

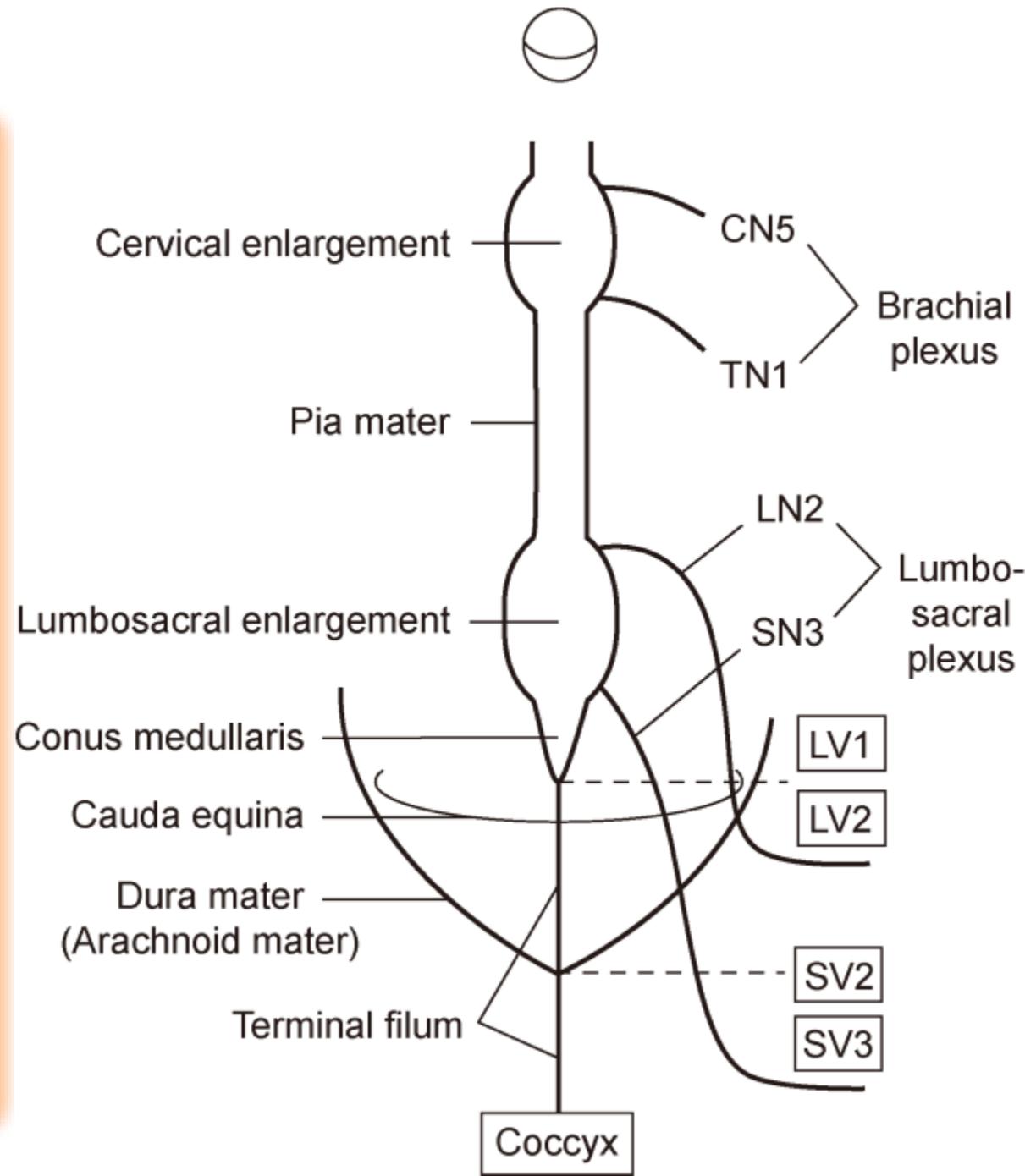
Upper limb
lecture three
brachial plexus

Dr Amal Albtoosh

Plexuses

At the root of the limbs, the anterior rami join one another to form complicated nerve plexuses.

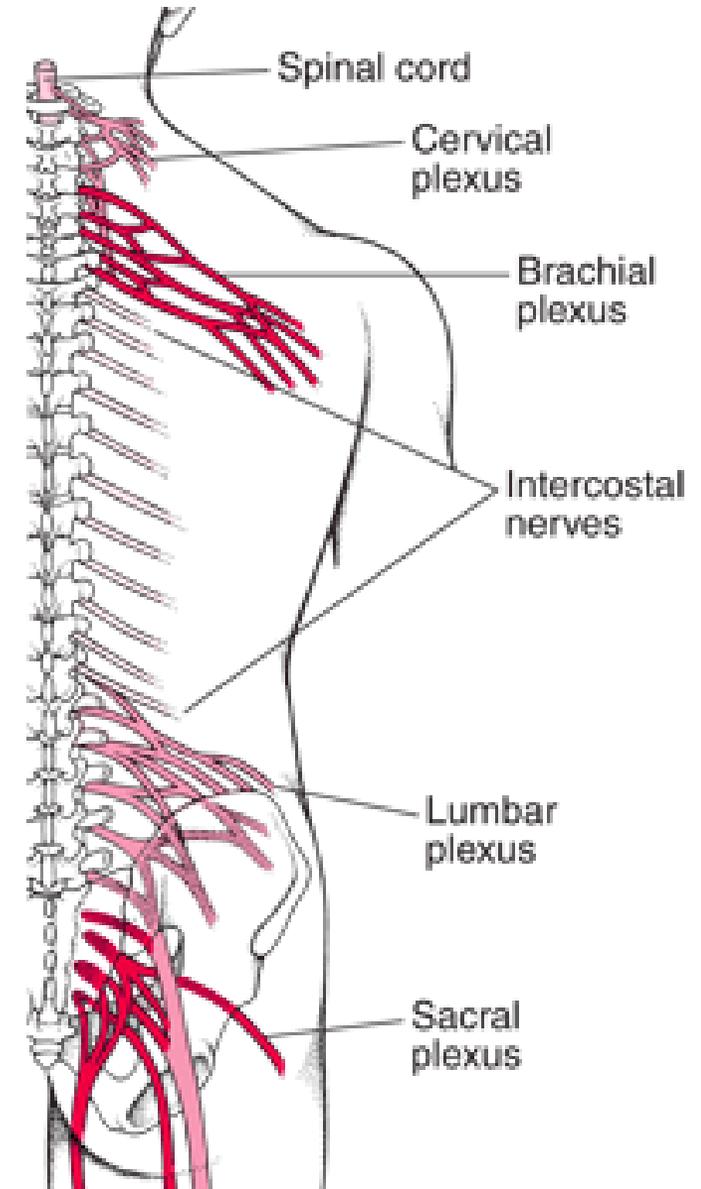
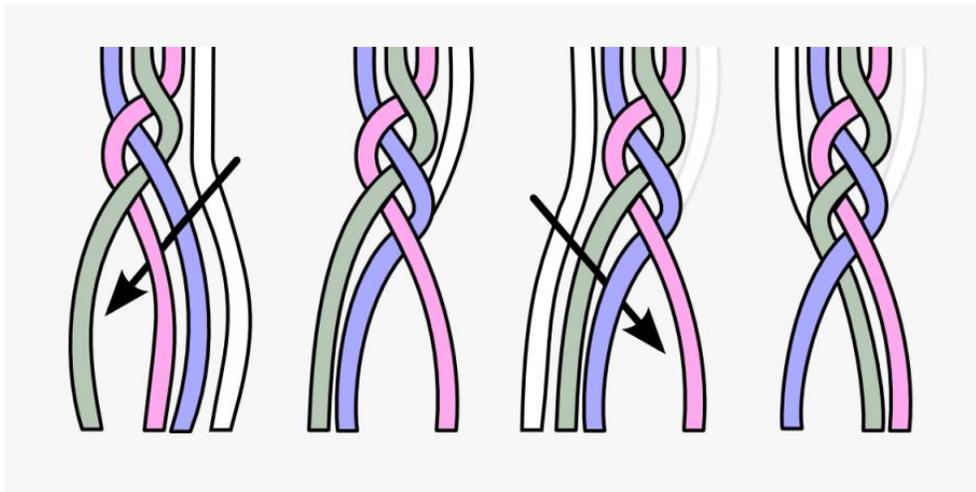
The **cervical** and **brachial plexuses** are found at the root of the upper limbs, and the **lumbar** and **sacral plexuses** are found at the root of the lower limbs. (Snell, page 21)

