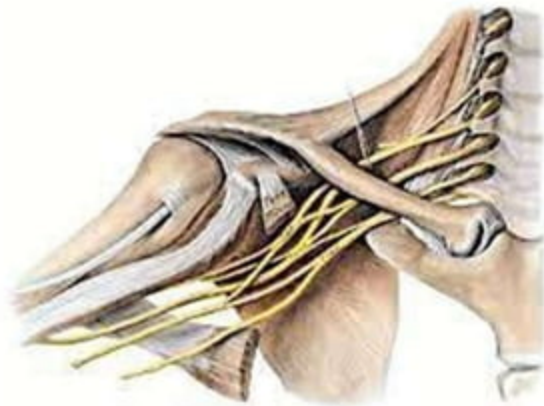


AN10.3

Describe, identify and demonstrate formation, branches, relations, area of supply of branches, course and relations of terminal branches of brachial plexus

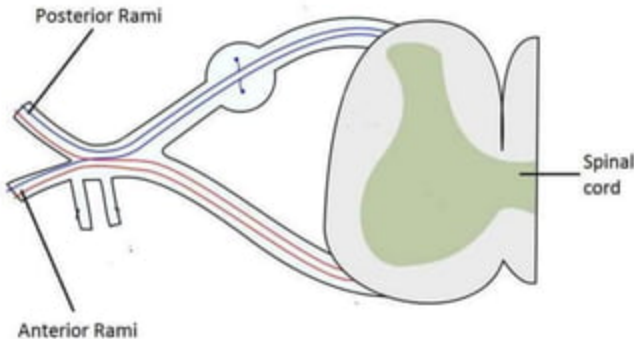
- a) Roots, trunks, divisions and branches of brachial plexus, area of supply of branches with diagram.
- b) Demonstrate the brachial plexus



Brachial plexus

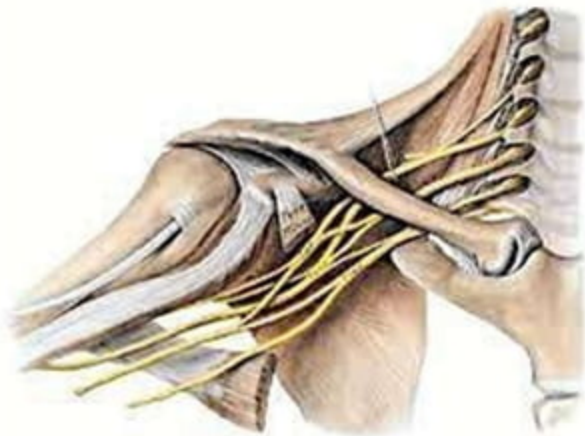
Spinal nerve

- Anterior primary ramus supplies
 - Larger area
 - Skin & muscles of
 - Anterior and lateral regions trunk
 - Upper & lower limbs
- Supplying trunk region
 - Remains in segmental pattern
- Supplying limbs
 - Merge with one or more adjacent anterior rami forming plexuses
 - And gives multisegmental peripheral nerves



