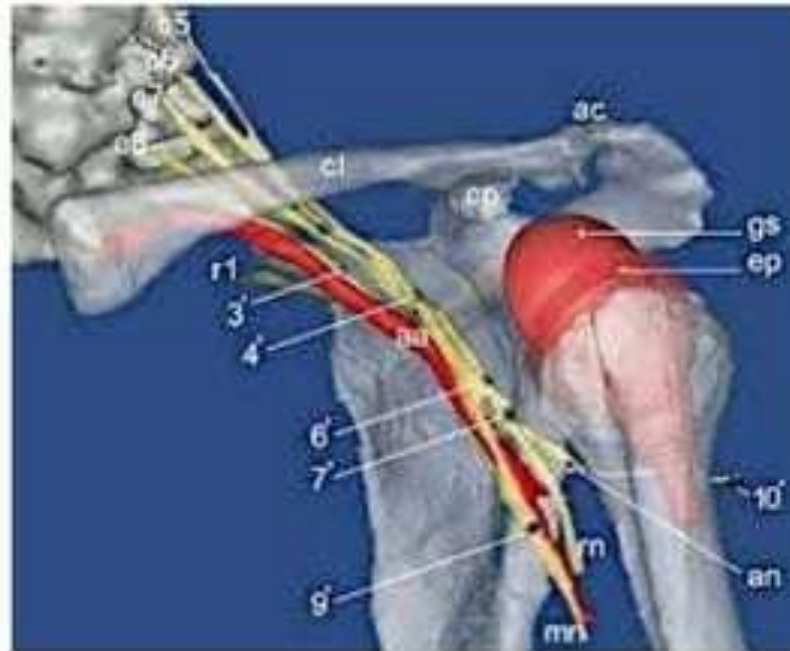


BRACHIAL PLEXUS



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NAIHS

Objective

At the end of this class students should be able to

- Draw diagram of brachial plexus with all branches
- Enumerate the root value of all branches of brachial plexus
- Identify lesions of brachial plexus

- What is a spinal Nerve?

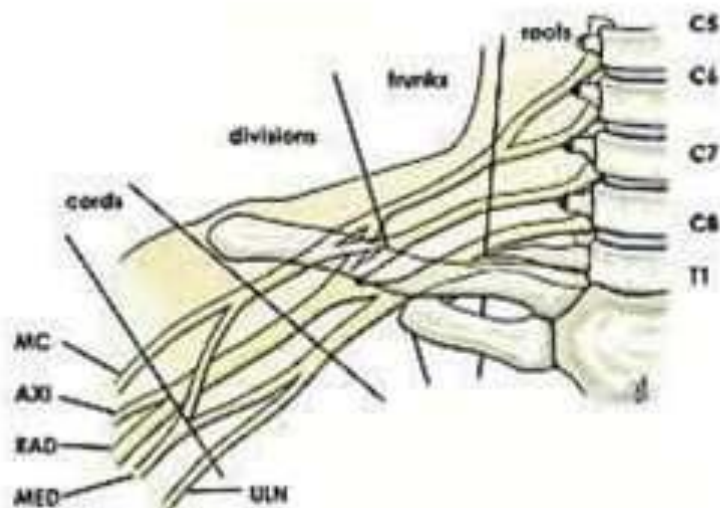
INTRODUCTION

- Network of nerves
- Lies in neck and axilla
- Formed by ventral rami of C5 to T1 (**roots**)
- Gives rise to nerves - innervate upper limb



