MSS Module

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Muscles of the Arm

Lecture objectives

- **By the end of this session, you should be able to:**

1. Identify the muscles of the anterior and posterior compartments of the forearm with relevance to their action and nerve supply

2. Study the boundaries, contents and relationship among structures of cubital fossa.

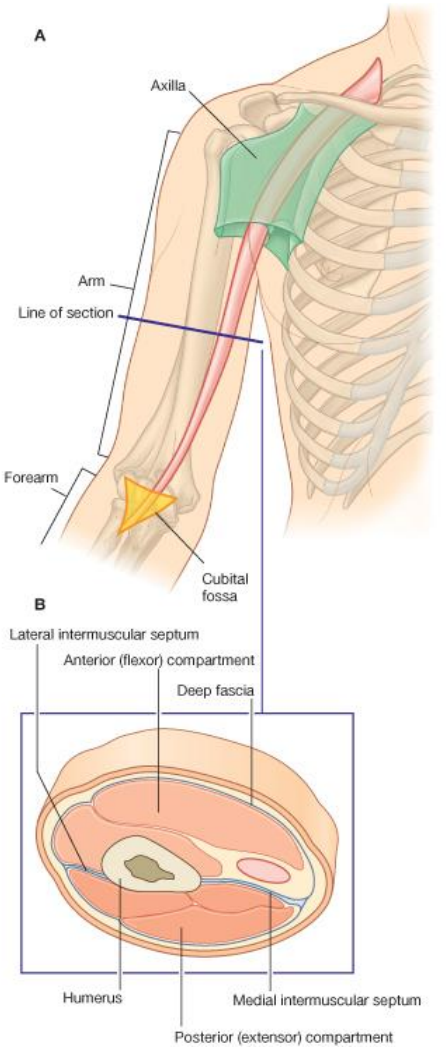
3. Clinical importance of the cubital fossa.

Arm

- The arm is the region of the upper limb between the shoulder and the elbow.
- The **superior** aspect of the arm communicates medially with the axilla.
- **Inferiorly,** a number of important structures pass between the arm and the forearm through the cubital fossa, which is positioned anterior to the elbow joint

Muscles of the Arm

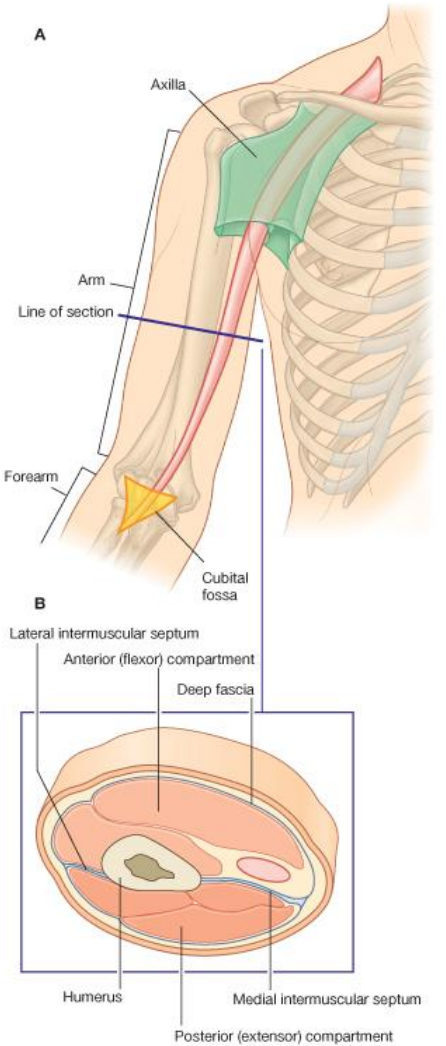
- The arm is divided into two compartments (**anterior and posterior**) **by medial and lateral intermuscular septa**, which pass from each side of the humerus to the outer sleeve of deep fascia that surrounds the limb.

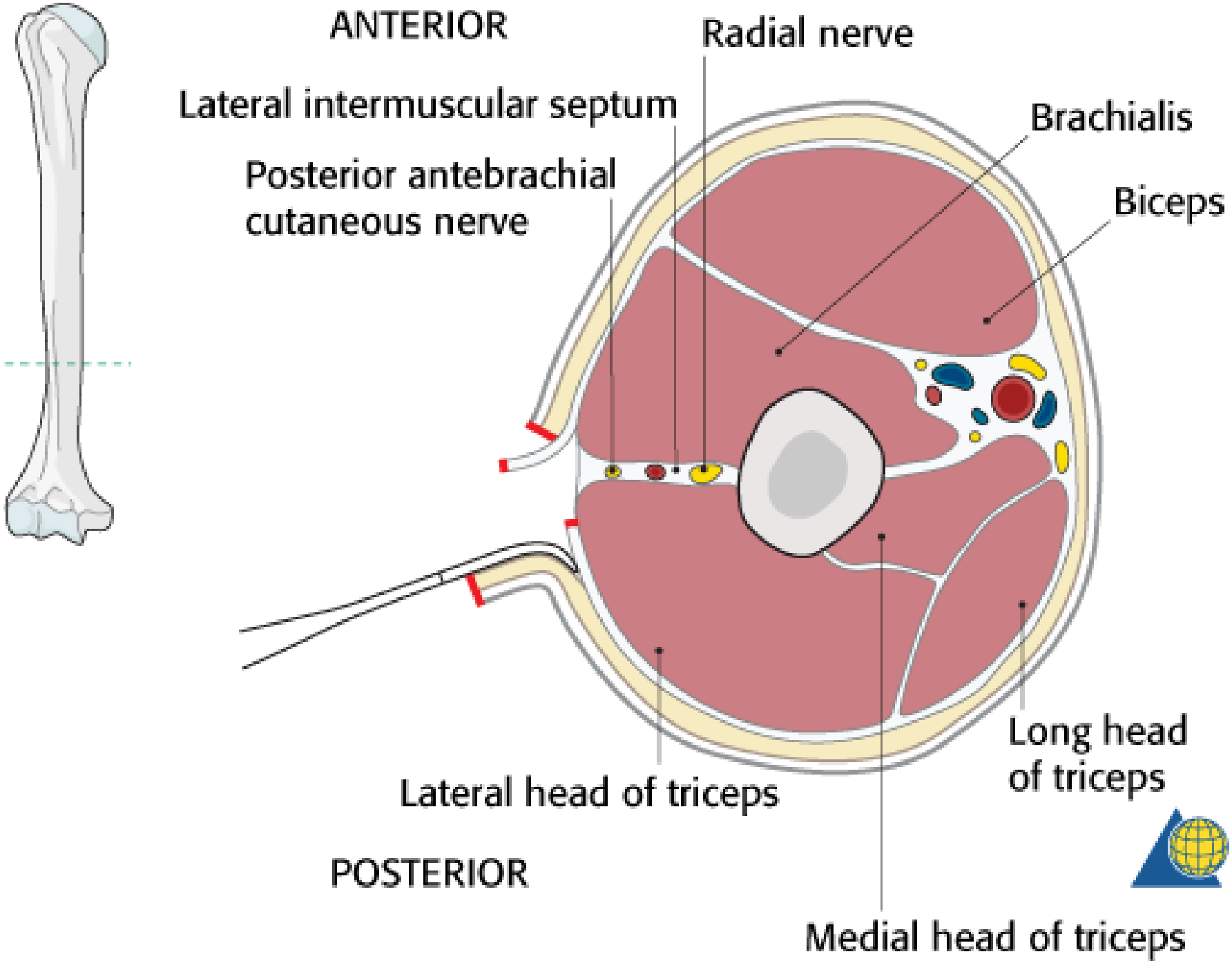


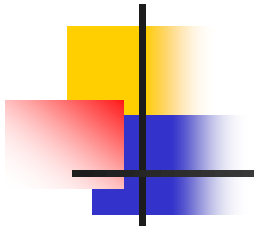
Muscles of the Arm

- The **anterior compartment** of the arm contains muscles that predominantly **flex the elbow joint**

- The **posterior compartment** contains muscles that **extend the joint**. Major nerves and vessels supply and pass through each compartment.




ANTERIOR
Radial nerve
Lateral intermuscular septum
Brachialis
Posterior antebrachial cutaneous nerve
Biceps
Long head of triceps
Lateral head of triceps
POSTERIOR
Medial head of triceps



Muscle of Anterior Compartment of Arm

Muscles of Anterior Compartment

- ***The anterior compartment of the arm contains three muscles:***

1. Biceps brachii muscles
2. Coracobrachialis
3. Brachialis

- They are innervated predominantly by the **musculocutaneous nerve**.

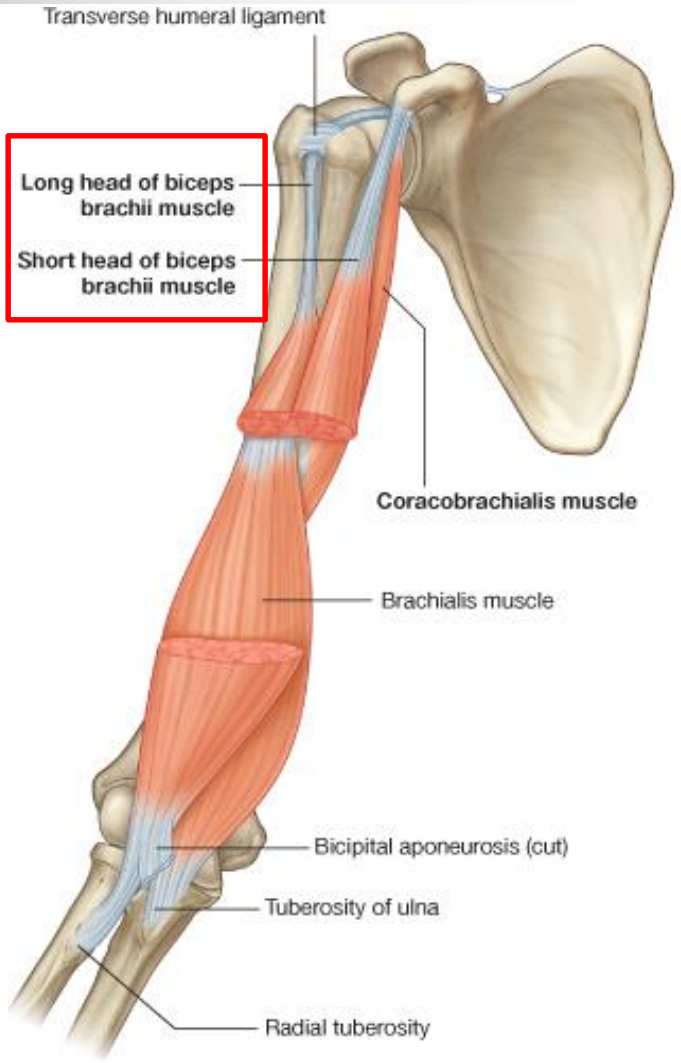
Biceps Brachii

- **Origin:**

1. Long head: from the supraglenoid tubercle of the scapula.
2. Short head: from the tip of coracoid process of the scapula.

- **Insertion:**

1. Into the tuberosity of the radius.
2. Forms the bicipital aponeurosis which is inserted into the deep fascia of the forearm.

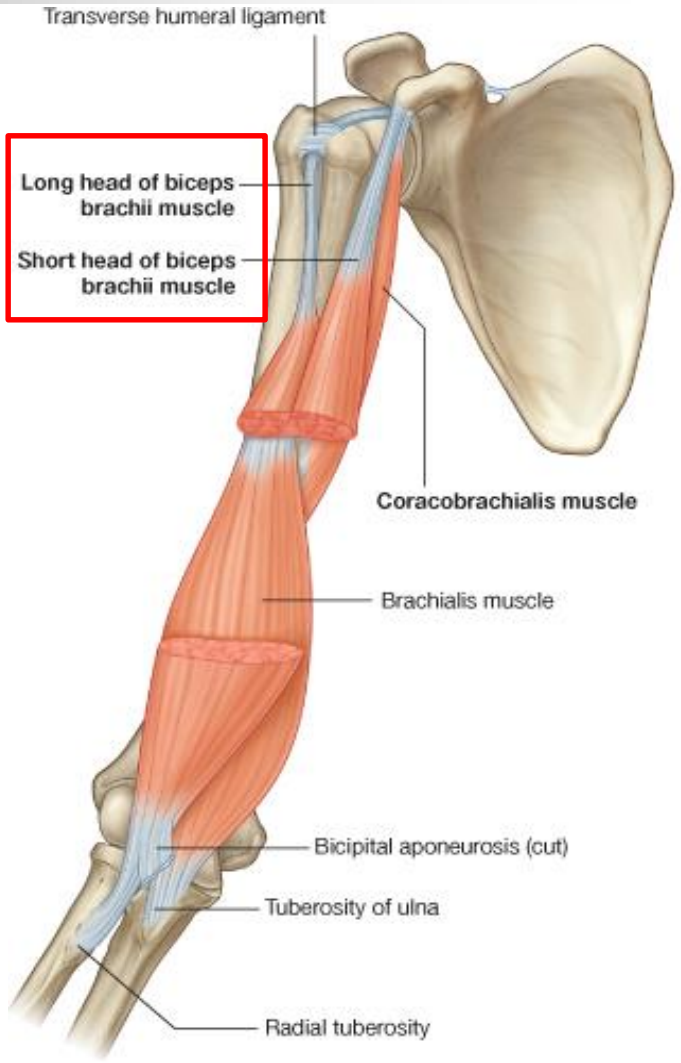


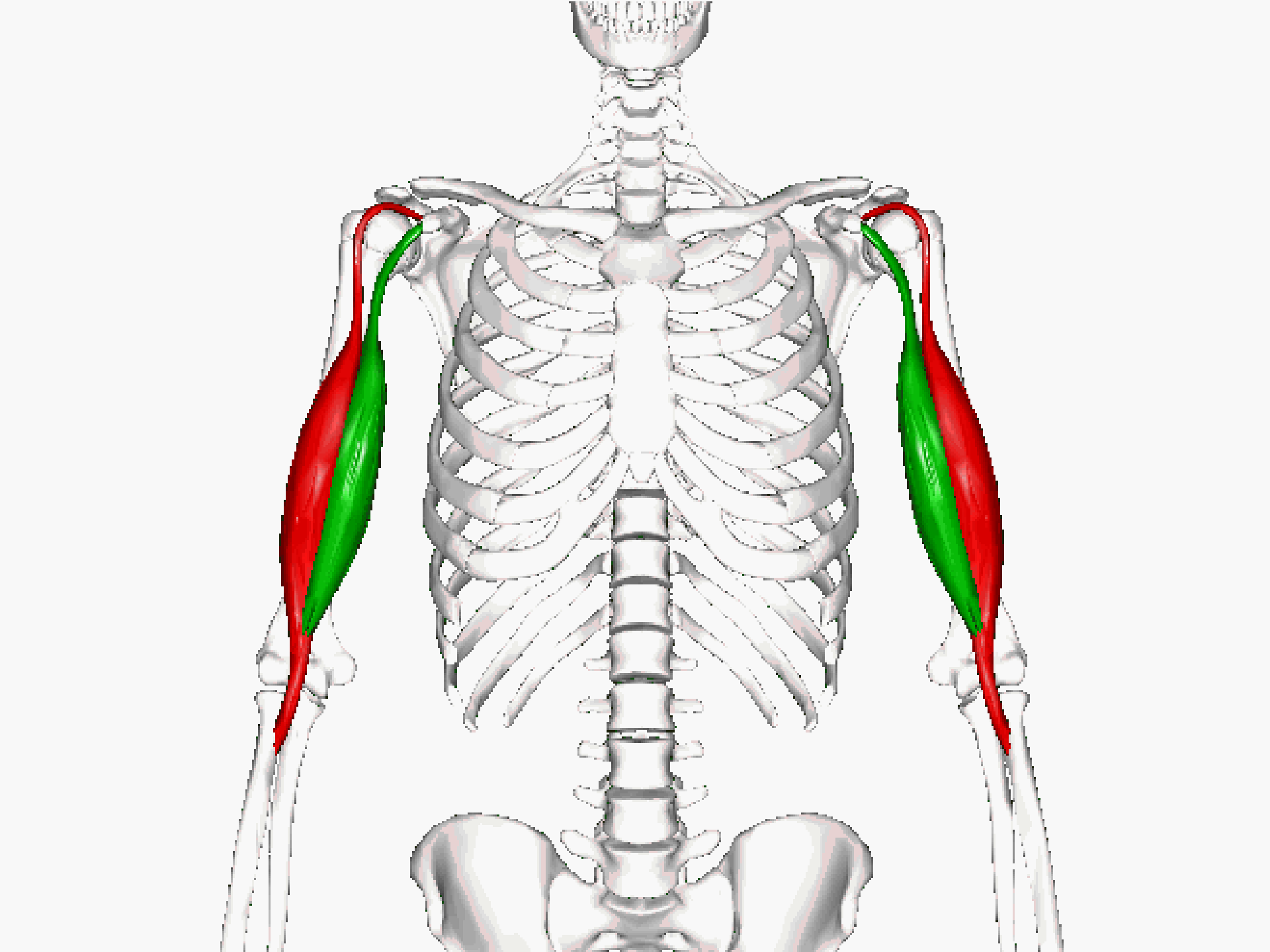
Biceps Brachii

- **Nerve Supply**: musculocutaneous N.

