

MED439
KING SAUD UNIVERSITY

Axillary and median nerve

Musculoskeletal Block - Lecture 6

Objective:

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

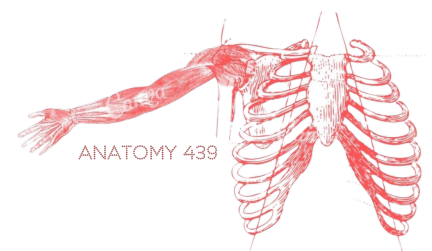
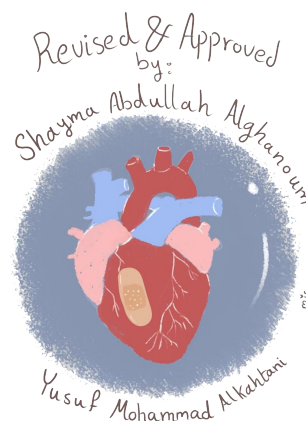
Color index:

Important

In male's slides only

In female's slides only

Extra information, explanation

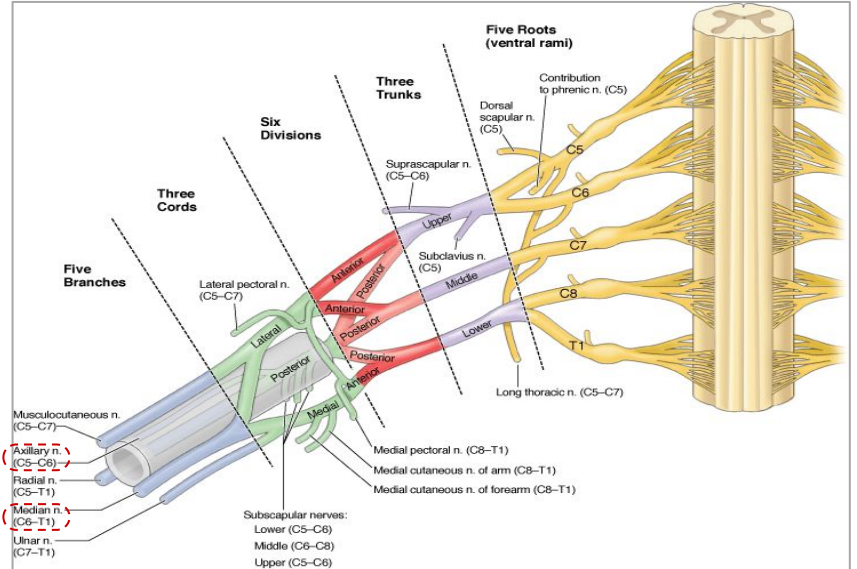
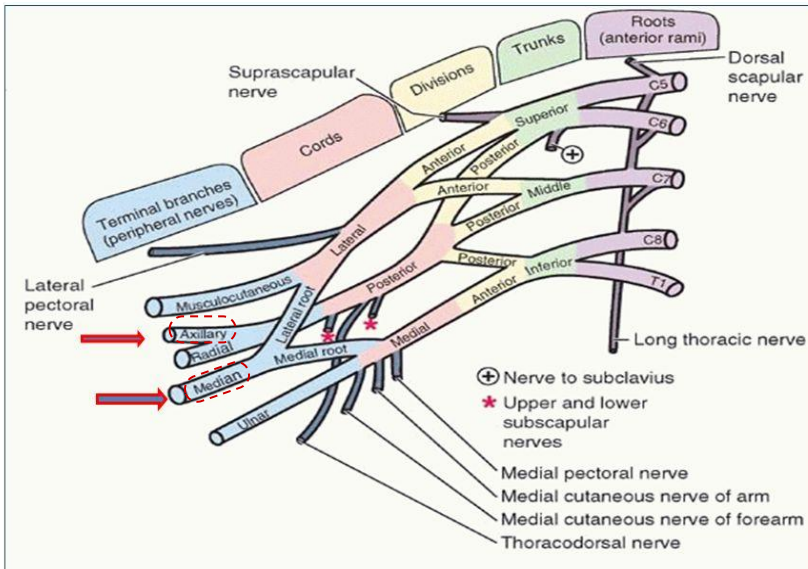


