

# Upper limb Lecture 4

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# WHAT IS ARM?

SQUELETTE DU MEMBRE SUPÉRIEUR (SUITE) PL. 25.

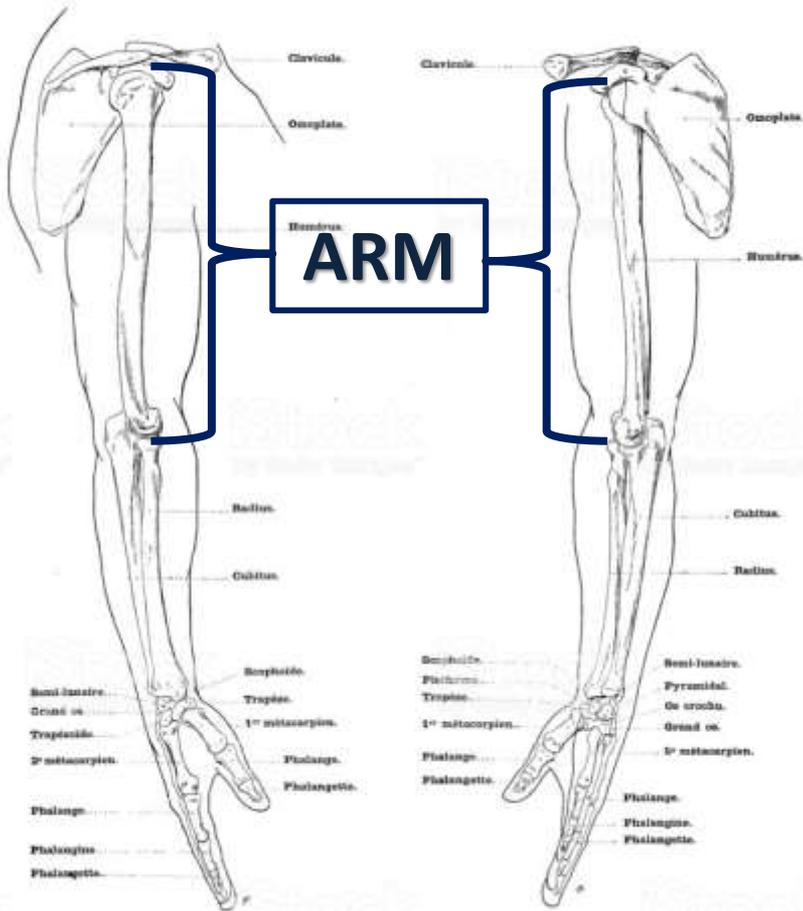


FIG. 1. — PLAN LATÉRAL EXTERIEUR.

FIG. 2. — PLAN LATÉRAL INTERIEUR.

The word **“ARM”** in anatomy is restricted to the area between the shoulder and elbow joints.

The **ARM (BRACHIUM)** consists of the humerus, which articulates distally with the **FOREARM (ANTEBRACHIUM)** through the elbow complex.

# FASCIA OF THE UPPER LIMB

The upper limb consists of superficial and deep fascia

■ **Superficial fascia** [Referred to as the subcutaneous or hypodermis layer]

→ the superficial fascia contains **fat**, **superficial veins**, **Lymphatics**, and **Cutaneous nerves**.

❖ The upper arm is enclosed in a sheath of deep fascia (BRACHIAL F.).

❖ Two fascial septa, one on the medial side and one on the lateral side, extend from this sheath and are attached to the medial and lateral supracondylar ridges of the humerus, respectively.

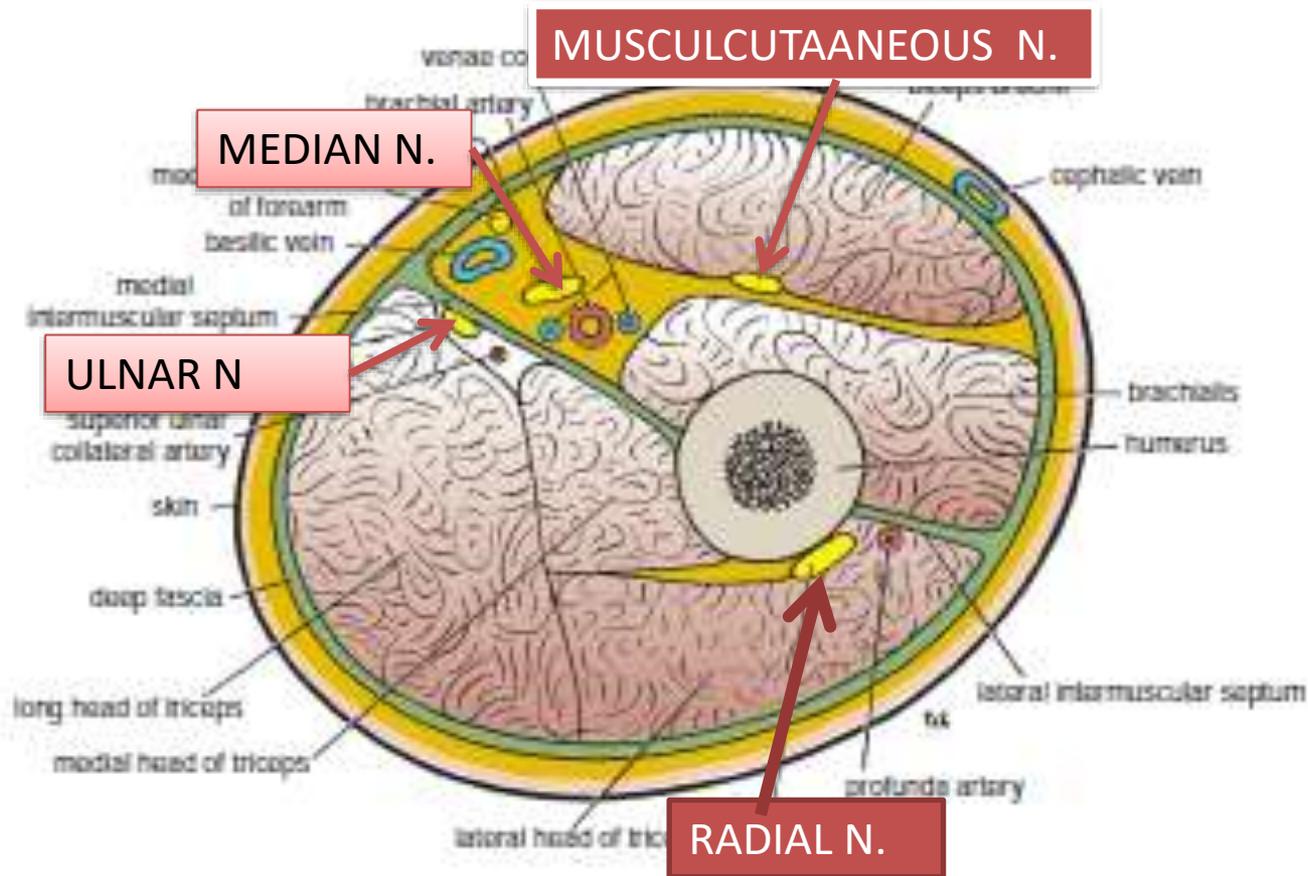
❖ By this means, the upper arm is divided into an **ANTERIOR** and a **POSTERIOR** fascial compartment

❖ each having its muscles, nerves, and arteries.