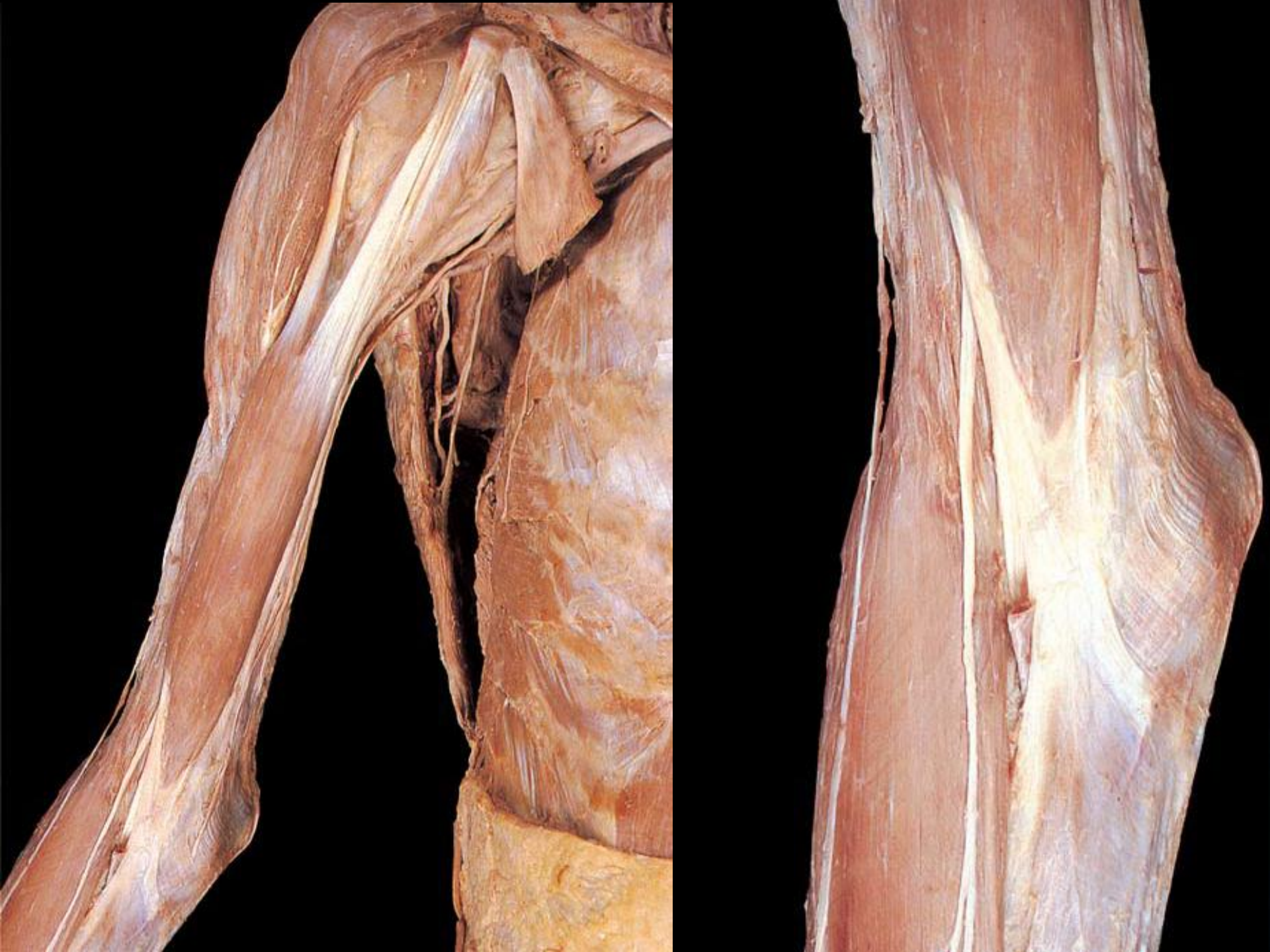
- **Action**:

1. Supination of the forearm at the radio-ulnar joints.
2. Flexion of the forearm at the elbow joint.
3. Weak flexion of the shoulder joint.






Anterior View



Coracobrachialis

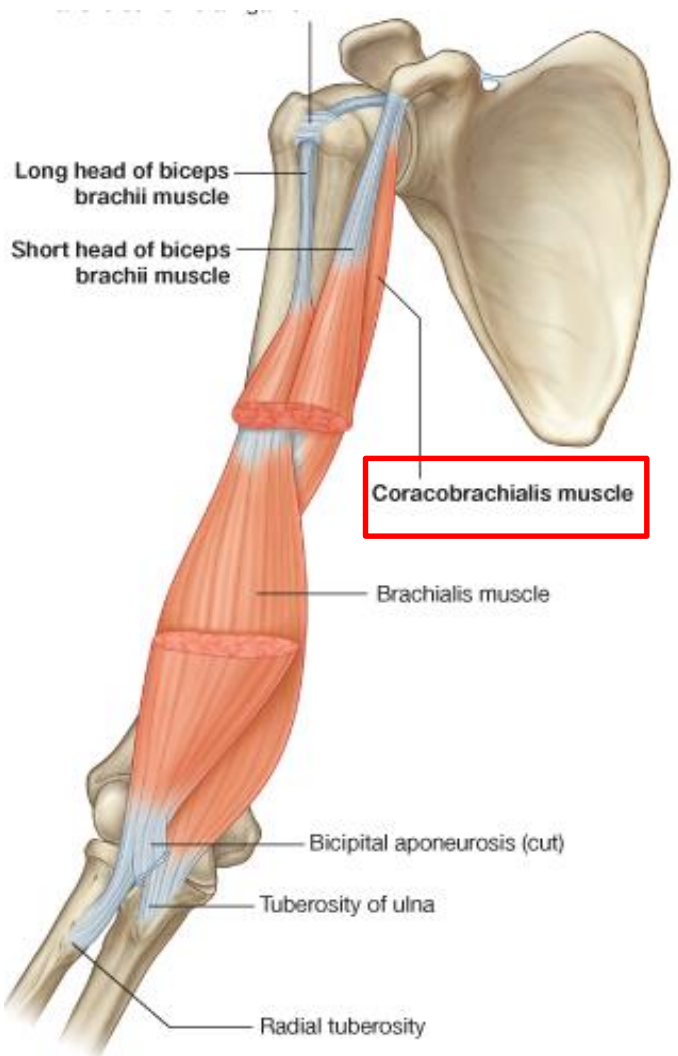
It passes through the axilla and is penetrated and innervated by the musculocutaneous nerve.

- **Origin:**

The tip of coracoid process of the scapula (with short head of biceps).

- **Insertion:**

The middle third of the medial side of the shaft of the humerus.

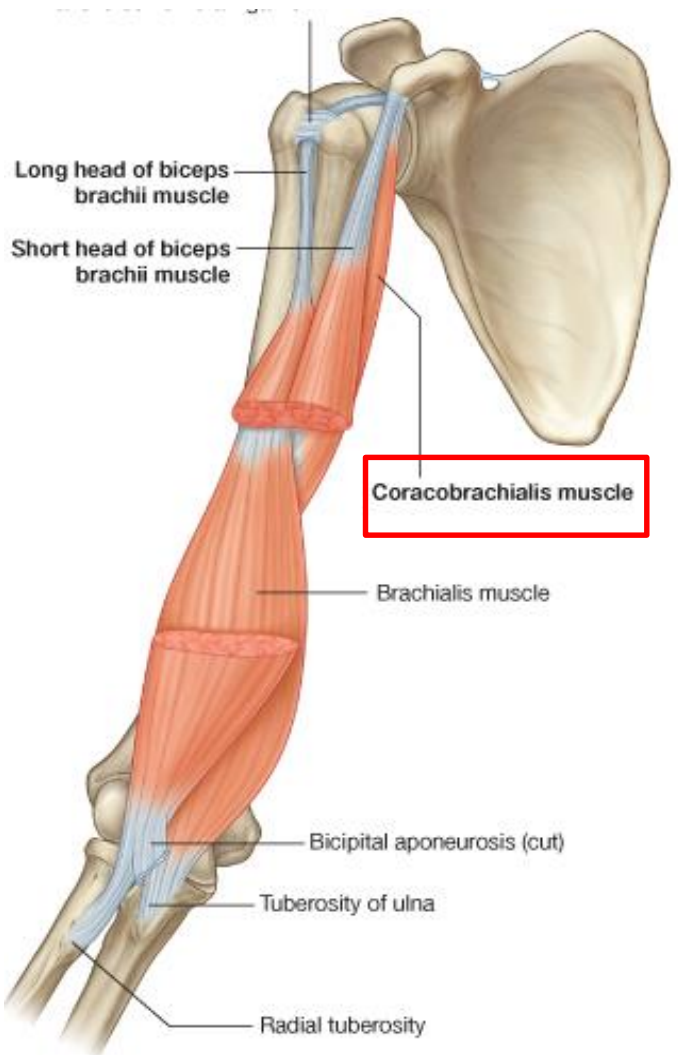


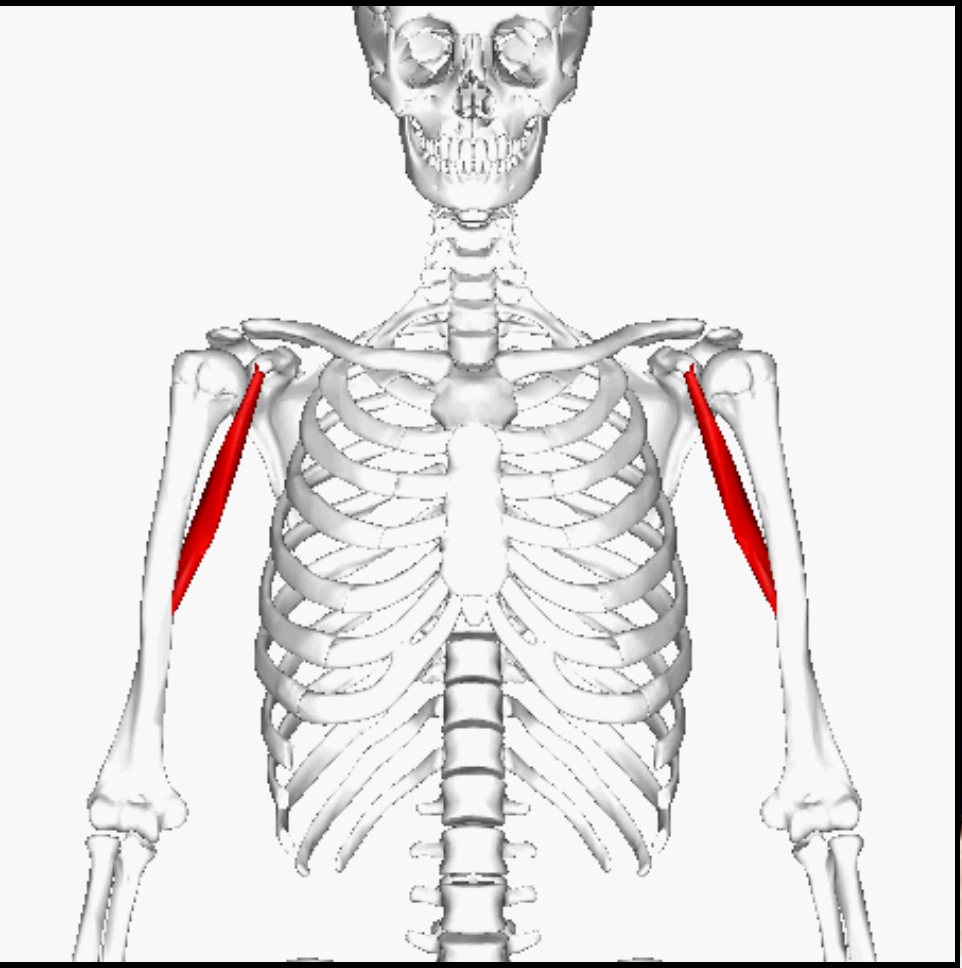
Coracobrachialis

- **Nerve Supply**: musculocutaneous N.

- **Action:**

1. Flexion of the arm at the shoulder joint.
2. Weak adduction of the shoulder joint.





Brachialis

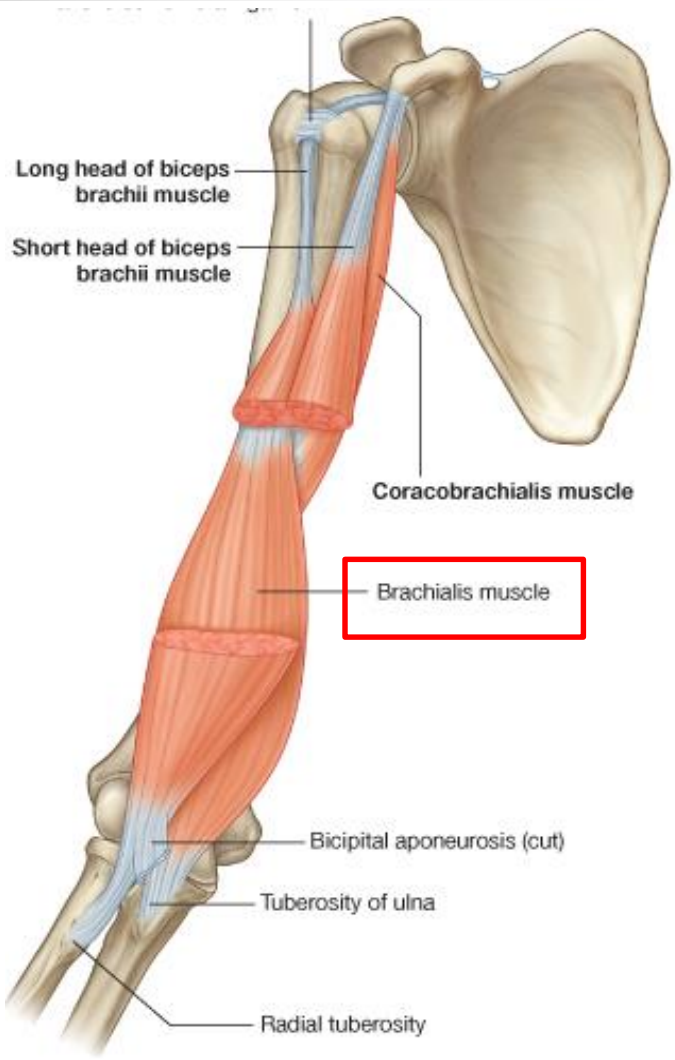
Lies deep to biceps brachii

- **Origin:**

Lower half of the anterior surface of the shaft of the humerus

- **Insertion:**

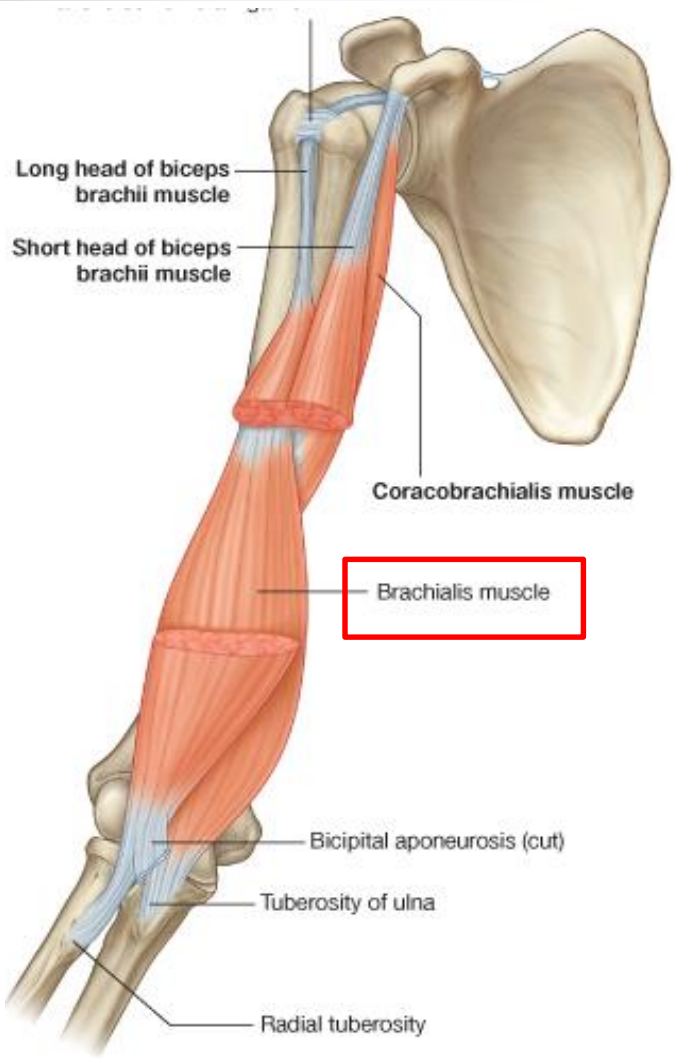
The coronoid process of the ulna.