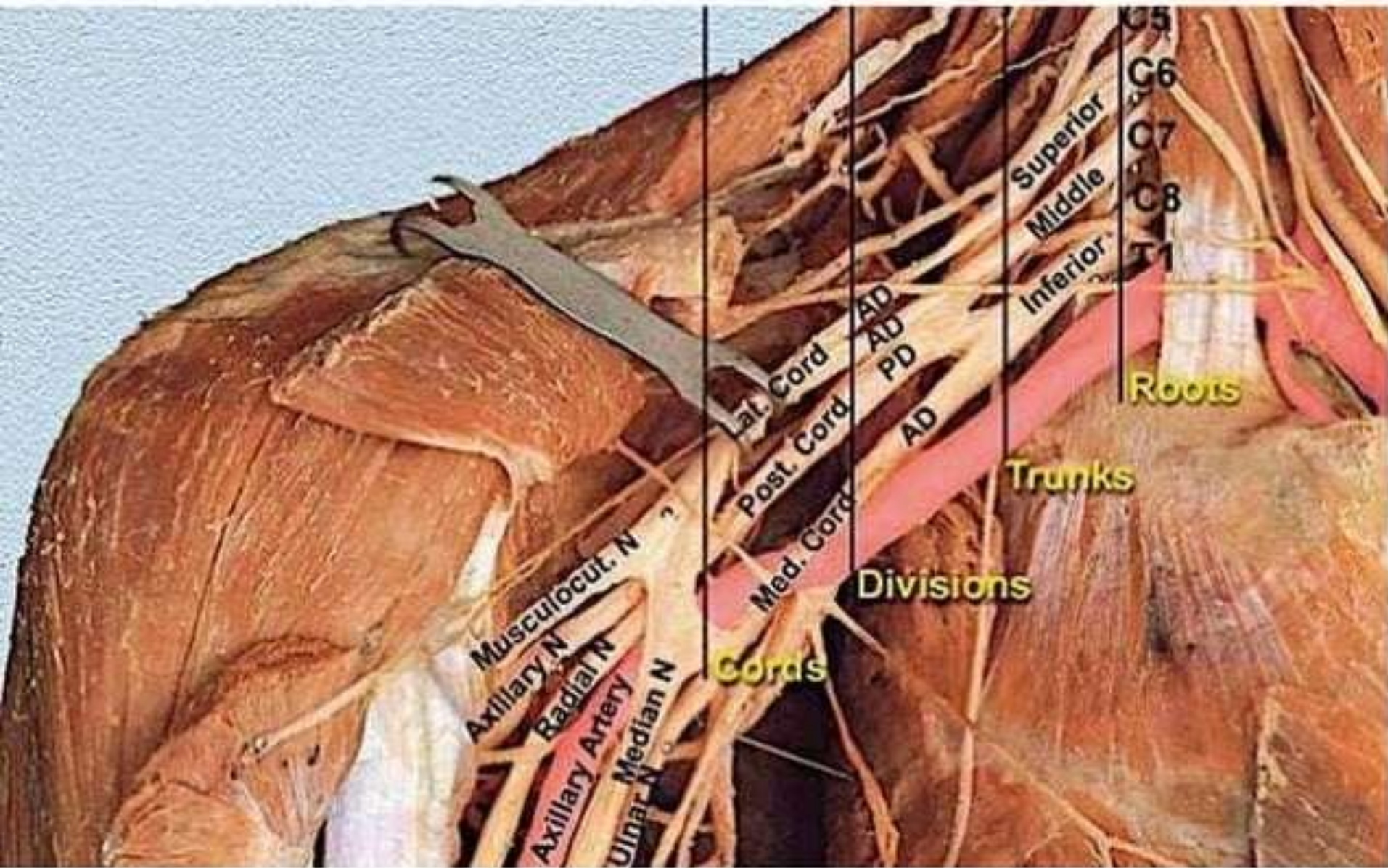
COMPONENT PARTS

- **ROOTS** - Five ventral rami (C₅-T₁)
- **TRUNKS** – Upper, Middle, and Lower
- **DIVISIONS** – Anterior & Posterior from each trunk, serve - front and back of limb..???
- **CORDS** – Lateral, Medial and Posterior
- **BRANCHES**



Location

- **Roots**– Behind scalenus anterior, emerge between scalene muscles
- **Trunks** -cross lower part of posterior triangle of neck
- **Divisions** - behind clavicle
- **Cords** - arranged around 2nd part of Axillary art in axilla
- Supraclavicular part - roots and trunks
- Infraclavicular part – cord and branches