❖ The **MUSCULOCUTANEOUS** nerve innervates the **anterior arm “muscles”** then becomes the lateral “cutaneous” nerve of forearm.

❖ **RADIAL NERVE**, responsible for the **posterior arm muscle**, is in contact with the humerus (groove for radial nerve)

❖ In the arm, the **median and ulnar nerves** having no special role. The nerves descend in the medial intermuscular septum which is relatively safe from outside impact



# Contents of the Anterior Fascial Compartment of the Upper Arm

## ☐ Muscles:

I. **Biceps brachii**

II. **Brachialis**

III. **Coracobrachialis**

☐ **Blood supply: Brachial artery**

☐ **Nerve supply to the muscles:**

## **Musculocutaneous nerve**

❖ **Structures passing through the compartment: (N,A,V)**

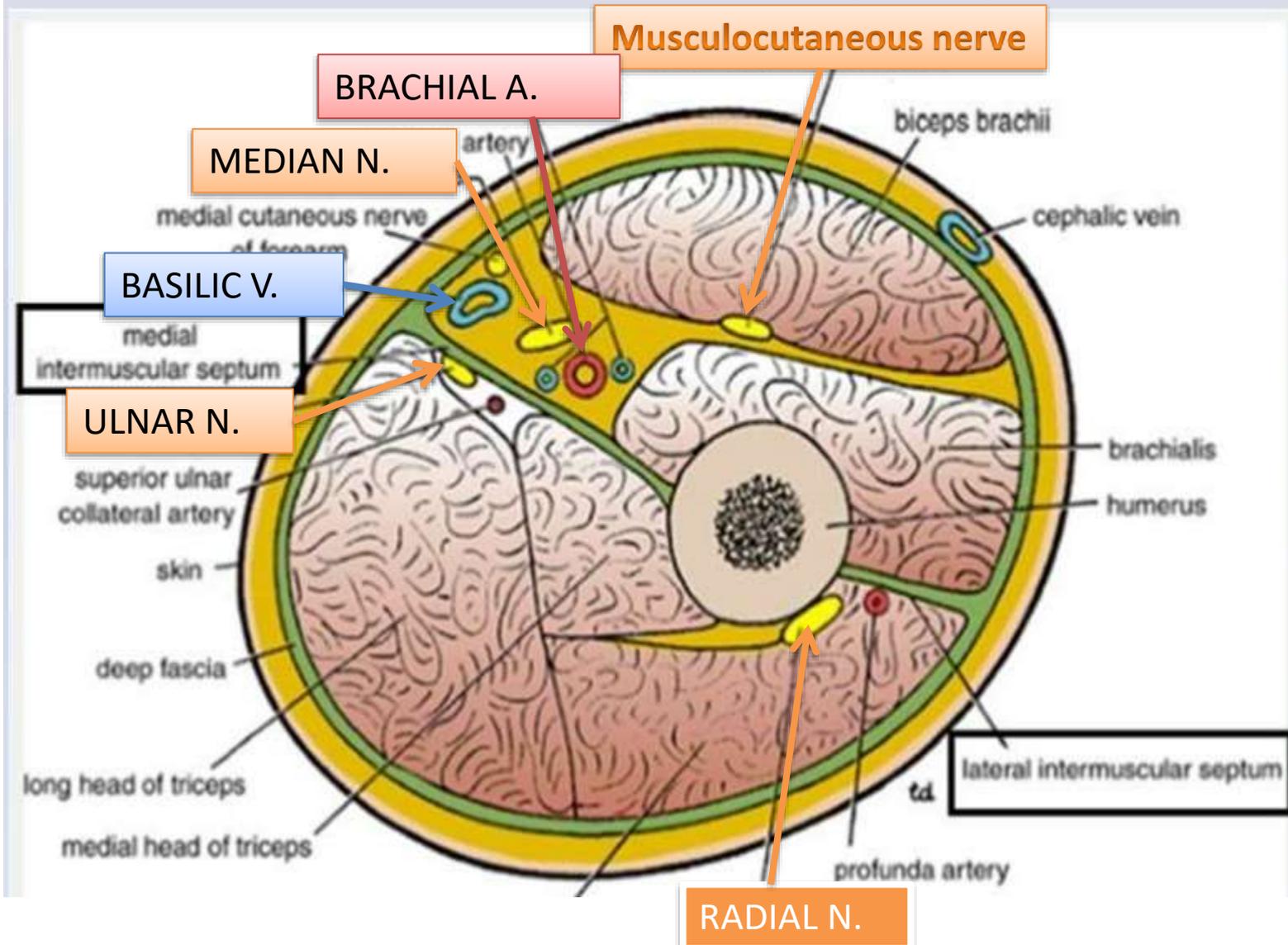
✓ **Musculocutaneous, Median NERVES**

✓ The **radial NERVE** is present in the lower part of the compartment.

✓ **Brachial ARTERY**

✓ **Basilic VEIN.**

# Fascial compartments of upper arm

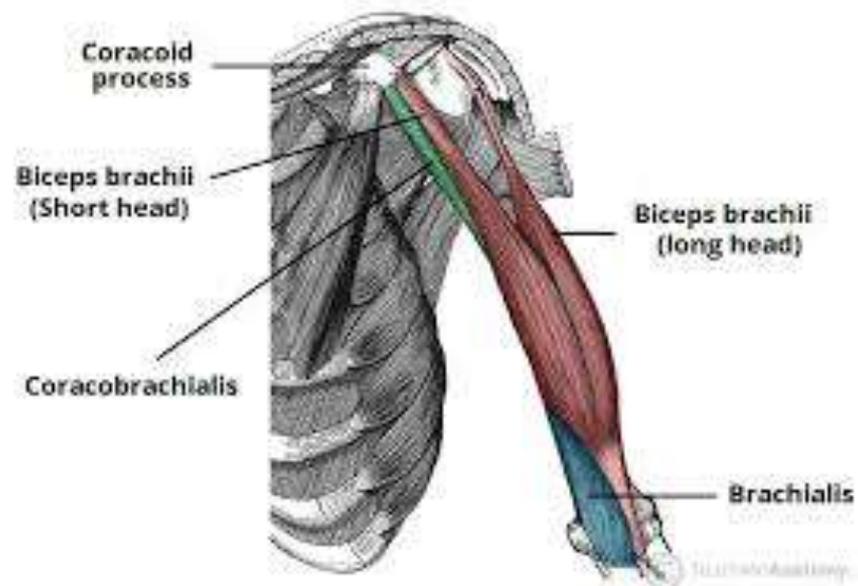


# Arm Muscles

- Muscles of the ANTERIOR COMPARTMENT of the arm. Include

- The Coracobrachialis
- Biceps Brachii
- Brachialis Muscles.

- ❖ The muscles of the ANTERIOR COMPARTMENT of the arm SHARE:  
Common actions → (primarily flexors (of the shoulder or elbow or both) because of their anterior orientation )  
✓ Innervation (**musculocutaneous nerve**).