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Contact us:
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Brachial plexus



Remember To Drink Cold Beer

Axillary Nerve

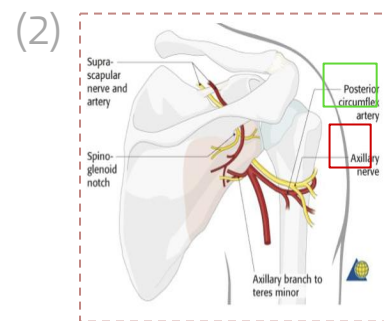
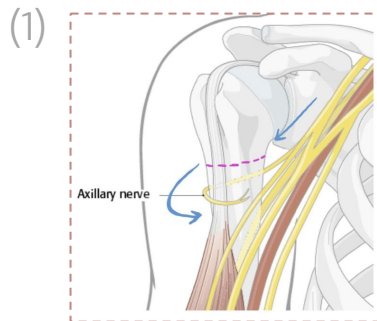
Origin

- (C5 & C6)
- Posterior cord of brachial plexus.

أي عصب نأخذه لازم نعرف من أي قطع من السبائيل كورد جاء، لأن أي ضرر يصير فيهم هو أيضا راح يتأثر

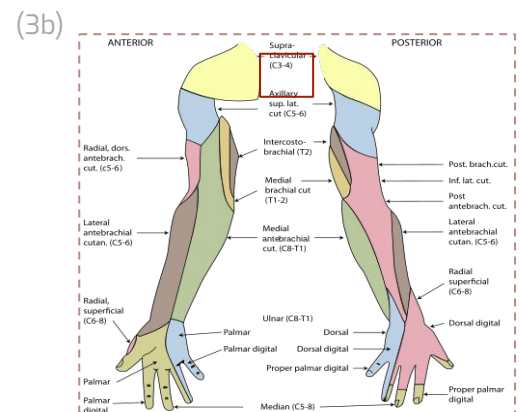
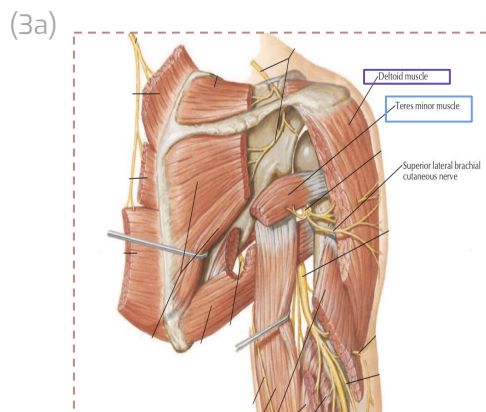
Course

- Remember 3 posterior
- It passes inferiorly and laterally along the posterior wall of the axilla to exit.
 - Then, it passes posteriorly around the **surgical neck** of the humerus. (1)
 - It is accompanied by the **posterior circumflex humeral artery**. (2)



Branches

- **Motor** :
 - to the **deltoid** and **teres minor** muscles. (3a)
- **Sensory** :
 - **superior lateral cutaneous nerve of arm** that loops around the posterior margin of the deltoid muscle to innervate skin in that region. (3b)
 - **Upper lateral cutaneous nerve of arm** which carries sensations from the skin above the deltoid muscle.



Axillary Nerve

Lesions

The axillary nerve is usually injured due to:

- **Fracture** of surgical neck of the humerus



- **Downward (inferior) dislocation** of the shoulder joint



- **Compression** from the incorrect use of crutches



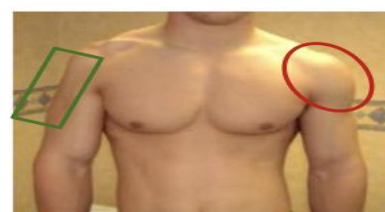
Effects

- **Motor:**

1- **Impaired** abduction of the shoulder (15/30-90°).

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 **lost** and becomes **flattened** compared to the uninjured side.



