

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



MEDICINE
KING SAUD UNIVERSITY

Revised by

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Color Code

- **Important**
- **Doctors Notes**
- **Notes/Extra explanation**

Axillary and Median Nerve

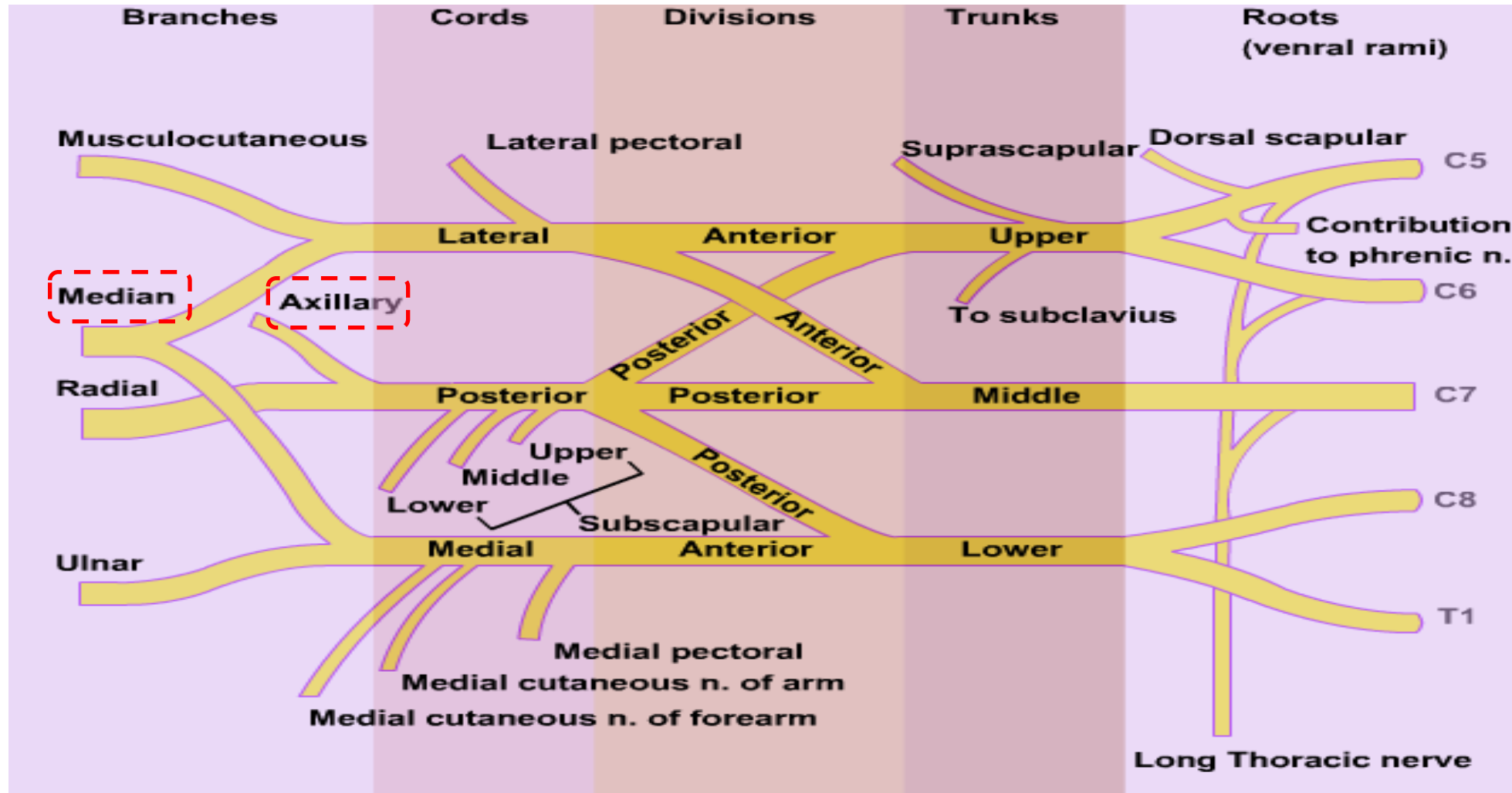
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Objectives

At the end of the lecture, students should be able to:

- ✓ Describe the origin, course, relations, branches and distribution of the axillary & median nerves
- ✓ Describe the common causes and affects of injury to the axillary and median nerves

Brachial plexus



Really Tired..? Drink Coffee

Axillary Nerve

Origin: (C 5 &6)- أي عصب ناخذه لازم نعرف من أي قطع من السباينل كورد جاء ، لأن أي ضرر يصير فيهم فهو أيضاً راح يتأثر

Posterior cord of brachial plexus

Course:-

It passes inferiorly and laterally along the posterior wall of the axilla to exit (from axilla) .

