Axillary and Median Nerve

Musculoskeletal block - Anatomy - lecture 6

Editing file

Objectives

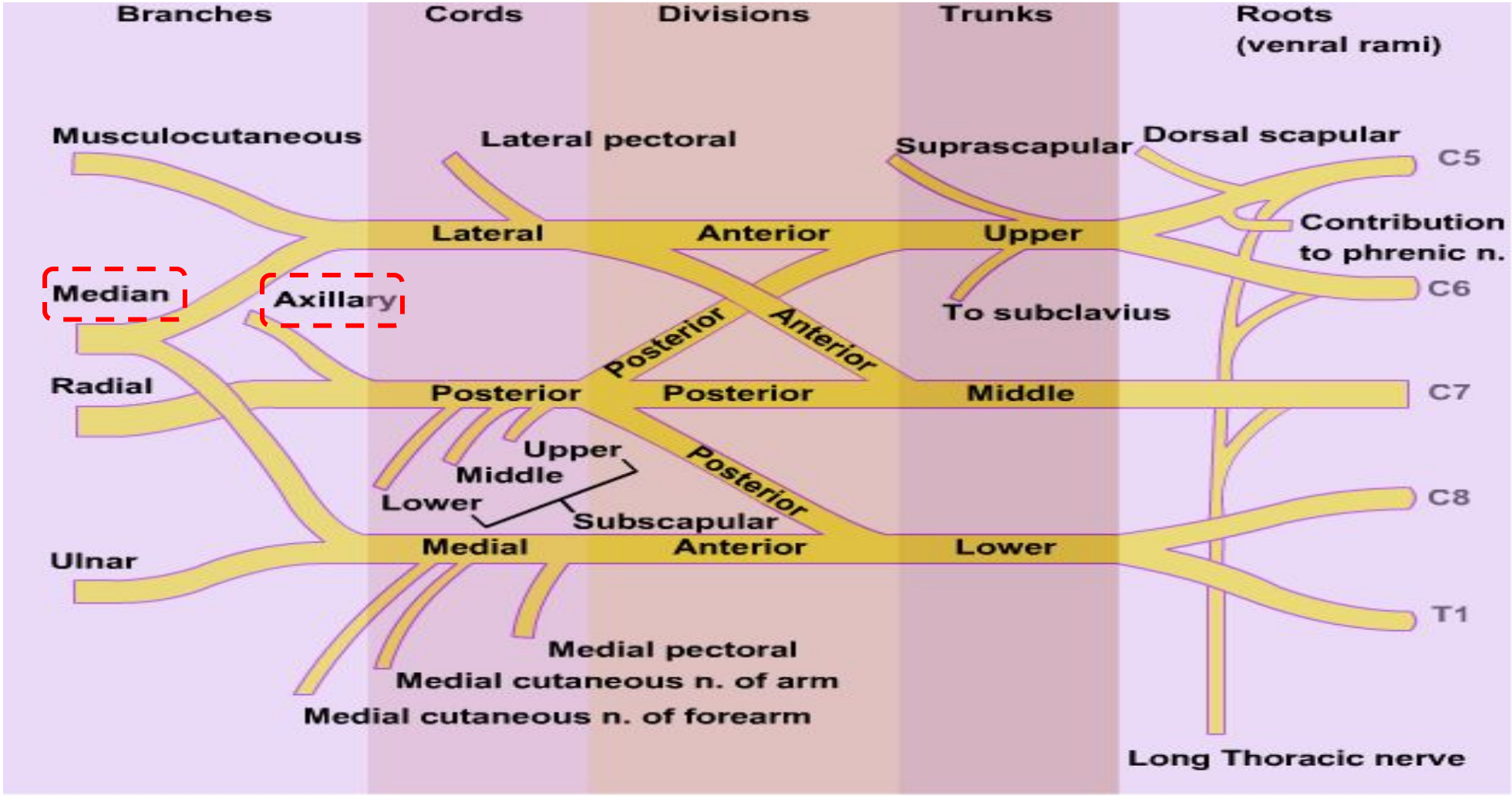
By the end of the lecture, students should be able to:

- ✓ Describe the origin, course, relations, branches and distribution of the axillary & median nerves

- ✓ Describe the common causes and effects of injury to the axillary and median nerves