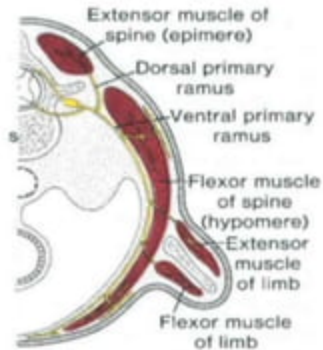
Brachial plexus

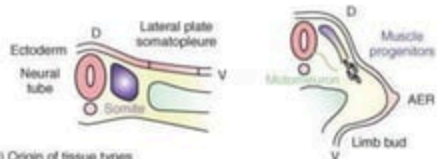
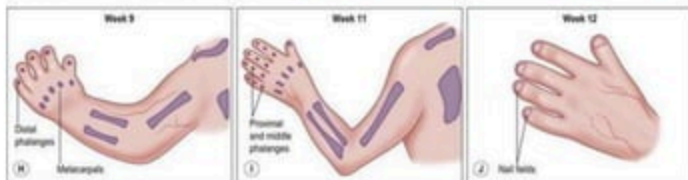
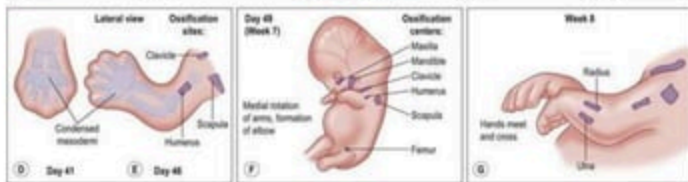
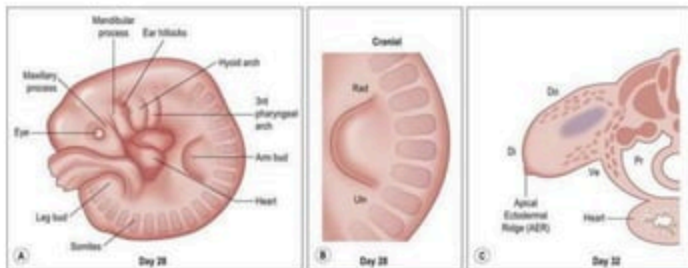
- Network of nerves which supply brachium
- At root of neck
 - Nerves form a complicated plexus
- Nerve fibres derived from different segments of spinal cord to be arranged and distributed efficiently
- Union of APR (anterior primary ramus) of C5-8 & T1



Brachial plexus

- Limb bud appears
 - 6th week of development
 - By localized proliferation of somatopleuric mesenchyme
 - Causes overlying ectoderm to bulge from the trunk
 - As 2 pairs of flat paddles
- Arm bud develop first
 - At the level of lower 4 cervical and upper 2 thoracic segments

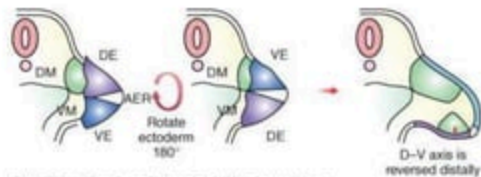




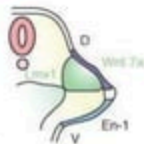
(a) Origin of tissue types



(b) Prelimb bud stages: mesenchyme signals to ectoderm



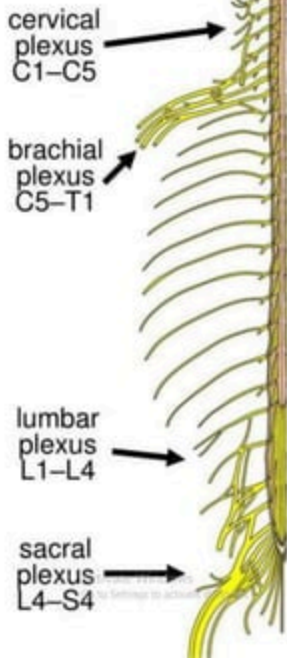
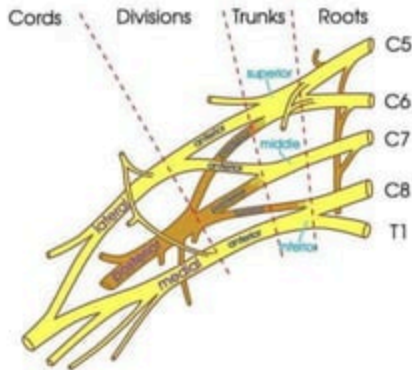
(c) Limb bud stages: ectoderm signals to mesenchyme



(d) Molecular determinants

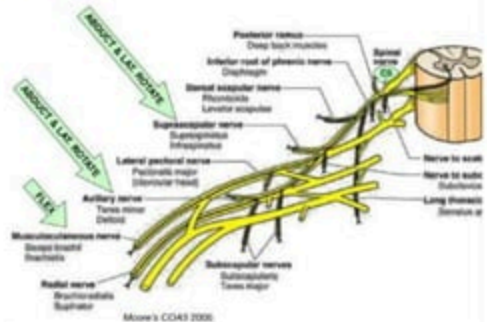
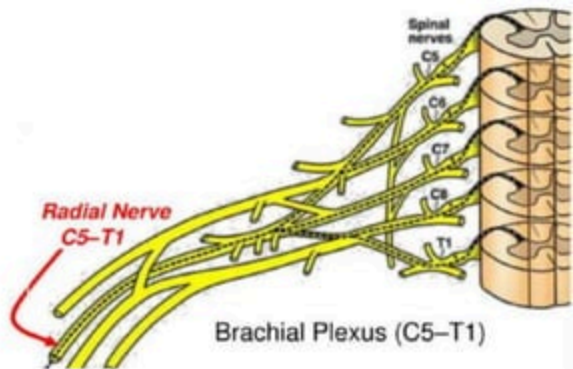
Formation