- **Sensory:**

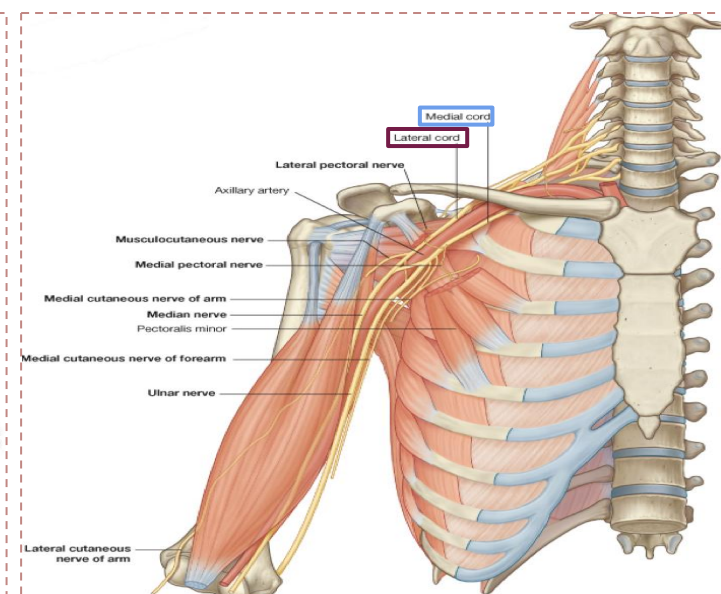
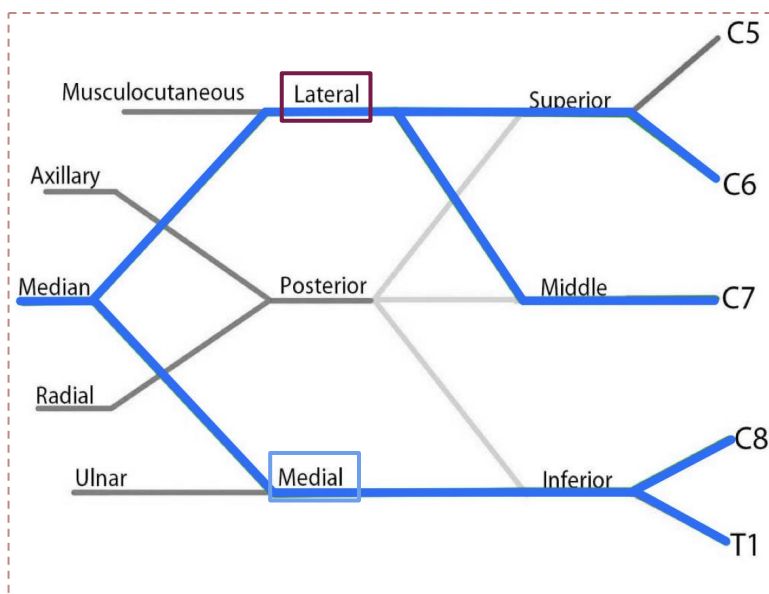
Loss of sensation over the upper lateral side of the proximal part of the arm.



Median Nerve

origin

- **(C5,6,7, 8, T1)** all roots
- 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.**

