

ANATOMY OF THE ARM

By DR. DALIA MAHMOUD BIRAM

- **Compartments of the arm:**

- The arm is divided into two compartments: anterior and posterior by:

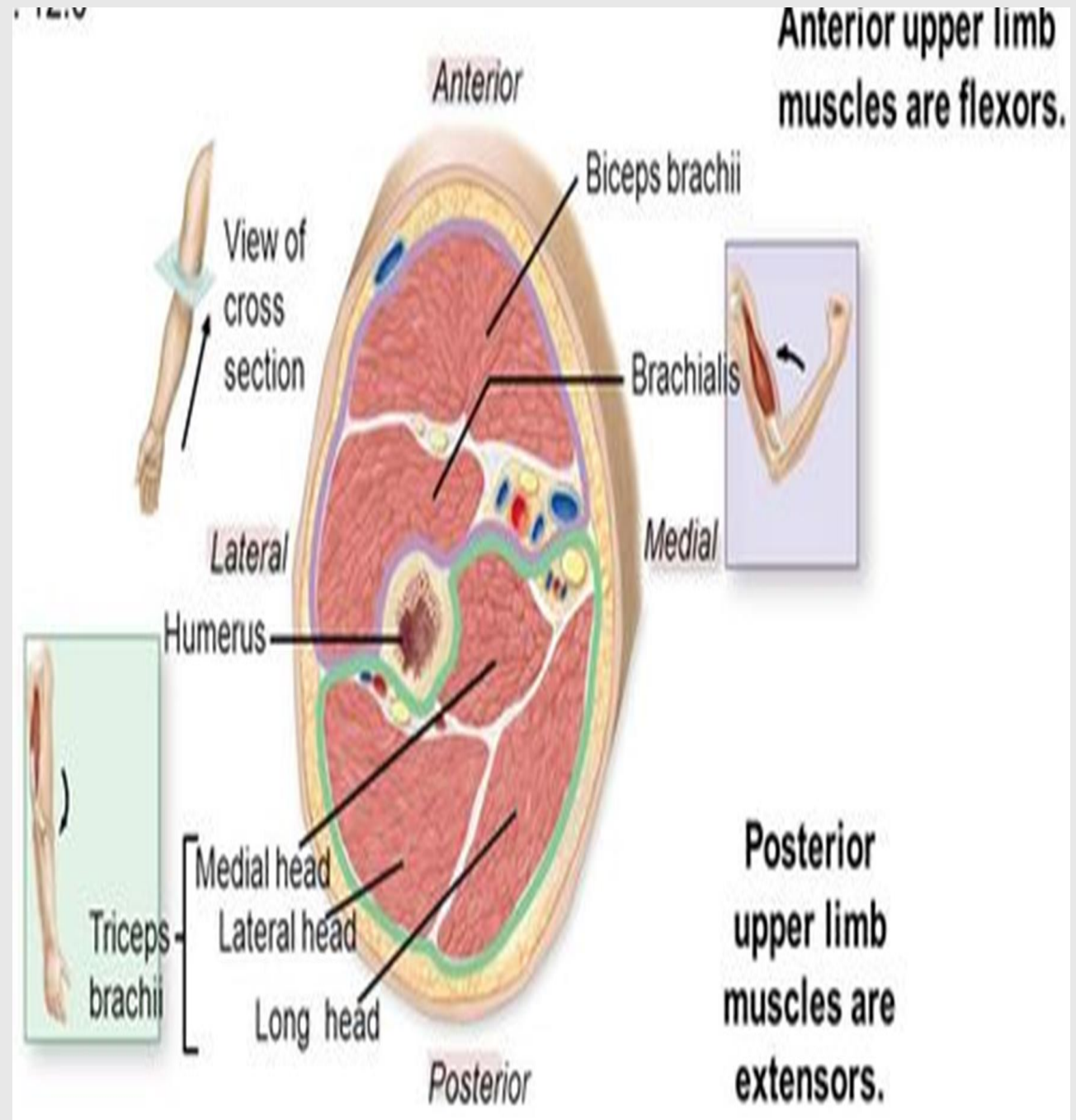
1. The deep fascia of the arm.
2. The humerus.
3. The lateral and medial intermuscular septa.

- **Medial intermuscular septum**

1. It is a fascial sheet that connects the medial supracondylar ridge of the humerus with the deep fascia of the arm.
2. It is pierced by **ulnar nerve** at the middle of the arm.

- **Lateral intermuscular septum:**

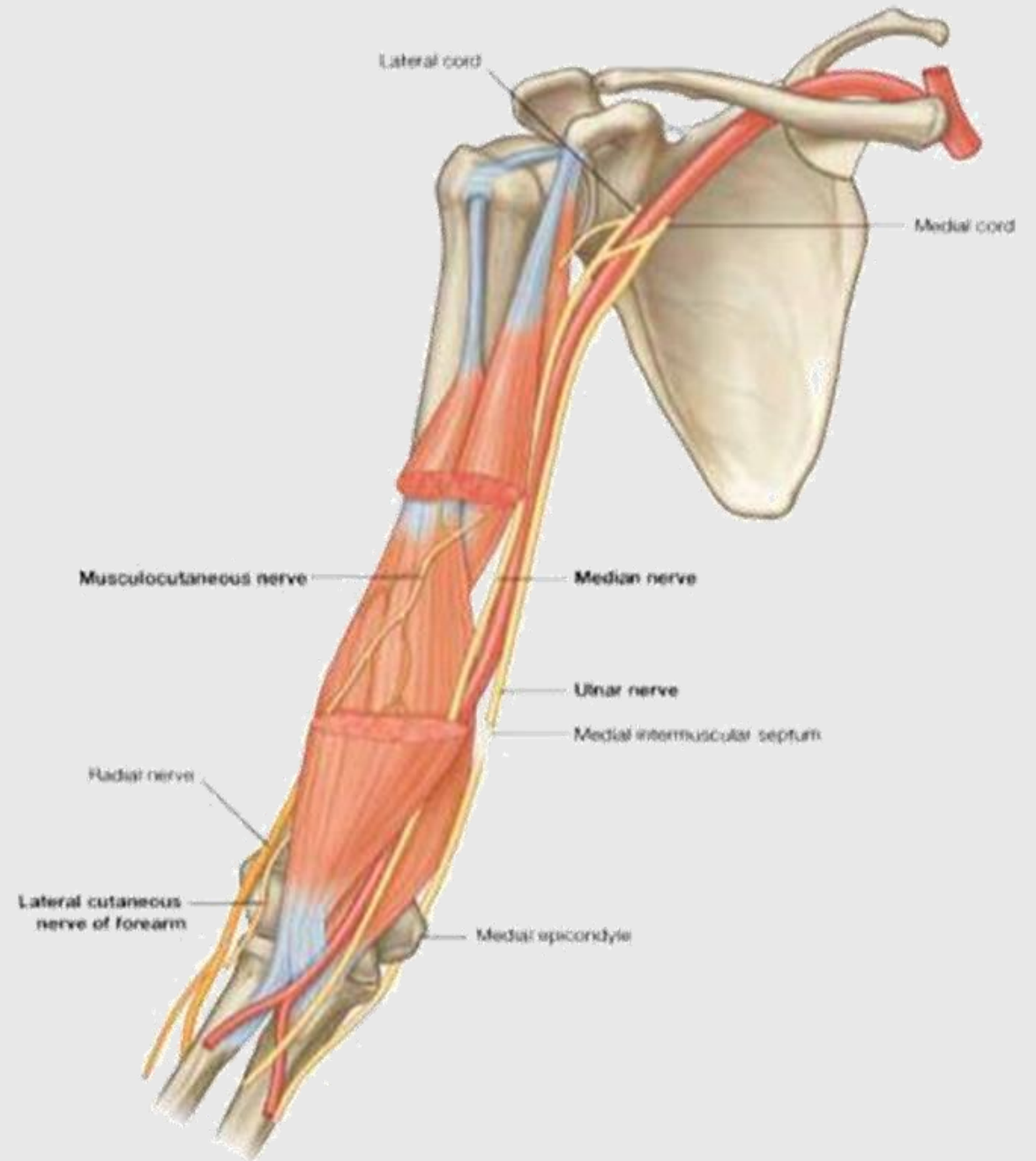
1. It is a fascial sheet that connects the lateral supracondylar ridge of the humerus with the deep fascia of the arm.
- It is pierced by **radial nerve** at the junction between middle and lower thirds of the arm



- **Anterior compartment of arm**

- **Contents:**

1. Flexor muscles; coracobrachialis, brachialis and biceps brachii.
2. Brachial artery and its 2 venae comitantes.
3. Musculocutaneous nerve
4. Basilic vein (at the upper half of the arm).
5. Median nerve.
6. Ulnar nerve (in the upper half of the arm).



Muscles of THR front of THE Arm

1-Bicepe Brachii

Origin

a. **Long head:** arises from the supraglenoid tubercle , runs in the shoulder joint (intra-capsular extra- synovial) and leave the joint by passing in the bicipital groove behind transverse humeral ligament.

b. **Short head:** arises from tip of coracoid process with coracobrachialis .

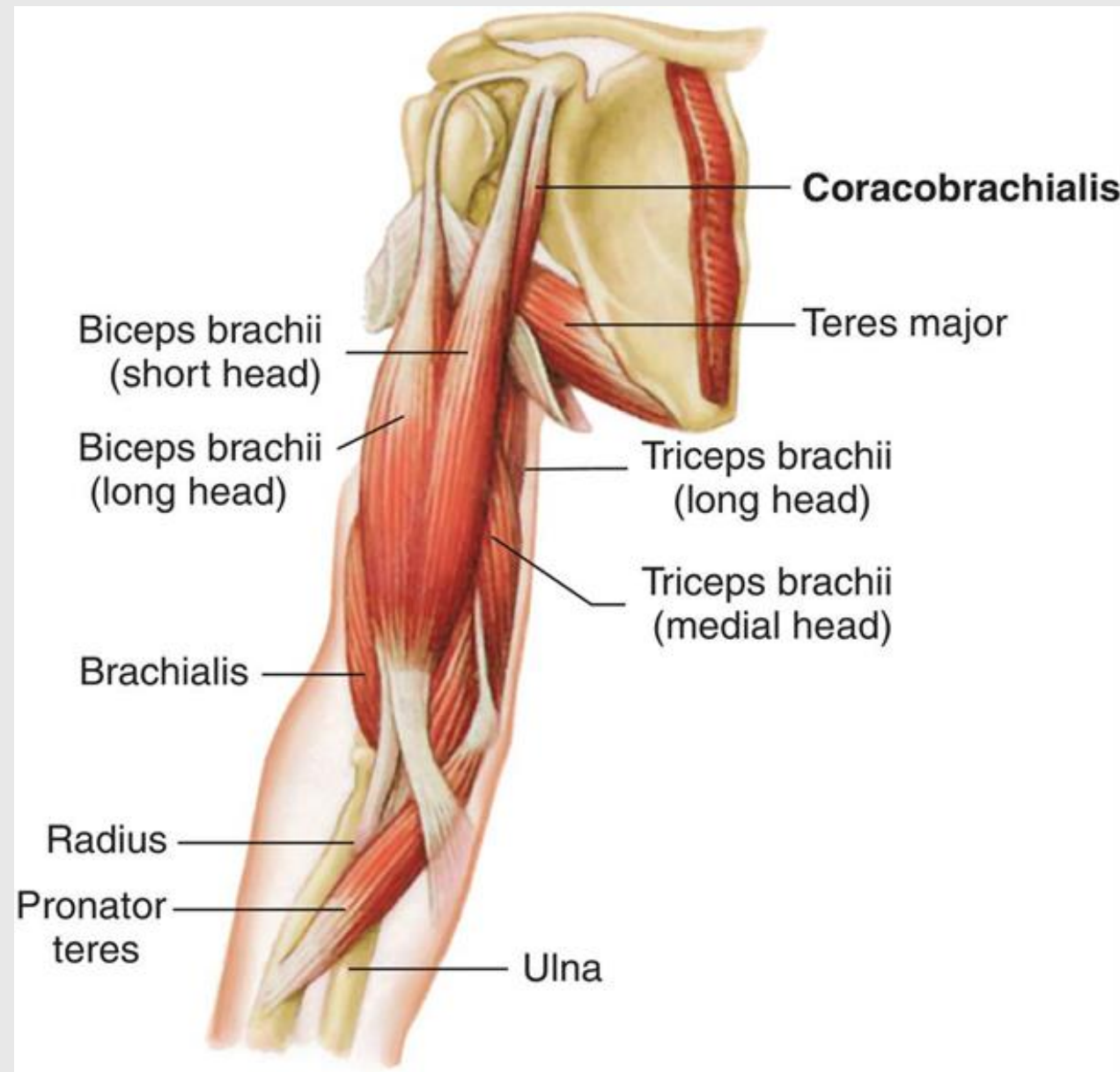
Insertion

1- By rounded **tendon** in the posterior part of radial tuberosity .