Color guide :
Only in boys slides in **Blue**
Only in girls slides in **Purple**
important in **Red**
Doctor note in **Green**
Extra information in **Grey**

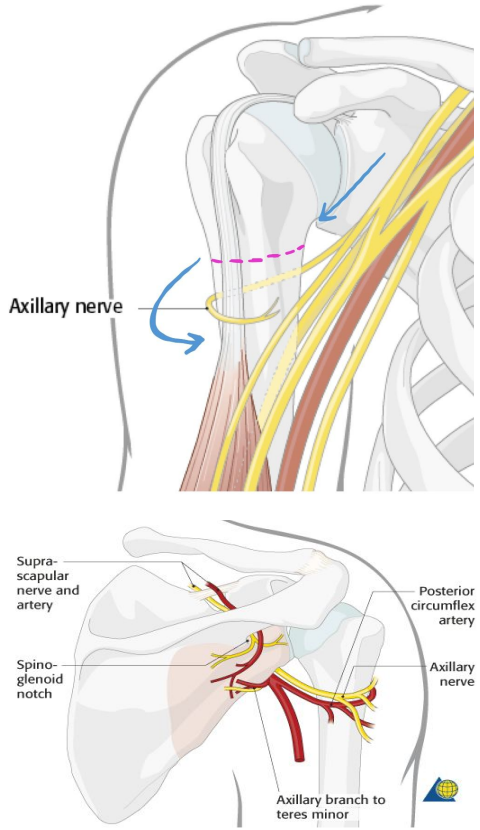
Brachial plexus



Remember **T**o **D**rink **C**old **B**eer

Axillary Nerve

<table>
<tr><th>Origin</th><th colspan="2">Course</th><th colspan="2">Branches</th></tr>
<tr>
<td rowspan="2">(C 5 & 6)
Posterior cord of brachial plexus.

أي عصب ناخذه لازم نعرف من أي قطع من السباينل كورد جاء ، لأن أي ضرر يصير فيهم هو أيضاً راح يتأثر.</td>
<td>- It passes inferiorly and laterally along the posterior wall of the axilla to exit.</td>
<td rowspan="2"> 
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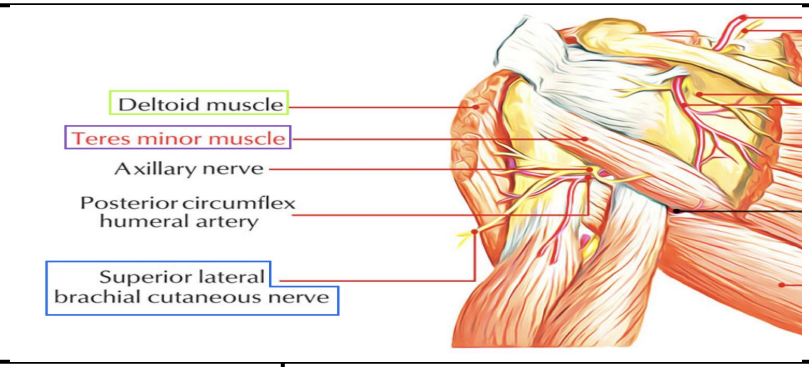
<td colspan="2" rowspan="2"> 
</td>
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<tr>
<td>-Then, it passes posteriorly around the surgical neck of the humerus.

-It is accompanied by the posterior circumflex humeral artery.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Motor)
to the deltoid and teres minor muscles.</td>
<td>(Sensory)
superior lateral cutaneous nerve of arm that loops around the posterior margin of the deltoid muscle to innervate skin in that region.</td>
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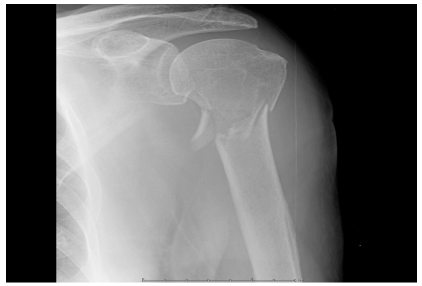
Axillary Nerve