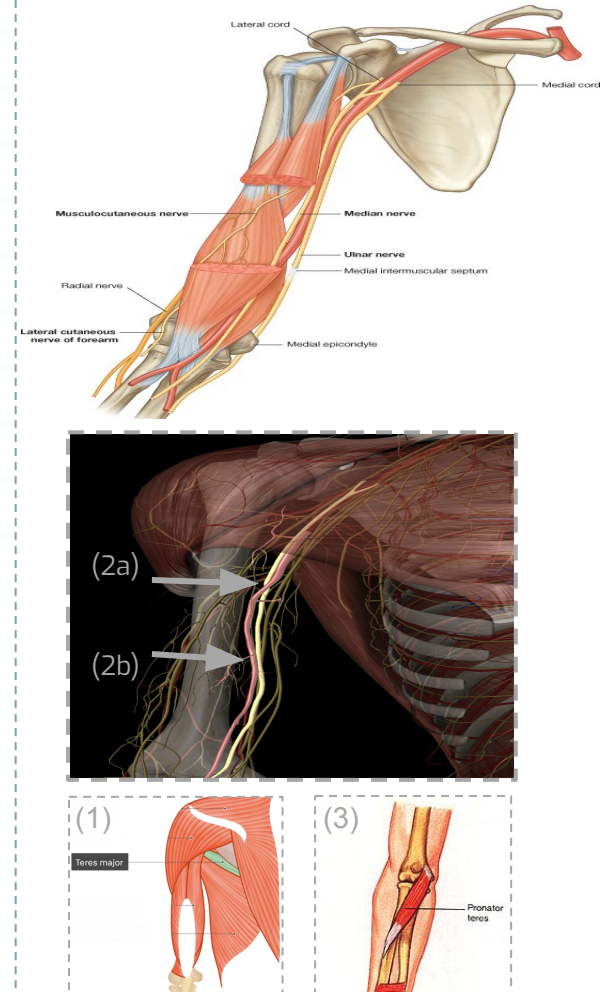


Median Nerve



In the arm

- It enters the arm from the axilla at the **inferior margin** of the **teres major**(1) 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 region** (In upper 1/2 of the arm) it lies immediately **lateral** to the **brachial artery**(2a)
 - **In more distal region** (In the middle of the arm) it crosses ***the artery from lateral to medial*** to the **medial side** of the **brachial artery** (2b), and descends **anterior** to the elbow joint.
 - In the lower 1/2 it descends on the medial side of the brachial artery.
- The median nerve has **no major branches in the arm**, but a branch to one of the muscles of the forearm, the **pronator teres** muscle(3), may originate from the nerve immediately **proximal** to the elbow joint.

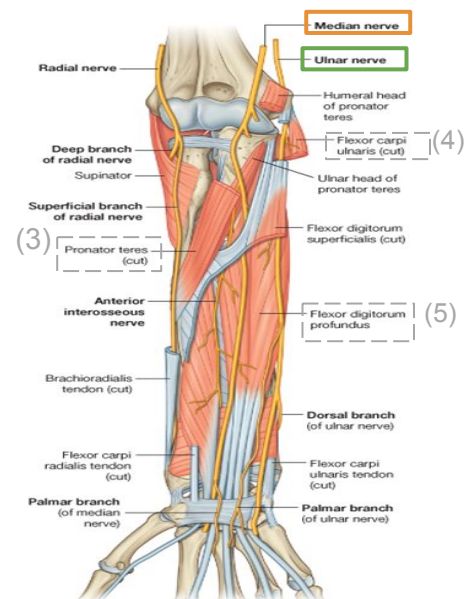


In the forearm

- **Median nerve** passes into the forearm **anterior** to the elbow joint (between the 2 heads of pronator teres)

Where its branches innervate most of the muscles in the **anterior compartment** of the forearm (6.5 muscles) **Except** the:

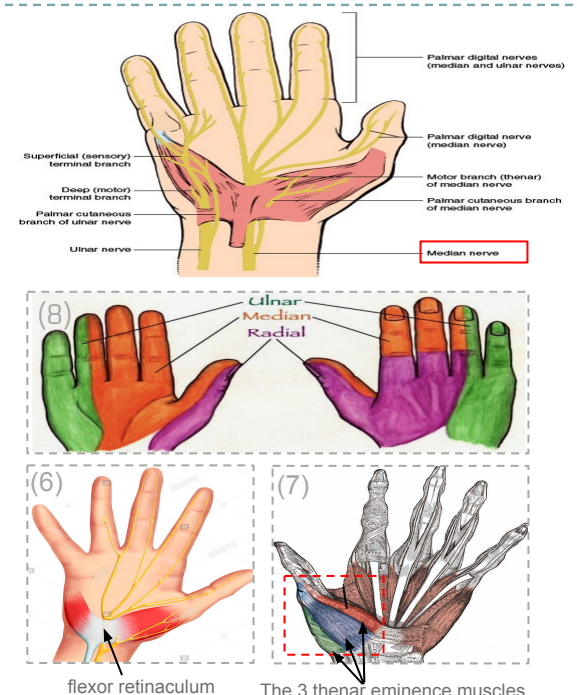
1. **Flexor Carpi Ulnaris** (4) (note that it's **ulnaris** NOT radialis, which is innervated by medial nerve)
2. The **medial half** of the **Flexor Digitorum Profundus**(5) (note that it's **profundus** not superficialis, which is innervated by medial nerve. Also note that it's **medial** not lateral which is innervated by medial nerve)
(which are innervated by the **ulnar nerve**).



