

UPPER LIMB:

Wrist and Hand:

- ① Bones of The hand → 8 Carpal Bones
 - Proximal Row (from lateral to Medial)
Scaphoid, Lunate, Triquetrum, Pisiform
 - Distal Row (from lateral to Medial)
Trapezium, Trapezoid, Capitate, Hamate
- ② Commonly fractured Carpal Bone → Scaphoid
Commonly dislocated Carpal Bone → Lunate
- ③ 5 Metacarpal Bones →
first metacarpal bone of the thumb is the shortest and most mobile
- ④ 14 Phalanges → Three phalanges for each of the fingers but only two for the thumb

• Proximal phalanges	• Proximal phalanges
• Middle phalanges	and Distal
• Distal phalanges	phalanges in the
	Thumb
- ⑤ Small Muscles of The Hand →
 - Four Lumbrical Muscles → Nerve Supply
1st n 2nd/lateral two → Median Nerve
3rd n 4th → Ulnar Nerve

- 8 Interossei Muscles →
 - 4 Palmar Muscles
 - 4 Dorsal Muscles → Ulnar Nerve
- Palmaris Brevis → Improve Grip of palm → Ulnar Nerve
- Short Muscles of Thumb / Thenar Eminence:
 - Abductor Pollicis Brevis
 - Flexor Pollicis Brevis
 - Opponens Pollicis
 - ↳ Median Nerve
 - Adductor Pollicis
 - ↳ Ulnar Nerve
- Short Muscles of Little Finger / Hypothenar Eminence:
 - Abductor Digiti Minimi
 - Flexor Digiti Minimi
 - Opponens Digiti Minimi
 - ↳ Ulnar Nerve

All Small Muscles of The Hand Supplied by Ulnar Nerve Except 1st n 2nd Lumbrical and 3 thenar Eminence Muscles Supplied by Median Nerve...

OR

Muscles of The hand Supplied by the Median Nerve Can be remembered using The mnemonic LOAF:

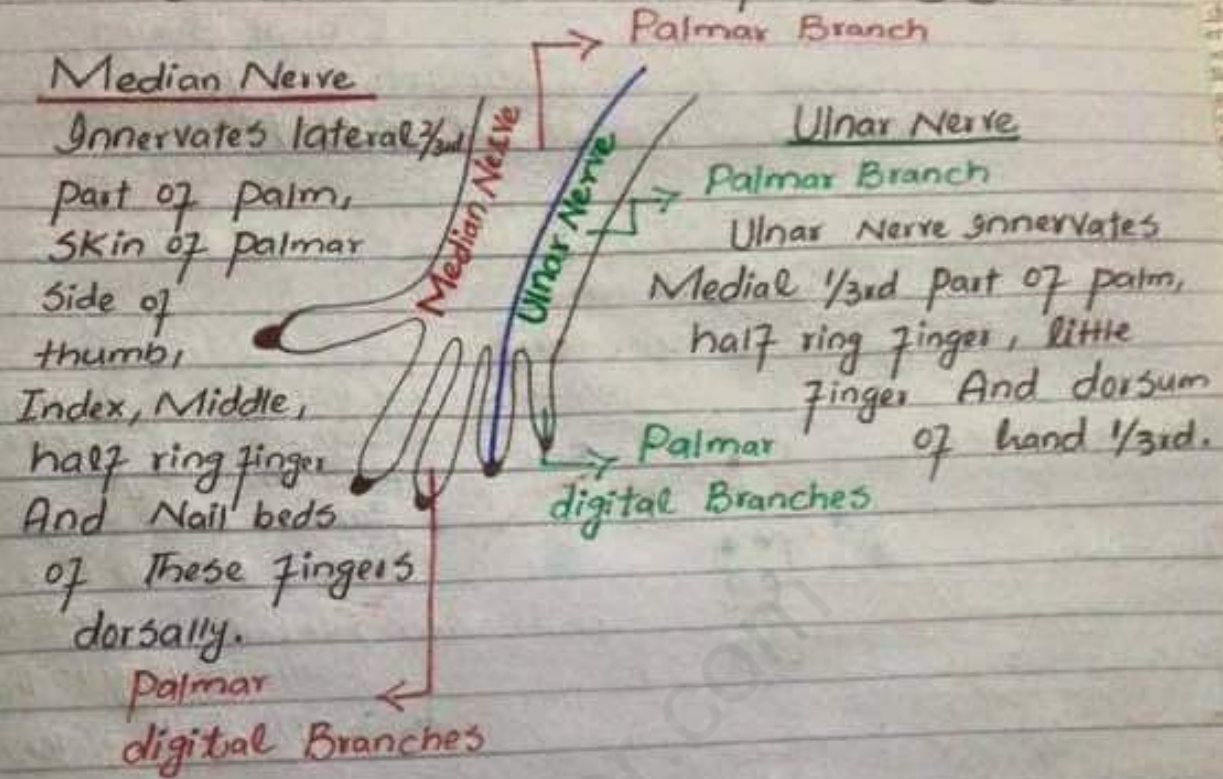
Lumbricals 1 & 2

Opponens Pollicis

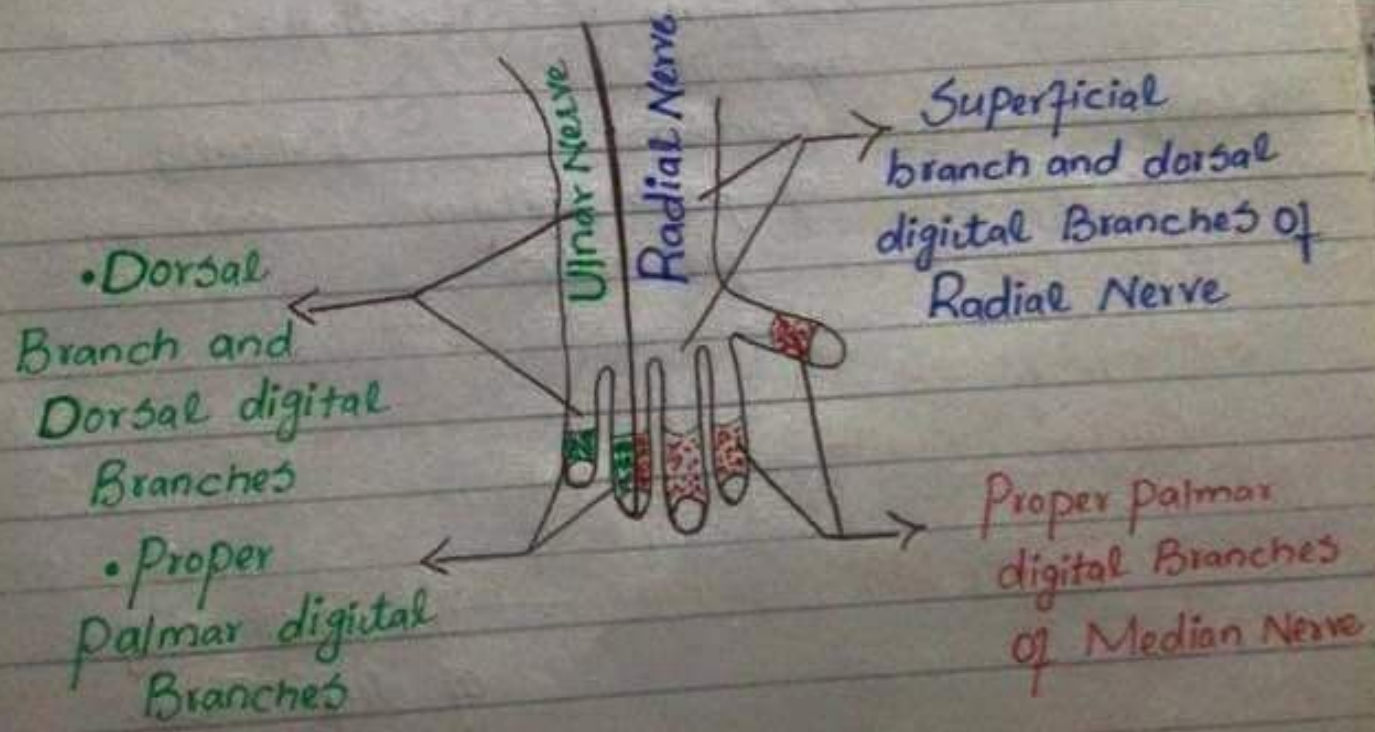
Abductor Pollicis Brevis

Flexor Pollicis Brevis

⑥ Cutaneous Innervation of Hand 🤲🤲 here

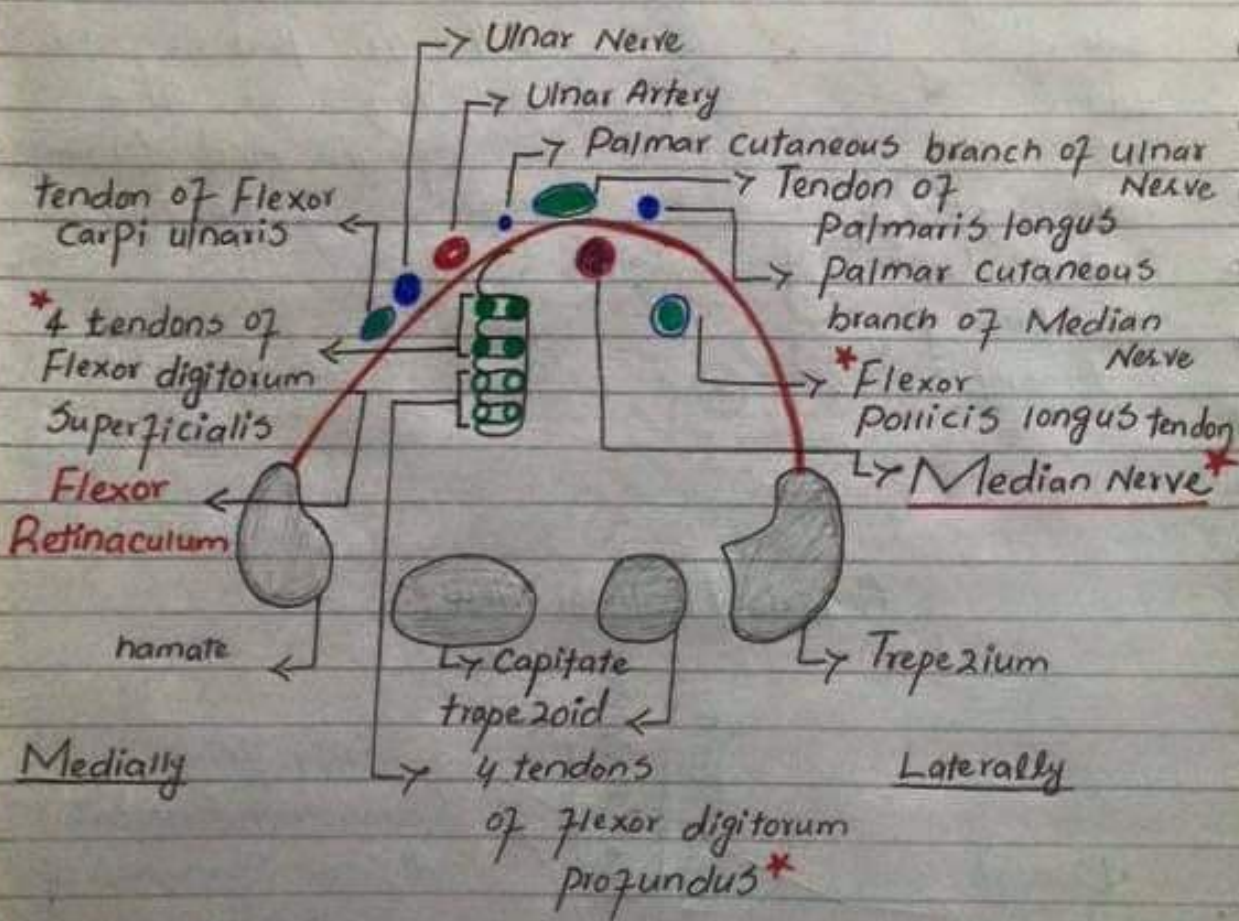


Anterior / Palmar View



Posterior / Dorsal View

① Carpal Tunnel → Carpal Bones and flexor Retinaculum form the Carpal tunnel at WRIST.



* Contents of Carpal Tunnel

Flexor Retinaculum → Thickening of deep fascia.

⑧ Carpal Tunnel Syndrome →

Causes:

- Pregnancy
- Amyloidosis
- Endocrine disorders
 - Hypothyroidism
 - Gigantism
 - Acromegaly
- Frequent use of Wrist during typing and cooking

Features: Due to Compression of The Median Nerve Within The tunnel ★

- Burning pain / pins and Needles on palmar aspect of lateral three & a half fingers
 - Weakness And Atrophy of The Thenar Muscles
- Worse features During Sleep
Apelike Hand.

Condition Relieved by: Decompressing the tunnel by Making a longitudinal Incision through flexor retinaculum.

⑨ Palmar Aponeurosis →

Triangular in Shape &
Modified deep fascia in palm

Fore Arm : / Ante Brachium

⑩ Bones of forearm → Radius & ulna

⑪ Muscles of forearm →

• Muscles Of Anterior / Flexor Compartment ⑧

Superficial Group:

- | | |
|-------------------------|--------------------|
| • pronator teres | Median Nerve |
| • Flexor Carpi Radialis | Median Nerve |
| • palmaris longus | Median Nerve |
| • Flexor Carpi Ulnaris | <u>Ulnar Nerve</u> |

Intermediate Group:

- | | |
|----------------------------------|--------------|
| • Flexor Digitorum Superficialis | Median Nerve |
|----------------------------------|--------------|

Deep Group :

- | | |
|------------------------------|---|
| • Flexor pollicis longus | Median Nerve |
| • Flexor Digitorum Profundus | <u>Ulnar</u> (Medial half)
Median (lateral half) |
| • pronator Quadratus | Median Nerve |

All Muscles supplied by Median Nerve

Except Flexor Carpi Ulnaris & Medial half of Flexor Digitorum profundus which are supplied by Ulnar Nerve...

