Arm
“Brachium”

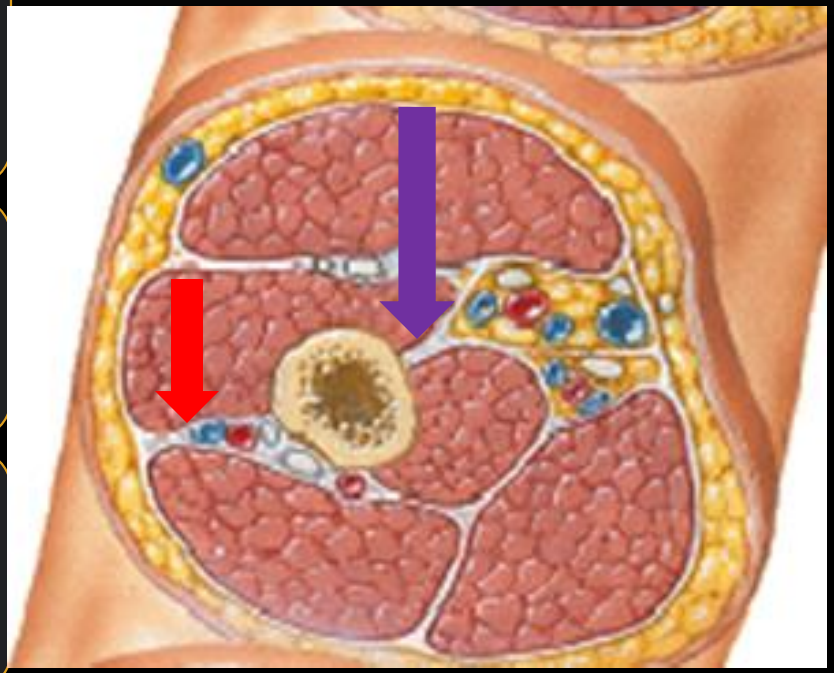
The brachial fascia

The brachial fascia enclosing the arm is relatively thin in the anterior compartment (flexor) and thick in the posterior compartment (extensor).

The brachial fascia gives two intermuscular septa; medial and lateral.

The medial and lateral intermuscular septa are attached to the medial and lateral supracondylar ridges respectively.

The humerus and the intermuscular septa divide the arm into anterior and posterior compartments.

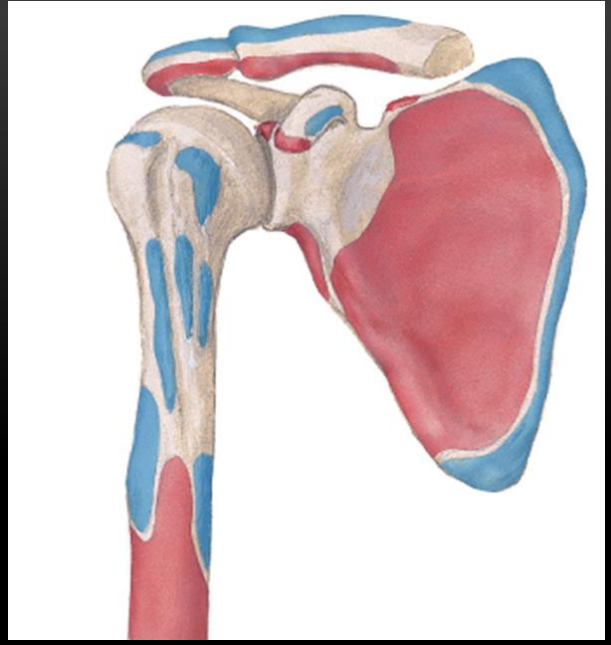


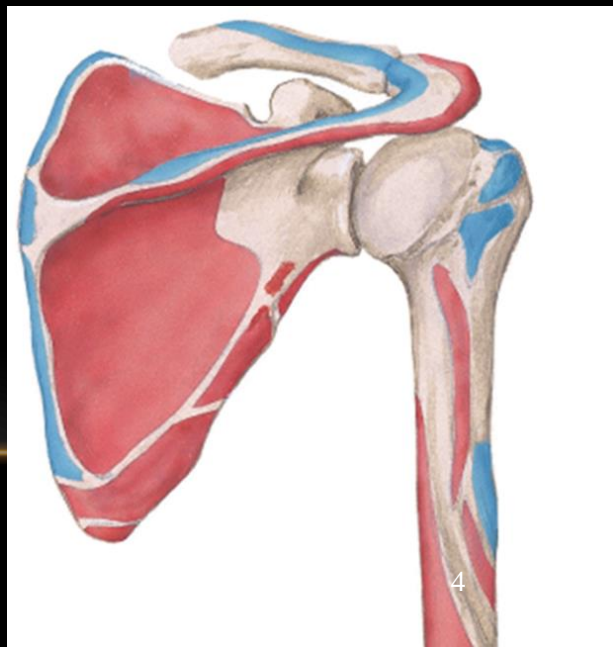
The medial intermuscular septum	**The lateral intermuscular septum**
Broader, thicker and shorter.	Longer, thinner and narrower.
Extends from the bicipital groove to the medial supracondylar ridge and medial humeral epicondyle.	Extends from the bicipital groove to the lateral supracondylar ridge and lateral humeral epicondyle.
Gives additional origin to brachialis and triceps.	Gives additional origin to brachialis, brachioradialis, extensor carpi radialis longus, medial and lateral heads of triceps.
Pierced by: ulnar nerve, superior ulnar collateral artery, and posterior branch of the inferior ulnar collateral artery	Pierced by: radial nerve, radial collateral branch of profunda brachii artery

Deltoid .1/2

Origin:

- The **anterior (clavicular) fibers** arise from most of the anterior border and upper surface of the lateral third of the clavicle.
- **Lateral (acromial) fibers**: from the superior surface of the acromion process.
- **Posterior (spinal) fibers**: from the lower lip of the posterior border of the spine of the scapula.





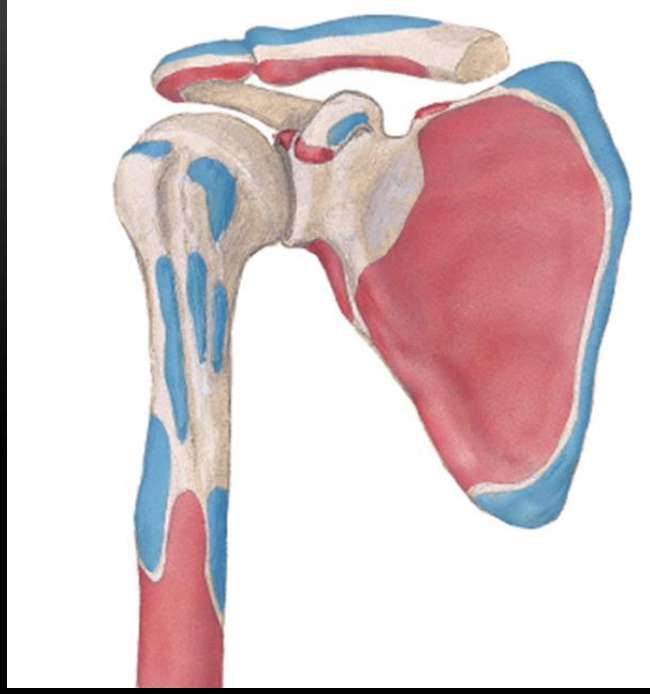
Deltoid ..2/2

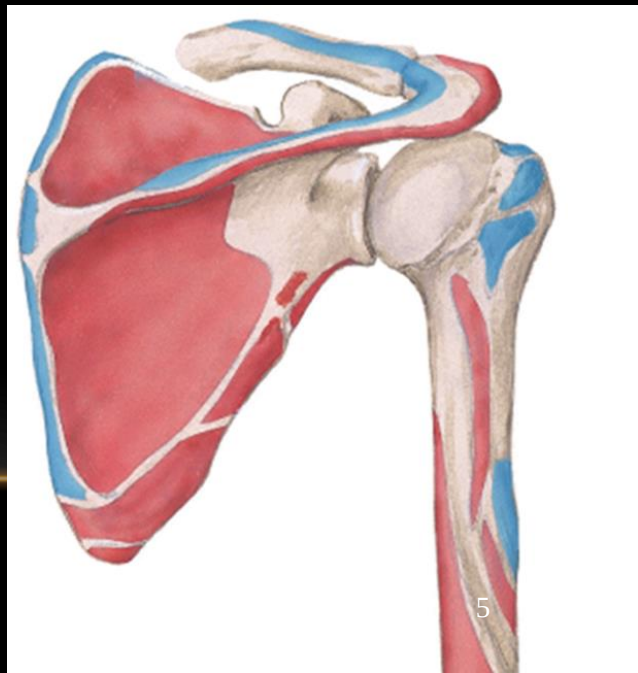
Insertion: The fibers converge toward their insertion on the deltoid tuberosity on the middle of the lateral aspect of the shaft of the humerus.

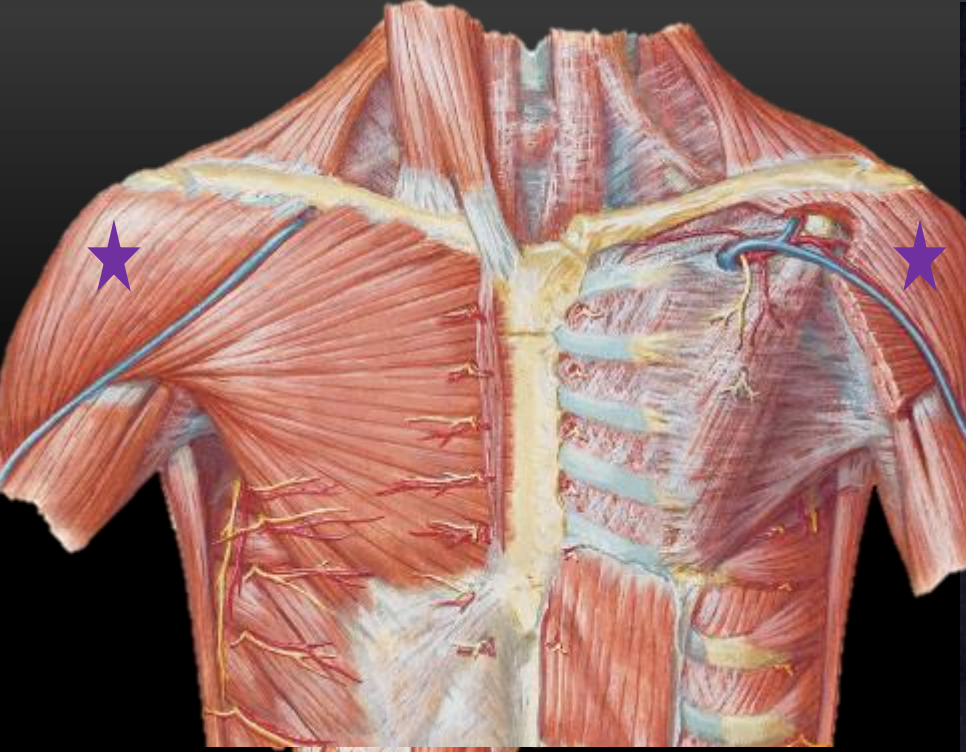
Nerve supply: Axillary nerve.

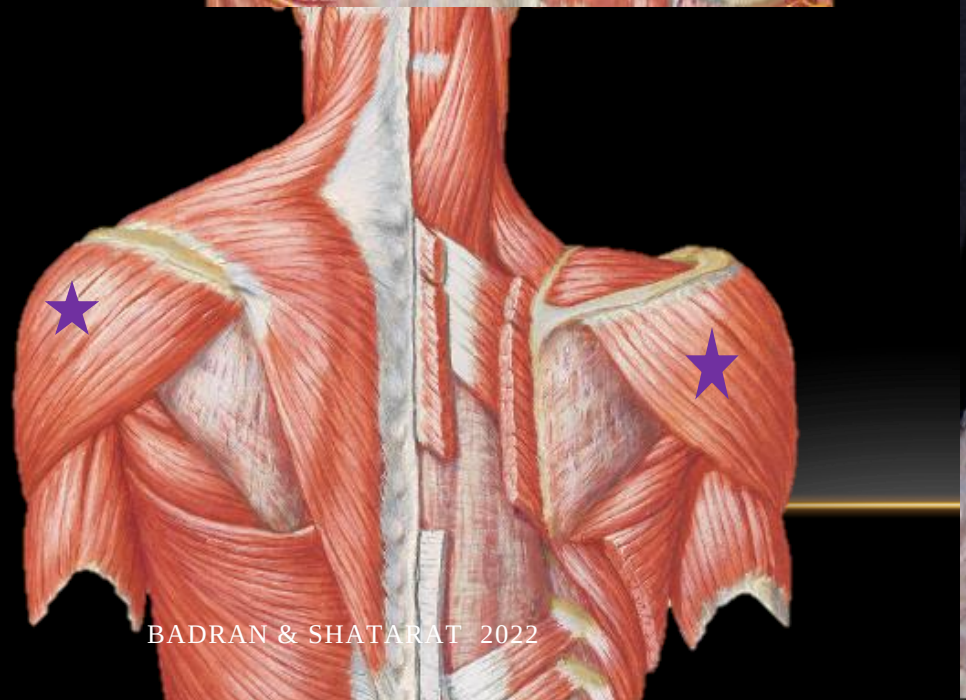
Action:

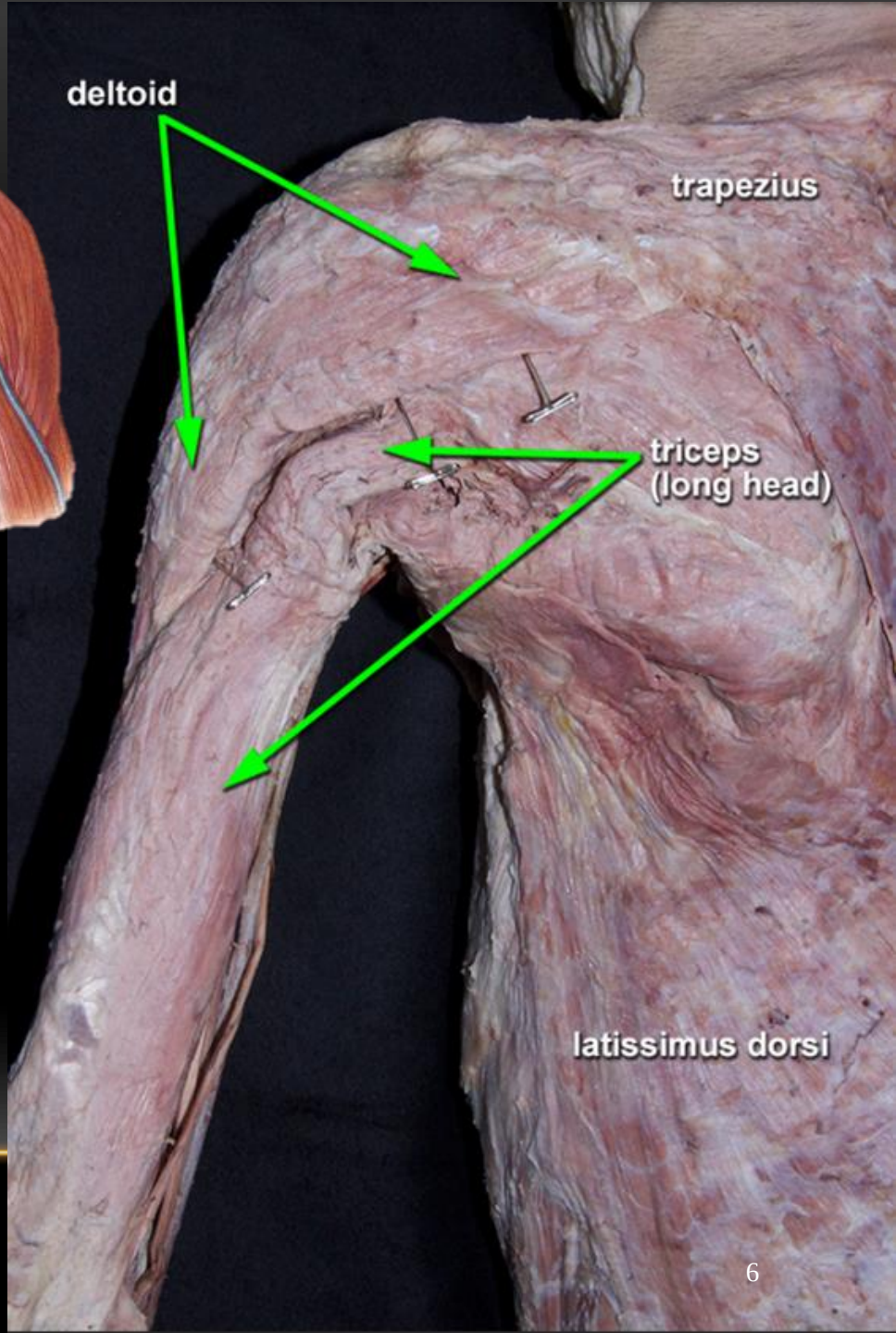
- Stabilizes the shoulder joint preventing subluxation or even dislocation of the head of the humerus particularly when carrying a load.
- It is the prime mover of shoulder abduction to 90 degrees.
- All heads of deltoid work together to produce abduction of the Shoulder Joint.
- It compensates for loss of strength in the rotator cuff.

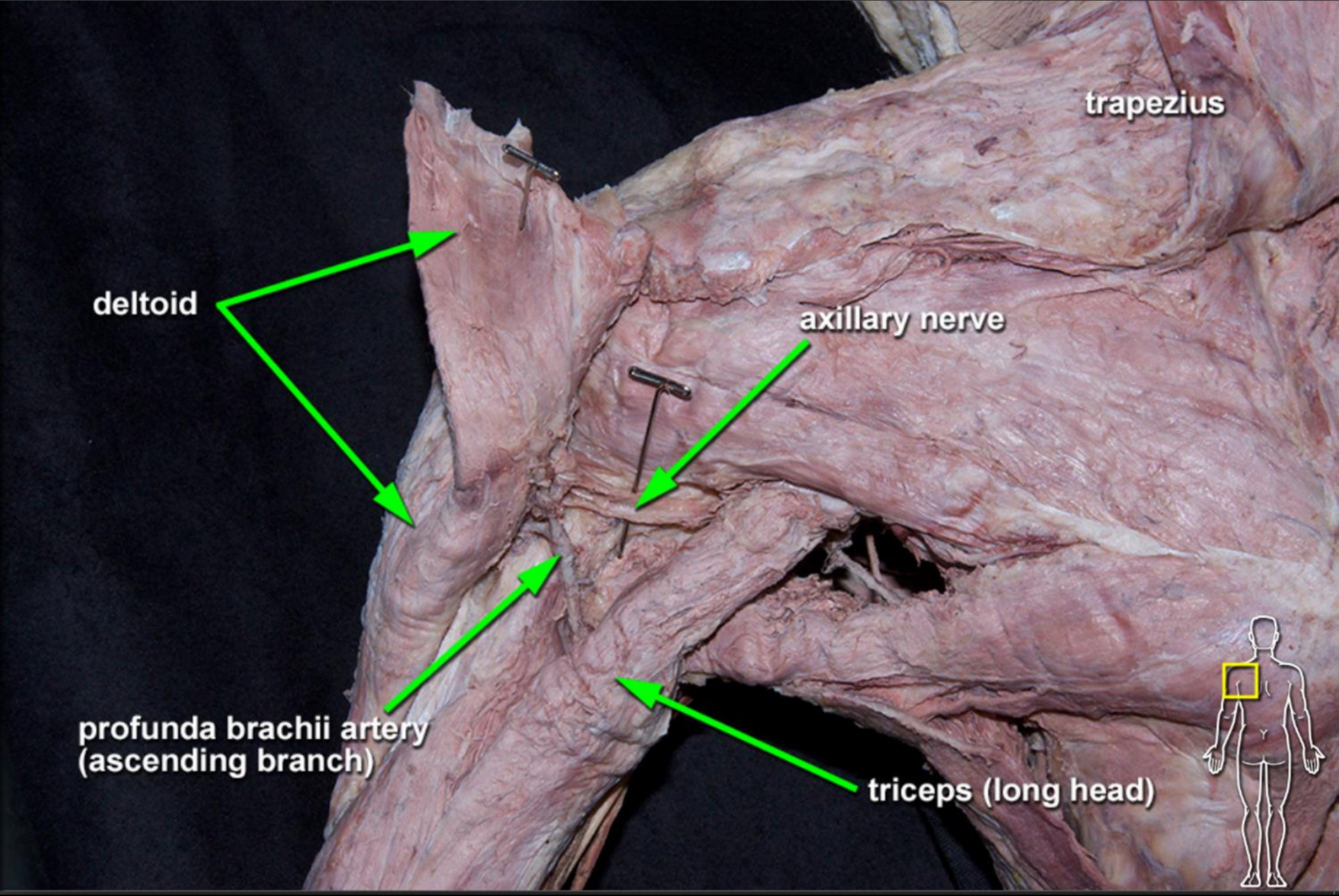









deltoid
trapezius
triceps
(long head)
latissimus dorsi


trapezius
deltoid
axillary nerve
profunda brachii artery
(ascending branch)
triceps (long head)

Biceps brachii

Origin:

- **Long head**: supraglenoid tubercle (intracapsular, extrasynovial).
- **Short head**: tip of the coracoid process.

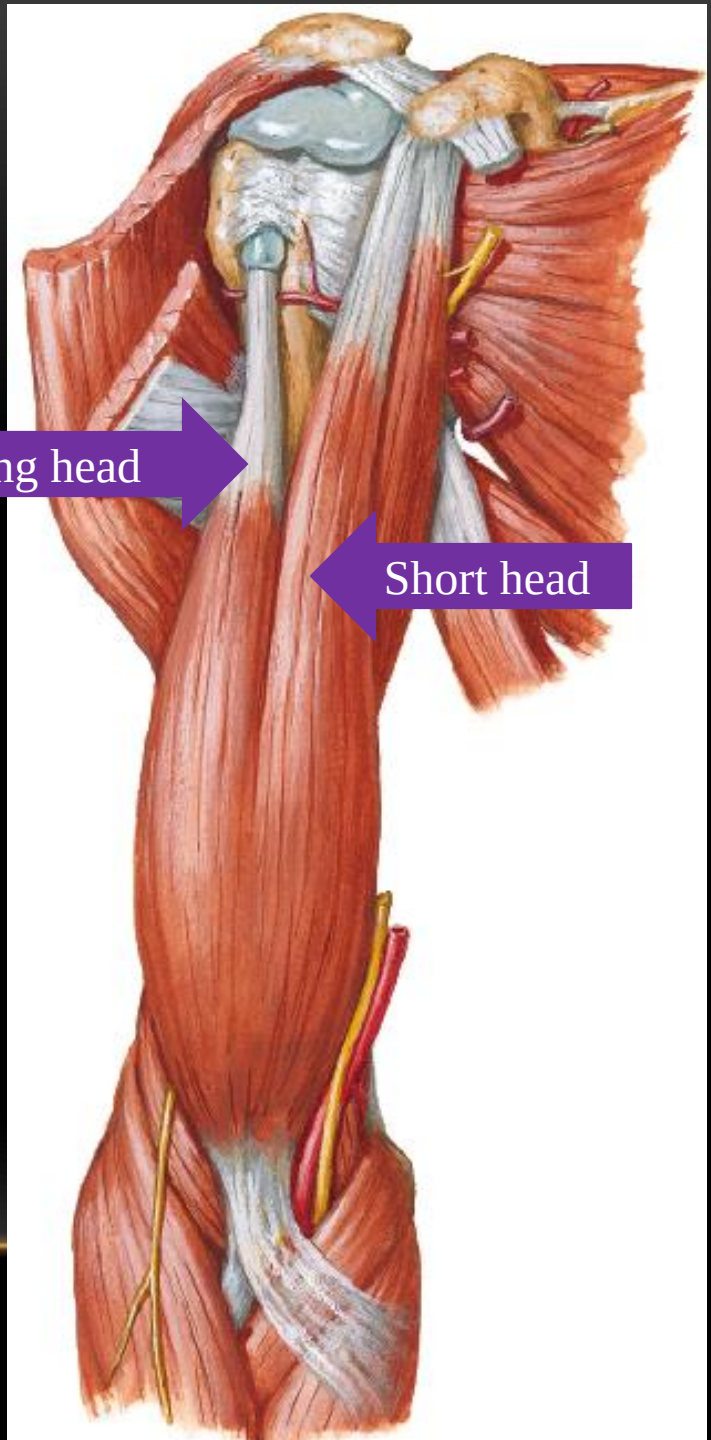
Insertion:

- Into the posterior rough part of the radial tuberosity.
- By an aponeurosis into the dep fascia on the medial aspect of the upper forearm.

Nerve supply: musculocutaneous nerve.

Action:

- Powerful supination of the flexed elbow.
- Long head stabilizes the shoulder joint.
- Short head helps in flexion of the shoulder.



Coracobrachialis

Origin:

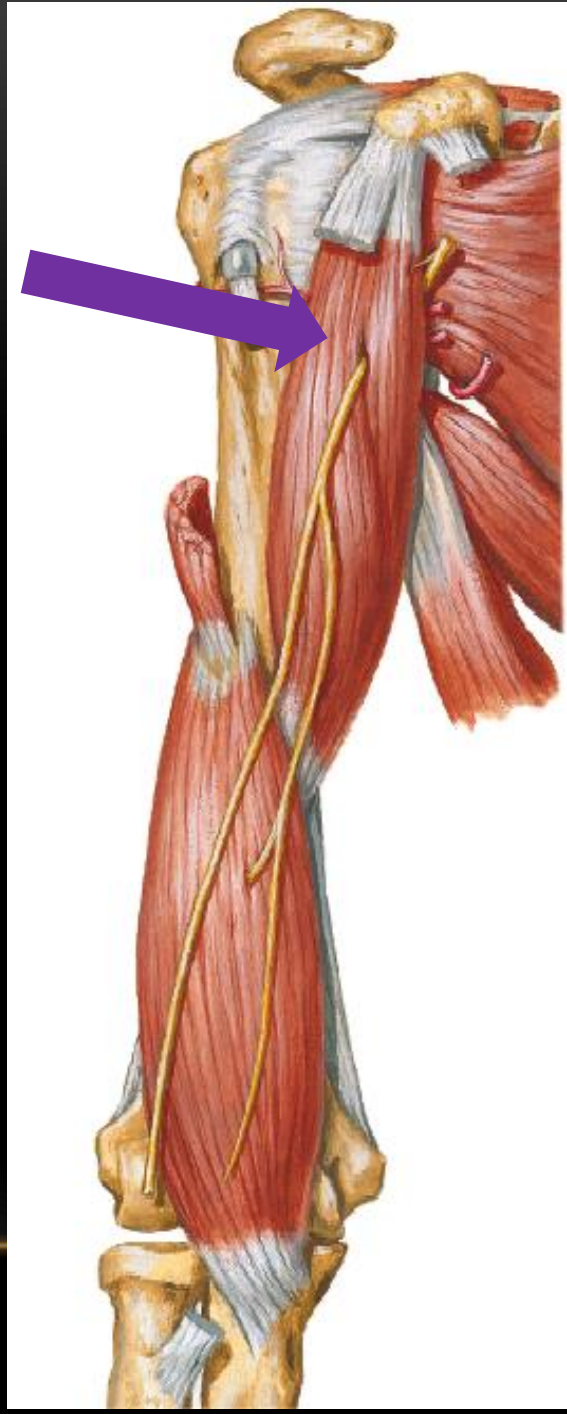
- Tip of the coracoid process.
- Fleshy fibres from the upper ~ 10 cms of the tendon of short head of biceps.