- Mixing of nerves from different cord levels
 - By union and division of bundles



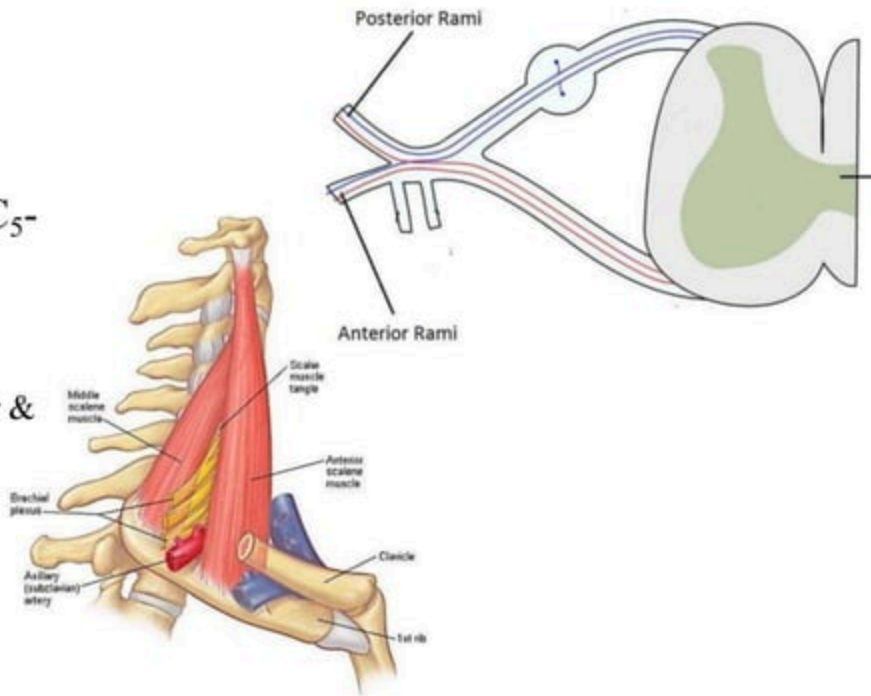
Advantages of plexus

- Fibres from different cord level
 - Passes through a single nerve
- Distribution of a spinal segment
 - Throughout the plexus

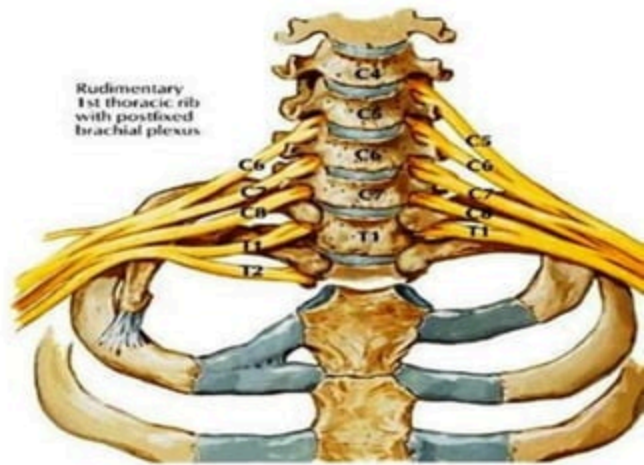


Roots

- Roots
 - Five ventral rami (C₅-T₁)
 - Lies
 - Between
 - Scalenus anterior & Medius