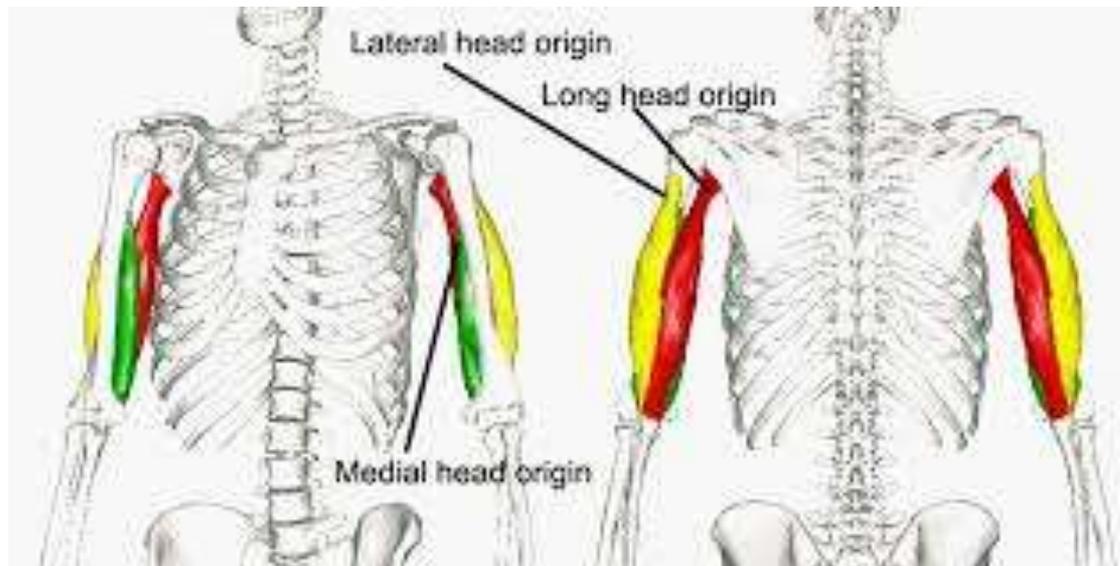


# Arm Muscles

**Muscles of the POSTERIOR COMPARTMENT of the arm. Consist of :**

➤ **TRICEPS BRACHII MUSCLE.**

- ✓ The triceps brachii is a three-headed muscle
- ✓ It extends from the glenohumeral joint to the elbow
- ✓ It receives motor innervation via the RADIAL nerve.

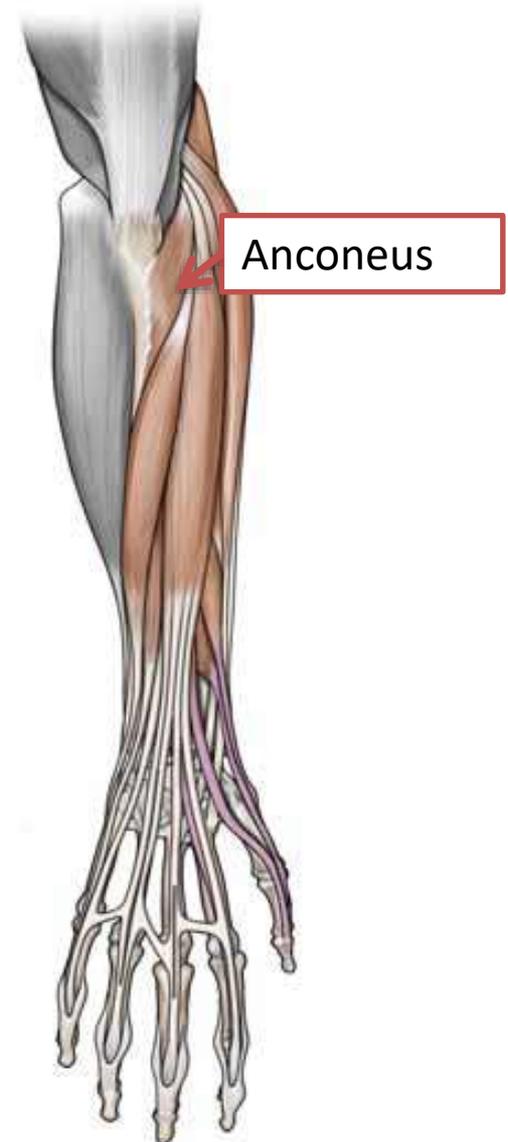


# Arm Muscles

“Posterior Fascial Compartment  
of the Forearm

■ ■ Muscles: The superficial group  
includes the ... and anconeus (Snell 393),  
big picture 354”

**NOT PART OF THE TRICEPS**

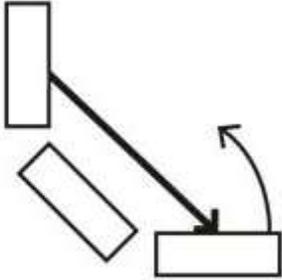


# NOTE

The **ACTIONS** produced by the muscles in **THE ANTERIOR COMPARTMENT** of the forearm **depend** upon which joints the muscles cross.

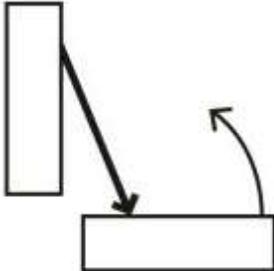
✓ Some muscles cross the elbow, wrist, digits, and perhaps a combination of each.

If a muscle crosses two joints, distal joint moves mainly.

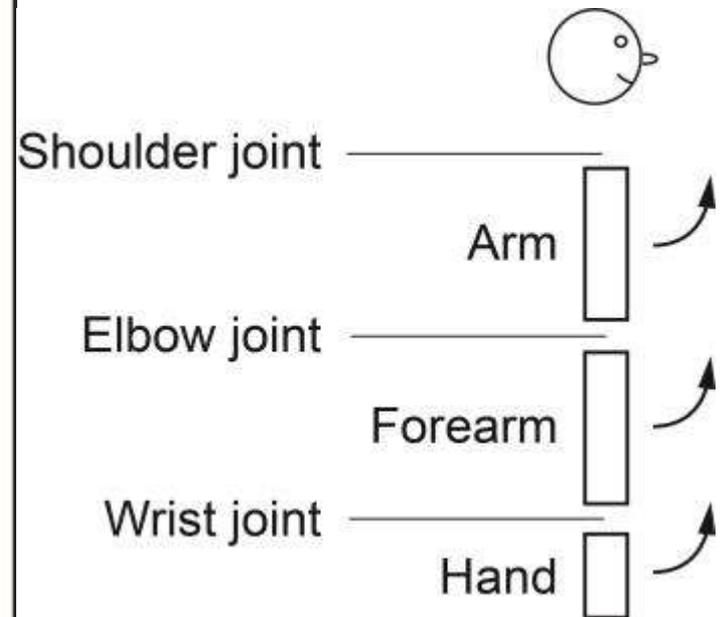


Biceps brachii flexes elbow joint rather than shoulder joint.

The rule is simple. Muscle mostly flexes the joint where the insertion is close,



no matter whether the muscle crosses one or two joints.