• Muscles Of Posterior / Extensor Compartment ⑫

- | | |
|-------------------|--------------|
| • Brachioradialis | Radial Nerve |
| • Anconeus | " |
| • Supinator | " |

Extensors of Wrist:

- Extensor Carpi Radialis longus //
- Extensor Carpi Radialis Brevis //
- Extensor Carpi Ulnaris //

Extensors of Digits (except thumb):

- Extensor digitorum //
- Extensor digiti Minimi //
- Extensor Indicis //

Extensors of thumb:

- Abductor pollicis longus //
- Extensor pollicis Brevis //
- Extensor pollicis longus //

All Muscles Supplied by Radial Nerve...

ARM/Brachium:

⑫ Bones of Arm → Humerus

⑬ Muscles of Arm →

Muscles Of Anterior/Flexor Compartment ③

- | | |
|--------------------|------------------------|
| • Biceps Brachii | Musculocutaneous Nerve |
| • Coracobrachialis | Musculocutaneous Nerve |
| • Brachialis | Musculocutaneous Nerve |

Biceps Brachii is a

Powerful Supinator of forearm

Powerful flexor of Elbow Joint

Weak flexor of Shoulder Joint

- Muscles Of Posterior/Extensor Compartment ①
- Triceps Brachii Radial Nerve

Shoulder Girdle :

- ① Shoulder Girdle → Consists of Clavicle and Scapula which articulate With one another at acromioclavicular Joint
- ② Most commonly fractured Bone in The body → Clavicle
- ③ Scapula → flat triangular Bone That lies on posterior chest wall b/w 2nd and 7th Ribs
- ④ Muscles Connecting The Scapula to The Humerus

• Deltoid	Axillary Nerve
• Supraspinatus	Suprascapular Nerve
• Infraspinatus	" "
• Teres Minor	Axillary Nerve
• Teres Major	Lower Subscapular Nerve
• Subscapularis	upper and lower Subscapular

Deltoid Muscle is The chief flexor and Chief Extensor at Shoulder Joint...

⑮ Rotator Cuff → Name given

To The tendons of The

- Subscapularis
- Supraspinatus
- Infraspinatus
- Teres Minor Muscles

which are fused to The underlying
Capsule of The Shoulder Joint.

Rotator cuff plays a very imp role
in Stabilizing The Shoulder Joint...

Tone of These Muscles assists
in holding The head of humerus
in Glenoid Cavity of Scapula
during movements at Shoulder Joint

AXILLA:

⑯ Axilla OR Armpit → pyramid-Shaped
Space b/w upper part of arm and
Side of Chest

• Walls of Axilla

Anterior Walls

formed by Pectoralis Major, Pectoralis Minor,
Subclavius

Posterior Wall :

formed by Subscapularis, Latissimus dorsi,
Teres Major from above down

Medial Wall :

formed by upper 4/5 ribs and Inter-costal Spaces Covered by Serratus Anterior Muscle

Lateral Wall :

formed by Biceps and Coracobrachialis Muscles

Base :

Skin Stretching b/w Ant and post walls

Apex : / Cervicoaxillary Canal

triangular in Shape, directed into The root of The Neck

• Contents of Axilla

- Axillary Artery
- Axillary Vein
- Axillary Group of Lymph Nodes
- Nerve plexus/ Brachial plexus
- Axillary pad of fat
- Axillary Sheath → Connective tissue
Sheath enclosed
Axillary Artery And Cords
of Brachial plexus

• Key Muscles in The Axilla

Pectoralis Minor → divide
Axillary Artery into Three parts
when crosses in front of
Axillary Artery.

Cubital Fossa:

- ② Cubital fossa → Triangular depression
That lies in front of elbow

Boundaries

- Laterally: Brachioradialis
Medially: Pronator Teres
Roof: Skin And Fascia
Floor: Supinator → laterally
Brachialis → Medially
Base: Imaginary line b/w two
epicondyles of Humerus

Contents Medial to Lateral Side

- Median Nerve
- Bifurcation of Brachial Artery
into Ulnar and Radial Arteries
- Tendon of Biceps Muscle
- Radial Nerve and its deep branch
And Supratrochlear Lymph Node.

