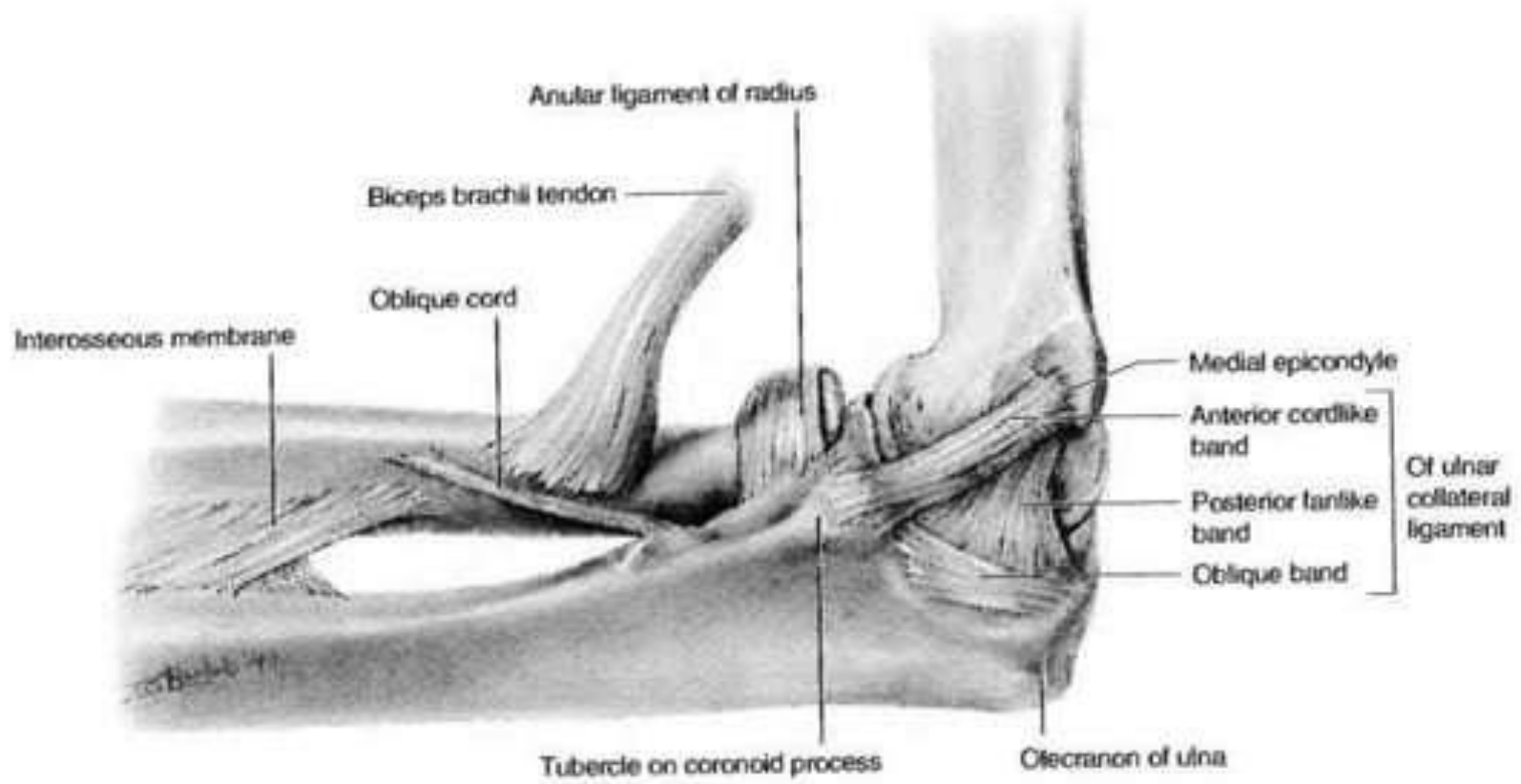
- **Capsule;** the capsule is closely applied around this complex articular arrangement.
- The non-articular medial and lateral epicondyles are extracapsular
- It is thin and loose anteriorly and posteriorly to allow flexion and extension, whereas it is strongly thickened on either side to form the medial and lateral collateral ligaments

- **Ligaments;** the collateral ligaments of the elbow joint are strong triangular bands that are medial and lateral thickenings of the fibrous capsule.
- The fanlike **radial collateral ligament** extends from the lateral epicondyle and attach distally to the annular ligament around the radial head.