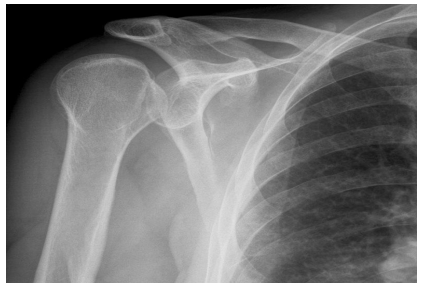
Lesions

The axillary nerve is usually injured due to:

- Fracture of surgical neck of the humerus

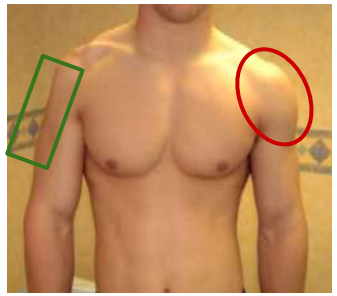


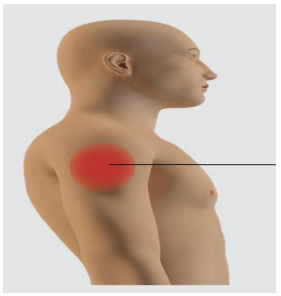
- Downward dislocation of the shoulder joint



- Compression from the incorrect use of crutches

affects





Motor:

1- Impaired abduction of the shoulder **(15-90˚)**

Note: the patient CANNOT raise his arm over 30˚.

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

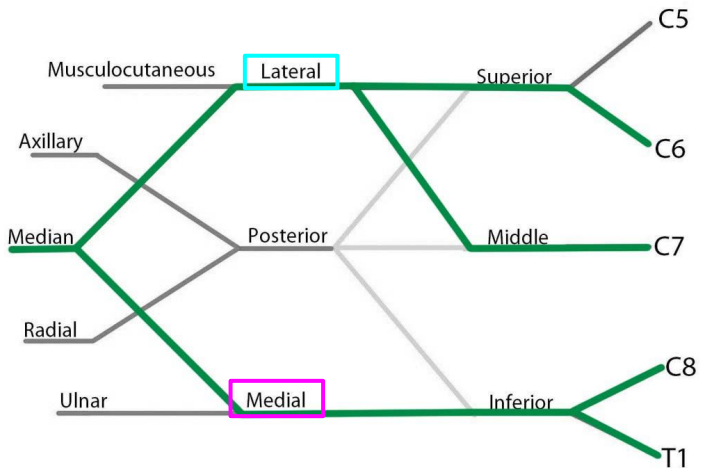
Origin

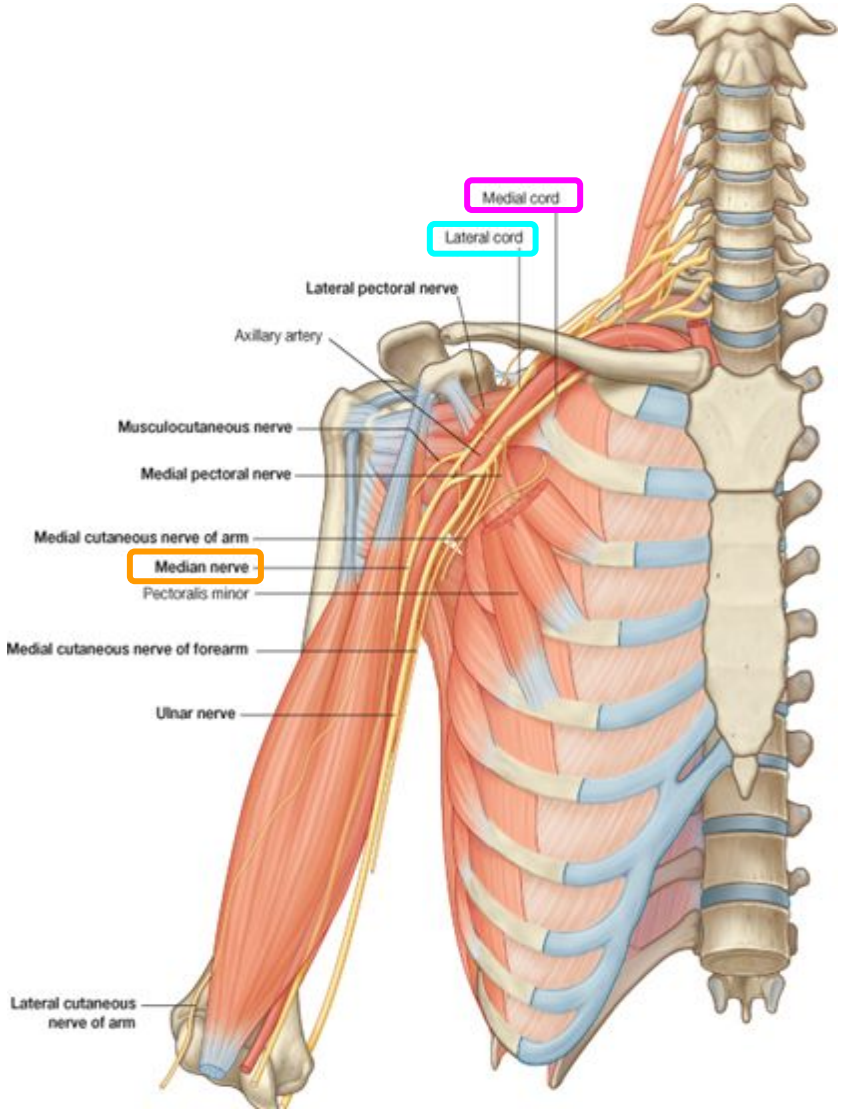
(C5,6,7, 8, T1)