Blood Supply Of Upper Limb:

② Arterial Supply:

- Subclavian Artery:

Origin → Rt from Brachiocephalic trunk
Lt from Arch of aorta

Termination → Outer Border of 1st Rib
Parts → ③ parts formed by Anterior Scalene Muscle
Branches →

1st Part

Vertebral Artery

Internal Thoracic Artery

ThyroCervical Trunk

2nd Part

CostoCervical Trunk

3rd part

Dorsal Scapular Artery

• Axillary Artery:

Location → Axilla

Origin → Outer Border of 1st Rib

Termination → lower Border of
teres Major

Parts → Pectoralis Minor
Will divide into 3 parts

Branches →

1st Part

Superior Thoracic Artery

2nd Part

Acromial Thoracic Artery

Lateral Thoracic Artery

3rd Part

Subscapular Artery

Anterior Circumflex humeral Artery

Posterior Circumflex humeral
Artery

• Brachial Artery

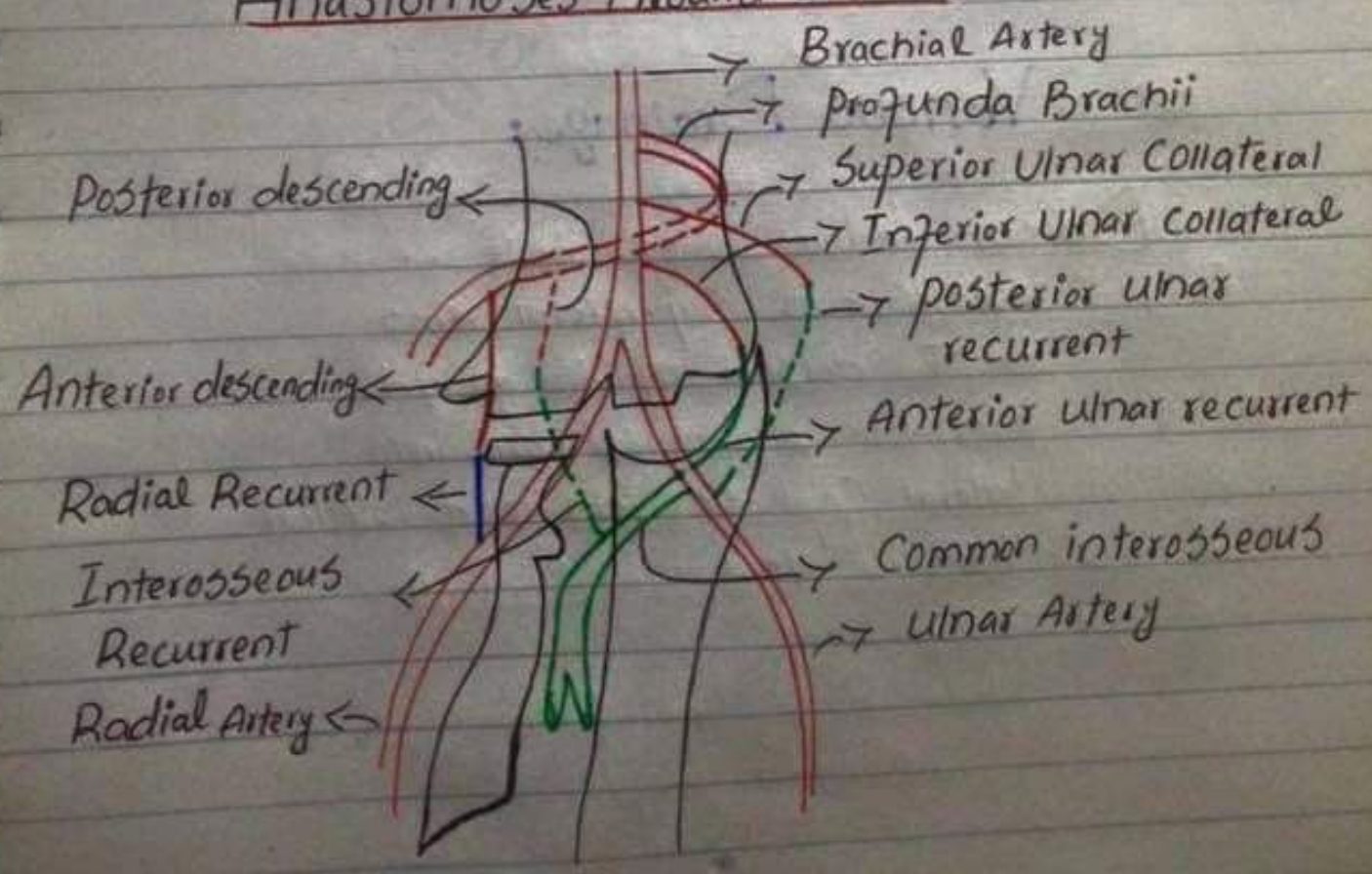
Origin → Continuation of Axillary Artery at lower Border of Teres Major Muscle