2- By **bicipital aponeurosis** into deep fascia of upper part of medial side of forearm. This aponeurosis separate median cubital vein from brachial artery.

Nerve supply

All muscles of front of arm are supplied by Musculo-cutaneous nerve except lateral part of brachialis which is supplied by radial nerve i.e. brachialis has double nerve supply .



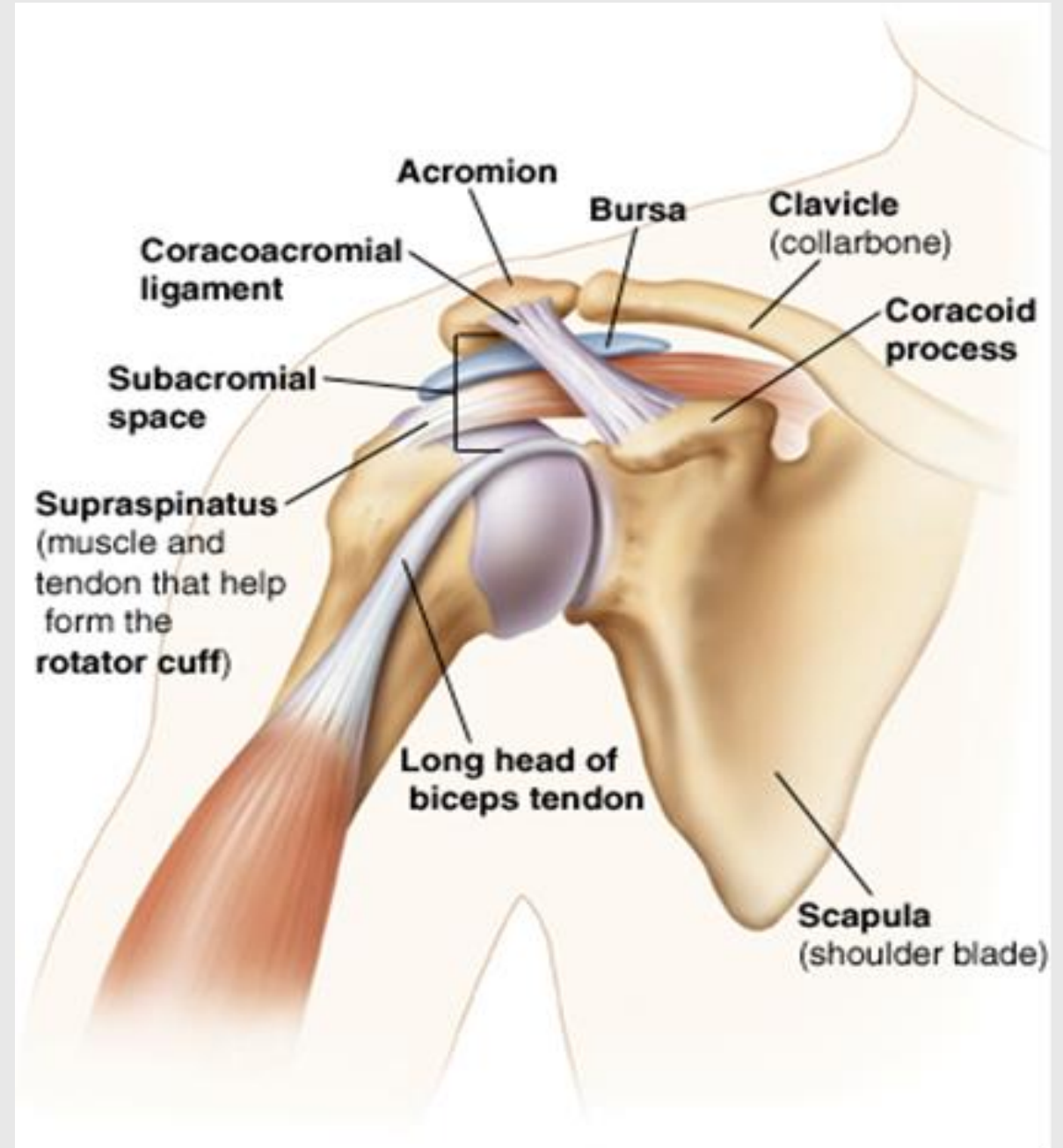
Action.

1-Flexion of forearm at the elbow joint .

2- Supination of flexed pronated forearm at radioulnar joints.

Short head: Weak flexor of shoulder .

Long head: Support head of humerus from above .



2-Caracobrachialis

Origin

Tip of Coracoid process (with short head of biceps)

Insertion

Middle of medial border of the shaft of humerus

ACTION

Flexion & adduction of shoulder

NERVE SUPPLY

It is pierced and supplied by Musculo-cutaneous nerve

3- Brachialis

Origin

Lower 1/ 2 of anterior surface of shaft of humerus.

Insertion

Ulnar tuberosity.

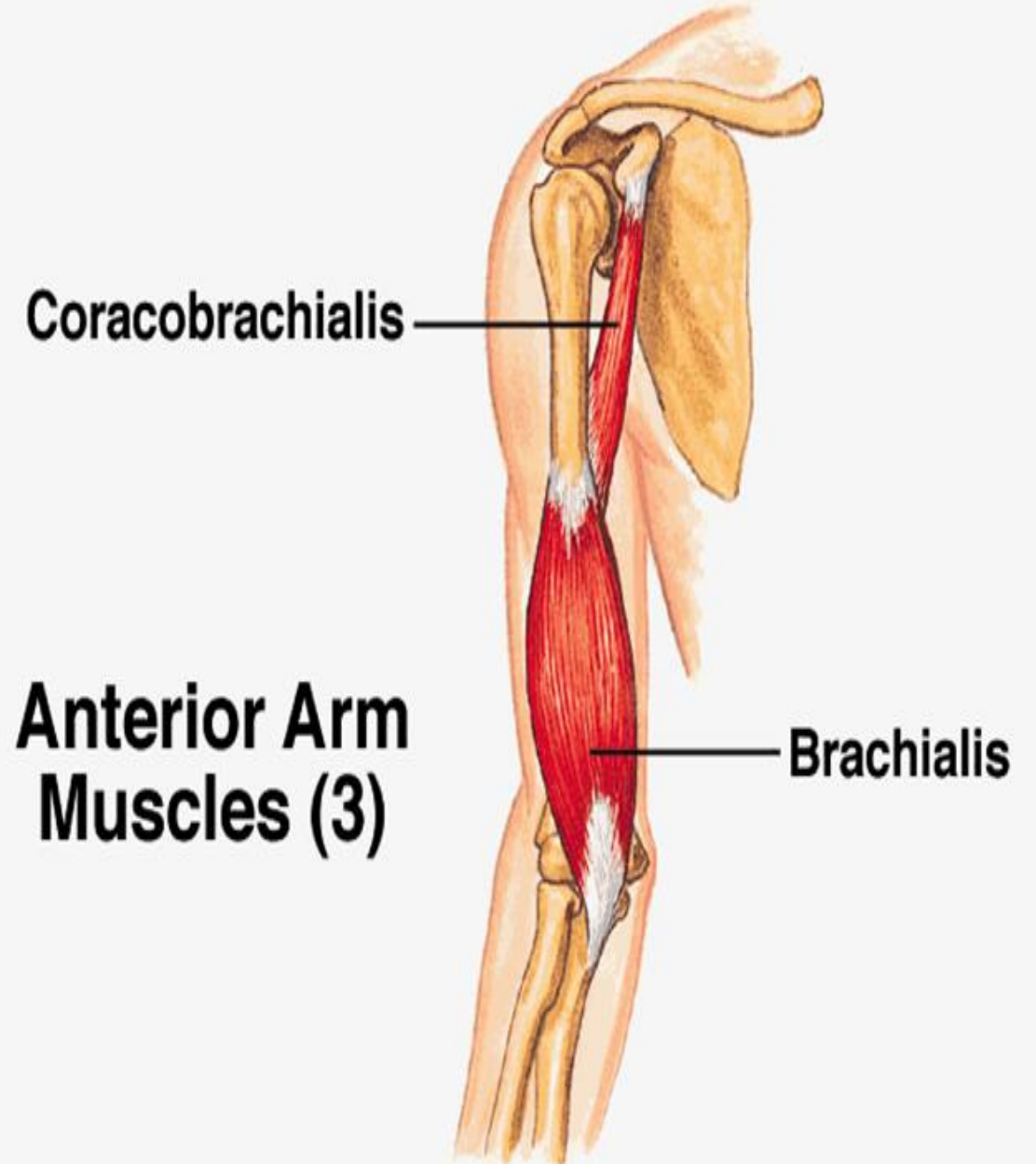
ACTION

Main flexor of elbow.

NERVE SUPPLY

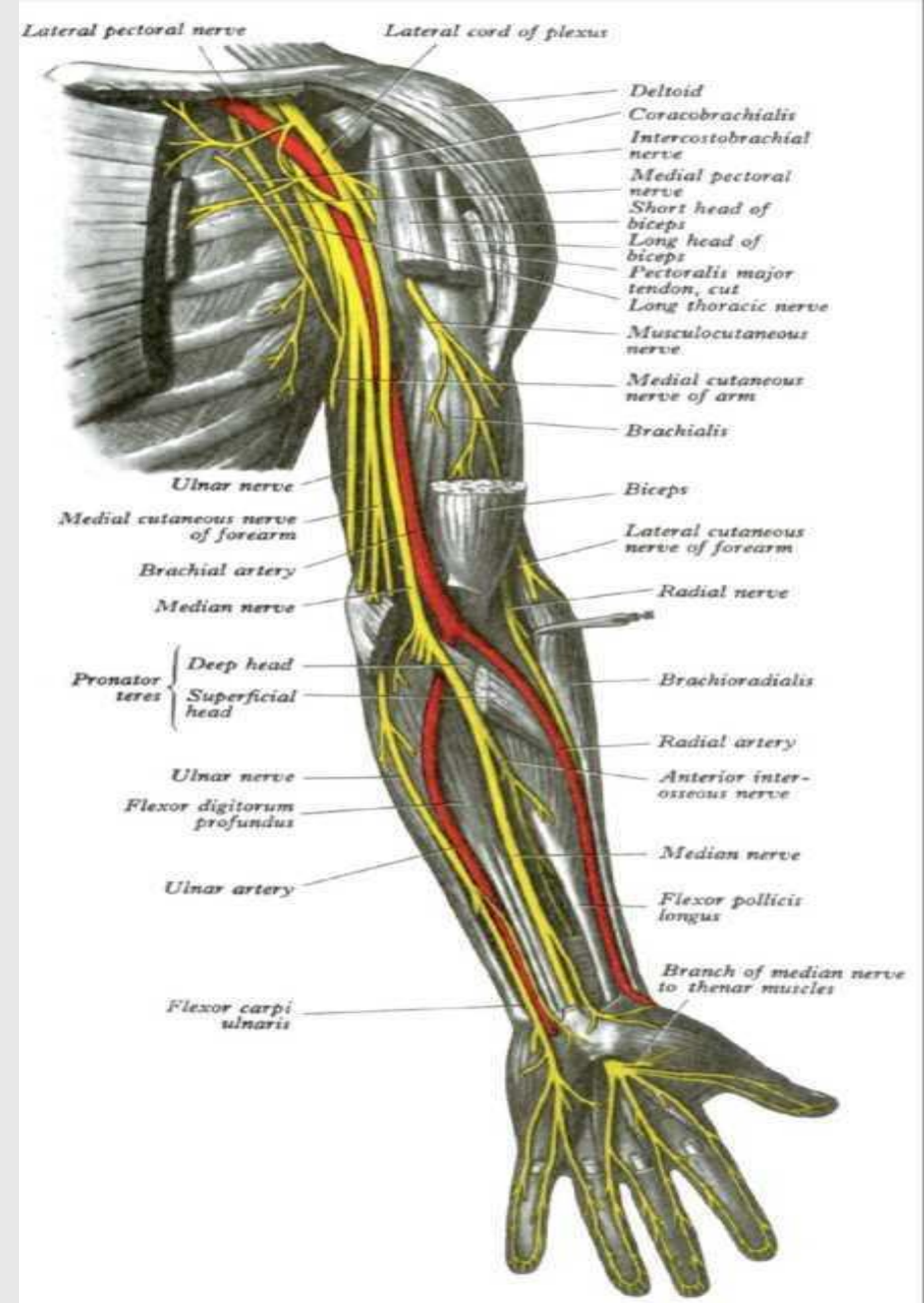
Its medial part is supplied by Musculo-cutaneous nerve
its lateral part is supplied by radial nerve i.e. brachialis has double nerve supply .

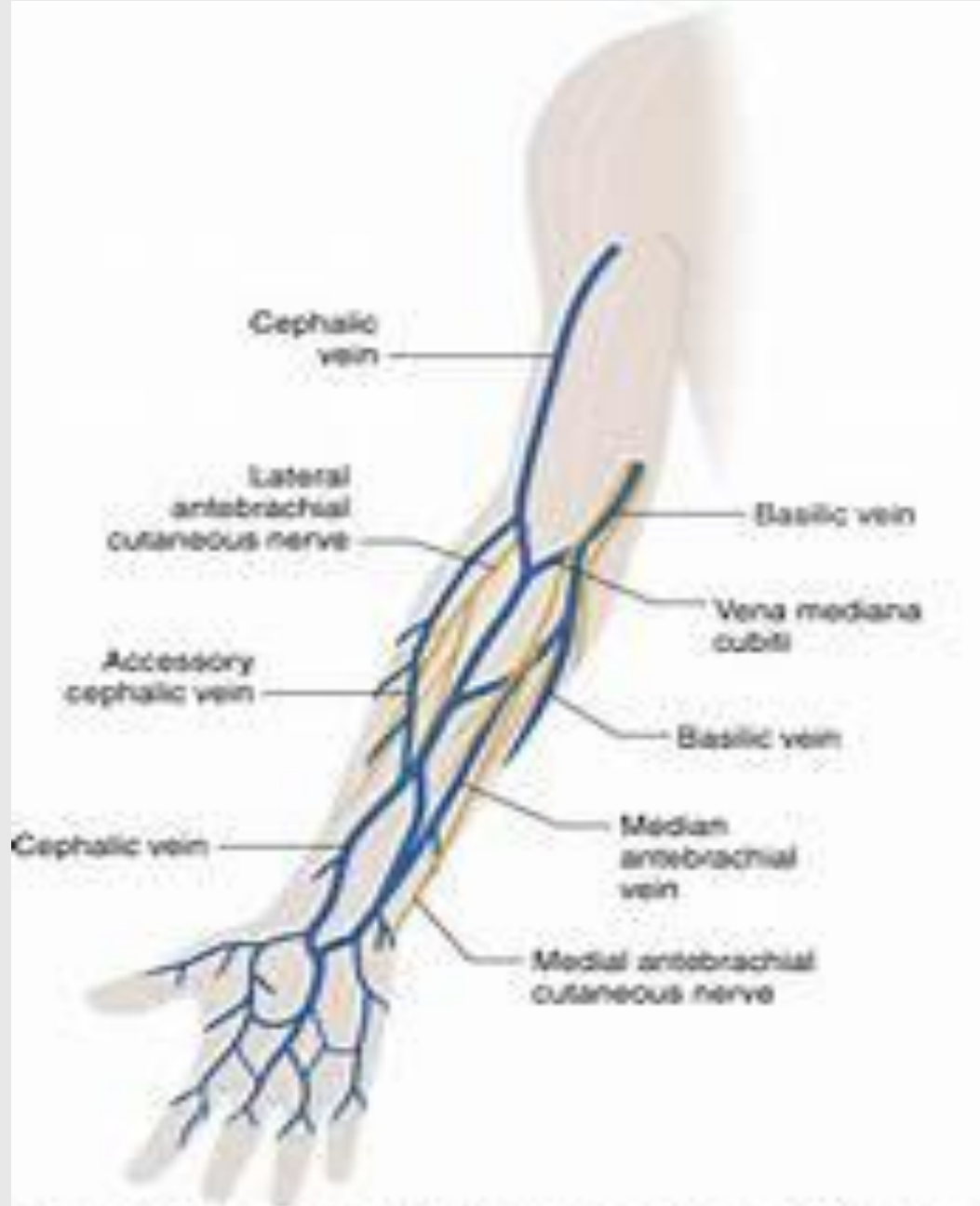
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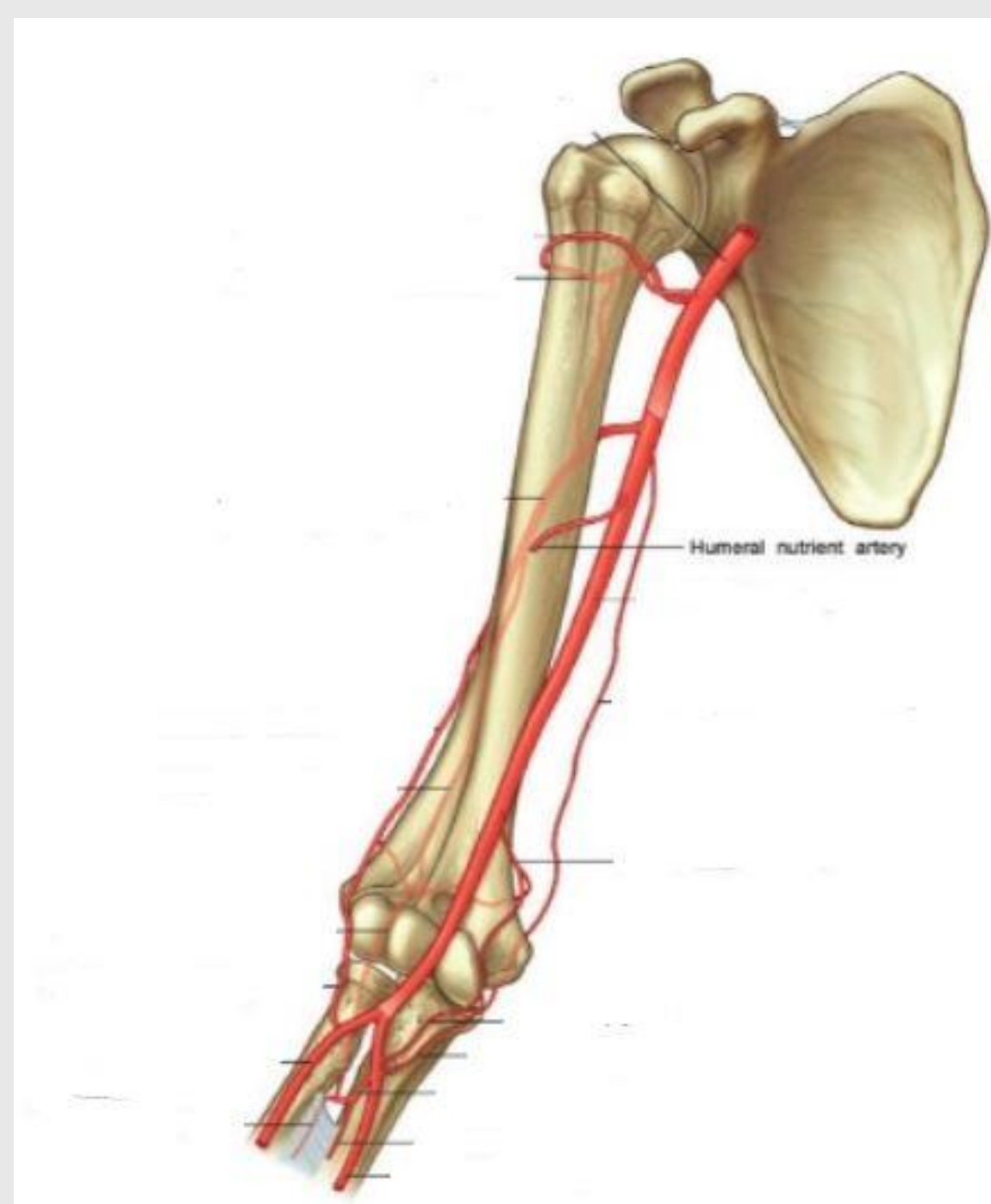
- **Changes that occur at the level of insertion of coracobrachialis:**

1. **The median nerve:** crosses in front of brachial artery from lateral to medial.
2. **The ulnar nerve:** pierces the medial intermuscular septum to reach the posterior compartment.
3. **The radial nerve & profunda brachii artery:** descend on the back of humerus through the spiral groove.
4. **The basilic vein** pierces the deep fascia to ascend medial to brachial artery.
5. **The medial cutaneous nerve of the arm and forearm** pierces the deep fascia to pass through the superficial fascia.
6. **The nutrient artery of the humerus** enters the bone.





Source: Tintinalli JE, Stabley DA, Ma OJ, Cline DM, Cuschka RR, Meckler GD
 Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 7th Edition
<http://www.accessmedicine.com>
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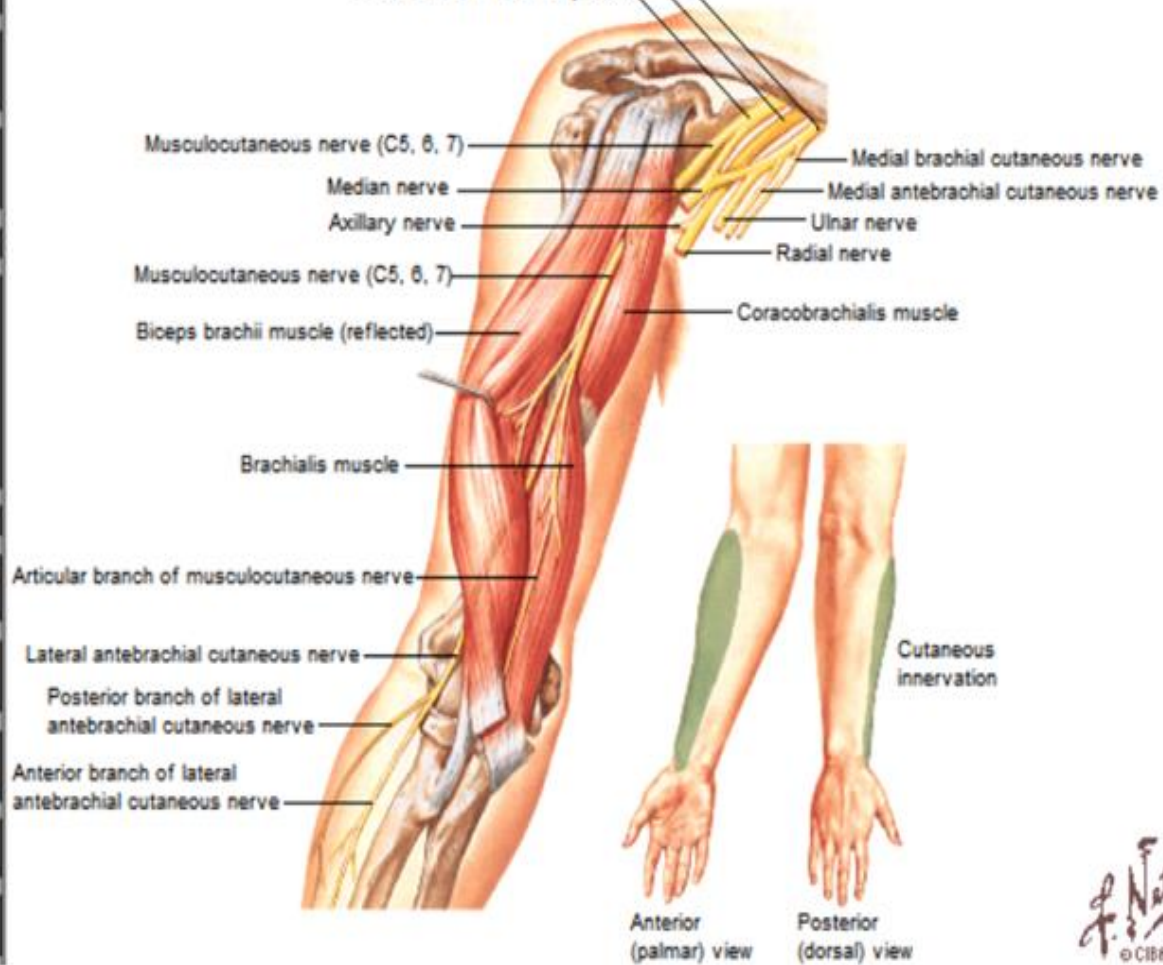


Nerve Supply of Muscles of Front of Arm

Musculocutaneous Nerve

Medial cord of brachial plexus
Posterior cord of brachial plexus
Lateral cord of brachial plexus

Note: only muscles innervated by musculocutaneous nerve shown



The Musculocutaneous nerve

Root value(C5, 6, 7):

Origin:

It is a branch of the lateral cord of brachial plexus

Course & relations:

The nerve descends lateral to 3rd part of axillary artery. then pierces the coracobrachialis. It pass between biceps and brachialis Then pierce the deep fascia to be superficial

Termination:

It terminates by continuing as the lateral cutaneous nerve of the forearm

Branches:

1-Muscular branches to:-

2 heads of biceps brachii.

Coracobrachialis.

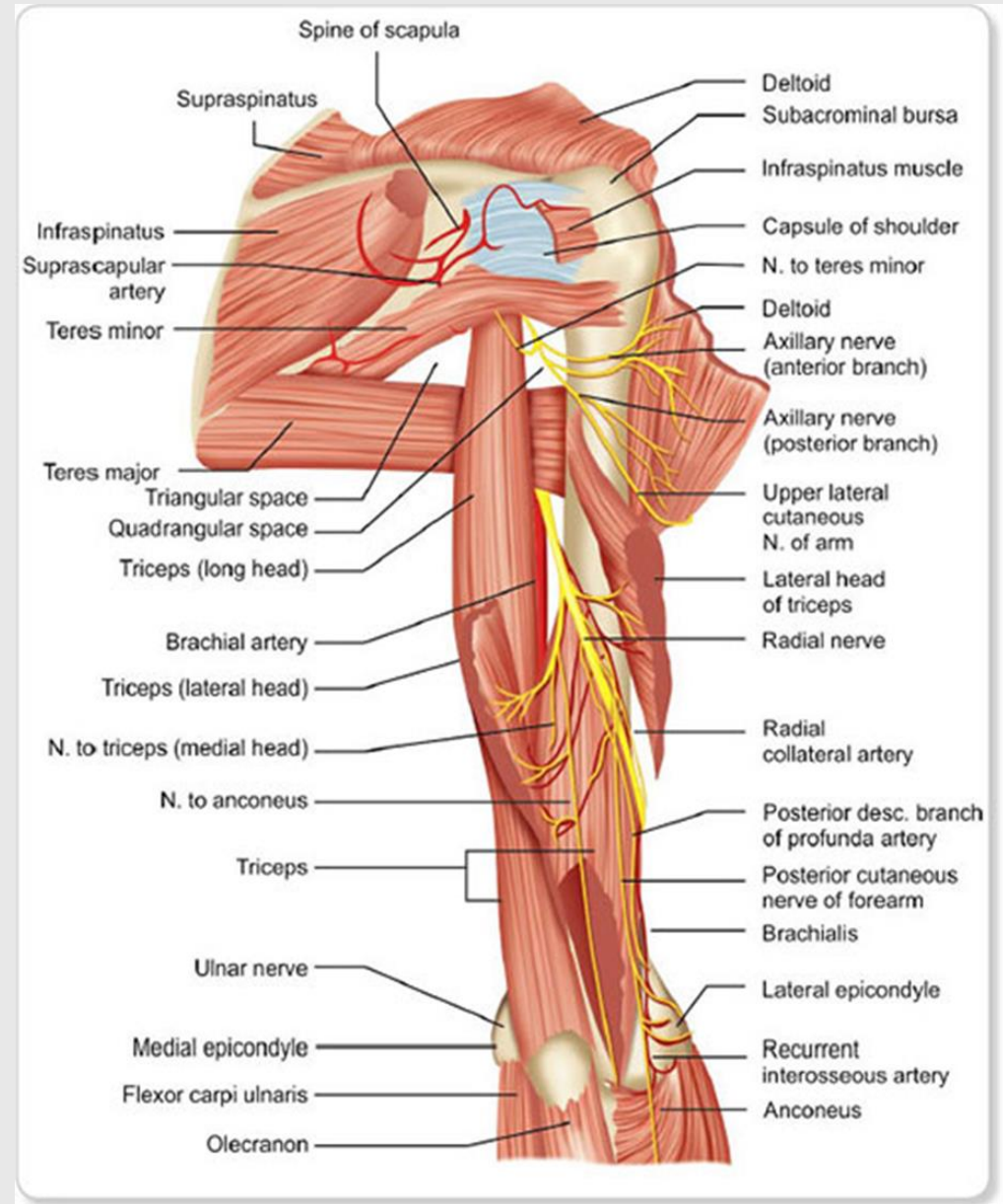
The greater part of brachialis.

2-lateral cutaneous nerves of forearm.

Posterior compartment of arm

Contents:

1. Triceps muscle.
2. Radial nerve.
3. Profunda brachii vessels.



Muscles of Back of Arm

Triceps Brachii

Origin

- Long head: infra-glenoid tubercle
- Lateral head : Back of shaft of humerus above spiral groove.
- Medial head: Back of shaft of humerus below spiral groove.

Insertion

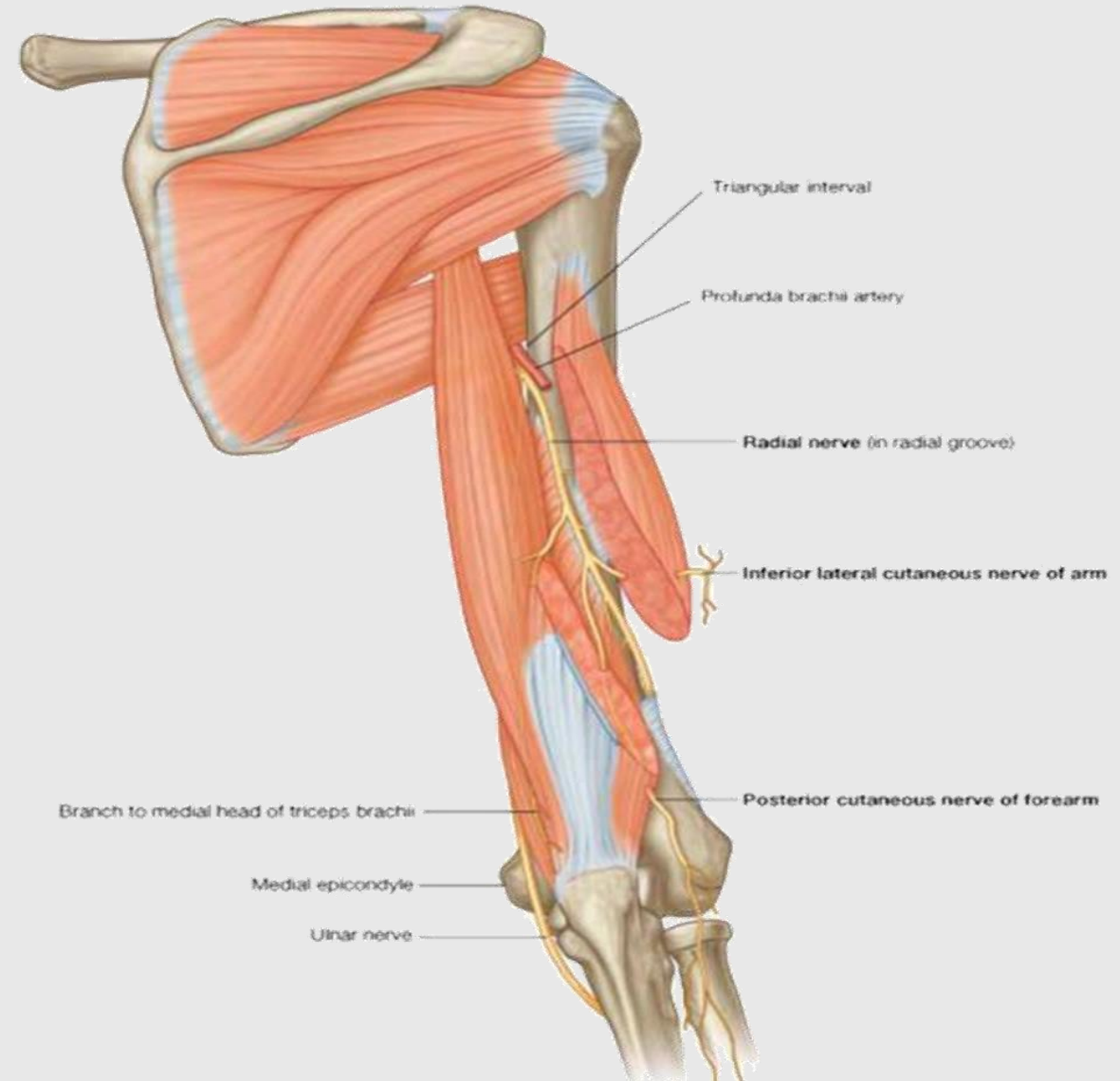
olecranon process of ulna

- **Articularis cubiti** are few fiber inserted in the fibrous capsule of elbow joint .

ACTION

Main extensor of the elbow.

- Long head shares in stability of shoulder.
- The long head helps in adduction of abducted arm
- **Articularis cubiti** draw up the posterior part of the capsule of elbow during extension.



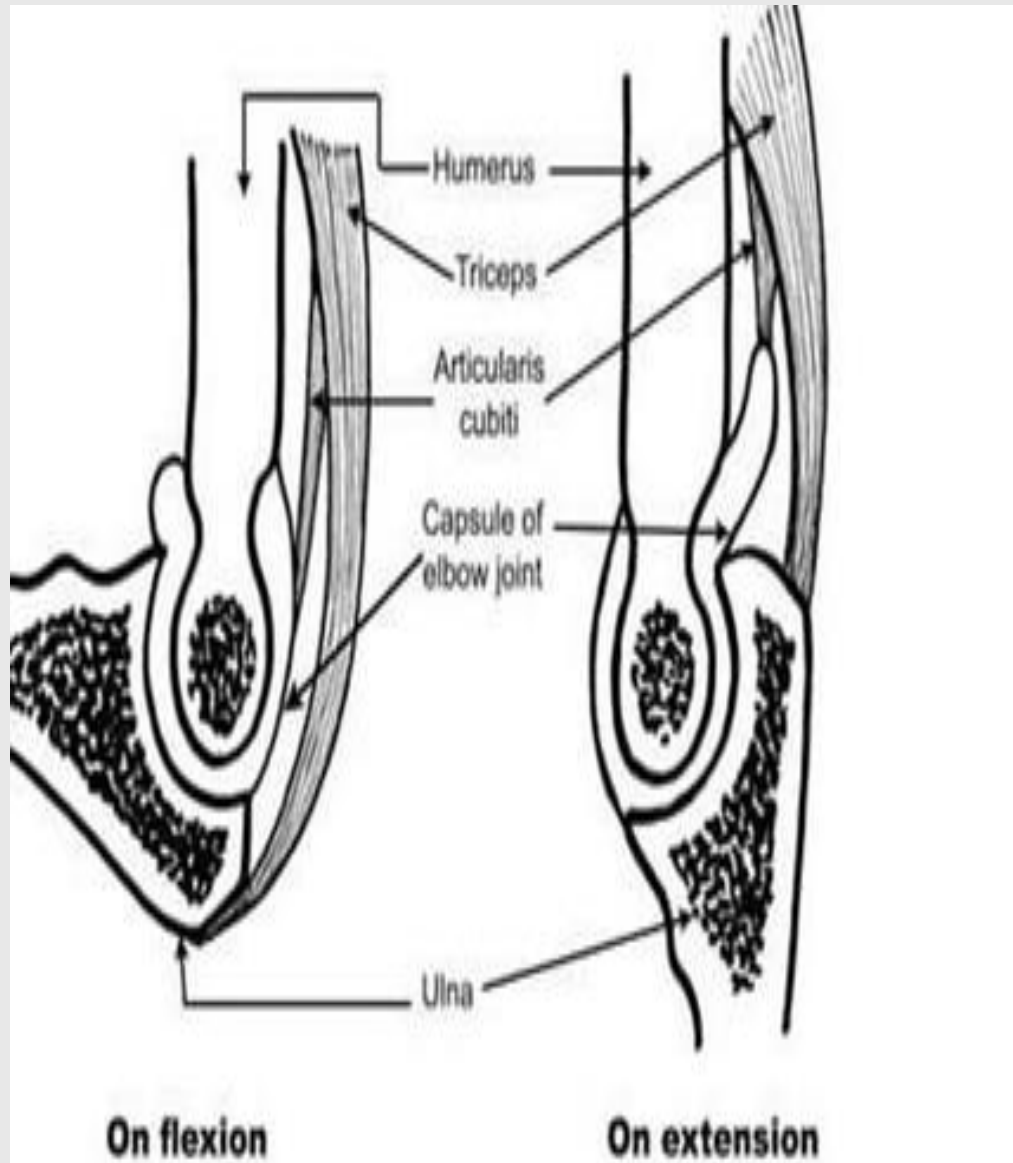
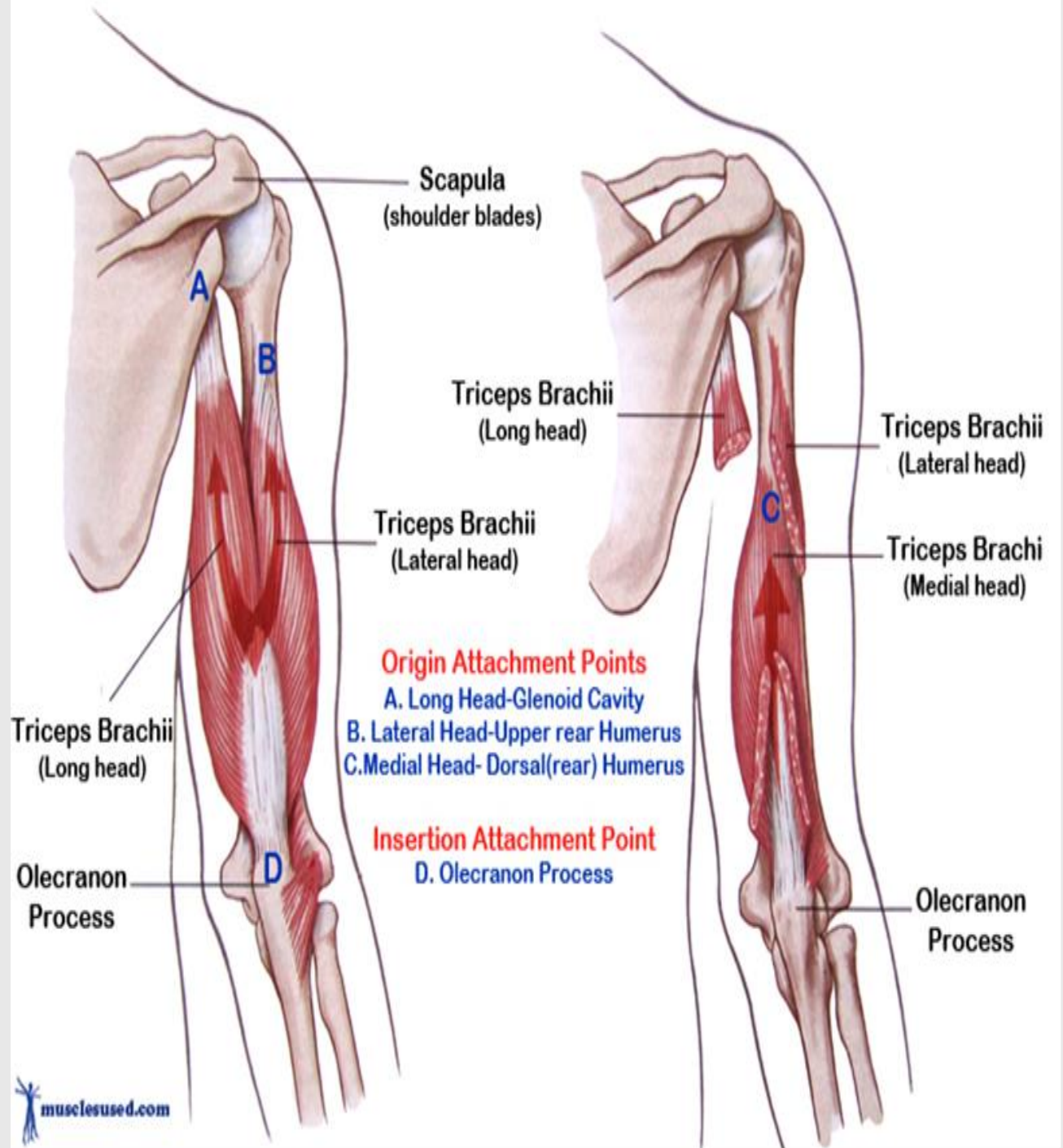
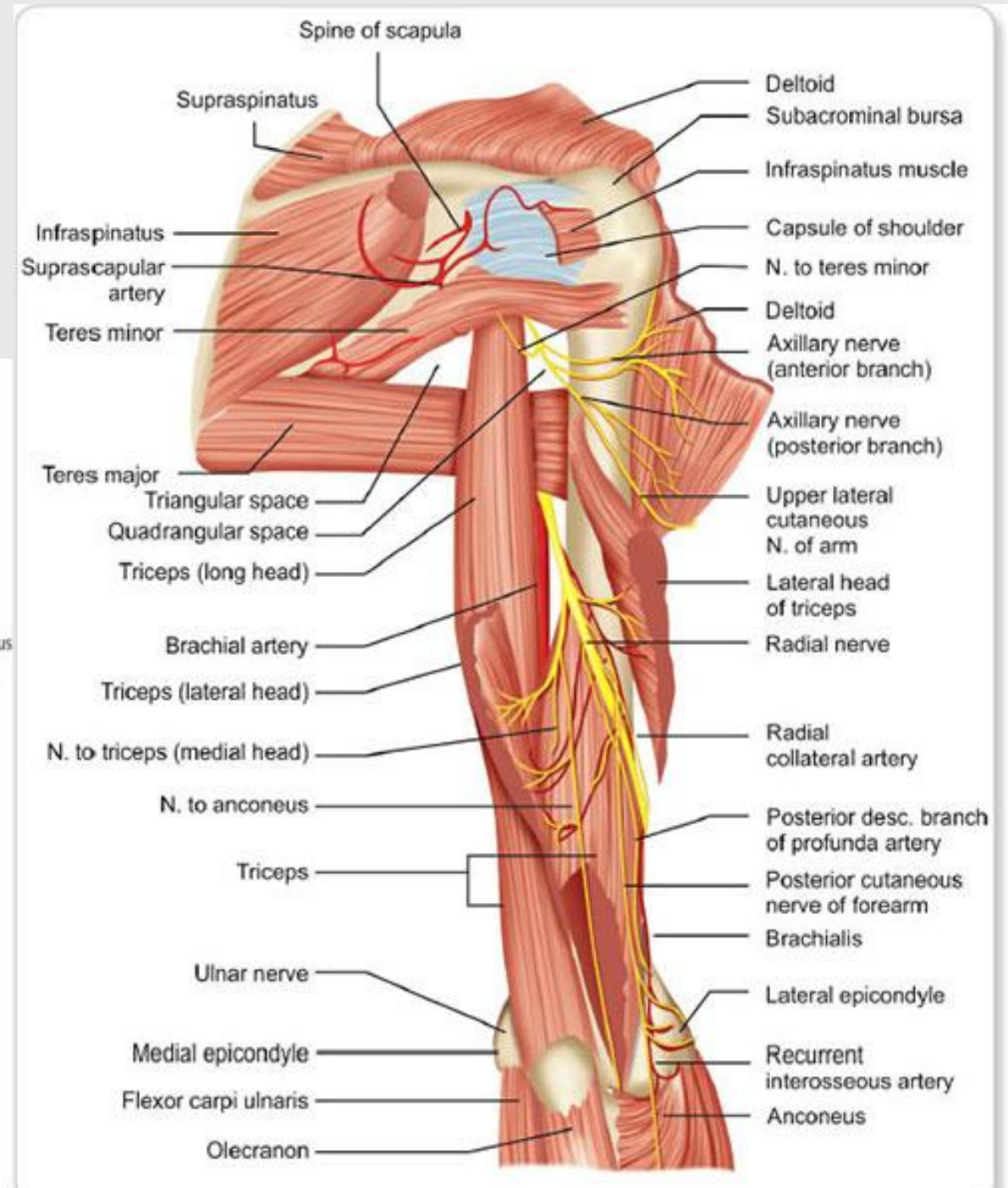
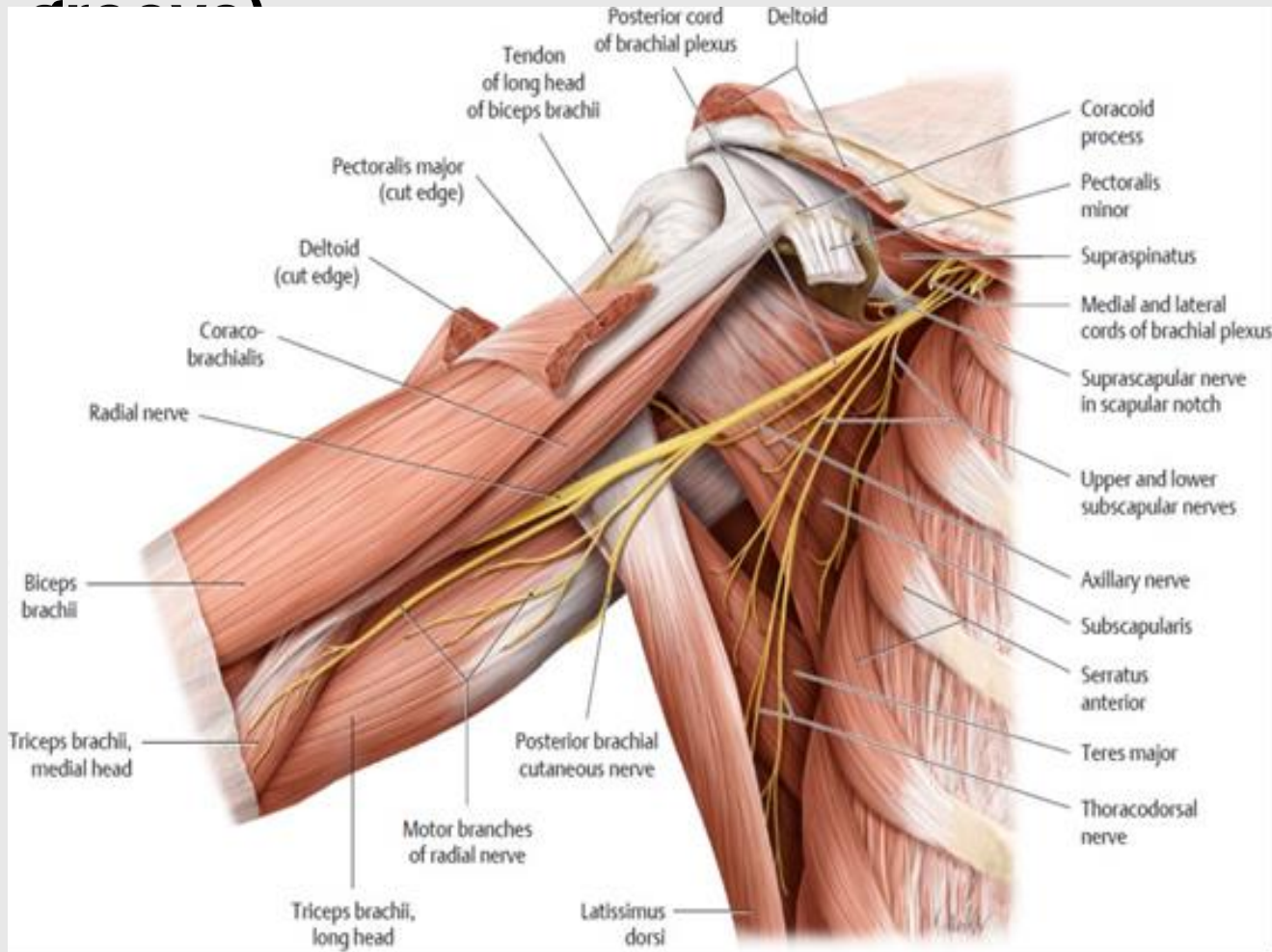