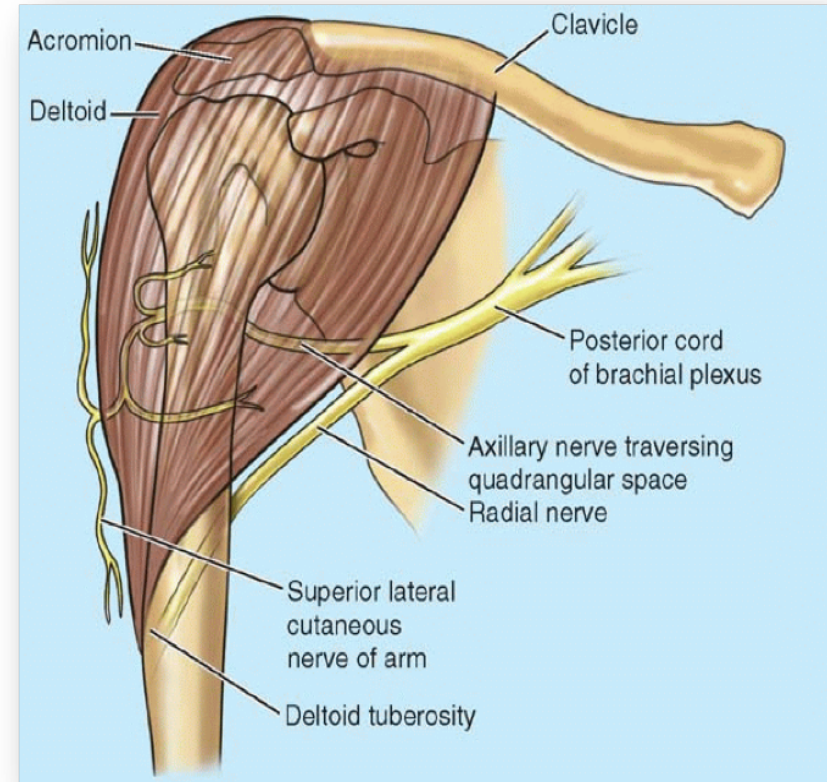
Then, it passes posteriorly around the **surgical neck of the humerus**.

• It is accompanied by the **posterior circumflex humeral artery**.

Branches:

• **Motor** to the deltoid and teres minor muscles

• **Sensory:** superior lateral cutaneous nerve of arm that loops around the posterior margin of the deltoid muscle to innervate skin in that region.



Axillary Nerve Lesion

The axillary nerve is usually injured due to:

1. Fracture of surgical neck of the humerus.



2. Downward dislocation of the shoulder joint



لان رأس الهيموس بيضغط عليه

3. Compression. from the incorrect use of crutches.



Effects:

Motor:

1- **Impaired abduction of the shoulder (30-90°)**

In boys' slides (20 – 90)
More than 90 = supraspinatus

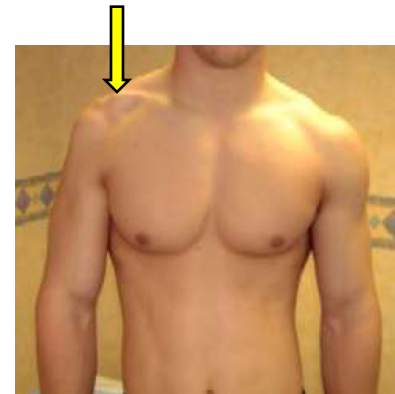
2- Paralysis of the deltoid and teres minor muscles

The paralyzed deltoid wastes rapidly

As the deltoid atrophies, the rounded contour of the shoulder is flattened compared to the uninjured side

Sensory:

Loss of sensation over the lateral side of the proximal part of the arm



Median Nerve

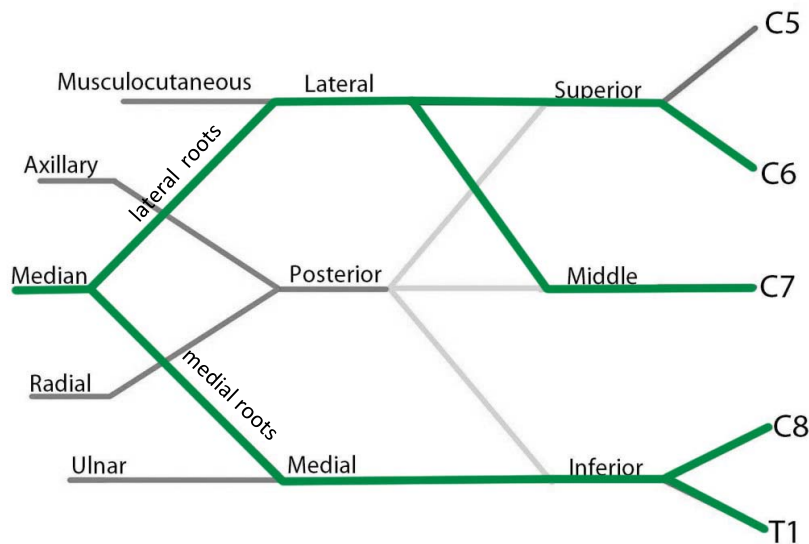
Nerve roots(Origin:): C5 ,C6,C7,C8 &T1 (in some individuals from C6-T1)

The median nerve is formed **anterior to the third part of the axillary artery** by the **union of lateral and medial roots.**

Originating:

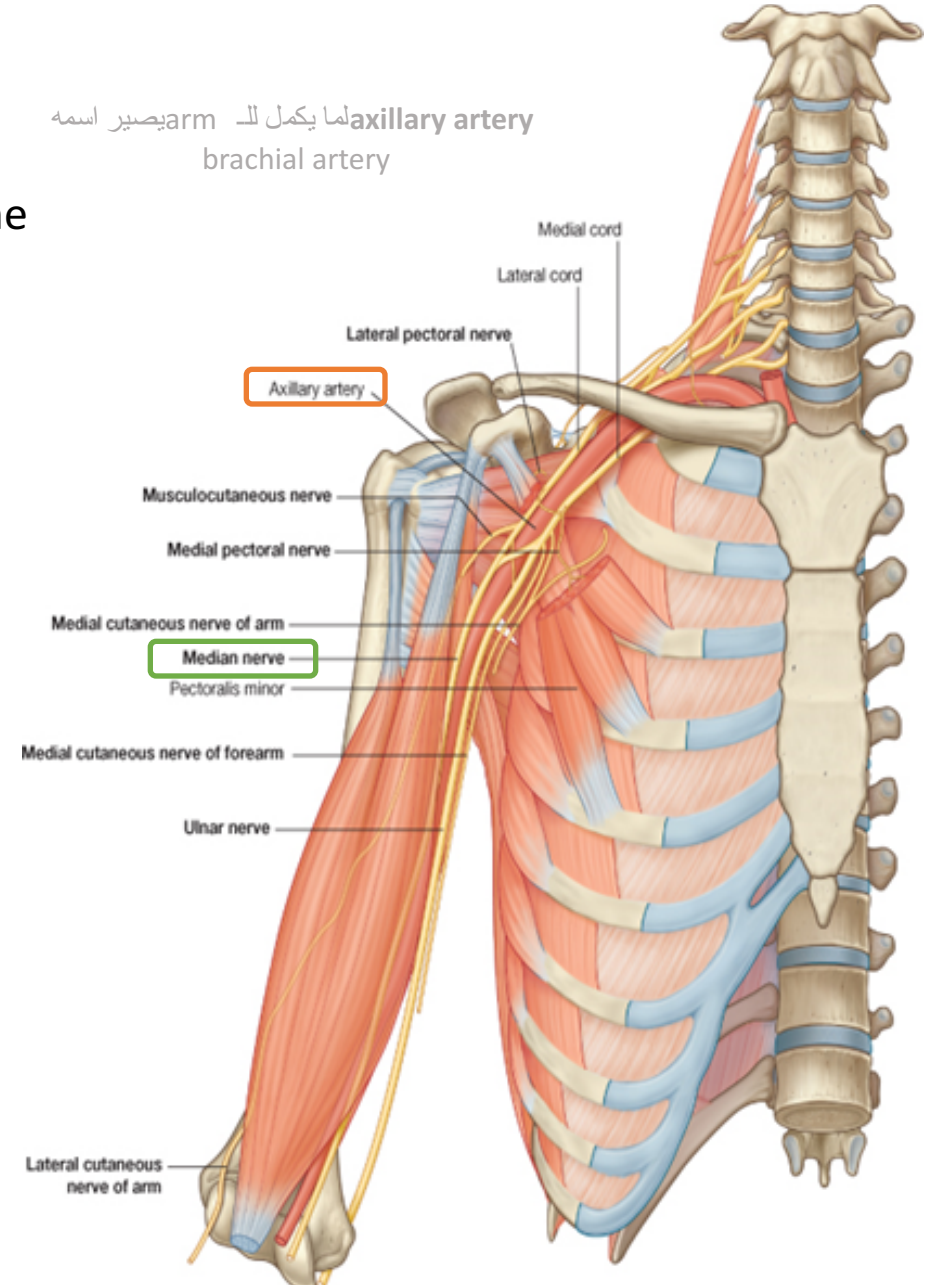
1)The lateral root (C5,6,7):
From the lateral cord of brachial plexus.

2)The medial root (C8&T1):
From the medial cord of brachial plexus.



Don't confuse the roots from the cords and the roots originating from the spine

axillary artery
brachial artery
arm يكمل للـ
اصميه



Median Nerve in the Arm

brachial artery	Median Nerve
proximal regions	lateral to it
Medial region	anterior to it
distal regions	medial to it

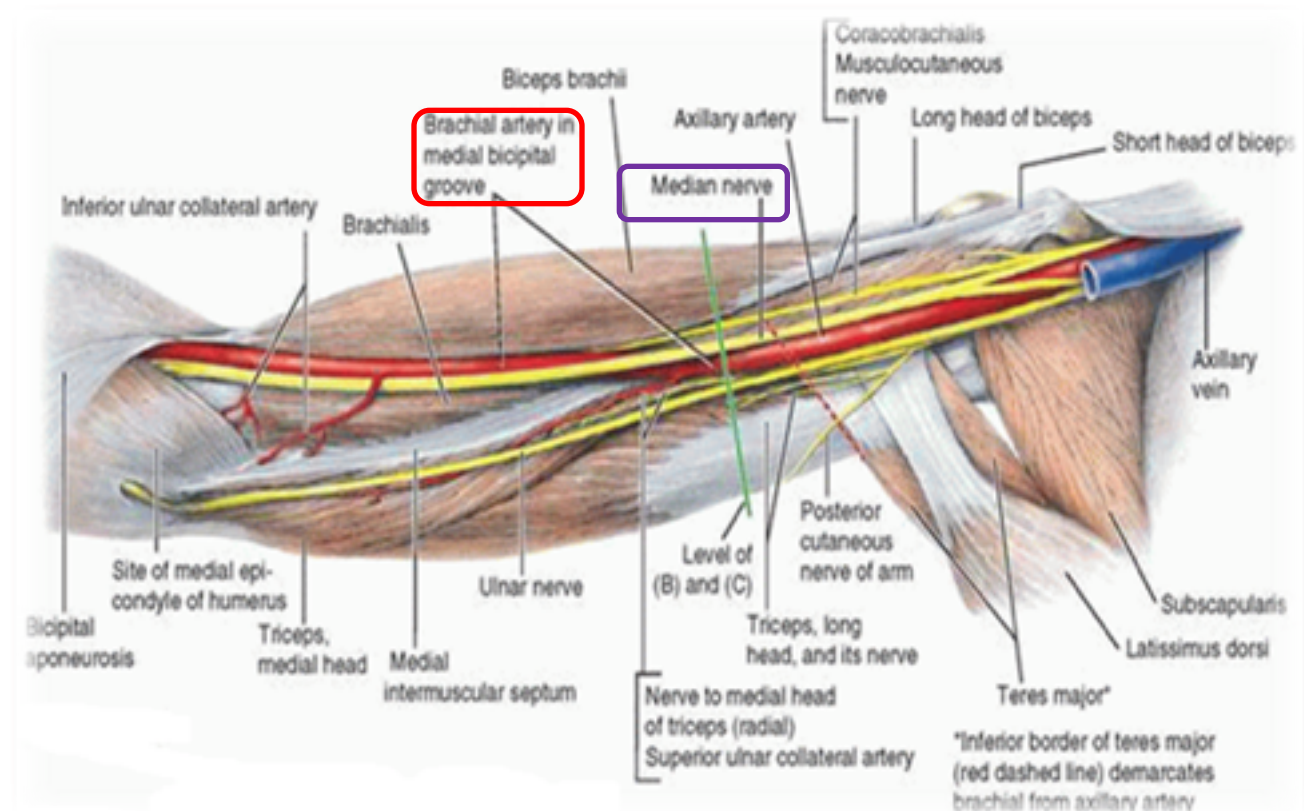
It enters the arm from the axilla at the inferior margin of the teres major muscle.-

- It passes vertically down the medial side of the arm in the anterior compartment and is related to the **brachial artery** throughout its course

in proximal regions: it lies immediately (1-lateral) to the brachial artery;

in more distal regions: it crosses to the (2-medial) side of the brachial artery and lies anterior to the elbow joint .