Brachialis

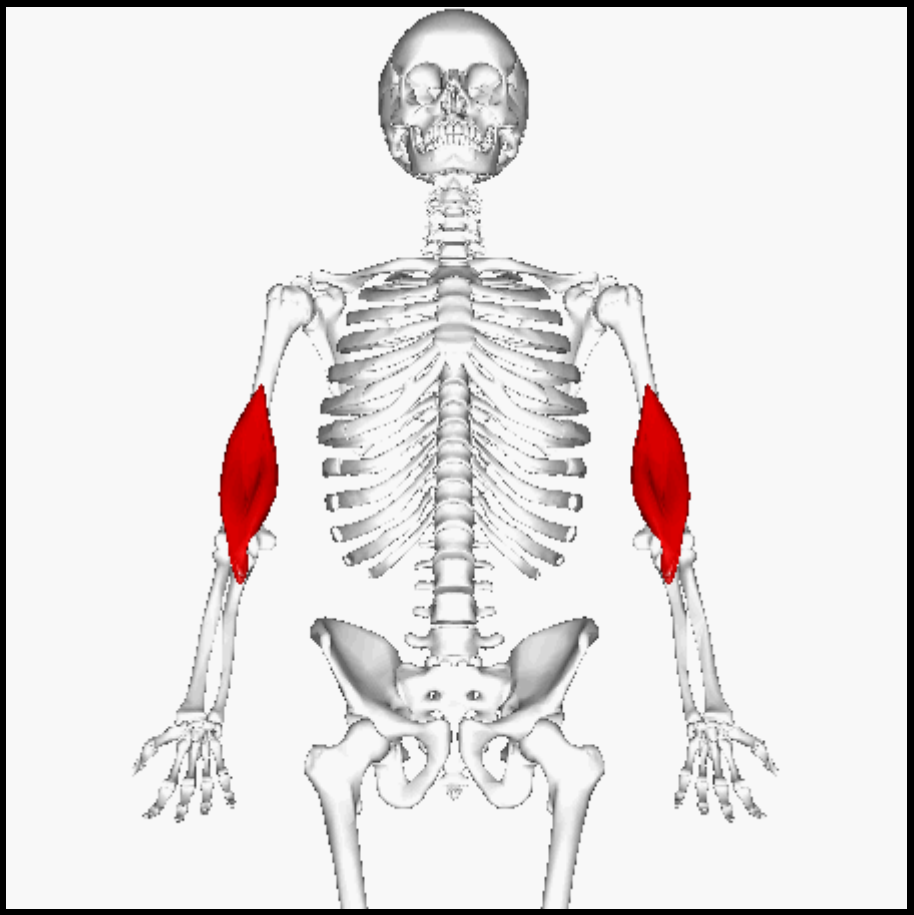
- **Nerve Supply:**

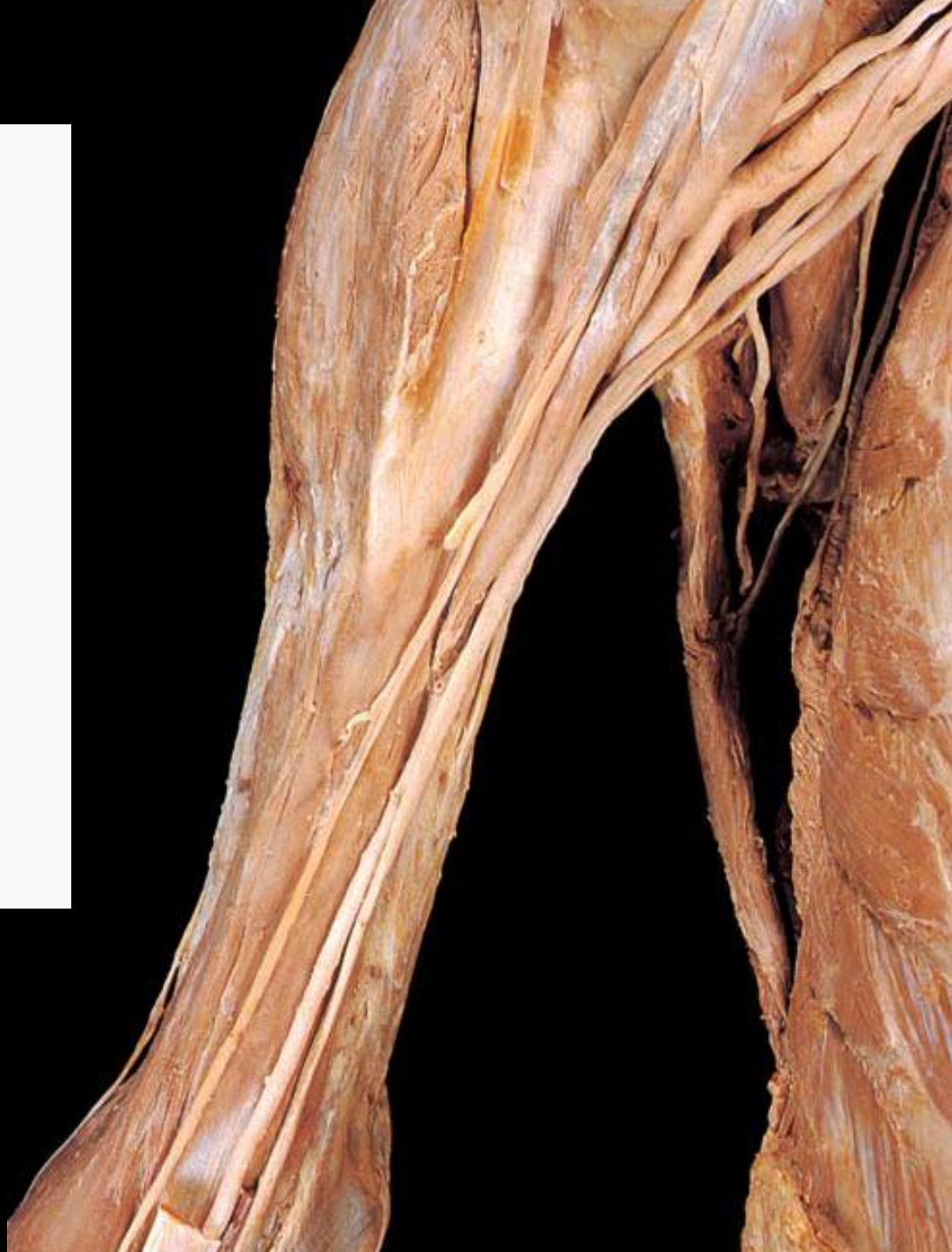
1. Majority of the muscle from musculocutaneous N.
2. Small lateral part by the radial N.

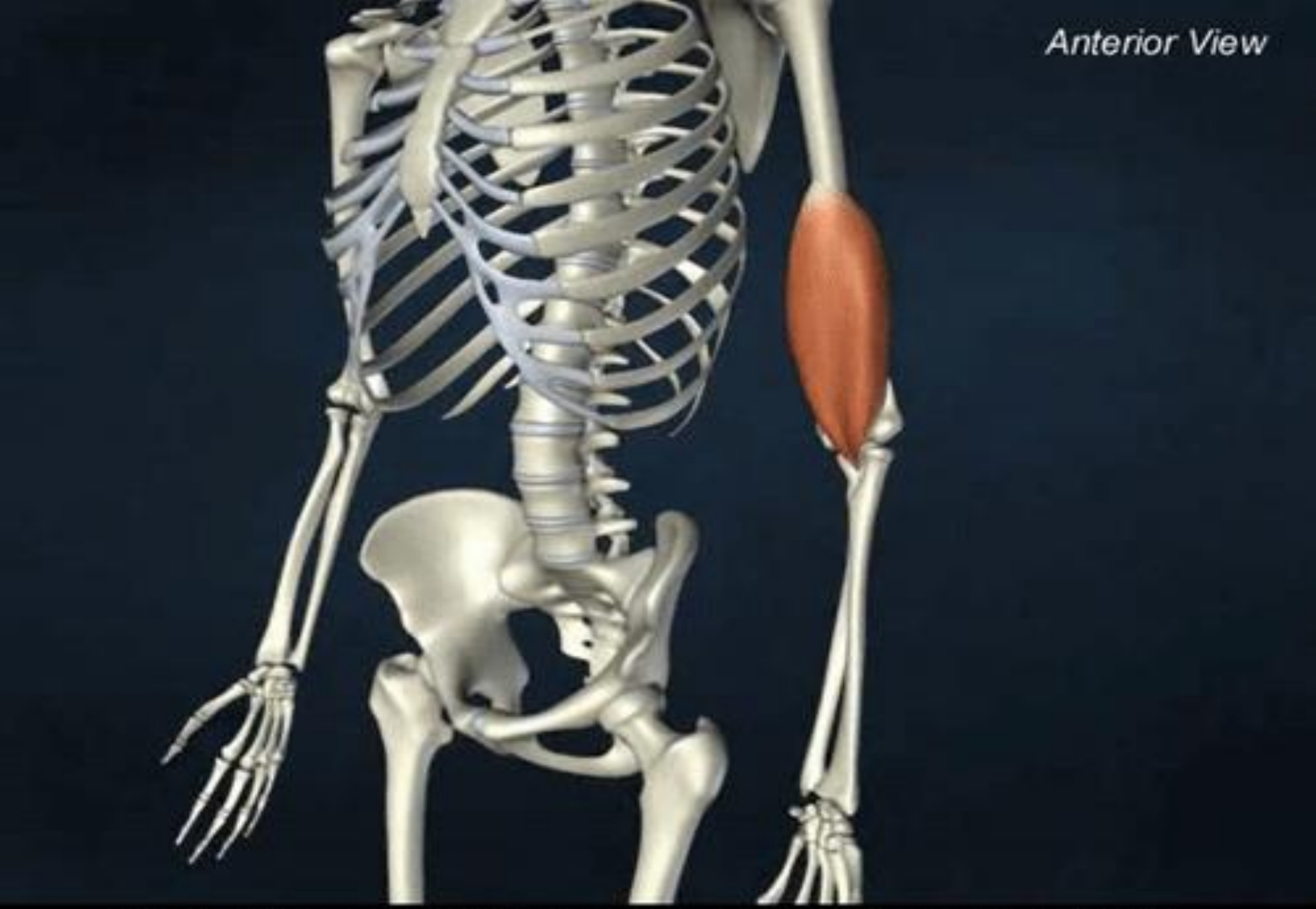


- **Action:**

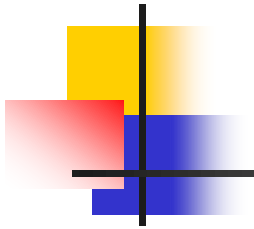
Strong flexion of the elbow joint.







Brachialis flexes the forearm at the elbow. It is innervated by the



Muscle of Posterior Compartment of Arm

Triceps Brachii

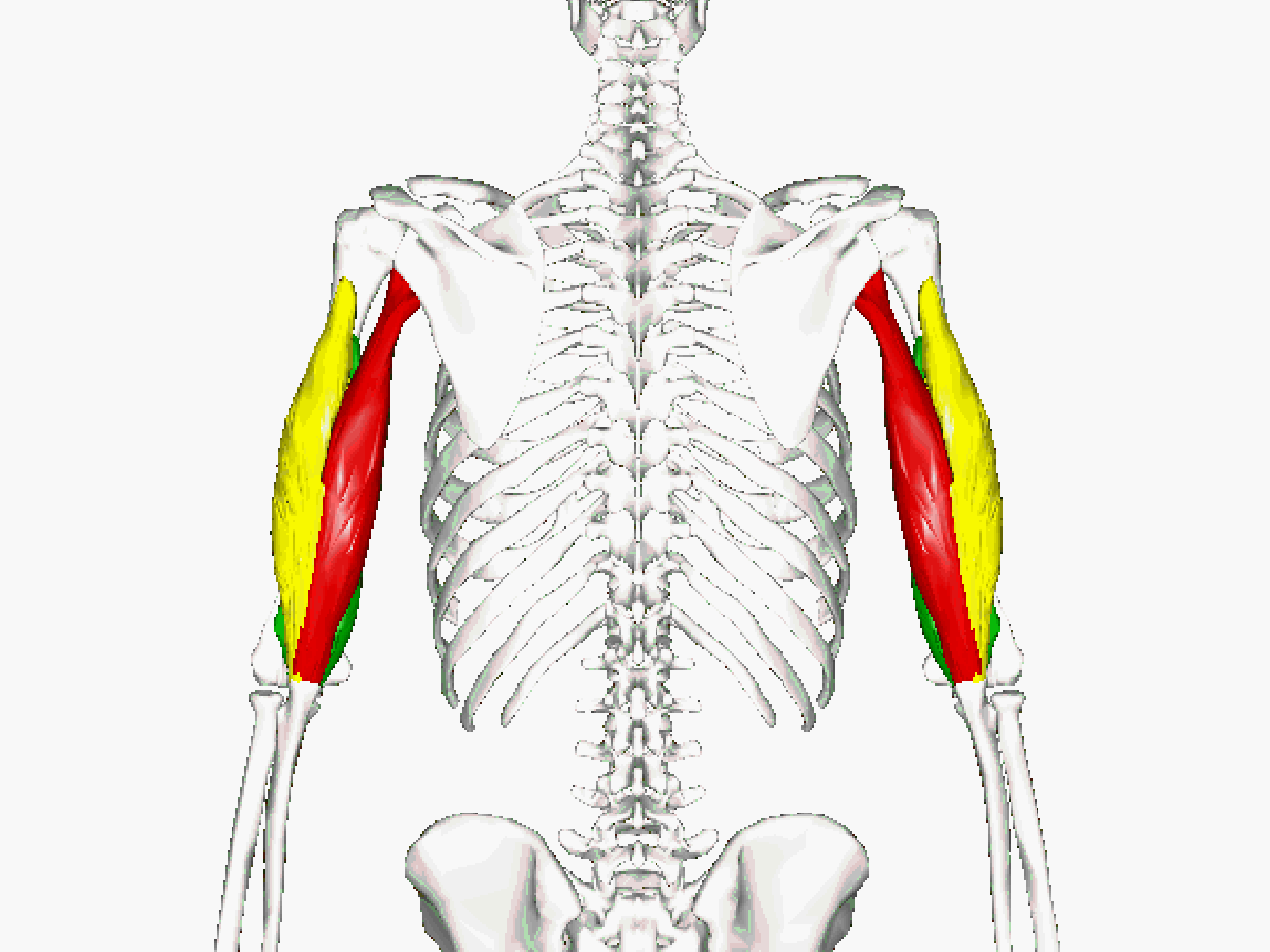
Only one muscle, has three heads:

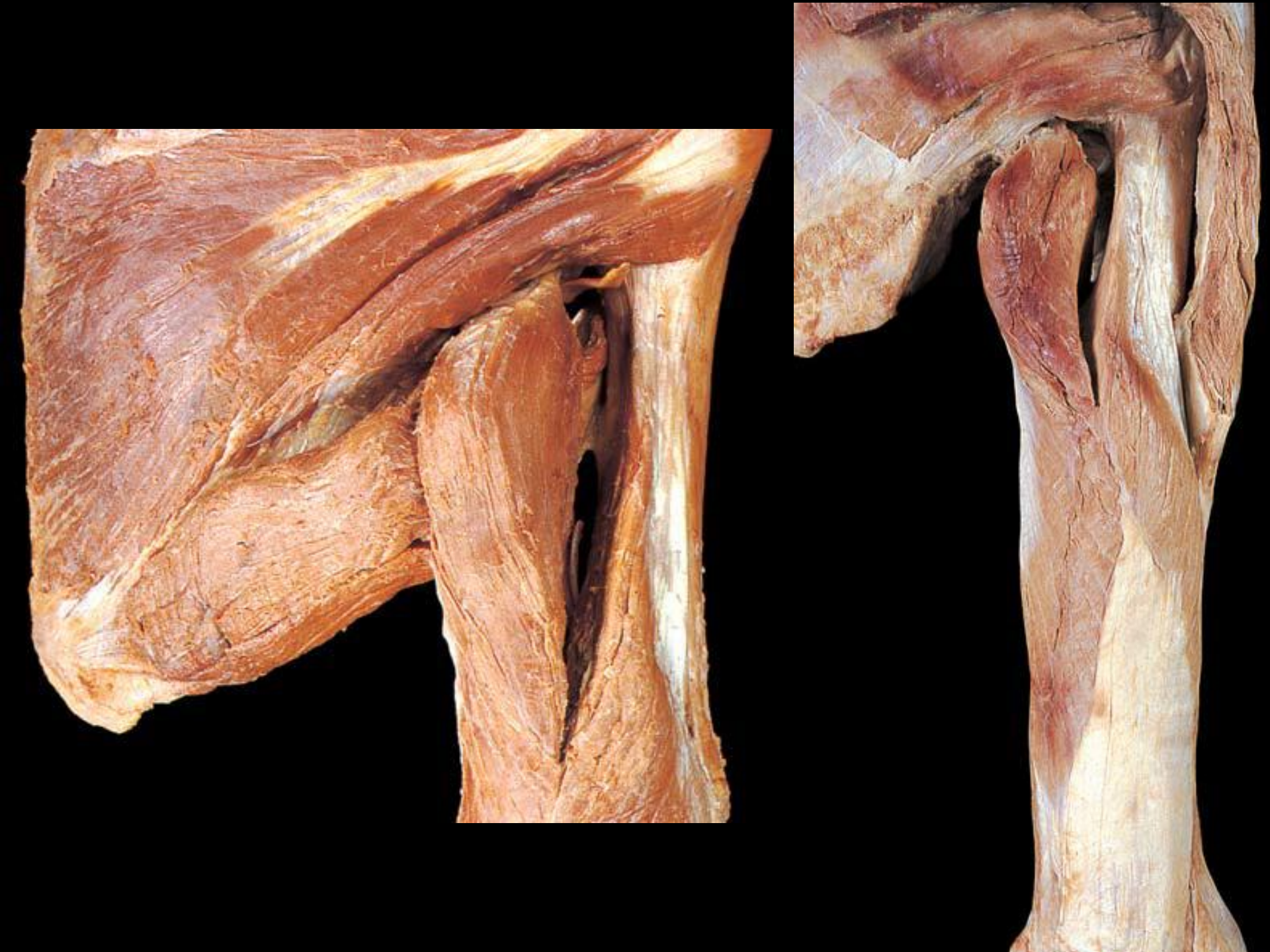
- ***Origin:***

1. The **long head** originates from the infra-glenoid tubercle of the scapula.
2. The **medial head** originates from the posterior surface of humerus, inferior to the radial groove.
3. The **lateral head** originates from the posterior surface of humerus, superior to the radial groove.

- ***Insertion:***

The three heads converge to form a large tendon, which **inserts on the olecranon of the ulna**.