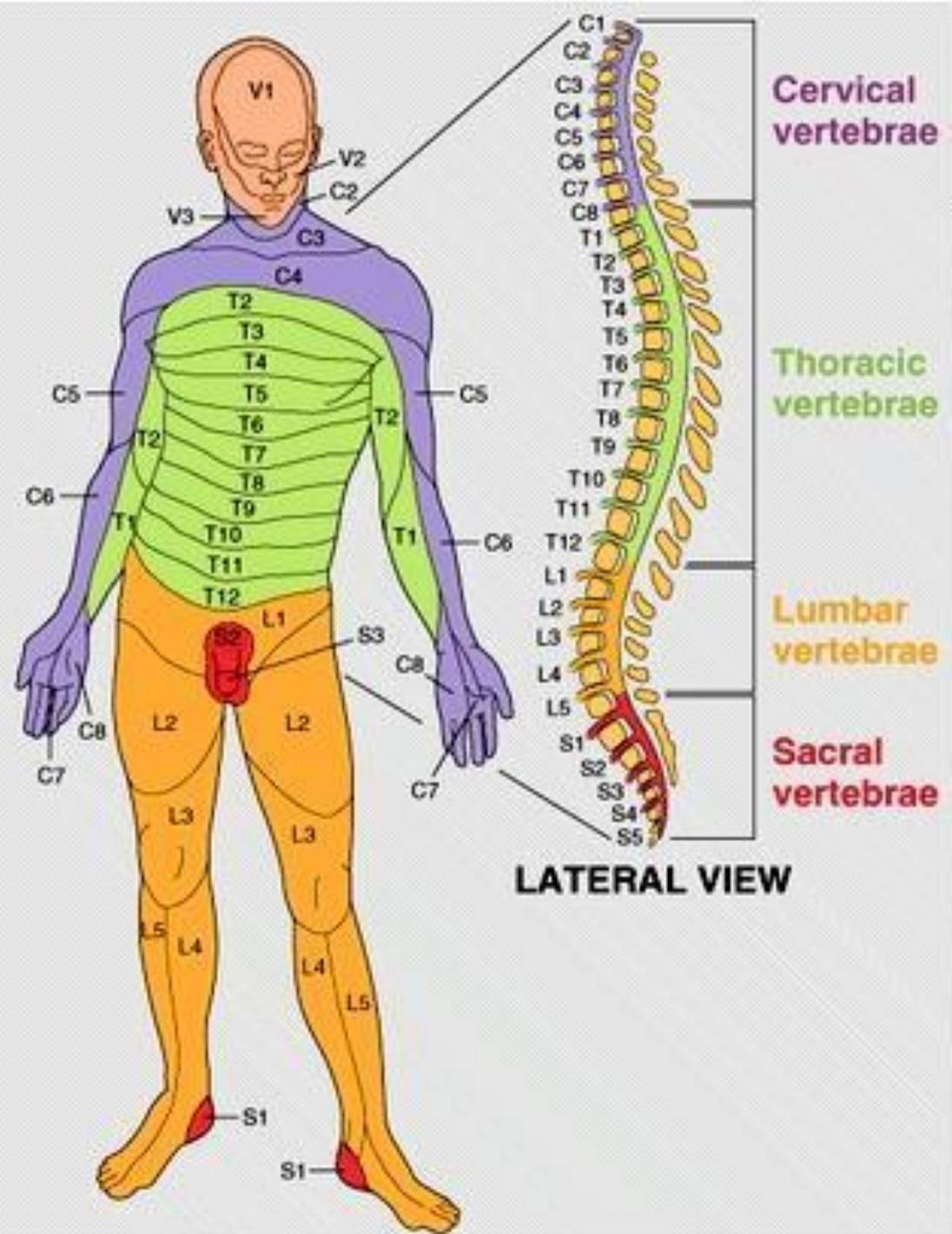


Four plexuses

- I. Cervical plexus
- II. Brachial plexus
- III. Lumbar plexus
- IV. Sacral plexus

❖ The thoracic nerves are separated from each other.





Brachial Plexus

Formed by C5-C8 and T1 (C4 and T2 may also contribute to this plexus)

It gives rise to the nerves that innervate the upper limb

Axillary - innervates the deltoid and teres minor

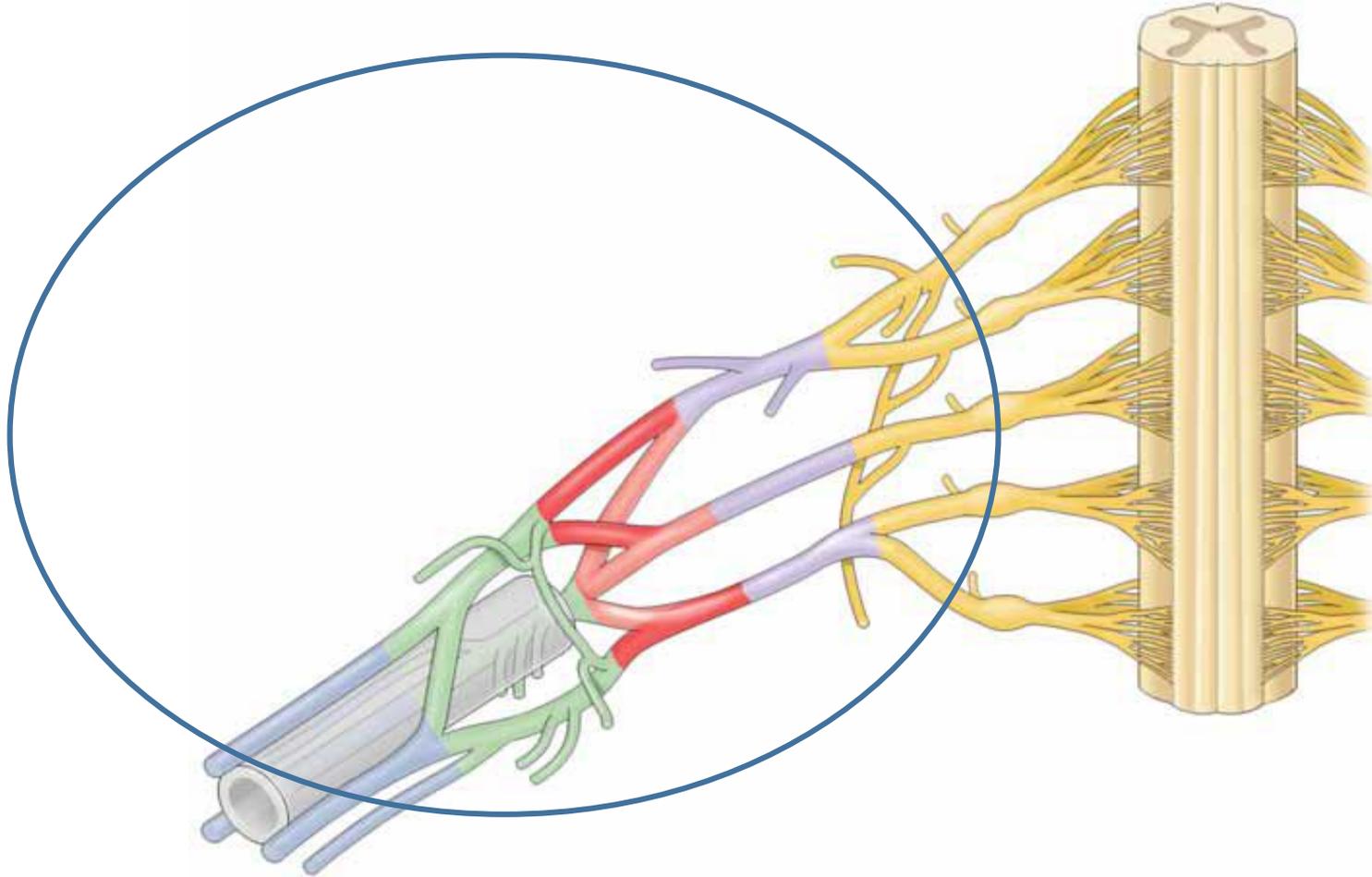
Median - branches to most of the flexor muscles of arm

Ulnar - supplies the flexor carpi ulnaris and part of the flexor digitorum profundus

Radial - innervates essentially all extensor muscles

Brachial Plexus

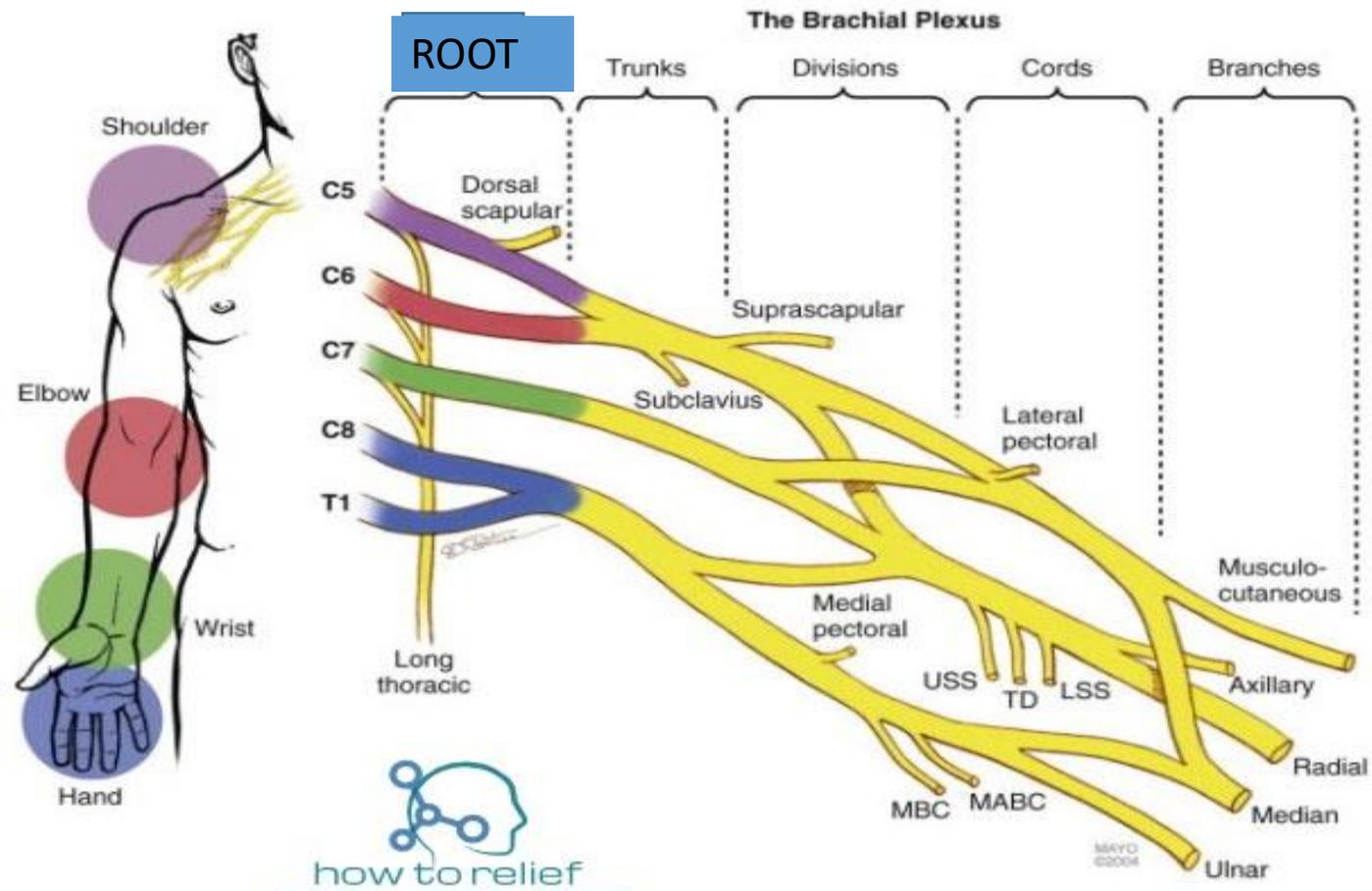
The plexus can be divided into **Roots**, **Trunks**, **Divisions**, and **Cords**.