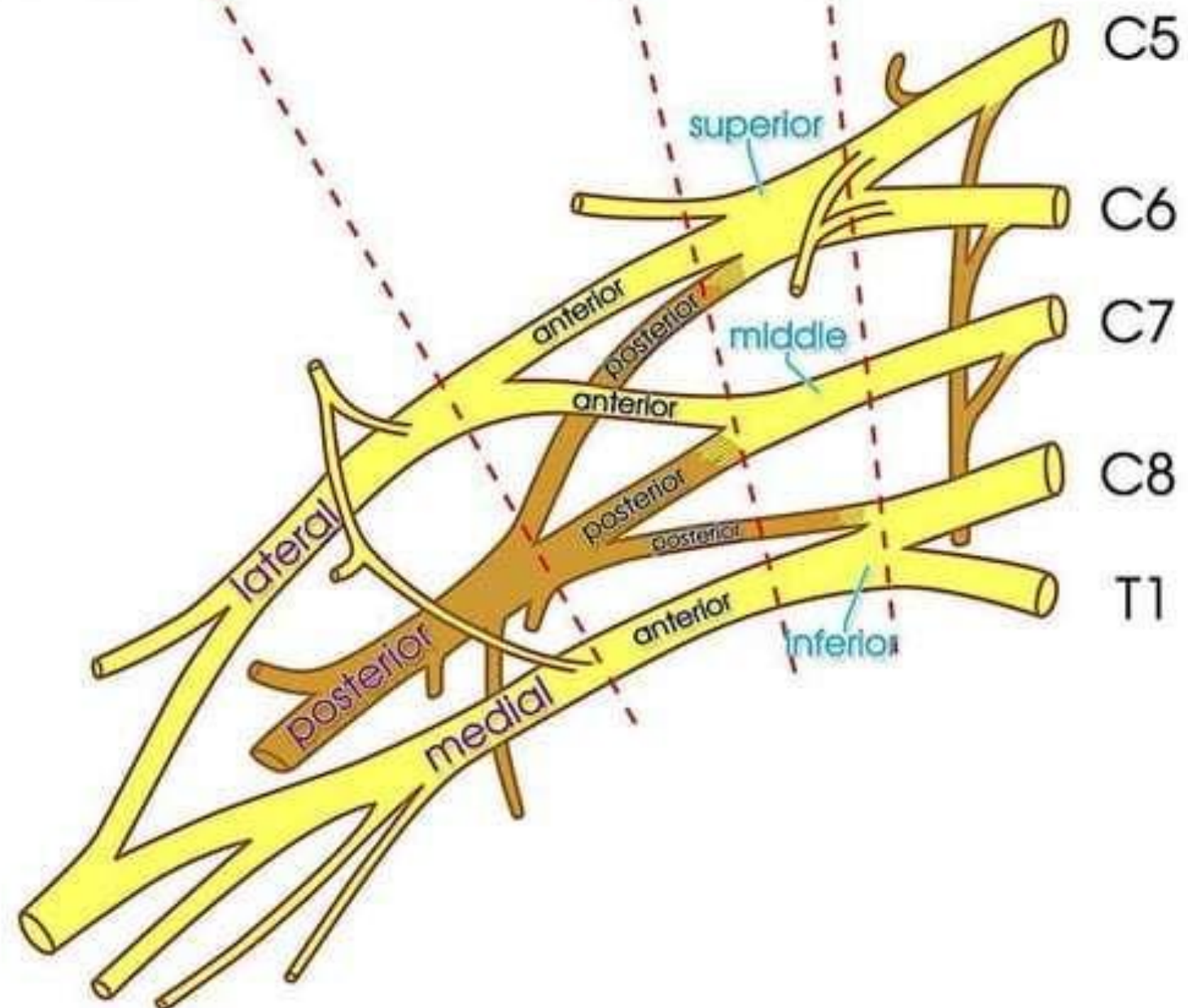


Cords

Divisions

Trunks

Roots



C5

C6

C7

C8

T1

superior

middle

inferior

anterior

anterior

posterior

posterior

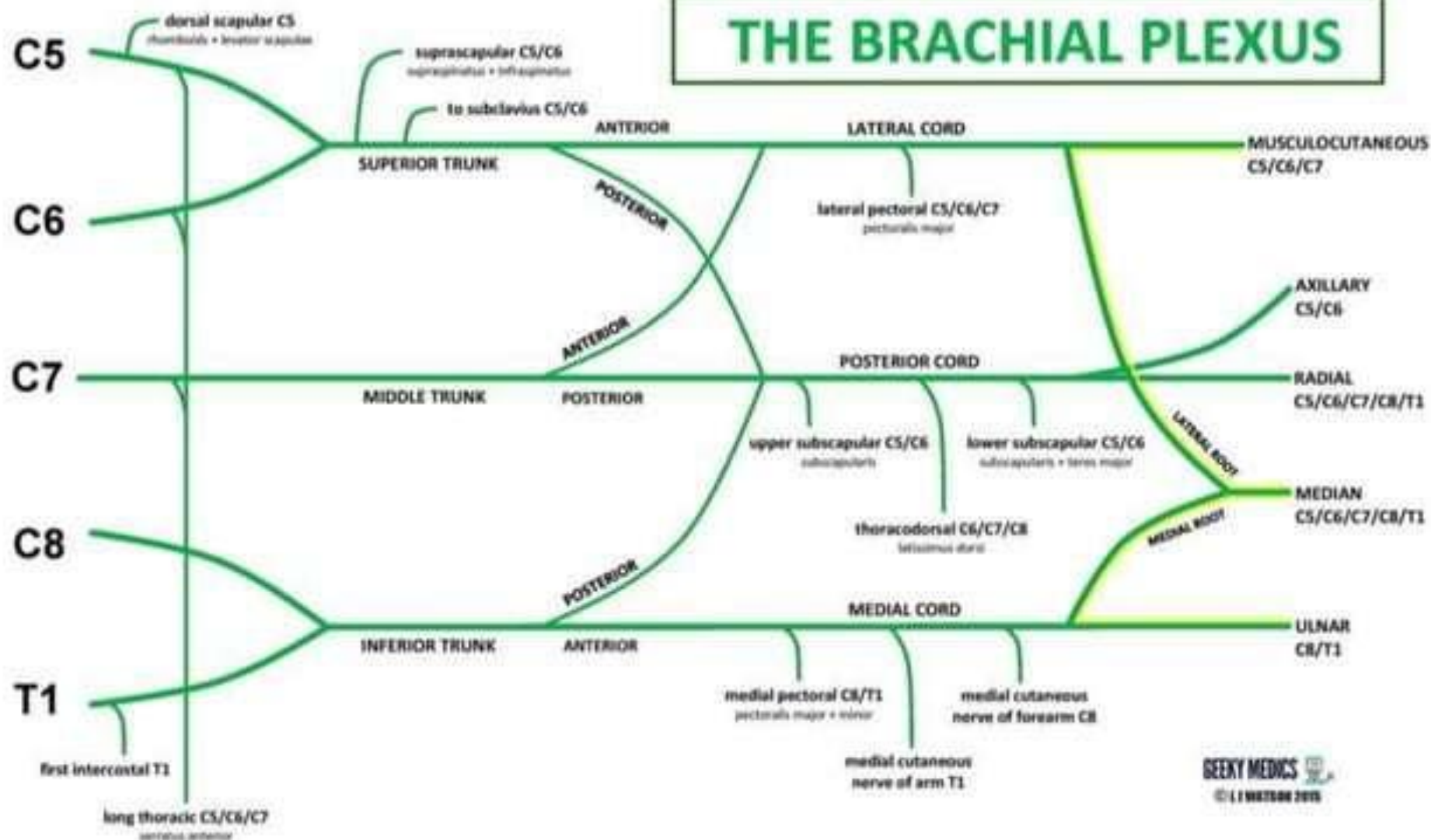
anterior

lateral

posterior

medial

THE BRACHIAL PLEXUS



GEEKY MEDICS
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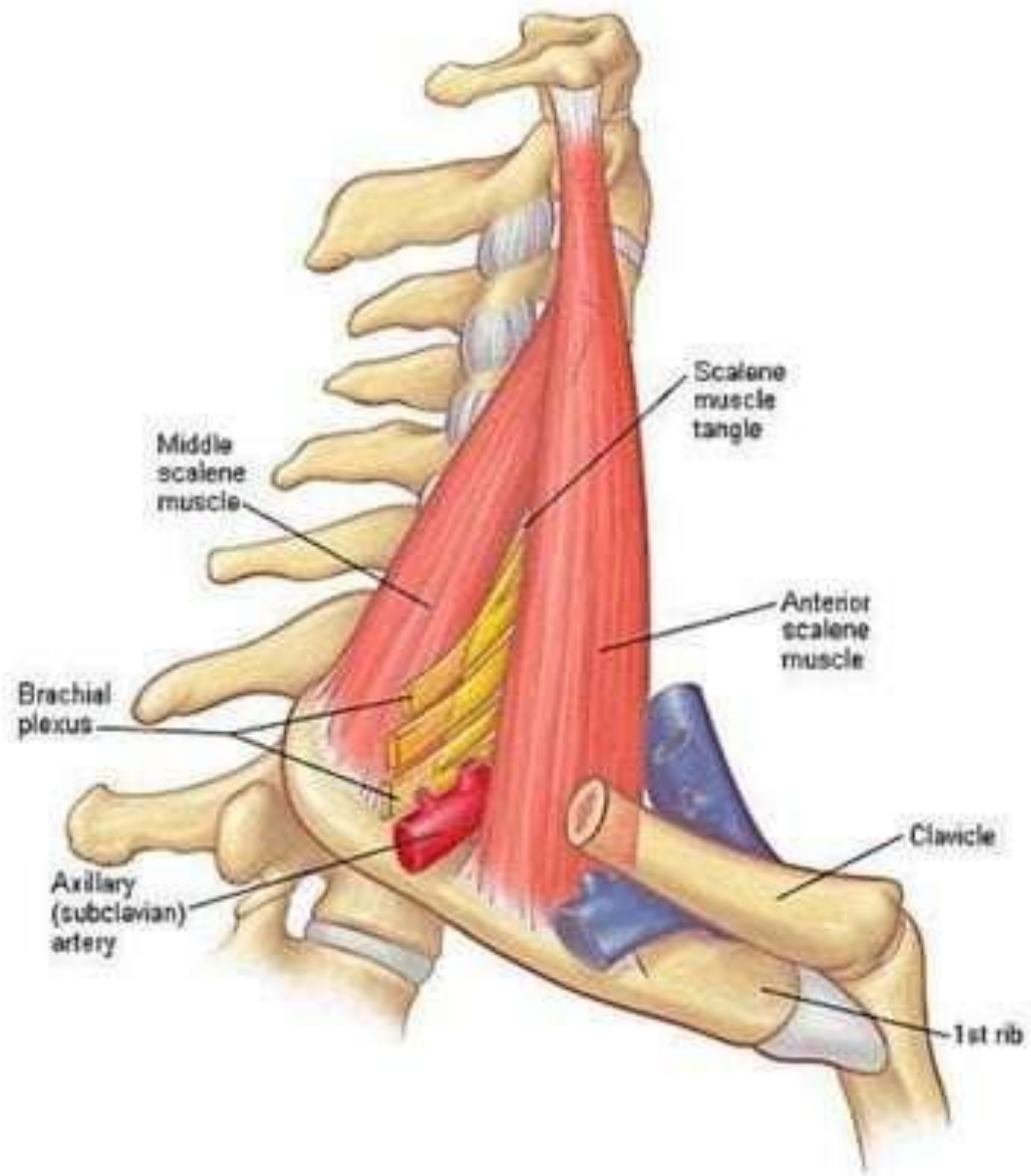
NERVE ROOTS x 5
(C5, C6, C7, C8, T1)
with vertebral foramina between anterior and medial scalene muscles in posterior triangle of neck
⊕ 2 EXTRA BRANCHES ⊕
dorsal scapular, first intercostal, long thoracic