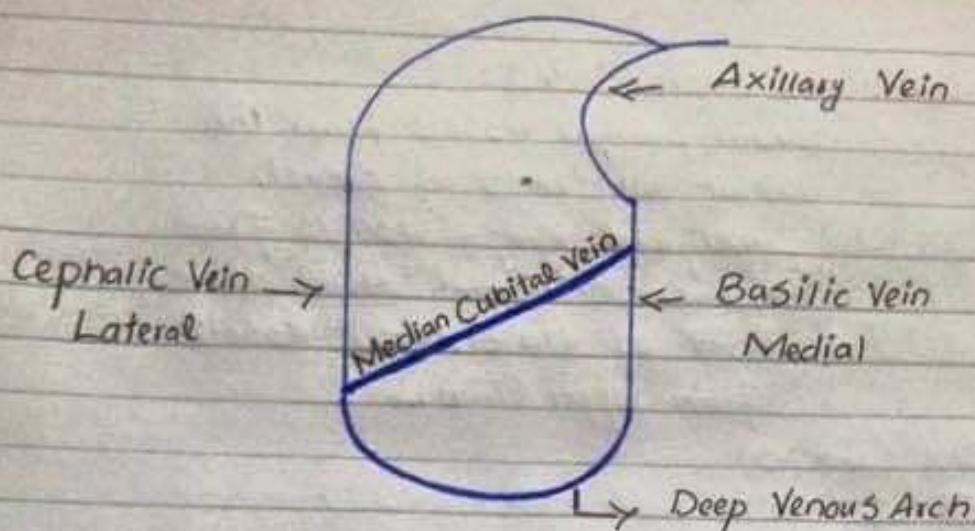
Termination → In Cubital fossa & gives 2 terminal Branches Radial & Ulnar Arteries

Location → Medial aspect of Anterior Compartment of arm

- Branches →
- Profunda Brachii
 - Superior Ulnar Collateral
 - Inferior Ulnar Collateral
 - Radial Artery
 - Ulnar Artery
 - Nutrient Artery of humerus

Anastomoses Around Elbow





Median Cubital Vein → links the Cephalic and Basilic Veins in the Cubital fossa.
Only Superficial Vein which is fixed.

Lymph Vessels And Nodes of Upper Limb:

②

Lymphatics

- Superficial Runs along Superficial Veins
- Deep Runs along Deep Veins

Lymph Nodes

- Superficial
Deltopectoral Group of LN
- Deep
Axillary Group of LN in Axilla

Superficial Lymphatics of thumb and 1st Web drains into Deltopectoral Group of Lymph Nodes...

Axillary Lymph Nodes:

Drain Lymph Vessels from The
lateral Quadrants of Breast,
Superficial lymph vessels from
thoracoabdominal walls above
level of Umbilicus, Vessels
from Upper limb...

Six Groups:

Anterior/Pectoral Group

Receive Lymph Vessels from

- lateral Quadrants of Breast
- Anterolateral Abdominal Walls
above level of Umbilicus/Superficial
vessels