In the hand

- The median nerve continues into the hand by passing deep to the **flexor retinaculum** in front of the carpal bones (6).
- **It innervates:**
 1. **The 3 thenar eminence muscles** (7) associated with the thumb.
 2. Lateral 2 lumbrical muscles associated with movement of the index and middle fingers.
 3. Skin over the palmar surface of the **lateral 3 1/2** digits and over the **lateral side** of the palm and middle of the wrist.(8)

(The lateral 2/3rd of the palm of the hand.)

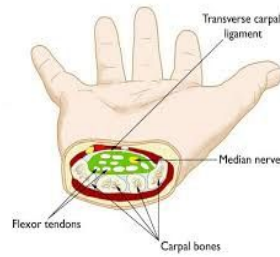
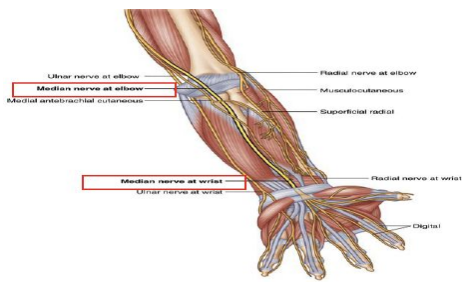


Median Nerve Lesion

- 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?, due to its relatively deep position.

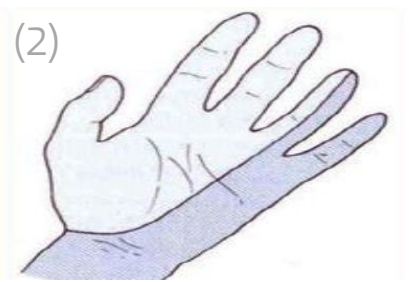
Sites of damage

- **In the elbow region**, (supracondylar fracture of the humerus).
- **At the wrist** above the flexor retinaculum.
- **In the carpal** tunnel.



Serious disabilities

- **Loss of opposition of the thumb.** The delicate pincer-like action is not possible.(1)
- **Loss of sensation** from lateral 3 1/2 fingers & lateral 2/3 of the palm.(2)



About



Damaged in supracondylar fracture of humerus. (3)

the Muscles that are affected:

- **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**).

Motor



Loss of pronation.

- Hand is kept in supine position.
- Wrist shows weak flexion, and ulnar deviation.
- **No** flexion possible on the interphalangeal joints of the index and middle fingers.
- Weak flexion of ring and little finger.
- Thumb is adducted and laterally rotated, with loss of flexion of terminal phalanx and loss of opposition.
- Wasting of thenar eminence. (4)
- Hand looks flattened and "**apelike**", and presents an inability to flex the three most radial digits when asked to make a fist.

Sensory

Loss of sensation from:

- The radial side 2/3 of the palm.
- Palmar aspect of the lateral 3 1/2 fingers.
- Distal part of the dorsal surface of the lateral 3 1/2 fingers.

Trophic

Trophic Changes:

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

Median Nerve Lesion in elbow region

Median Nerve Lesion at the wrist

About

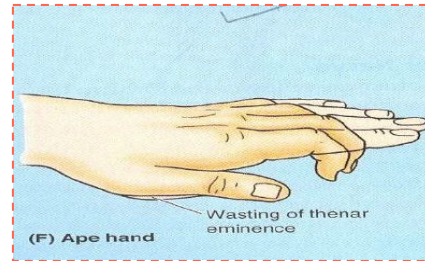
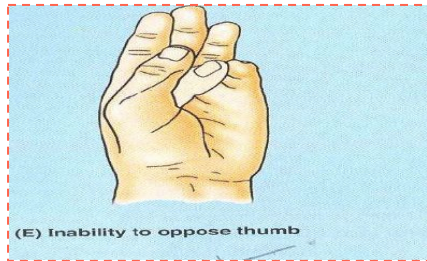
Often injured by penetrating wounds (stab wounds or broken glass) of the **forearm**.