TRUNKS x 3
(superior, middle, inferior)
cross posterior triangle, over first rib, behind subclavian artery
⊕ 2 EXTRA BRANCHES ⊕
suprascapular, n. to subclavius

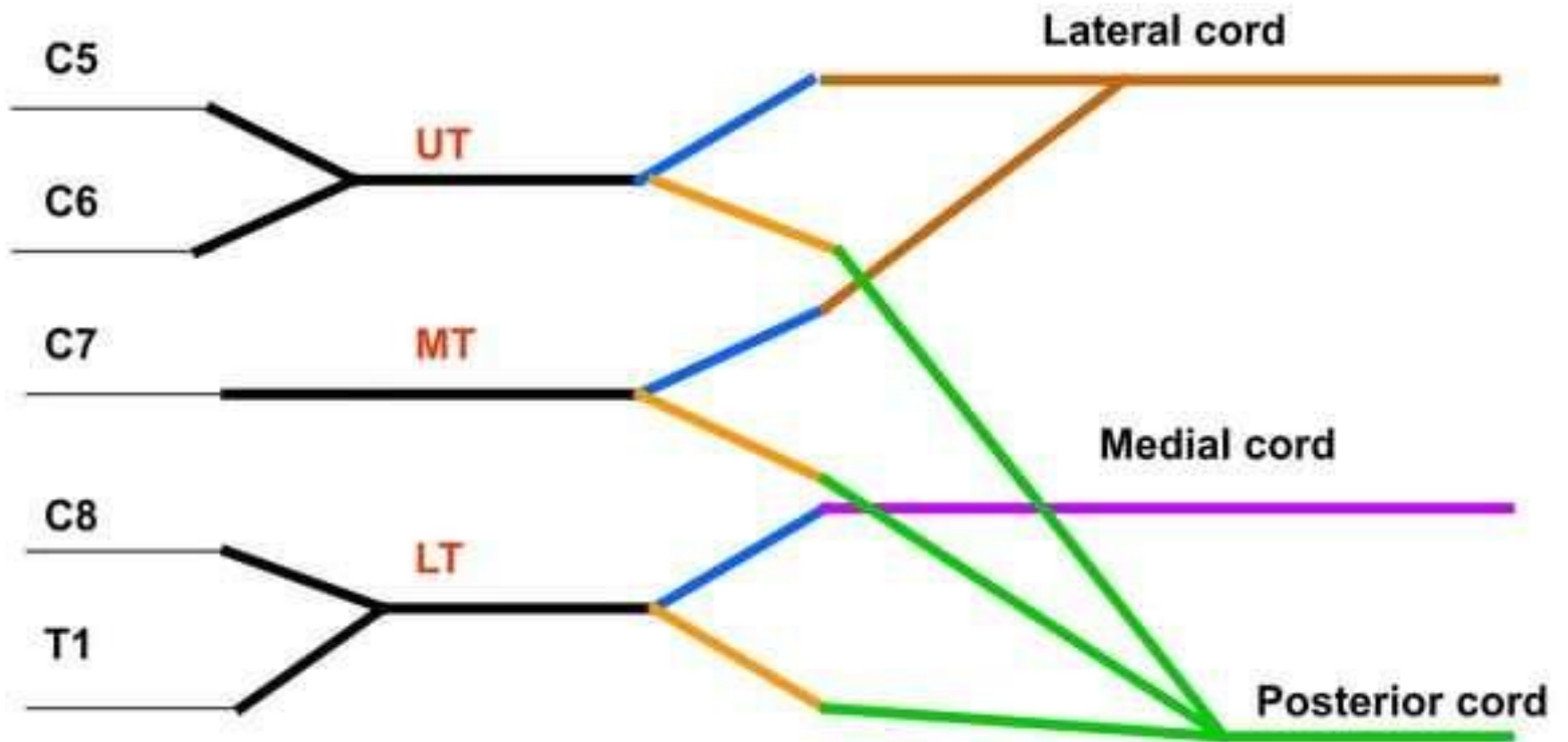
DIVISIONS x 6
(3 x anterior, 3 x posterior)
located posterior to middle third of clavicle; anterior = flexors, posterior = extensors
⊕ NO EXTRA BRANCHES ⊕

CORDS x 3
(lateral, posterior, medial)
distributed around second part of axillary artery
⊕ 2 EXTRA BRANCHES ⊕
lateral + lateral pectoral; upper + lower subscapular; thoracodorsal, med. cut. n. of arm + forearm

TERMINAL BRANCHES x 5
(musculocutaneous, axillary, radial, median, ulnar)
origins are distributed around third part of axillary artery
ALWAYS FIND THE "M" SHAPE M → MEDIAN ⊕
NOW YOU CAN CONSIDER THE BRACHIAL PLEXUS!