- **No major branches in the arm** or axilla, BUT a branch to one of the muscles of the forearm, the (**Pronator Teres**), this branch may originate from the nerve immediately proximal to the elbow joint.



Median Nerve in the forearm

Median nerve passes into the forearm to elbow joint **anteriorly** where it **innervates most** of the muscles in **the anterior compartment** of the forearm,

(EXCEPT FOR

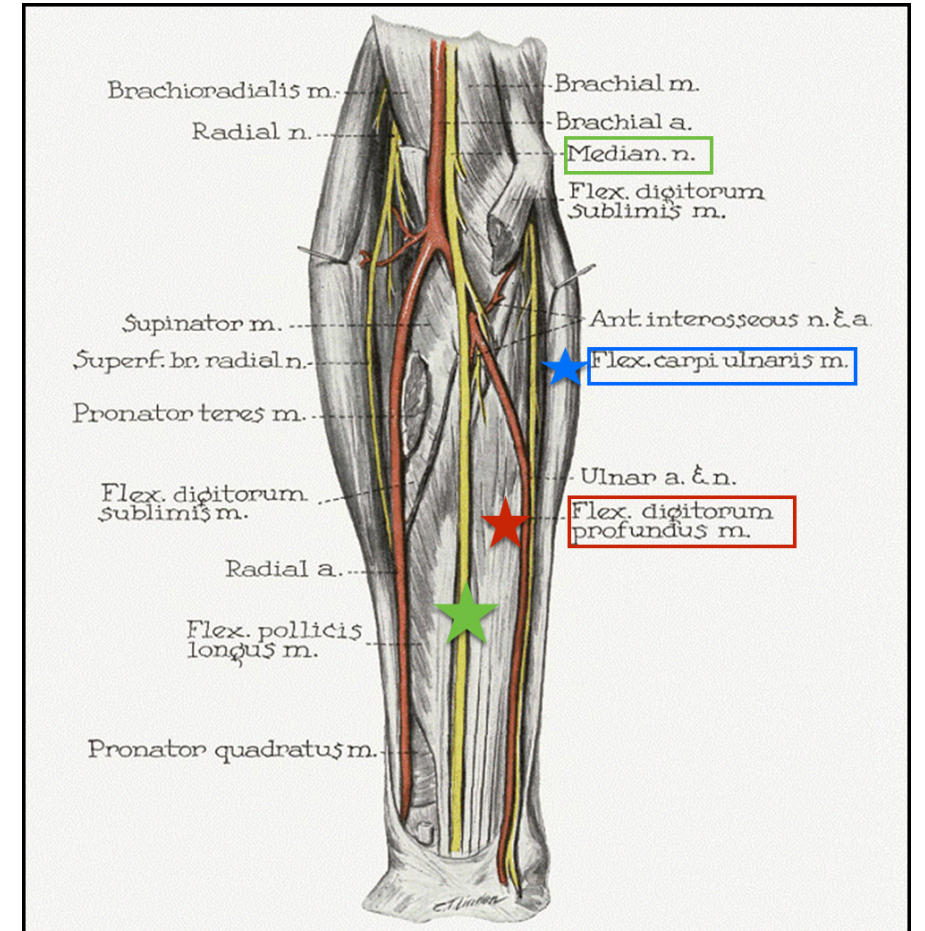
1- Flexor Carpi Ulnaris ★

2- the medial half of the Flexor Digitorum Profundus ★

(which are **innervated** by the **ulnar nerve**).

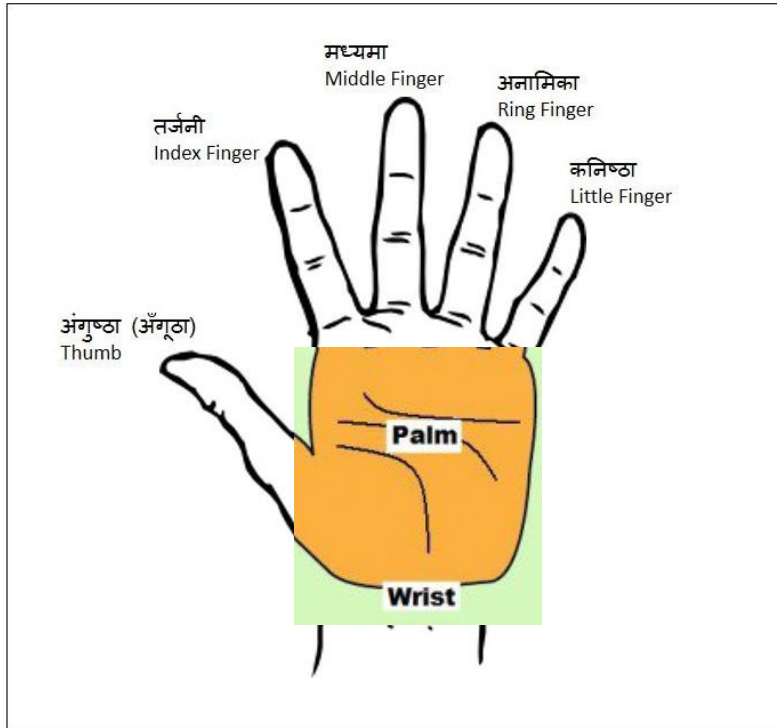
Profundus = deep

فليكسور = تعمل فليكشن
كارباي = للكاريل بونز
والكاريل بونز وينها؟ في الريبست ، إذا تسوي فليكشن
للريبست :)