Triceps Brachii

- ***Action:***

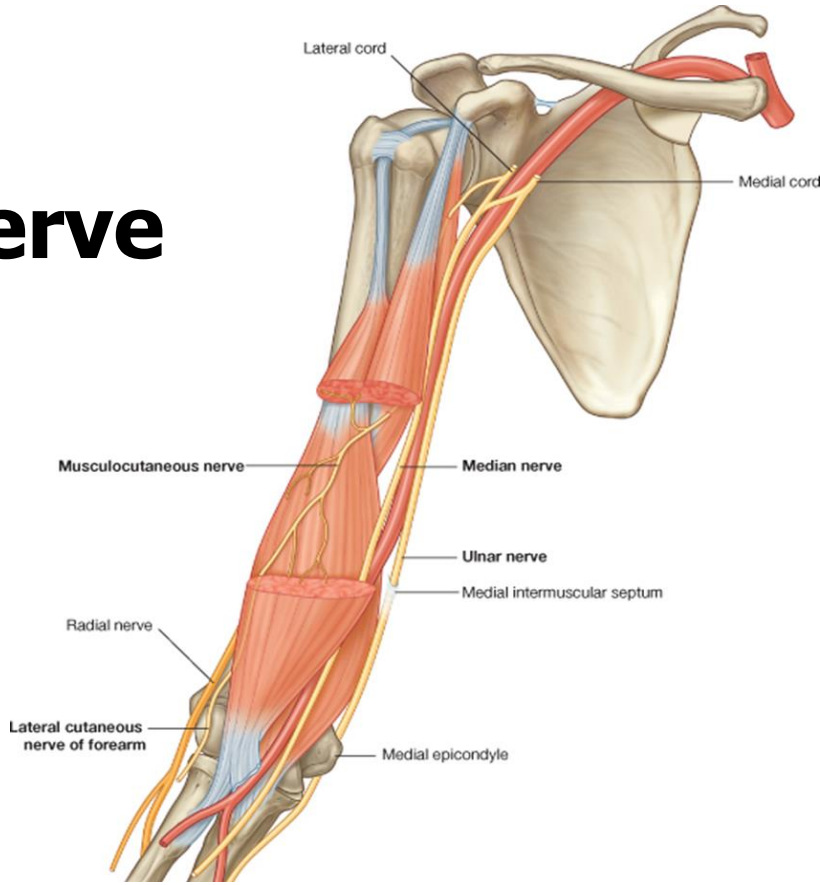
The triceps brachii muscle **extends the forearm at the elbow joint**

- ***Nerve Supply:***

Innervation of triceps brachii is by branches of **the radial N.**

Structures passing through the Anterior Fascial Compartment

1. **Brachial artery**
2. **Musculocutaneos nerve**
3. **Median nerve**
4. **Ulnar nerve**

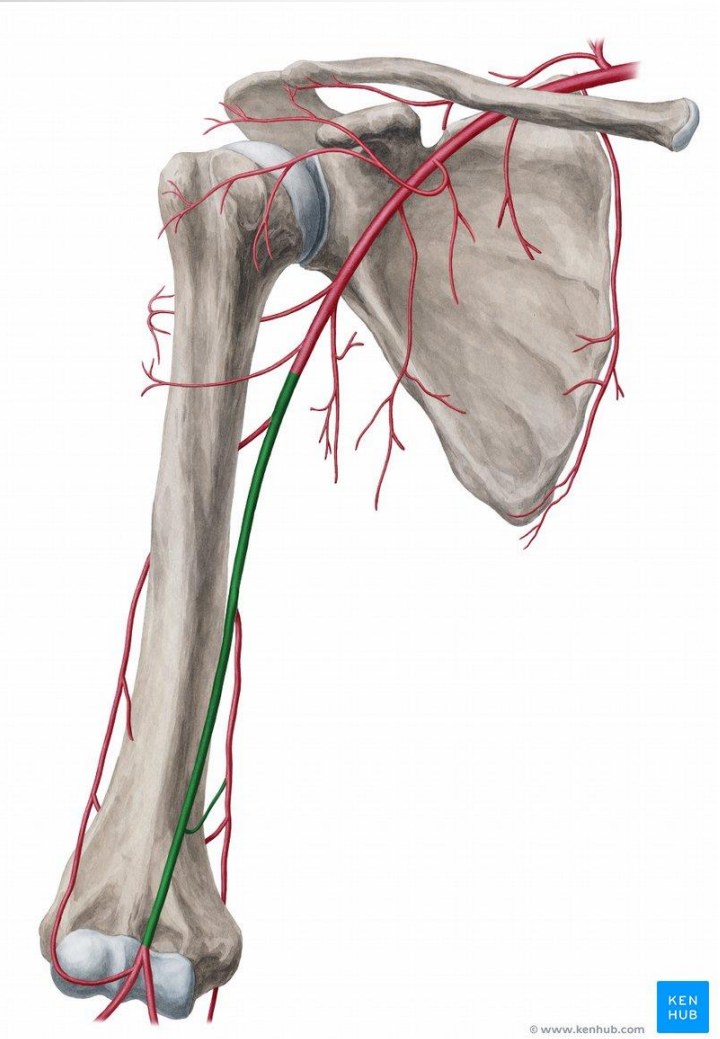


Brachial Artery

Brachial artery

Beginning: The brachial artery begins at the lower border of the teres major muscle as a continuation of the axillary artery. It provides the main arterial supply to the arm.

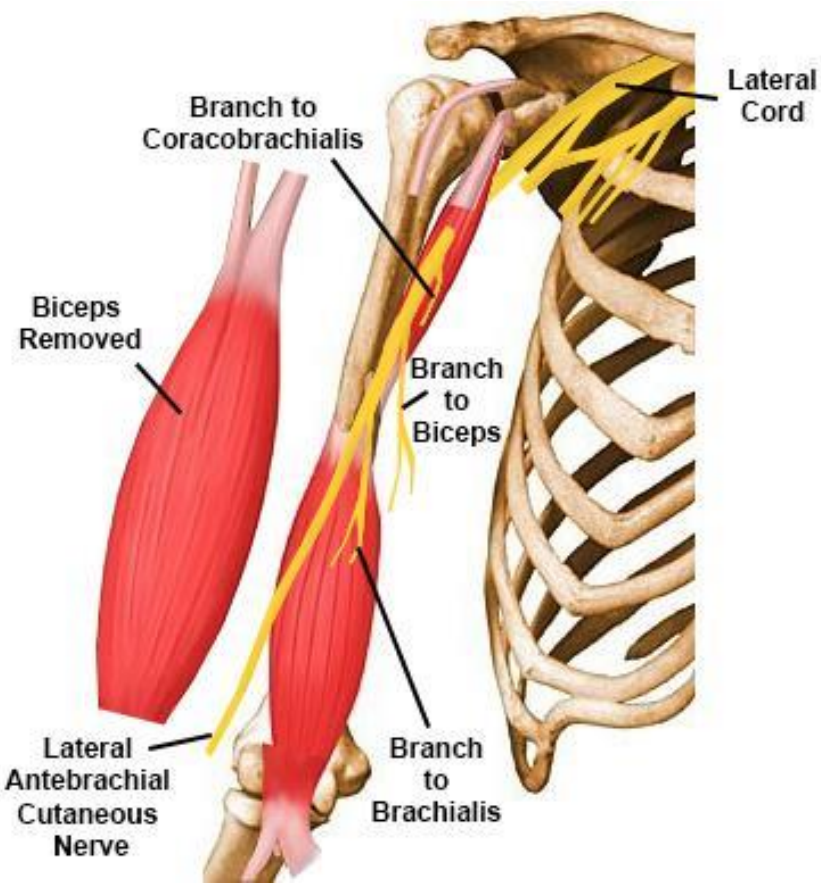
Termination: It terminates opposite (medial to) the neck of the radius by dividing into the **radial** and **ulnar** arteries.



Musculocutaneous Nerve

From the lateral cord of the brachial plexus.

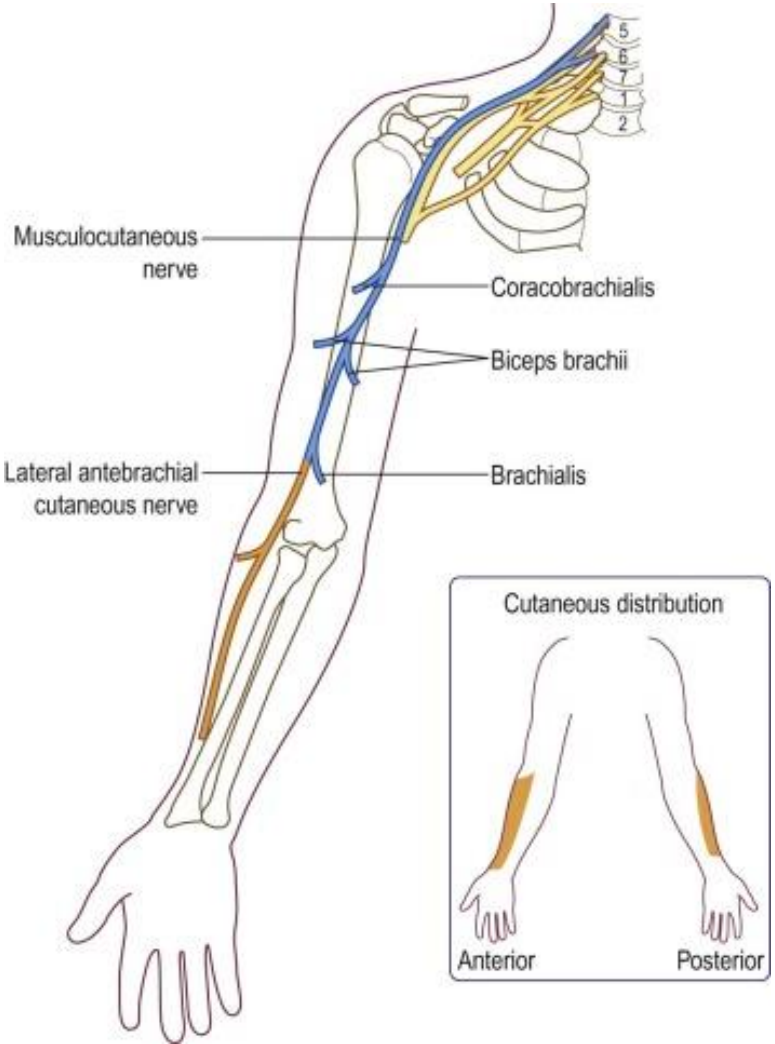
It runs downward and laterally, pierces the coracobrachialis muscle, and then passes downward between the biceps and brachialis muscles



Musculocutaneous Nerve

It appears at the lateral margin of the biceps tendon and pierces the deep fascia just above the elbow.

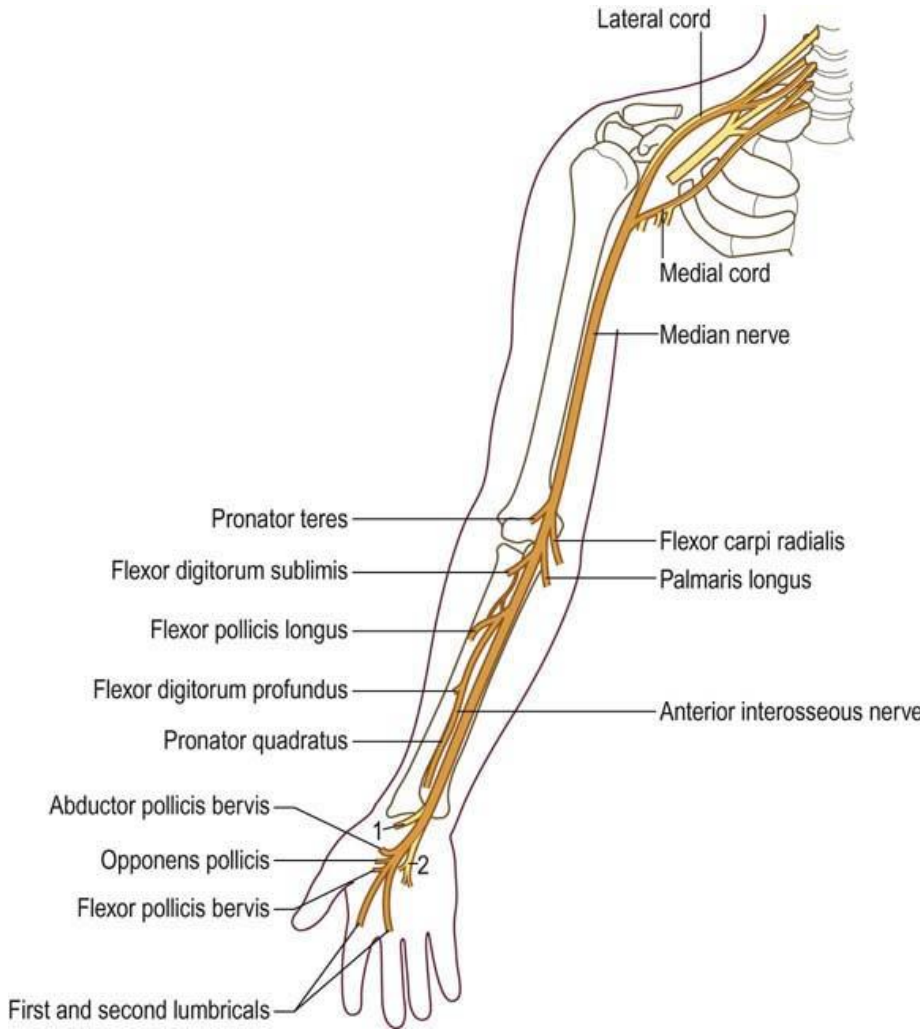
It runs down the lateral aspect of the forearm ***as the lateral cutaneous nerve of the forearm***



Median Nerve

From the medial and lateral cords of the brachial plexus

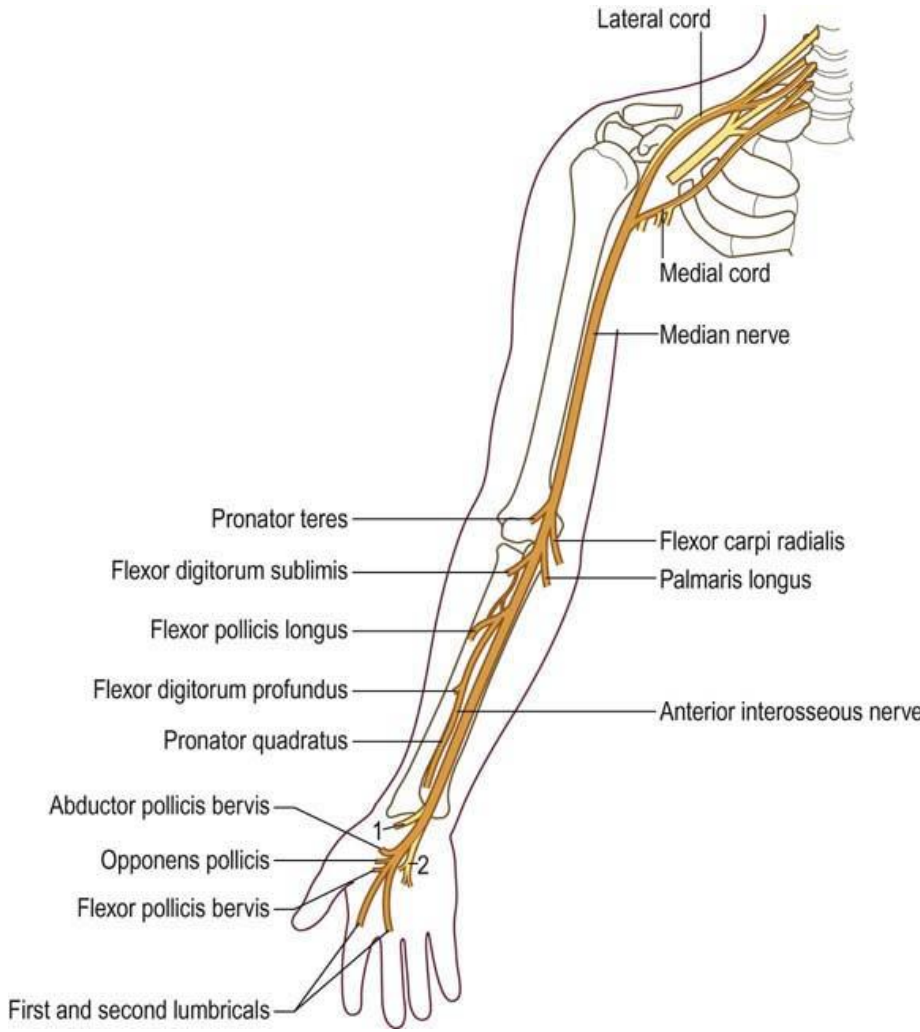
It runs downward on the lateral side of the brachial artery . Halfway down the upper arm, it crosses the brachial artery and continues downward on its medial side.



Median Nerve

At the elbow, it is crossed by the bicipital aponeurosis.

Has no major branches in the arm

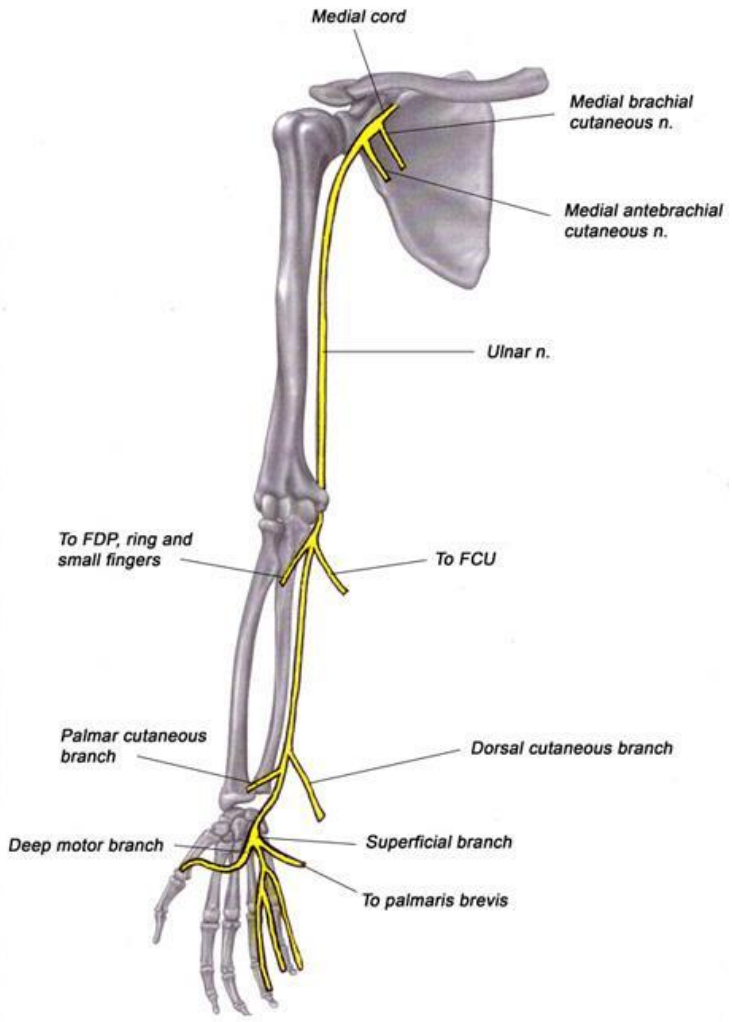


Ulnar Nerve

From the medial cords of the brachial plexus

It passes through proximal regions medial to the brachial artery.