Formation of Brachial plexus



Branches

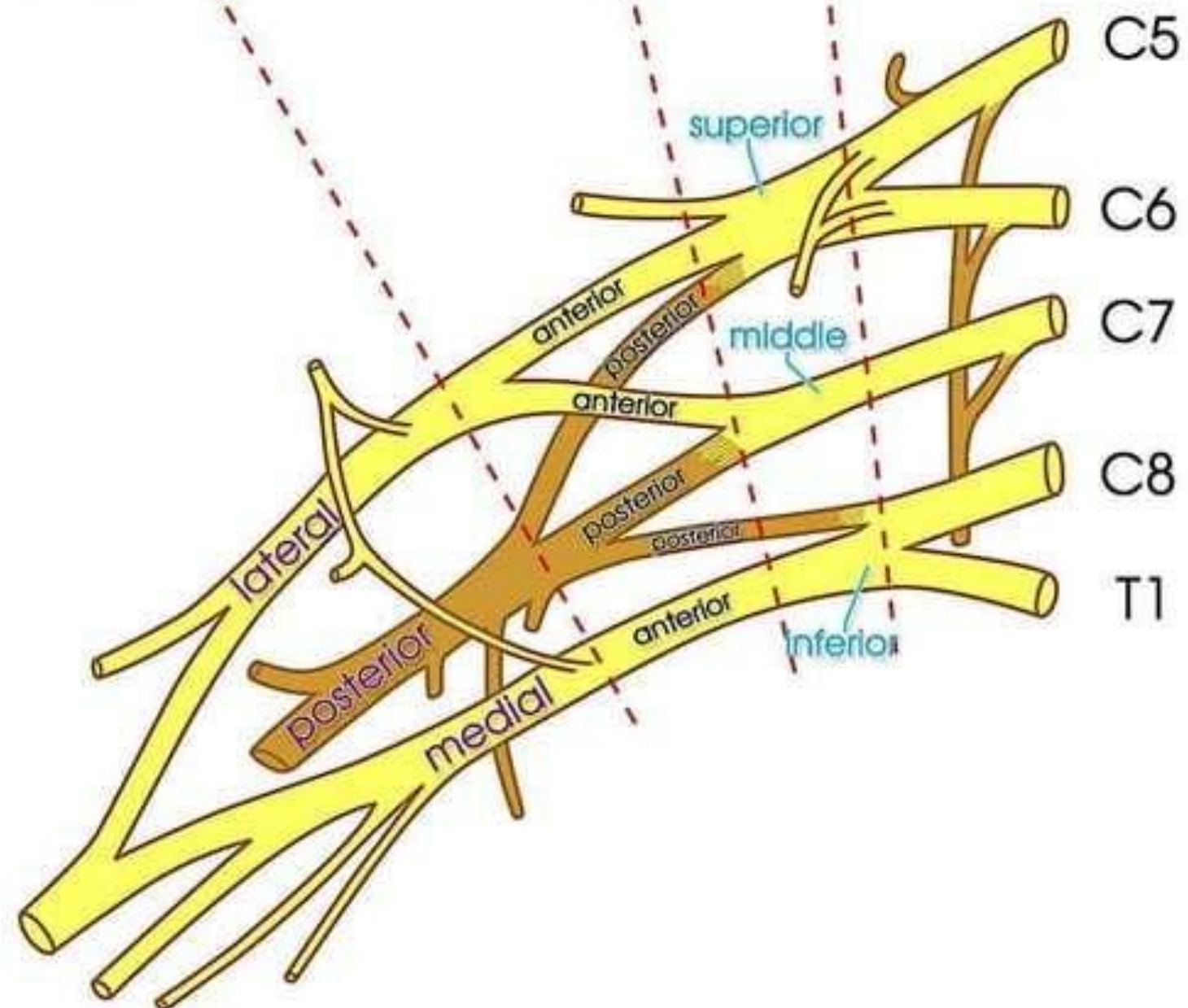
Roots	Trunks (upper)	Divisions	Cords		
			Lateral	Medial	Posterior
3	1	NIL	3	5	5

Cords

Divisions

Trunks

Roots



C5

C6

C7

C8

T1

superior

middle

inferior

anterior

anterior

posterior

posterior

anterior

lateral

posterior

medial

BRANCHES

FROM ROOTS

1. Dorsal scapular nerve C5

2. Nerve to subclavius C5, 6

3. Long thoracic nerve C5, 6, 7

- Unnamed muscular branches from all roots- scaleni / longus colli
- C5 root of Phrenic nerve

FROM TRUNKS (UPPER)

1. Suprascapular nerve C5, 6

❖ *No branches arise from Divisions*

BRACHIAL PLEXUS: NERVES FROM CORDS

Lateral cord

Lateral pectoral	C5, 6, 7
Lateral root of median	C(5), 6, 7
Musculocutaneous	C5, 6, 7

Medial cord

Medial pectoral	C8, T1
Medial root of median	C8, T1
Medial cutaneous N of forearm	C8, T1
Medial cutaneous N of arm	C8, T1
Ulnar	C(7), 8, T1

Posterior cord

Upper subscapular	C5, 6
Thoracodorsal	C6, 7, 8
Lower suscapular	C5, 6

DISTRIBUTION OF MAIN NERVES

– MUSCULOCUTANEOUS

- Muscles of Anterior Compartment of arm (flexors)