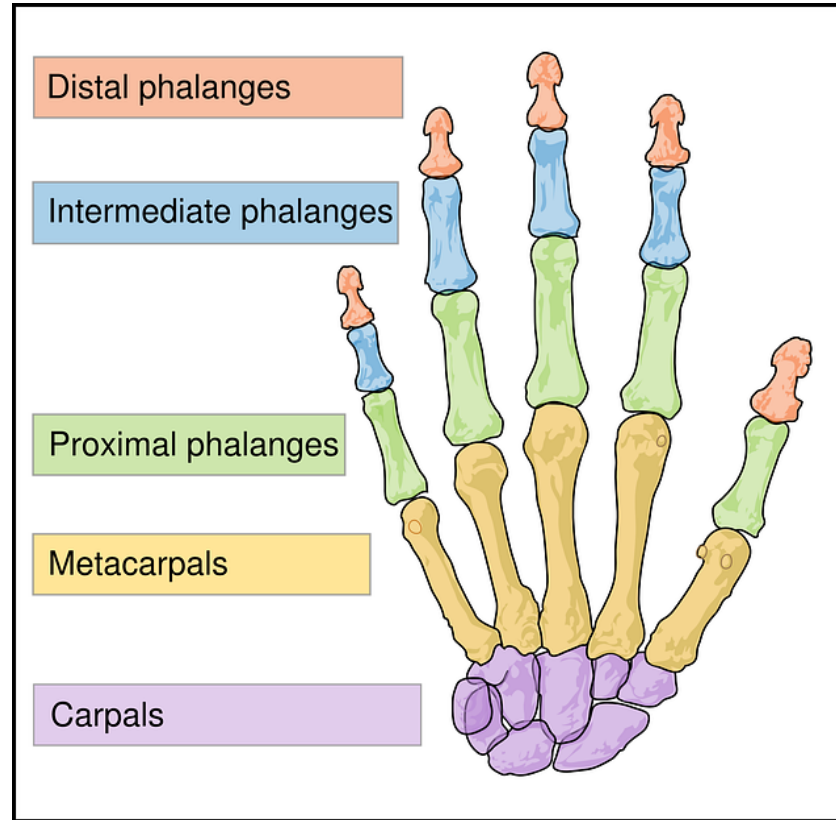


recall

Extra picture*



أحياناً تختلف بعض الأسماء



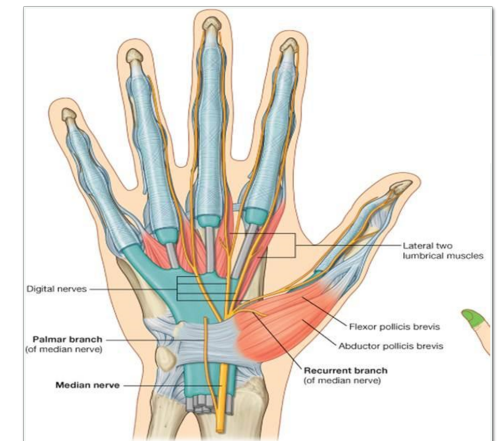
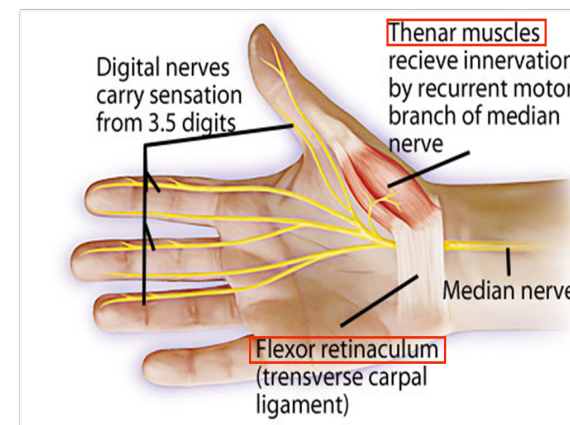
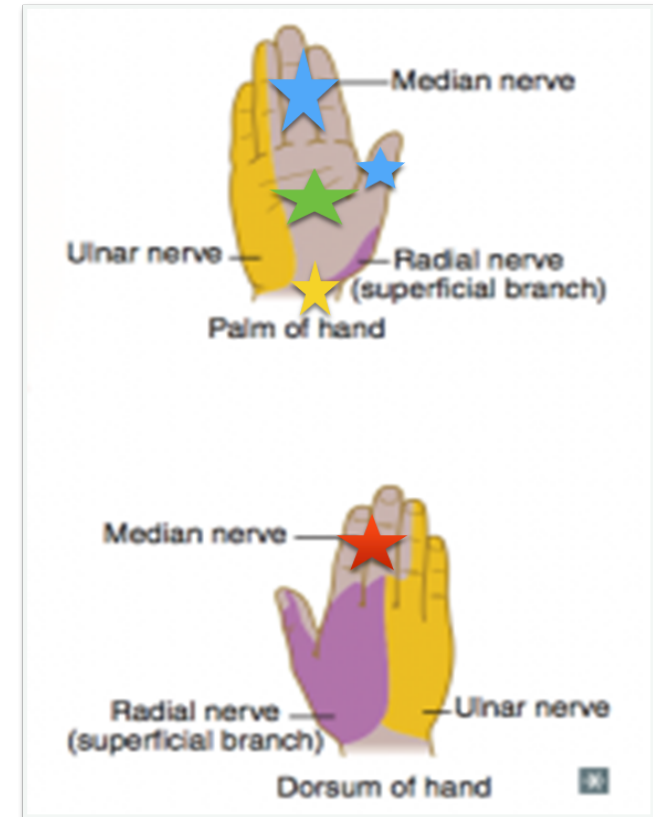
Median Nerve in the hand

The median nerve continues into the hand by passing **deep** to the **flexor retinaculum**.