# MUSCLES OF THE ANTERIOR COMPARTMENT OF THE ARM

## Biceps brachii muscle

→ Consists of two heads

### ORIGIN:

➤ **Long head:** Supraglenoid tubercle of scapula

➤ **Short head:** Coracoid process of scapula

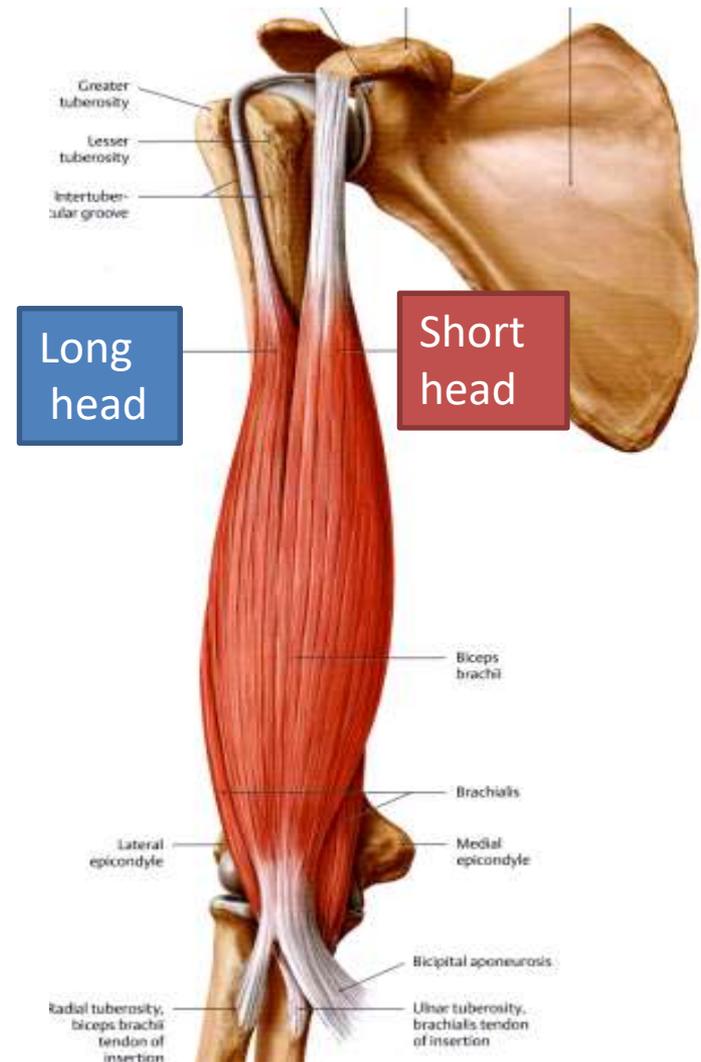
**INSERTION:** Radial Tuberosity and bicipital aponeurosis into deep fascia of forearm

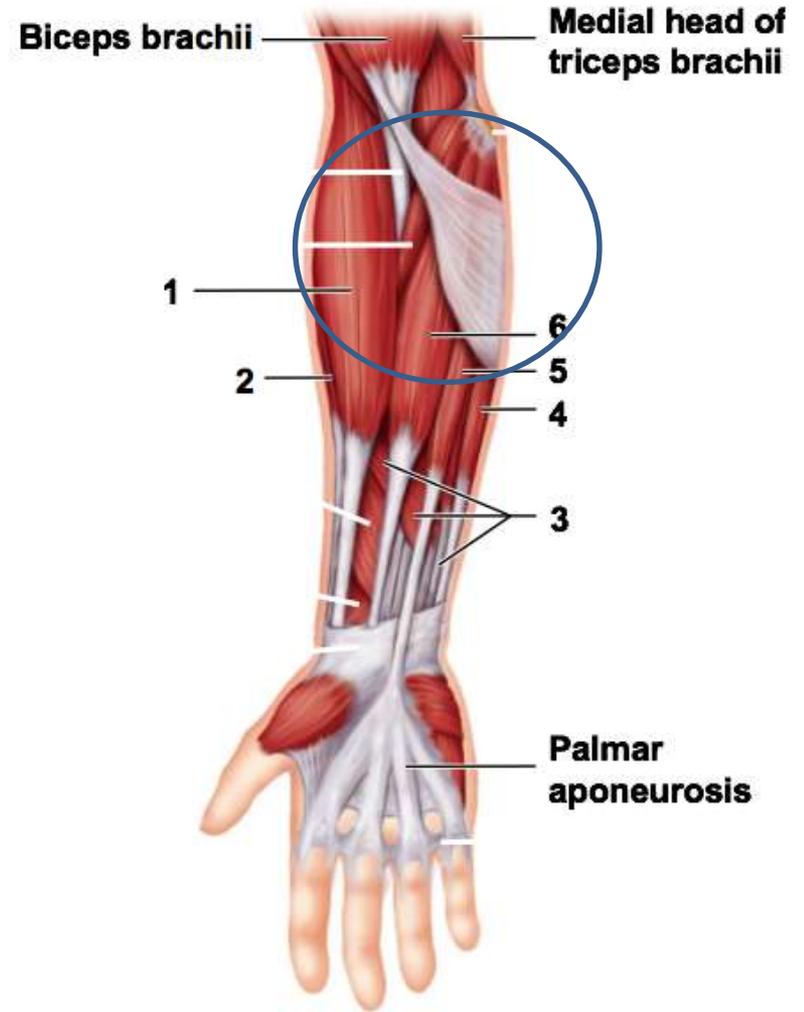
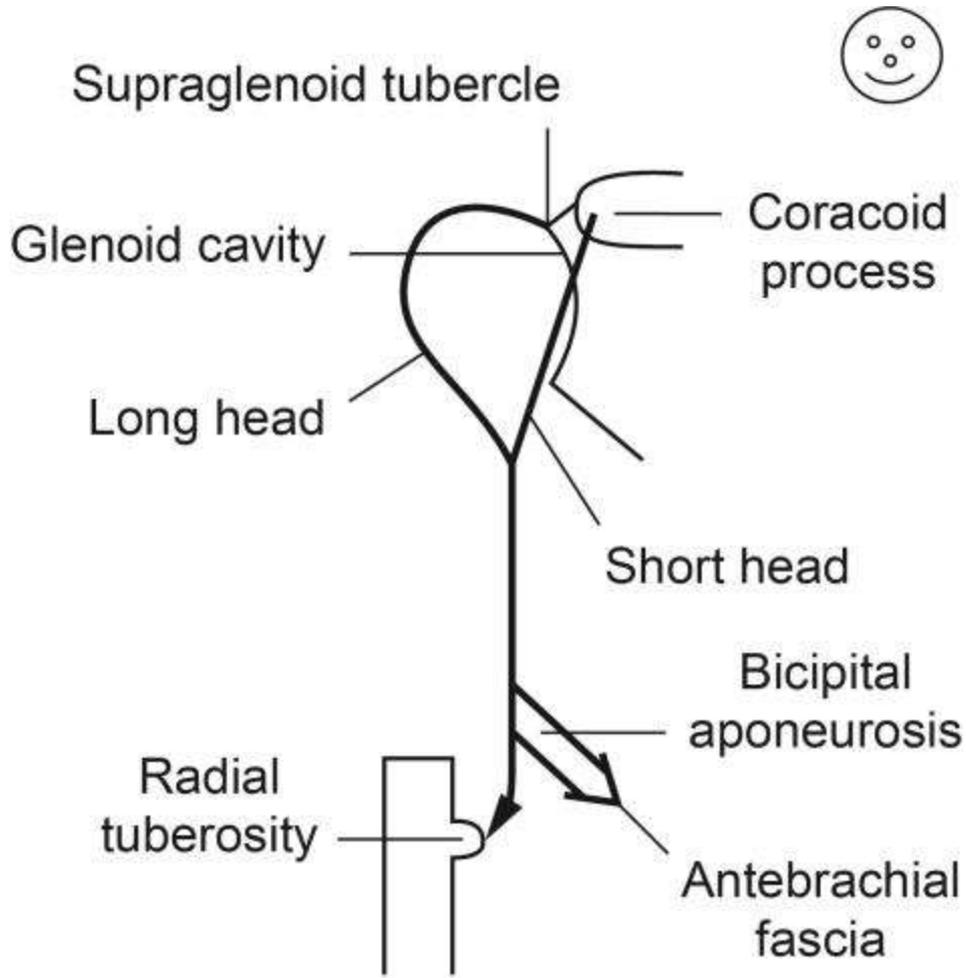
**NERVE SUPPLY:** musculocutaneous nerve