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

- The lateral root (**C5,6&7**), arises from the lateral cord of the brachial plexus.
- The medial root (**C8 & T1**), arises from the medial cord of the brachial plexus.

originating from the lateral and medial cords of the brachial plexus.





Note: **Axillary artery** is named **Brachial artery** when it reaches the arm

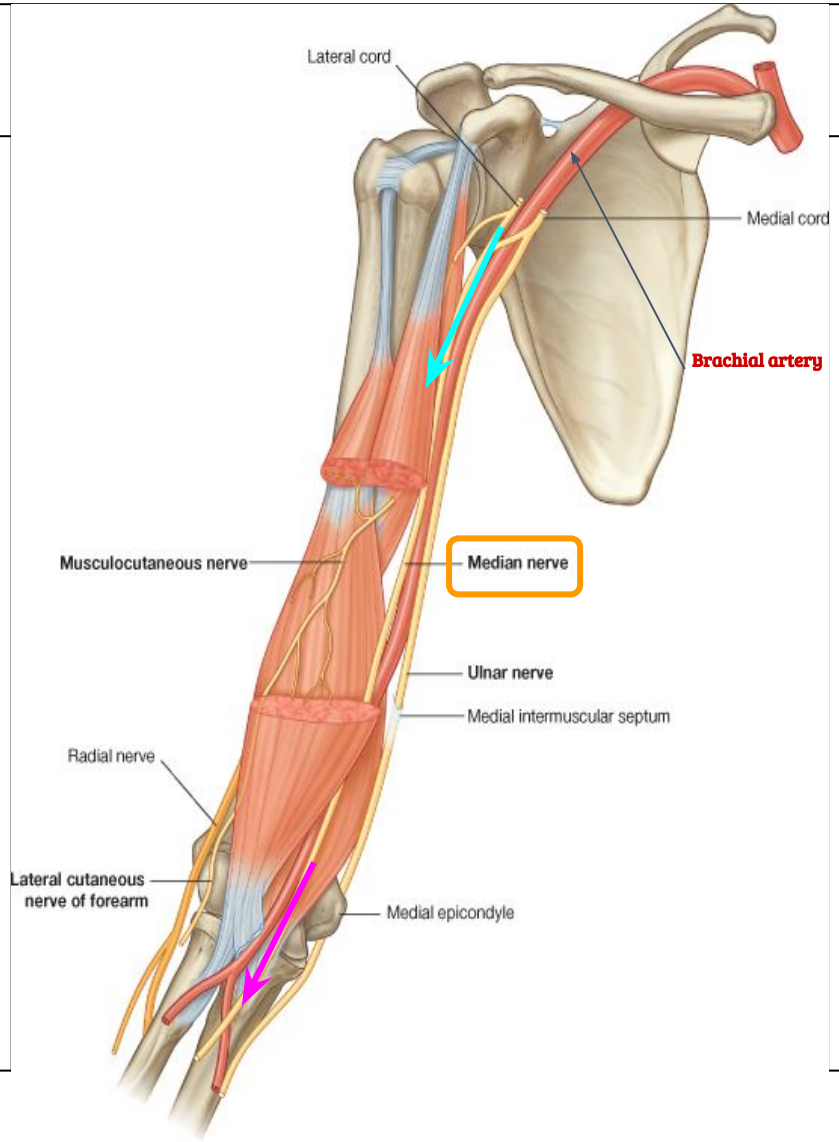
Median Nerve

In the arm

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 (In upper 1/2 of the arm), it lies immediately lateral to the brachial artery.
- In more distal regions (In the middle of the arm), it crosses the medial side of the brachial artery.
- In the lower 1/2 it descends on the medial side of the brachial artery.
- It descends anterior to the elbow joint.



Note that