The sentence “Robert Taylor Drinks Coffee” represents the “ Root (Rami), Trunks, Divisions, Cords” of brachial plexus

The Brachial Plexus (scalene fissure, axilla)

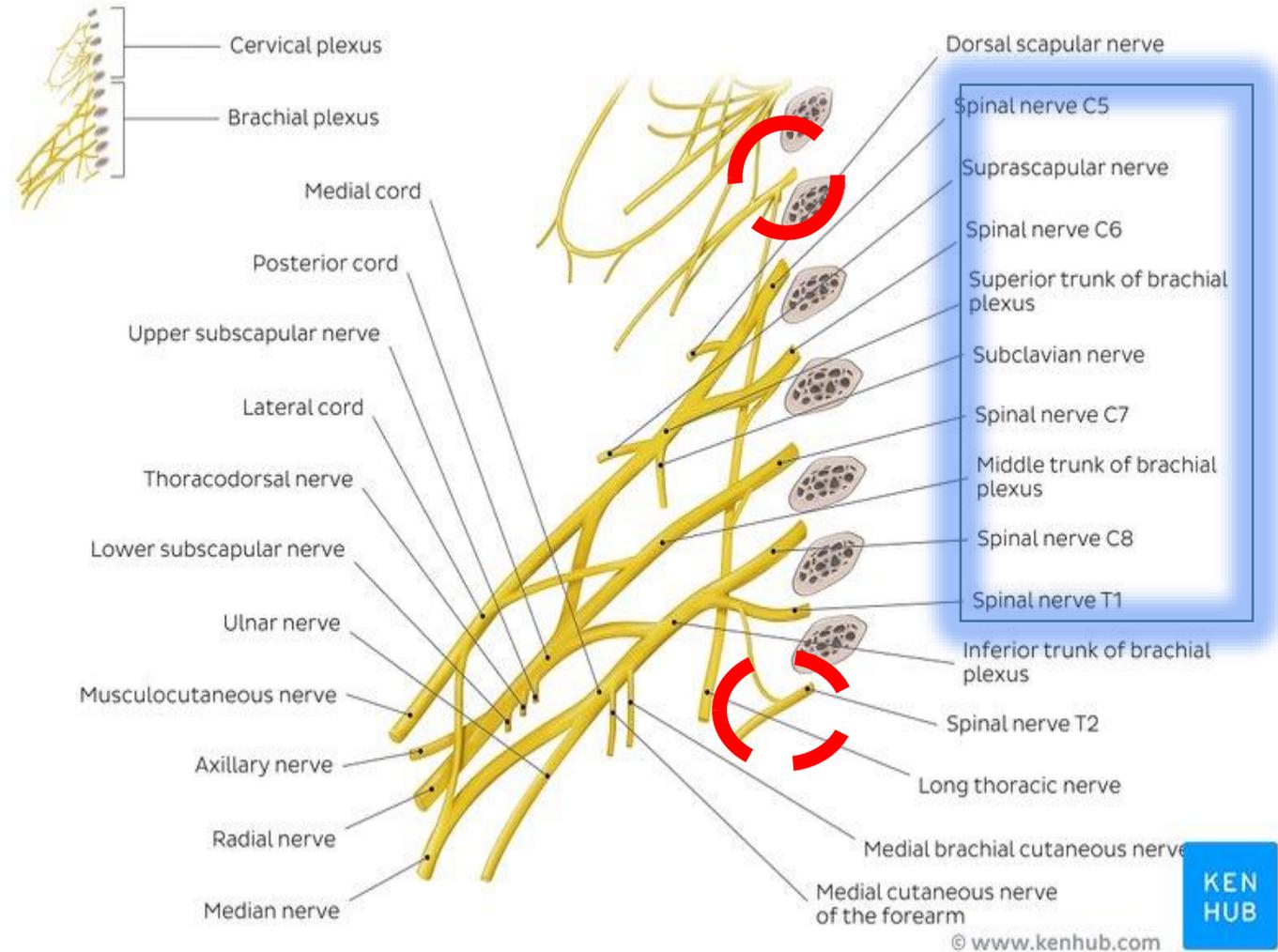
Formation: ROOT of BRACHIAL PLEXUS:
Anterior rami(C5 – T1) in **the posterior triangle of the neck**



Brachial Plexus

Formed by C5-C8 and T1

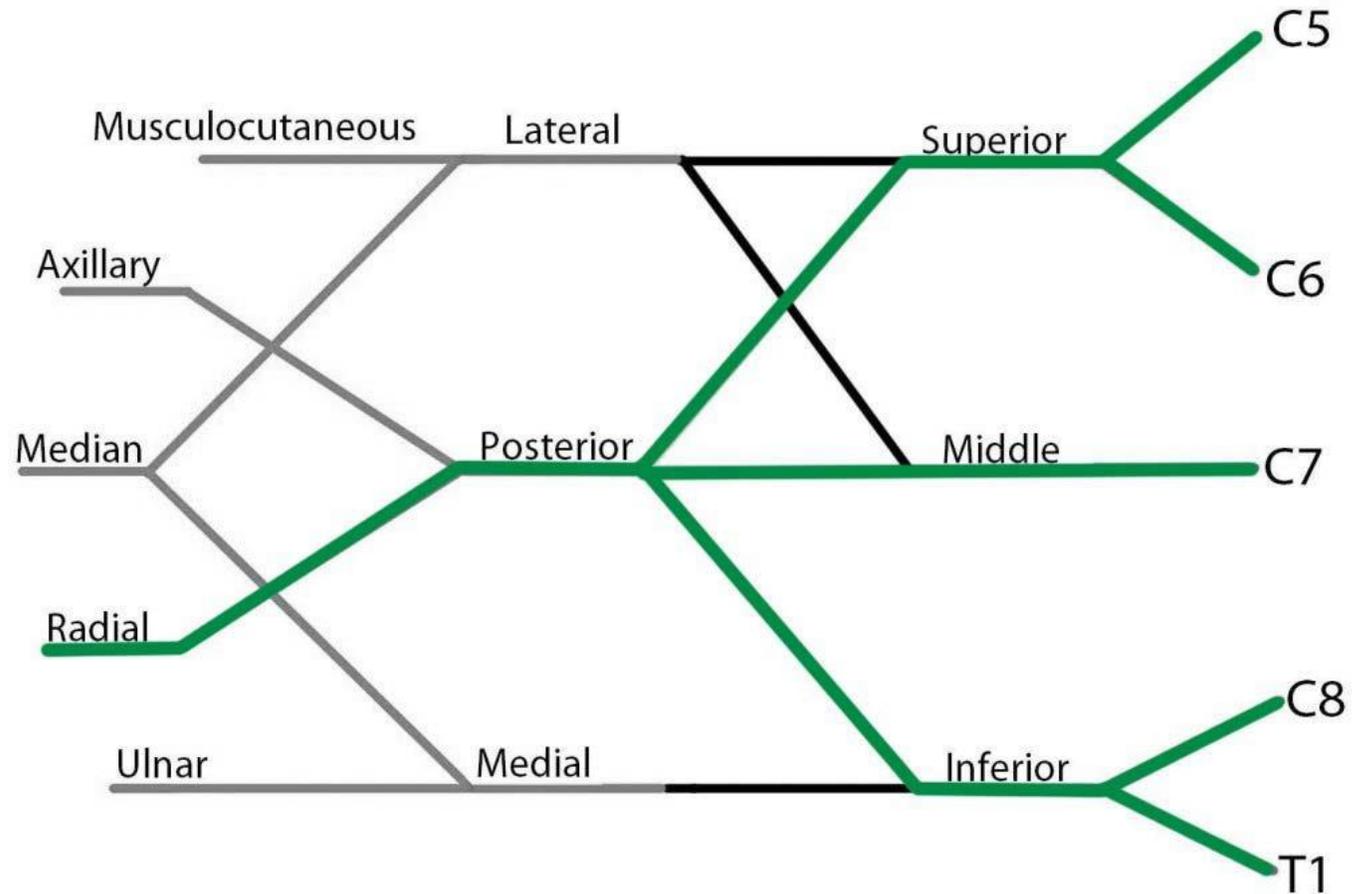
(C4 and T2 **MAY** also contribute to this plexus)
It gives rise to the nerves that innervate the upper limb





Brachial Plexus

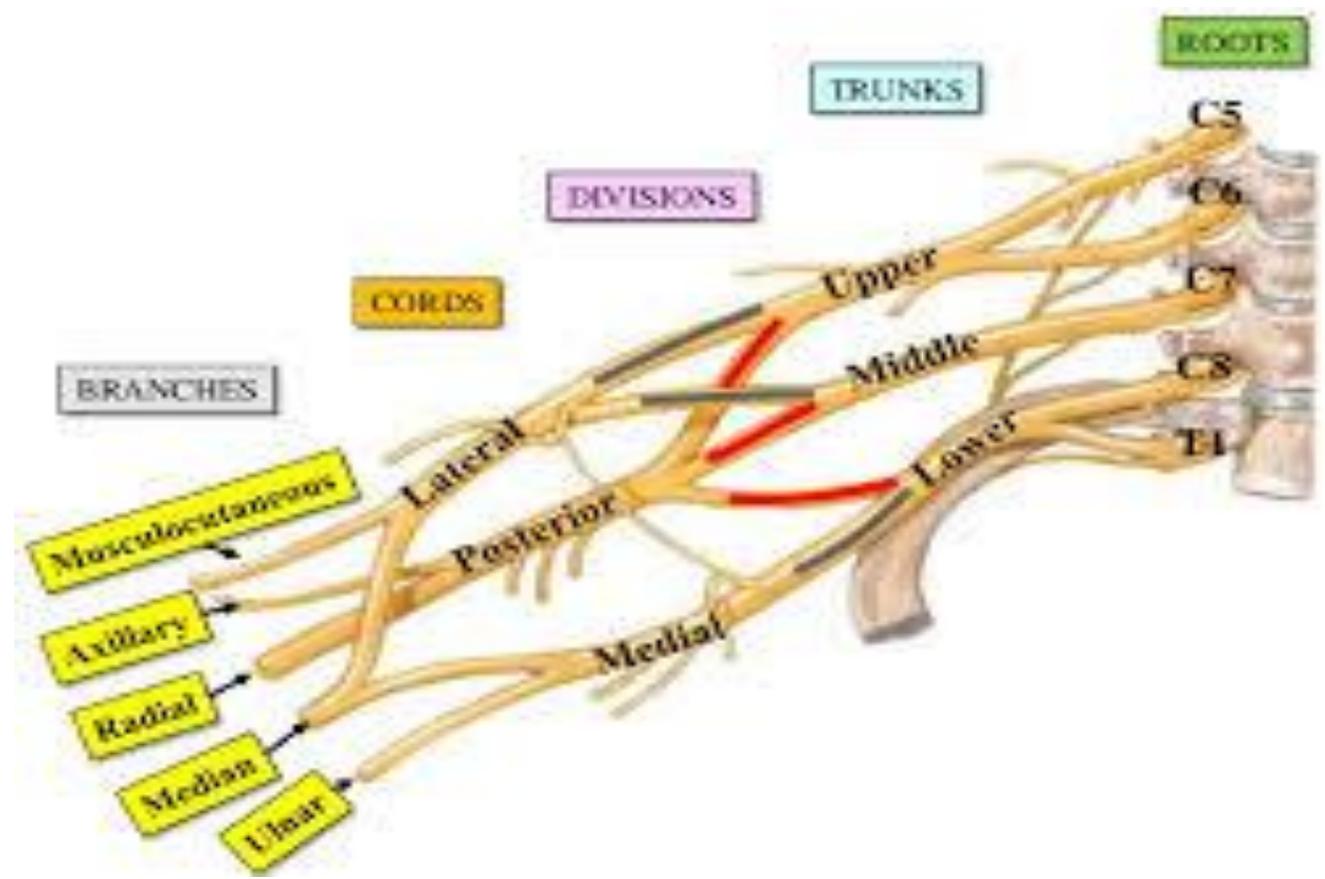
- The roots of **C5** and **C6** unite to form the **upper (superior) trunk**
- The root of **C7** continues as the **middle trunk**
- The roots of **C8** and **T1** unite to form the **lower (inferior) trunk**



Brachial Plexus

Each trunk then divides into **anterior** and **posterior** divisions.

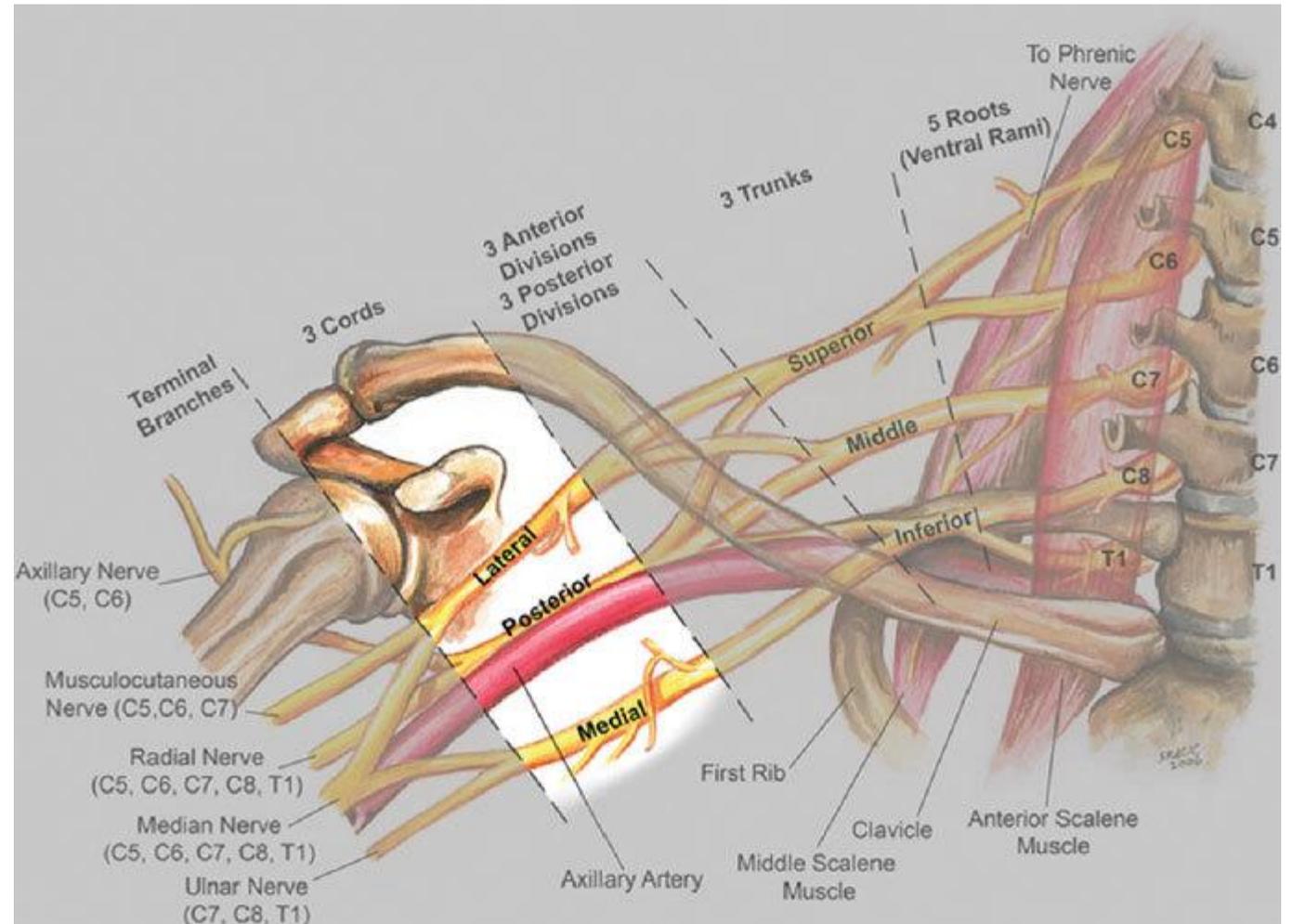
- ✓ **The anterior divisions** of the **upper** and **middle trunks** unite to form **the lateral cord**.
- ✓ **The anterior division** of the **lower trunk** continues as **the medial cord**.
- ✓ **The posterior divisions** of all **three trunks** join to form **the posterior cord**.



Brachial Plexus

❖ The **roots, trunks, and divisions** of the brachial plexus reside in the lower part of the **POSTERIOR TRIANGLE OF THE NECK**

❖ The cords become arranged around **THE AXILLARY ARTERY** in the axilla → the brachial plexus and **THE AXILLARY ARTERY** and **VEIN** are enclosed in **THE AXILLARY SHEATH**.



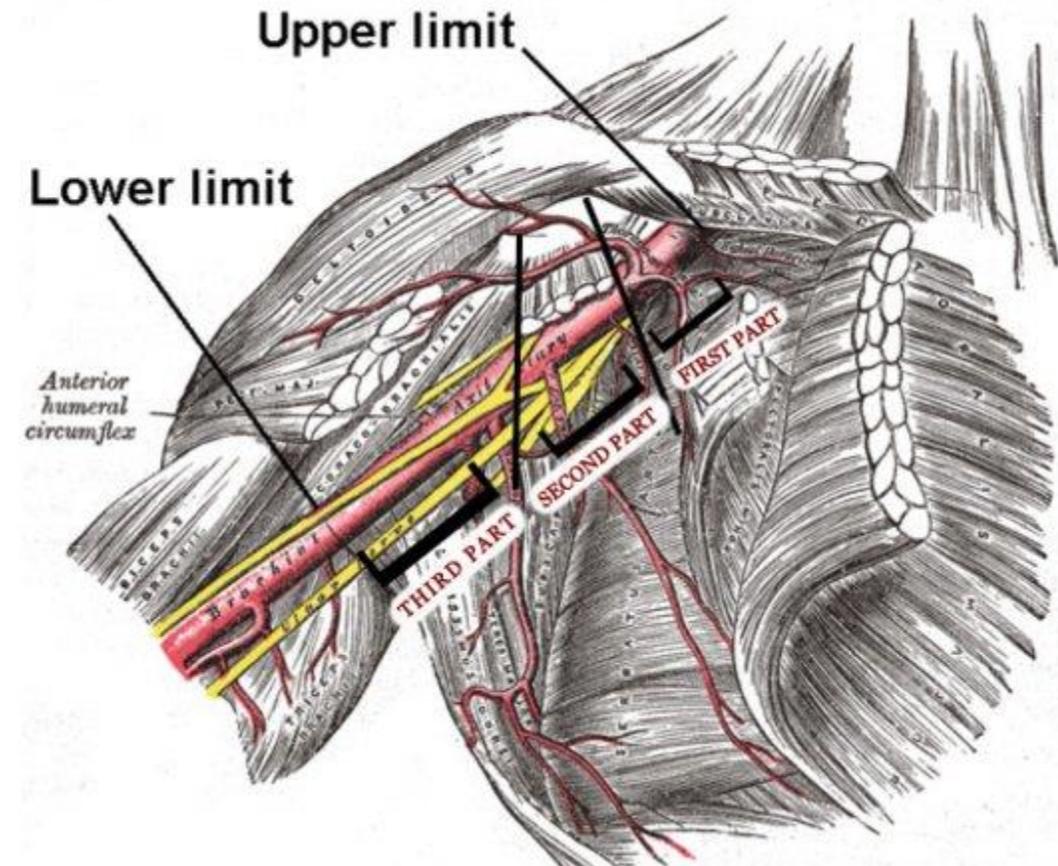
Brachial Plexus

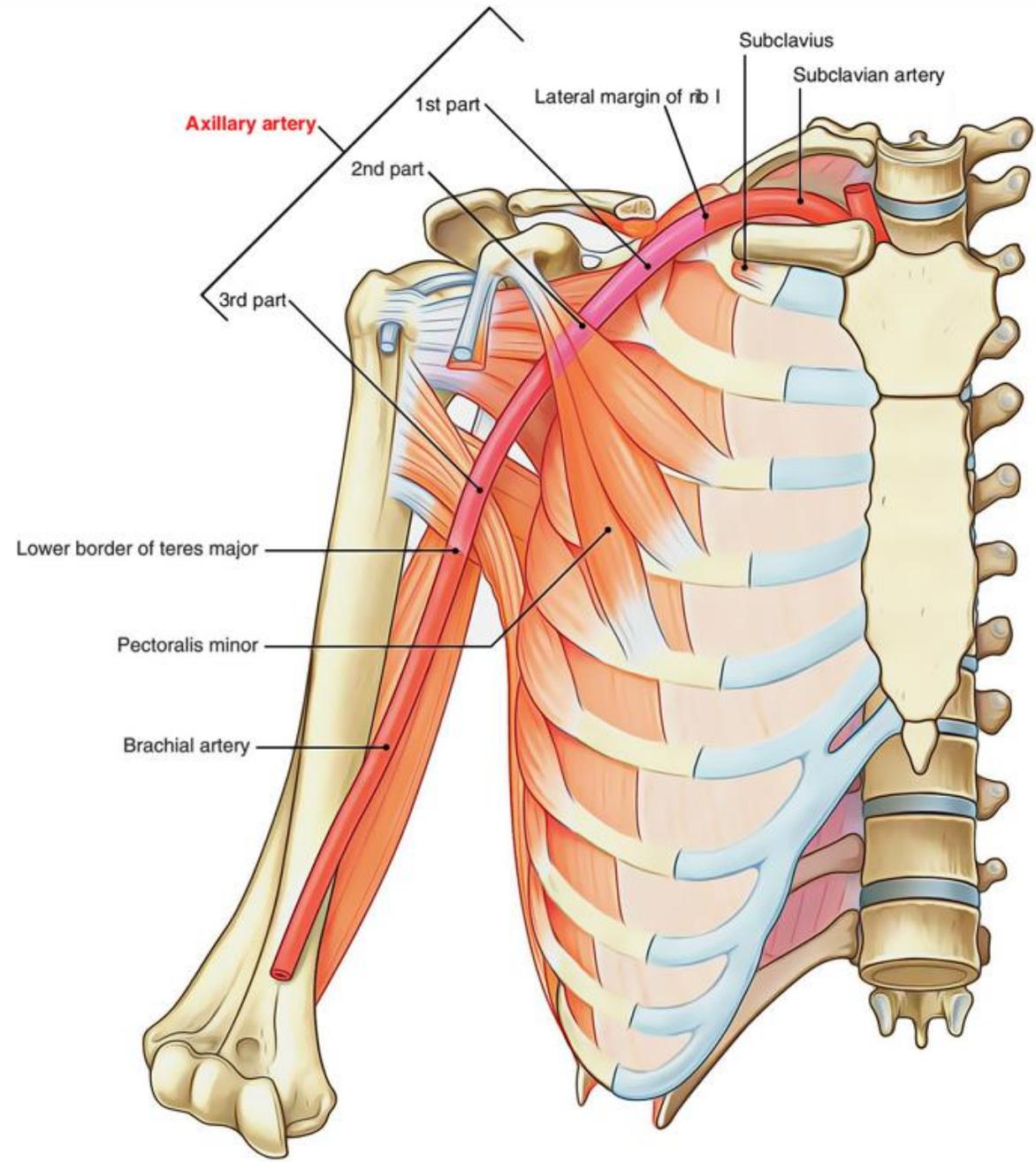
Cords of the Brachial Plexus

All three cords of the brachial plexus lie **above and lateral** to the *first part* of the **axillary artery**.

- ✓ The **MEDIAL CORD** crosses behind the artery to reach the **MEDIAL SIDE** of the **second part** of the artery
- ✓ The **POSTERIOR CORD** lies **BEHIND**(posterior) the **second part** of the artery
- ✓ The **LATERAL cord** lies on the **LATERAL** side of the **second part** of the artery

- ✓ Thus, the cords of the plexus have the relationship to the second part of **the axillary artery** that is indicated by their names.





Brachial Plexus

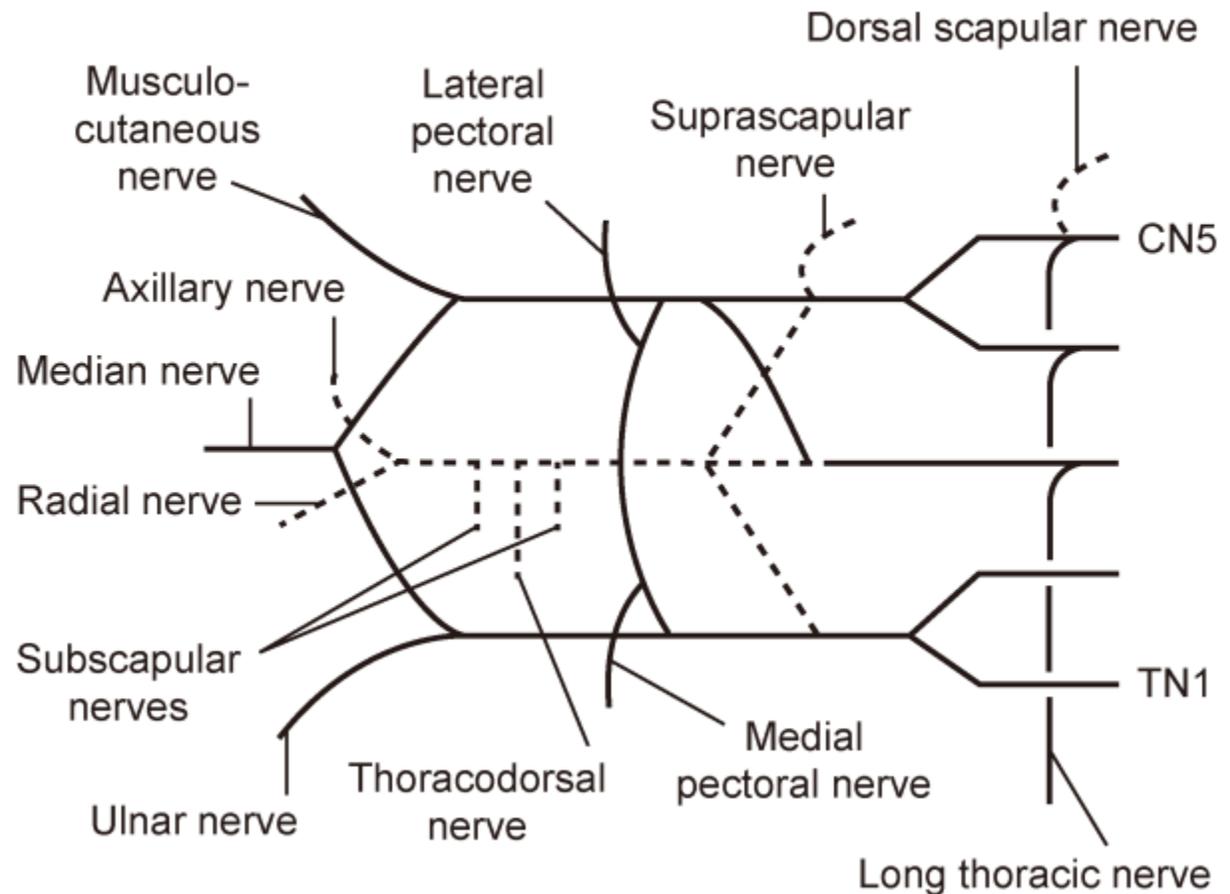
The branches of the different parts of the brachial plexus are as follows:

Roots

- ✓ Dorsal scapular nerve (C5) Rhomboid minor, rhomboid major, levator scapulae muscle
- ✓ Long thoracic nerve (C5, 6, 7) Serratus anterior muscle

Upper Trunk

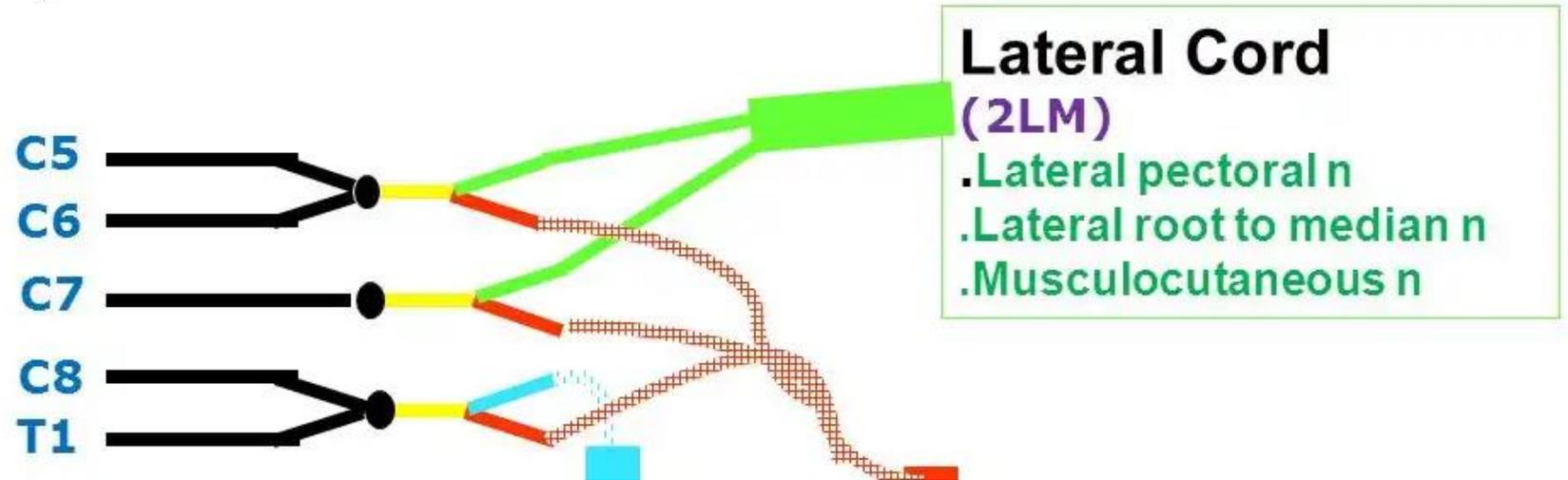
- ✓ Suprascapular nerve (C5, 6) Supraspinatus and infraspinatus muscles
- ✓ Nerve to subclavius (C5, 6) Subclavius



Brachial Plexus

Lateral Cord

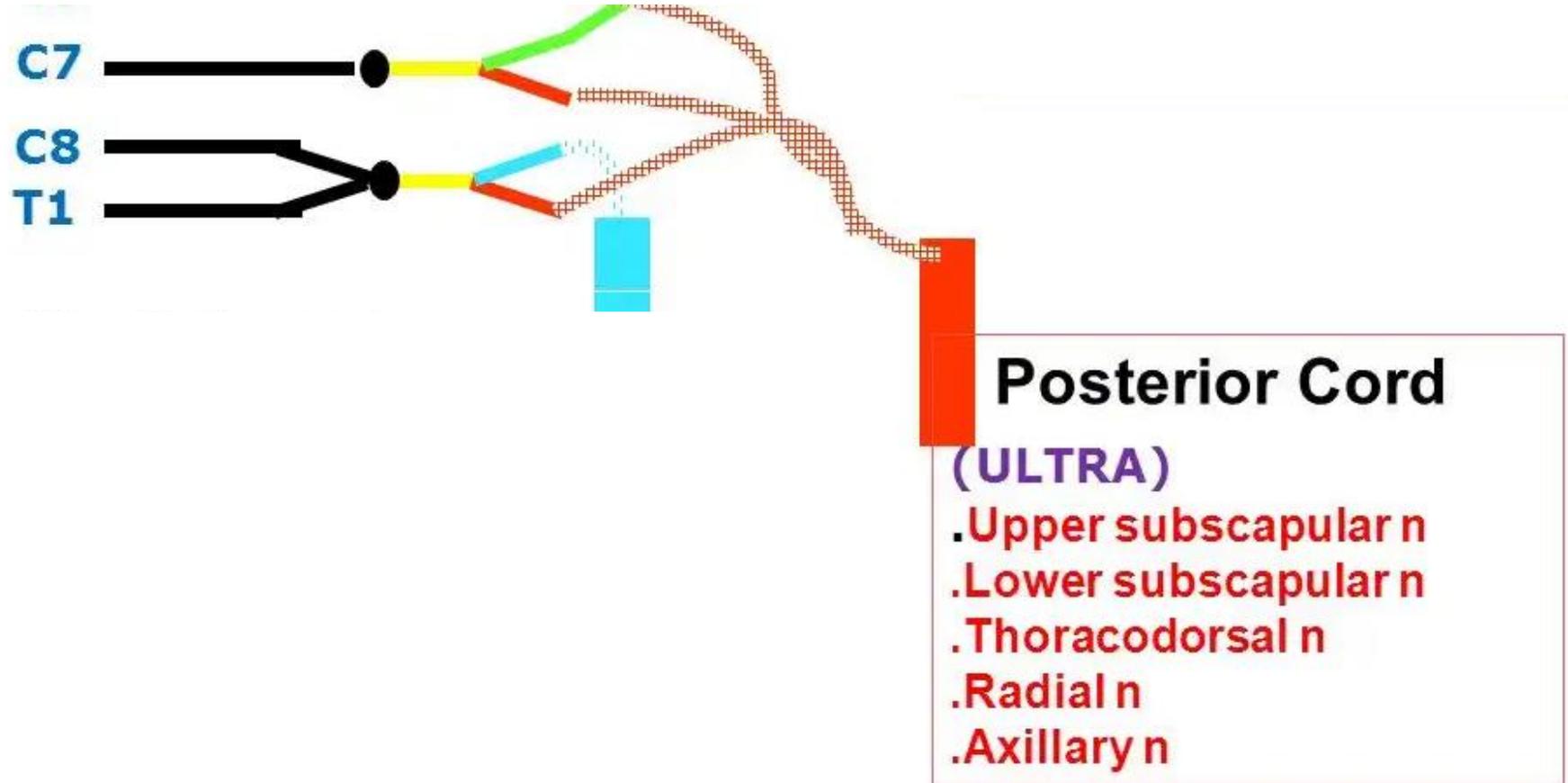
1. Lateral pectoral nerve
(C5, 6, 7) Pectoralis major muscle
2. Musculocutaneous nerve
(C5, 6, 7) (BBC NERVE)
Coracobrachialis, biceps brachii, brachialis muscles; supplies skin along lateral border of forearm when it becomes the lateral cutaneous nerve of forearm
3. Lateral root of median nerve (C5, 6, 7)



Brachial Plexus

Posterior Cord

1. Upper subscapular nerve (C5, 6) Subscapularis muscle
2. Lower subscapular nerve (C5, 6) Subscapularis and teres major muscles
3. Thoracodorsal nerve (C6, 7, 8) Latissimus dorsi muscle
4. Axillary nerve (C5, 6) Deltoid and teres minor muscles; upper lateral cutaneous nerve of arm supplies skin over lower half of deltoid muscle



Brachial Plexus

Posterior Cord

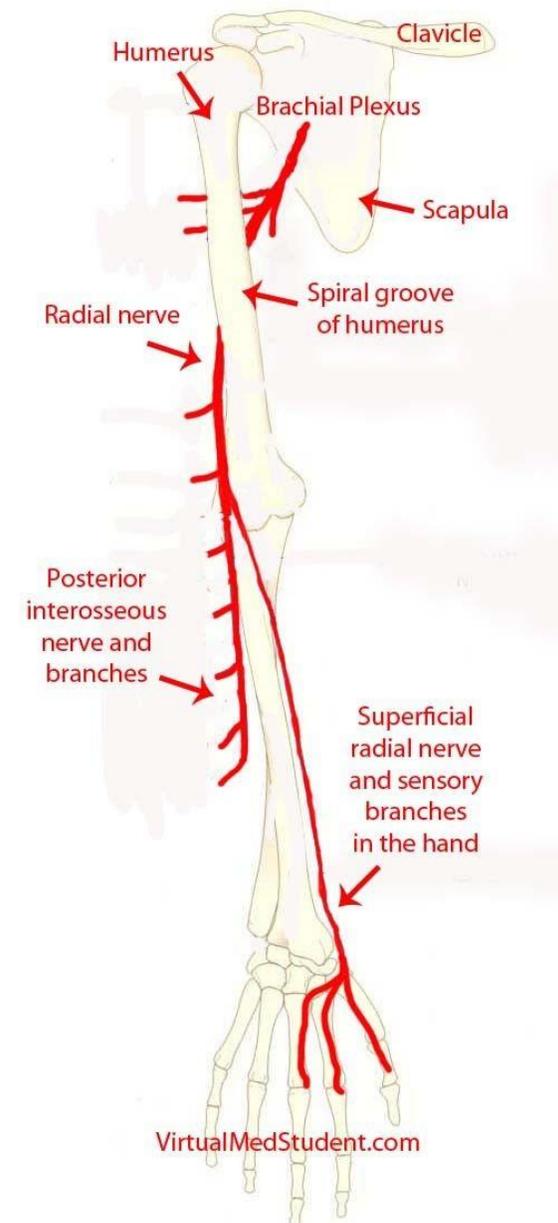
5. Radial nerve (C5, 6, 7, 8; T1)

On leaving the axilla, the radial nerve immediately enters the **posterior compartment of the arm** → and enters **the anterior compartment just above the lateral epicondyle**.

It passes forward into **the cubital fossa**.

At the level of the lateral epicondyle, it divides into **superficial** and **deep branches**

Radial Nerve Anatomy



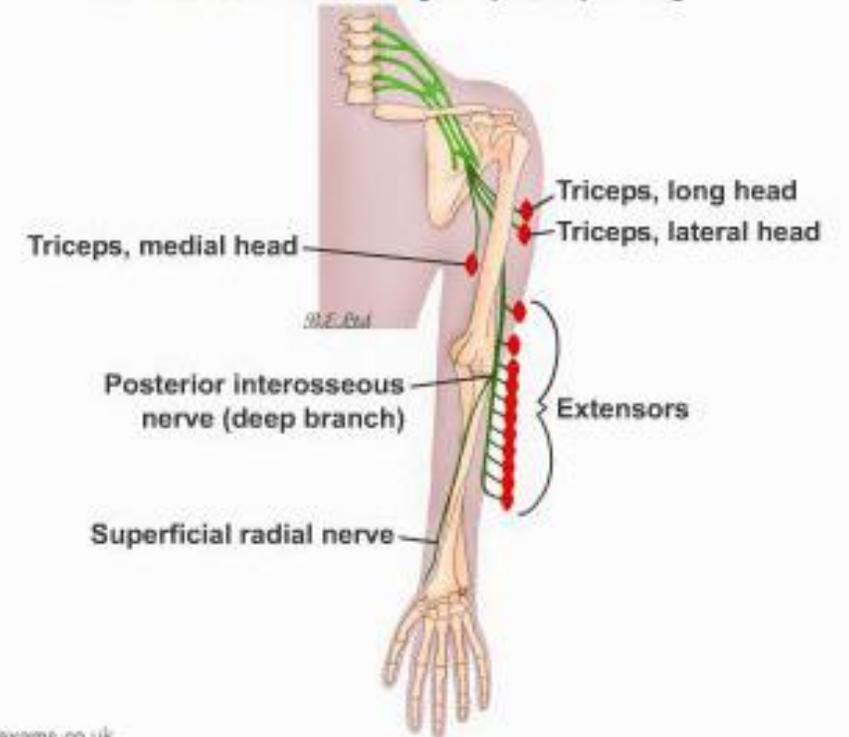
Posterior Cord

✓ Radial nerve (C5, 6, 7, 8; T1)

➤ Branches

- **Muscular branches** to the brachioradialis, to the extensor carpi radialis longus, and a small branch to the lateral part of the brachialis muscle
- **Articular branches to the elbow joint**
- **Deep branch of the radial nerve.**
- **Superficial branch of the radial nerve**

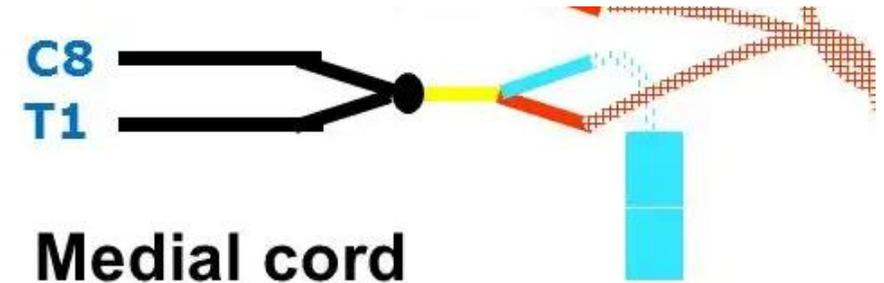
Radial nerve (C6, C7, C8)



Brachial Plexus

Medial Cord

- ❖ Medial pectoral nerve (C8; T1) Pectoralis major and minor muscle
- ❖ Medial cutaneous nerve of arm joined by intercostal brachial nerve from second intercostal nerve (C8; T1, 2)
Skin of medial side of arm
- ❖ Medial cutaneous nerve of forearm (C8; T1) Skin of medial side of forearm



Medial cord

(4MU)

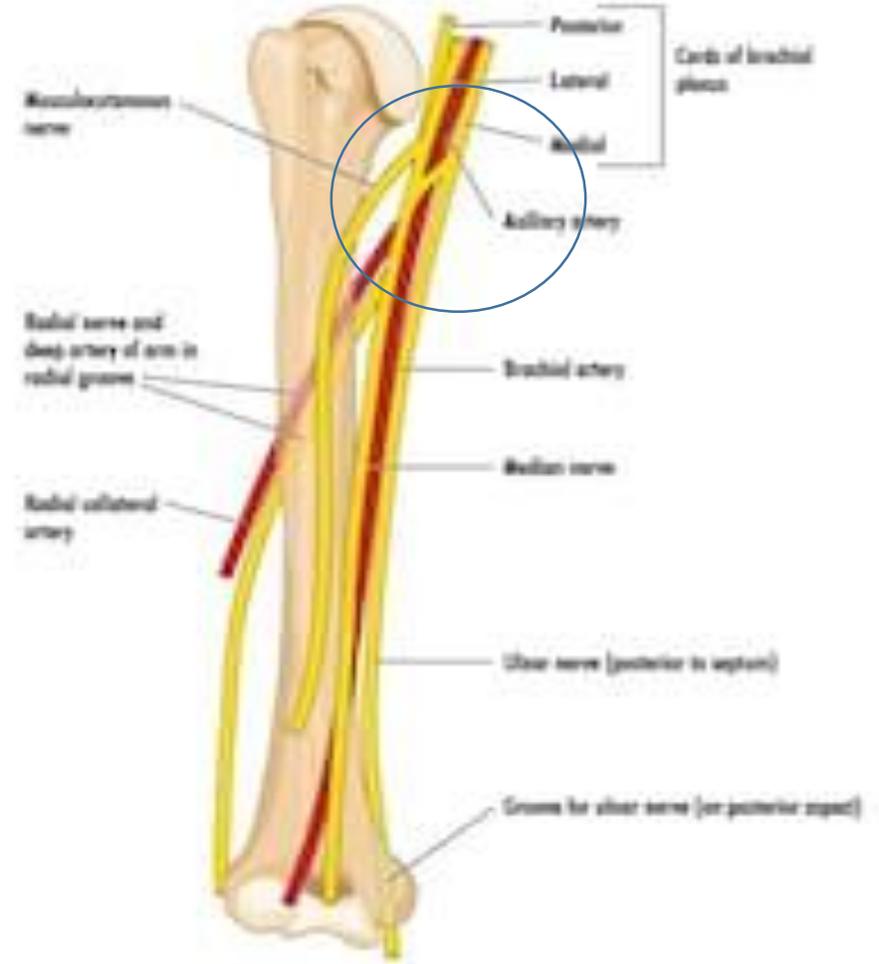
- .Medial pectoral n.
- .Medial root to median n.
- .Medial cutaneous n of arm.
- .Medial cutaneous n of forearm.
- .Ulnar n.

Brachial Plexus

Medial Cord

❖ Medial root of median nerve (with lateral root) forms Median nerve (C5, 6, 7, 8; T1)

✓ The median nerve has NO branches in the upper arm except for a small vasomotor nerve to the brachial artery.