**BLOOD SUPPLY:** brachial artery

### ACTION:

- ✓ Supinator of elbow
- ✓ flexor of elbow joint
- ✓ weak flexor of shoulder joint





## MUSCLES OF THE ANTERIOR COMPARTMENT OF THE ARM

### **CORACOBRACHIALIS** MUSCLE.

➤ **NAMED AFTER ITS ATTACHMENT**

**ORIGIN:** the Coracoid process of the scapula

**INSERTION:** Medial, midshaft surface of  
humerus

**NERVE SUPPLY:** musculocutaneous nerve

**BLOOD SUPPLY:** via branches of the axillary  
artery.

**ACTION:**

✓ Flexion of shoulder



## MUSCLES OF THE ANTERIOR COMPARTMENT OF THE ARM

### **Brachialis muscle**

❖ **ORIGIN:** distal anterior surface of the humerus

❖ **INSERTION:** the Coronoid process and tuberosity of ulna.

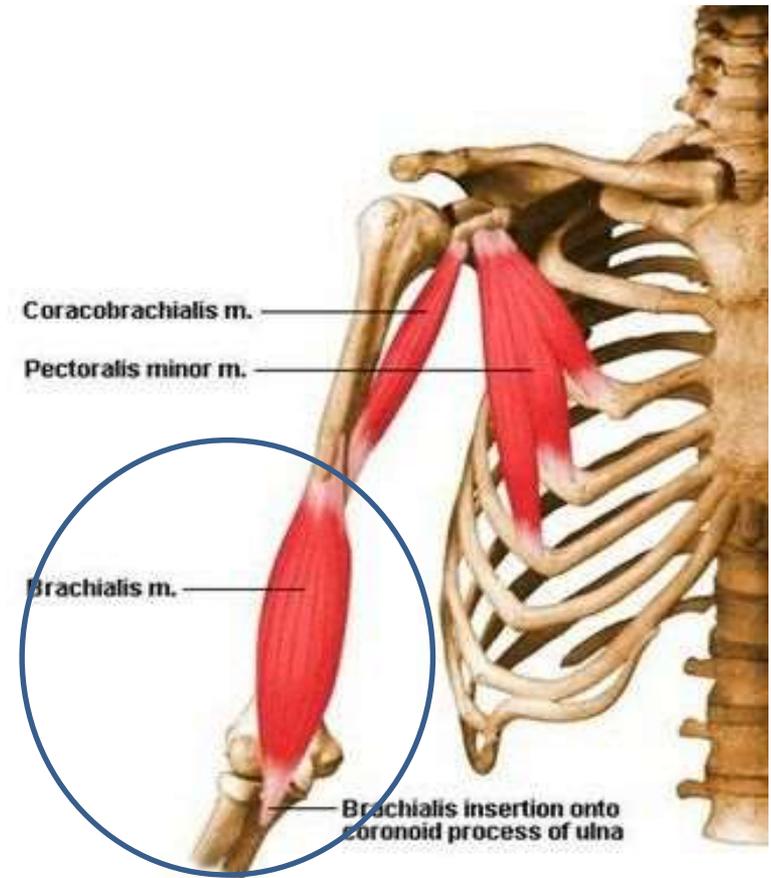
❖ **NERVE SUPPLY:**

✓ musculocutaneous nerve

✓ And the radial nerve

**BLOOD SUPPLY:** the brachial artery.

❖ **ACTION:** flexion of the elbow



# Musculocutaneous Nerve (C5/C6/C7)

## ORIGIN

**lateral cord** of brachial plexus

{formed from **anterior divisions** of **superior** and **middle trunks**}

## COURSE

it leaves the axilla by **piercing coracobrachialis** muscle

it then passes down the arm **beneath biceps muscle**

it ends as the **lateral cutaneous nerve of forearm**

## SENSORY SUPPLY

skin of **lateral forearm**

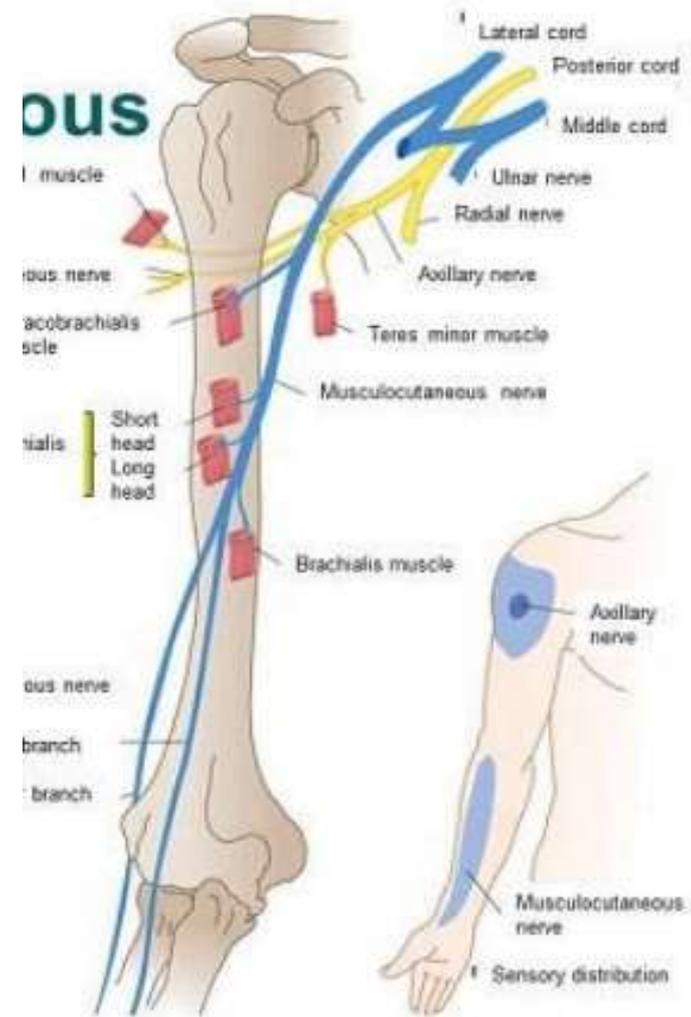
## MOTOR SUPPLY

**anterior compartment of arm (BBC)**

**biceps** – flexes elbow, supinates forearm

**brachialis** – flexes elbow

**coracobrachialis** – flexes elbow



## COMMON INJURIES

musculocutaneous nerve injuries are **rare**, as the **nerve is protected** beneath the bulk of the biceps muscle  
it may be damaged by **stab wounds** to the **upper arm**