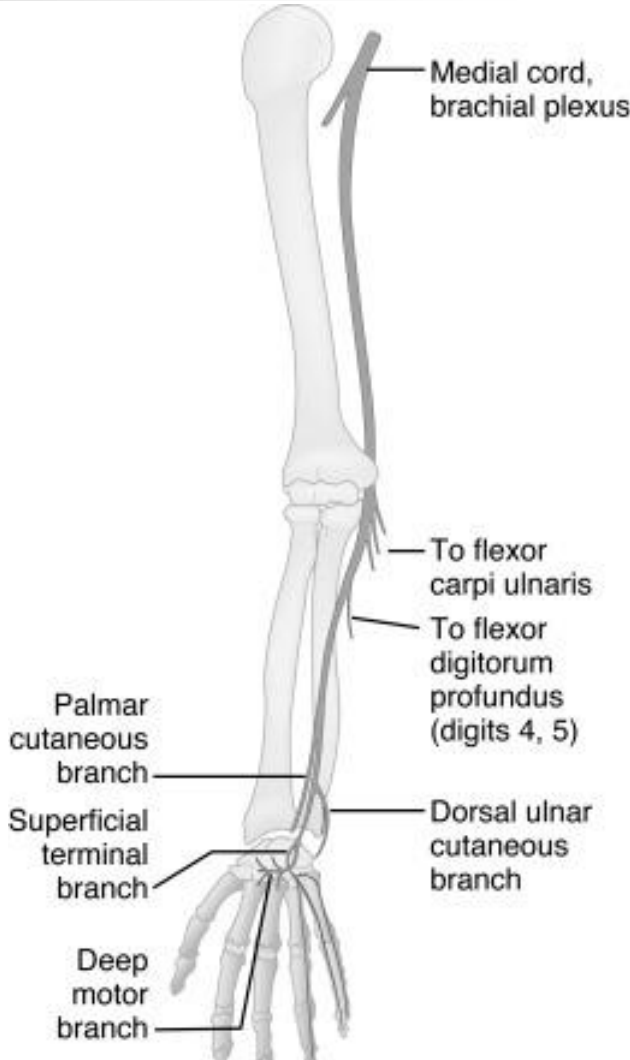
In the middle of the arm, penetrates the medial intermuscular septum and enters the posterior compartment where it lies anterior to the medial head of the triceps brachii muscle.



Ulnar Nerve

It passes posterior to the medial epicondyle of the humerus and then into the anterior compartment of the forearm.

Has no major branches in the arm.

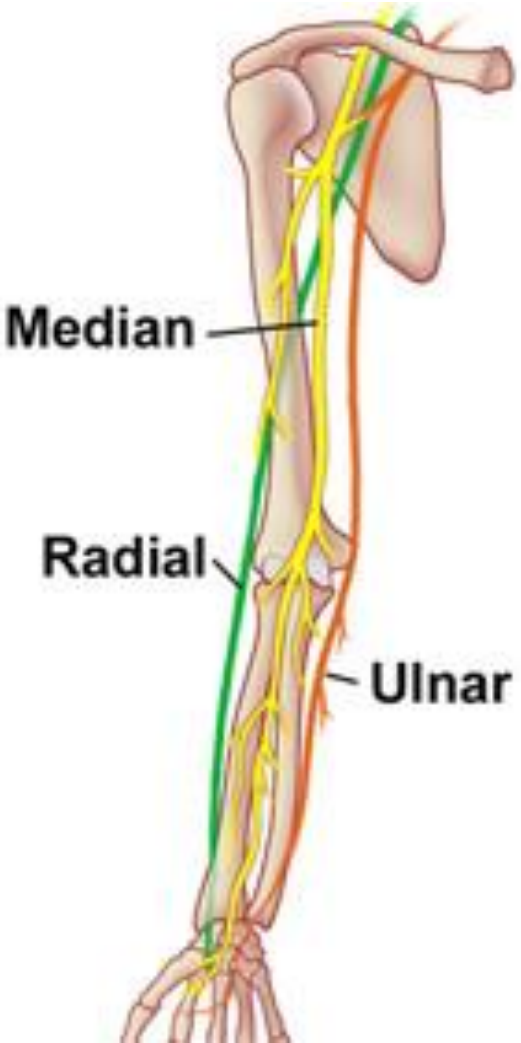


Radial Nerve

From the posterior cord of the brachial plexus

Accompanied by the profunda brachii artery, the radial nerve enters the posterior compartment of the arm by passing through the triangular interval.

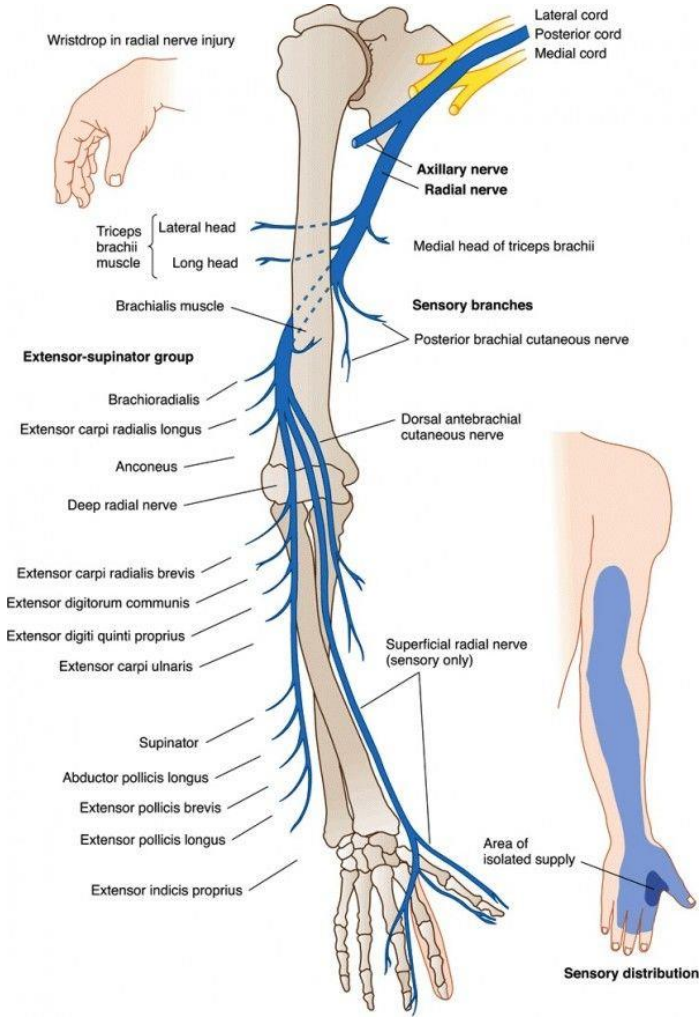
The radial nerve passes diagonally, from medial to lateral, through the posterior compartment, it lies in the radial groove directly on bone.



Radial Nerve

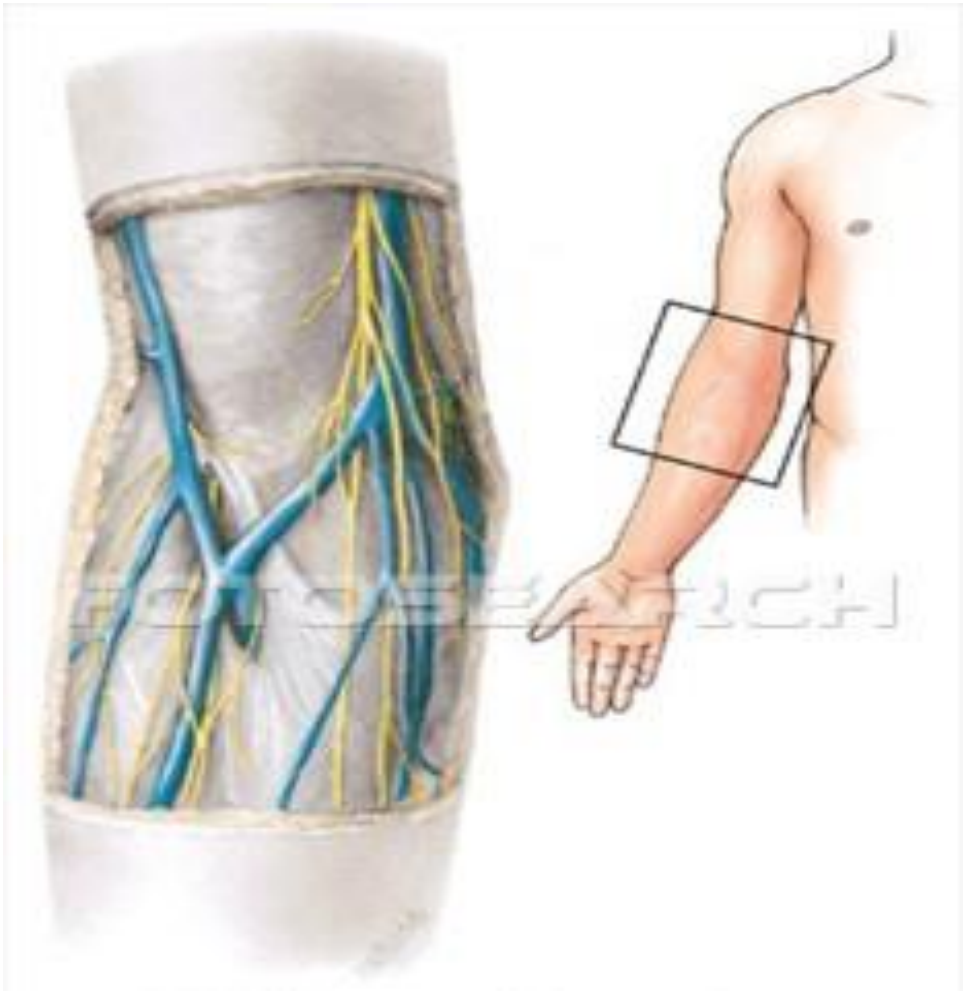
On the lateral side of the arm, it passes anteriorly through the lateral intermuscular septum and enters the anterior compartment.

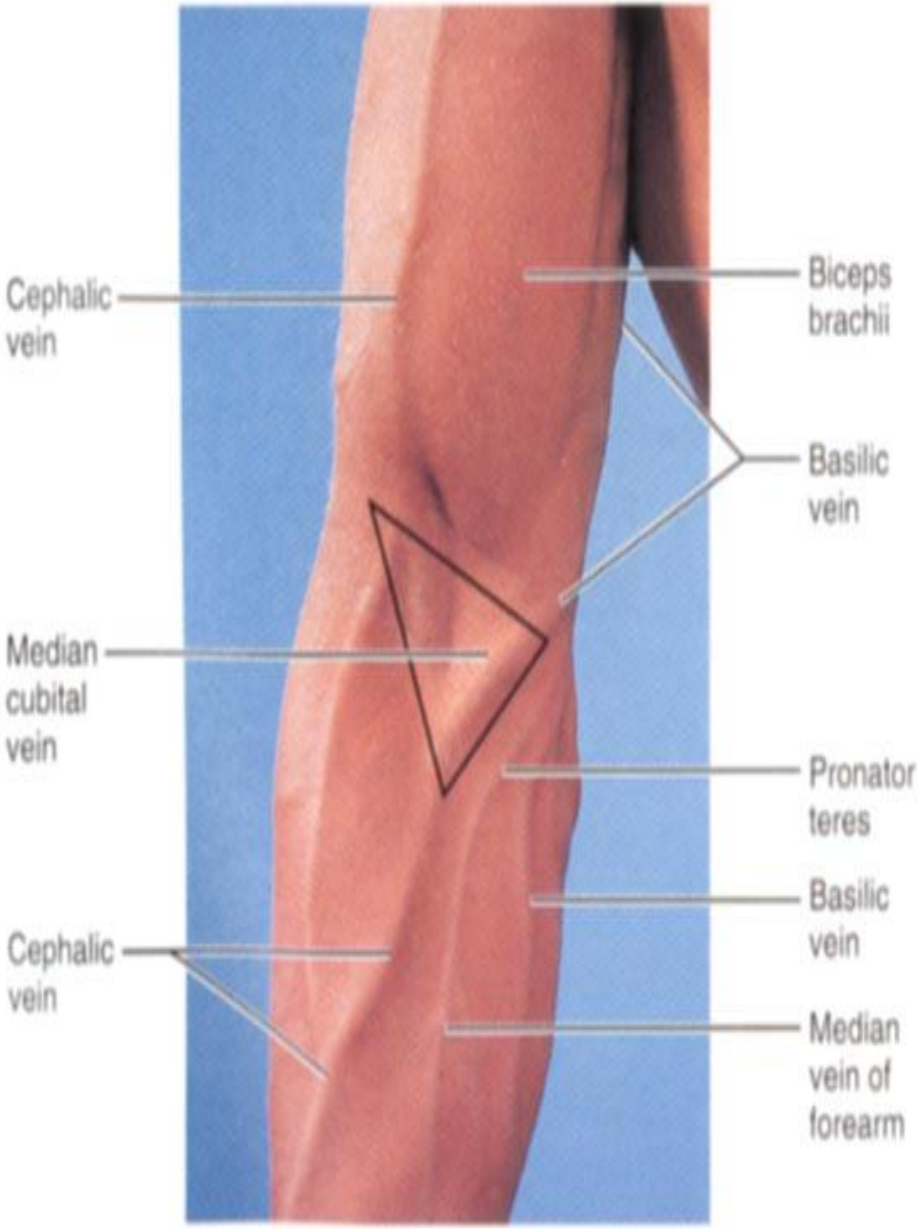
The radial nerve enters the forearm anterior to the lateral epicondyle of the humerus, just deep to the brachioradialis muscle.

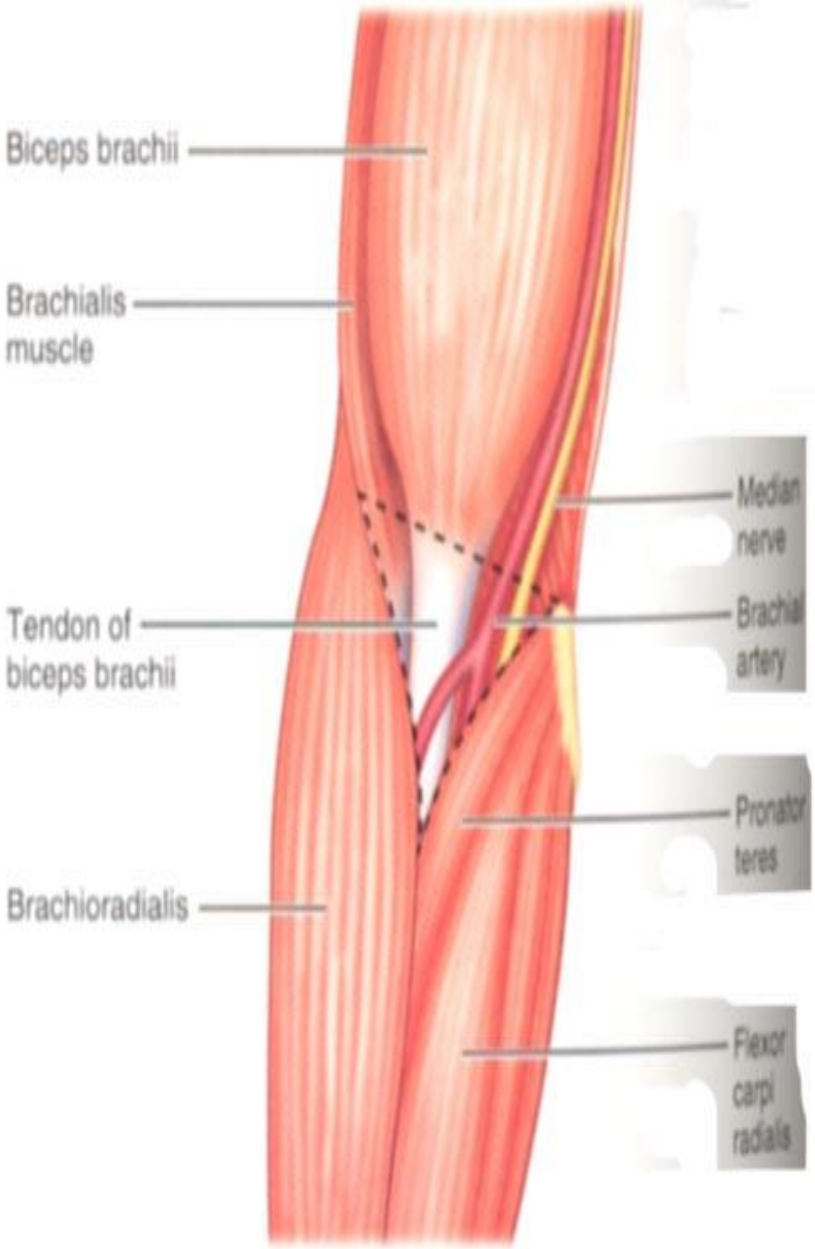


Cubital Fossa

The Cubital Fossa is a triangular hollow area that lies in front of the elbow joint.