- The median nerve has **NO major branches in the arm or axilla**, but a branch to one of the muscles of the forearms, the (Pronator Teres), this branch may originate from the nerve immediately proximal to the elbow joint.

Note: Flexor retinaculum is a fibrous tissue:
Retinaculum = Deep fascia
flexor = in the middle

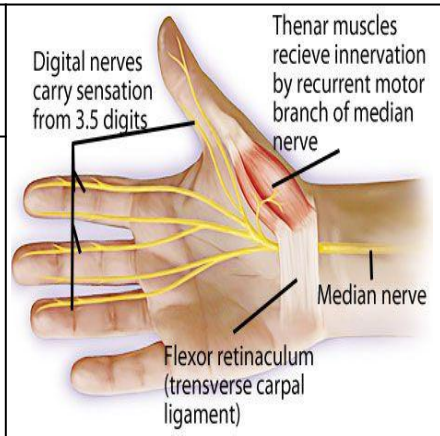
Median Nerve

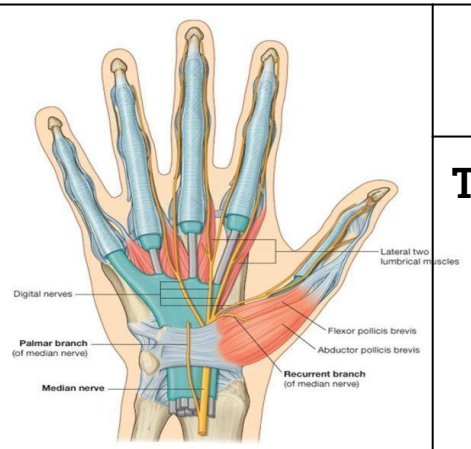
In the forearm

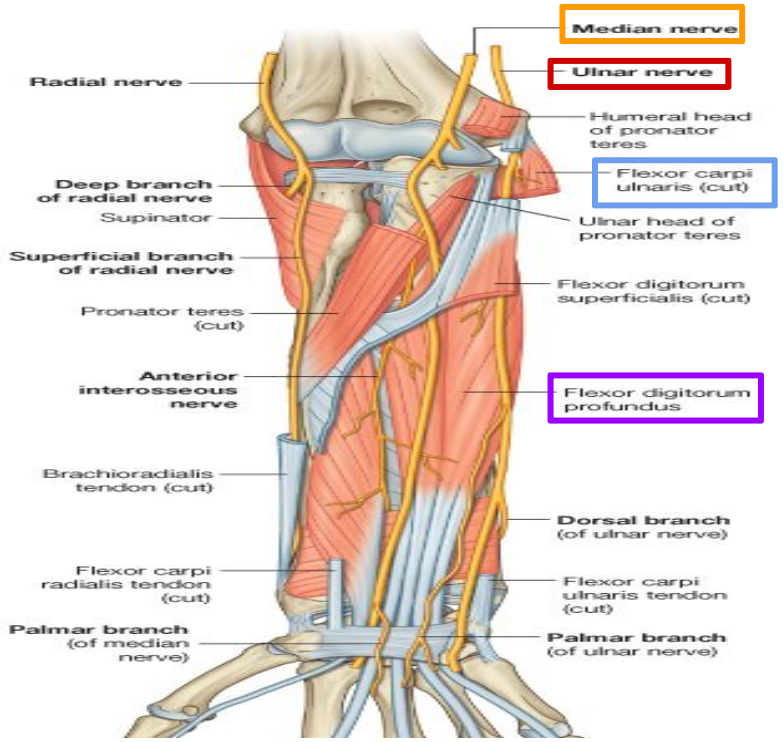
Median nerve passes into the forearm anterior to the elbow joint(between the 2 heads of pronator teres) where it branches innervates most of the muscles in the anterior compartment of the forearm (6.5 muscles) **Except** the:

- Flexor Carpi Ulnaris
- the medial half of the Flexor Digitorum Profundus

(which are innervated by the ulnar nerve).