Fig. 72: Articularis cubiti muscle (Sagittal section at elbow)



Nerve supply

Radial nerve (long head is supplied in axilla while lateral & medial heads are supplied in spiral groove)



Elbow Joint

Type of joint:

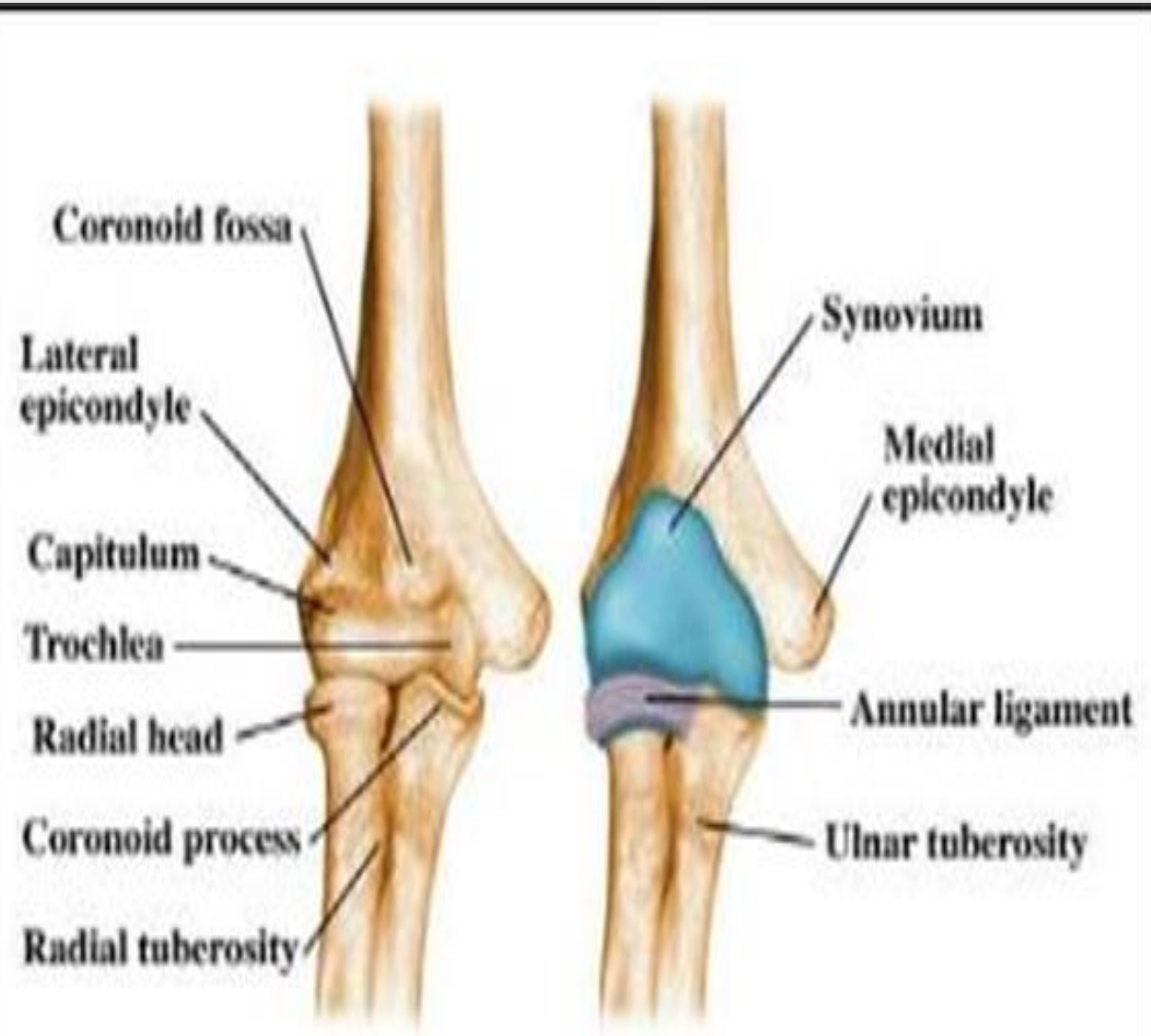
Synovial, Uniaxial, Hinge.

Articular surfaces

The elbow joint is a composite joint formed of two parts:

Humero-ulnar part; the articulation is between the trochlea and trochlear notch of the ulna.

Humero-radial part; articulation is between the capitulum and the upper surface of the head of the radius.