Insertion: into the middle of the medial border of the humerus.

Nerve supply: musculocutaneous nerve.

Action:

- Flexion of the shoulder joint.
- Adduction of the arm.



Brachialis

Origin:

- From the lower ½ of the shaft of the humerus.
- From medial and lateral intermuscular septa.

Insertion:

- Ulnar tubersoity.
- Coronoid process.

Nerve supply: musculocutaneous nerve. The lateral fibres receive fibres from the radial nerve.

Action: the main flexor of the elbow.

Triceps brachii

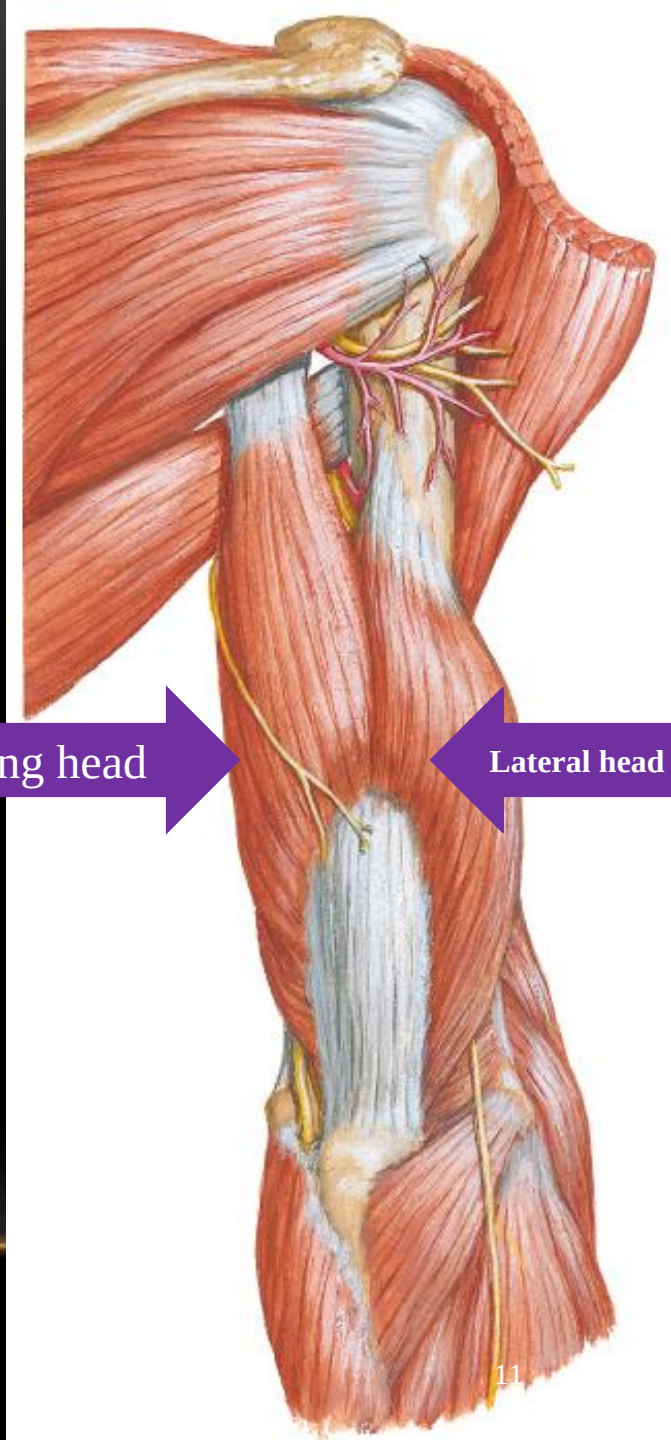
Origin: by three heads:

- **Long head**: from the infraglenoid tubercle.
- **Lateral head**: From the back of the humerus and the spiral groove and from the lateral intermuscular septum.
- **Medial (deep) head**: From the posterior surface of the humerus below the spiral groove and the medial intermuscular septum.

Insertion: Into the upper surface of the olecranon and the fascia covering the anconeus muscle.

Nerve supply: radial nerve by separate branches to each head.

Action: Extension of the elbow, and weak extension of the shoulder joint.



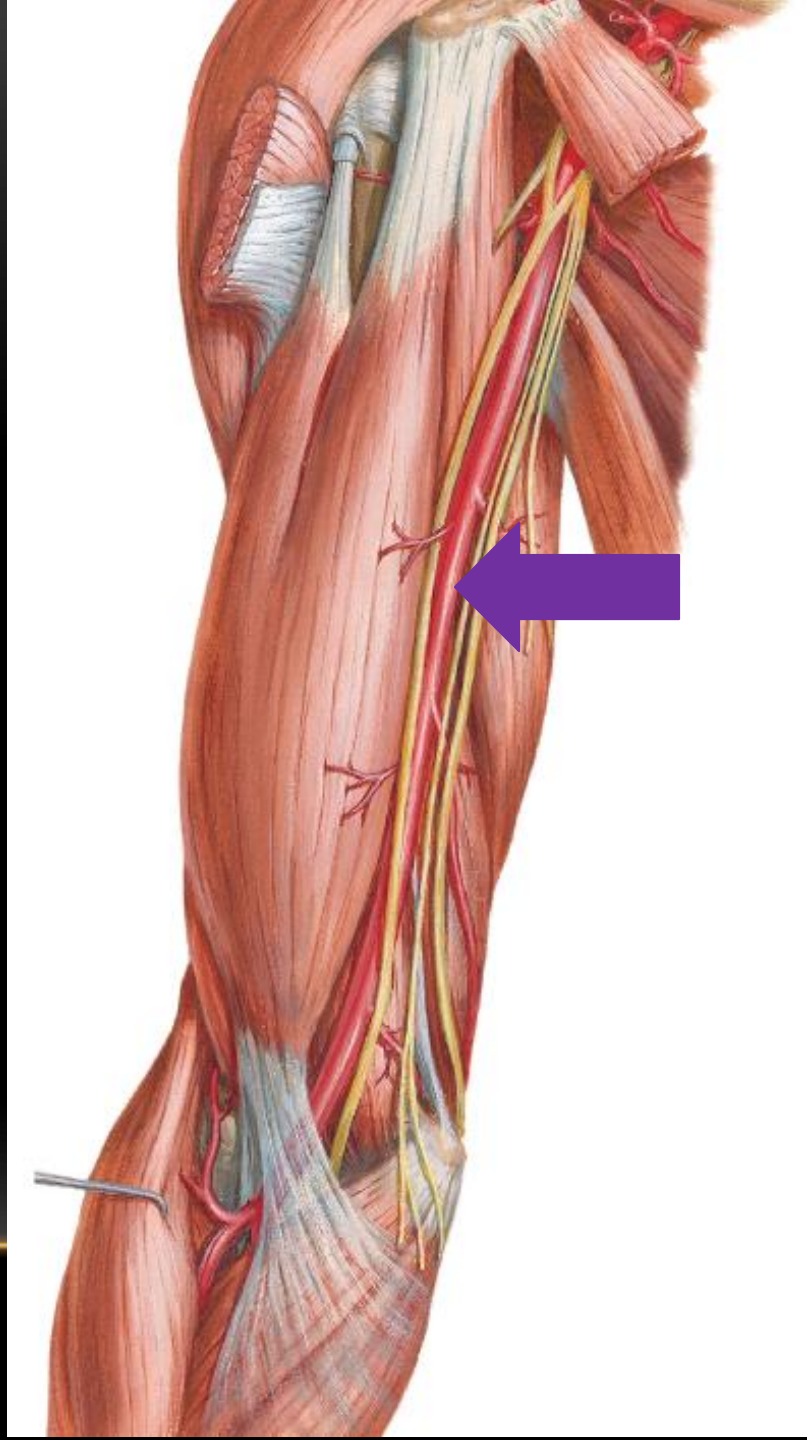
Brachial artery ..1/5

Beginning: At the lower border of the teres major.

End: Opposite the neck of the radius 1 cm below the crease of the elbow joint.

The artery changes its direction from the medial side of the humerus at its beginning to the front of the humerus at its lower end.

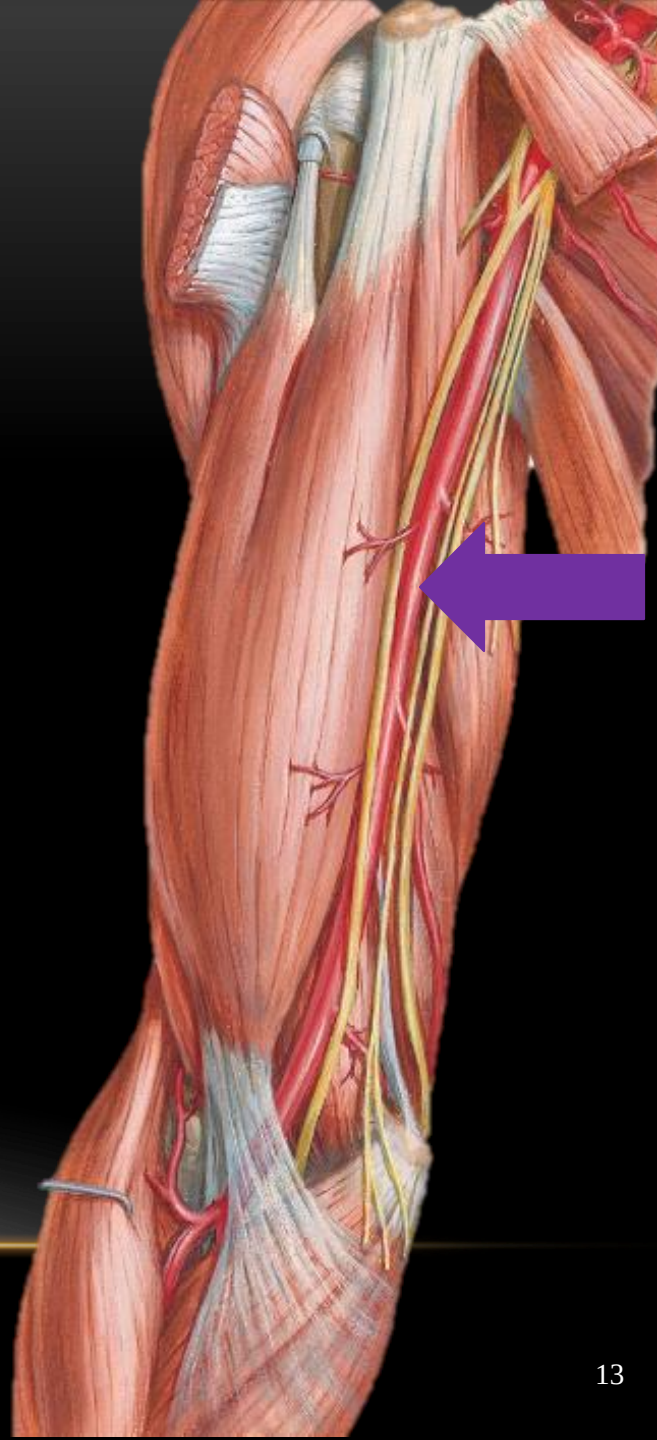
The brachialis muscle separates the artery at its lower part from the humerus.



Brachial artery ..2/5

Relations:

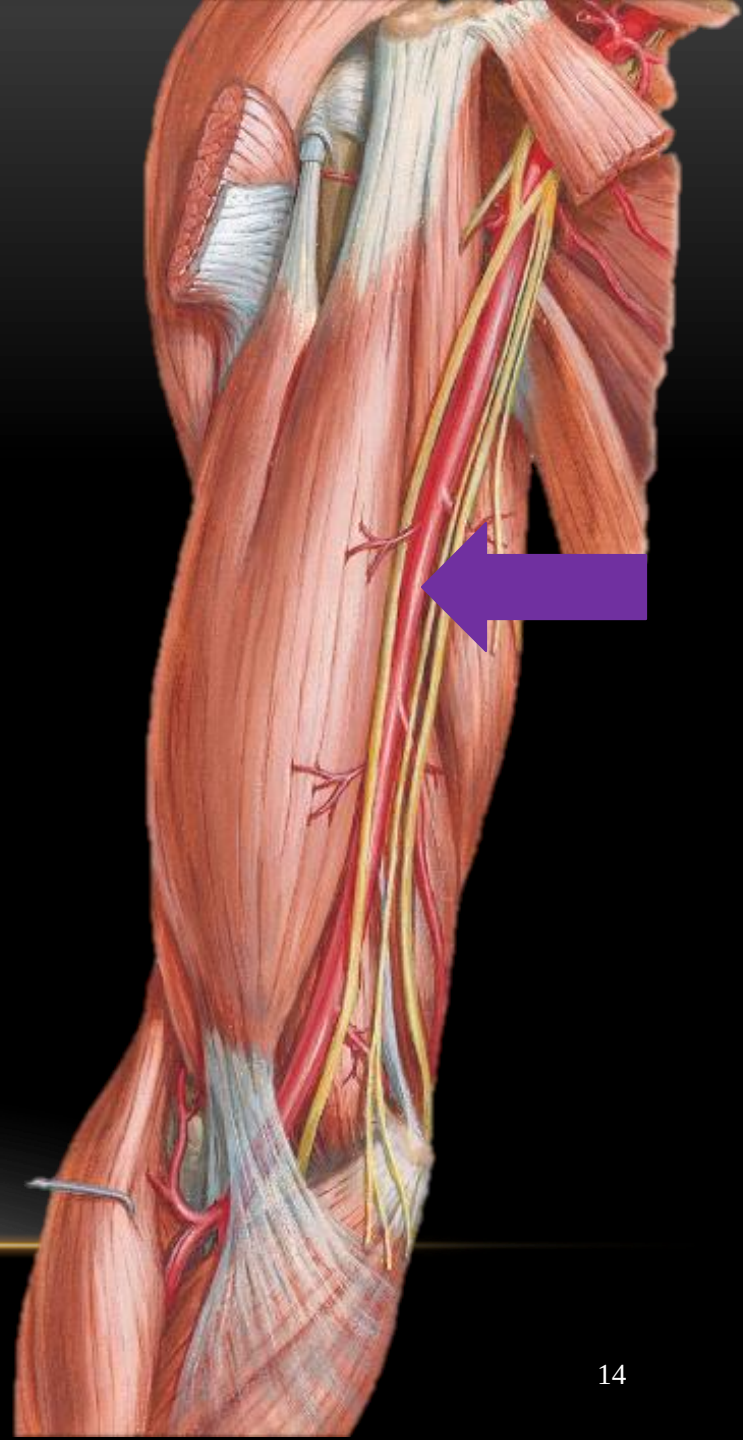
- **<u>Anteriorly:</u>**
  - Skin, superficial fascia and deep fascia.
  - Crossed by the median nerve.
  - Bicipital aponeurosis at its lower end.



Brachial artery ..3/5

Relations:

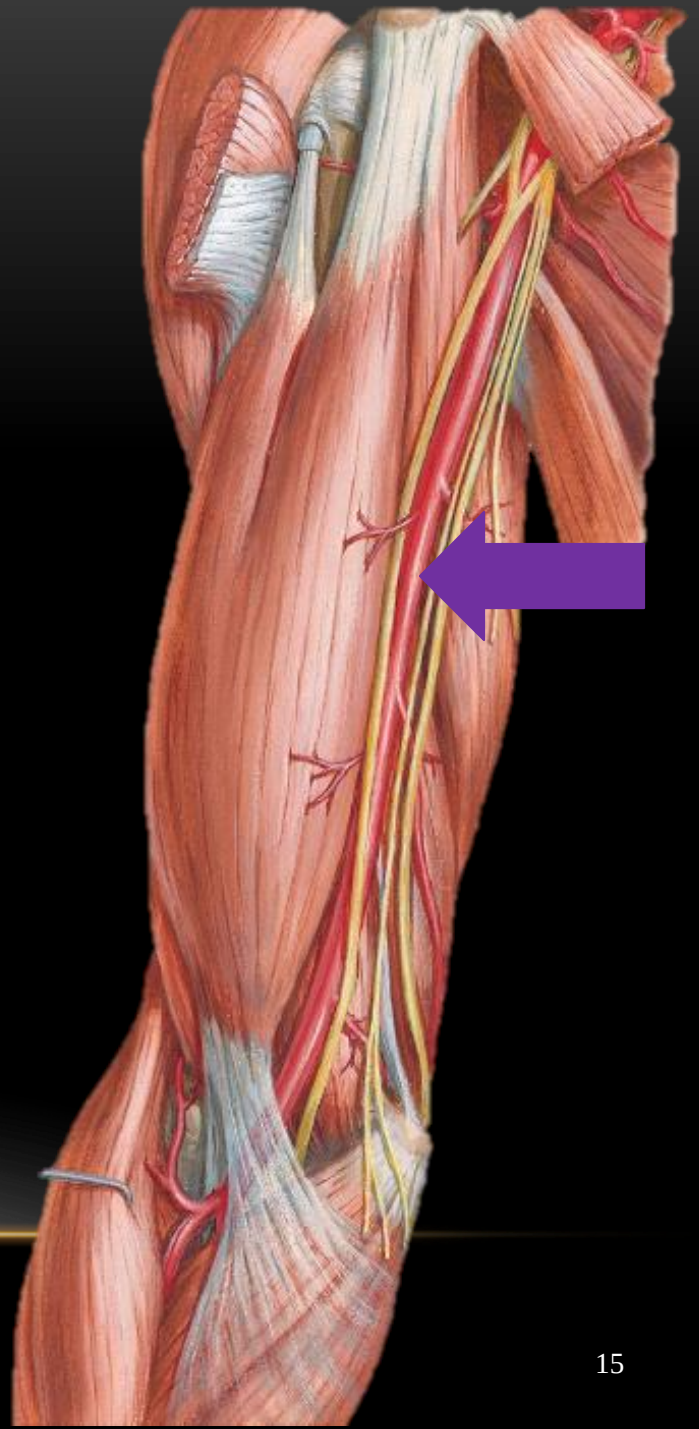
- **Posteriorly:**
  - Long head of triceps; separated from it by the profunda brachii and radial nerve.
  - Medial head of triceps.
  - The insertion of coracobrachialis.
  - The brachialis muscle.



Brachial artery ..4/5

Relations:

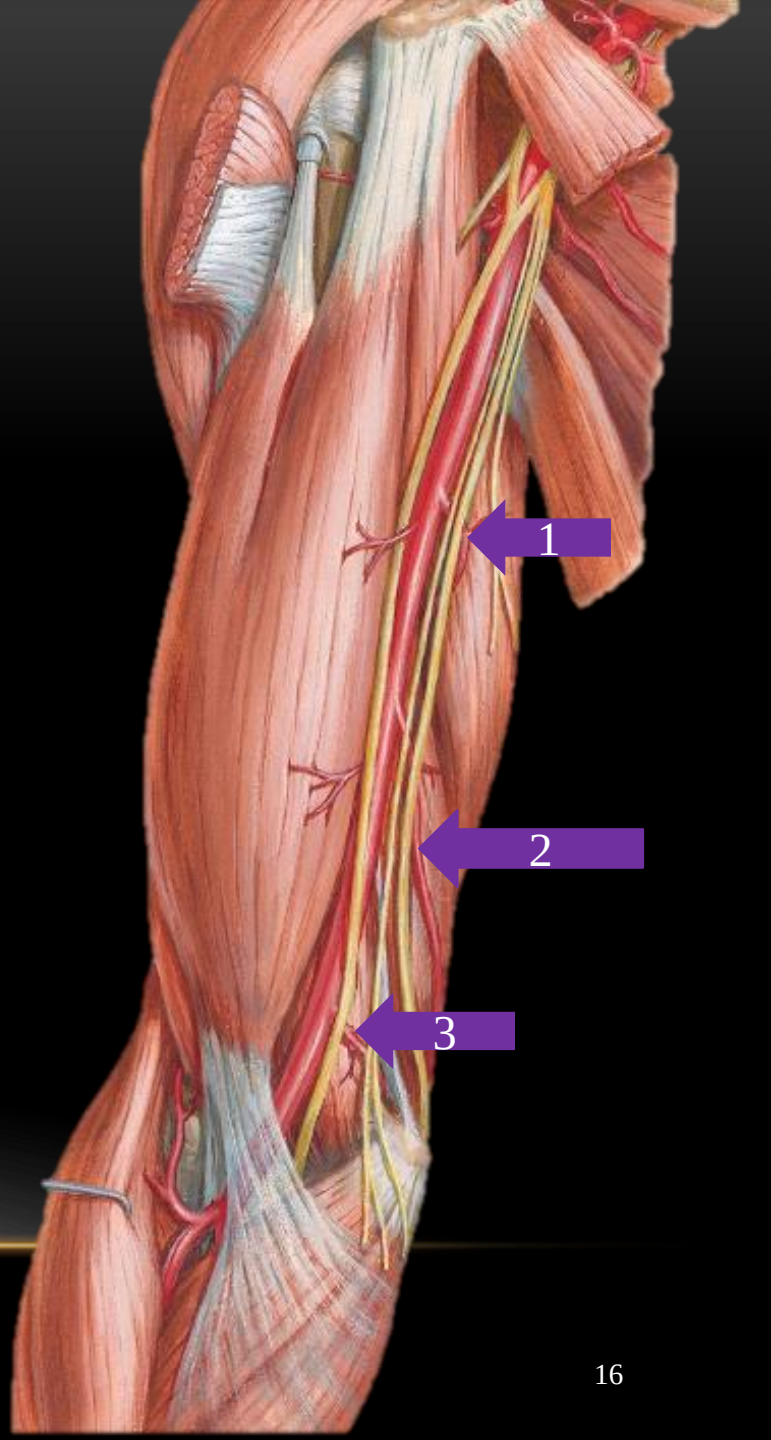
- **Medially:**
  - Basilic vein throughout its course.
  - Medial cutaneous nerve of the forearm, and ulnar nerve above.
  - Median nerve below.
- **Laterally**:
  - Coracobrachialis and median nerve, above.
  - Biceps brachii, below.



Brachial artery ..5/5

Branches:

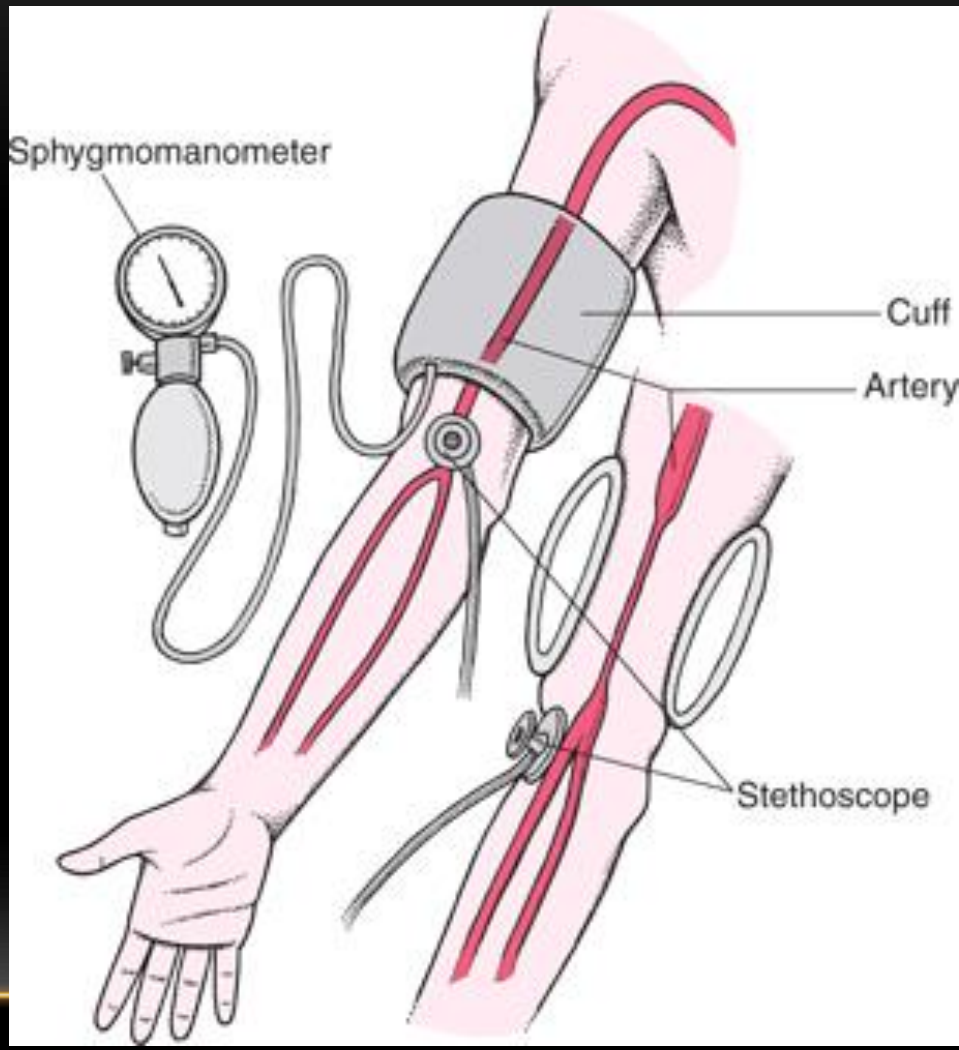
- Profunda brachii (1)
- Superior ulnar collateral (2)
- Inferior ulnar collateral (3)
- Nutrient artery
- Muscular branches



Clinical notes

The brachial artery is the artery commonly used to check the blood pressure.

The artery can be compressed against the humerus in its upper part; this is done to control bleeding from the artery.



Musculocutaneous nerve (C5, 6, 7)

Arises from the inferior cord of the brachial plexus at the lower border of pectoralis minor.

Descends lateral to the 3rd part of the axillary artery.

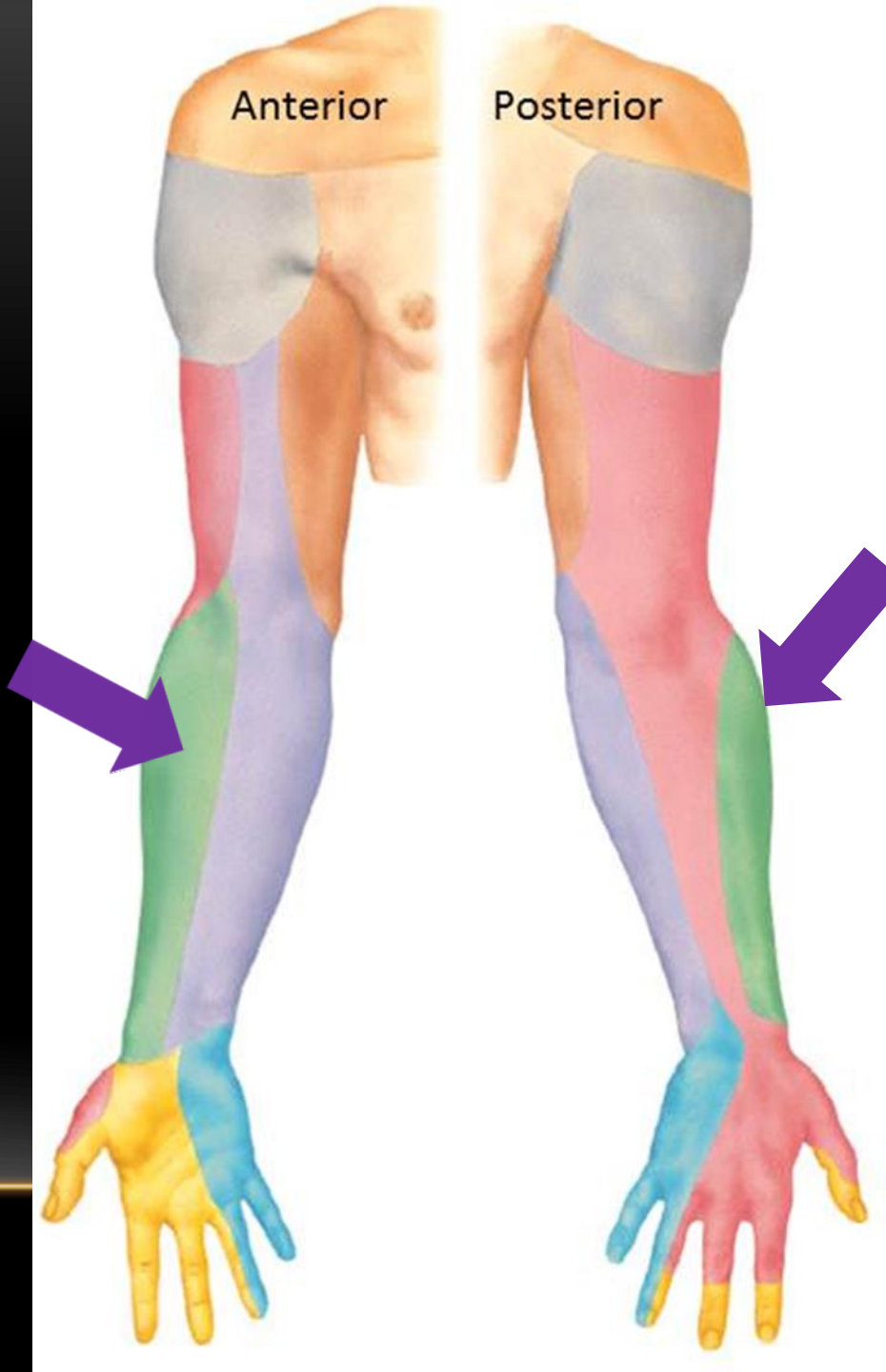
Supplies the coracobrachilis muscle before piercing it.

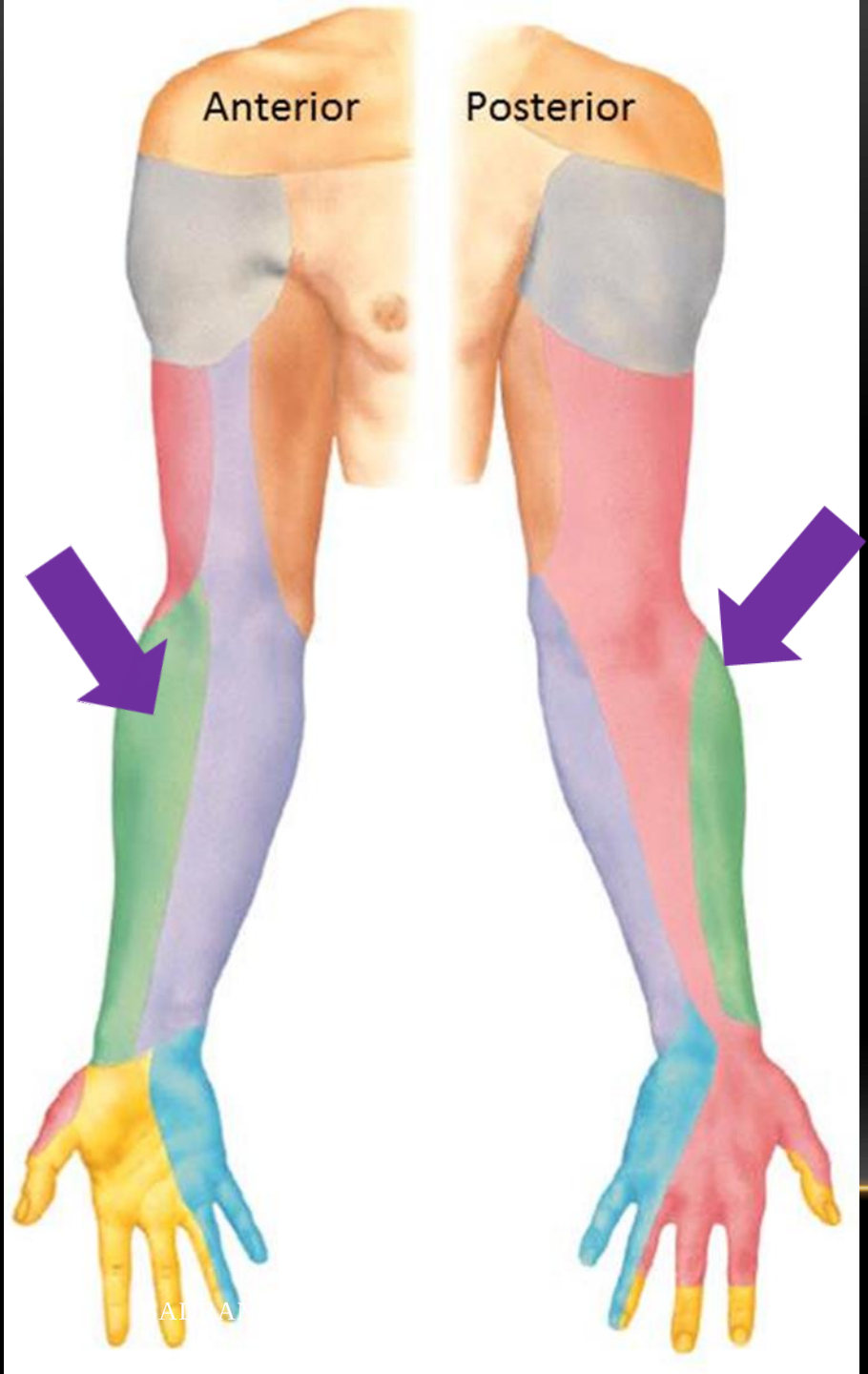
After piercing the brachialis, it descends between it and the biceps brachii, then between biceps and brachialis supplying all these muscles.

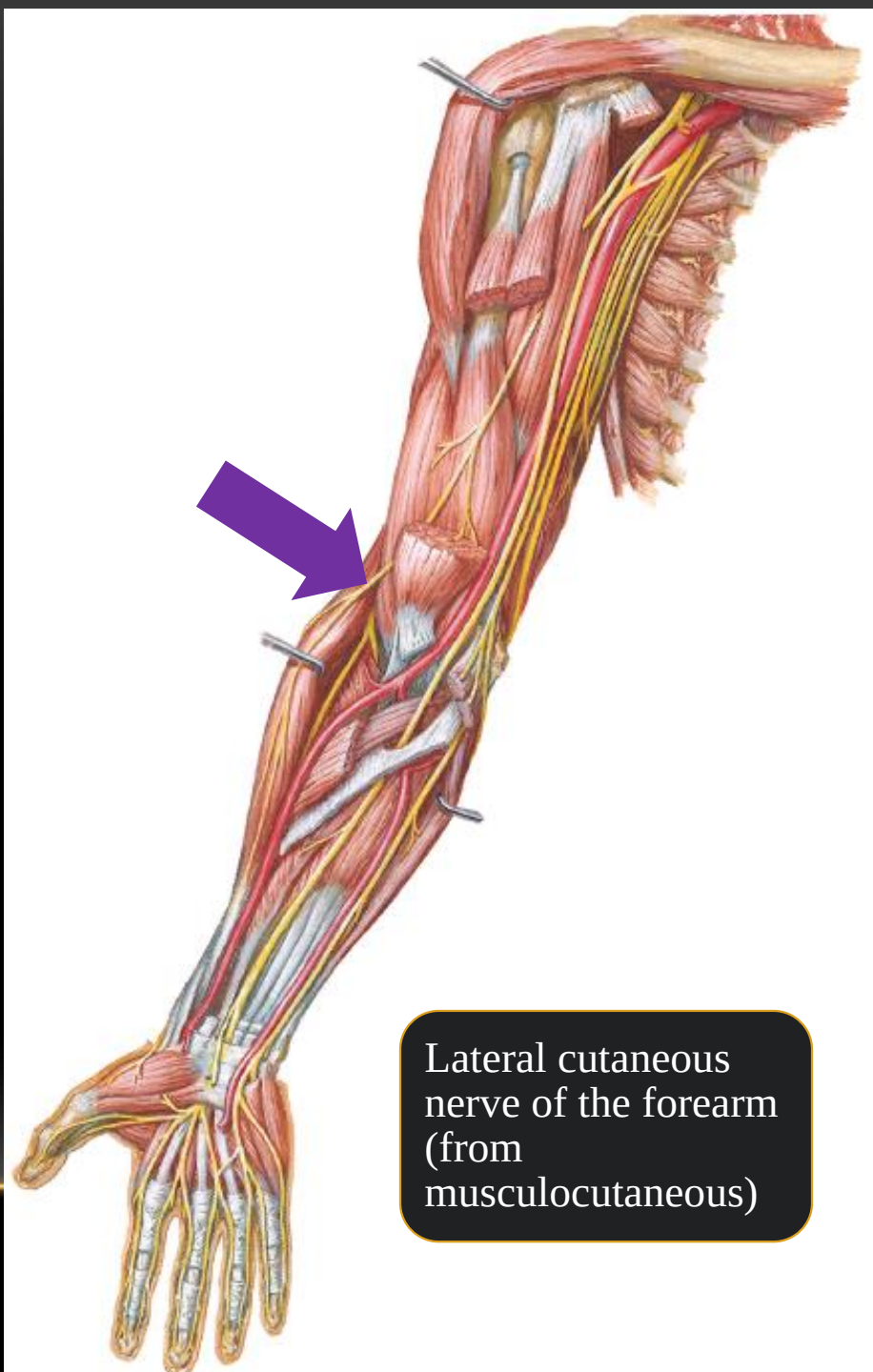
Pierces deep fascia lateral to the tendon of biceps and continues as the lateral cutaneous nerve of the forearm.

Lateral cutaneous nerve of the forearm

Supplies the skin of the front of the lateral aspect of forearm down to the base of the thenar eminence.







Lateral cutaneous nerve of the forearm (from musculocutaneous)

Median nerve (C5, 6,7,8,T1)

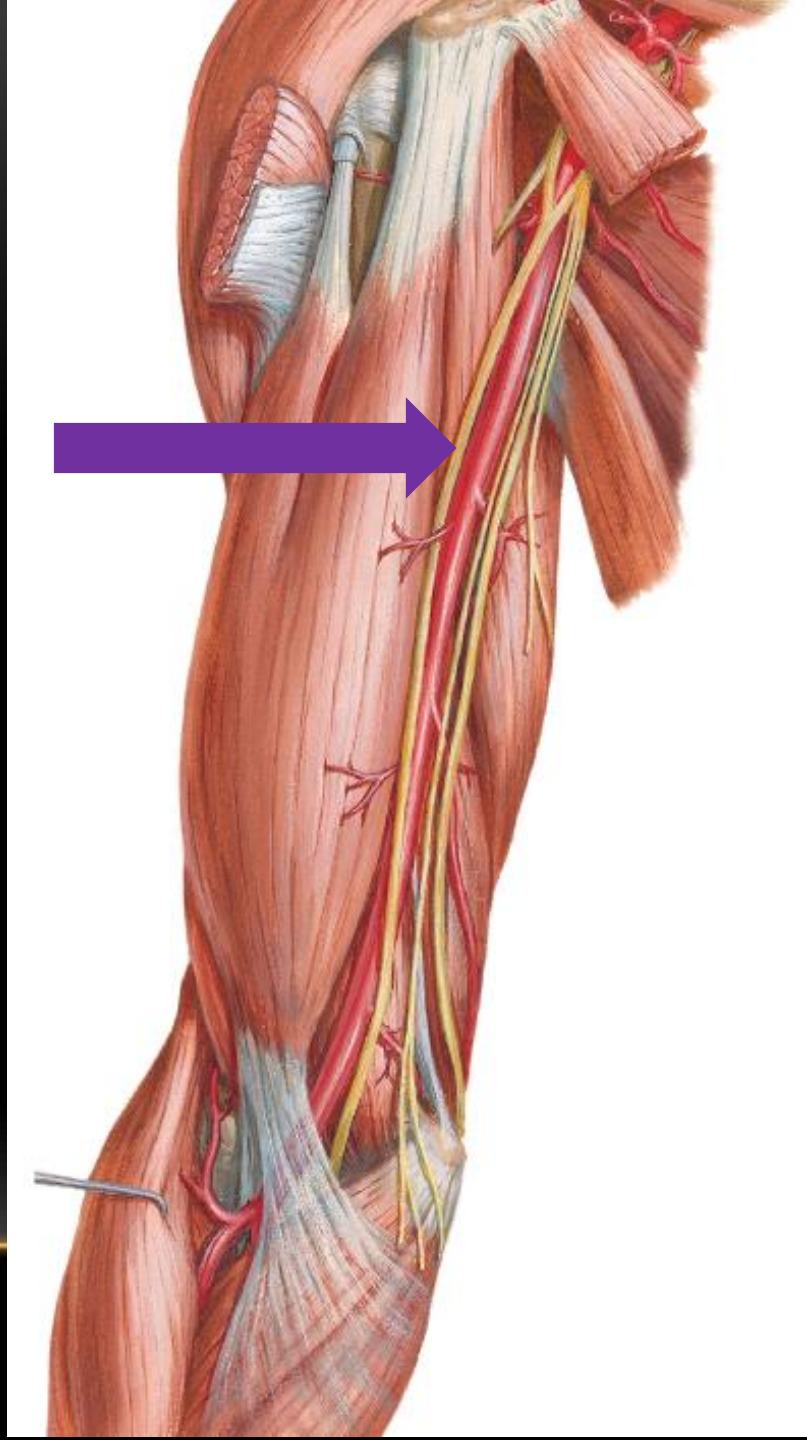
Formed by two roots medial and lateral from the corresponding cords of the brachial plexus.

The two roots unite on the lateral aspect of the 3rd part of the axillary artery.

Descends lateral to the 3rd part of the axillary artery and upper part of the brachial artery.

At the level of the insertion of the coracobrachialis, it crosses in front of the brachial artery from lateral to medial and continues downwards on the medial aspect of the artery.

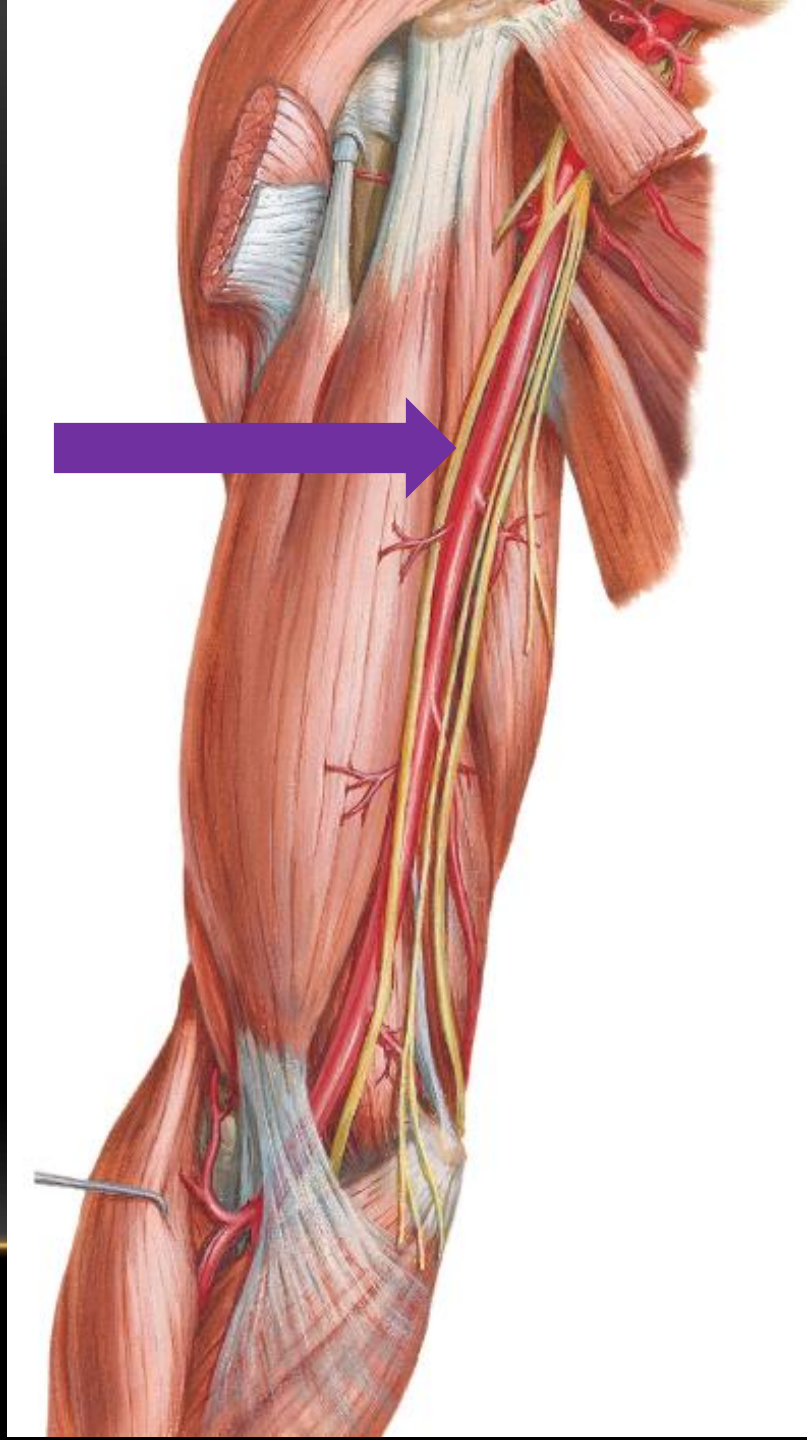
Leaves the arm by passing between the two heads of pronator teres muscle.



Median nerve (C5, 6,7,8,T1)

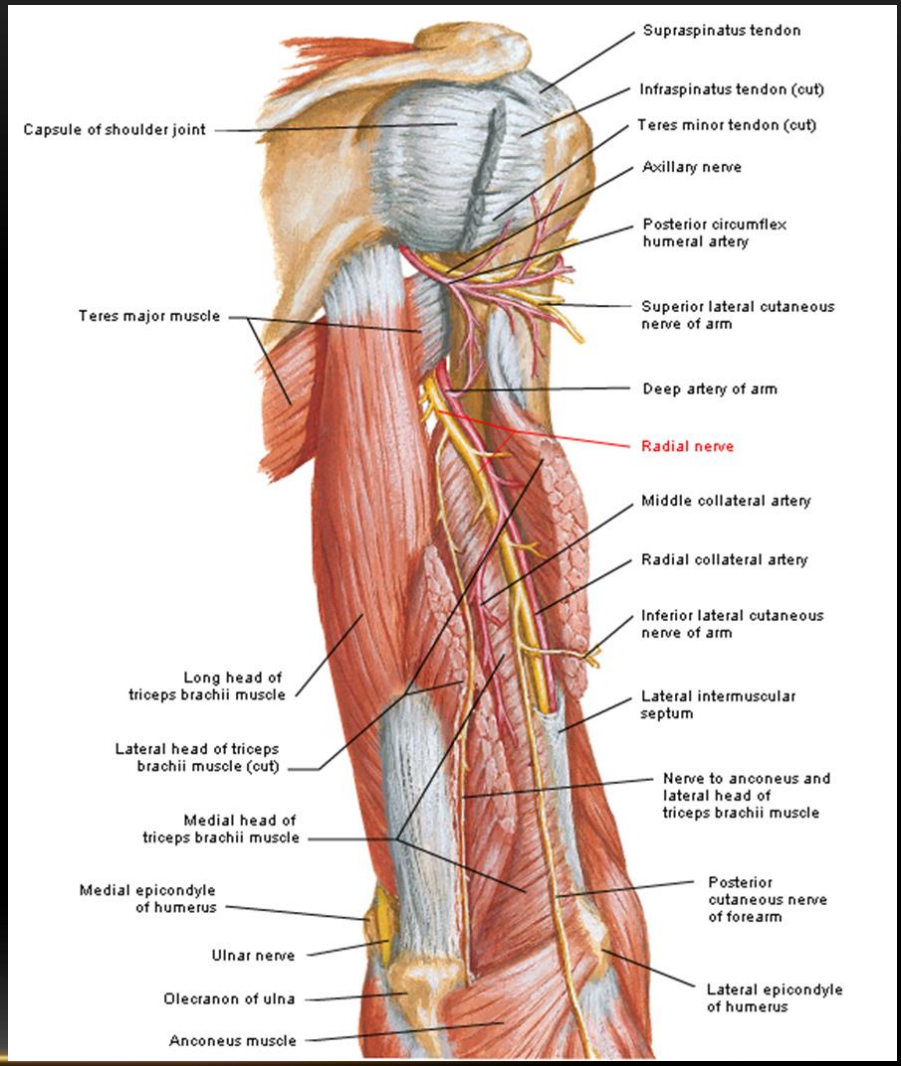
Branches of the median nerve in the arm:

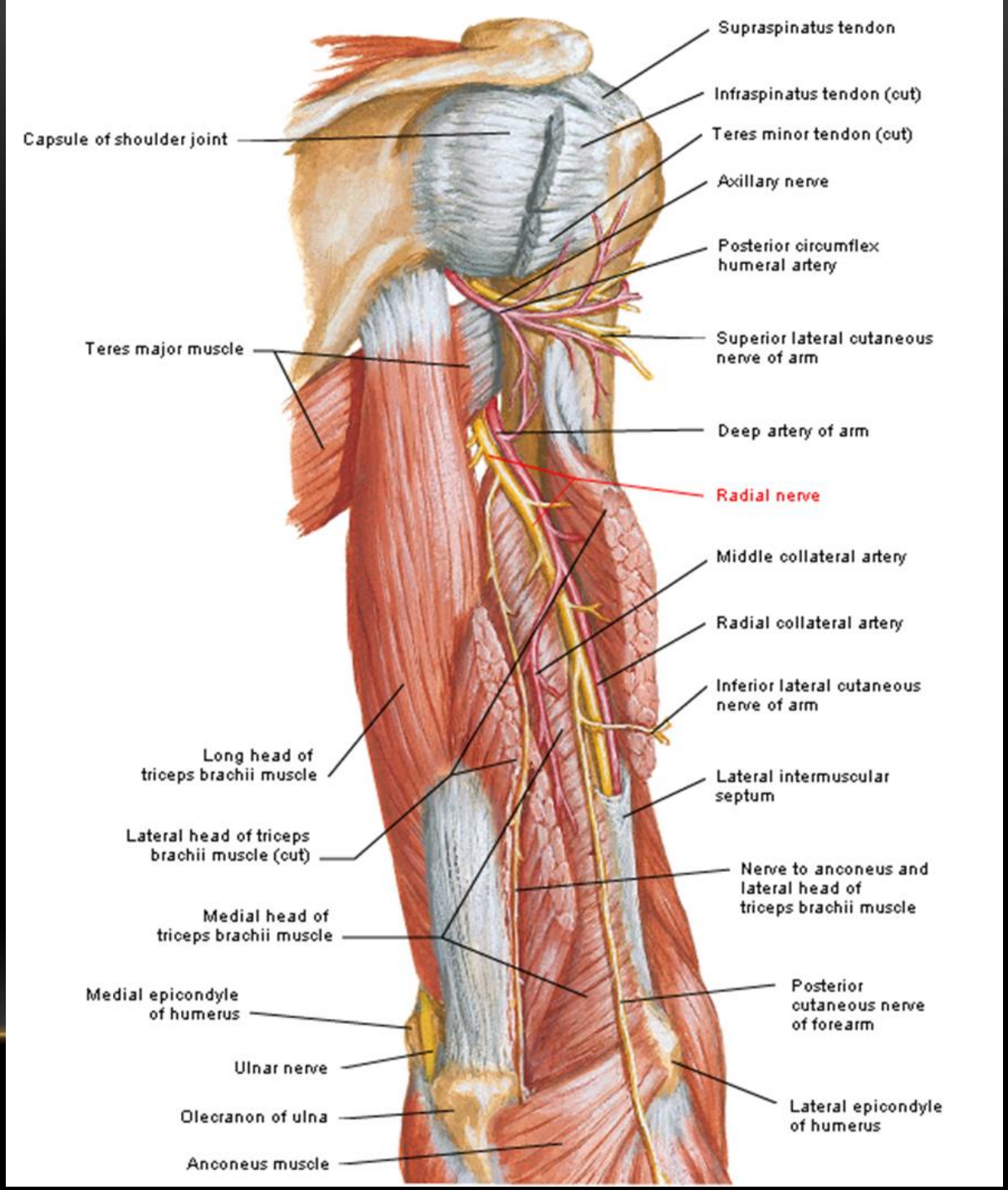
- Vascular branches to the brachial artery.
- Branch to the pronator teres muscle before it pierces the muscle.



Radial nerve (C5, 6, 7, 8, T1)

- Arises from the posterior cord of the brachial plexus.
- Runs posterior to the third part of the axillary artery.
- In the axilla, it runs on the posterior axillary wall.
- It continues in the arm posterior to the brachial artery in front of the long head of triceps.
- Reaches the spiral groove by passing between the long and medial heads of the triceps.
- In the spiral groove, it lies between the lateral and medial heads of the triceps.
- Pierces the lateral intermuscular septum.
- It descents in between brachialis and brachioradialis.




Supraspinatus tendon
Infraspinatus tendon (cut)
Capsule of shoulder joint
Teres minor tendon (cut)
Axillary nerve
Posterior circumflex humeral artery
Teres major muscle
Superior lateral cutaneous nerve of arm
Deep artery of arm
Radial nerve
Middle collateral artery
Radial collateral artery
Inferior lateral cutaneous nerve of arm
Long head of triceps brachii muscle
Lateral intermuscular septum
Lateral head of triceps brachii muscle (cut)
Nerve to anconeus and lateral head of triceps brachii muscle
Medial head of triceps brachii muscle
Medial epicondyle of humerus
Posterior cutaneous nerve of forearm
Ulnar nerve
Lateral epicondyle of humerus
Olecranon of ulna
Anconeus muscle

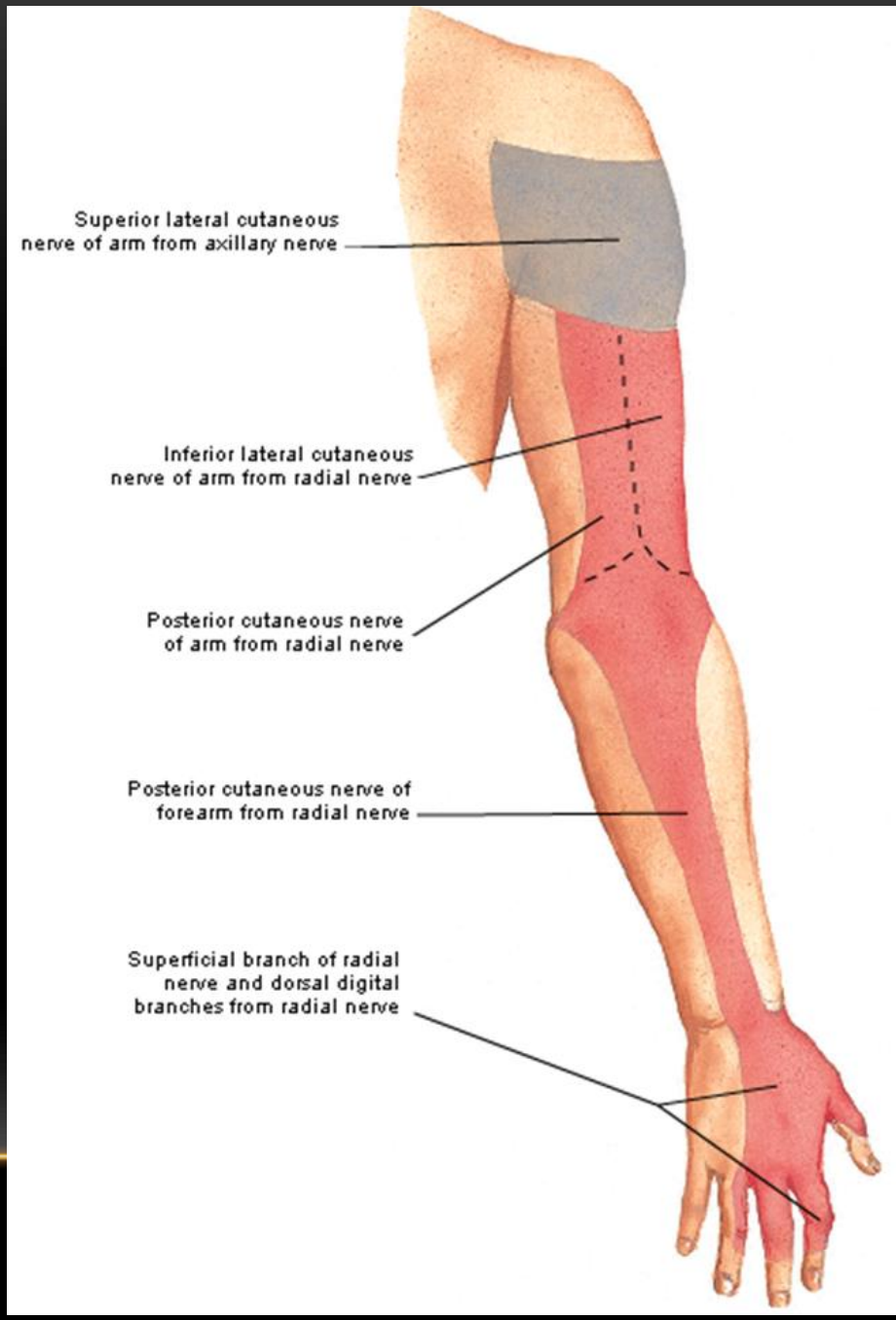
Branches of the Radial nerve

Muscular branches to the heads of the triceps muscle.

Cutaneous branches:

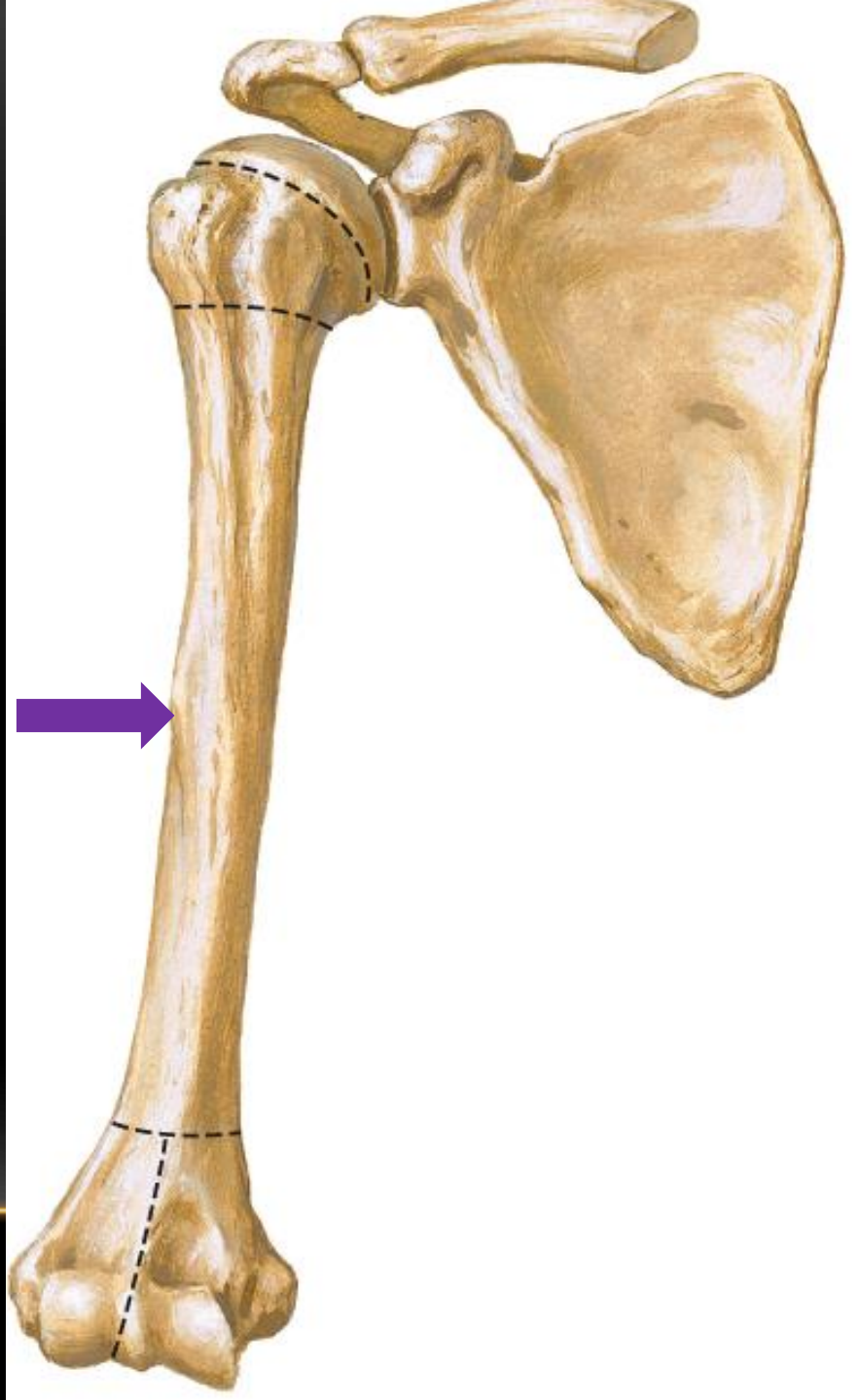
- **Posterior cutaneous nerve of the arm**: supplies the skin of the back of the arm to the olecranon.
- **Inferior lateral cutaneous nerve of the arm**: supplies the skin of the lateral part of the lower ½ of the arm.
- **Posterior cutaneous nerve of the forearm**: supplies the skin of the back of the forearm down to the wrist.

Articular branches to the elbow joint.



Events at the deltoid tuberosity

- Insertion of the coracobrachialis
- Median nerve crosses the brachial artery from lateral to medial.
- Ulnar nerve and superior ulnar collateral artery pierce lateral intermuscular septum from behind forward.
- Radial nerve and radial collateral artery pierce lateral intermuscular septum from behind forward.
- Medial cutaneous nerve of forearm pierces the deep fascia to become cutaneous.
- Basilic vein pierces deep fascia.
- Nutrient branch arises from brachial artery.

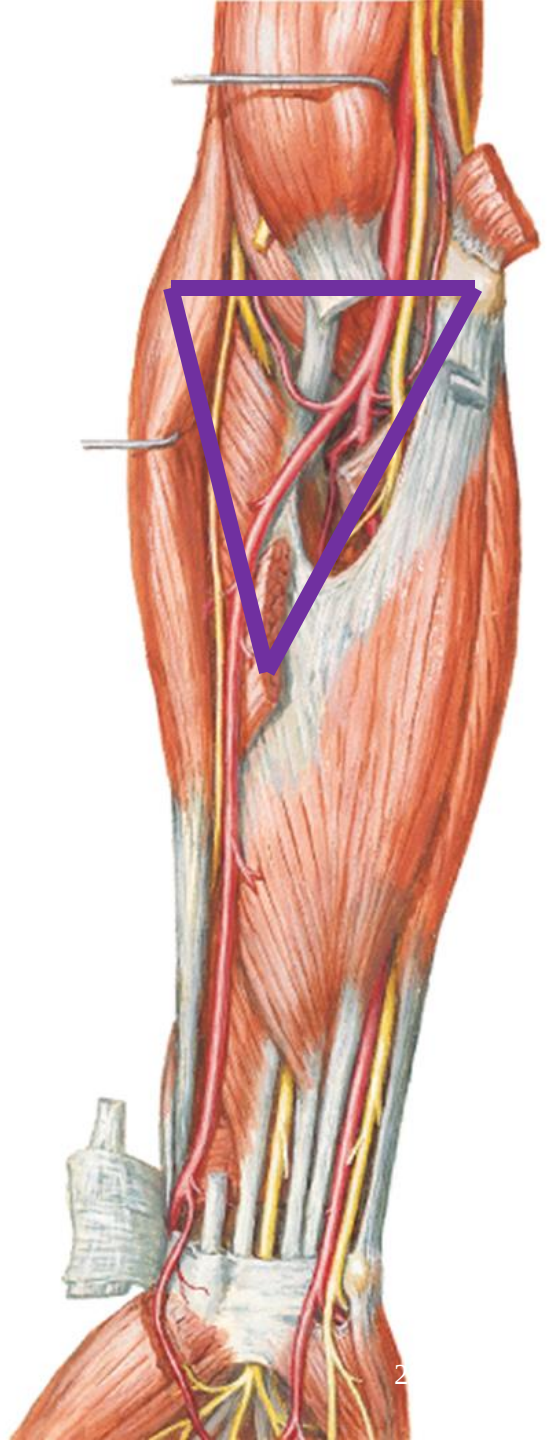


The cubital fossa

It is a triangular depression in front of the elbow.

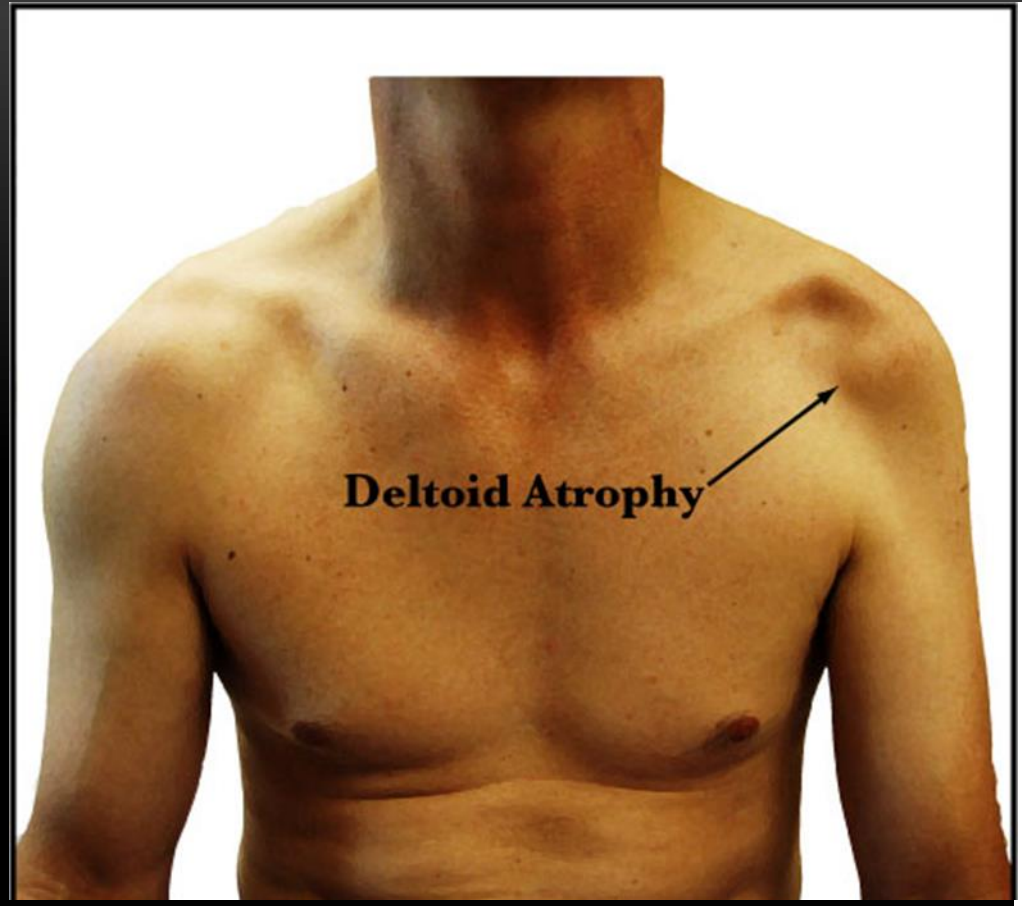
Boundaries:

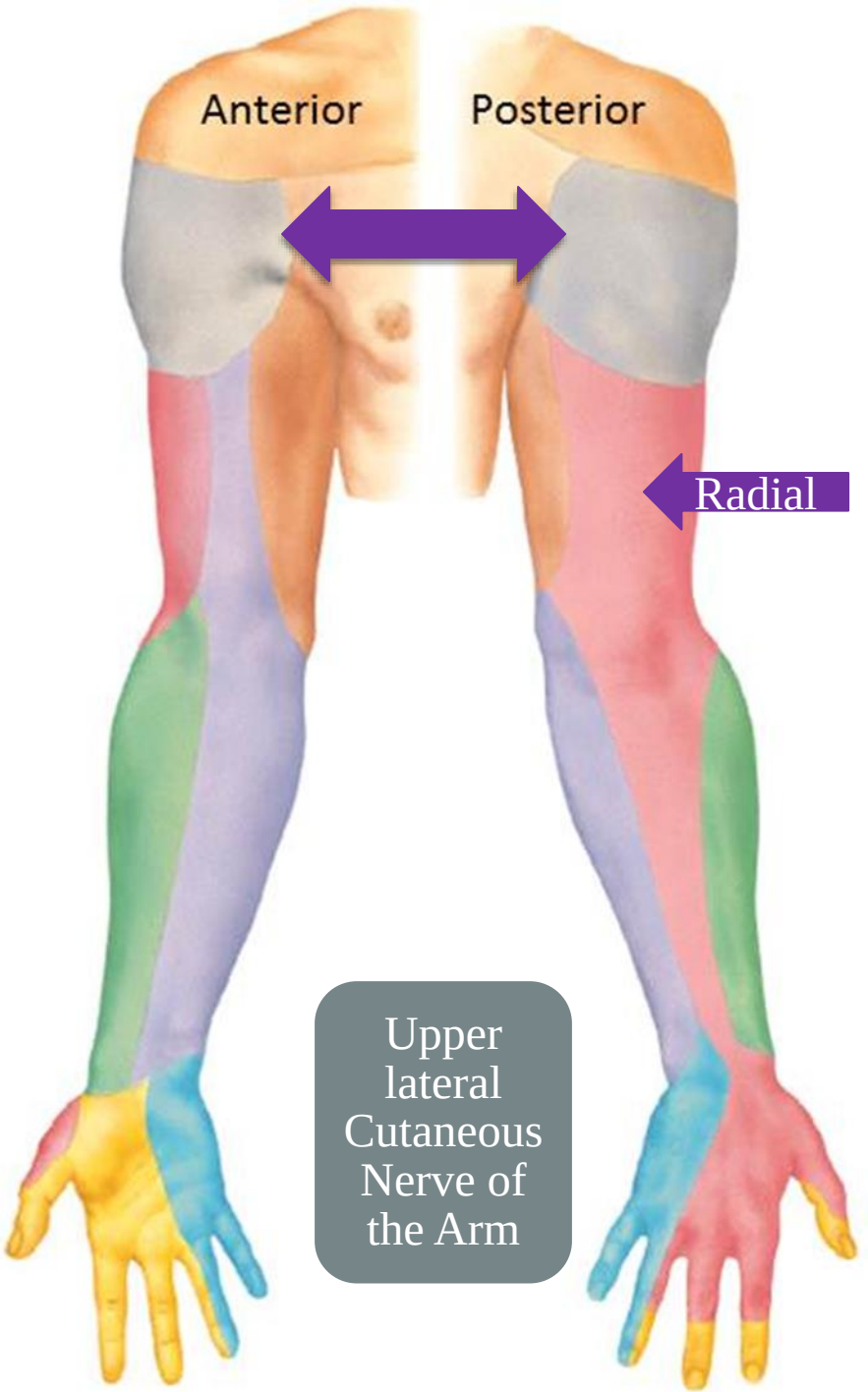
- Roof: skin, fascia, reinforced by bicipital aponeurosis
- Medially: pronator teres
- Laterally: brachioradialis
- Floor: supinator, laterally and brachialis medially
- Base: an imaginary line connecting the two humeral epicondyles.
- Apex: brachioradialis overlapping the pronator teres



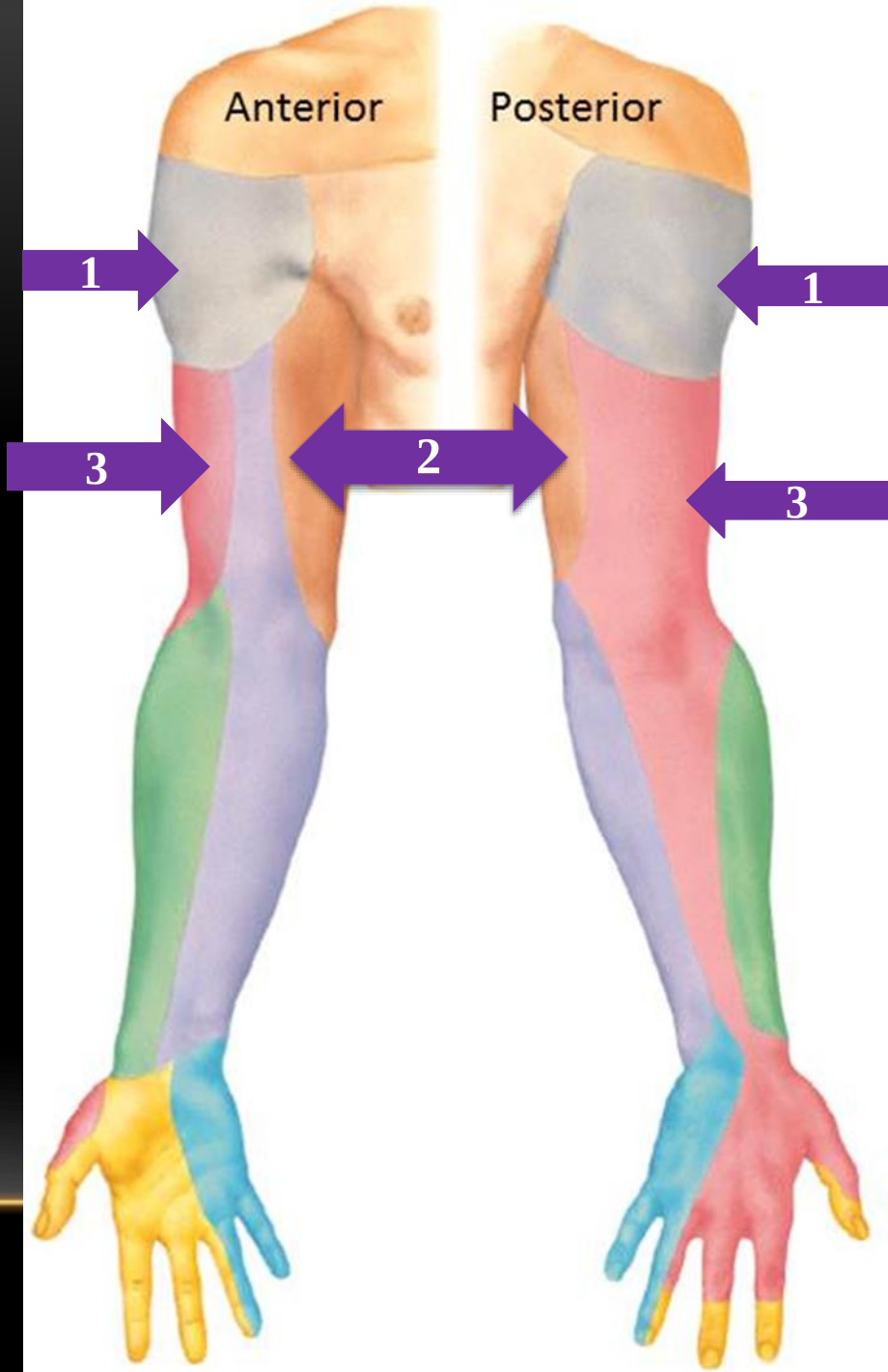
Contents of the Cubital Fossa:

- Median nerve.
- End of the brachial artery and its 2 terminal branches.
- Biceps tendon.
- Radial nerve (most lateral).
- Variable amounts of fat and lymphatics.


Deltoid Atrophy


Anterior
Posterior
Radial
Upper lateral Cutaneous Nerve of the Arm

- 1) Axillary nerve
- 2) Interstobrachial nerve
- 3) Radia nerve



Ulnar nerve (C7, 8, T1)

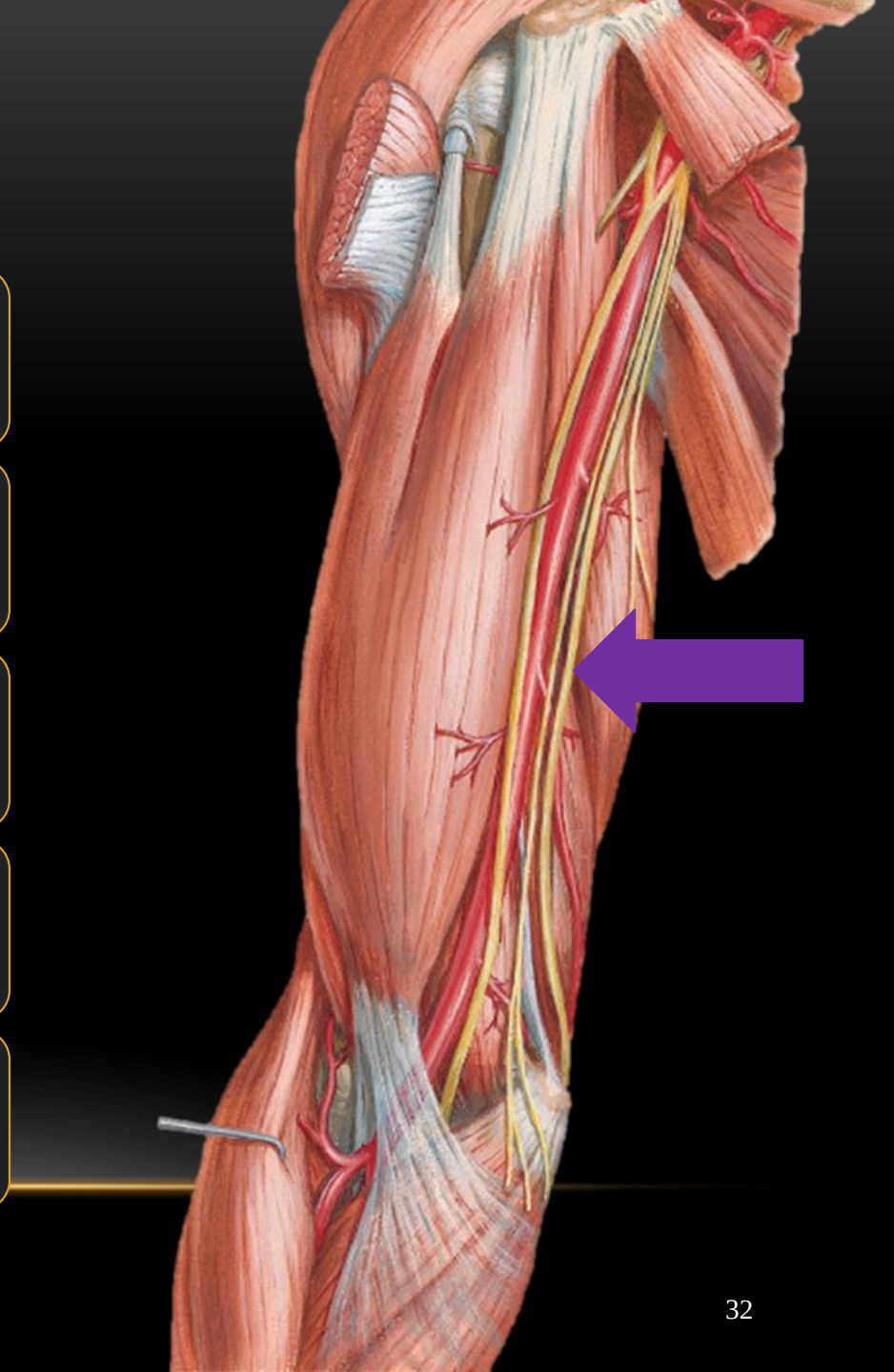
Arises from the medial cord of the brachial plexus.

Descends on the medial side of the 3rd part of the axillary artery and upper part of the brachial artery.

Pierces the medial intermuscular septum at the level of the insertion of the coracobrachialis muscle.

Descends behind the medial epicondyle and enters the forearm between the two heads of the flexor carpi ulnaris.

It has **NO** branches in the arm



Carrying angle

When the arm is extended, with the palm facing forward or up (supination), the upper arm is not in straight alignment with the forearm. The deviation from a straight line (generally on the order of 5-10°) occurs in the direction of the thumb (in supination), and is referred to as the carrying angle (visible in the right half of the picture of x-ray above). In females the carrying angle is usually greater than the carrying angle in males.

The carrying angle can influence how objects are held by individuals and may decrease efficiency of elbow flexion and elbow flexion force production. Increased carrying angle causes increased valgus stress on the medial structures of the elbow.