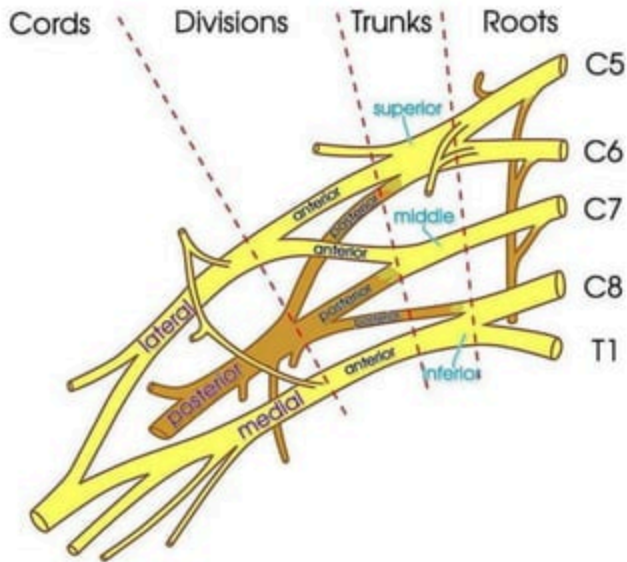


Pre & post fixed



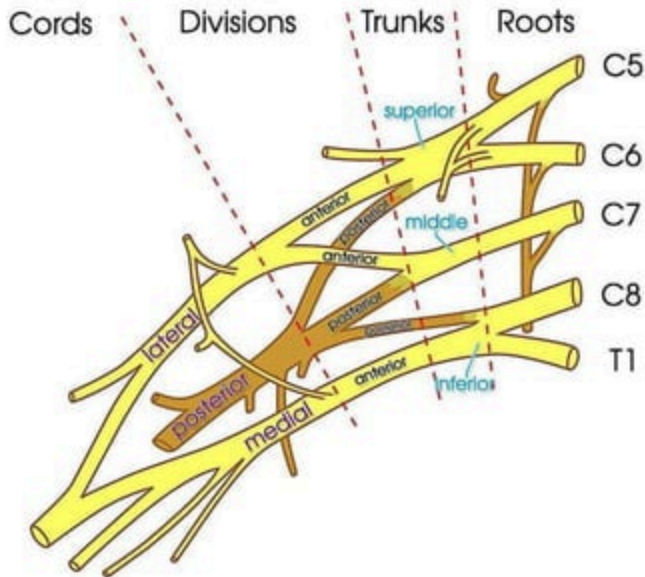
Trunks

- Lies in
 - Posterior triangle of Neck
- 3 trunks are present
 - Upper trunk
 - Union of Roots C5 & C6
 - Middle trunk
 - Continuation of C7 root
 - Lower trunk
 - Union of roots C8 & T1



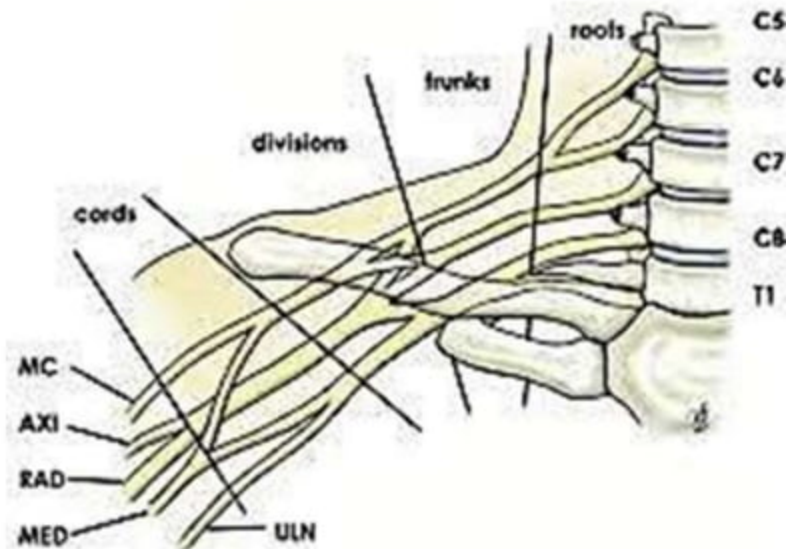
Divisions

- Lies in
 - Behind the clavicle
 - In cervicoaxillary canal
- Each trunk divides into
 - Anterior and posterior divisions