Cephalic vein
Biceps brachii
Basilic vein
Median cubital vein
Pronator teres
Basilic vein
Cephalic vein
Median vein of forearm

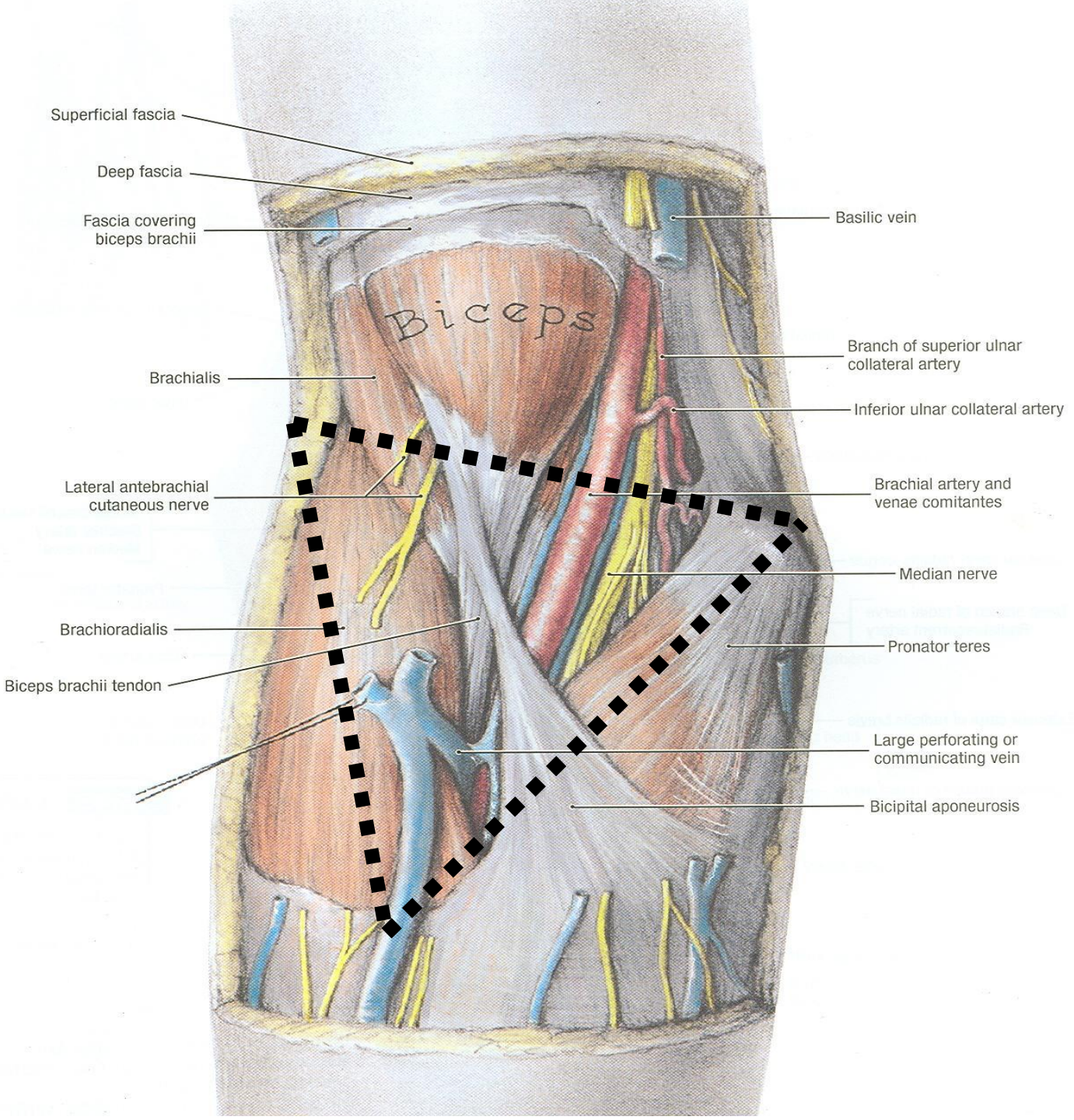

Biceps brachii
Brachialis muscle
Median nerve
Tendon of biceps brachii
Brachial artery
Pronator teres
Brachioradialis
Flexor carpi radialis

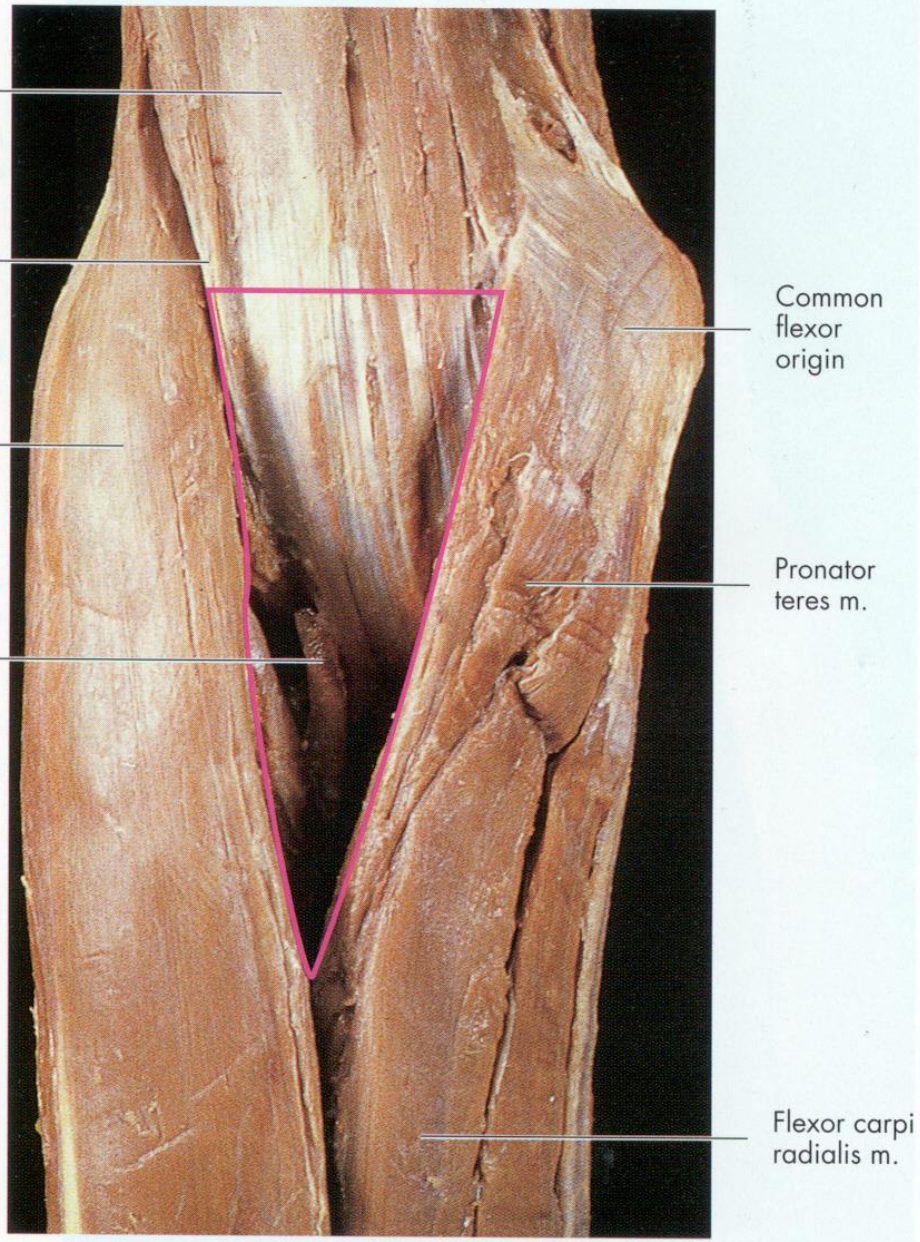
Cubital Fossa - Boundaries

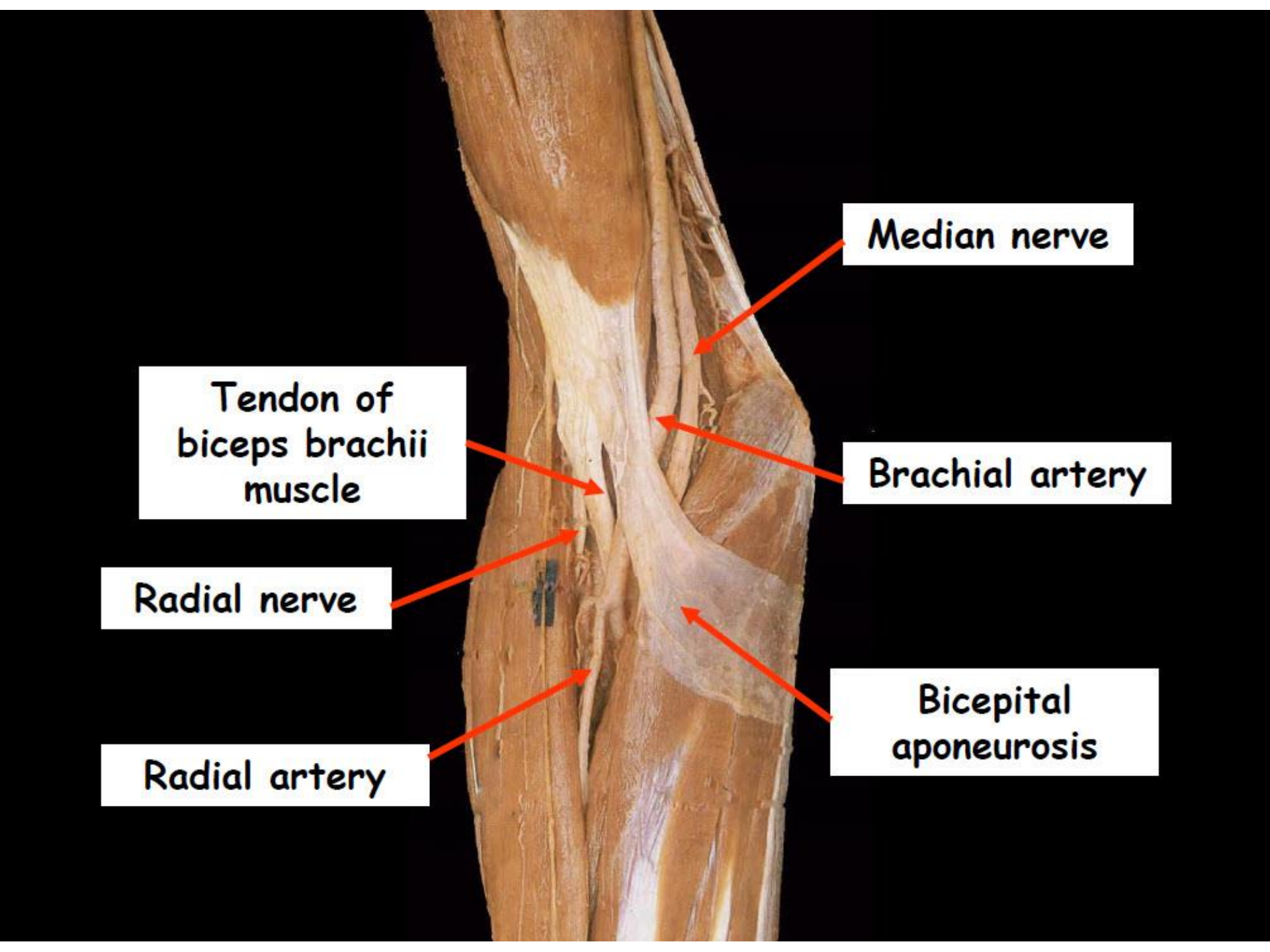
BOUNDARIES:

It is bounded by:

1. ***Base:*** An imaginary line between the 2 epicondyles of humerus
2. ***Laterally:*** Medial border of brachioradialis
3. ***Medially:*** Lateral border of pronator teres
4. ***Apex:*** Brachioradialis overlapping pronator teres


Superficial fascia
Deep fascia
Fascia covering biceps brachii
Biceps
Brachialis
Lateral antebrachial cutaneous nerve
Brachioradialis
Biceps brachii tendon
Basilic vein
Branch of superior ulnar collateral artery
Inferior ulnar collateral artery
Brachial artery and venae comitantes
Median nerve
Pronator teres
Large perforating or communicating vein
Bicipital aponeurosis


Brachialis m.
Proximal limit of cubital fossa
Brachio-radialis m.
Tendon of biceps m. (cut)
Common flexor origin
Pronator teres m.
Flexor carpi radialis m.
Cubital fossa


Median nerve
Tendon of biceps brachii muscle
Brachial artery
Radial nerve
Bicepital aponeurosis
Radial artery

Cubital Fossa - Boundaries

BOUNDARIES (Cont.):

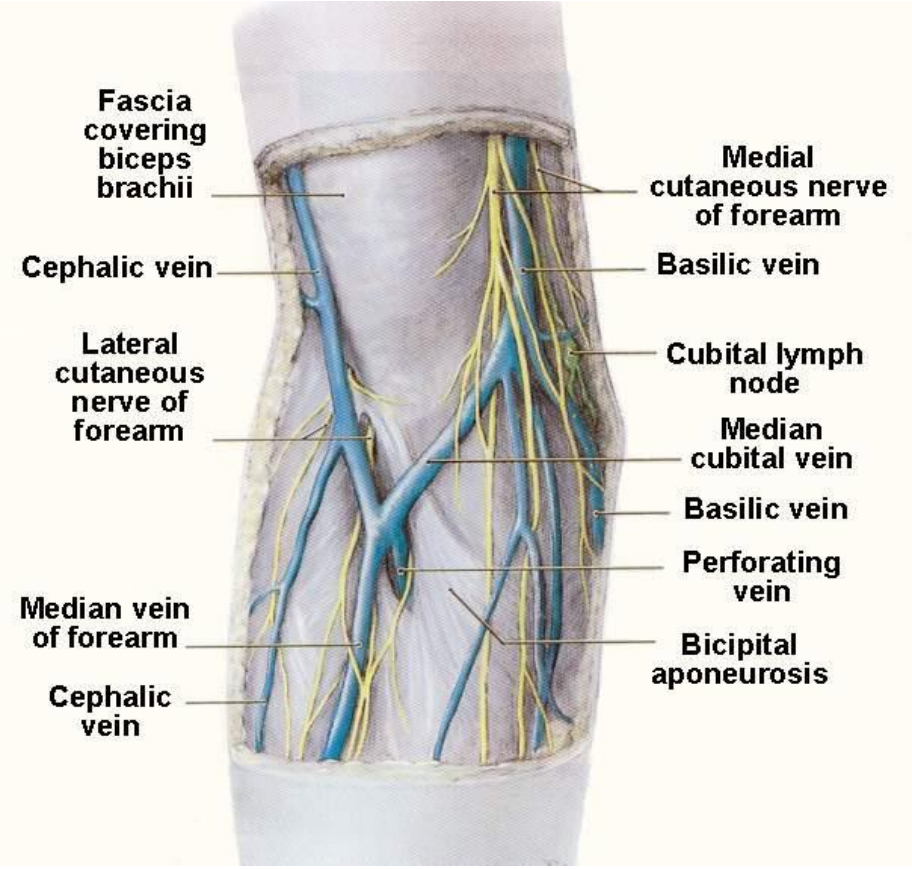
Floor: Its floor is formed of the brachialis and supinator muscles overlying the capsule of the elbow joint.

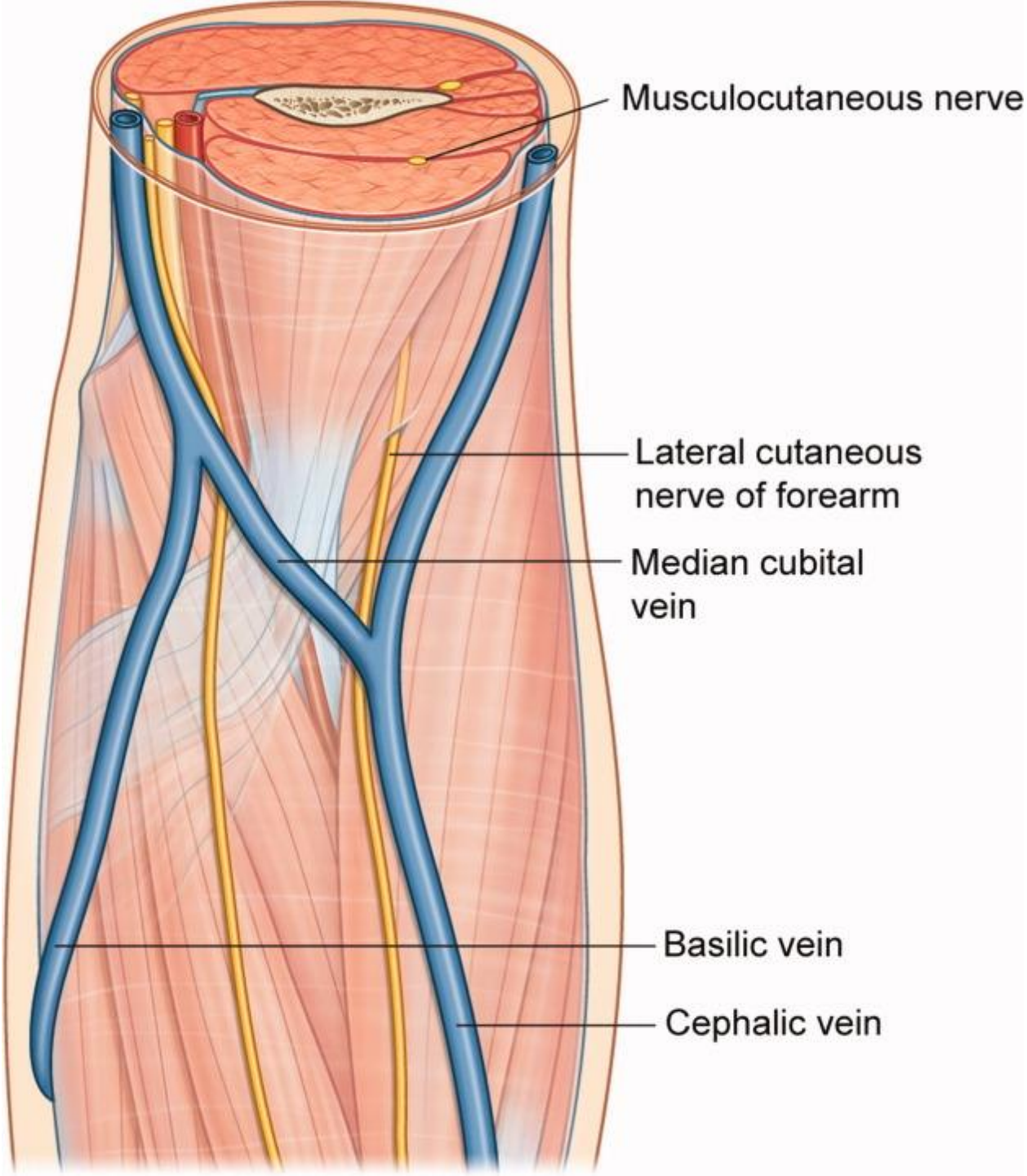
Roof: The deep fascia of the forearm forms its roof, which is strengthened by fibers of the bicipital aponeurosis.

Cubital Fossa - Boundaries

Roof:

- Lying on the roof in the superficial fascia are the anterior branches of the medial and lateral cutaneous nerves of the forearm and the median cubital vein, which joins the cephalic and basilic veins.