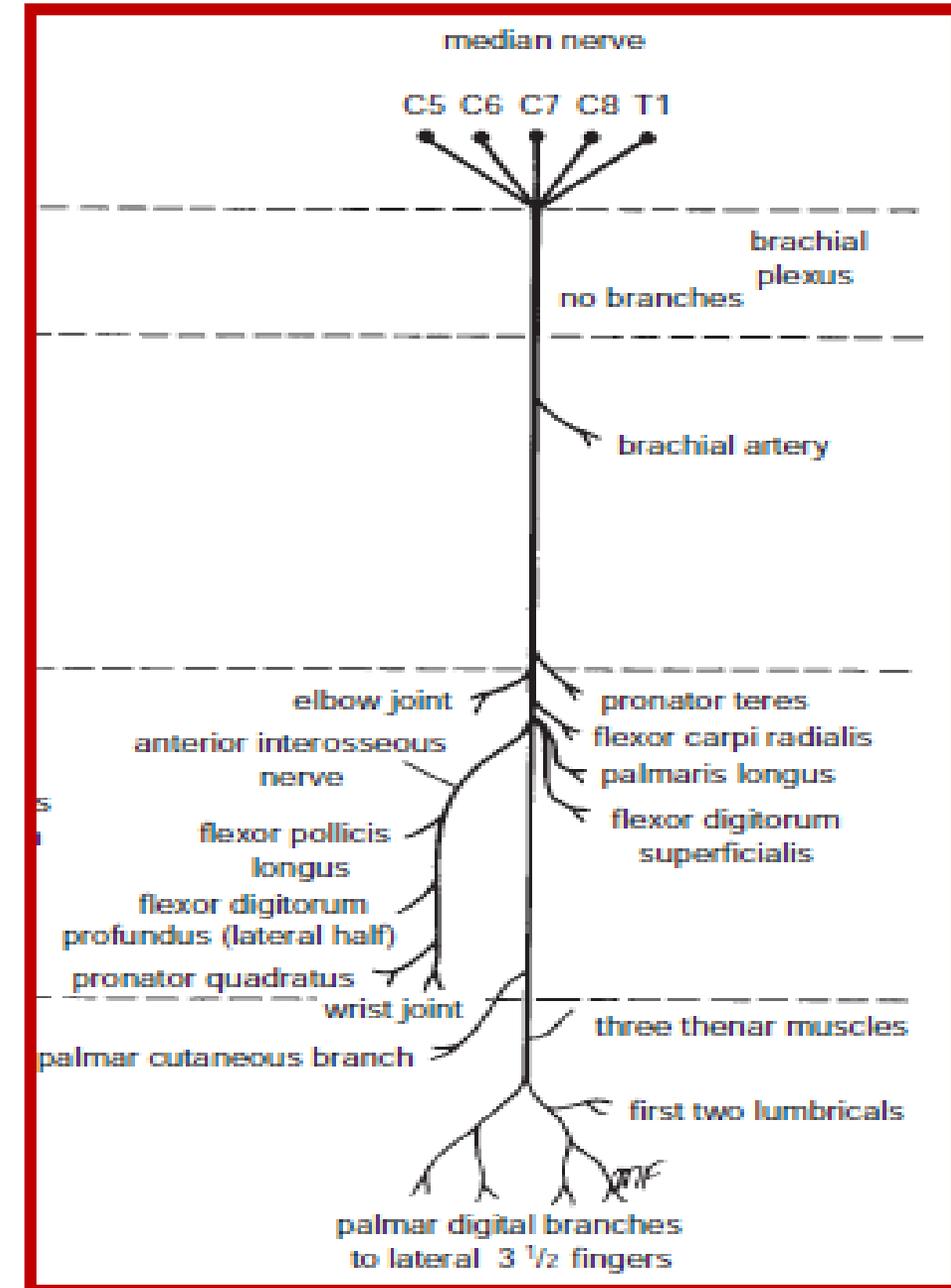


Medial Cord

❖ Median nerve (C5, 6, 7, 8; T1)

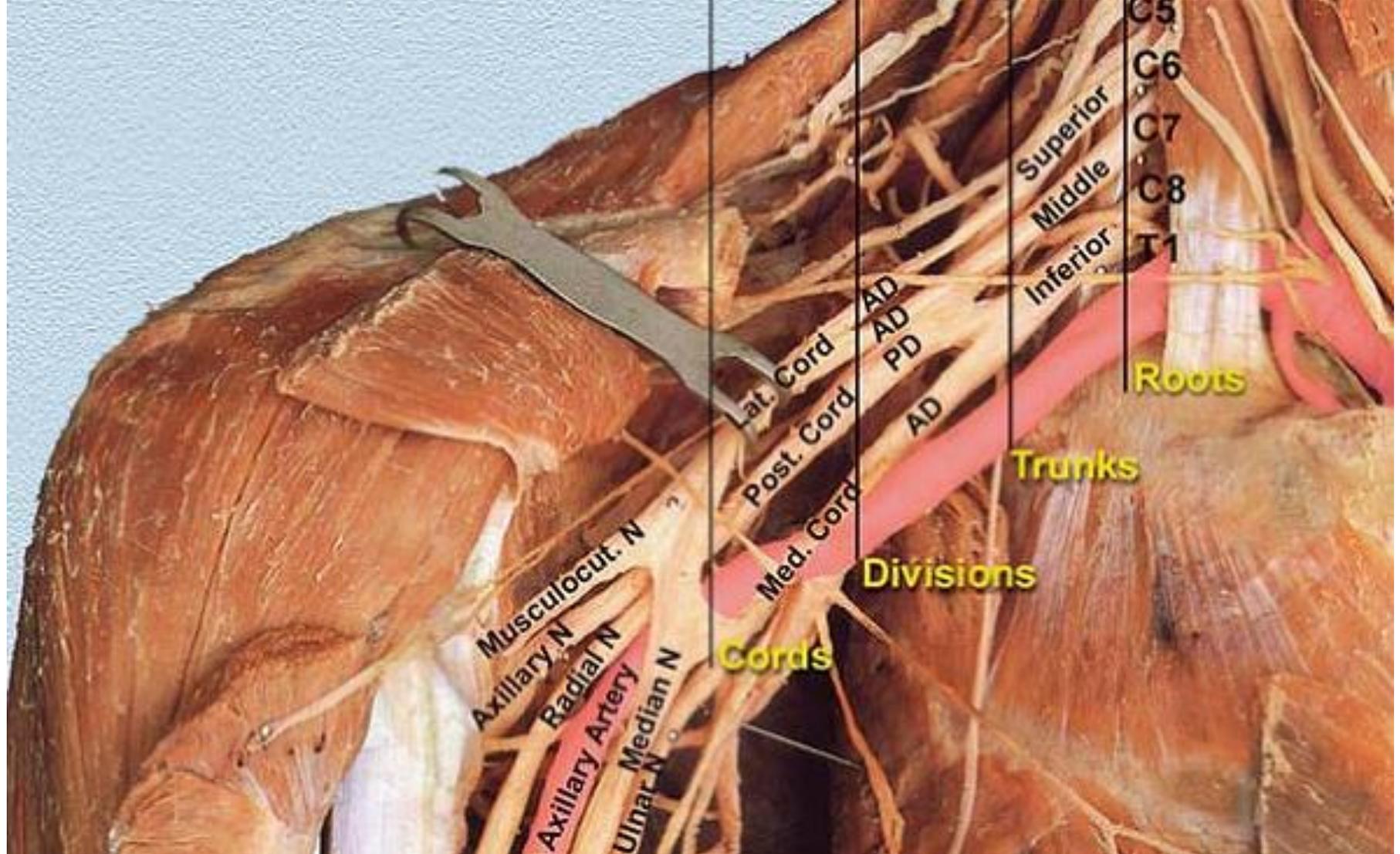
Branches

- **Muscular branches** in the cubital fossa to the pronator teres, the flexor carpi radialis, the palmaris longus, and the flexor digitorum superficialis
- **Articular branches to the elbow joint**
- **Anterior interosseous nerve**
- **Palmar cutaneous branch.** is distributed to the skin over the lateral part of the palm



Branches of brachial plexus

| Lateral Cord | Medial Cord | Posterior Cord |
|------------------------------|---|---------------------------|
| <i>m</i> - Lucy Loves Me | <i>m</i> - Most Medical Men Uses Morphine | <i>m</i> - ULNAR |
| Lateral pectoral nerve | Medial cutaneous nerve of arm | Upper subscapular nerve |
| Lateral root of median nerve | Medial cutaneous nerve of forearm | Lower subscapular nerve |
| Musculocutaneous nerve | Medial pectoral nerve | Nerve to Latissimus dorsi |
| | Ulnar nerve | Axillary nerve |
| | Medial root of median nerve | Radial nerve |



| BRANCHES | MOTOR SUPPLY |
|---|--|
| ROOT | |
| Dorsal scapular nerve (C5) | Rhomboid minor, rhomboid major, levator scapulae muscles |
| Long thoracic nerve (C5, 6, 7) Serratus anterior muscle | Serratus anterior muscle |
| UPPER (SUPERIOR) TRUNK | |
| Suprascapular nerve (C5, 6) | Supraspinatus and infraspinatus muscles |
| Nerve to Subclavius (C5, 6) | Subclavius |
| Lateral Cord | |
| Lateral pectoral nerve (C5, 6, 7) | Pectoralis major muscle |
| Musculocutaneous nerve (C5, 6, 7) | Coracobrachialis, biceps brachii, brachialis muscles |
| Lateral root of median nerve (C5, 6, 7) | |

| BRANCHES | MOTOR SUPPLY |
|---|--|
| Posterior Cord | |
| Upper subscapular nerve (C5, 6) | Subscapularis muscle |
| Thoracodorsal nerve (C6, 7, 8) [Nerve to Latissimus dorsi muscle] | Latissimus dorsi muscle |
| Lower subscapular nerve (C5, 6) | Subscapularis and teres major muscles |
| Axillary nerve (C5, 6) | Deltoid and teres minor muscles |
| Radial nerve (C5, 6, 7, 8; T1) | <p>ARM: Triceps, part of brachialis</p> <p>FOREARM: anconeus, extensor carpi radialis longus.</p> <p>deep radial nerve:</p> <p>EXTENSOR MUSCLES OF FOREARM: supinator, extensor carpi radialis brevis, extensor carpi ulnaris, extensor digitorum.</p> <p>EXTENSOR MUSCLES OF THE HAND: extensor digiti minimi, extensor indicis, abductor pollicis longus, extensor pollicis longus, extensor pollicis brevis</p> |

| BRANCHES | MOTOR SUPPLY |
|---|--|
| MEDIAL CORD | |
| Medial pectoral nerve (C8; T1) | Pectoralis major and minor muscles |
| Ulnar nerve (C8; T1) | Flexor carpi ulnaris, medial half of flexor digitorum profundus, flexor digiti minimi, opponens digiti minimi, abductor digiti minimi, adductor pollicis, third and fourth lumbricals, interossei, palmaris brevis. |
| Medial root of median nerve (with lateral root) forms median nerve (C5, 6, 7, 8; T1) | Pronator teres, flexor carpi radialis, palmaris longus, flexor digitorum superficialis, abductor pollicis brevis, flexor pollicis brevis, opponens pollicis, first two lumbricals (by way of anterior Interosseous branch), flexor pollicis longus, flexor digitorum profundus (lateral half), pronator quadratus. |