It is Fibrous tissue
Retinaculum = Deep fascia
flexor = at the middle

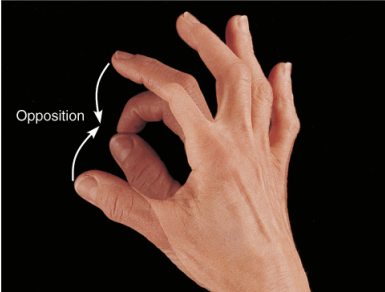
It innervates:

- 1) **Three** thenar muscles: associated with the thumb
- 2) Lateral **two** lumbrical muscles: associated with movement of the index and middle fingers;
- 3) Skin over the palmar surface of the lateral three and one-half digits and over the lateral side of the palm and middle of the wrist.



Median Nerve Lesions

Injury of median nerve at different levels causes different syndromes.
 In the arm and forearm the median nerve is usually not injured by truma ..way? Because of its relatively deep position .



(e) Opposition
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Median nerve can be damaged :		
In the carpal tunnel (deep in flexor retinaculum)	At the wrist above the flexore retinaculum	In the elbow region

The most serious disability of median nerve injuries is the:	
<p>Loss of opposition of the thumb</p> <p>The delicated pincer-like action is not possible</p> <p>هي أخطر شيء ، لأن مافي عضلة تاذية تسوي نفس الحركة او عصب ثاني يعوض</p>	<p>Loss of sensation from the thumb and lateral 1/2 fingers or (1/2 3lateral fingers) & lateral 2/3 of the palm.</p>



Median Nerve Lesion in Elbow Region

Due to supracondylar fracture of Humerus



Affected Muscles :

1- Pronator muscles of the forearm

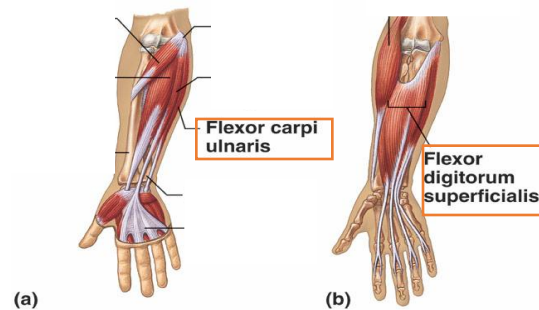
2- All long flexors of wrist & fingers **except**

-flexor carpi ulnaris

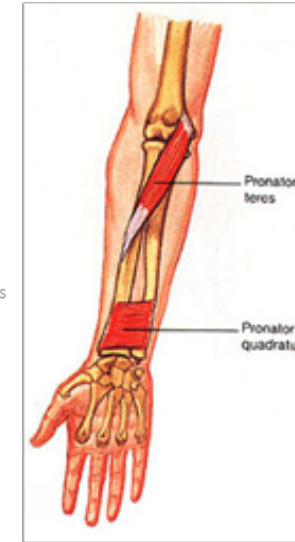
-1/2 flexor digitorum profundus

Because they are supplied by the ulnar nerve

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Pronators
(extra
picture)



Flexors
(extra picture)



فليكسور = تعمل فليكشن

كارپاي = للكاريل بونز

والكاريل بونز وينها؟ في الريبست ، إذا تسوي فليكشن

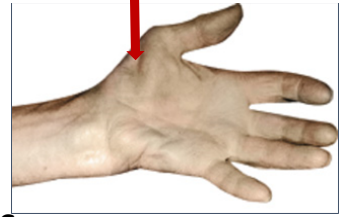
للريبست (:)

Motor effects

- **loss of pronation** (hand is kept supine position)
- **loss of flexion** on interphalangeal joints of index & middle fingers
- **weak flexion** of ring & little fingers
- weak flexion of wrist & ulnar deviation**
- adduction and lateral rotation of Thumb (loss of flexion of terminal phalanx and loss of opposition)
- wasting of thenar eminence (look the picture)
- hand is flattened and **"Apelike"*** (unable to flex 3 most radial digits when asked to make a fist)