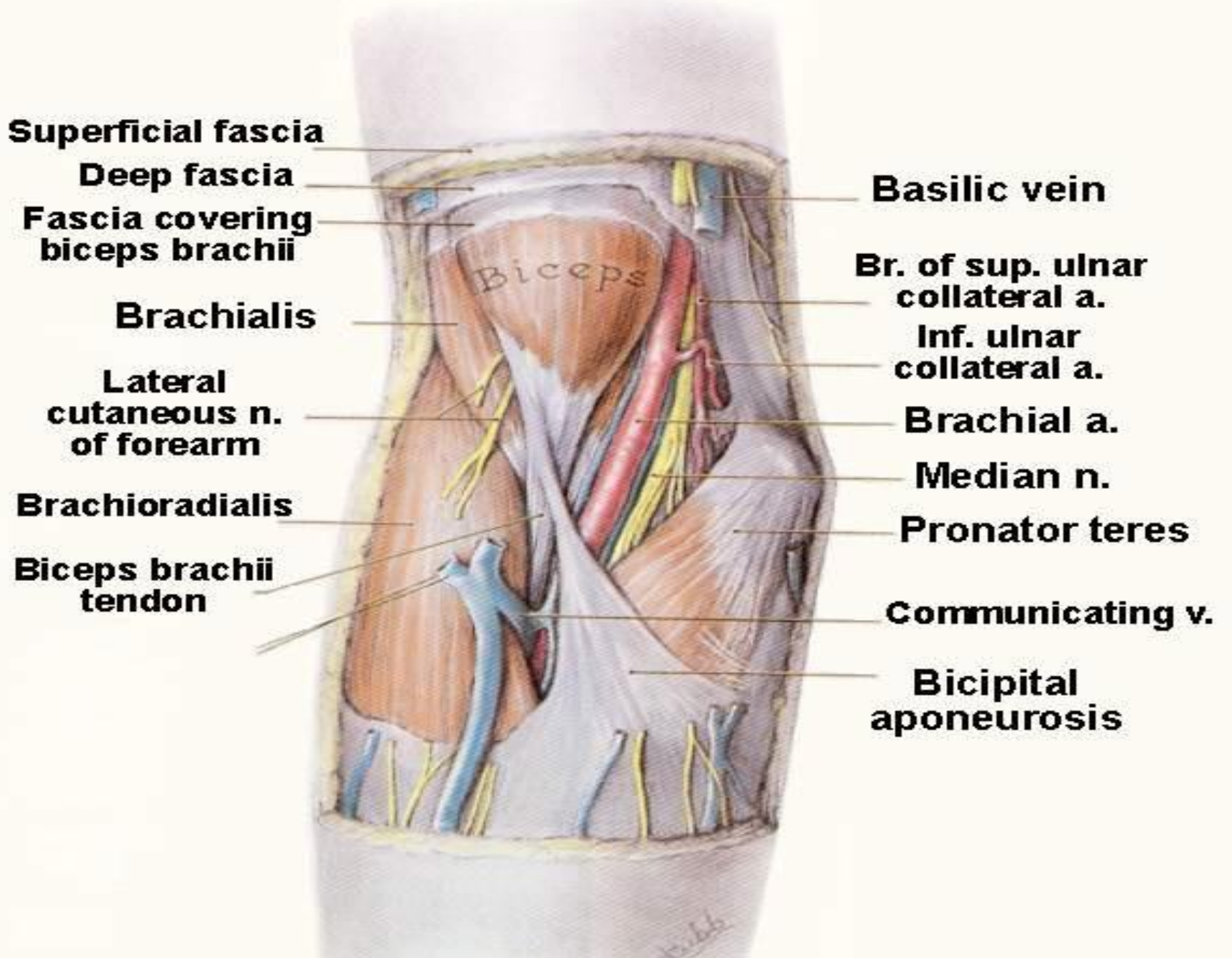


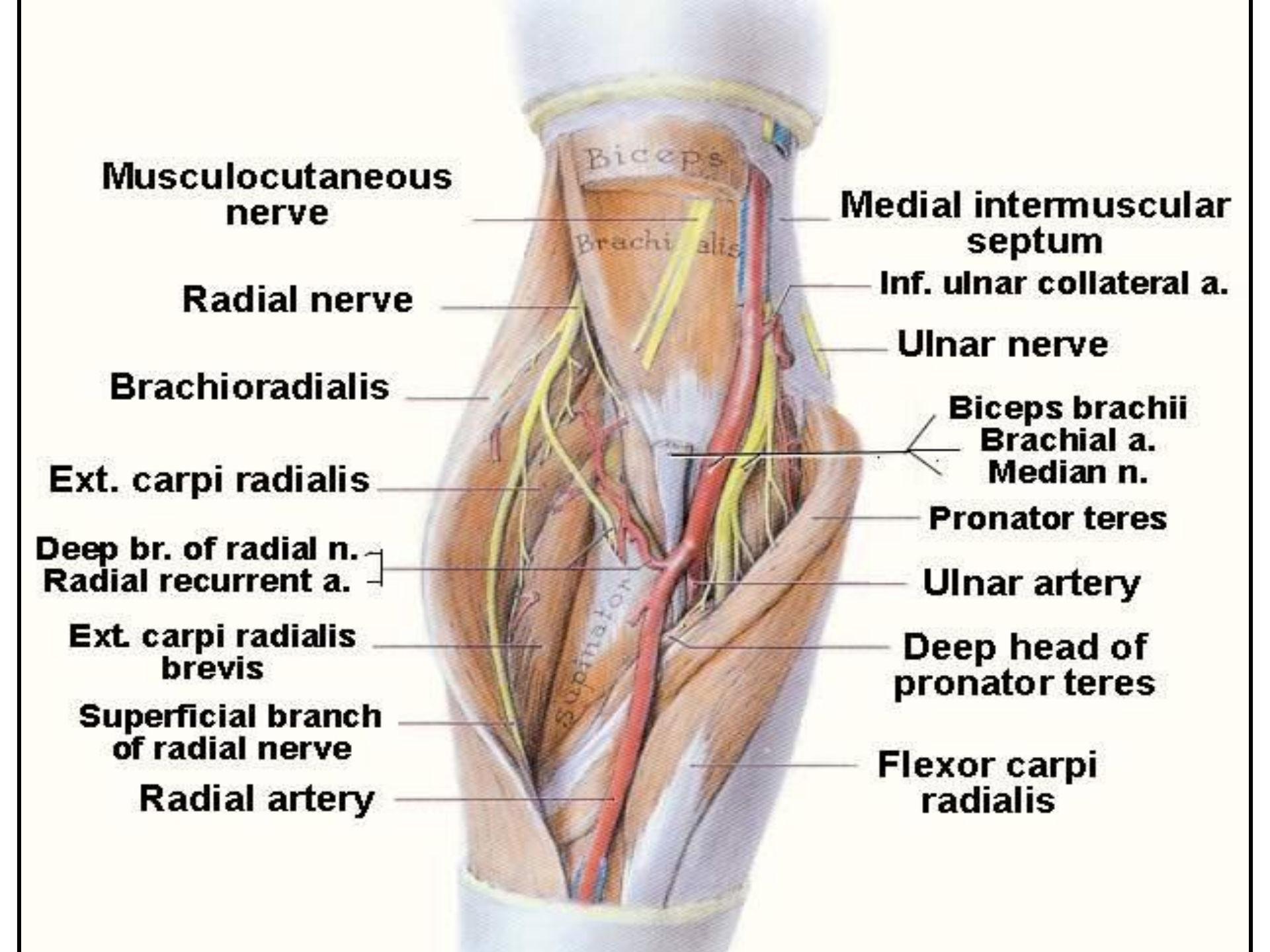

Musculocutaneous nerve
Lateral cutaneous nerve of forearm
Median cubital vein
Basilic vein
Cephalic vein

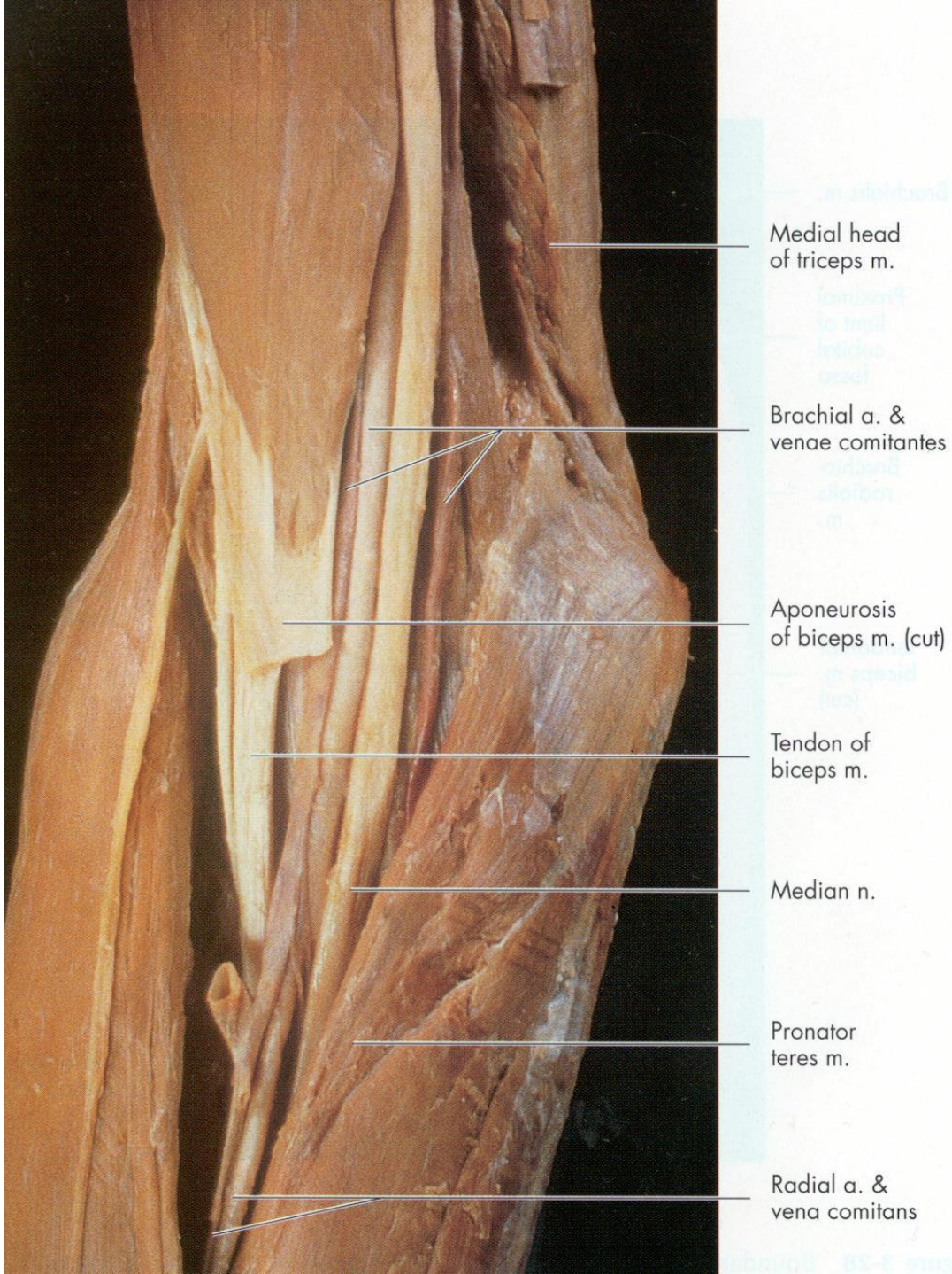
Cubital Fossa - Content

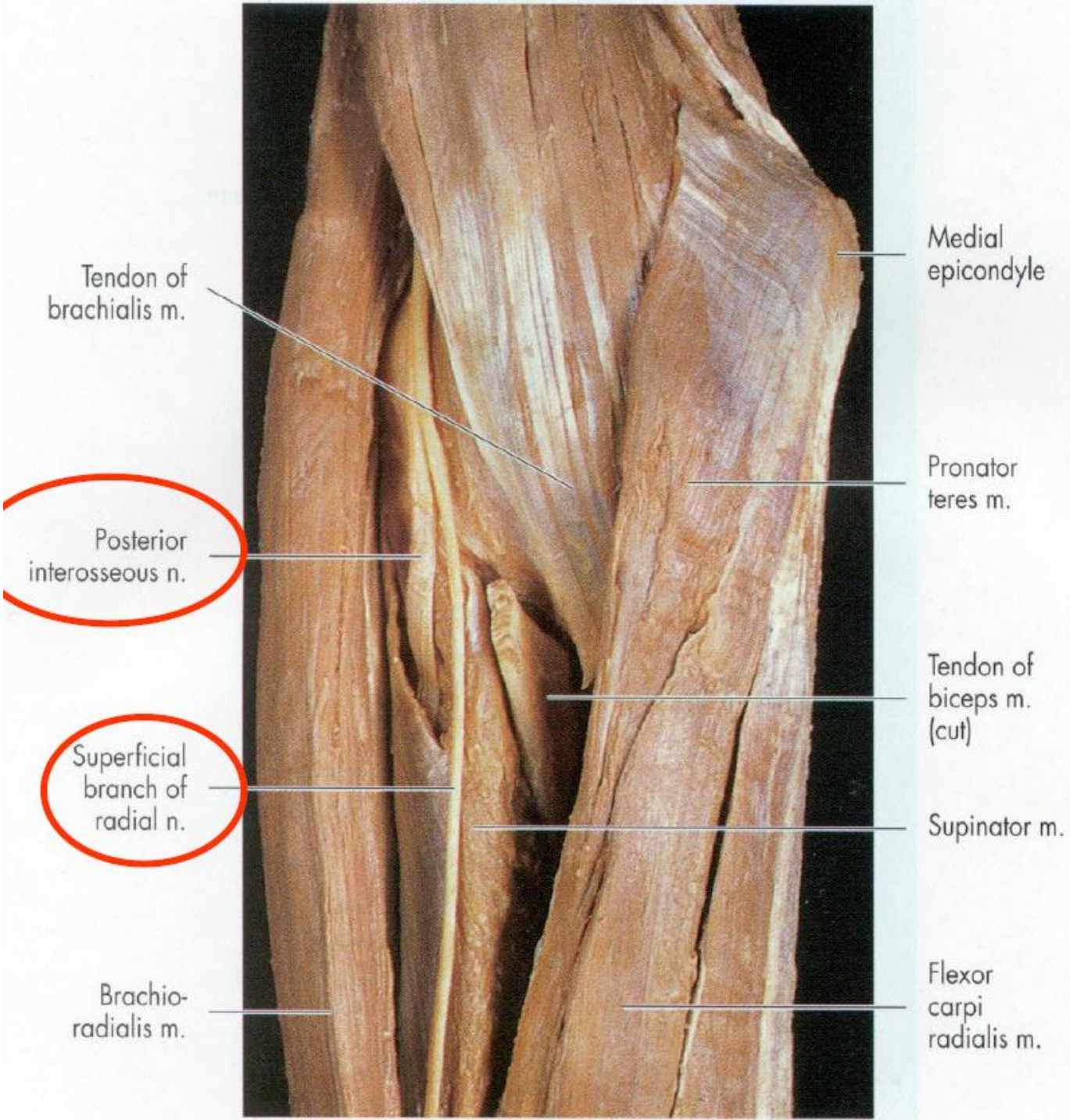
The contents of the fossa from medial to lateral are:

1. *Median nerve*
2. *Brachial artery and its terminal branches, the radial and ulnar arteries*
3. *Biceps tendon and bicipital aponeurosis*
4. *Radial and posterior interosseous nerves, which are often overlapped by the fibres of brachioradialis*


Superficial fascia
Deep fascia
Fascia covering biceps brachii
Brachialis
Lateral cutaneous n. of forearm
Brachioradialis
Biceps brachii tendon
Biceps
Basilic vein
Br. of sup. ulnar collateral a.
Inf. ulnar collateral a.
Brachial a.
Median n.
Pronator teres
Communicating v.
Bicipital aponeurosis


Musculocutaneous nerve
Radial nerve
Brachioradialis
Ext. carpi radialis
Deep br. of radial n.
Radial recurrent a.
Ext. carpi radialis brevis
Superficial branch of radial nerve
Radial artery
Medial intermuscular septum
Inf. ulnar collateral a.
Ulnar nerve
Biceps brachii
Brachial a.
Median n.
Pronator teres
Ulnar artery
Deep head of pronator teres
Flexor carpi radialis
Biceps
Brachialis
Supinator


Medial head of triceps m.
Brachial a. & venae comitantes
Aponeurosis of biceps m. (cut)
Tendon of biceps m.
Median n.
Pronator teres m.
Radial a. & vena comitans


Tendon of brachialis m.
Posterior interosseous n.
Superficial branch of radial n.
Brachio-radialis m.
Medial epicondyle
Pronator teres m.
Tendon of biceps m. (cut)
Supinator m.
Flexor carpi radialis m.