– MEDIAN

- Most Flexor muscles of forearm & Intrinsic muscles in hand

– ULNAR

- FCU & part of FDP (forearm) and Intrinsic muscles in hand

– AXILLARY

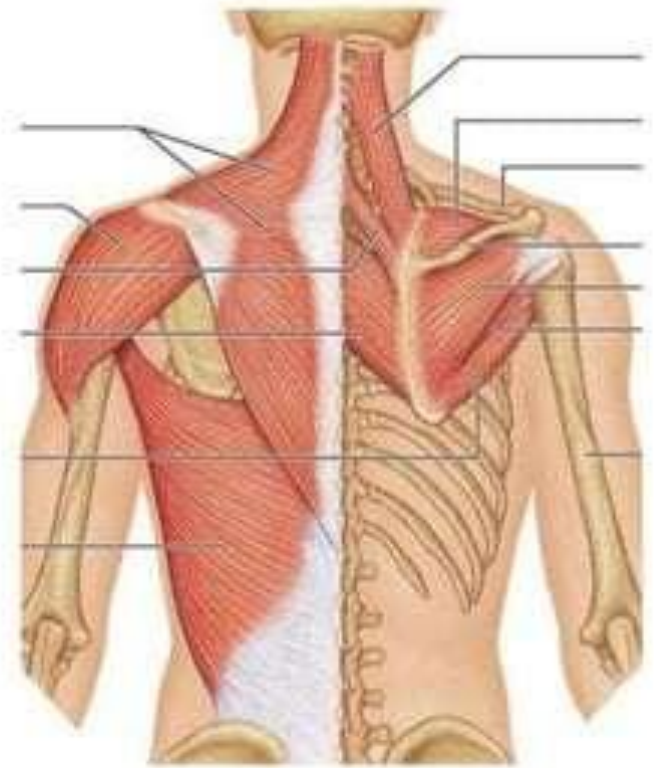
- Deltoid & Teres minor

– RADIAL

- Innervates all Extensor muscles of arm & forearm

DORSAL SCAPULAR NERVE

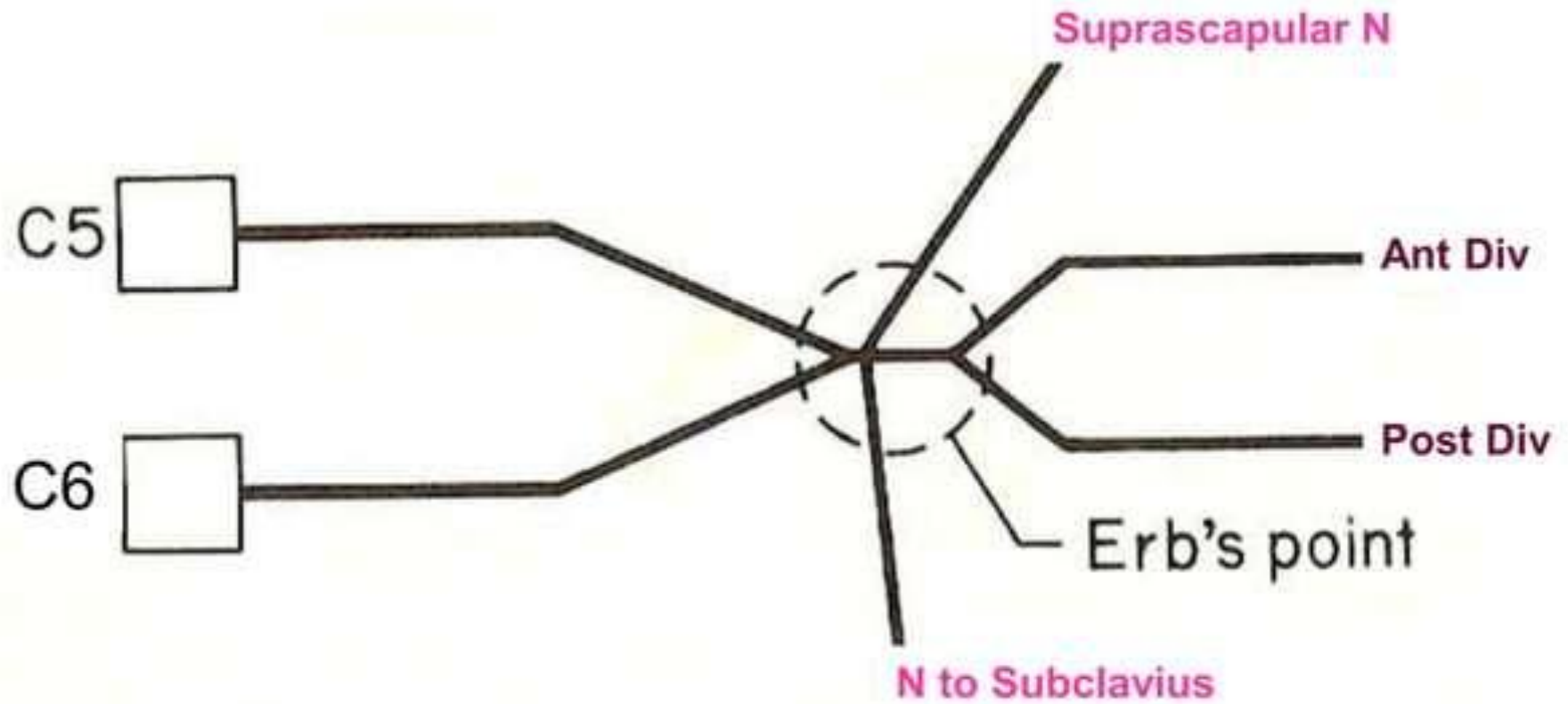
- arise from C 5 roots
posterior aspect
- Run down deep to levator
scapulae and two
rhomboids.
- Supply
 - levator scapulae and two
rhomboids



NERVE TO SUBCLAVIUS

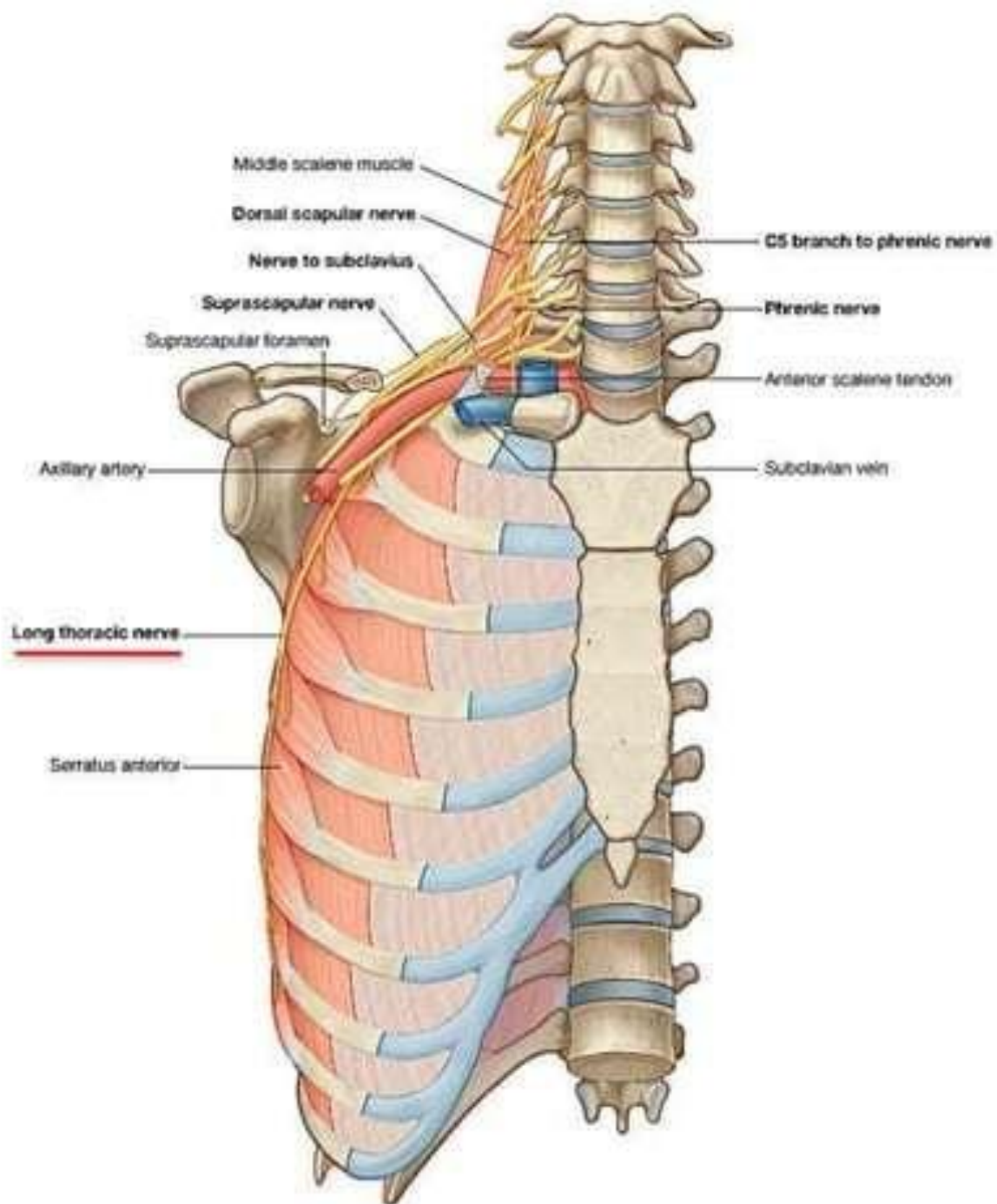
- Small & arises near the junction of C5 and C6 ventral rami (ERBS POINT)
- Descends anterior to the trunks of plexus and Subclavian vessels
- connected to Phrenic nerve (if it contains fibres of accessory phrenic nerve.)
- Supply Subclavius.