Wasting of thenar eminence

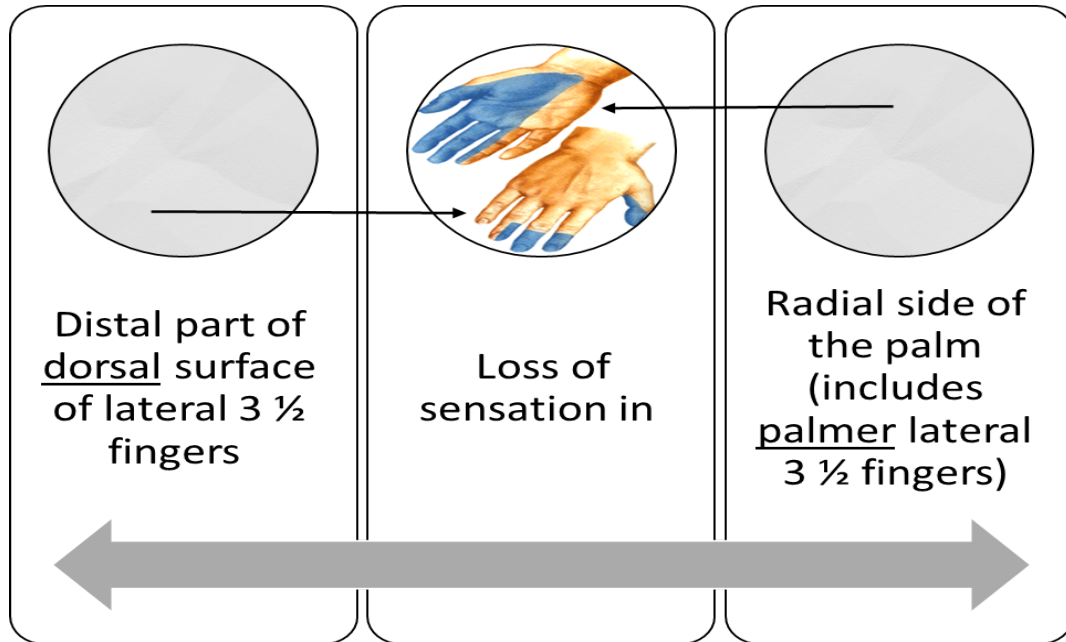


Ulnar Deviation



Extra picture

Sensory Effects



Apelike* مثل الشمبانزي

Trophic Changes

- Dry and scaly skin
- Easily cracking nails
- Atrophy of the pulp of the fingers



Extra picture

** Two muscles work together to flex the wrist:

Flexor carpi ulnaris and flexor carpi radialis; each one pulls or deviates the wrist towards it. (the ulnaris flexes the wrist and pulls it medially toward the ulna and the radialis flexes the wrist and pulls it laterally towards the radius). When they work together they cancel each other so as a result there is no deviation. But when the median nerve is damaged the flexor carpi radialis won't work but the ulnaris will since it is supplied by the ulnar nerve so there will be medial/ulnar deviation as a result

Median Nerve Lesion in the Wrist

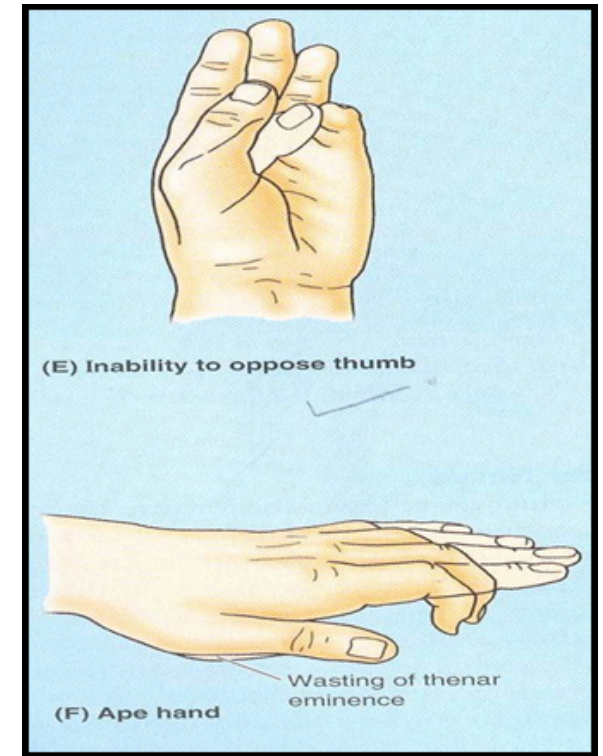
Often injured by penetrating wounds (stab wounds or broken glass) of the forearm. (لما الشخص يحاول ينتحر)

Motor:

- Thenar muscles are paralyzed and **atrophy** in time so that the thenar eminence becomes **flattened** .
- **Opposition and abduction** of thumb are lost, and thumb and lateral two fingers are arrested in adduction and hyperextension position. "**Apelike hand**"

Sensory & trophic changes are the same as in the elbow region injuries .

NOTE: You have to know each deformity and the muscles/nerves involved



Median Nerve Lesion deep in flexore retinaculum (Carpal Tunnel Syndrome)

•The commonest neurological problem associated with the median nerve is **compression** beneath the **flexor retinaculum** at the wrist .

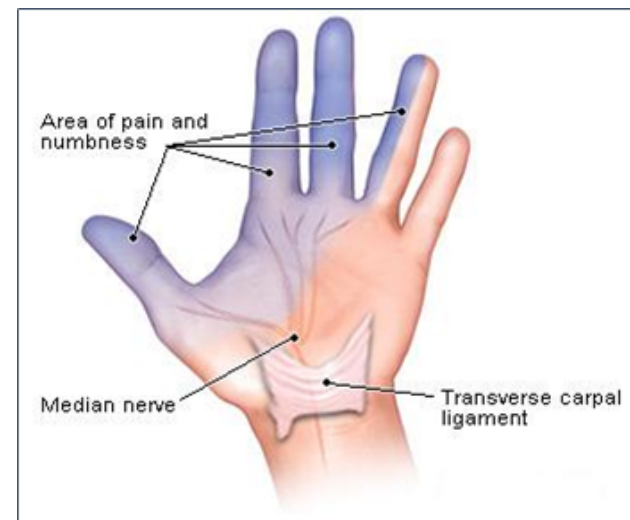
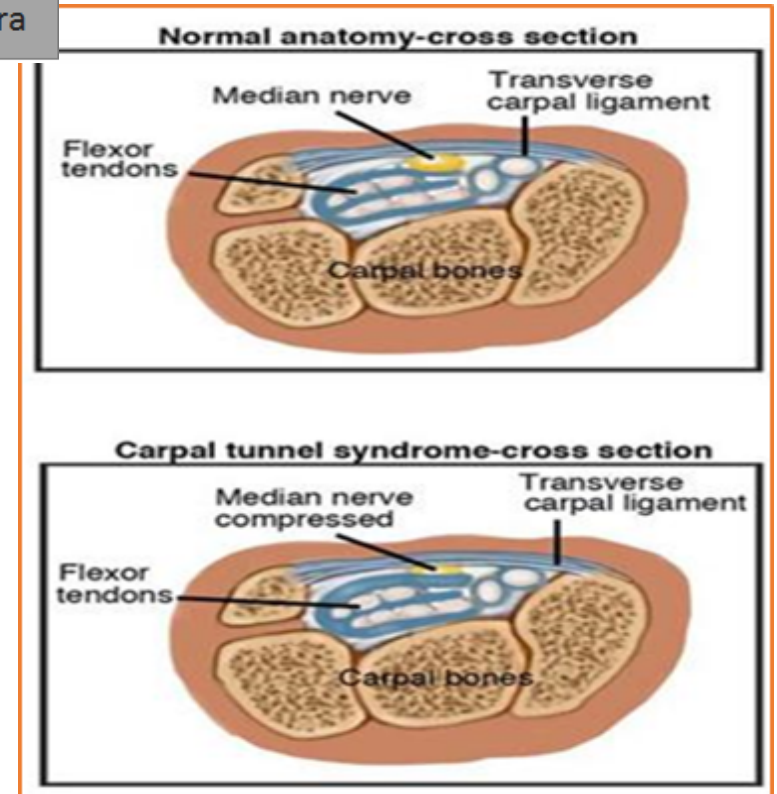
•**Motor:** **Weak** motor function of thumb, index & middle fingers