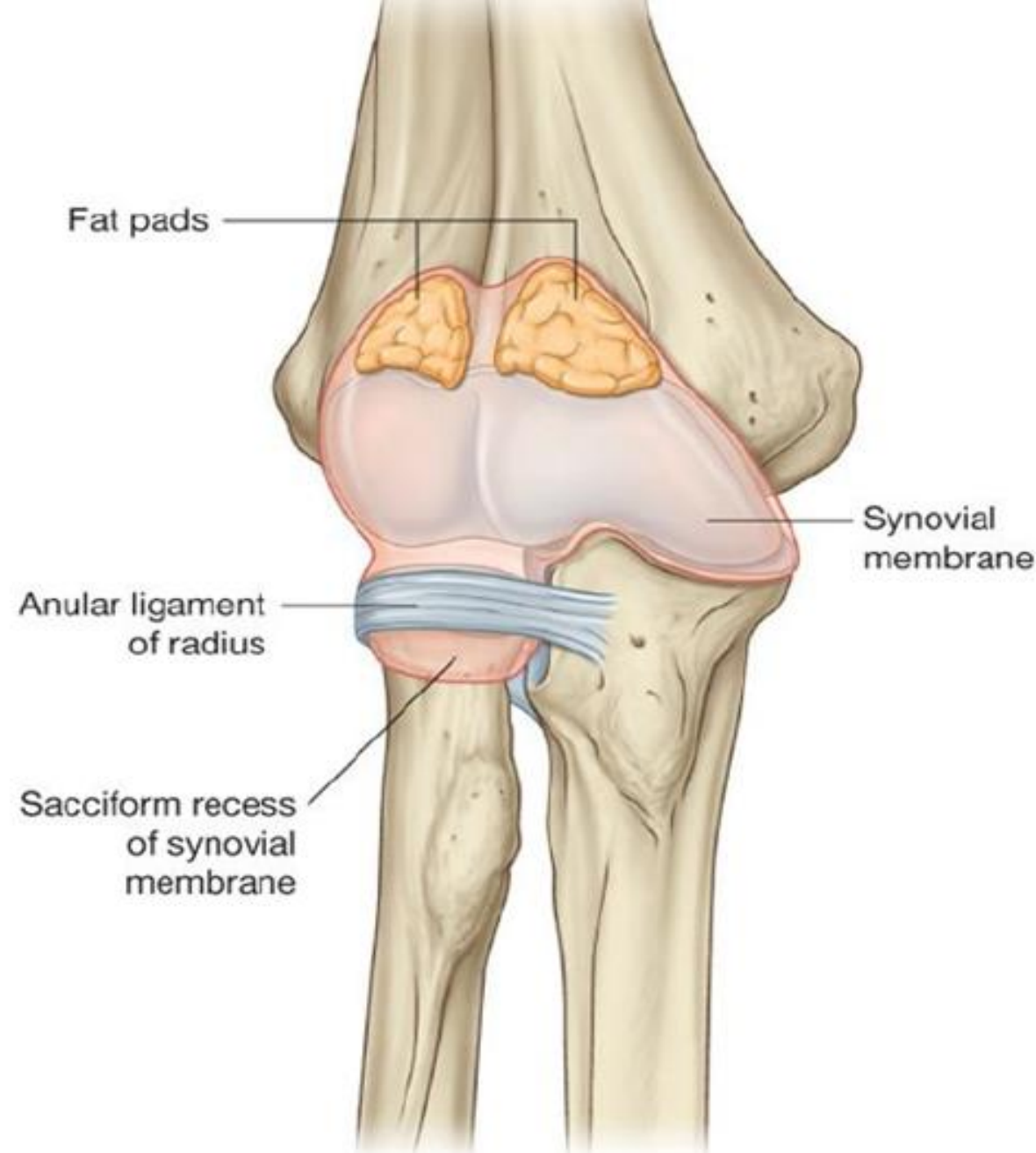


- **CAPSULE**

- The capsule is attached to the margins of the articular parts of bones.
- The capsule is attached inferiorly to the **annular ligament** so the elbow joint is continuous with the superior radioulnar joint (the 2 joints together form the **cubital articulation**).

- **Synovial membrane**

- It lines all the structures inside the capsule of the elbow joint EXCEPT the articular cartilage.
- Inferiorly, it is continuous with the synovial membrane of the superior radioulnar joint.



Drake: Gray's Anatomy for Students, 2nd Edition.
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Figure 7.72 Synovial membrane of elbow joint (anterior view).

LIGAMENTS RELATED TO ELBOW JOINT

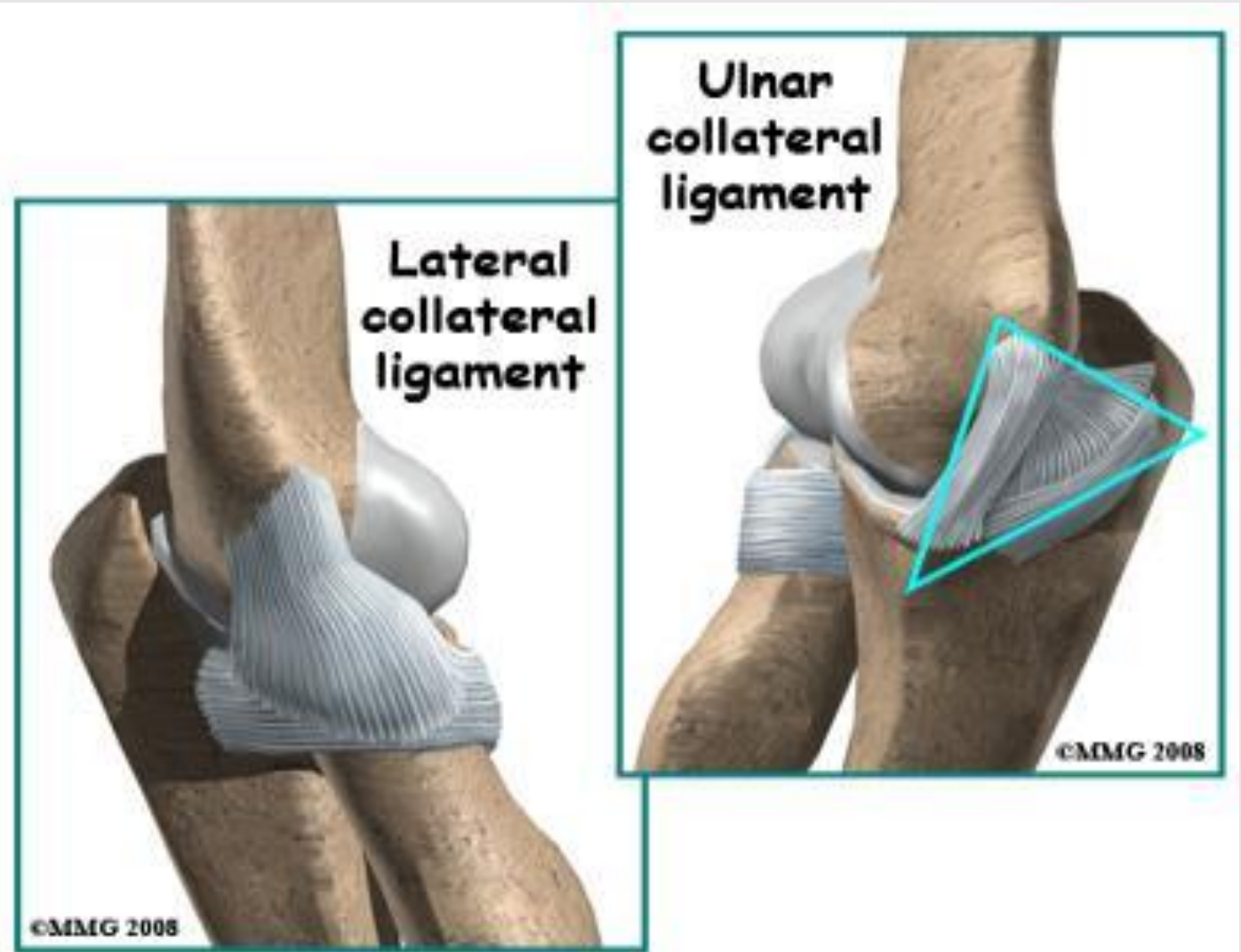
Ulnar collateral (medial) ligament

:

it is a thick triangular ligament closely related to **ulnar nerve**. The ligament is attached to the medial epicondyle superiorly and the medial surface of upper end of ulna.

Radial collateral (lateral) ligament

it is a triangular ligament that connects the lateral epicondyle to the upper border of annular ligament



Annular ligament:

- It is a strong fibrous band that is attached to the margins of the radial notch of ulna and surrounds the circumference of head of radius
- The upper border is continuous with the capsule of elbow joint while the lower border is free surrounding the neck of radius.

Movements of elbow joint:

The joint is uniaxial HINGE joint, so it moves around one transverse axis.

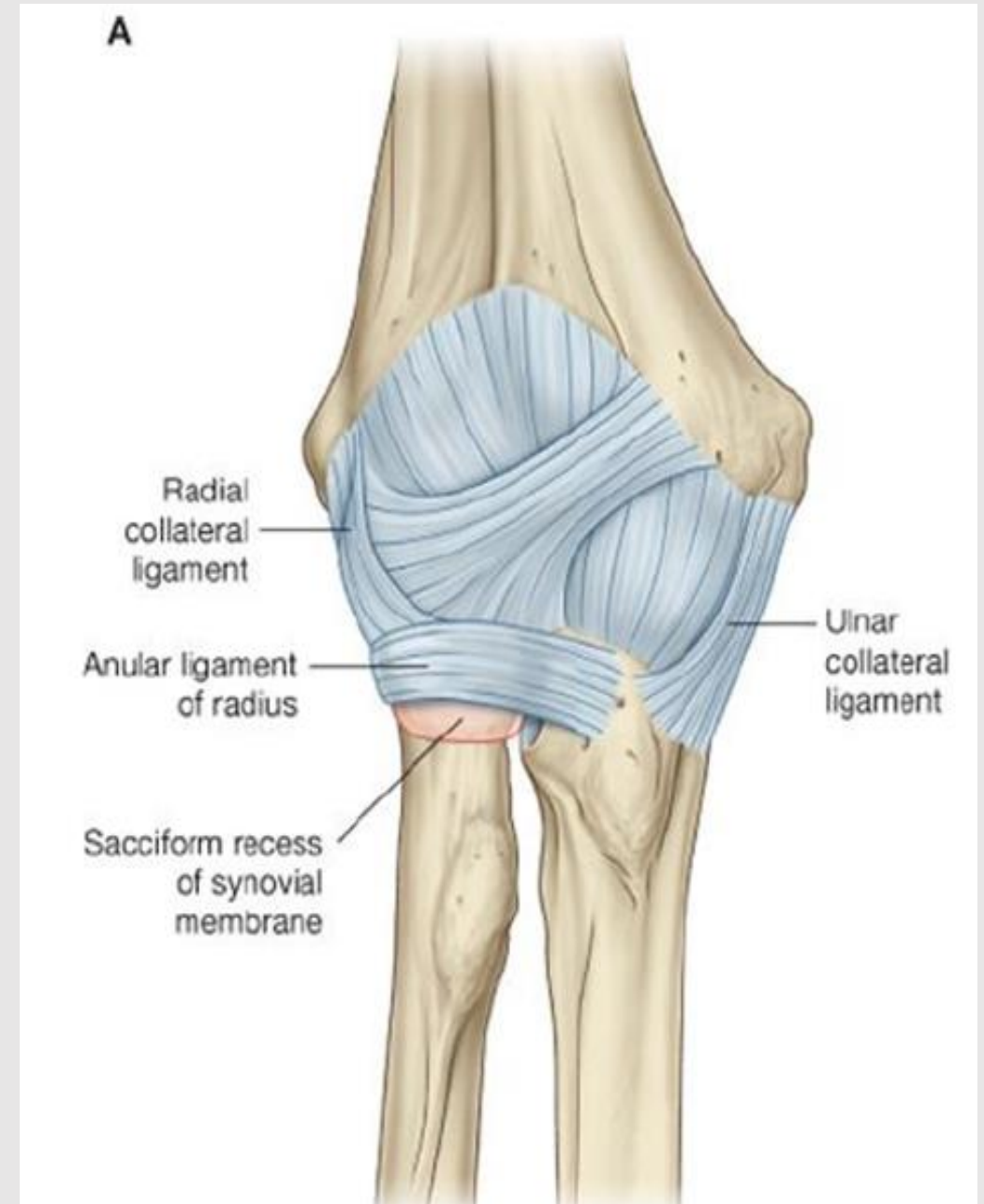
The movements are **flexion- extension**.