In the hand

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

- **Three** thenar eminence muscles associated with the thumb.
- Lateral **two** lumbrical muscles associated with movement of the index and middle finger.
- **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.
  (The lateral 2/3rd of the palm of the hand.)

Median Nerve Lesions

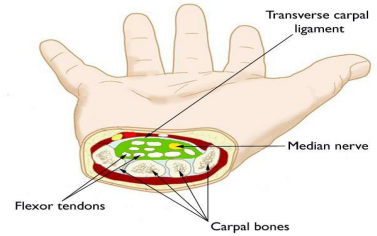
Injury of the median nerve at different levels causes different syndromes -

In the arm and forearm the median nerve is usually not injured by trauma, why ?

Because of its relatively deep position.

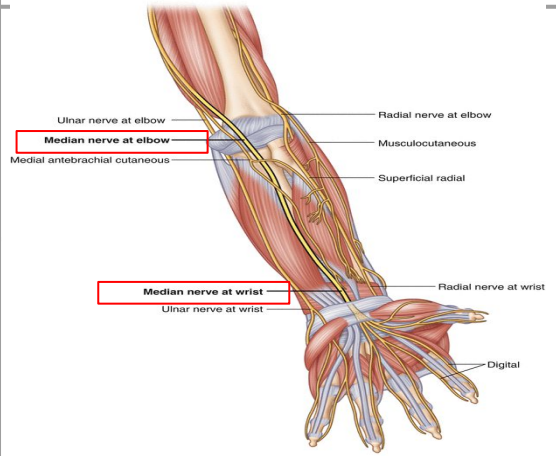
Sites of damage

In the carpal tunnel (deep in the flexor retinaculum)



At the wrist above the flexor retinaculum

In the elbow region (supracondylar fracture of the humerus)

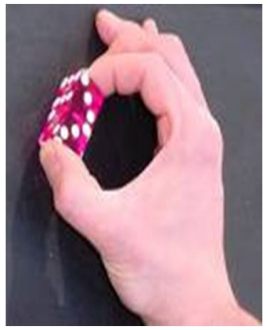


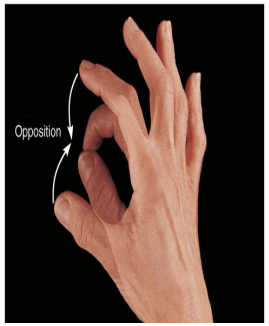
Serious effects

Loss of opposition of the thumb:

The delicate pincer- like action is not possible.

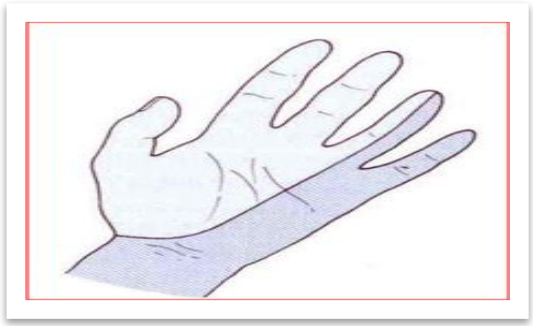
اخطر شي لان ما في عضلة ثانية تسوي نفس الحركة أو عصب ثاني يعوض