## CLINICAL FEATURES OF MUSCULOCUTANEOUS NERVE PALSY

### SENSORY LOSS

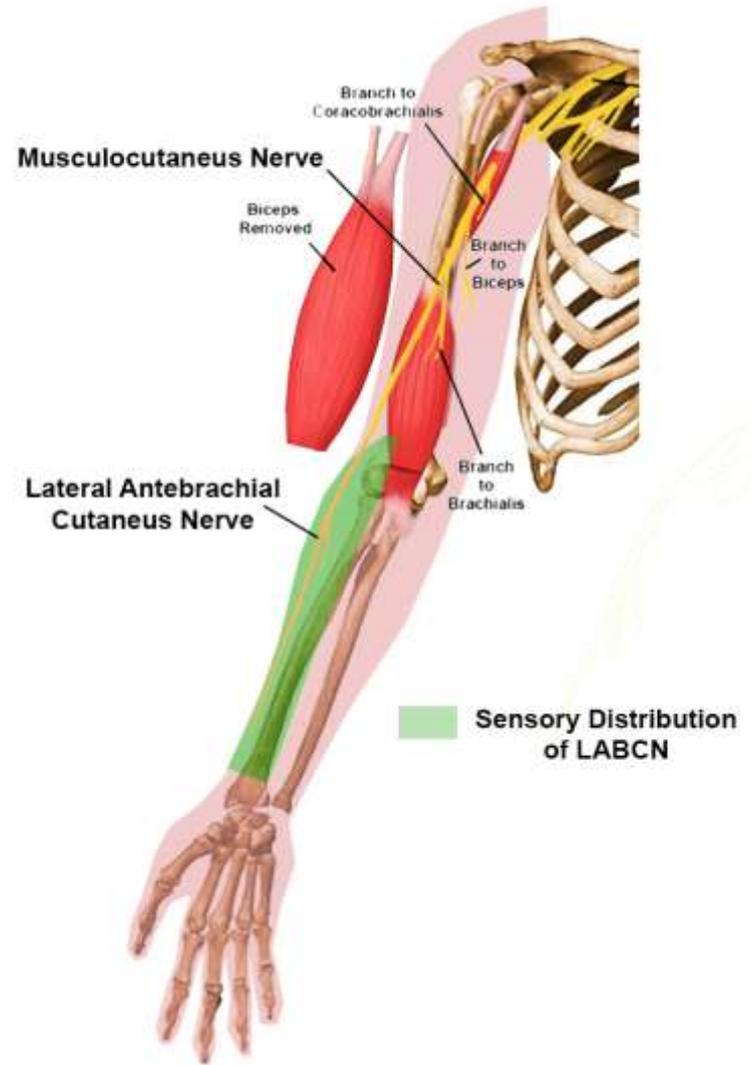
numbness over **lateral forearm**

### MOTOR DEFICIT

paralysis of **anterior compartment of arm** – very weak **elbow flexion** and weak **forearm supination**  
**absent biceps reflex**

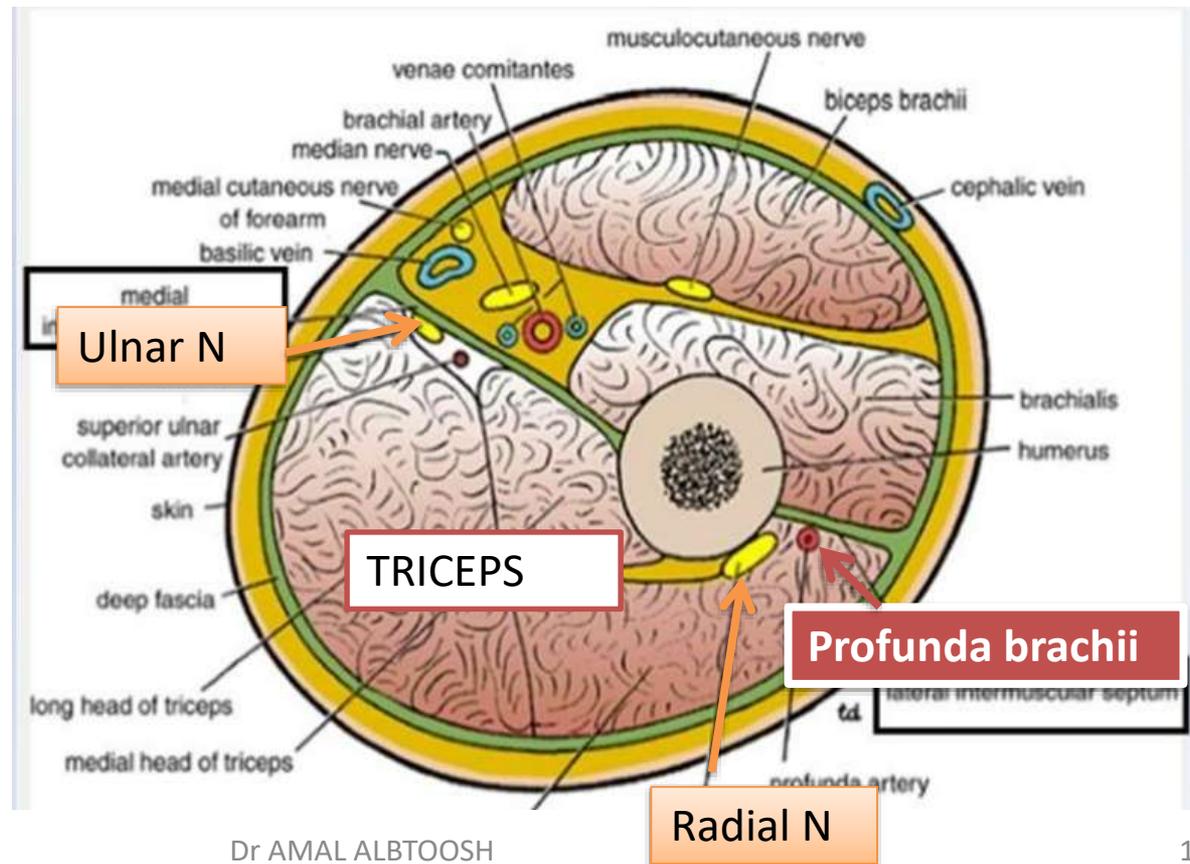
### DEFORMITY

wasting of **anterior compartment of arm**  
**elbow usually held in extension** with **forearm pronated**