Motor

- **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

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



Carpal Tunnel Syndrome

About

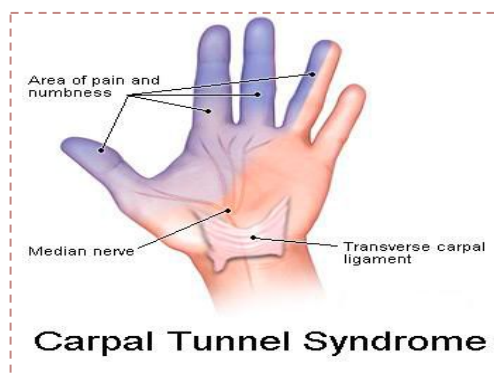
The **most common** neurological problem associated with the median nerve is the compression beneath the flexor retinaculum at the **wrist**.

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 palmar cutaneous branch is given before the median nerve enters the carpal tunnel.



MCOs

Q1: The median nerve enters the arm from the axilla at the inferior margin of the

- A.teres minor
- B.deltoid
- C.pectoralis major
- D.teres major

Q2: How many branches does the median nerve have in the arm

- A.one
- B.three
- C.none
- D.two

Q3: Which muscle is innervated by the ulnar nerve

- A.flexor digitorum superficialis
- B.flexor carpi ulnaris
- C.biceps brachii
- D.flexor carpi radialis

Q4: The median nerve continues into the hand by passing deep to the

- A.flexor retinaculum
- B.brachialis
- C.coracobrachialis
- D.extensor digitorum longus

Q5: Which of the following is one of the serious disabilities of a median nerve lesion?

- A.impaired abduction
- B.Thenar muscles
- C.Loss of sensation
- D.paralyzed deltoid

Q6: If a lesion in the elbow region is present, then which muscle is affected?

- A.Quadriceps
- B.pronator
- C.flexor pollicis
- D.deltoid

Q7: Loss of pronation is a

- A.Motor effect
- B.sensory effect
- C.trophic change
- D.Lesion disability

Q8: The axillary nerve originates from

- A.Posterior cord
- B.anterior cord
- C.medial cord
- D.lateral cord

Q9: Axillary nerve originate from?

- A. C6 & C7
- B. C5 & C6
- C. C8 & T1
- D. C5 & C6 & C7

Q10: Axillary nerve can innervate which one of the following?

- A. Teres major
- B. Teres minor
- C. Deltoid
- D. B&C

Q11: The Sensory branch of axillary nerve can innervate?

- A. Inferior lateral cutaneous
- B. Superior medial cutaneous
- C. Superior lateral cutaneous
- D. Inferior medial cutaneous

Q12: which one of the following can cause axillary nerve to be injured

- A. Damage in supracondylar of the humerus
- B. Fracture in the head of the radius
- C. Fracture of surgical neck of the humerus
- D. Fracture of anatomical neck of the humerus

Q12)A
Q8)A
Q9)B
Q10)D
Q11)C
Q12)C

Q1)D
Q2)C
Q3)B
Q4)A
Q5)C
Q6)B

SAOs

Q:1

What muscles in the forearm are not innervated by the median nerve?

Answer: ~~Flexor carpi ulnaris and the medial half of the flexor digitorum profundus~~

Q:2

What does the median nerve in the hand innervate?

Answer: ~~the 3 thenar eminence muscles associated with the thumb and the skin over the palmar surface of the lateral three and a half digits and over the lateral side of the palm and middle of the wrist~~

Q: 3

What are the motor effects of carpal tunnel syndrome?

Answer: ~~Weak motor function of thumb, index and middle fingers.~~

Q: 4

List the 3 sites of damage in a median nerve lesion.

Answer: ~~Elbow, wrist and carpal.~~

Q: 5

If the motor branch of the axillary nerve was injured, the Impaired shoulder will allow how many degree of abduction?

Answer: ~~15-30/90~~

This lecture is done by



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