ERB'S POINT



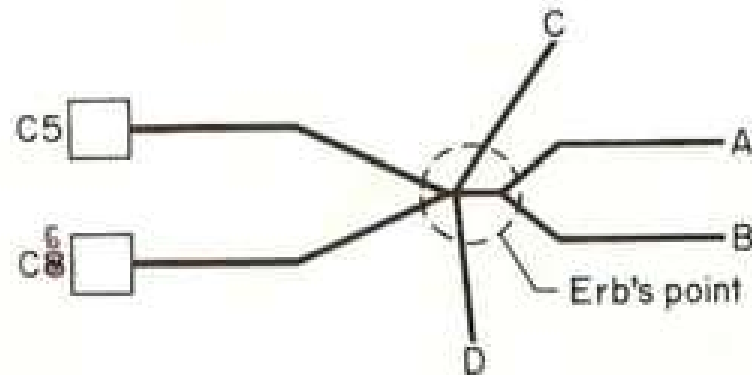
LONG THORACIC NERVE

- Arises from roots C 5,6,7
- Forms on first digitations of serratus anterior muscle
- run vertically downwards just behind the mid axillary line.
- Nerve supply
 - C5 – supply first two digitations,
 - C6 – next two digitations,
 - C7 – lowest four digitations.



SUPRASCAPULAR NERVE

- Derived from upper trunk C5,6 at erb's point
- Supplies
 - Supraspinatus,
 - Infraspinatus
 - Articular rami to Shoulder and Acromio clavicular

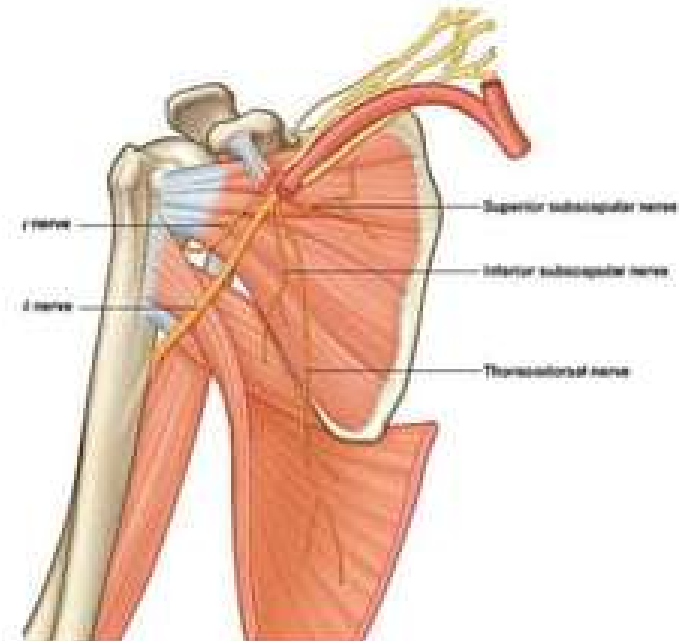


1. UPPER SUBSCAPULAR NERVE

- Smaller than lower.
- Enters Subscapularis at a high level.
- Frequently double.
- Supplies subscapularis

2. LOWER SUBSCAPULAR NERVE

- Pass deep to sub scapular art.
- Supplies
 - Subscapularis (lower part)
 - Teres major



THORACODORSAL NERVE

- Arises between upper and lower Sub scapular nerves .
- Accompanies sub scapular artery along posterior axillary wall.
- Supplies Latissimus dorsi.

Lesions in Brachial plexus

1. Damage to whole plexus ??
2. Lesion of Long Thoracic N of Bell
3. Lesion of Suprascapular N
4. **Upper trunk** palsy
5. **Lower trunk** palsy
6. Cord injuries – Lateral, Medial , Posterior
7. Lesion of Axillary N
8. Lesion of Musculocutaneous N
9. Variations
10. Brachial plexus block

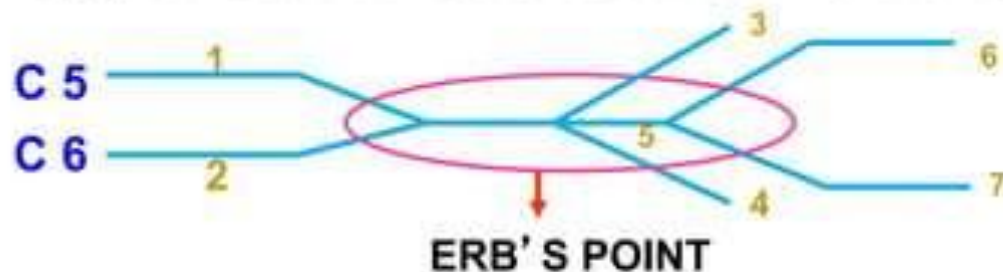
Lesion of long thoracic nerve

- CAUSES
 - Sudden heavy loads on shoulder
 - Carrying heavy loads on shoulder
- Symptom and sign
 - Winging of scapula
 - prominence of medial border of scapula
 - Loss of pushing and punching actions.
 - Abduction of arm affected.
- Demonstrated by
 - asking the patient to push against resistance with the forearm extended at the elbow and flexed to 90° at the shoulder.