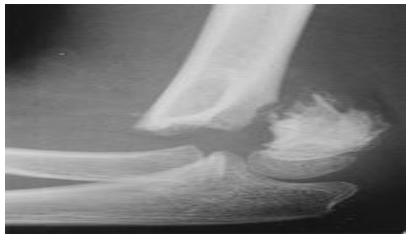
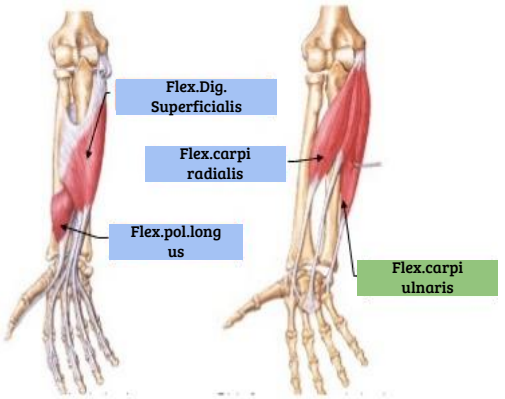
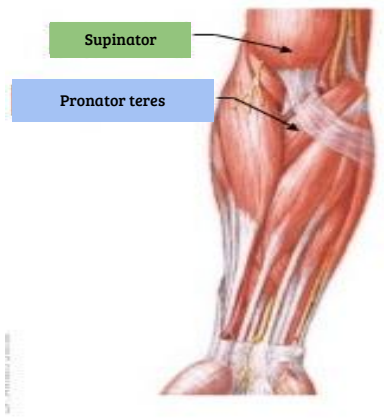
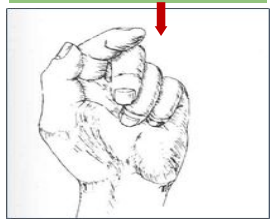
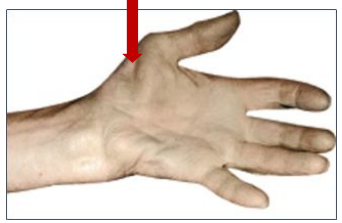
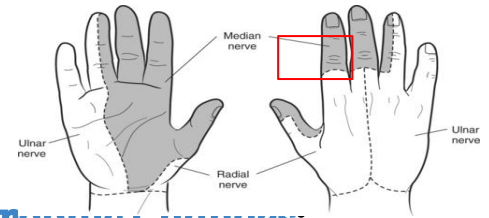


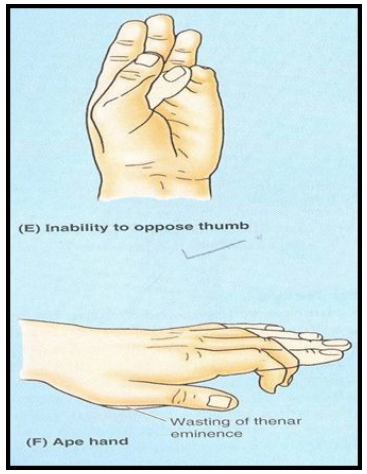
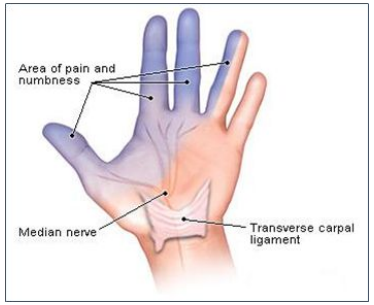


Loss of sensation:

from the thumb and lateral 3½ fingers & lateral ⅔ of the palm.



Lesion	About	Motor	Sensory and tropic
Median Nerve Lesion in the Elbow Region	 Damaged in supracondylar fracture of humerus **Muscles affected are:** • Pronator muscles of the forearm (they will always be supinated) • All long flexors of the wrist and fingers **except** flexor carpi ulnaris and medial half of flexor digitorum profundus   	• Loss of pronation. • Hand is kept in supine position. • Wrist shows weak flexion, and ulnar deviation. (cause there is no muscle to antagonise the action of the ulnaris) • Loss of flexion on the interphalangeal joints of the index and middle fingers. • Weak flexion of ring and little fingers. • Thumb is adducted (cause the adductor muscle is not supplied by the median nerve) and laterally rotated, with loss of flexion of terminal phalanx and loss of opposition. • Wasting of thenar eminence. • Hand looks flattened and "**apelike**",and presents an inability to flex the three most radial digits when asked to make a fist. The index and middle fingers are extended because of the antagonist muscle  Wasting of thenar eminence 	**Sensory**: Loss of sensation from: • The **radial side** ⅔ of the **palm.** • **Palmar** aspect of the lateral **3½ fingers.** • **Distal part of the dorsal surface of the lateral 3½ fingers.**  **Trophic changes:** • Dry and scaly skin • Easily cracking nails • Atrophy of the pulp of the fingers Extra 