- The medial, **triangular ulnar collateral ligament** extends from the medial epicondyle of the humerus to the coronoid process and olecranon of the ulna.
- It consist of 3 bands;
- An anterior cordlike band which is the strongest
- A posterior fanlike band, which is the weakest
- The slender oblique band, which deepens the socket for the trochlea of the humerus.





- **Innervation;** nerve supply is by the ulnar, radial and musculocutaneous nerves.
- *May also have innervation from median nerve as it passes through.*

- **Movements;** two sets of movements take place at the elbow:
- Flexion and extension at the humero-ulnar and humero-radial joints;
- Pronation and supination at the proximal radio-ulnar



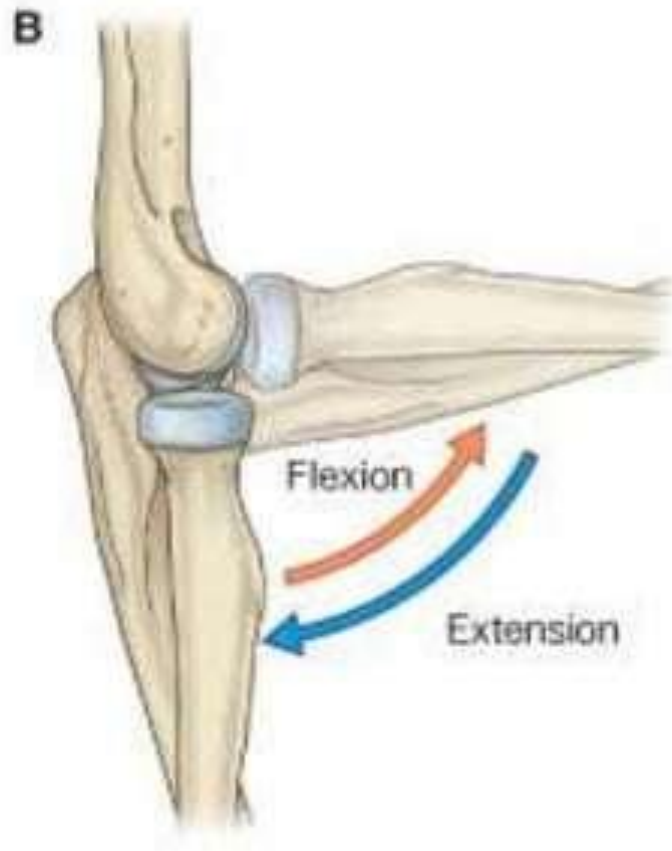
- **MUSCLES INVOLVED IN THE MOVEMENTS;**

- **FLEXION;**

- Biceps brachii
- Brachialis
- Brachoradialis
- Pronator teres

- **EXTENSION;**

- Triceps brachii
- aconeus





- **PRONATION;**

- Pronator teres
- Pronator quadratus
- Flexor carpi radialis

- **SUPINATOR;**

- Biceps brachii
- Supinator
- Extensor pollicis longus
- Extensor pollicis bravis
- Abductor pollicis longus

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# BURSAE

- Three olecranon bursae are clinically important to the elbow joint. They include;
- **Intratendinous olecranon bursa;** which is sometimes present in the tendon of triceps brachii.
- **Subtendinous olecranon bursa;** which is located between the olecranon and the triceps tendon, just proximal to its attachment to the olecranon.
- **Subcutaneous olecranon bursa;** which is located in the subcutaneous connective tissue over the olecranon

- **BLOOD SUPPLY;** the arteries supplying the elbow joint are derived from the anastomosis around the elbow.

# APPLIED ANATOMY

- **Bursitis of the elbow;**
- The subcutaneous olecranon bursa is exposed to injury during falls on the elbow and to infection from abrasions of the skin covering the olecranon.
- Repeated excessive pressure and frictions, as occurs in wrestling, for example, may cause this bursa to become inflamed, producing a friction called **subcutaneous olecranon bursitis.**  
(“student elbow”)

- **Subtendinous olecranon bursitis;** is much less common.
- Results from excessive friction between the triceps tendon and olecranon, e.g; resulting from repeated flexion-extension of the forearm as occurs during some assembly line job.



- **Dislocation of the elbow joint;**
- Posterior dislocation of the elbow joint may occur when children fall on their hands with their elbows flexed.
- The distal end of the humerus is driven through the weak anterior part of the fibrous capsule as the radius and ulna dislocate posteriorly.



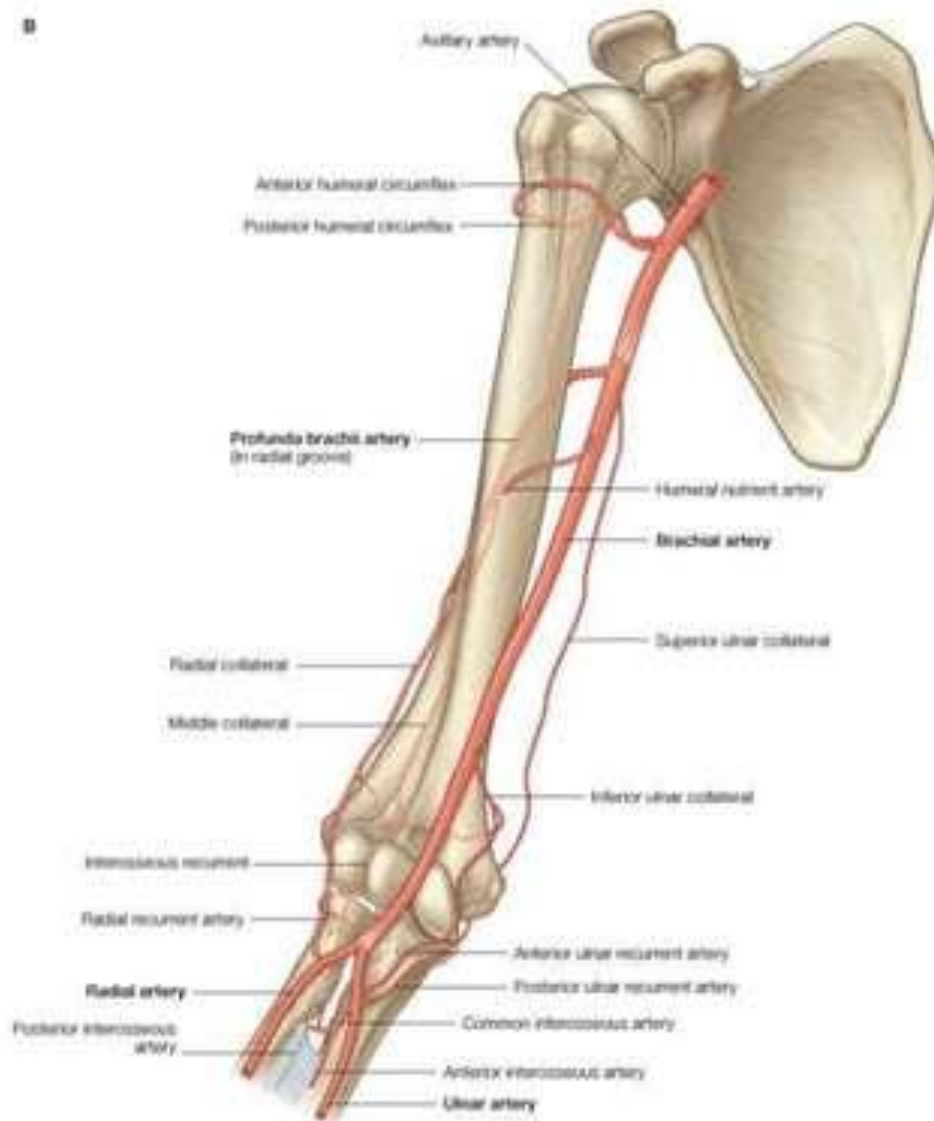
# **ELBOW ANASTOMOSIS**

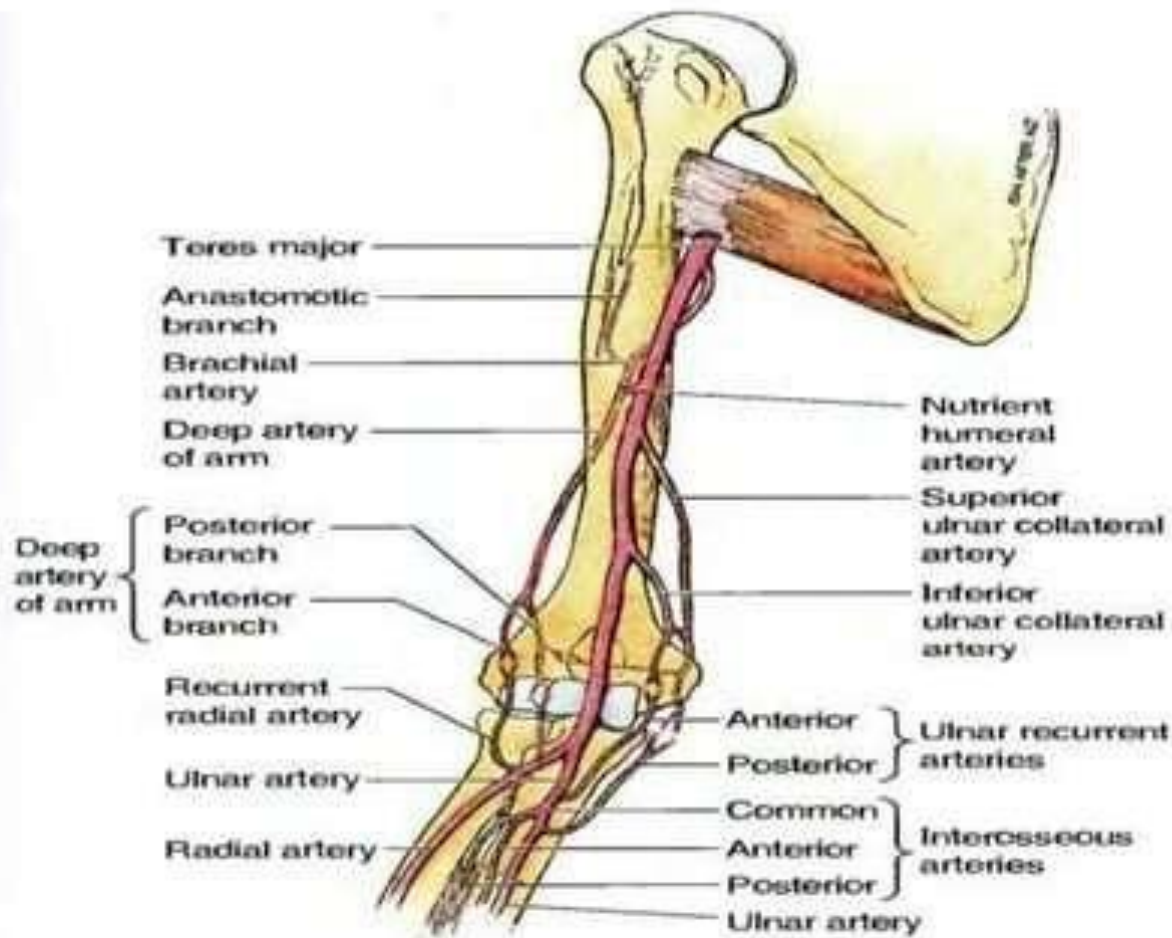
- There is a rich arterial anastomosis around the elbow joint, the arteries involved are branches of brachial, radial and ulnar arteries.
- **In front of the medial epicondyle;**
- Anterior ulnar recurrent branch of ulnar artery anastomoses with inferior ulnar collateral branch of brachial artery.

- **Behind the medial epicondyle;**
- Posterior ulnar recurrent branch of ulnar artery anastomoses with superior ulnar collateral branch of brachial artery.
- **In front of lateral epicondyle;**
- Radial recurrent branch of radial artery anastomoses with the anterior descending branch of profunda brachii artery.

- **Behind the lateral epicondyle;**
- Interosseous recurrent artery from posterior interosseous branch of common interosseous of ulnar artery anastomoses with posterior descending branch of profunda brachii artery.

# Elbow anastomosis





**LIFE ISN'T ABOUT  
FINDING YOURSELF.  
LIFE IS ABOUT  
CREATING  
YOURSELF.**

(UNKNOWN)

**GOODMORNING**