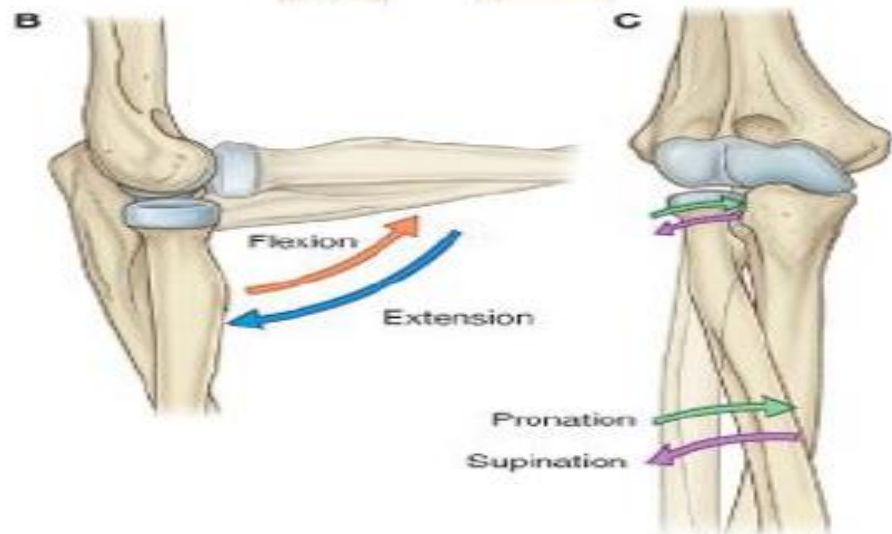
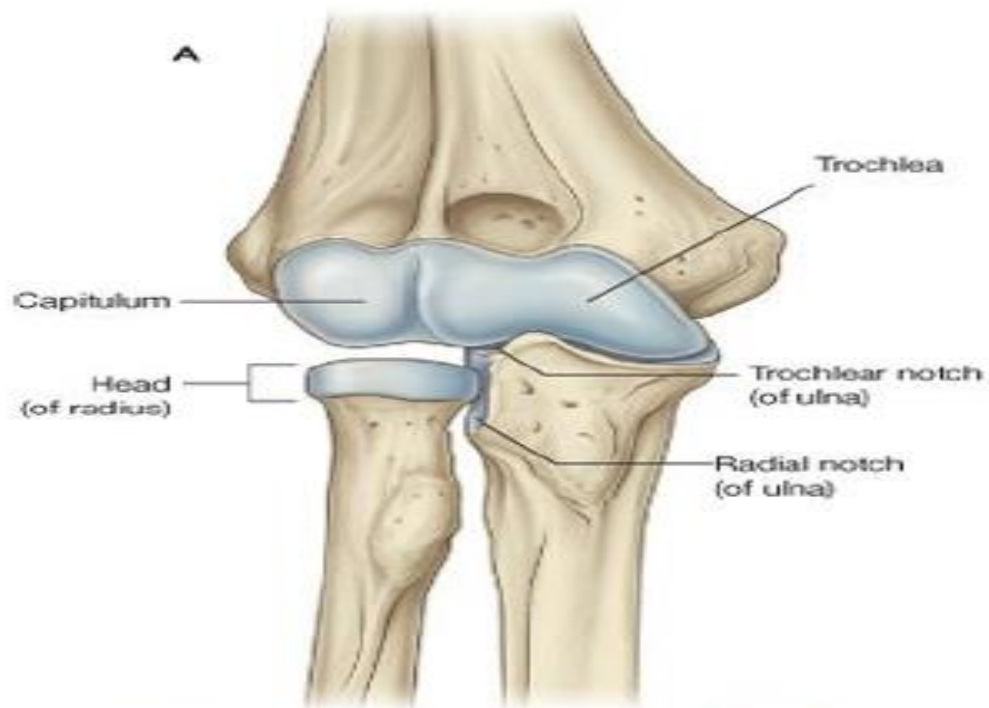
During **flexion** of elbow the head of radius lies inside the radial fossa above the capitulum, and the coronoid process of ulna lies inside the coronoid fossa above the trochlea.

While in **extension**, the olecranon process lies inside the olecranon fossa.

Flexion: This movement is done by the brachialis, biceps and brachioradialis.

Extension: This movement is done by the triceps and anconeus.





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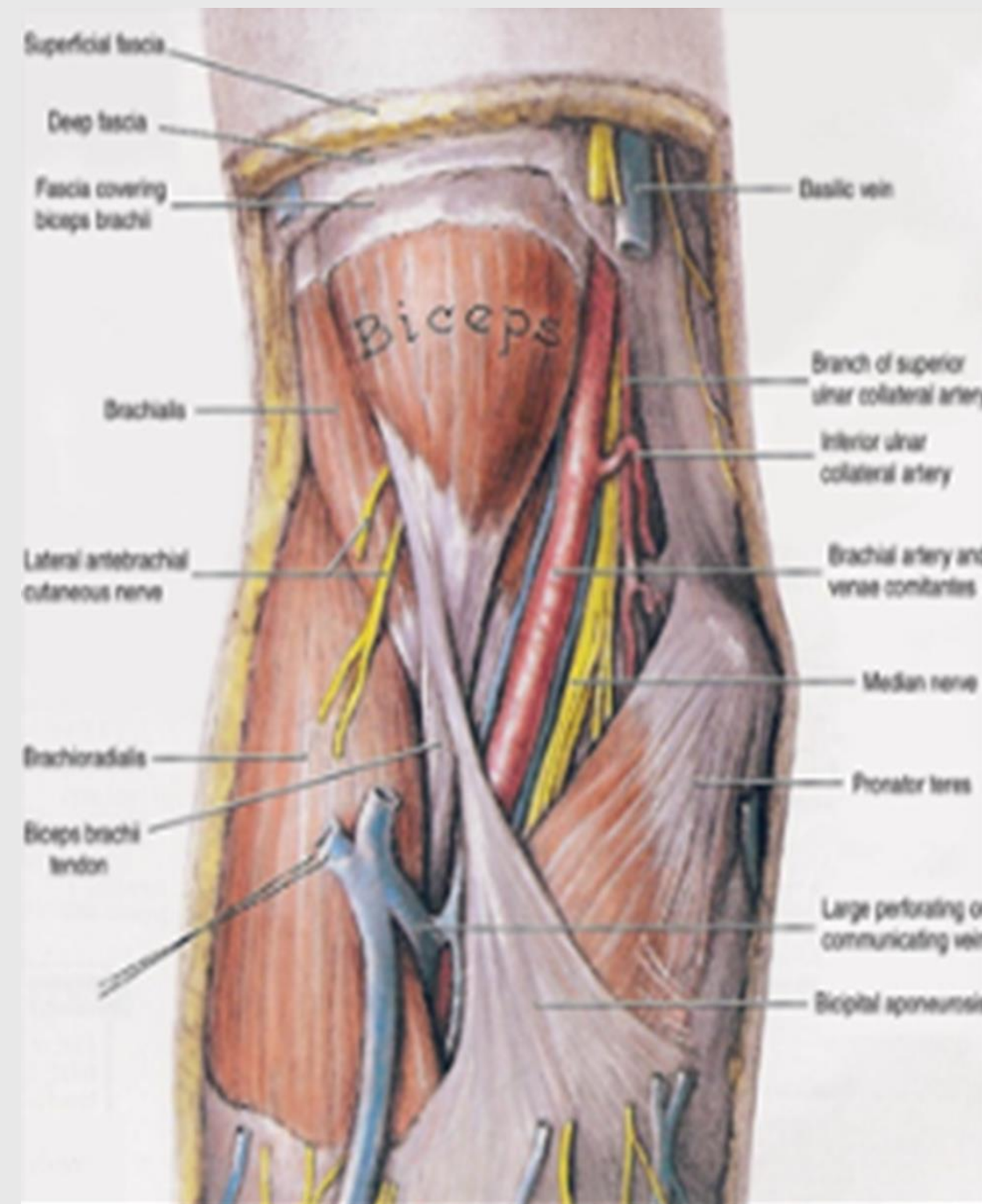
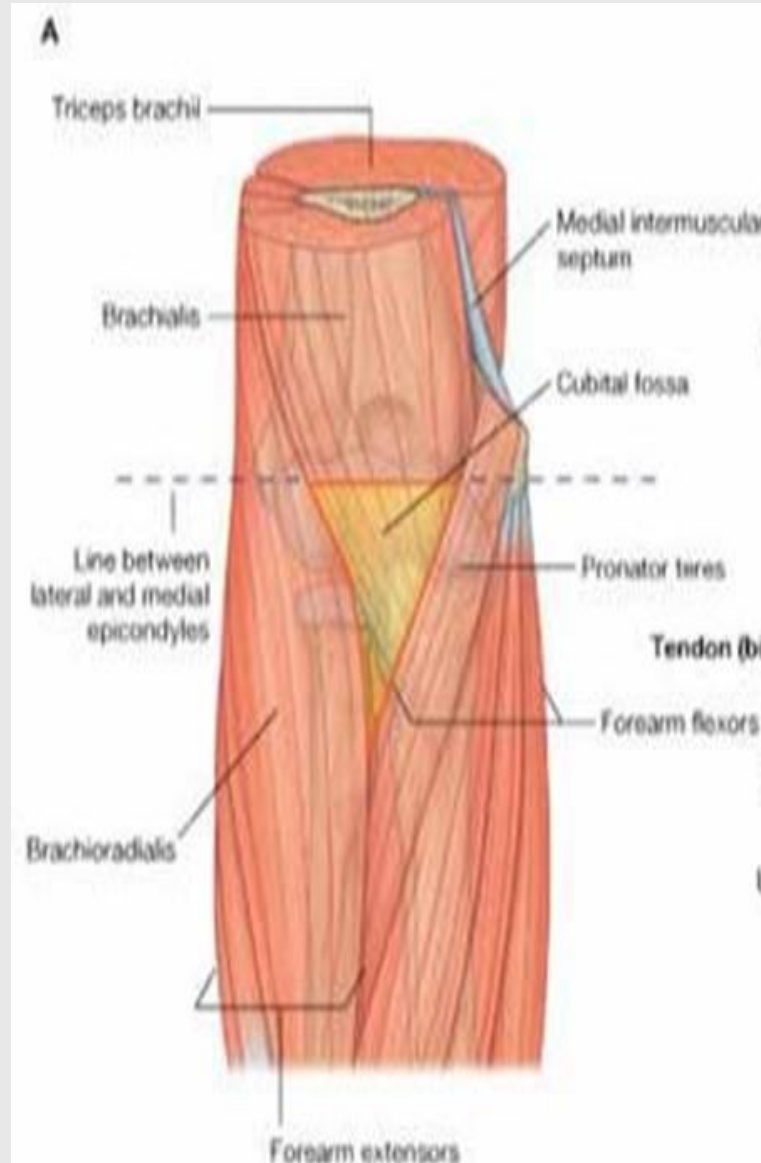
Figure 7.71 Components and movements of the elbow joint. **A.** Bones and joint surfaces. **B.** Flexion and extension. **C.** Pronation and supination. **D.** Radiograph of a normal elbow joint (anterior-

CUBITAL FOSSA

- It is a triangular depression in the front of the elbow

Boundaries:

- Medial boundary; pronator teres muscle.
- Lateral boundary; brachioradialis muscle.
- Base; directed upwards and is formed by an imaginary line connecting the 2 humeral epicondyles.
- **Apex:** Directed downwards and formed by the point of overlap of brachioradialis over pronator teres



Roof: is formed by:

- Skin.
- Superficial fascia containing median cubital vein, parts of basilic and cephalic veins, medial and lateral cutaneous nerves of forearm.
- Deep fascia.
- Bicipital aponeurosis.

Floor:

- Brachialis muscle (medially) and supinator muscle (laterally).

Contents: From lateral to medial

- Radial nerve
- Biceps tendon.
- Brachial artery.
- Median nerve.

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