•**Sensory:** **Burning pain** or 'pins and needles' along the distribution of median nerve to lateral 3½ fingers

➤No sensory changes over the palm as the **palmer cutaneous branch** is given before the median nerve enters the carpal tunnel .

The symptoms first appear as sensory but when it progresses further the motor symptoms appear.

Extra



SUMMARY

Axillary nerve

Origin: posterior cord.
Spinal segments:
C5&C6.

Motor:
Deltoid,teres minor.

Sensory:
Skin over upper lateral
part of arm(superior
lateral cutaneous nerve
of arm)

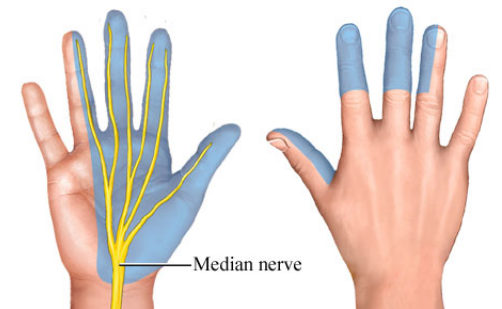


Median nerve

Origin : medial and
lateral cords.
Spinal segments :
(C5,C6,C7,C8 and T1).

Motor
All muscles in the anterior
compartment of the forearm
(Except flexor carpi ulnaris and
medial half of flexor digitorum
profundus), three thenar
muscles of the thumb and two
lateral lumbrical muscles.

Sensory
Skin over the palmar surface
of the lateral three and one-
half digits and over the
lateral side of the palm and
middle of the wrist.



DON'T FORGET

Lateral root from lateral cord

Medial root from medial cord

اکثر شي مميز في الميديان نيرف والي يخليه يأخذ شكل حرف *γ*
عشان كذا محد يغلط في الميديان نيرف.

- Opponens muscle: take muscles supply from median nerve .
- Apelike hand: injury of median nerve " **important**"
- Dislocation: head leave the glenoid cavity .
- Branches: in Axillary Nerve will supply 2 muscles and skin.
- Teres minor is responsible for lateral rotation if it injured the body is **not affected** due to the presence of another muscle which do the same job .
- superior lateral cutaneous nerve of the arm if it affected the sensation of the skin will be lost .
- Median Nerve Lesion at the Elbow Region (Hand cannot do flexion) + Median Nerve Lesion at the Wrist
(Here I can do supination and weak flexion of the wrist)

- No major branches of Median Nerve in the arm, BUT a branch to one of the muscles of the forearm, the (Pronator Teres), this branch may originate from the nerve immediately proximal to the elbow joint.

Quiz yourself

1) The median nerve innervates most of the muscles in the anterior compartment of the forearm except?

- A) Flexor carpi ulnaris
- B) Brachialis
- C) Extensor digitorum longus
- D) Coracobrachialis

2) The median nerve continues into the hand by passing deep to the?

- A) Biceps brachii
- B) Axillary nerve
- C) Flexor retinaculum
- D) Thoracodorsal nerve

3) A physician examined an xray and saw that the patient had a fracture in the surgical neck, which nerve will he be worried about?

- A) Axillary
- B) Musculocutaneous
- C) Radial
- D) Brachial

4) Which of the following is a sensory supply of the median nerve?

- A) Palmer lateral 3 and a half digits
- B) Palmer medial 1 and a half digits
- C) 3 thenar muscles
- D) 3 hypothenar muscles

5) The median nerve originates from:

- A) Medial cord
- B) Lateral cord
- C) Posterior cord
- D) A & B

- 1)A
- 2)C
- 3)A
- 4)A
- 5)D

Quiz yourself

6) Which of the following is trophic change due to median nerve lesion in elbow?

- A) Loss of sensation in thumb
- B) Apelike hand
- C) Dryness of skin
- D) Loss of pronation

7) When the injury is in the median nerve at wrist, the thenar muscle become:

- A) Paralyzed, Hypertrophy
- B) Paralyzed, larger in size
- C) Paralyzed, atrophy
- D) No change

8) In the median nerve lesion at wrist the hand look like:

- A) Apelike hand
- B) Claw hand
- C) Drop fist

9) The compression in the carpal tunnel syndrome:

- A) Above the extensor retinaculum
- B) Beneath the flexor retinaculum
- C) Above the flexor retinaculum
- D) Beneath the extensor retinaculum

6)C

7)C

8)A

9)B