Posterior/Subscapular Group

Receive Superficial Lymph Vessels
from back

- iliac Crests

Lateral Group

From • Upper Limb except
thumb and 1st Web

Central Group

From • Anterior group
• Posterior group
• Lateral group

Infraclavicular/Deltopectoral group

Apical Group

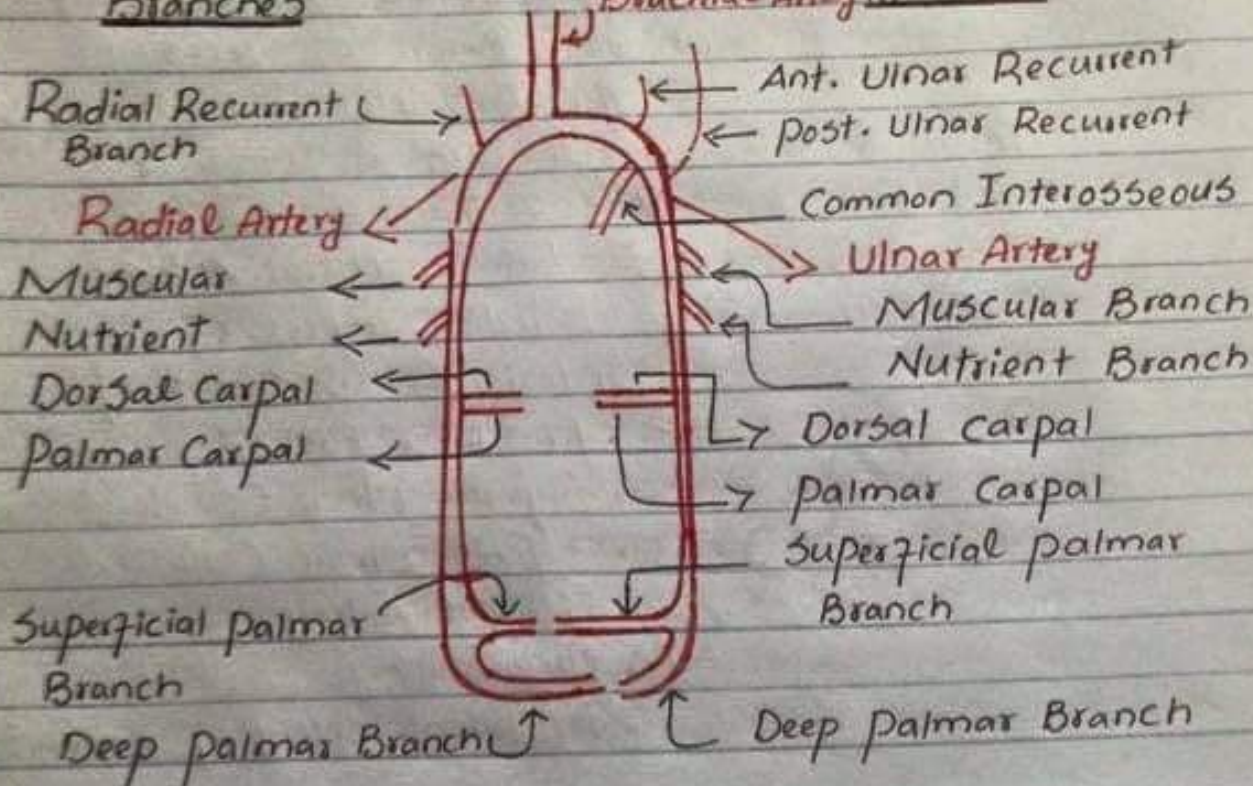
Receive Lymph From

- Central group

• Radial And Ulnar Artery:

Branches

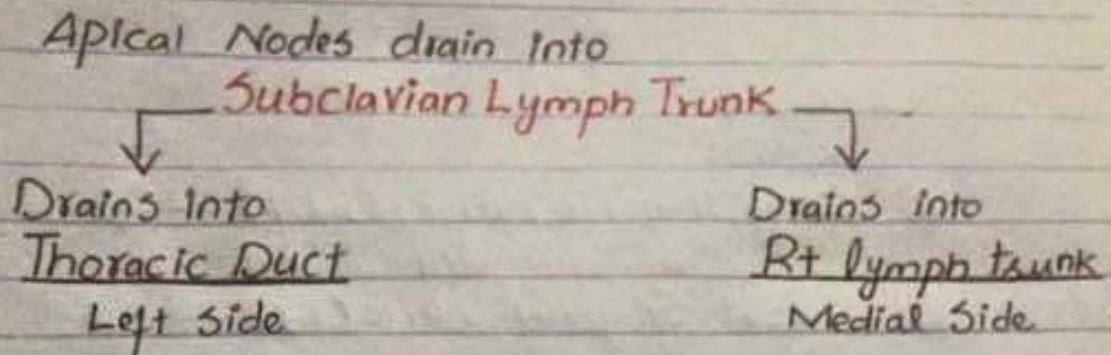
Brachial Artery Branches



② Venous Drainage:

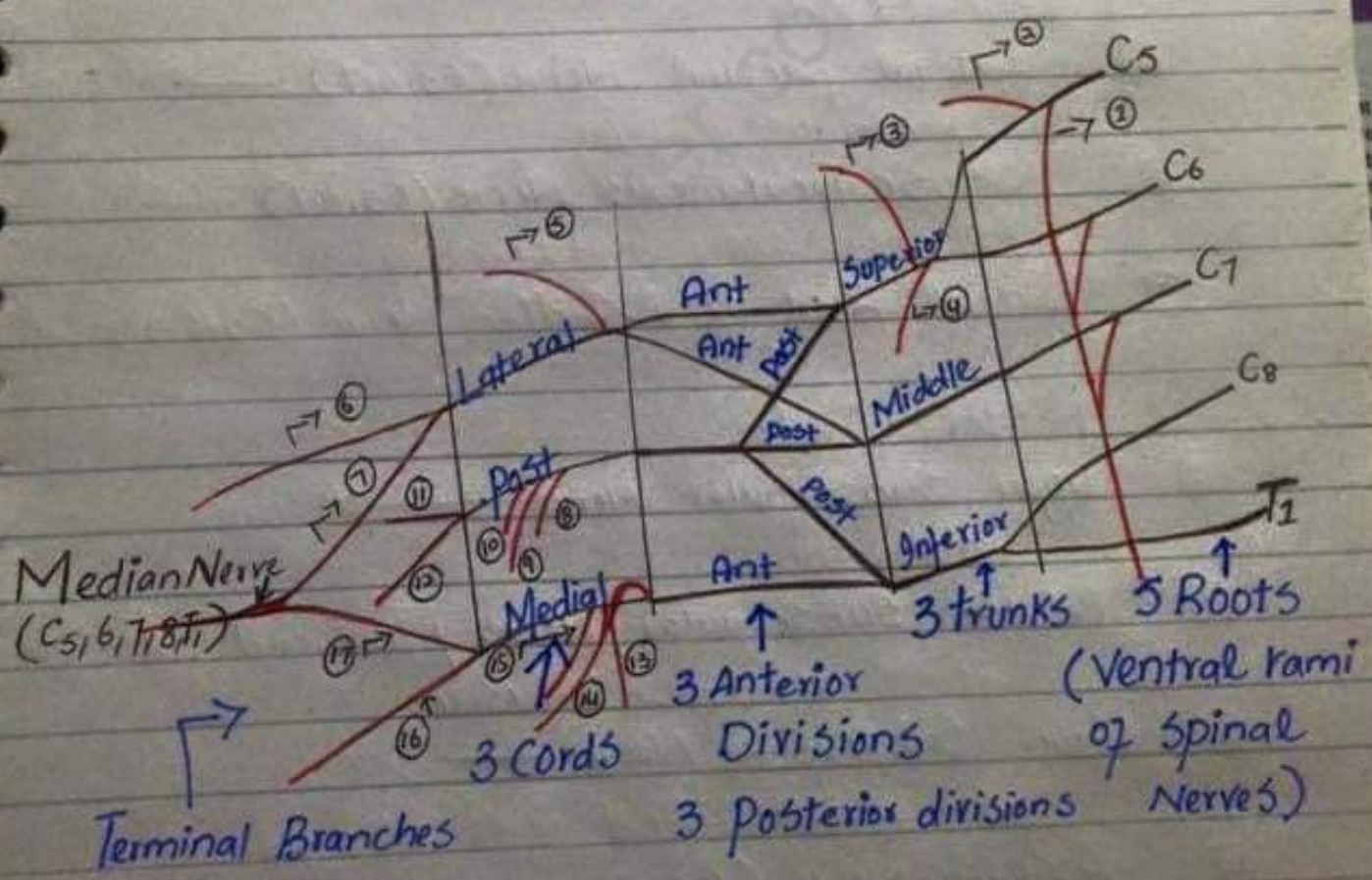
Dorsal Venous Network:

Network of Superficial Veins
on the dorsum of the hand.
Network drains upward into
lateral Cephalic Vein and Medial
Basilic Vein



Nerve Plexus Of Upper Limb :

③ Brachial Plexus :



Branches:

Roots:

- ① Long thoracic Nerve (C₅, 6, 7) →
Serratus Anterior Muscle
- ② Dorsal Scapular Nerve (C₅) →
Rhomboid Minor, Major and levator Scapulae

Trunks:

- ③ Suprascapular Nerve (C₅, 6) →
Supraspinatus & Infraspinatus
- ④ Subclavius Nerve (C₅, 6) →
Subclavius Muscle

Lateral Cord:

- ⑤ Lateral pectoral Nerve (C₅, 6, 7) →
Pectoralis Major
- ⑥ Musculocutaneous Nerve (C₅, 6, 7) →
Muscles of Ant. Compartment of Arm
- ⑦ Lateral Root of Median Nerve (C₅, 6, 7)

Posterior Cord:

- ⑧ Upper Subscapular Nerve →
Subscapularis
- ⑨ Middle Subscapular Nerve / Thoracodorsal →
Latissimus Dorsi Muscle
- ⑩ Lower Subscapular Nerve →
Subscapularis And Teres Major
- ⑪ Axillary Nerve (C₅, 6) →
Deltoid, Teres Minor
- ⑫ Radial Nerve (C₅, 6, 7, 8, T₁) →
Muscles of post. Compartment
of Arm and Forearm

Medial Cords

- ⑬ Medial pectoral Nerve →
Pectoralis Major, Minor
- ⑭ Medial brachial cutaneous Nerve →
Skin of medial side of Arm
- ⑮ Medial Antebrachial Cutaneous Nerve →
Skin of Medial Side of forearm
- ⑯ Ulnar Nerve (C_{7,8}, T₁)
- ⑰ Medial Root of Median Nerve

⑱ Brachial Plexus Injuries:

- Upper Trunk Injury → Erb-Duchenne palsy (Waiter's tip)
- Lower Trunk Injury → Klumpke Palsy