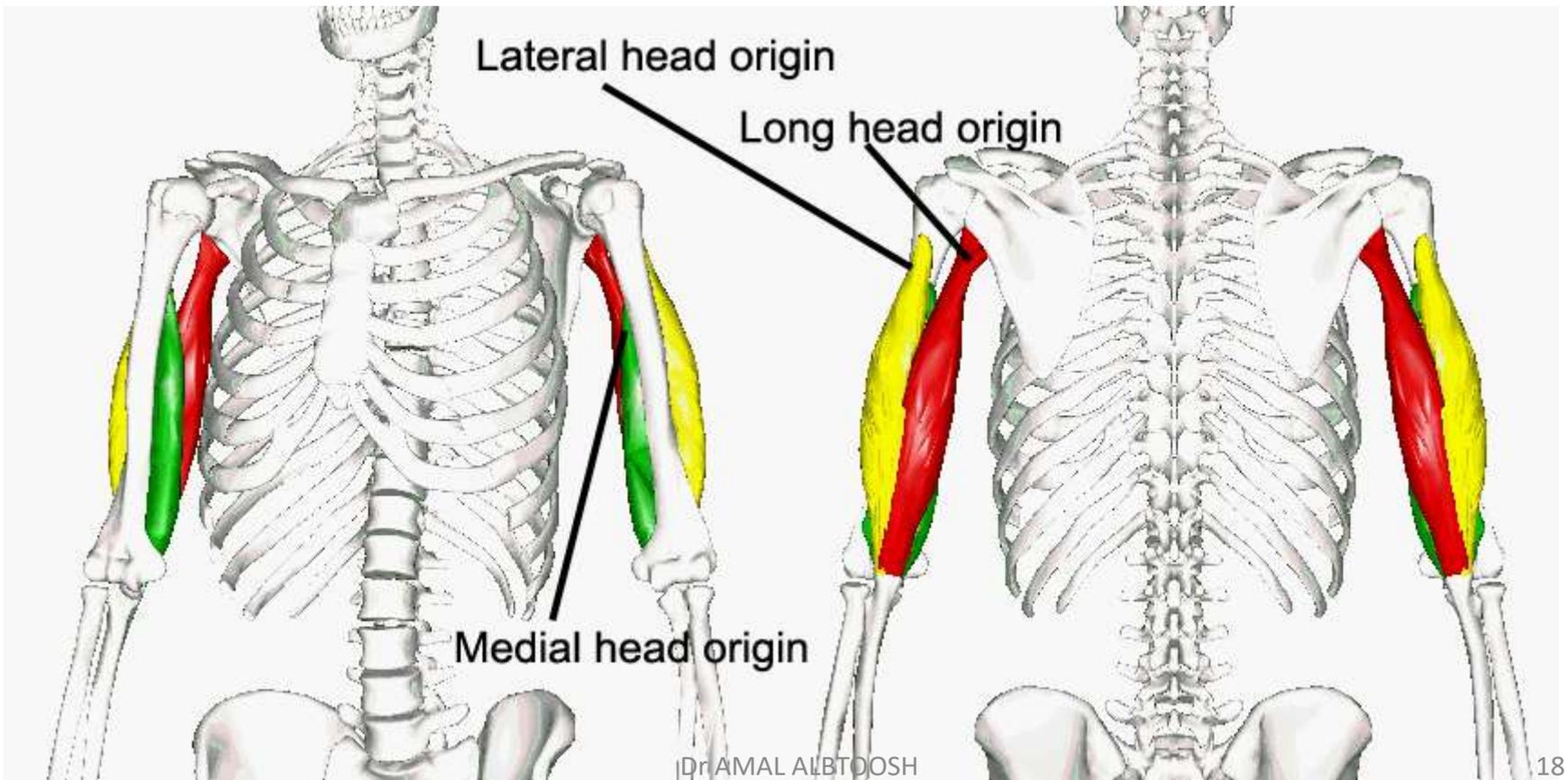
# Contents of the Posterior Fascial Compartment of the Upper Arm

- ❖ **Muscle:** The three heads of the triceps muscle
- ❖ **Nerve supply to the muscle:** Radial nerve
- ❖ **Blood supply:** Profunda brachii and ulnar collateral arteries
- ❖ **Structures passing through the compartment:** **RADIAL NERVE AND ULNAR NERVE**



# MUSCLES OF THE POSTERIOR COMPARTMENT OF THE ARM

- ❖ The muscles in the posterior compartment of the arm and forearm are primarily **extensors of the shoulder and elbow**.
- ❖ The **radial nerve** innervates the muscle in the posterior compartment of the arm.



# MUSCLES OF THE POSTERIOR COMPARTMENT OF THE ARM

## **Triceps Brachii Muscle**

➤ **Consists of three heads.**

### **ORIGIN:**

➤ **The long head:** the **infraglenoid tubercle of the scapula**

➤ **The lateral head:** **UPPER HALF** of **POSTERIOR** surface of shaft of humerus

➤ **The medial head:** **LOWER HALF** of **POSTERIOR** surface of shaft of humerus

**Insertion:** The three heads converge to attach to the olecranon process of the ulna. **Action:** The long head produces shoulder extension and elbow extension.

**The other two heads produce elbow extension only.**

**Nerve supply:** The radial nerve

**Blood supply:** profunda brachii and superior ulnar collateral arteries



Sebastian Kaulitzki / shutterstock.com

**caput longum**



**caput mediale**



**caput laterale**

## **musculus triceps brachii**

TABLE 31-1. Muscles of the Arm

Muscle	Proximal Attachment	Distal Attachment	Action	Innervation
<i>Anterior compartment of the arm</i>				
<b>Biceps brachii</b>	Long head: supraglenoid tubercle Short head: coracoid process	Radial tuberosity	Flexion of shoulder and flexion and supination of elbow	Musculocutaneous n. (C5–C6)
<b>Brachialis</b>	Distal anterior surface of humerus	Coronoid process and tuberosity of ulna	Flexion of the elbow	Musculocutaneous n. (C5–C6) & radial n. (C7)
<b>Coracobrachialis</b>	Coracoid process of scapula	Medial, midshaft surface of humerus	Flexion of shoulder	Musculocutaneous n. (C5–C7)
<i>Posterior compartment of the arm</i>				
<b>Triceps brachii</b>	Long head: infraglenoid tubercle Lateral head: posterior humerus Medial head: posterior humerus	Olecranon process of ulna	Extension of shoulder and elbow	Radial n. (C6–C8)

## The Cubital Fossa

The cubital (مرفقي) fossa is a triangular [inverted] depression that lies in front of the elbow.

### Boundaries

**LATERALLY:** The brachioradialis muscle

**MEDIAALLY:** The pronator teres muscle

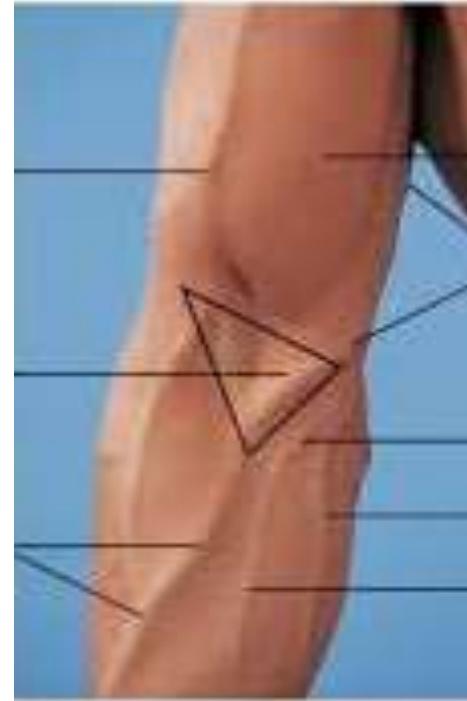
**BASE of the triangle:** is formed by an imaginary line drawn between the two epicondyle of the humerus.