Cords

- Formed within
 - Axilla
- 3 cords are present
 - Lateral cord
 - Union of anterior divisions of
 - Upper and middle trunks
 - Medial cord
 - Continuation of
 - Inferior trunk
 - Posterior cord
 - Posterior divisions of
 - All trunks



Branches

- Different parts of brachial plexus

- From Root

- Dorsal scapular
- Long thoracic nerve

- From Trunks

- Upper trunk

- Nerve to subclavius (C5 & 6)
- Suprascapular nerve

- From cords

- Lateral cord

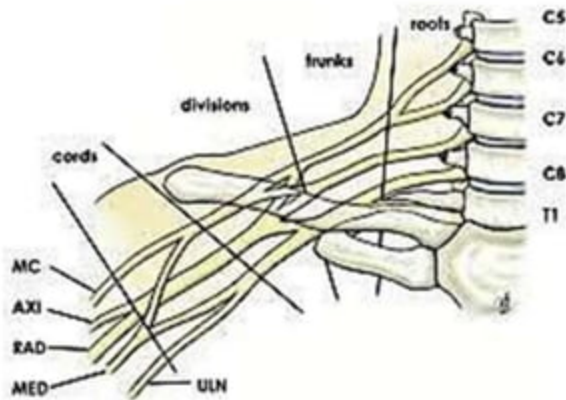
- Lateral pectoral nerve
- Musculocutaneous nerve
- Lateral root of Median nerve

- Medial cord

- Medial pectoral nerve
- Medial cutaneous nerve of arm
- Medial cutaneous nerve of forearm
- Ulnar nerve
- Medial root of median nerve

- Posterior cord

- Upper subscapular nerve
- Thoracodorsal nerve
- Lower subscapular nerve
- Axillary nerve
- Radial nerve

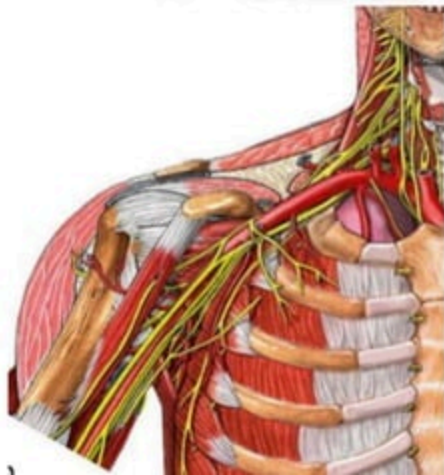
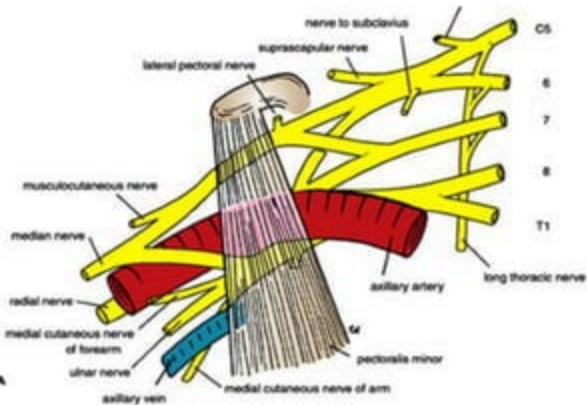


Location of the parts of brachial plexus

- Roots
 - Between
 - Scalenus anterior & scalenus medius
 - Posterior triangle of neck
- Trunks
 - Posterior triangle of neck
- Divisions
 - Behind clavicle
 - In cervico axillary canal
- Cords
 - Axilla
- Branches
 - Starts in Axilla

Relations

- Cords
 - I & II part of axillary artery
- Branches
 - III part of axillary artery



ERB'S palsy

- **Upper trunk lesion**
- Nerve roots involved - C5, C6
- Erb's point
 - Where 6 nerves meet
- **Causes**
 - Forceful separation of head from shoulder e.g. during birth
 - Fall on shoulder
- **Muscles**
 - Biceps
 - Brachialis, brachialis brachioradialis, Supraspinatus
 - Infraspinatus
- **Deformity (Porter's tip hand)**
 - Arm - adducted, medially rotated
 - Forearm - pronated and extended



Klumpke's palsy

- Lower trunk palsy
- Nerve roots involved - C 8, T1
- **Cause**
 - Cervical rib
 - Undue abduction of arm while holding something with hands during fall from height
- **Muscle Involved**
 - 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