SUPERFICIAL CUBITAL FOSSA
RIGHT SIDE

Boundaries

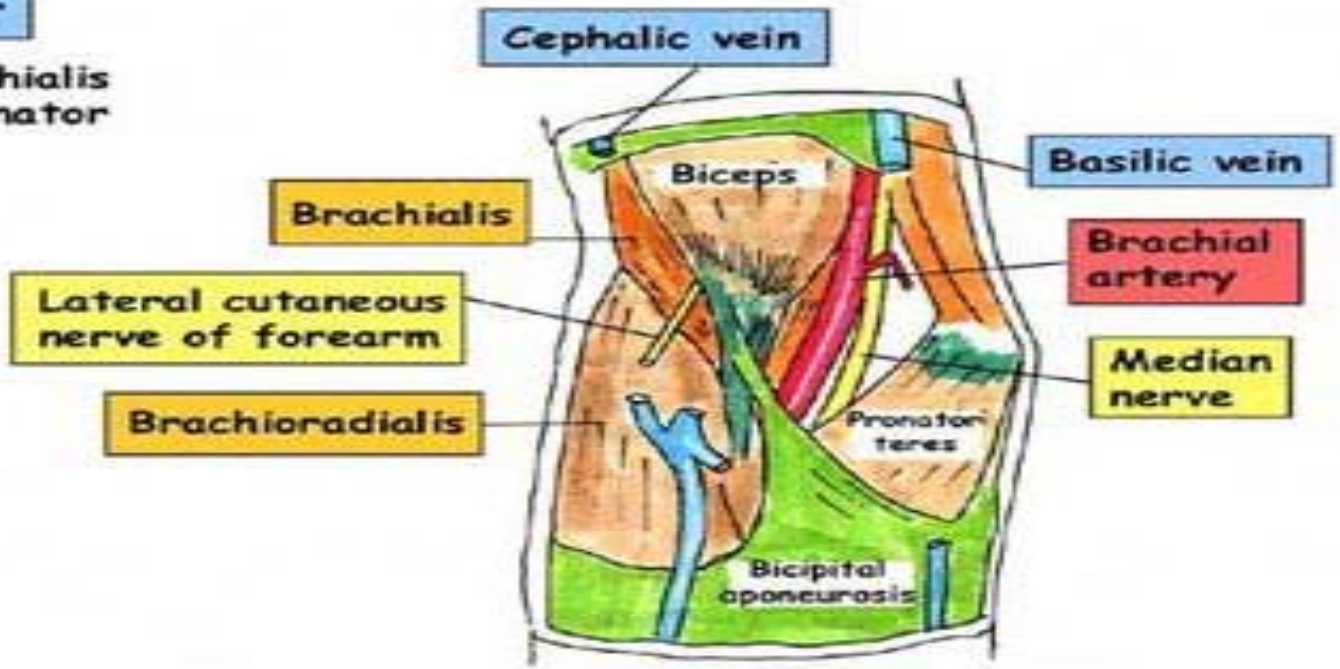
Triangular area between:
- Pronator teres
- Brachioradialis
- Line between epicondyles

Roof

Deep fascia of forearm
Bicipital aponeurosis
Median cubital vein
Medial cutaneous nerve of forearm
Lateral cutaneous nerve of forearm

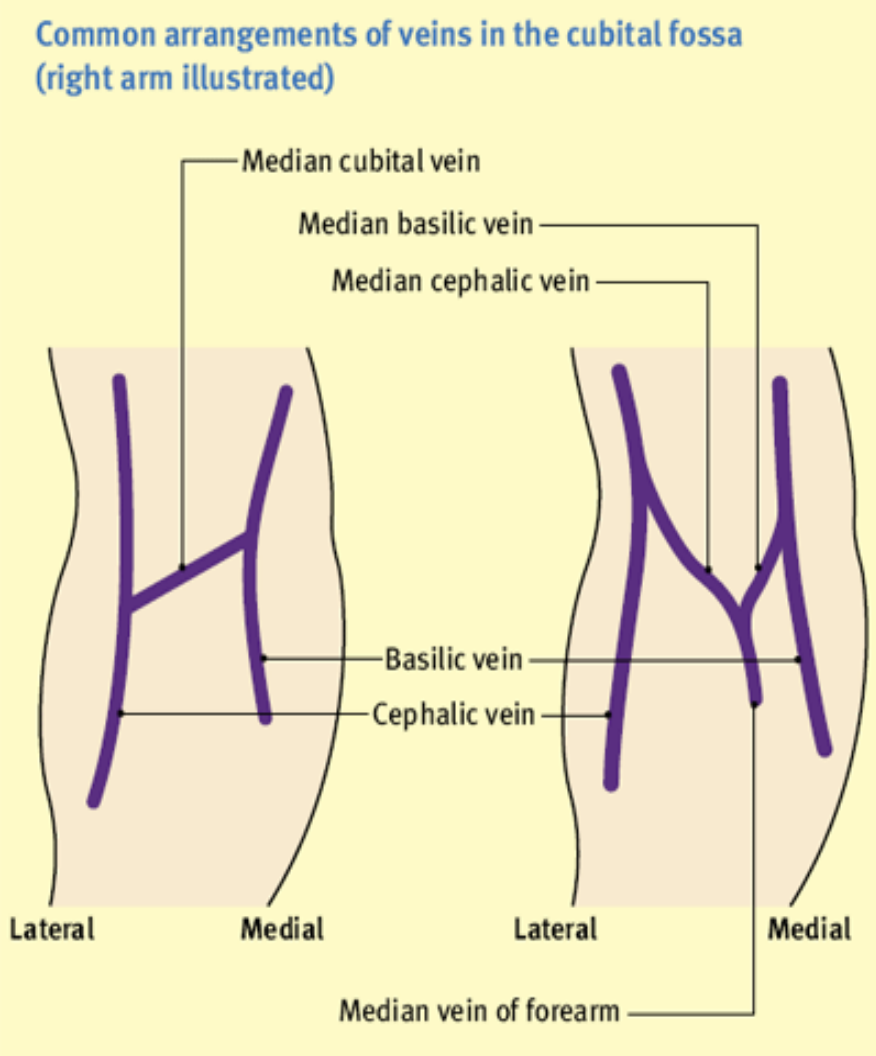
Floor

Brachialis
Supinator



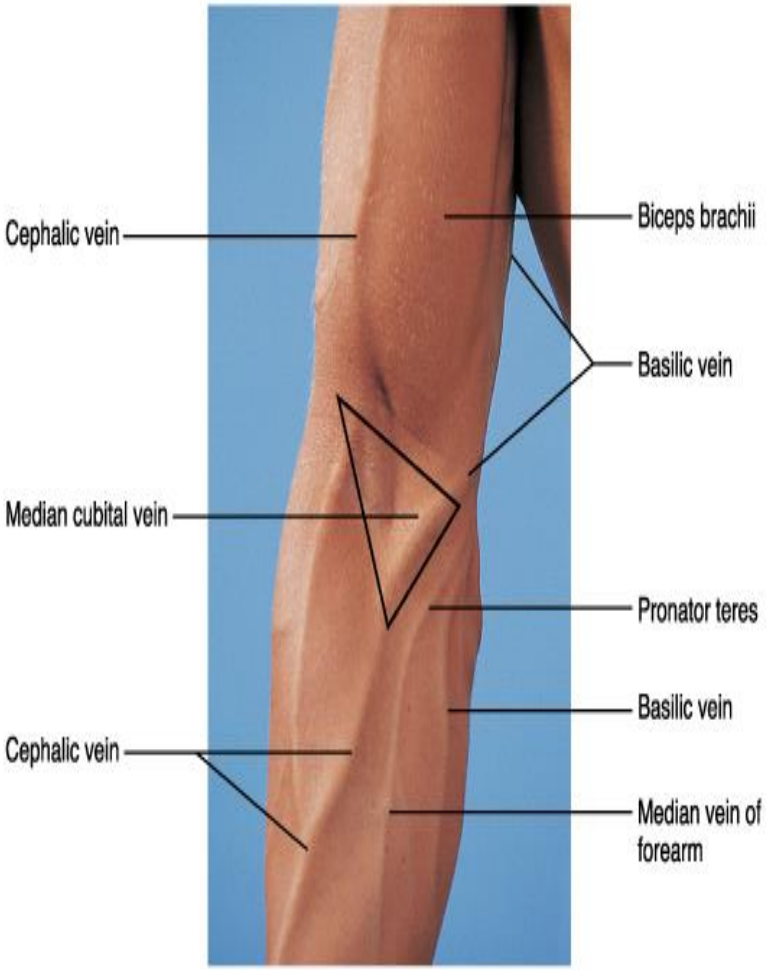
Clinical Correlation

The cephalic, basilic and median cubital veins are usually easily seen and palpated in the roof of the fossa, and this is therefore a common site for ***venepuncture***.



Clinical Correlation

The area is often used for obtaining intravenous access for the purpose of intravenous therapy or for blood sampling.



Clinical Correlation

It is worth noting that variations in venous anatomy at this site are common .

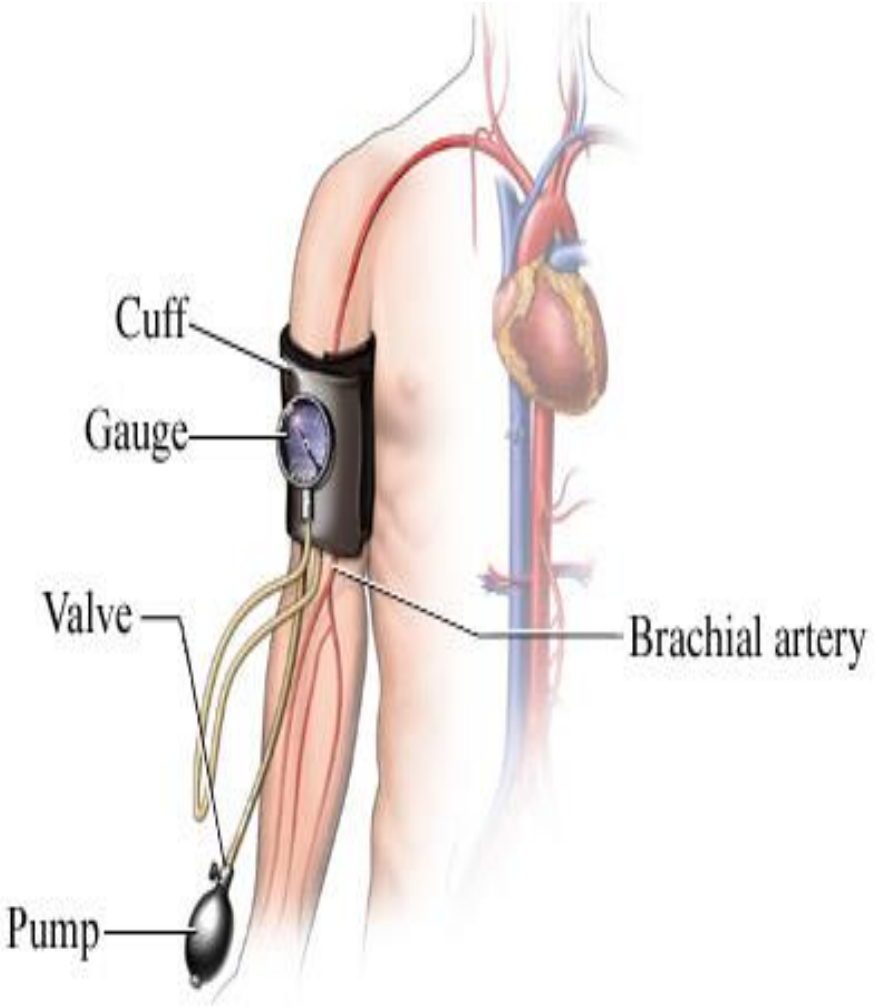
The use of the cubital fossa for intravenous fluid therapy ***is not recommended***

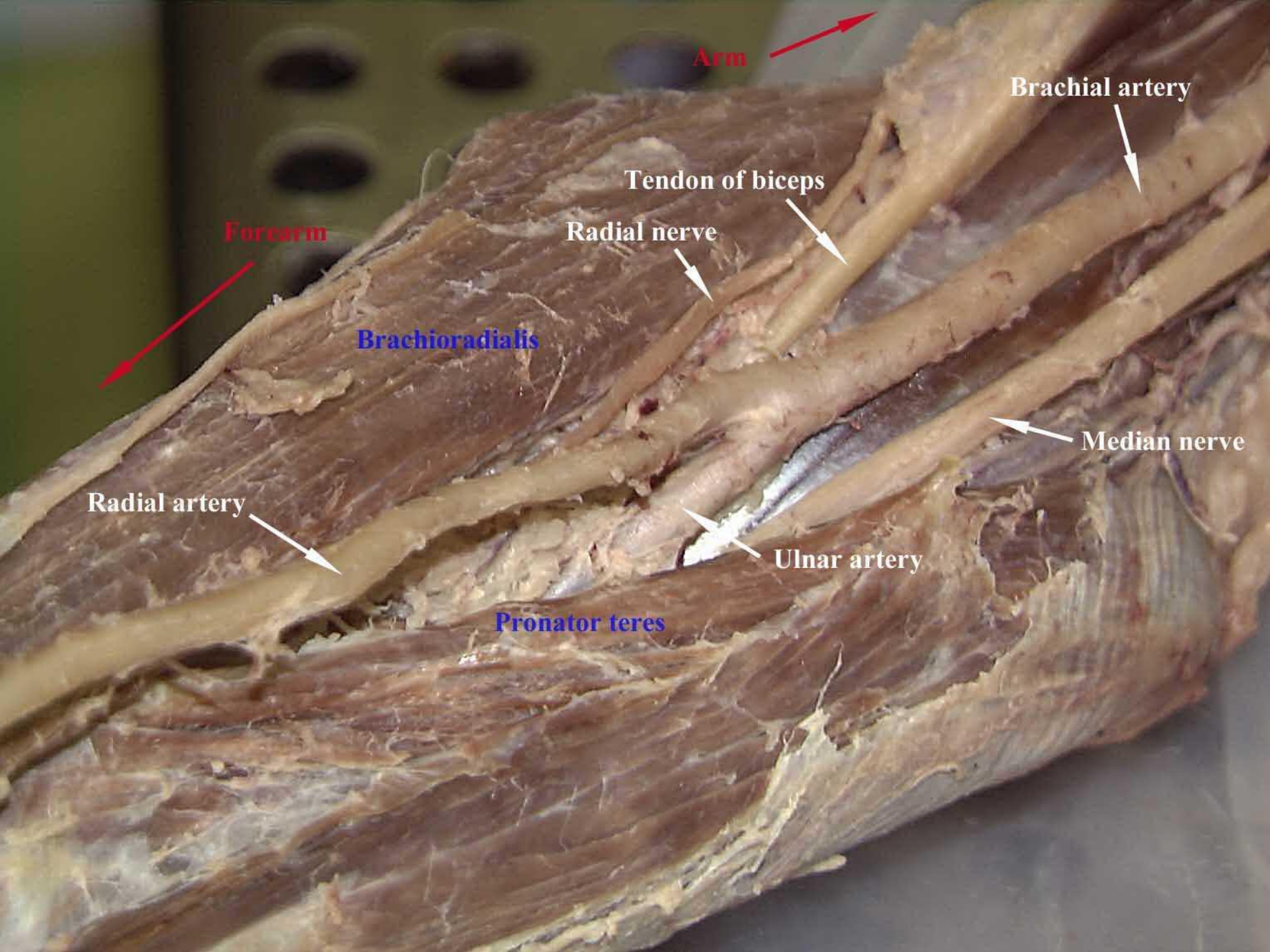
Clinical Correlation

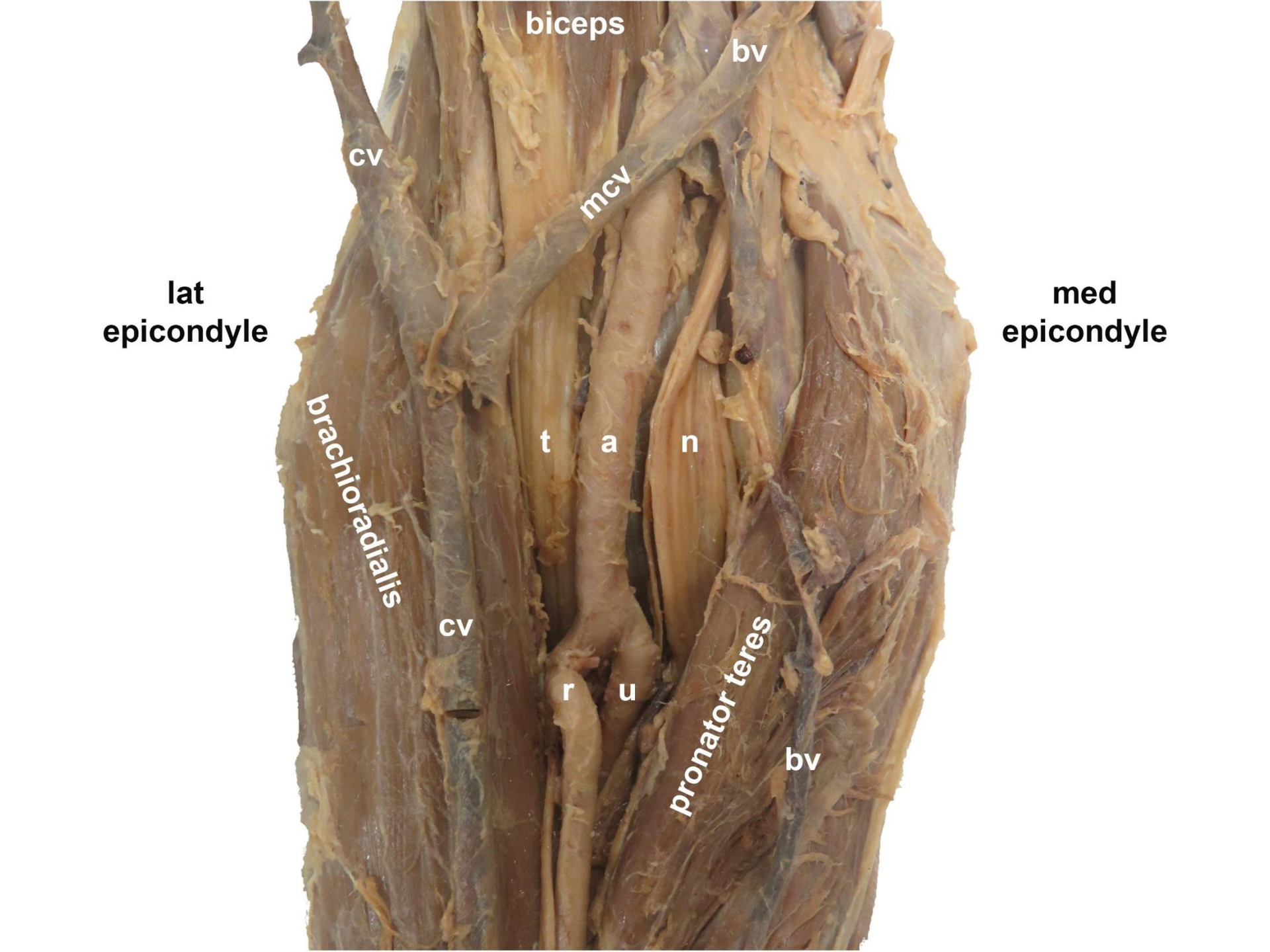
The sphygmomanometer cuff is applied proximal to the base of it and the diaphragm of the stethoscope is placed over it to measure the blood pressure of the individual.

Clinical Correlation

The brachial pulse may be palpated in the cubital fossa also just medial to the tendon.




Arm
Brachial artery
Tendon of biceps
Radial nerve
Forearm
Brachioradialis
Median nerve
Radial artery
Ulnar artery
Pronator teres


biceps
bv
cv
mcv
lat
epicondyle
med
epicondyle
brachioradialis
t a n
cv
r u
pronator teres
bv

- For further inquiries ***PLZ*** feel free to contact at any time through email

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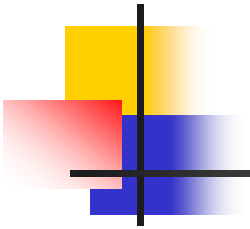

Thank You