**FLOOR of the fossa:** is formed by

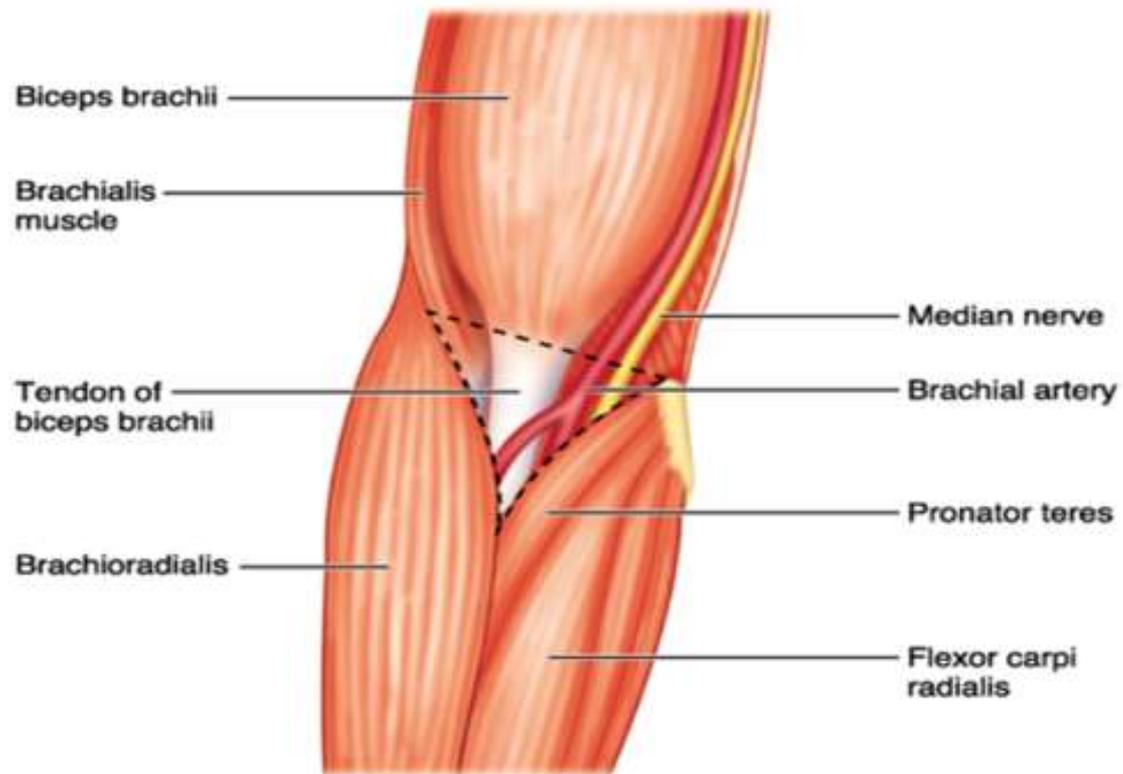
- the supinator muscle laterally
- the brachialis muscle medially.

Note: The supinator occupies a small portion of the floor of the cubital fossa

**ROOF :** is formed by skin and fascia and is reinforced by the bicipital aponeurosis.



**Cubital** - derived from cubitus meaning elbow, now refers to that region of the upper limb



**(b)**

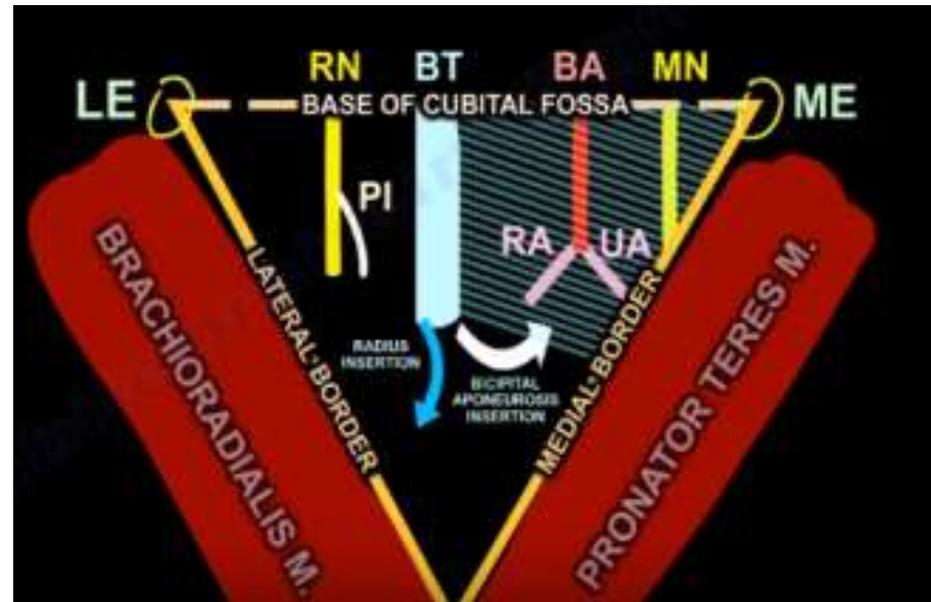
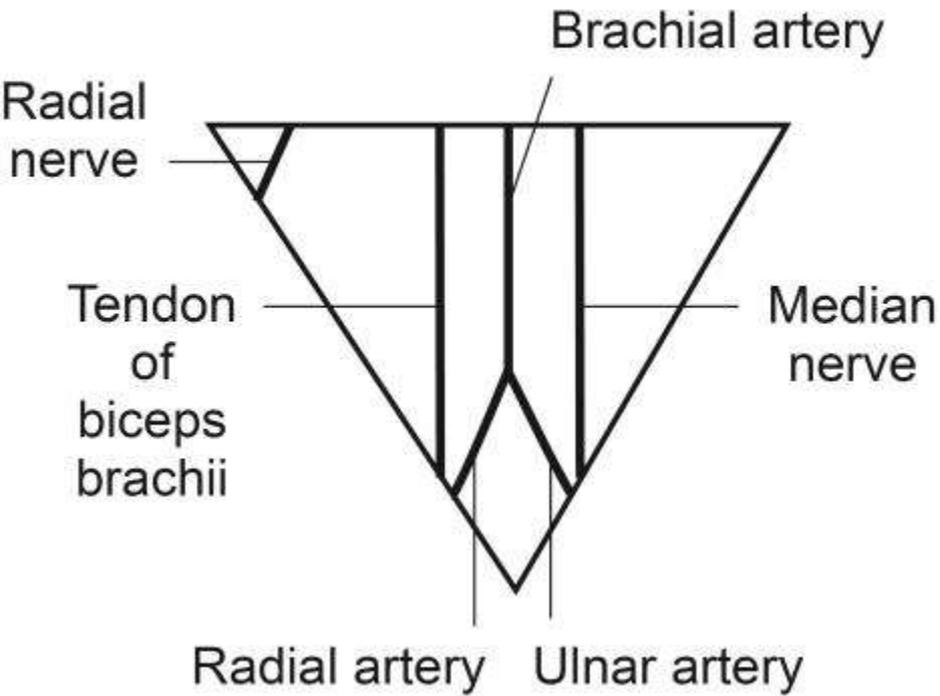
**Not pictured: median cubital vein**

# The Cubital Fossa

## Contents

The cubital fossa contains the following structures,  
[ from the medial to the lateral side]

- ✓ the median nerve
- ✓ the bifurcation of the brachial artery into the ulnar and radial arteries
- ✓ the tendon of the biceps muscle,
- ✓ the radial nerve and its deep branch.
- **IN CONTRAST**, the ~~ulnar~~ nerve does not appear in the cubital fossa since it passes behind the medial epicondyle.
- ✓ The **supratrochlear** lymph node lies in the superficial fascia over the upper part of the fossa, above the trochlea.



At the entrance gate of a university in South Africa, the following message was posted for contemplation

"Destroying any nation does not require the use of atomic bombs or the use of long range missiles... It only requires lowering the quality of education and allowing cheating in the examinations by the students..."

Patients die at the hands of such doctors...

Buildings collapse at the hands of such engineers...

Money is lost at the hands of such economists & accountants...

Humanity dies at the hands of such religious scholars...

Justice is lost at the hands of such judges...

"The collapse of education is the collapse of the nation."