Klumpke's paralysis

- Due to involvement of T1
 - Sympathetic fibres also involved
- Klumpke's paralysis associated with Horner's syndrome
 - Ptosis
 - Drooping or falling of upper eyelid
 - Miosis
 - Excessive constriction (shrinking) of your pupil
 - Anhidrosis
 - Decreased sweating
 - Enophthalmos
 - Posterior displacement of the eyeball
 - Loss of ciliospinal reflex
 - Dilation of ipsilateral pupil in response to pain applied to the neck, face and upper trunk



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

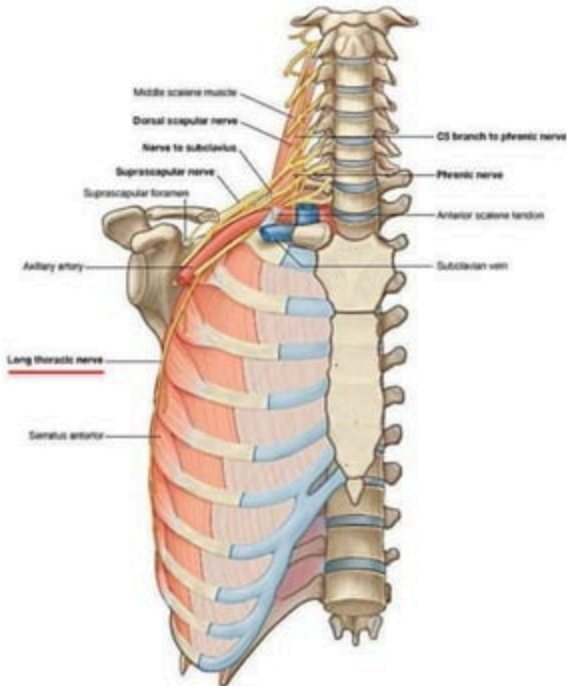
- Deltoid & Teres minor

– Radial

- Innervates all Extensor muscles of arm & forearm

Long thoracic nerve

- Arises from
 - Roots C5, 6, 7
- Forms on
 - First digitations of serratus anterior muscle
- Runs vertically downwards
 - Just behind the mid-axillary line
- Nerve supply
 - C5 – supply first two digitations
 - C6 – next two digitations
 - C7 – lowest four digitations



Lesion of long thoracic nerve

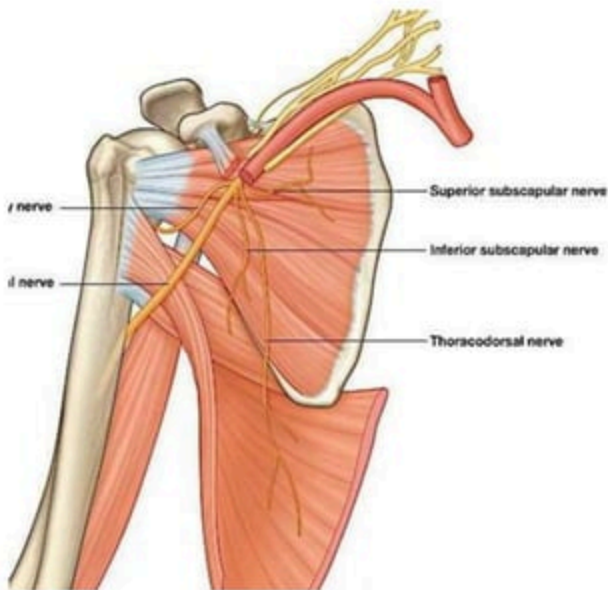
- Causes
 - Sudden heavy loads on shoulder
 - Carrying heavy loads on shoulder
- Symptom and sign
 - Winging of scapula
 - Prominence of medial border of scapula
 - Loss of pushing and punching actions
 - Abduction of arm affected.
- Demonstrated by
 - Ask the patient to push against resistance with the forearm



Winging of scapula

Upper & lower subscapular nerves

- Upper subscapular nerve
 - Smaller than lower
 - Enters Subscapularis at a high level.
 - Frequently double
 - Supplies
 - Subscapularis
- 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