Winging of scapula

Upper trunk lesions: ERB' S PALSY



- Cause of injury
 - Forceful separation of head from shoulder e.g. during birth
 - fall on shoulder.
- Nerve roots involved - C5, C6
- position of limb-
 - Arm hangs by side - Adducted - (no abduction)
 - medially rotated -(no lateral rotation)
 - Extension at elbow.- (no flexion)
 - Forearm is pronated.- (no supination)
- POLICEMAN' S TIP OR WAITER TIP HAND

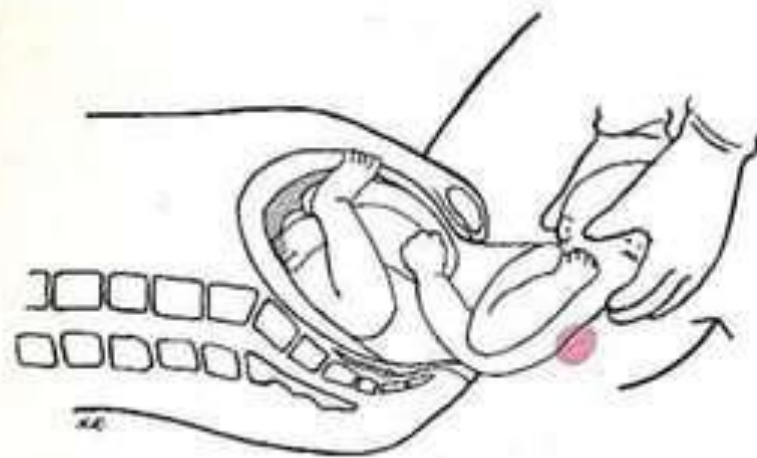
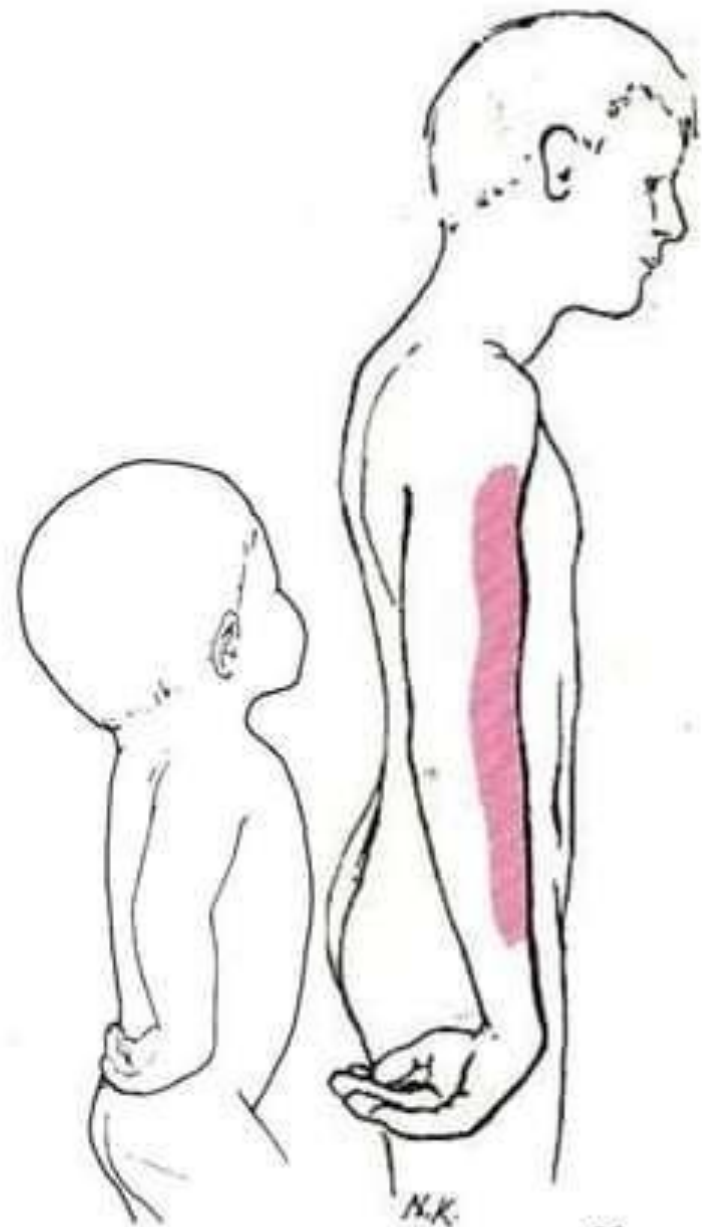


Figure 6-25. The superior part of the brachial plexus may be injured by violent stretching of the neck during delivery of a baby.



N.K.



LOWER TRUNK PALSIES: Klumpke's palsy

Site of Injury

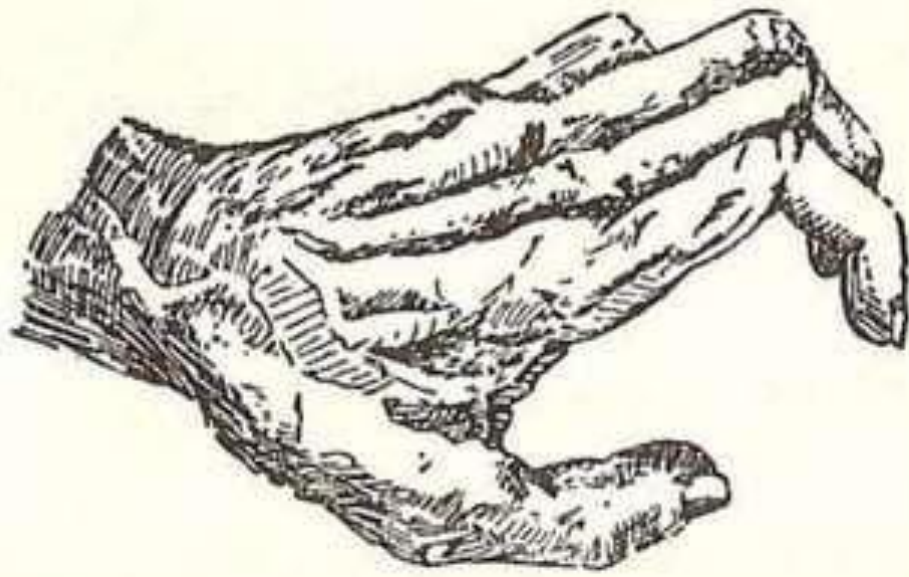
- Lower trunk (C 8, T1).
- Medial Cord involved (ulnar, medial cut N of Arm and forearm)

Cause of injury

- Birth injury (**klumpke' s paralysis**)
- Cervical rib
- Undue abduction of arm while holding something with hands during fall from height.



- Muscle Involved
 - Ulnar N
 - paralysis of Intrinsic muscle of hand, ulnar flexors of wrist and fingers
- Symptom and Sign
 - Claw hand (medial two fingers more affected)
 - due to unopposed action of long flexors fingers and extensors
 - paralysis of all interossei and medial two lumbricals.
 - Sensory loss on ulnar side of hand and forearm.



Claw hand

Assignment

- What is Froment's sign?
- What is anatomical reason of position of hand in Erb's palsy and Klumpke's palsy?