Lesion	About	Motor	Sensory
Median Nerve Lesion at the Wrist	Often injured by penetrating wounds (stab wounds or broken glass) of the forearm. (لما الشخص يحاول ينتحر) **NOTE:** You have to know each deformity and the muscles/nerves involved.  Extra 	**Thenar muscles** are **paralyzed** and **atrophy happens** with 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**: Loss of sensation from: • The **radial side** of the **palm.** • **Palmar** aspect of the **lateral 3½ fingers.** • **Distal** part of the **dorsal surface of the lateral 3½ fingers.** **Trophic Changes**: • Dry and scaly skin • Easily cracking nails • Atrophy of the pulp of the fingers are the same as in the elbow region injuries.
Median Nerve Lesion deep in flexor retinaculum "Carpal Tunnel Syndrome"	The **most common** neurological problem associated with the median nerve is the compression beneath the flexor retinaculum at the wrist. The symptoms first appear as sensory but when it progresses further the motor symptoms appear. most common in postmenopausal women	**Weak** motor function of thumb, index & middle fingers.  	Burning pain or **'pins and needles'** along the distribution of median nerve to lateral 3½ fingers. No sensory changes over the palm as the palmar cutaneous branch is given before the median nerve enters the carpal tunnel.

SUMMARY

Axillary nerve

Origin: posterior cord.

Spinal segments:

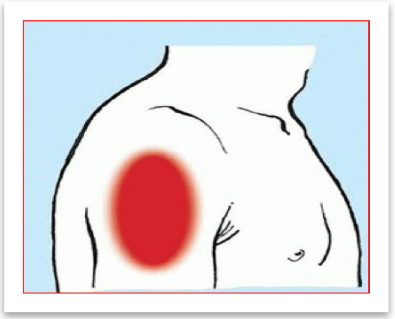
C5&C6.

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.

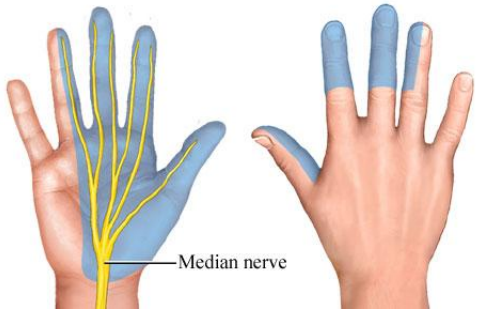
Spinal segments : (C5,C6,C7,C8 and T1).

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.



MCQs

Question 1: The median nerve continues into the hand by passing deep to the?

A. Flexor retinaculum

B. Brachialis

C. Coracobrachialis

D. Extensor digitorum longus

Question 2: The median nerve originate from:

A. Lateral cord

B. Medial cord

C. Both B & A

D. Posterior cord

Question 3: Which one of the following is a sensory supply of the median nerve?

A. 3 thenar Muscles

B. 3 hypothenar Muscles

C. Palmer lateral 3 and a half digit

D. Palmer medial 1 and a half digit

Question 4: A physician examined an X ray and saw that the patient had a fracture in the surgical neck, which nerve will he be worried about?

A. brachial

B. Radial

C. Musculocutaneous

D. Axillary

Question 5: Loss of pronation is a motor effect of:

A. Median nerve injury in elbow

B. Median nerve injury at the wrist

C. Axillary nerve injury

D. Median nerve injury in the carpal tunnel

Question 6: A patient complaining of pins and needles sensation along the medial side of the upper limb and the 3 lateral fingers, that would indicate:

A.Median Nerve Lesion in the Elbow Region

B. Carpal tunnel syndrome

C. Surgical neck fracture

D.Median Nerve Lesion at the wrist

SAQ

Question 1: One of the trophic changes in Median Nerve Lesion in the Elbow Region?

Dry and scaly skin

Question 2: Where are the axillary motor branches located?

In the deltoid and teres minor muscles.

Answers: Q1.A- Q2.C -Q3.C -Q4.D- Q5.A- Q6.B

Team members

Boys team:

- Khalid AL-Dossari
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- Ziyad Al-jofan
- Suhail Basuhail
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- Khalid AlKhani
- Omar Alammari

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★ =This lecture done by

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Special thank for Anatomy team 436

King Saud University
Med438
Anatomy team

Good luck

Give us your feedback: