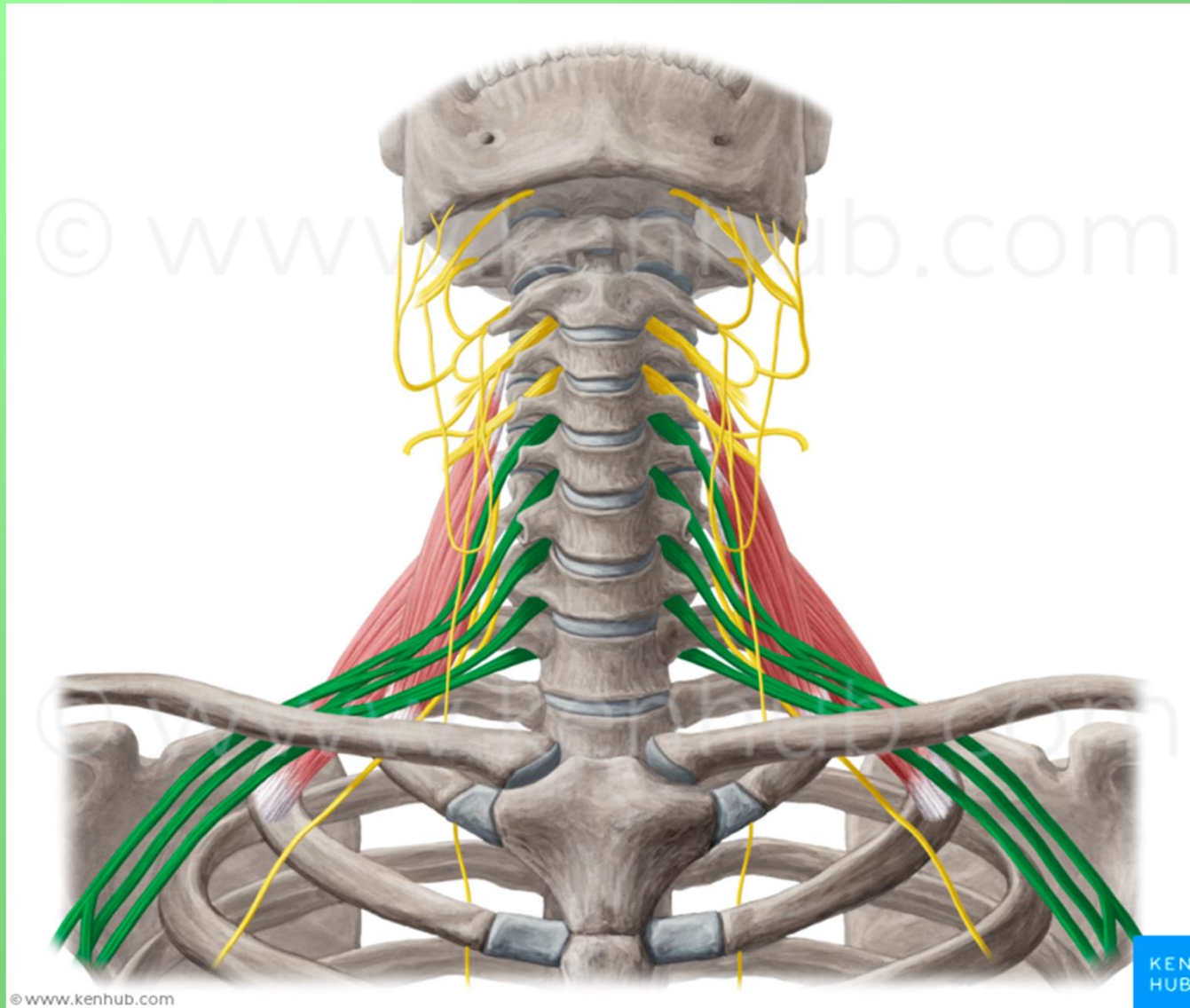
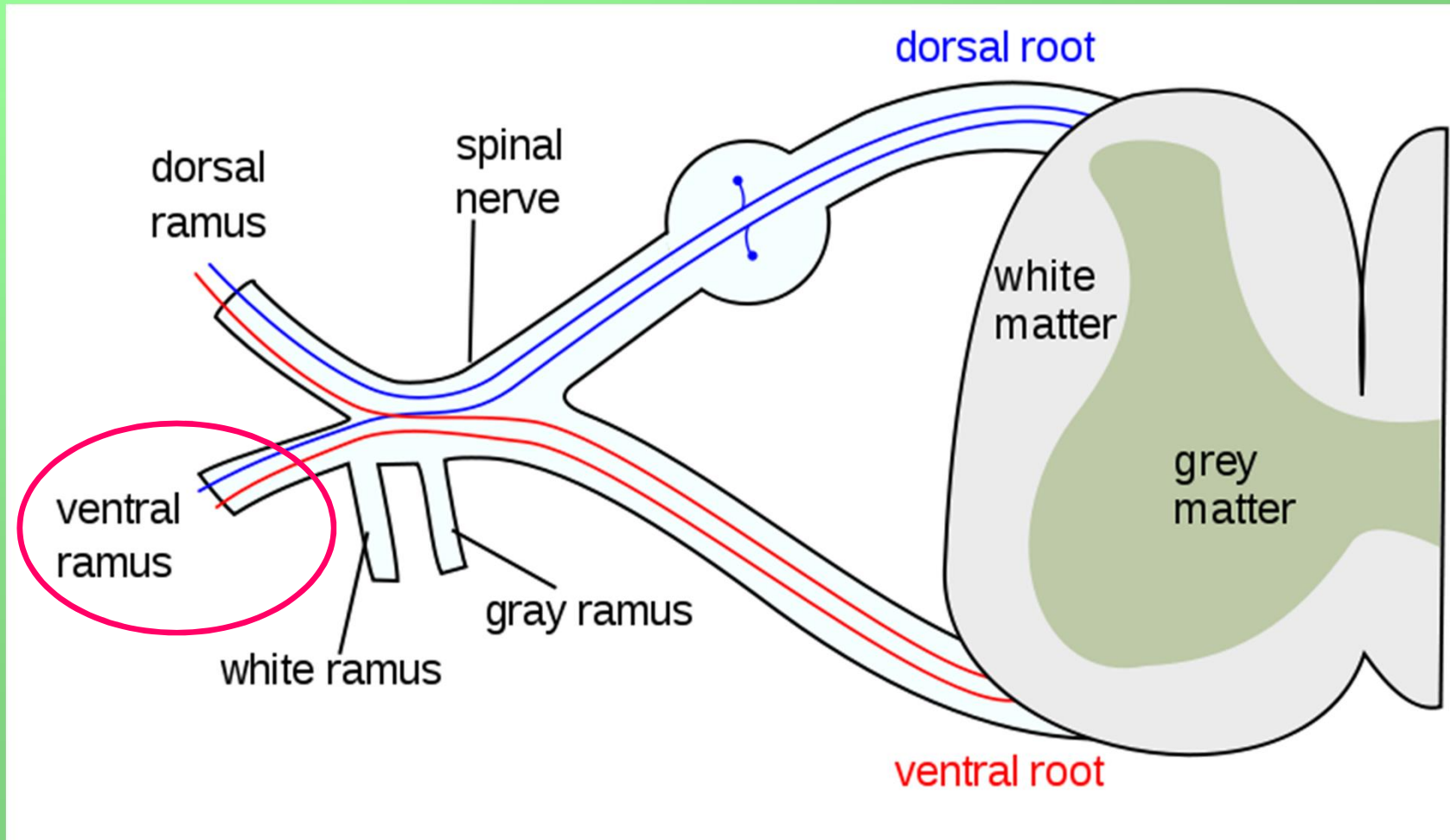


BRACHIAL PLEXUS

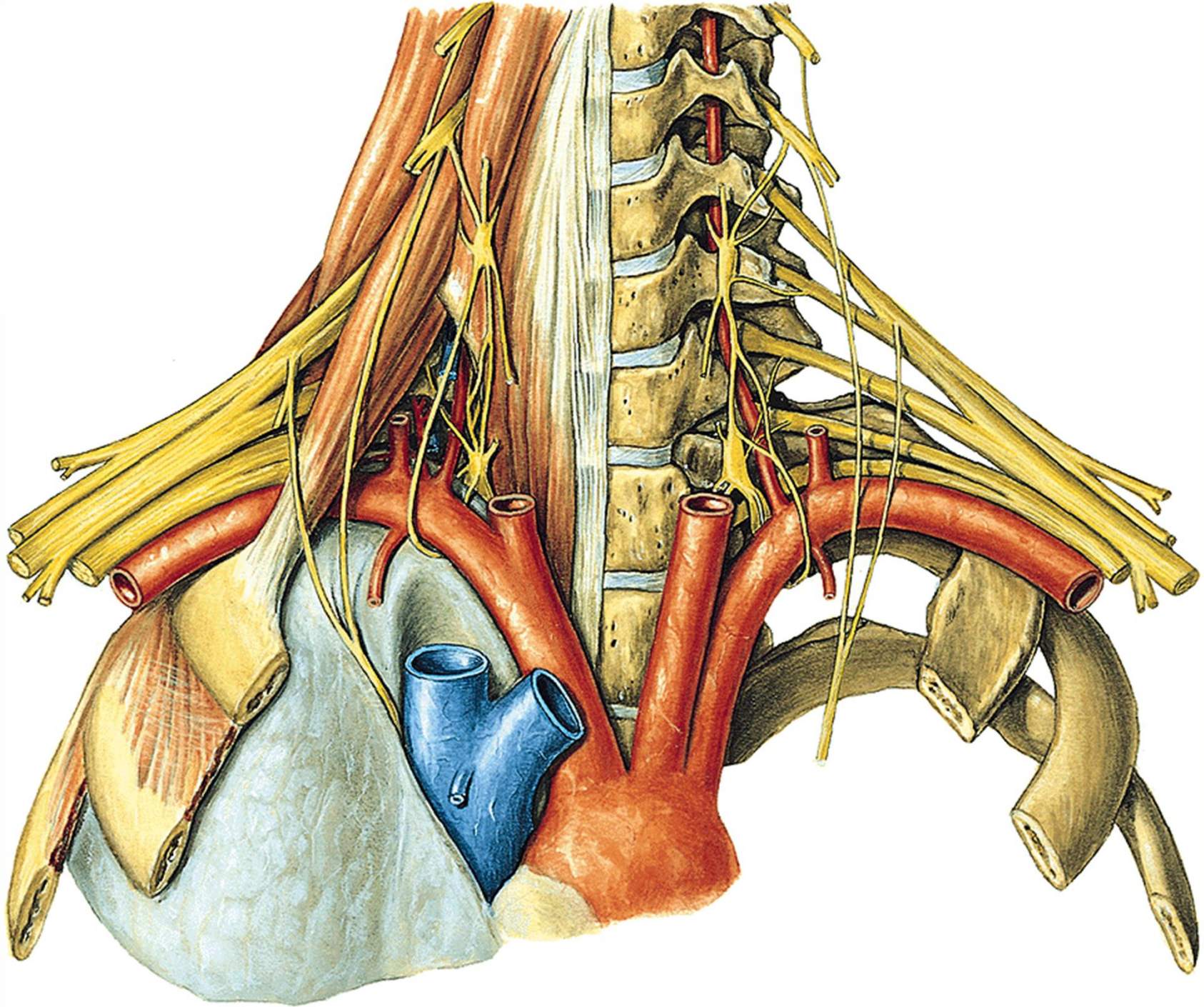


Spinal nerve



Plexus brachialis (C4-Th1)

- within fissura scalenorum
- Senzory innervation: skin of the upper limb
- Motor innervation: muscles of the upper extremity and some muscles of the back and thorax



Plexus brachialis (C4-Th1)

The primary bundles - trunks/*trunci*:

Truncus superior (C4) C5+6

Truncus medius C7

Truncus inferior C8+Th1

The secondary bundles - cords/*fasciculi*:

Fasciculus posterior: connection of all three posterior branches

Fasciculus lateralis: connection of anterior branches of truncus superior and medius

Fasciculus medialis: anterior branch of truncus inferior

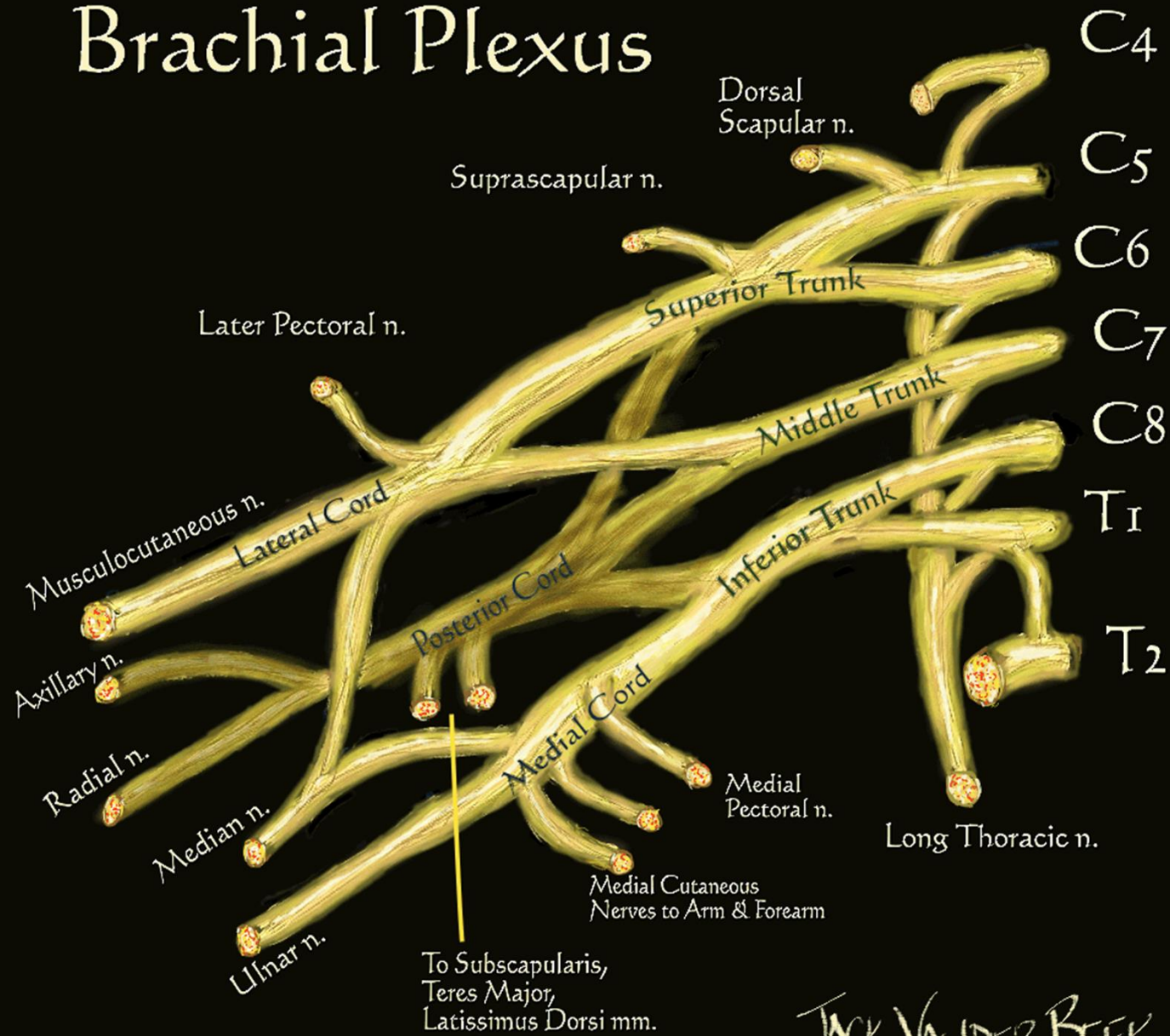
The particular nerves arise from the cords:

FP: n. radialis, n. axillaris

FL: n. musculocutaneus + part of n. medianus

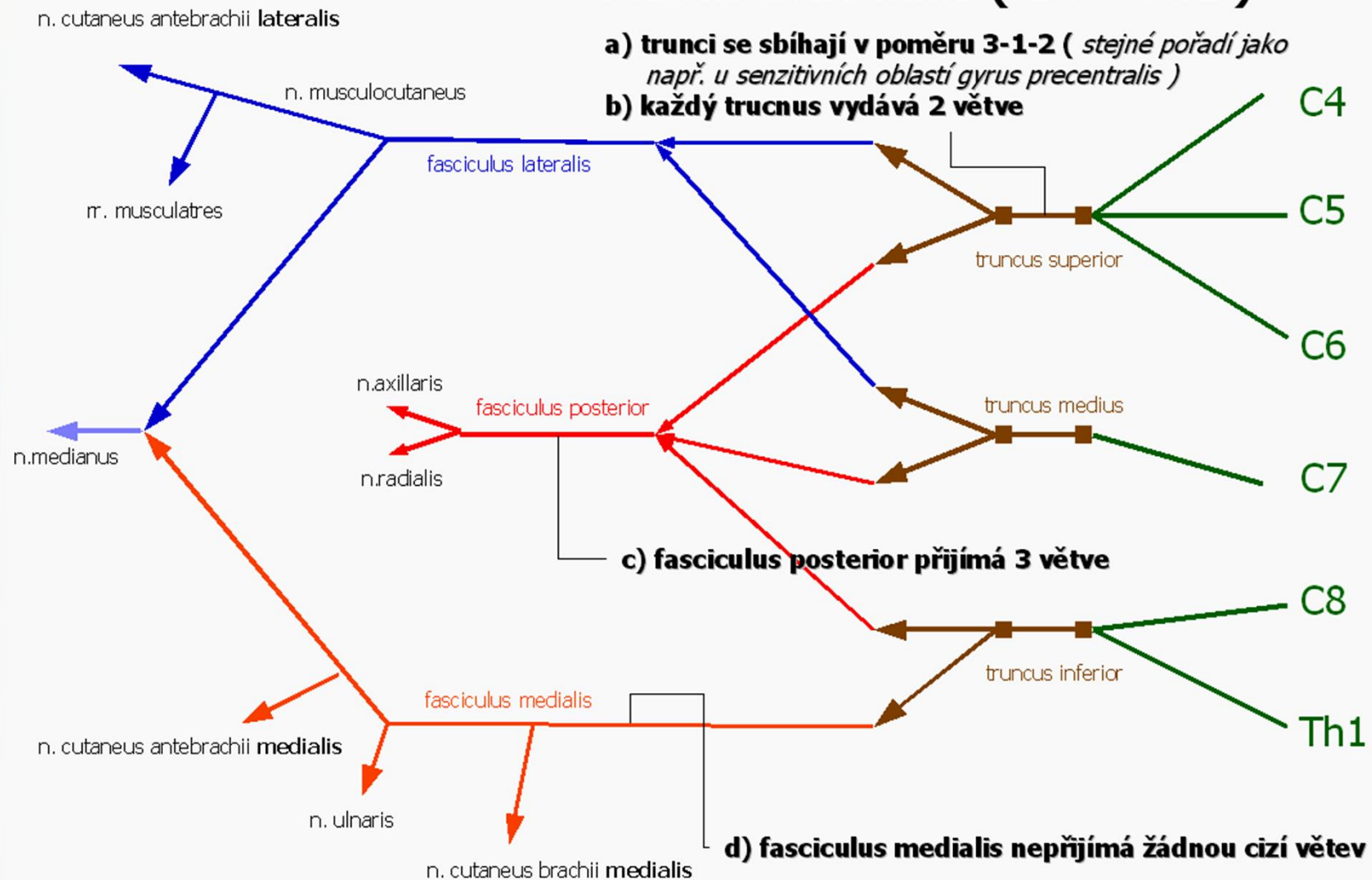
FM: n. ulnaris + part of n. medianus

Brachial Plexus

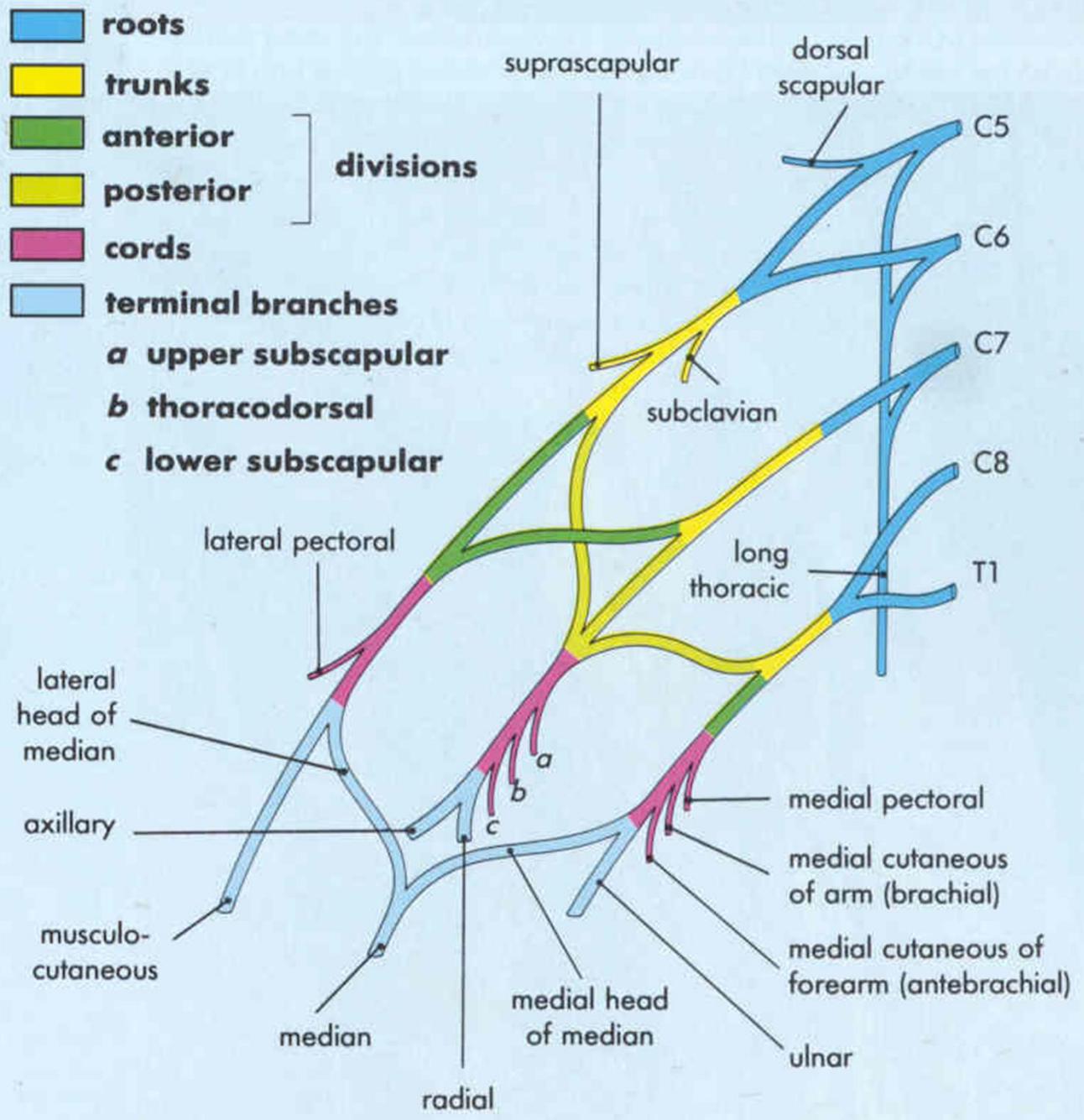


JACK VANDER BEEK
(c) 2005 neuraxiom.com

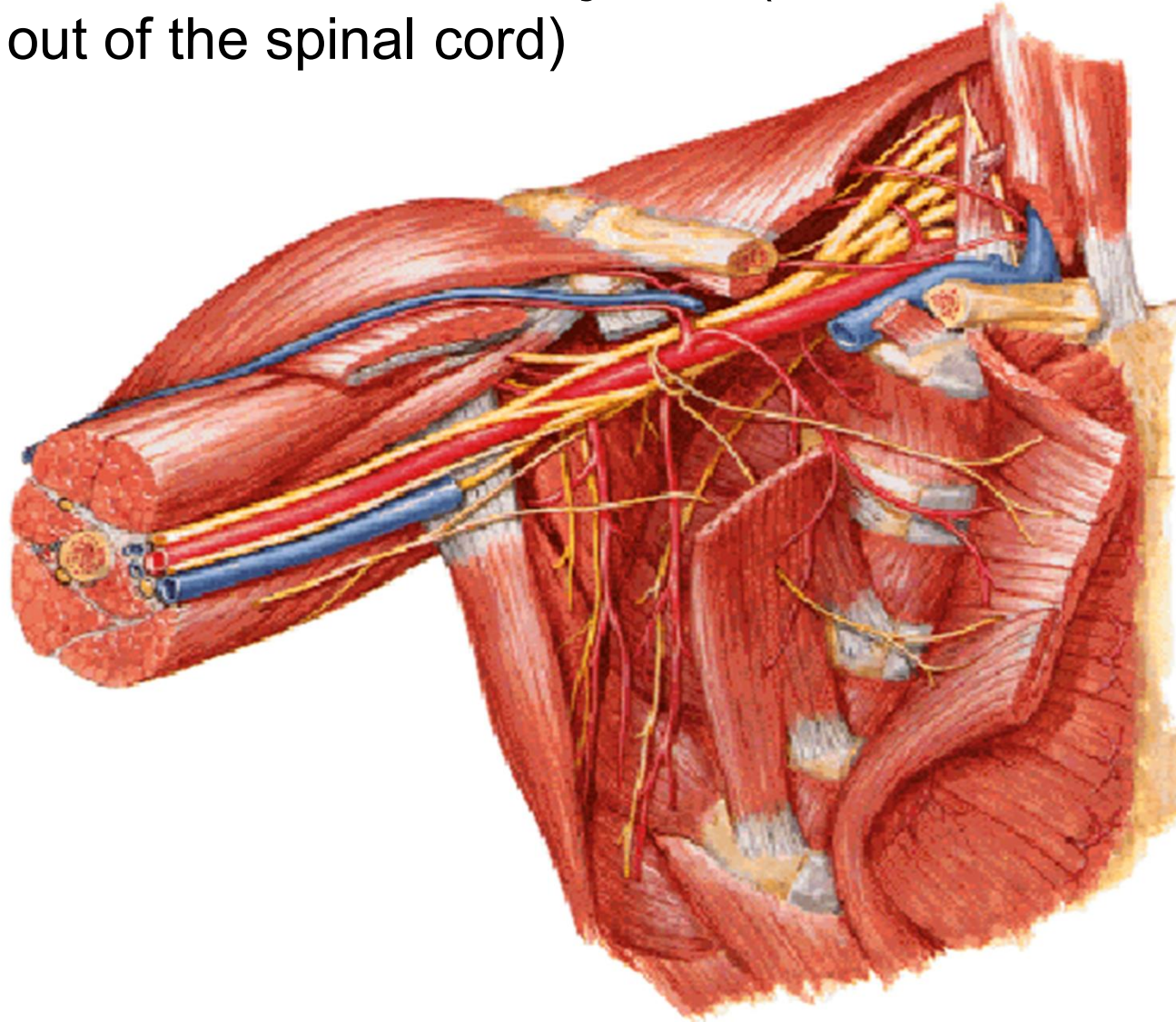
Plexus brachialis (C4 – Th1)

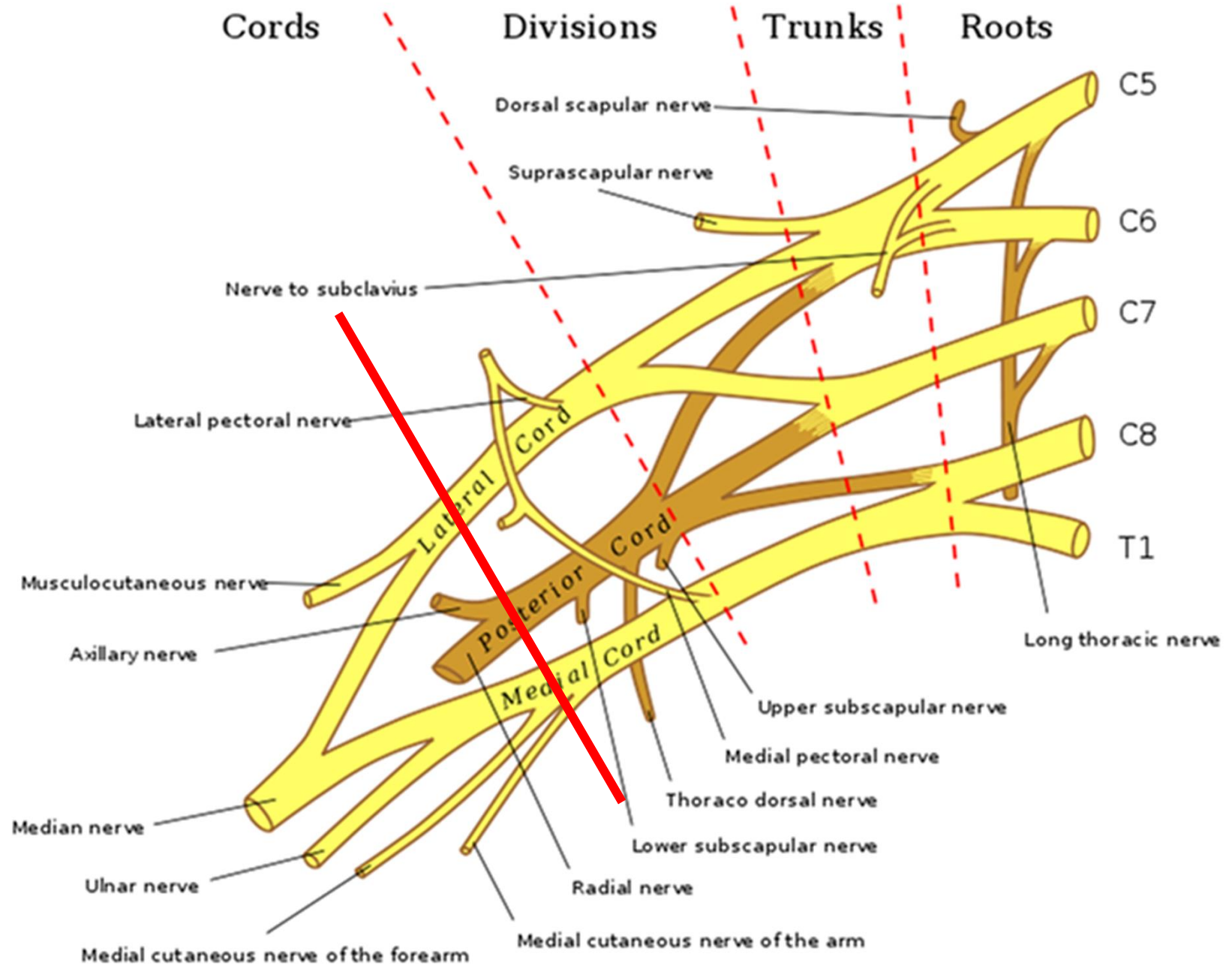


Result: there are axons from more segments within one nerve- by injury of the root, there can be paralysis of more muscles



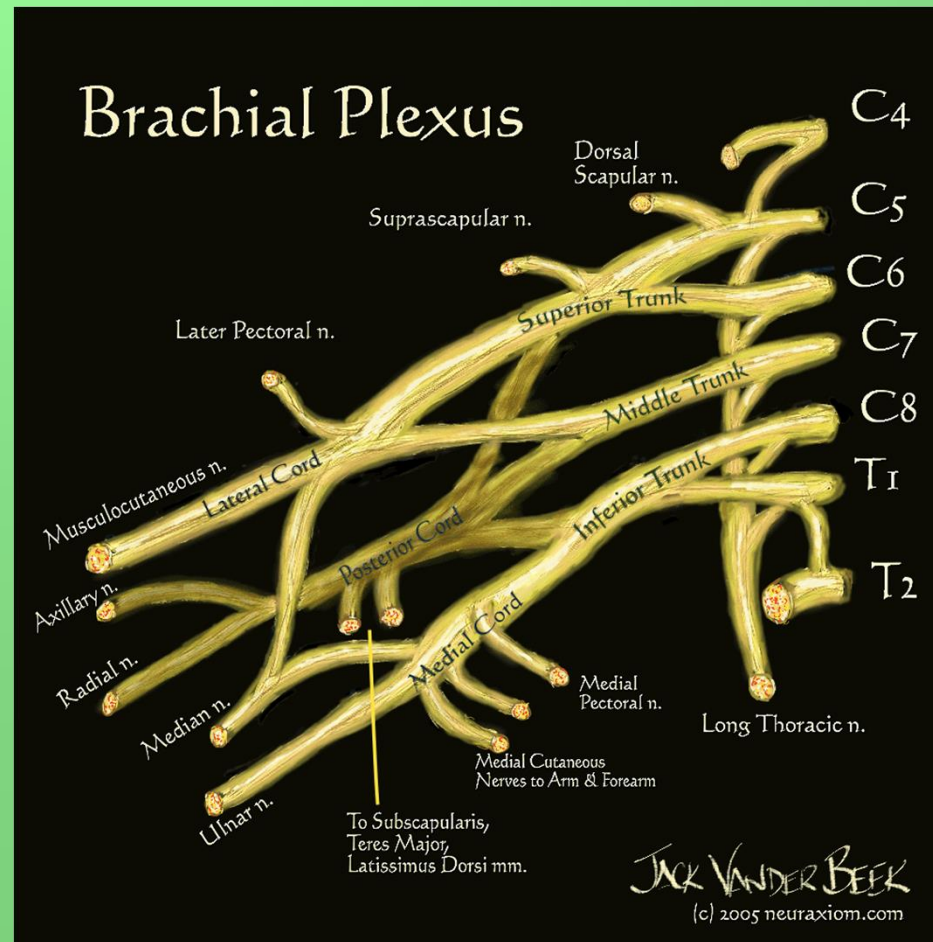
- **scalenus syndrome** (fissura scalenorum)
- **Costoclavicular syndrome** (1th rib and clavicle)
- **Brachial Plexus Avulsion Injuries** (the nerves are actually teraed out of the spinal cord)

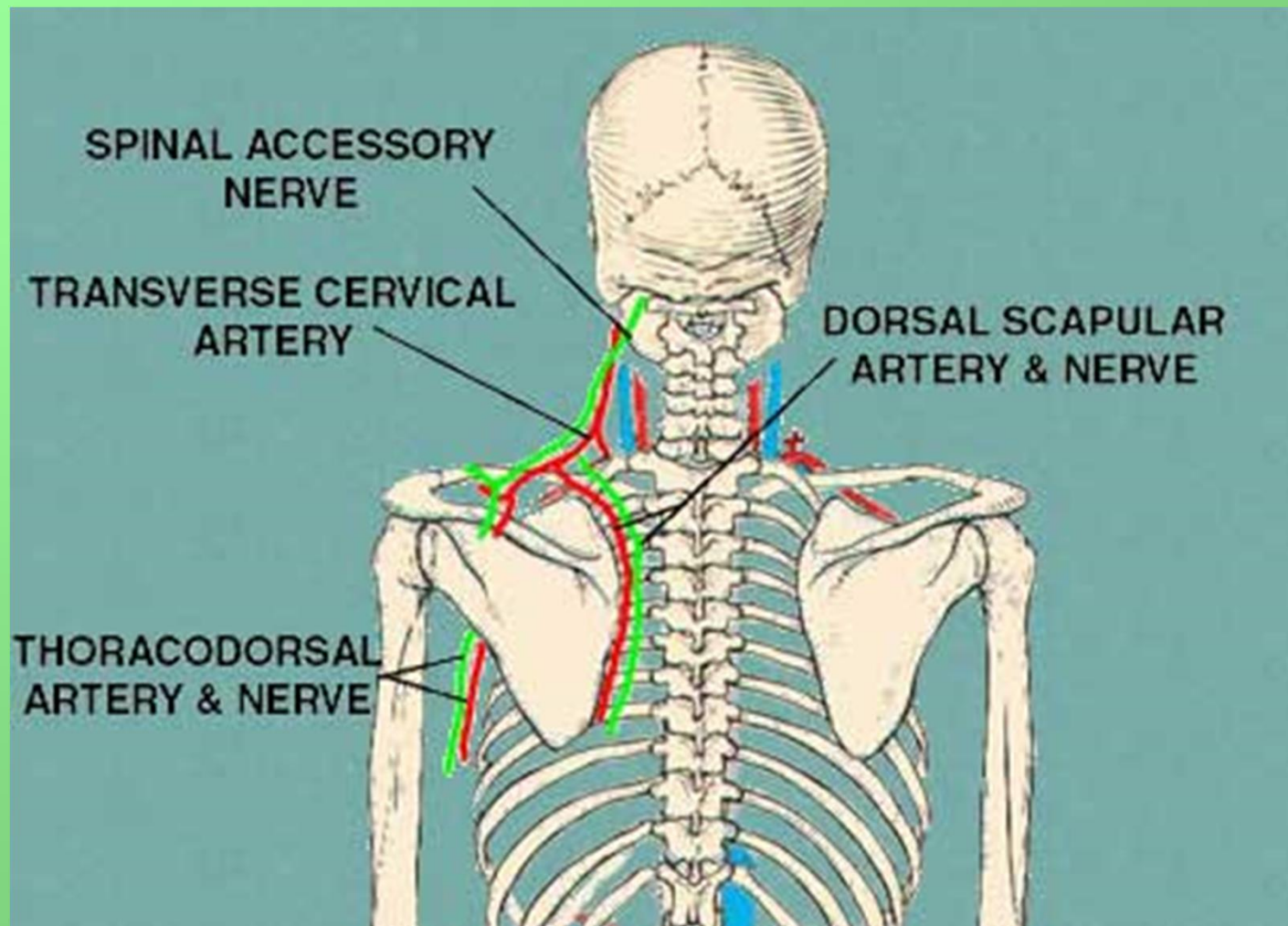




nervus dorsalis scapulae (C5-6)

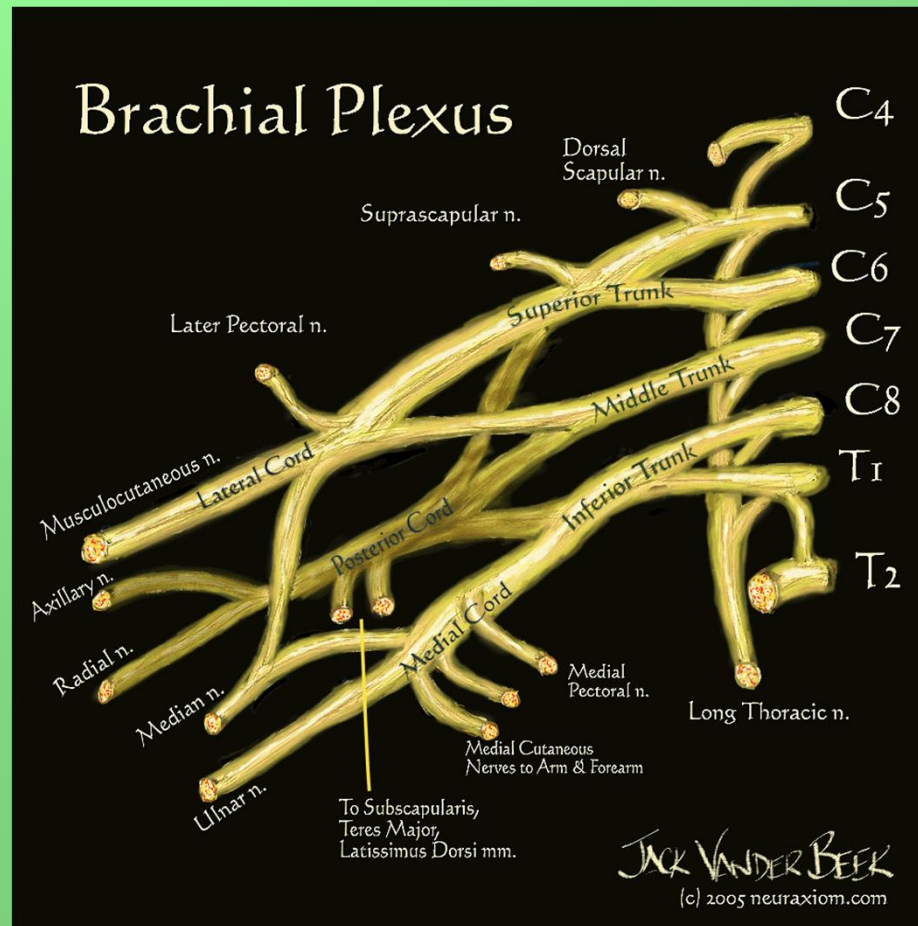
- m. levator scapulae et mm. rhomboidei



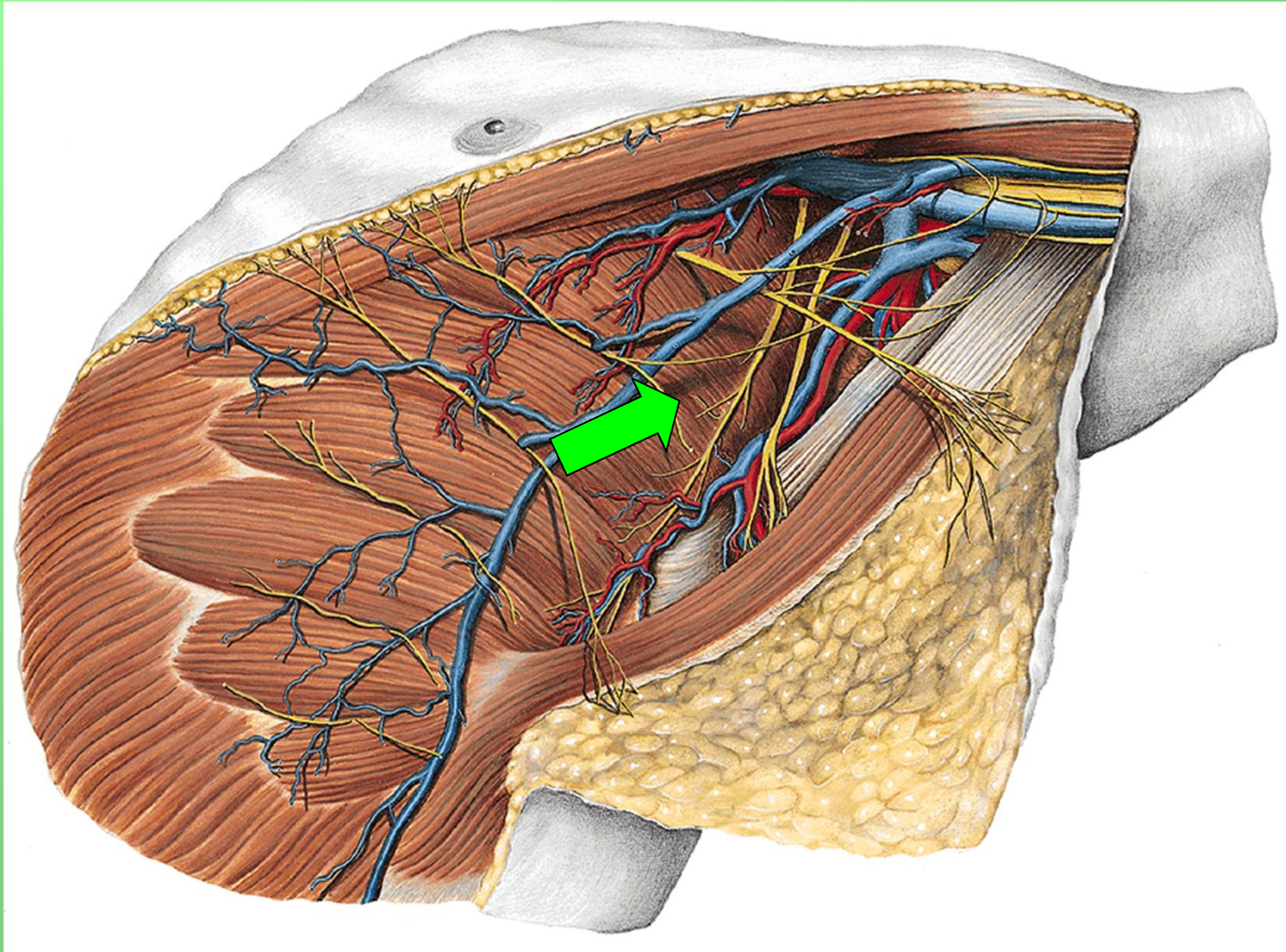


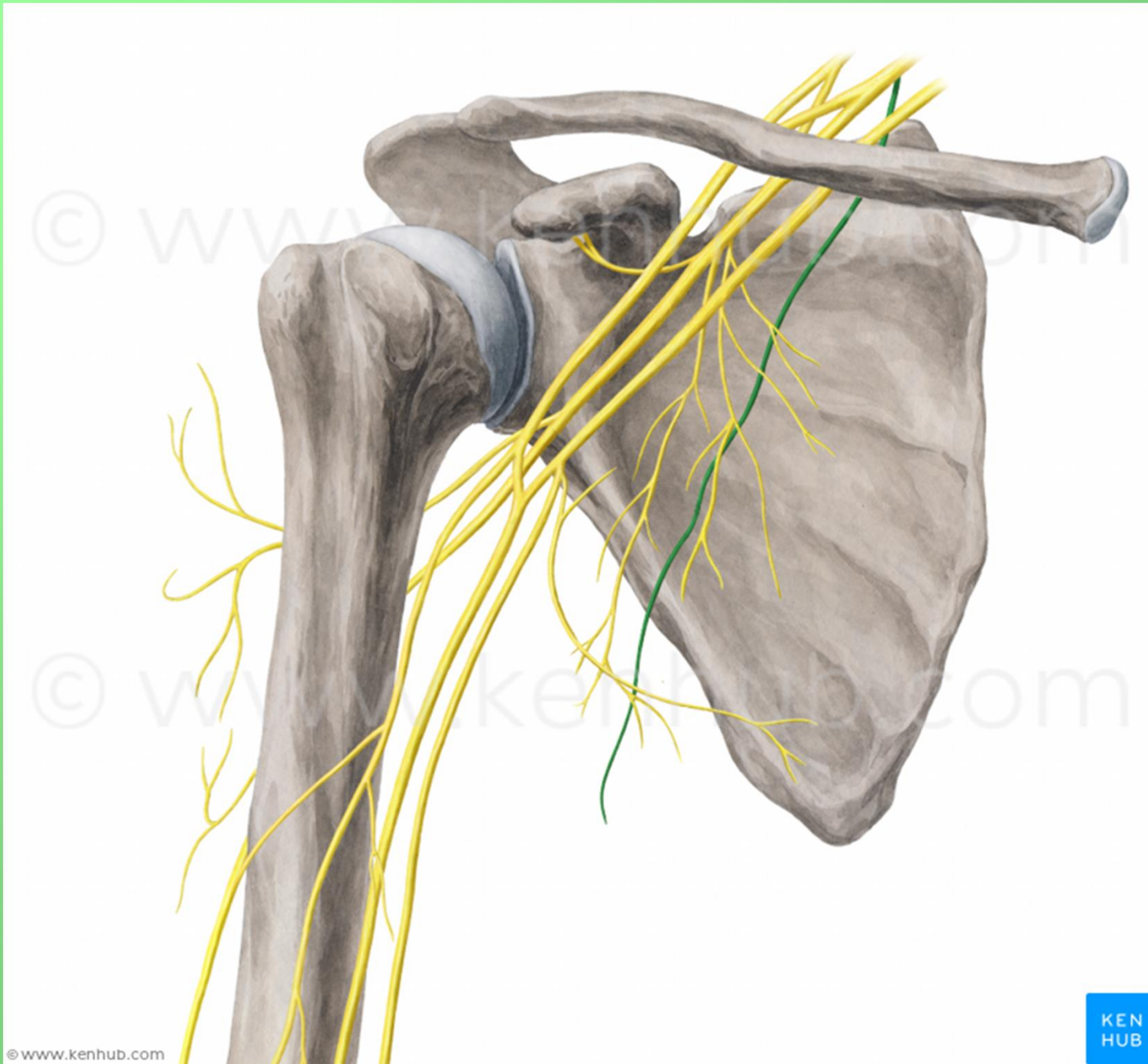
nervus thoracicus longus (C5-7)

- m. serratus anterior



nervus thoracicus longus (C5-7)





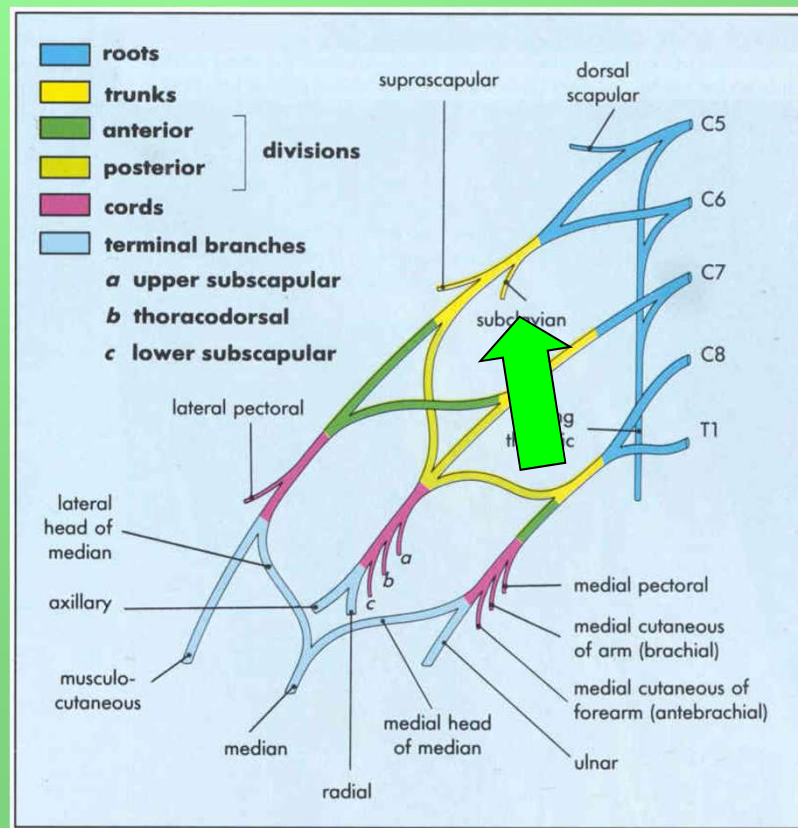
nervus thoracicus longus (C5-7)

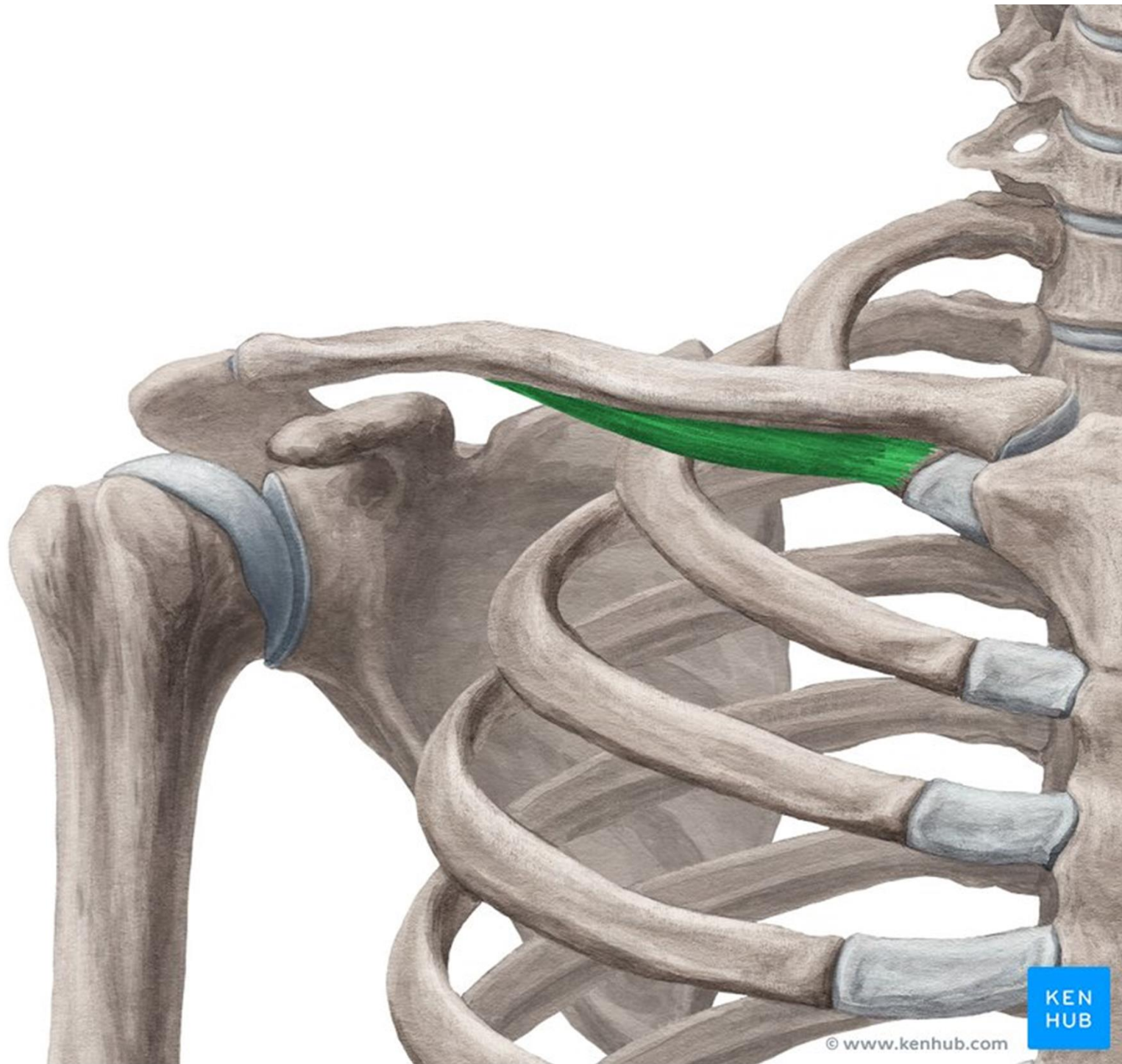
- scapula alata



nervus subclavius C4-6

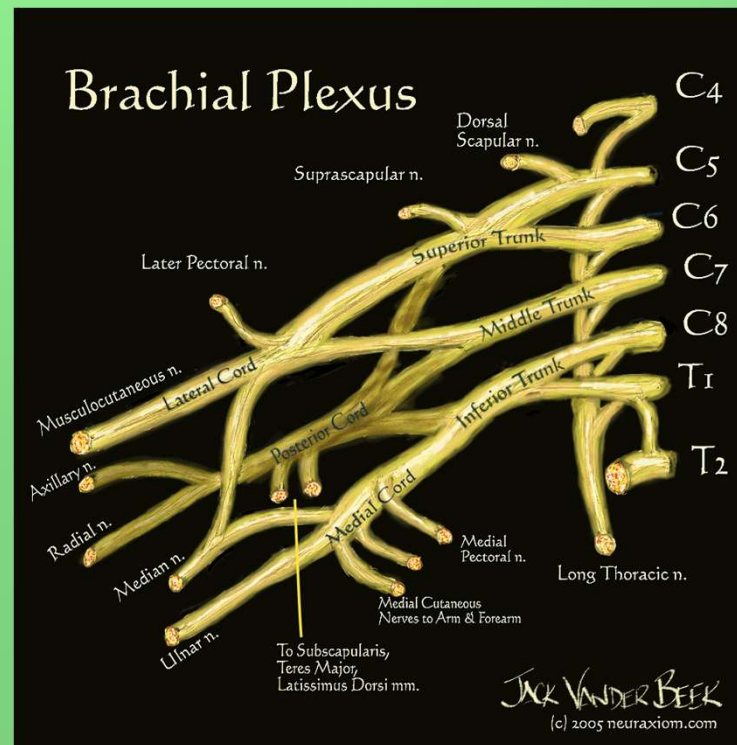
- m. subclavius

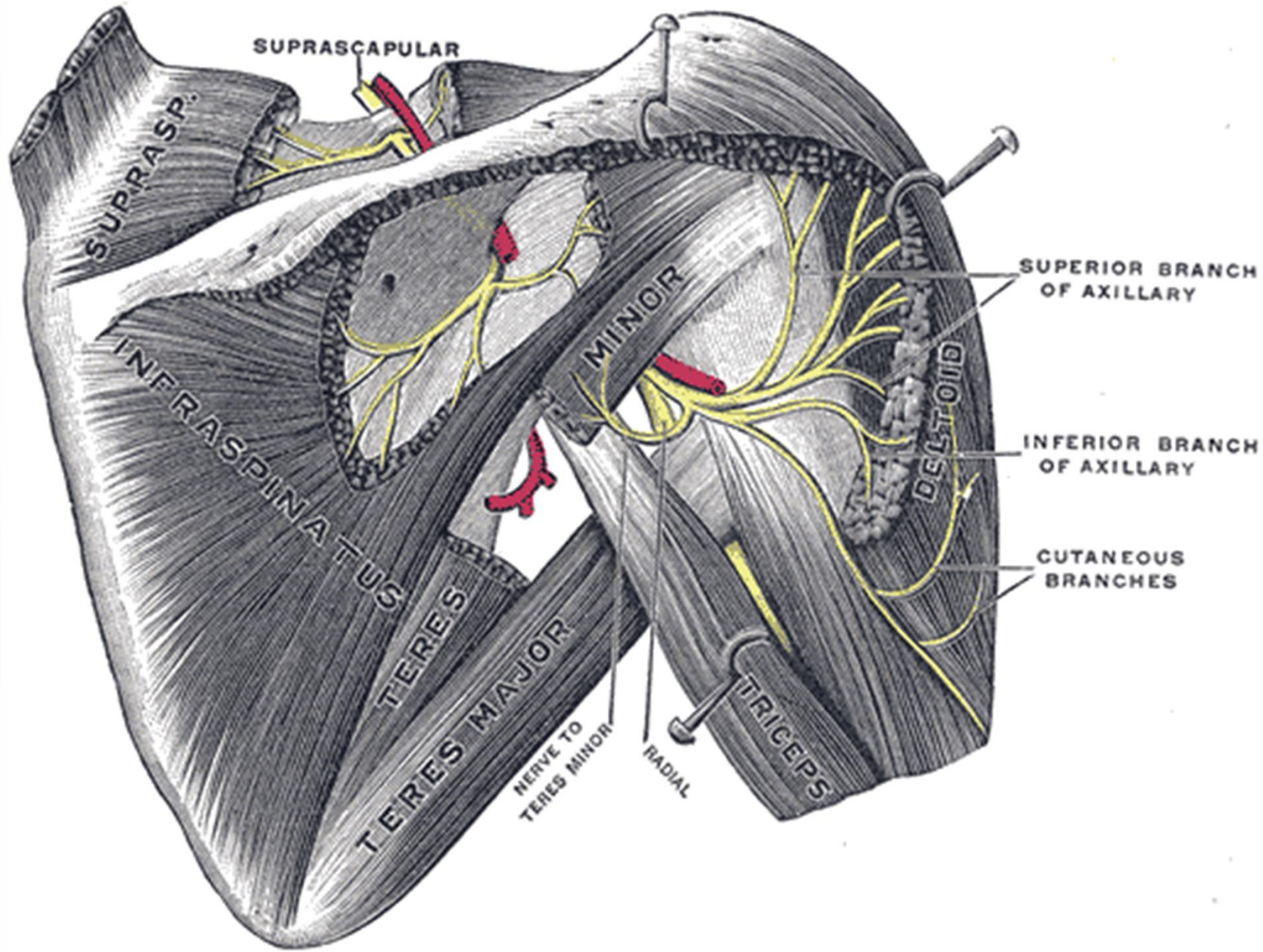


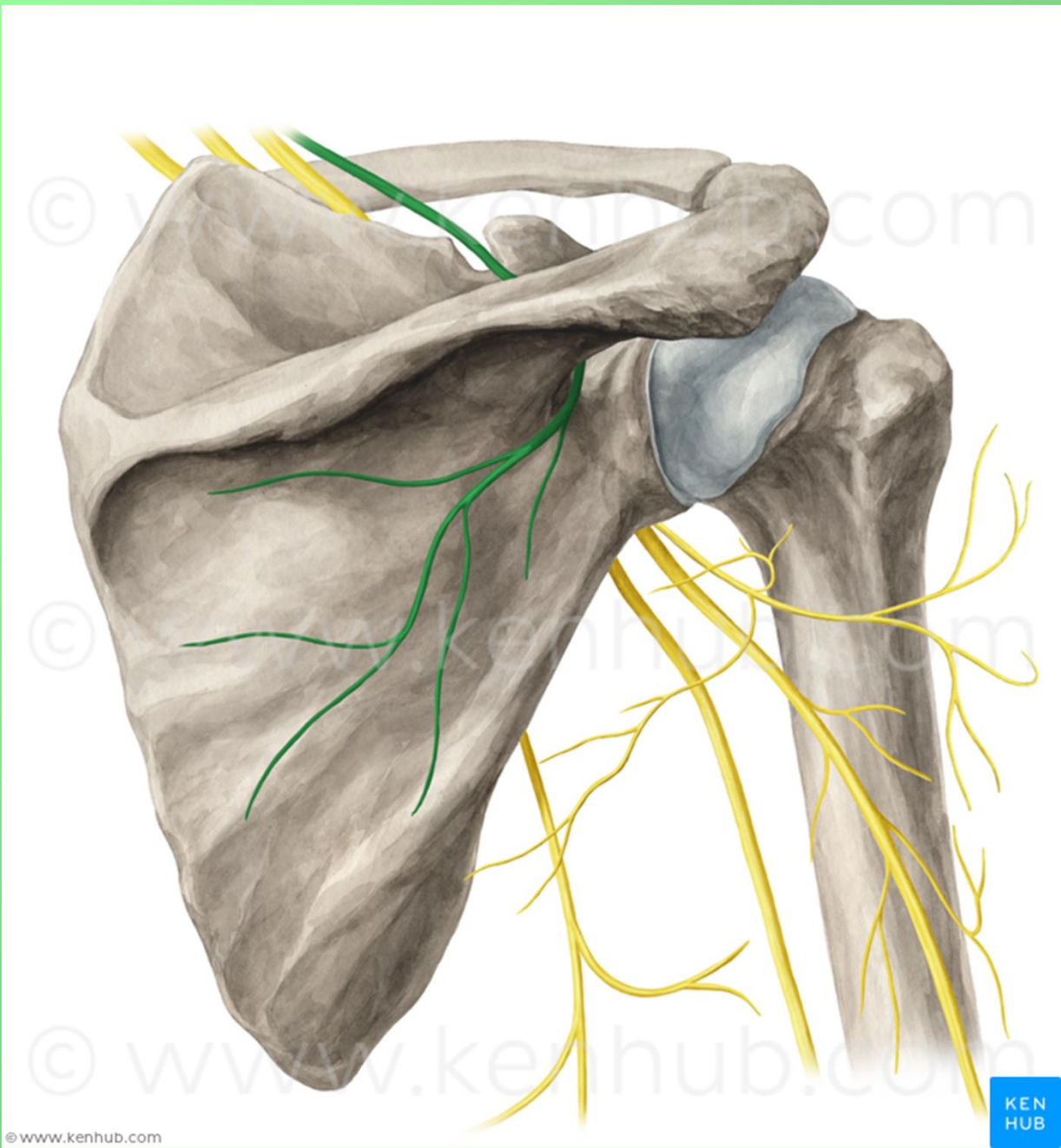


nervus suprascapularis (C4-6)

- m. supraspinatus, m. infraspinatus, sensory innervation of articular capsule of the shoulder joint

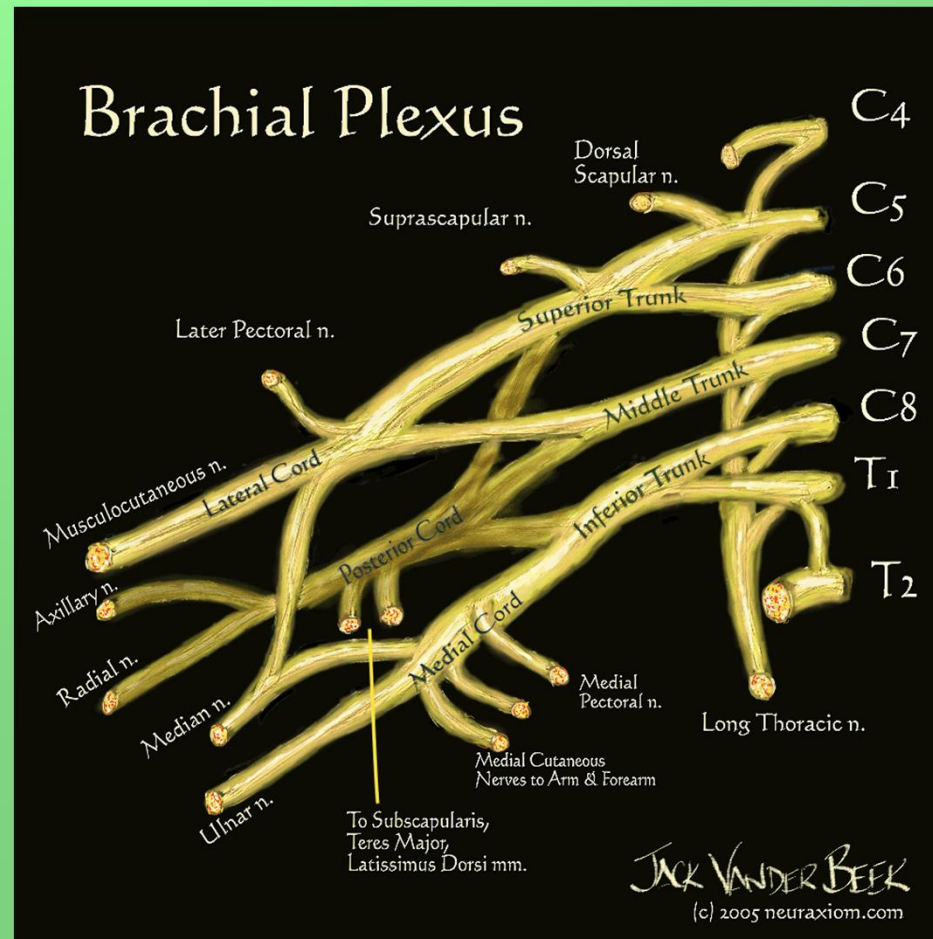


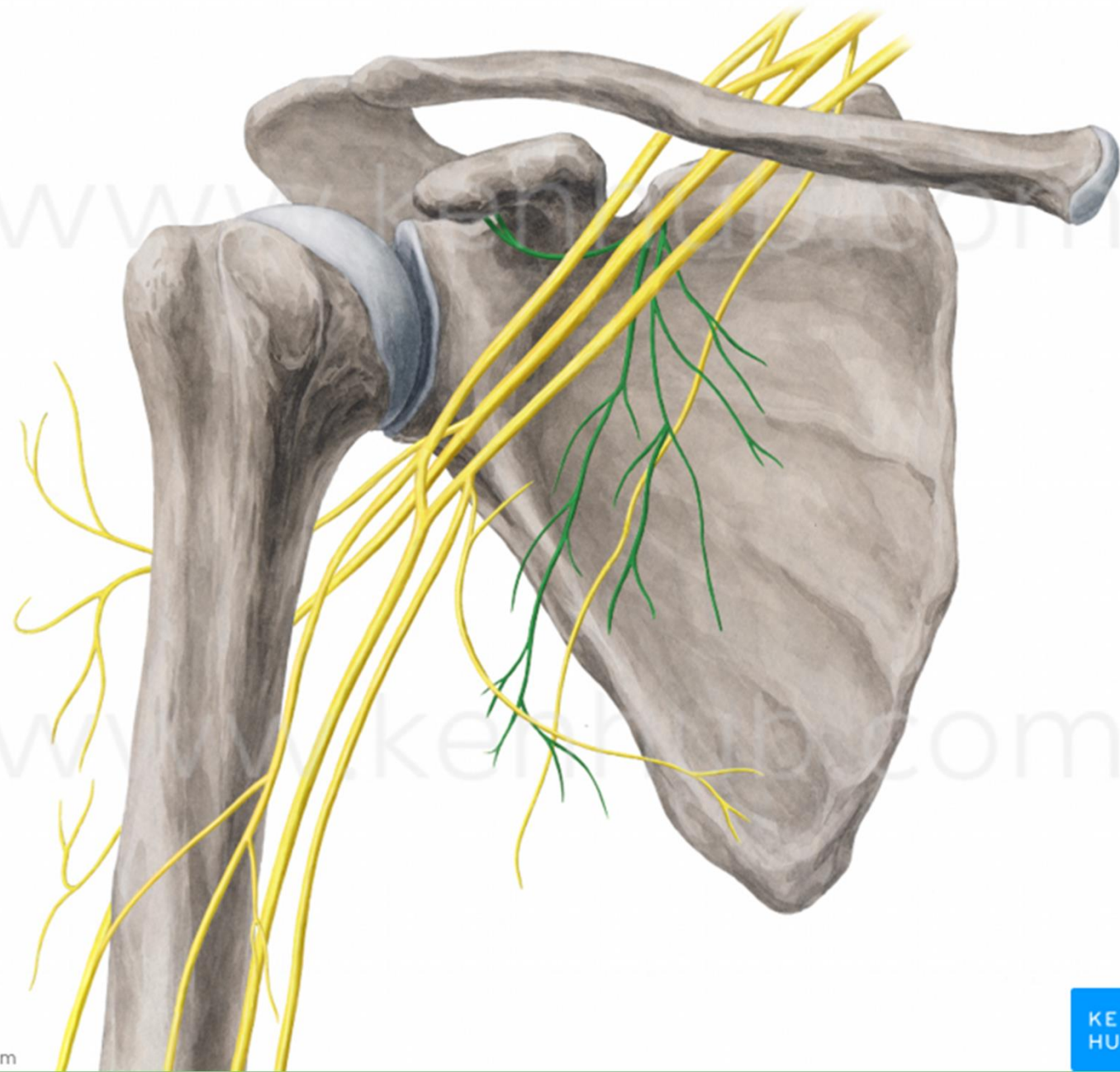


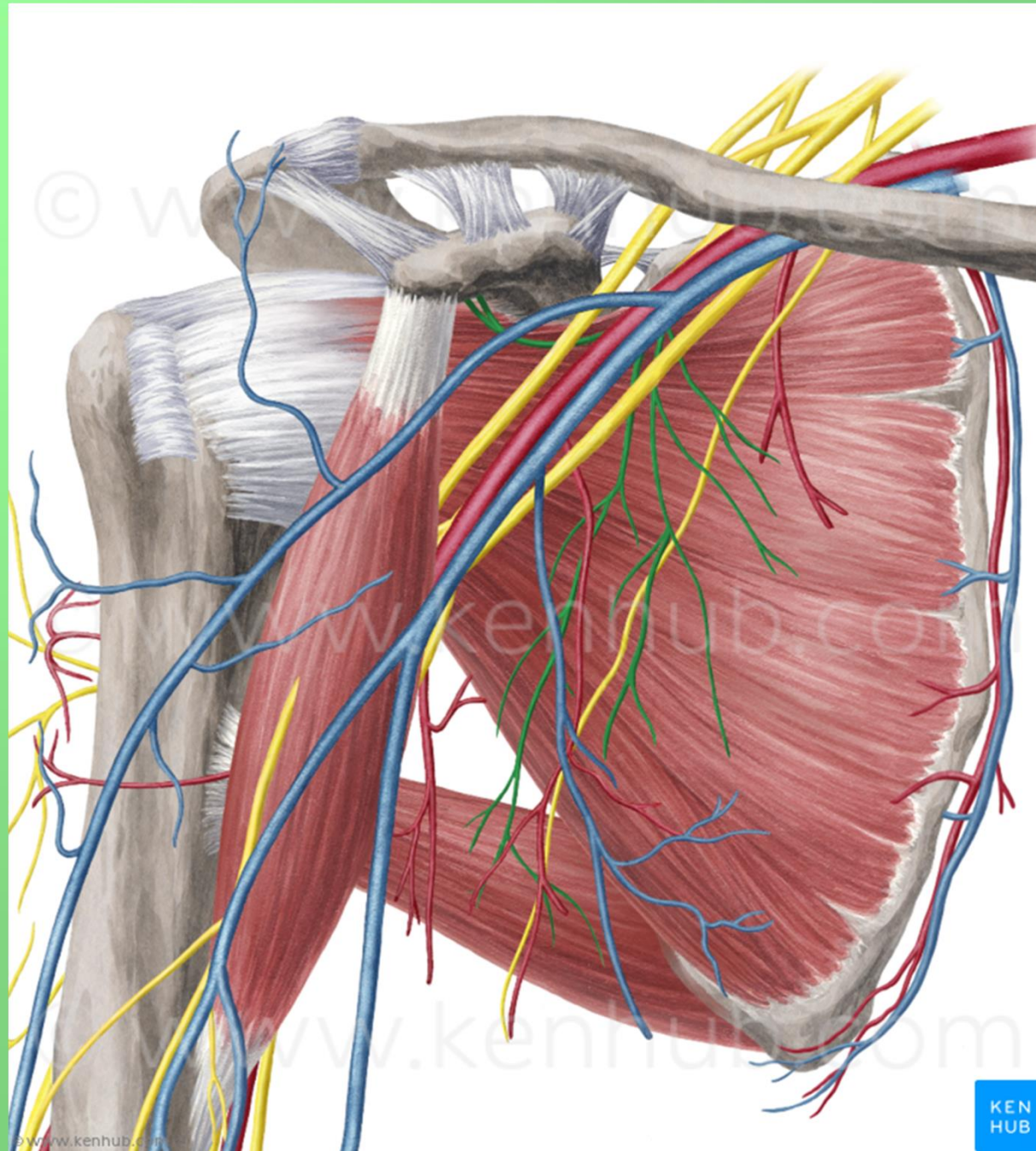


nervi subscapulares C5-7

- m. subscapularis, m. teres major

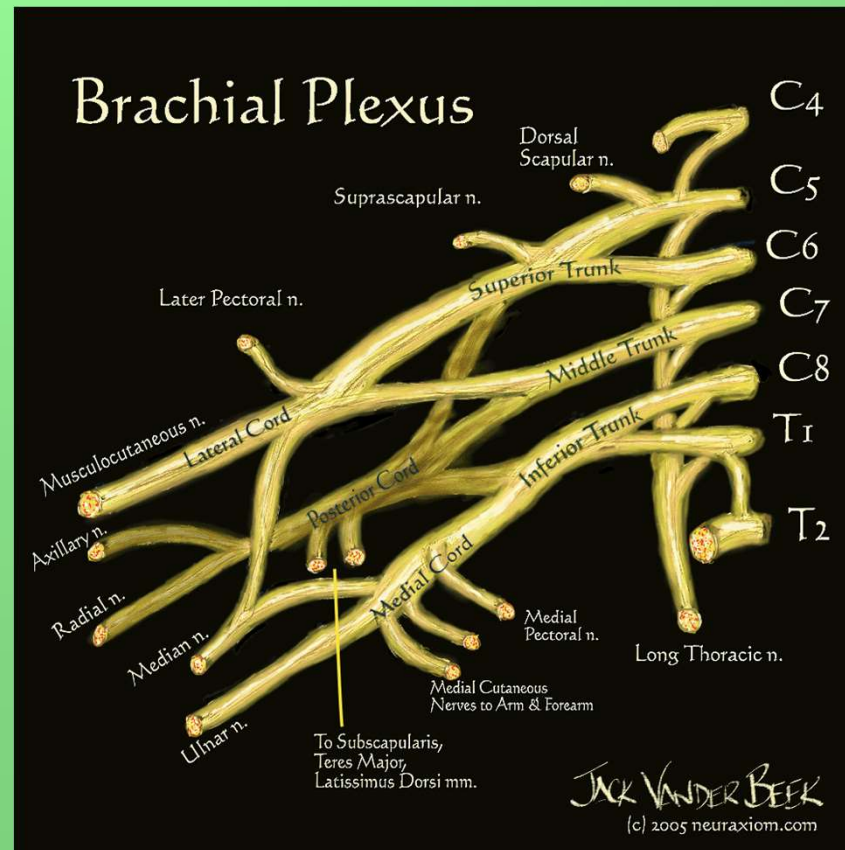


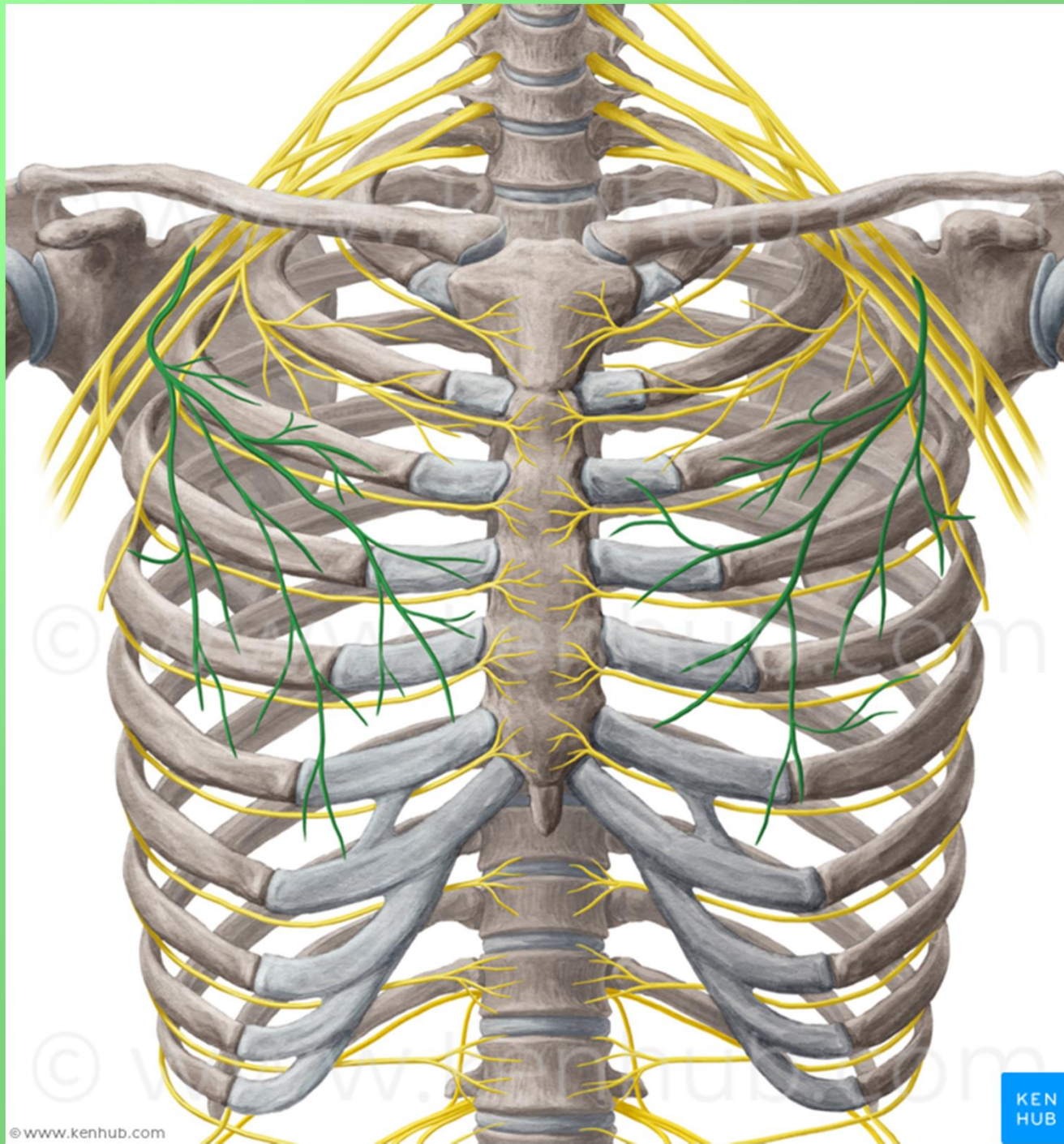


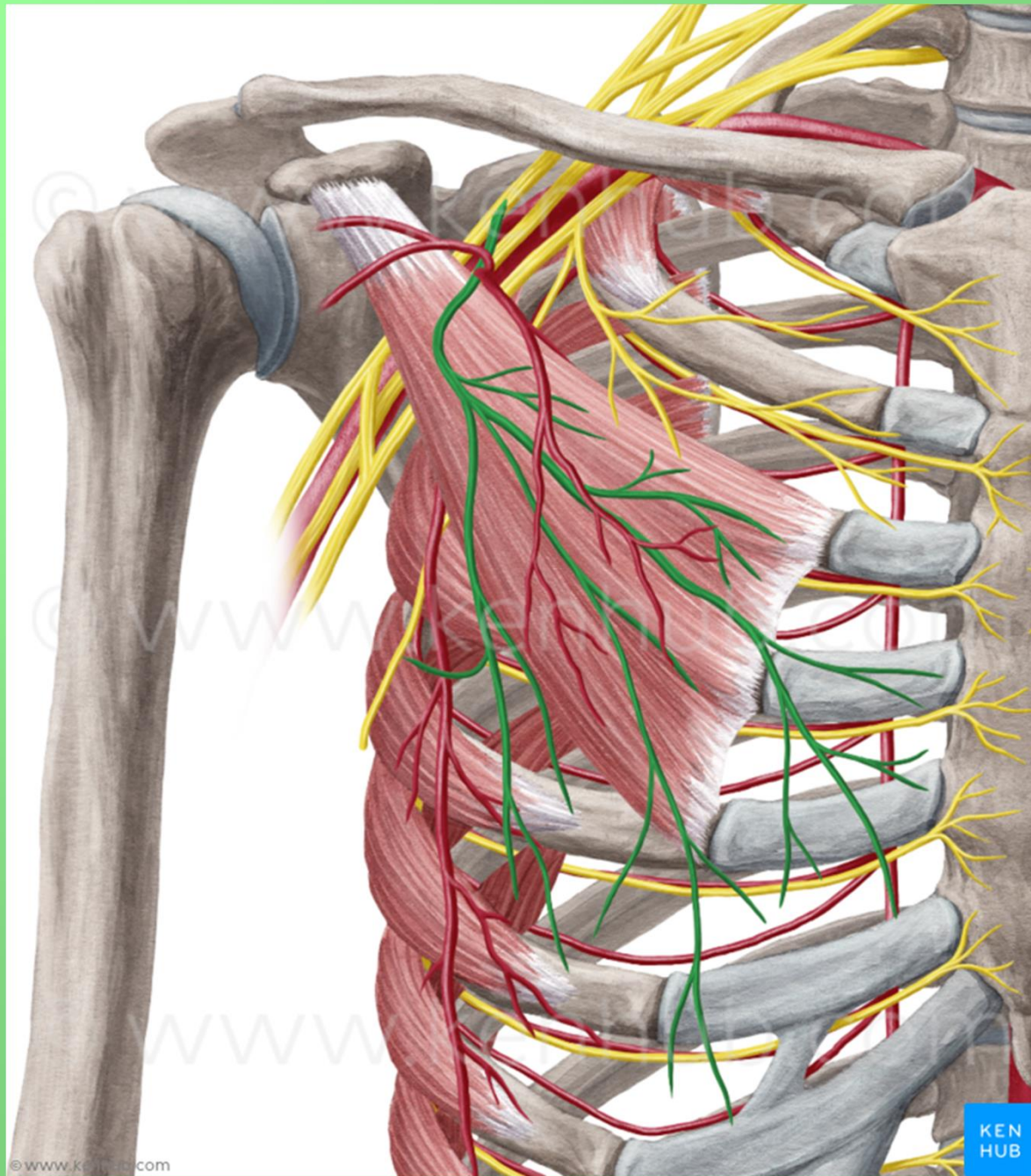


nervus pectoralis lateralis C5-7

- m. pectoralis major et minor

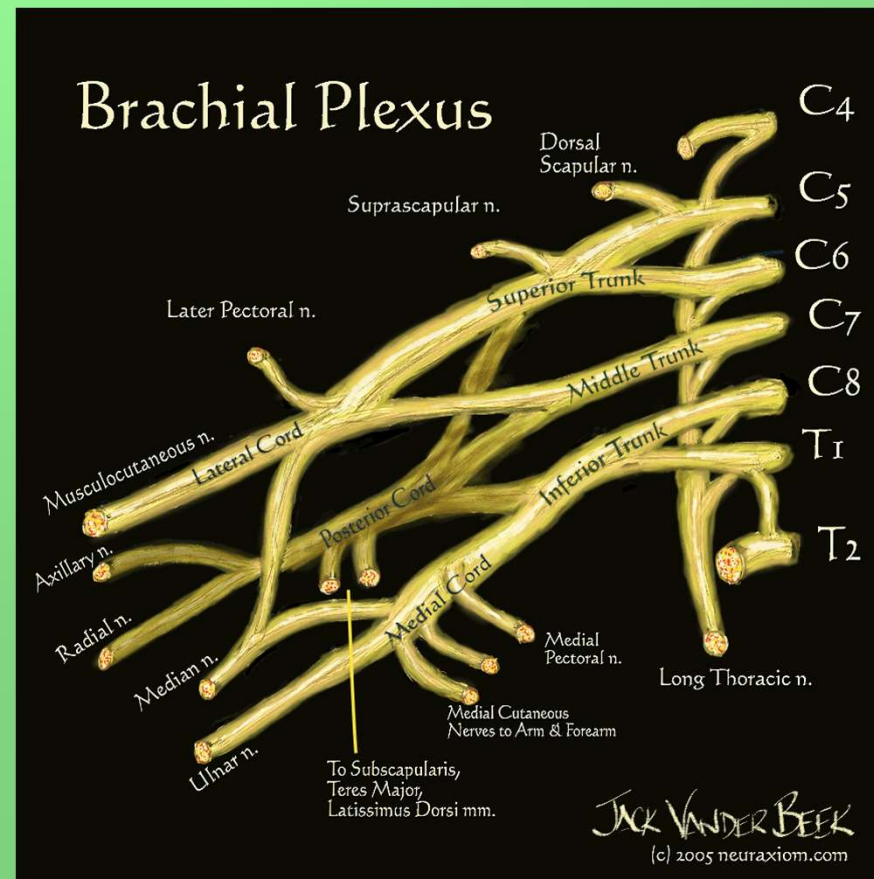


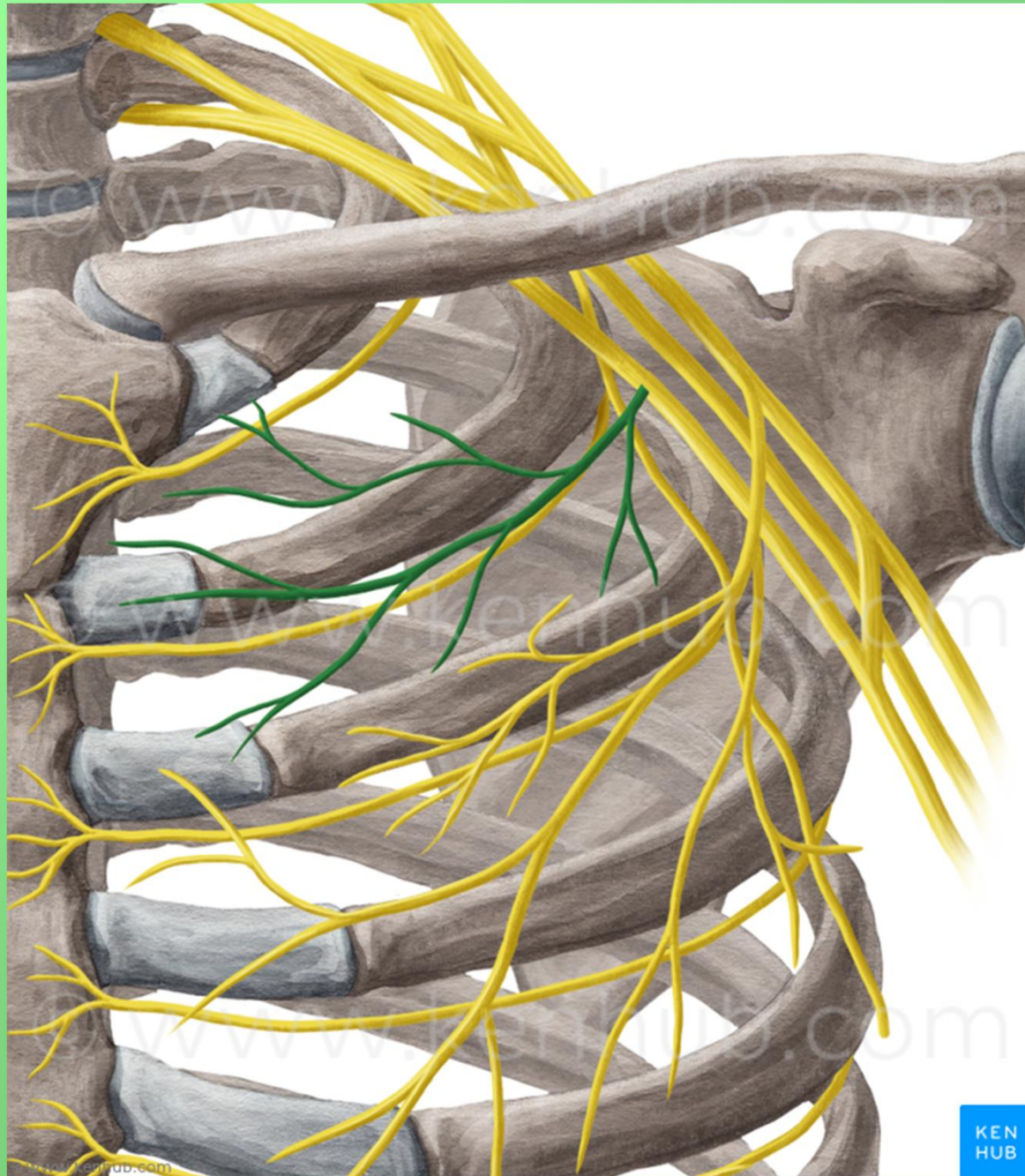


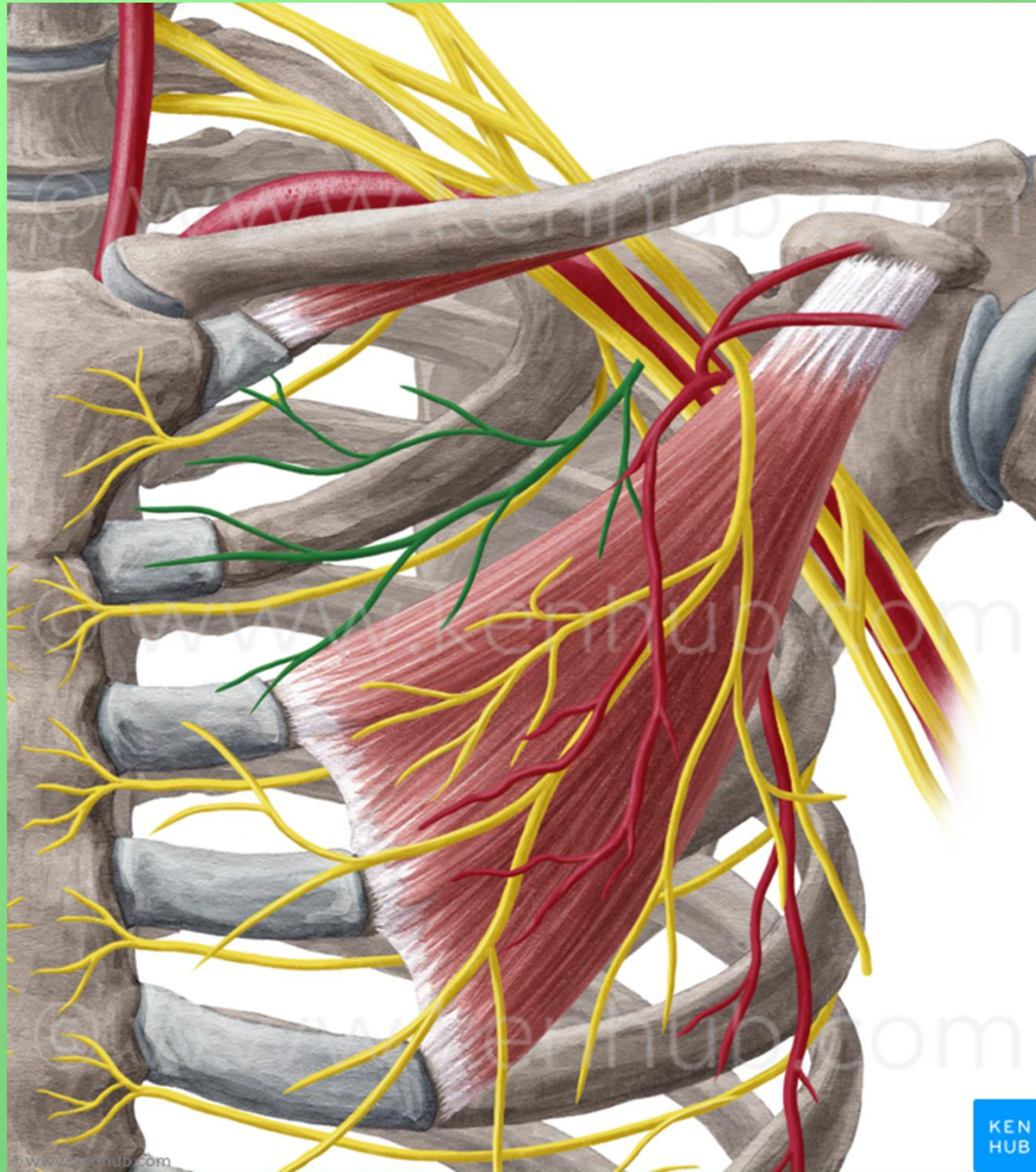


nervus pectoralis medialis C8-Th1

- m. pectoralis major et minor

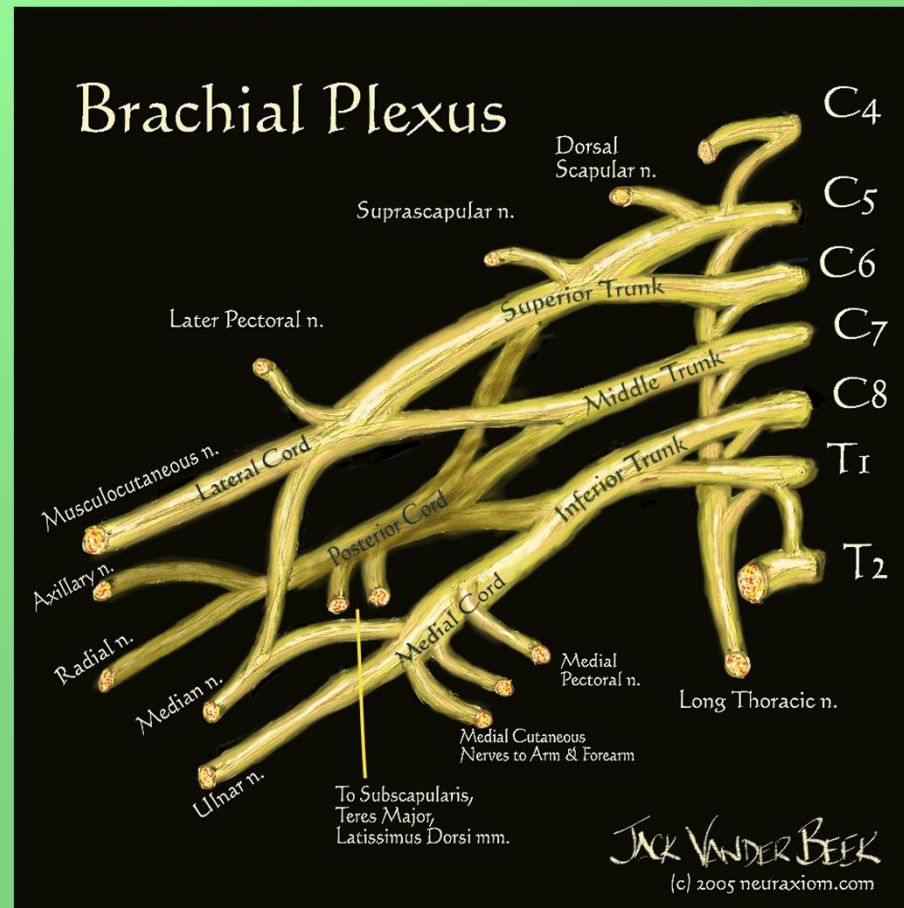


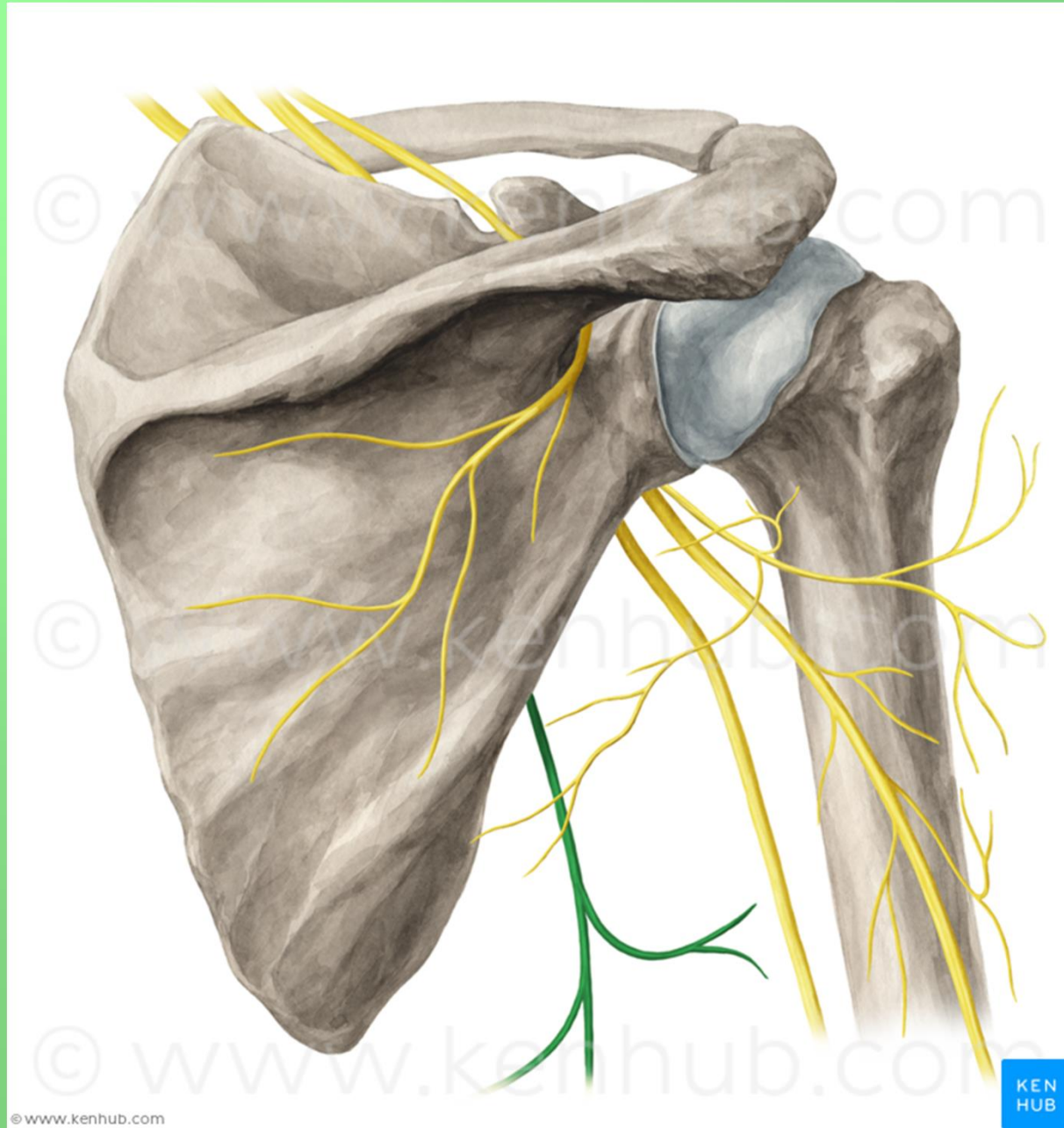


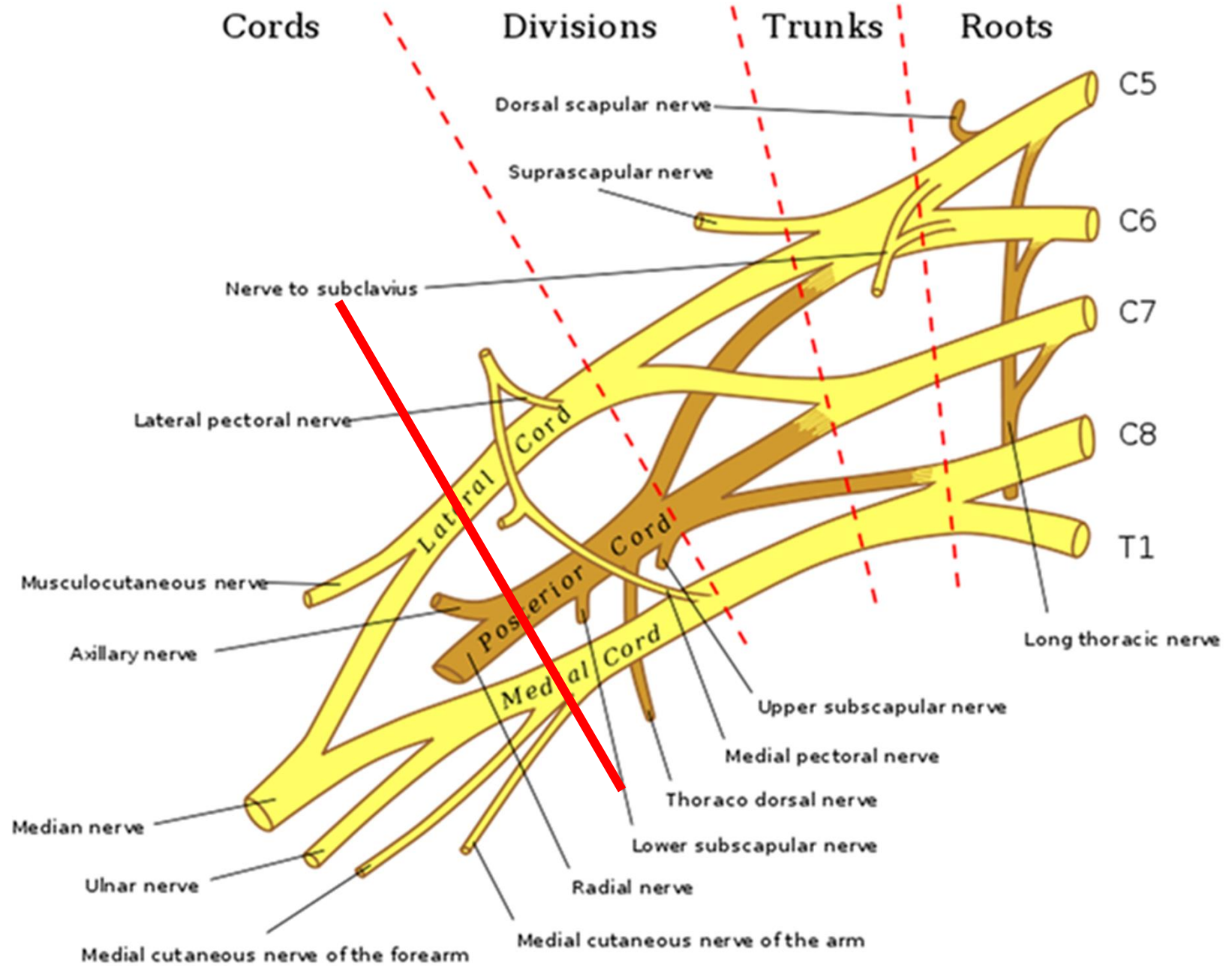


nervus thoracodorsalis C6-8

- m. latissimus dorsi

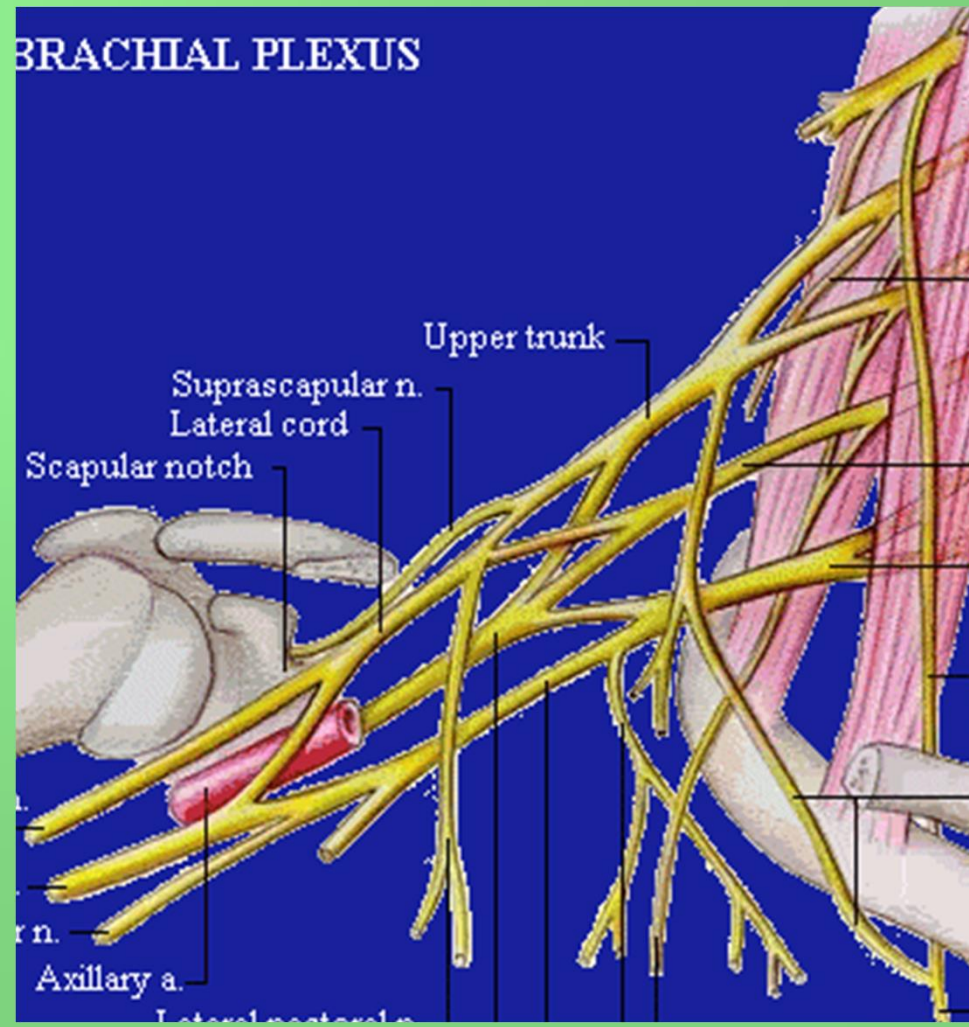


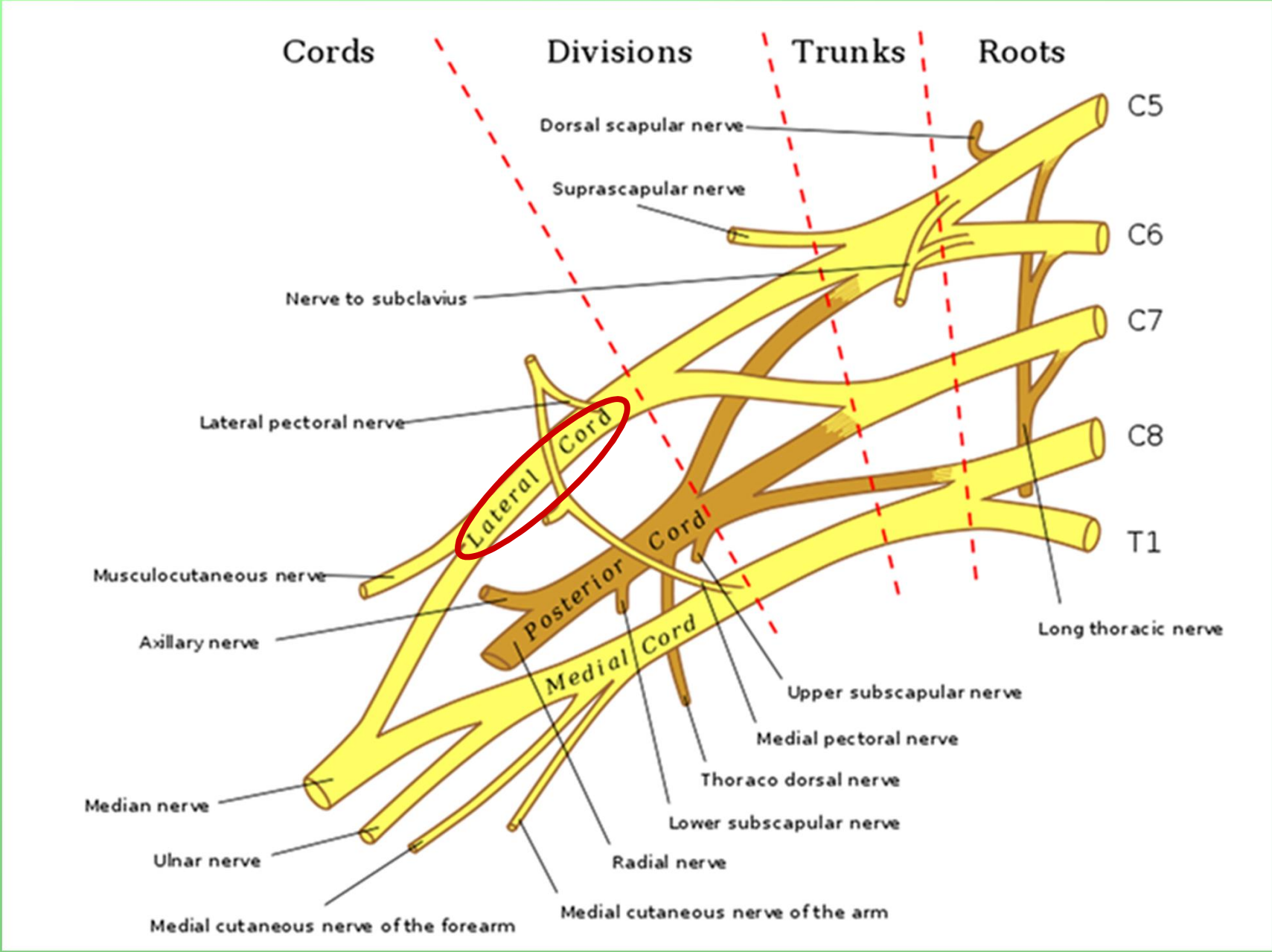




Pars infraclavicularis plexus brachialis

- fasciculus lateralis
- fasciculus medialis
- fasciculus posterior





Fasciculus lateralis

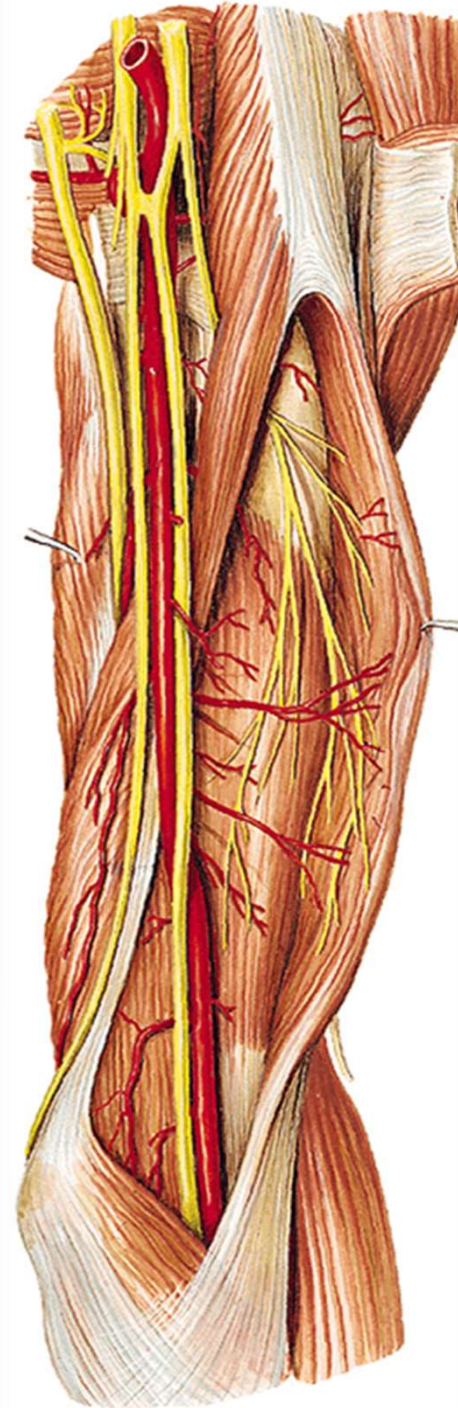
n. musculocutaneus

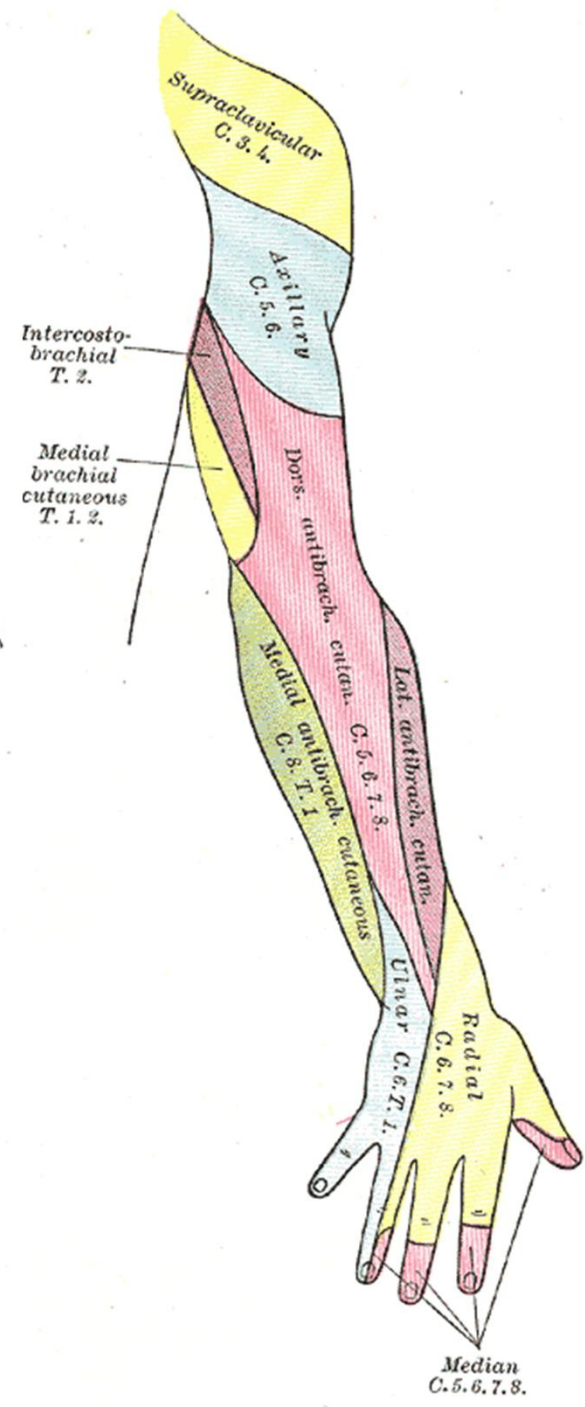
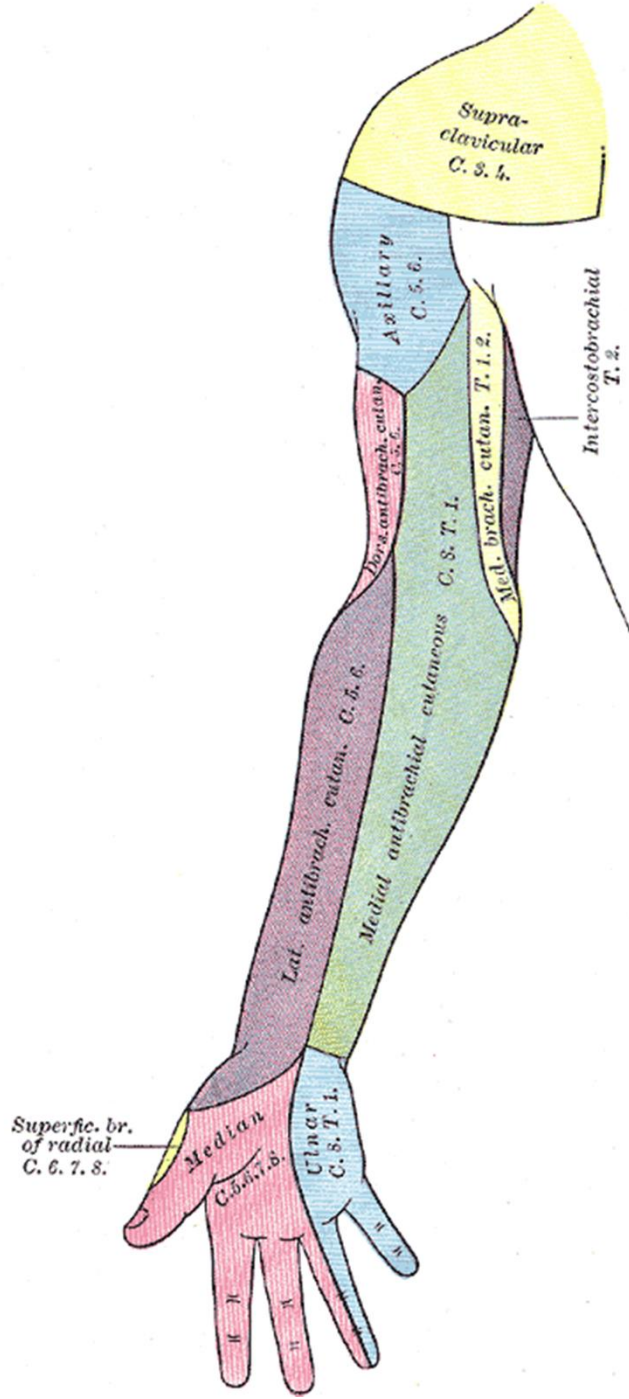
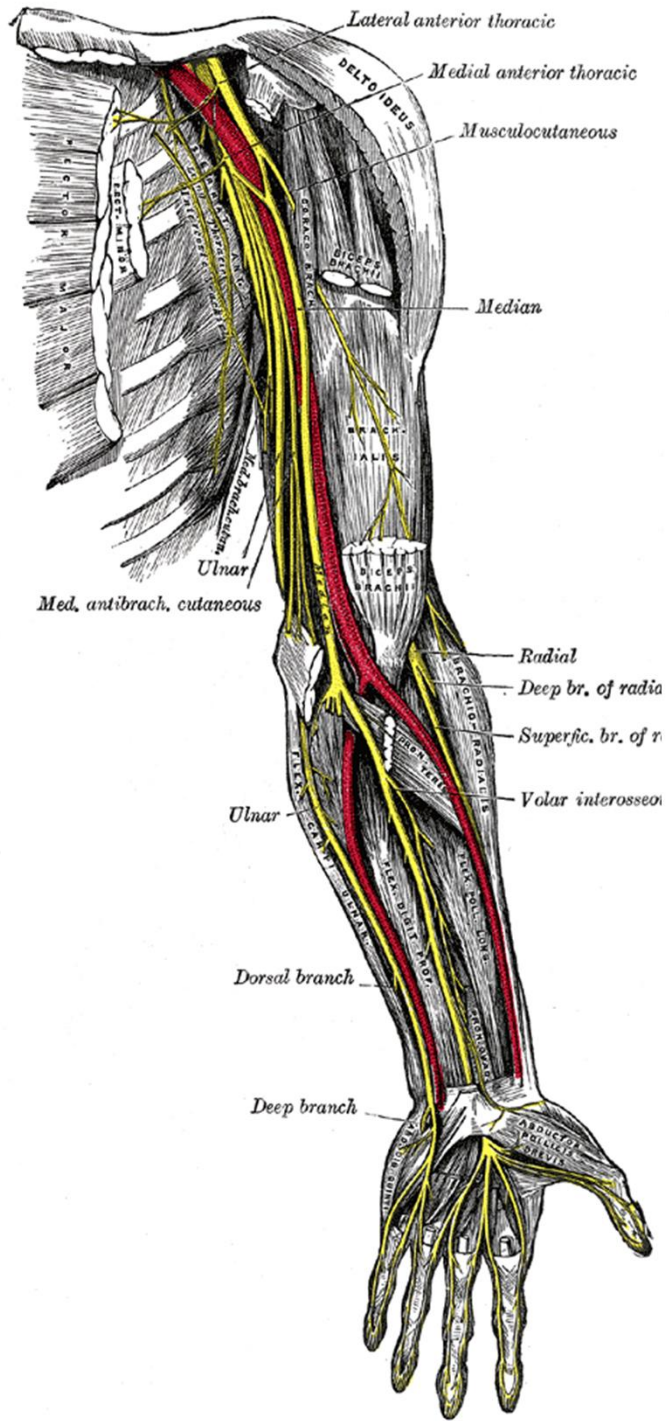
(mixed) (C5-7)

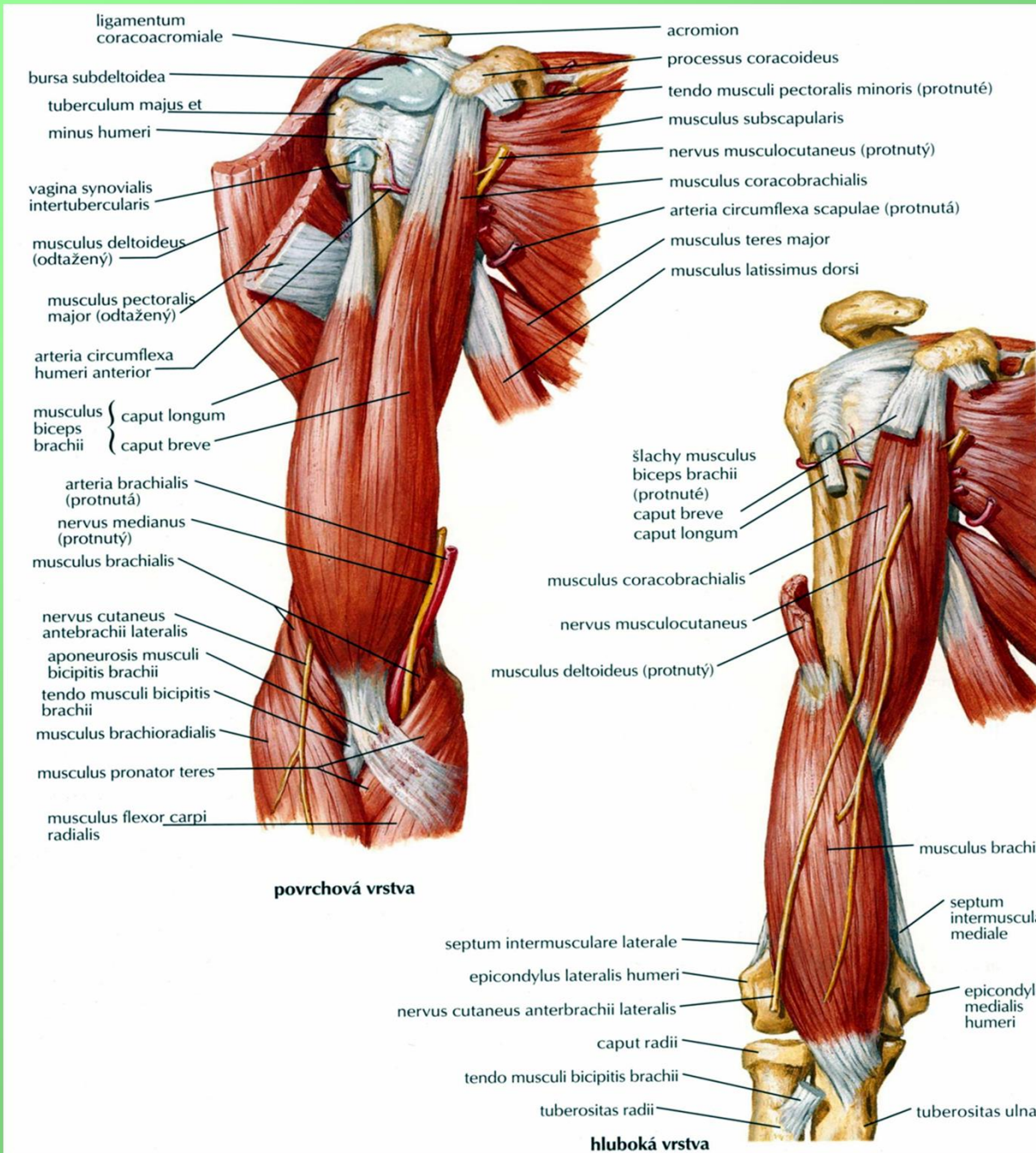
rr. musculares (m. coracobrachialis,
m. biceps brachii, m. brachialis)

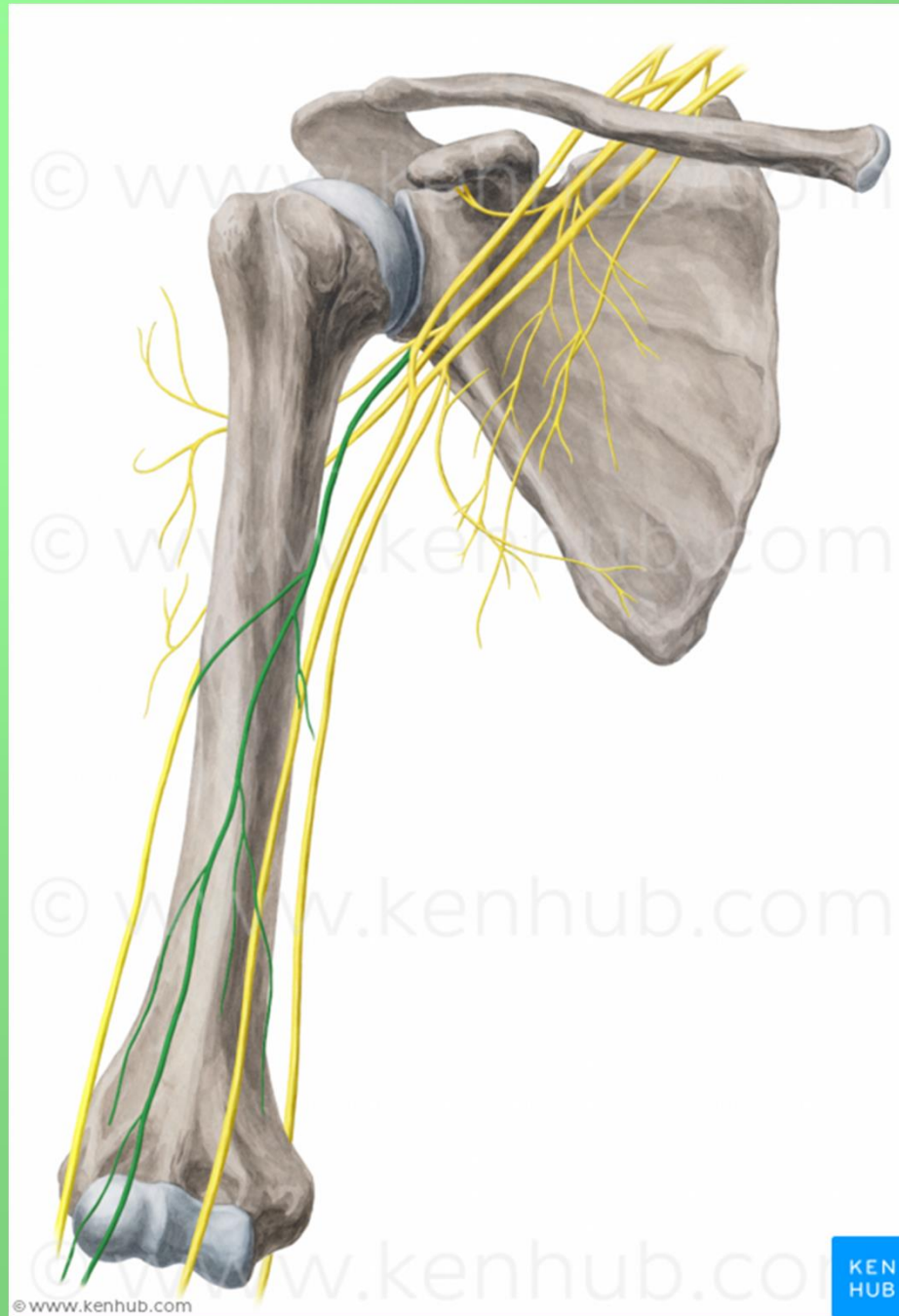
n. cutaneus antebrachii lateralis
vulnerable place - fossa cubiti

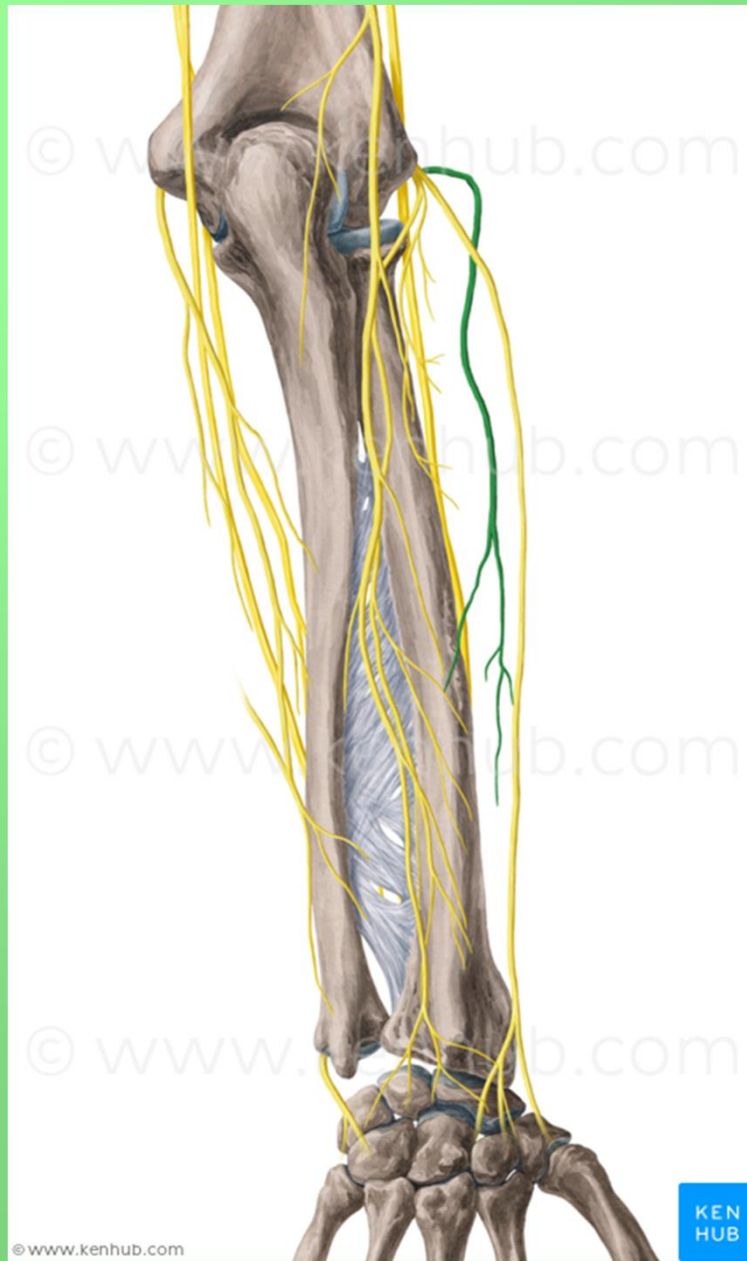
radix lateralis n. mediani





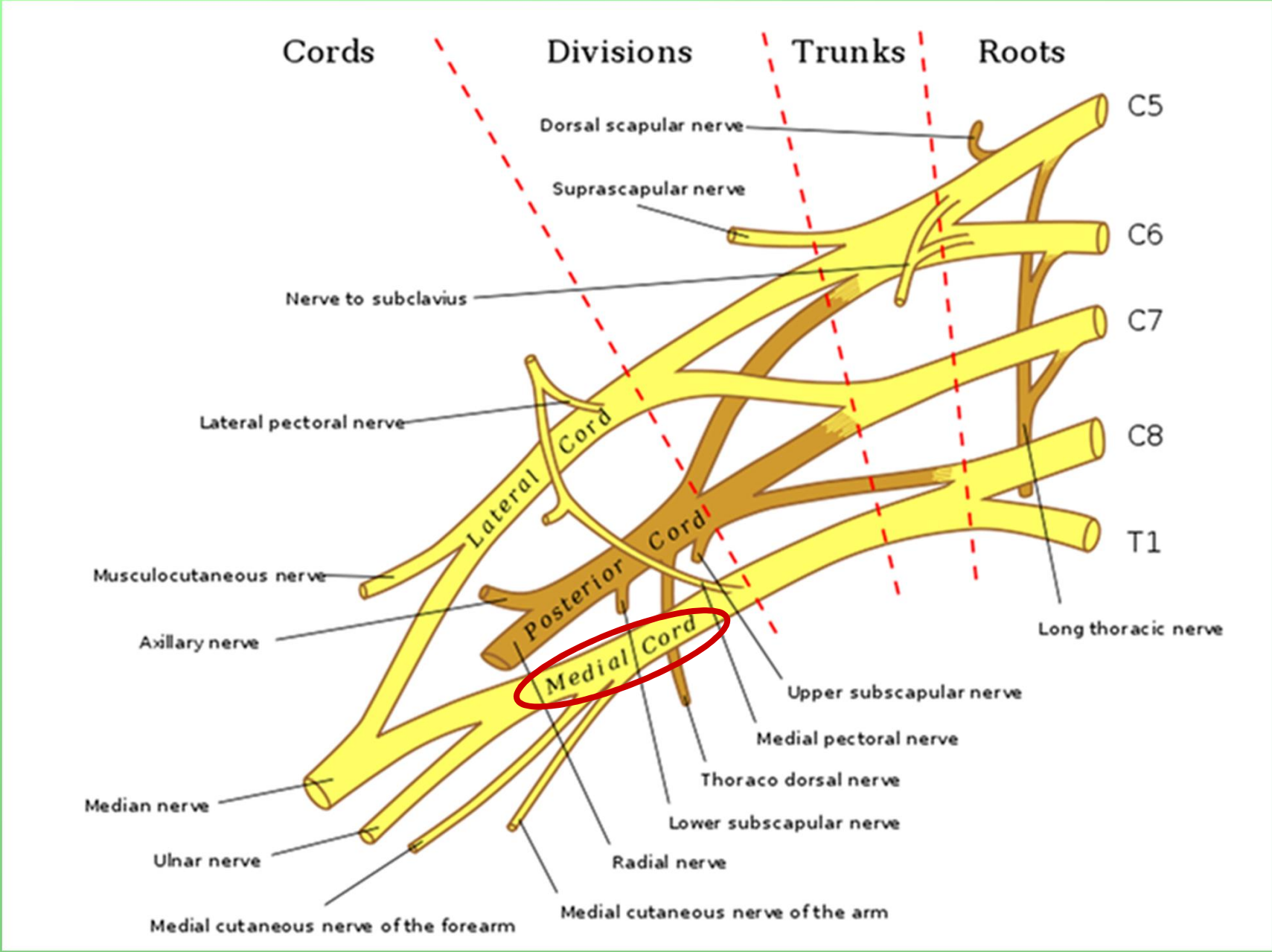






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Fasciculus medialis

radix medialis n. mediani

n. cutaneus brachii medialis (C8–Th1)

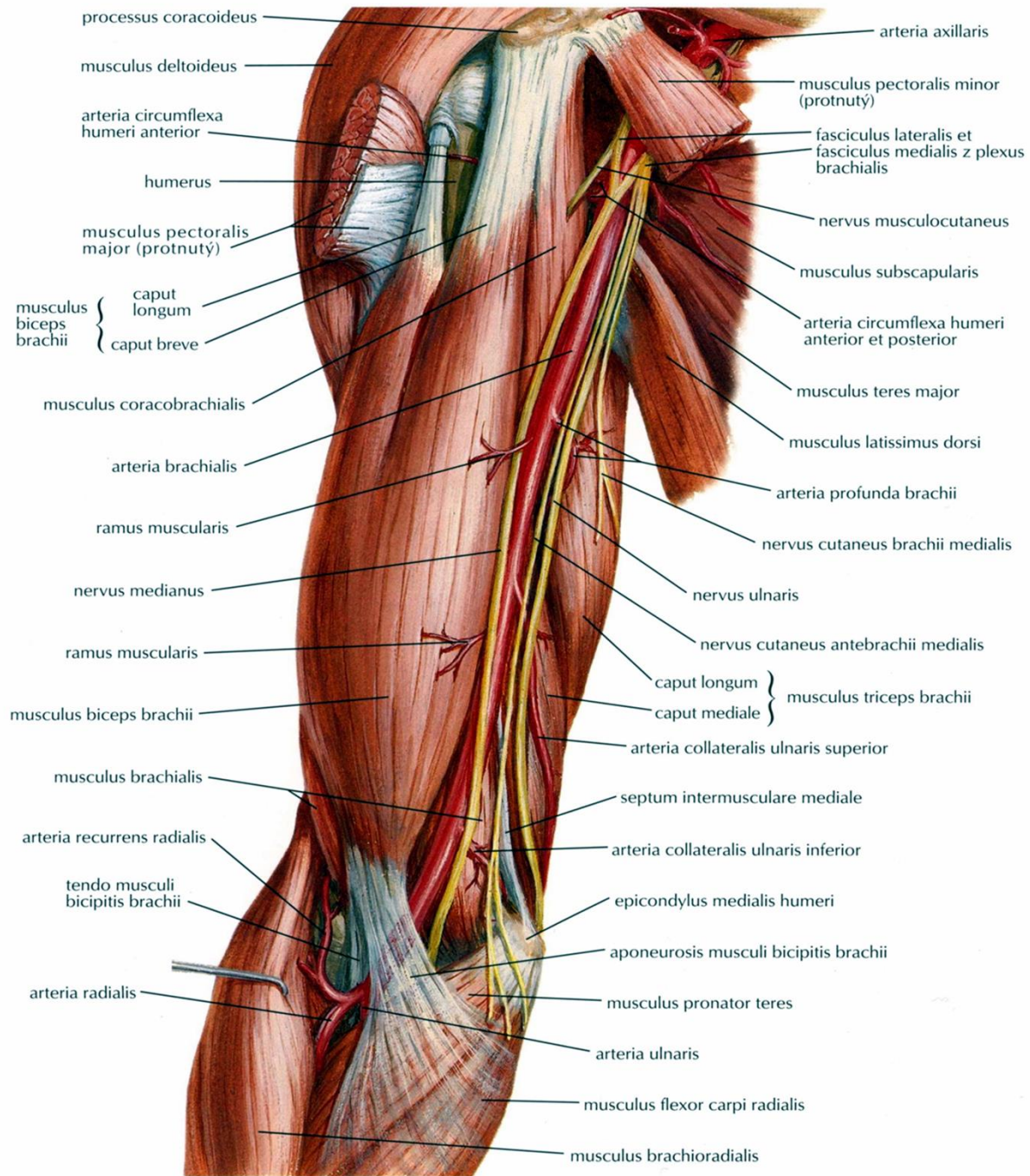
- Connections with nn. intercostales II., (III.) – **nn. intercostobrachiales**

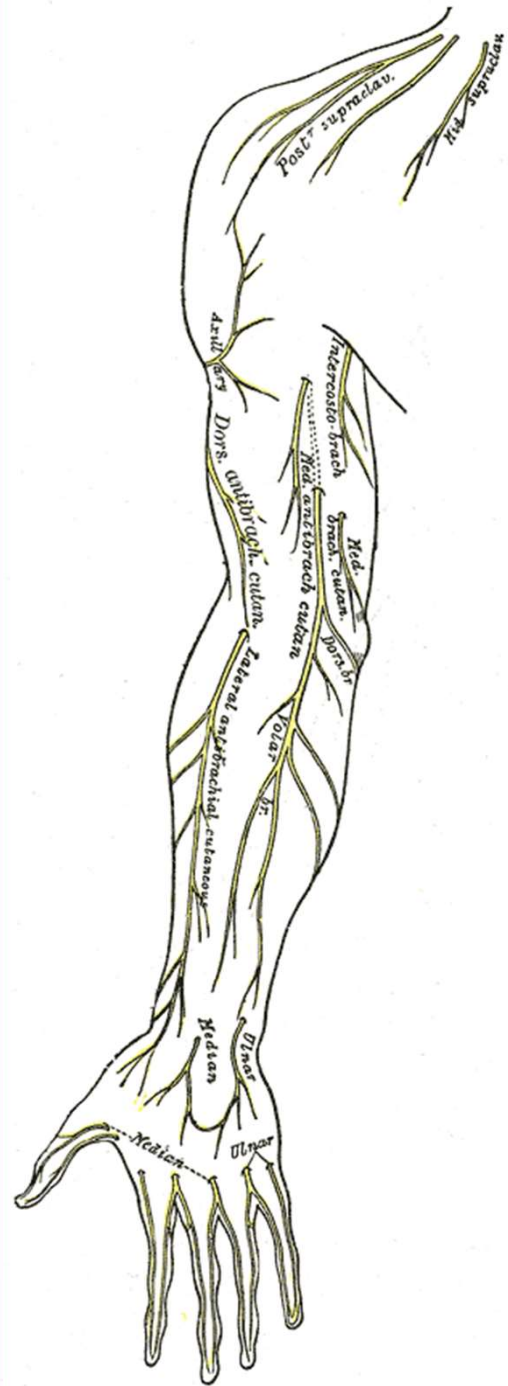
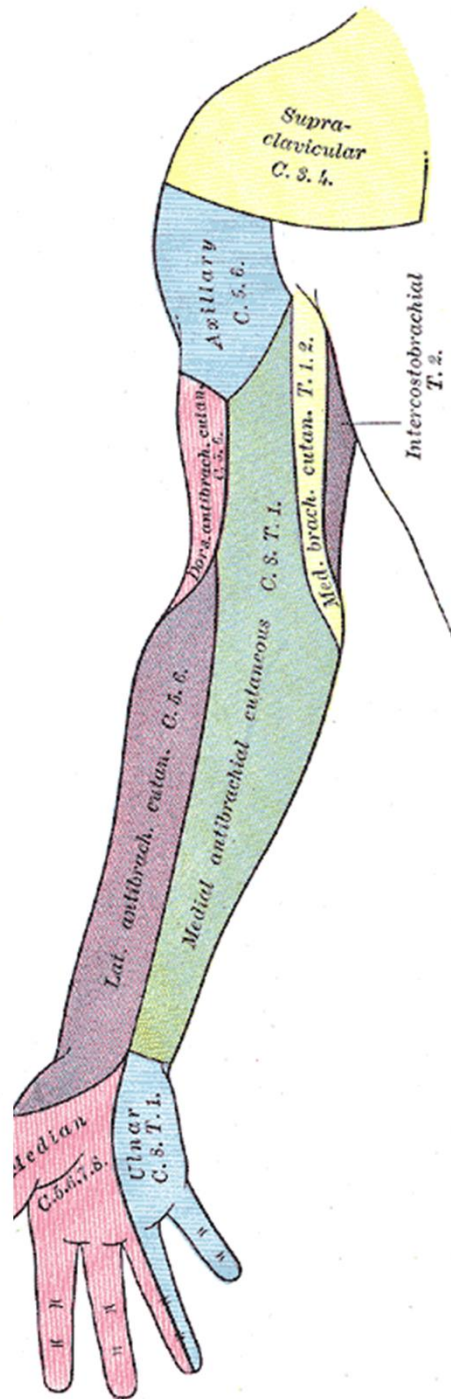
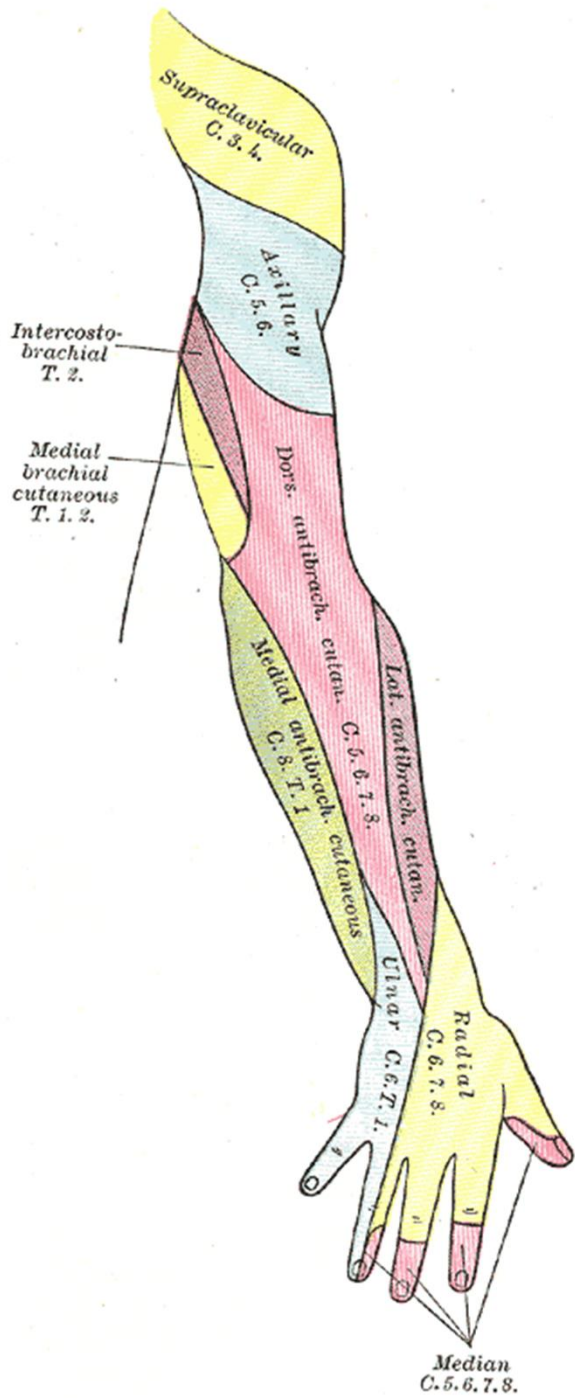
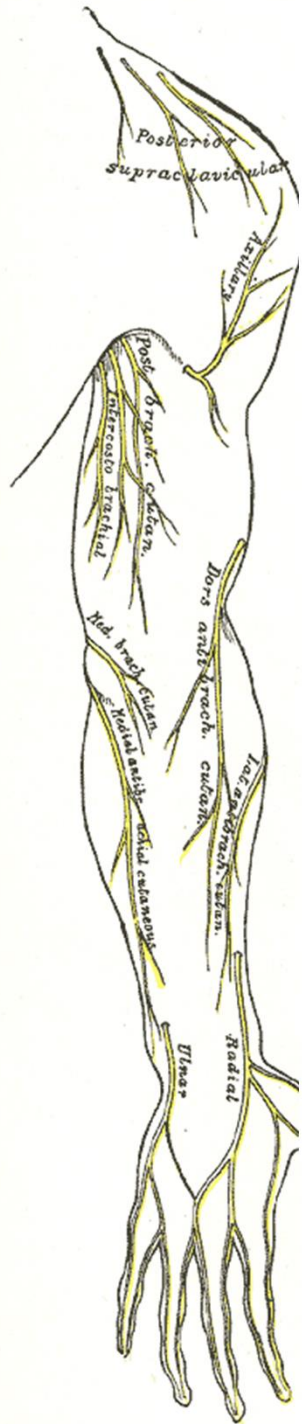
n. cutaneus antebrachii medialis (C8–Th1)

(it passes through hiatus basilicus into the subcutaneous tissue and it continues distally onto the antebrachium)

r. anterior et r. ulnaris

n. ulnaris





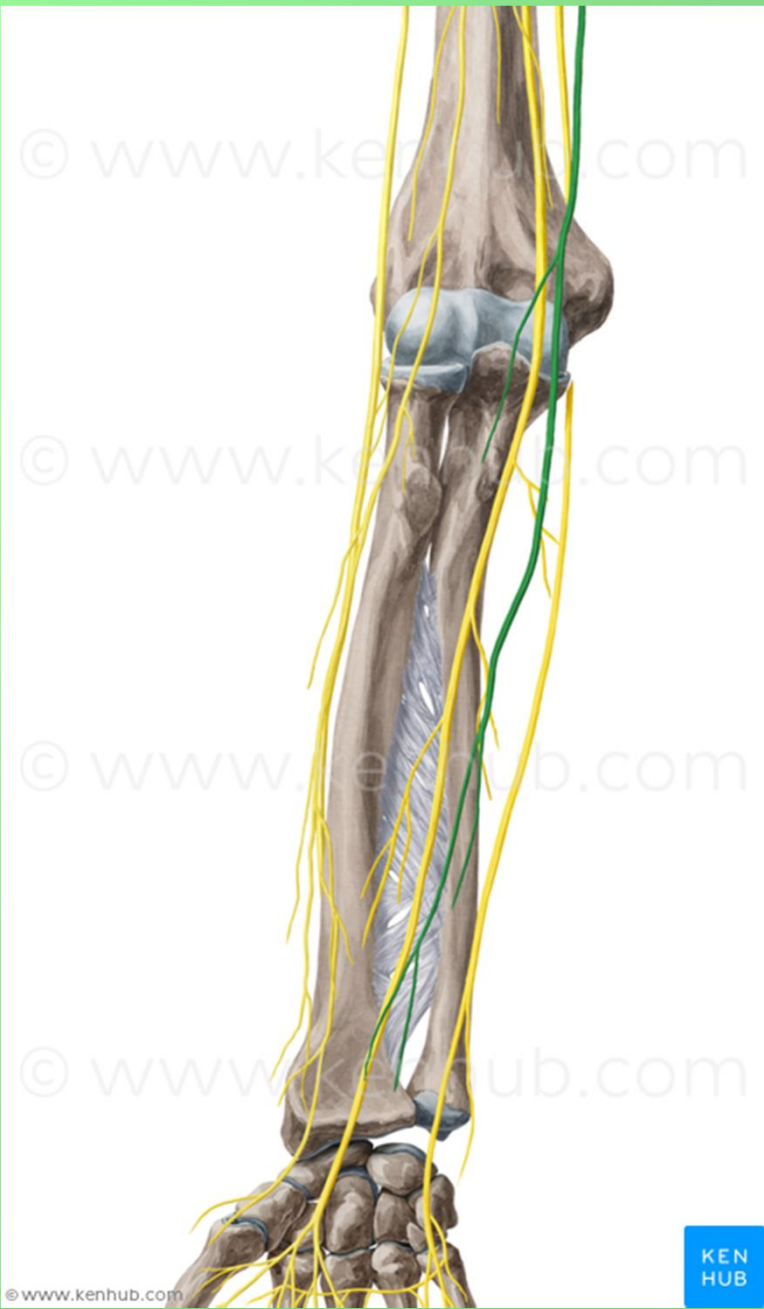
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n. ulnaris - (mixed) (C8–Th1)

- It runs on the medial side of the arm, then within sulcus nervi ulnaris, between m. flexor carpi ulnaris and m. flexor digitorum profundus together with a. ulnaris and further toward the palm on the surface of retinaculum flexorum

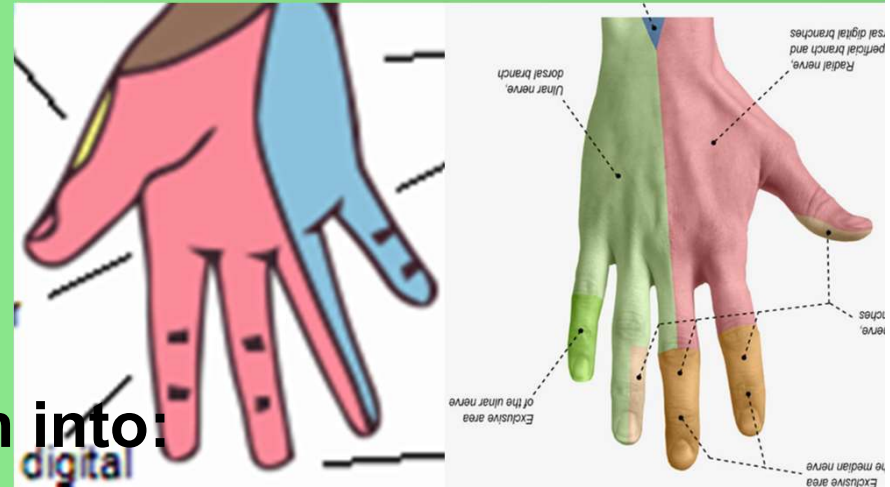
- **rr. articulares**
- **rr. musculares**
- **r. dorsalis n. ulnari**
 - nn. digitales dorsales
- **r. palmaris n. ulnaris**

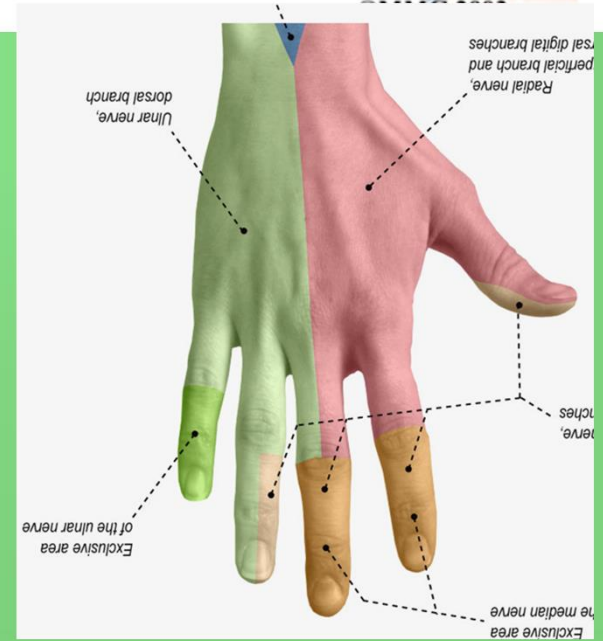
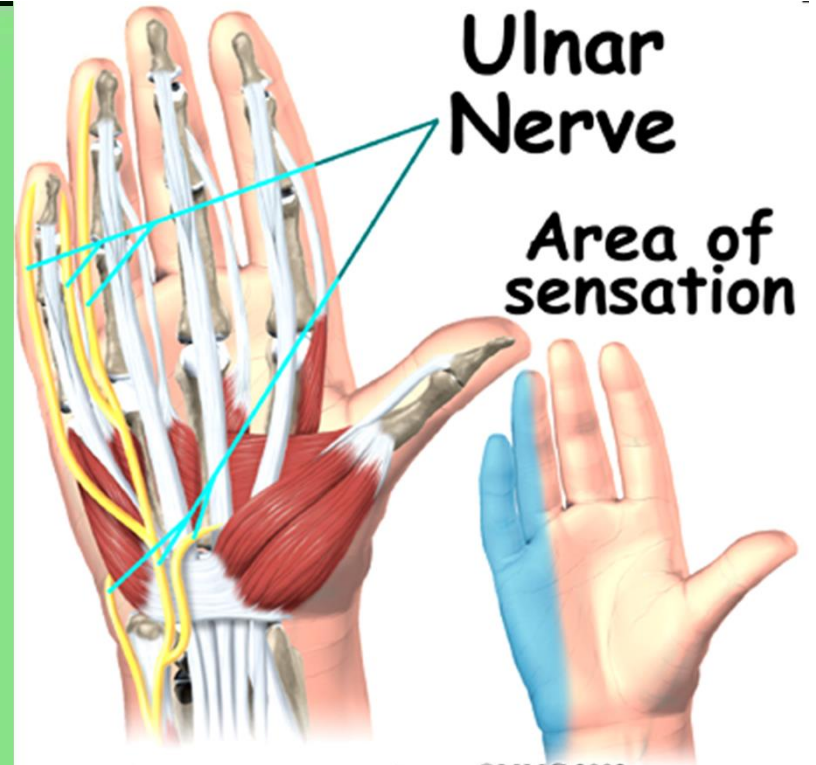
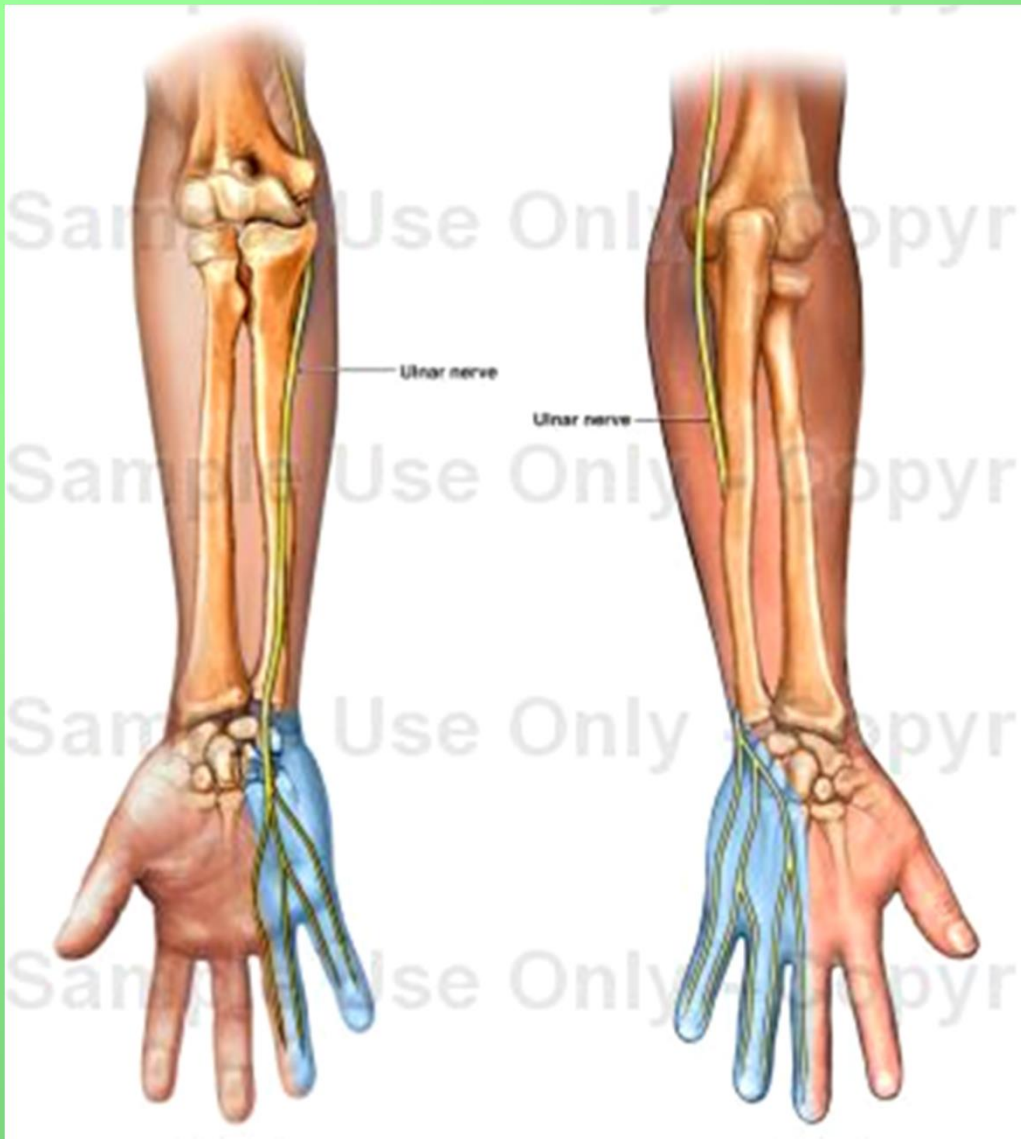
N. ulnaris divides within the palm into:

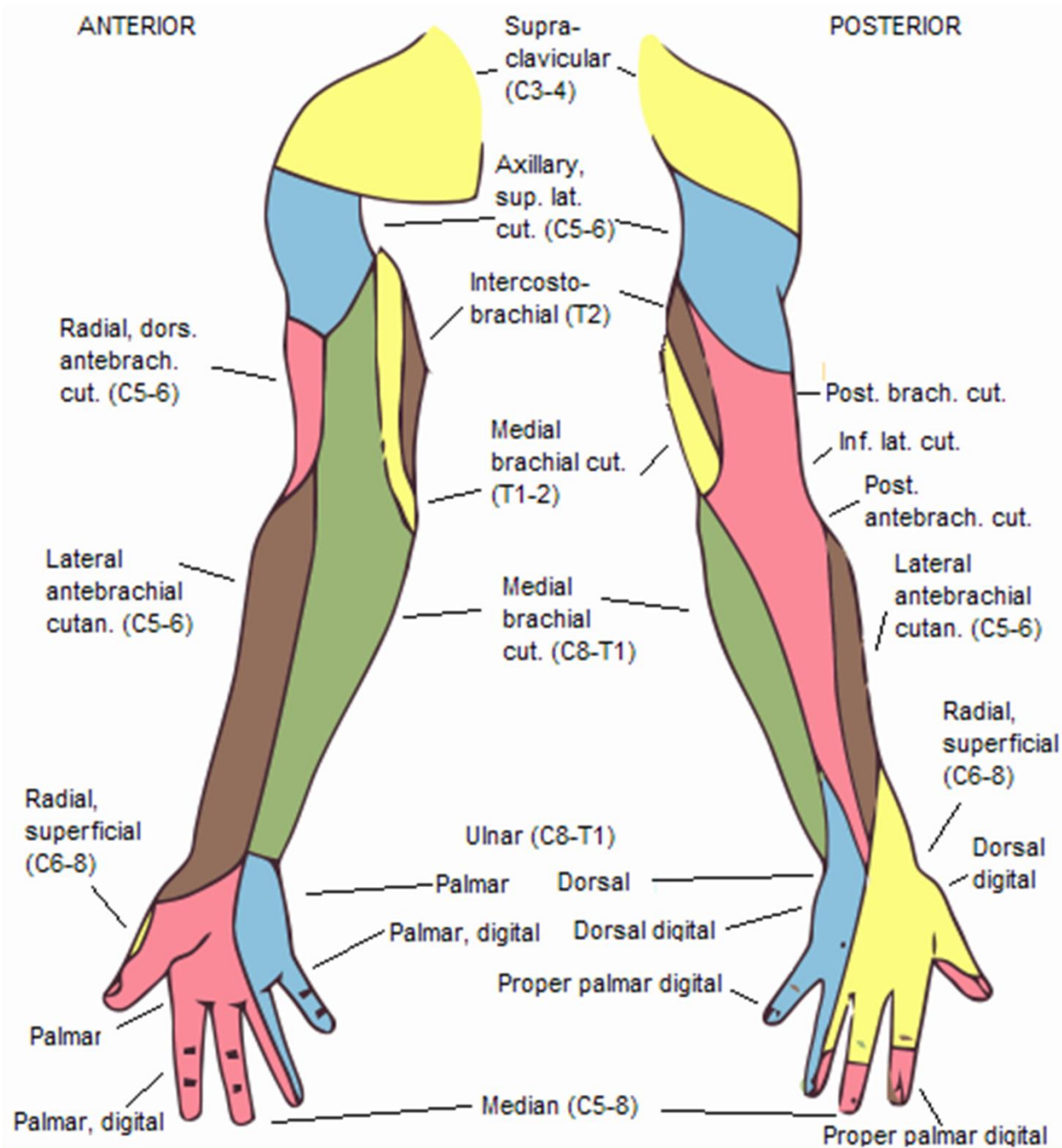
- **r. superficialis**
 - r. muscularis (m. palmaris brevis)
 - 2 nn. digitales palmares communes et proprii
- **r. profundus** - rr. musculares

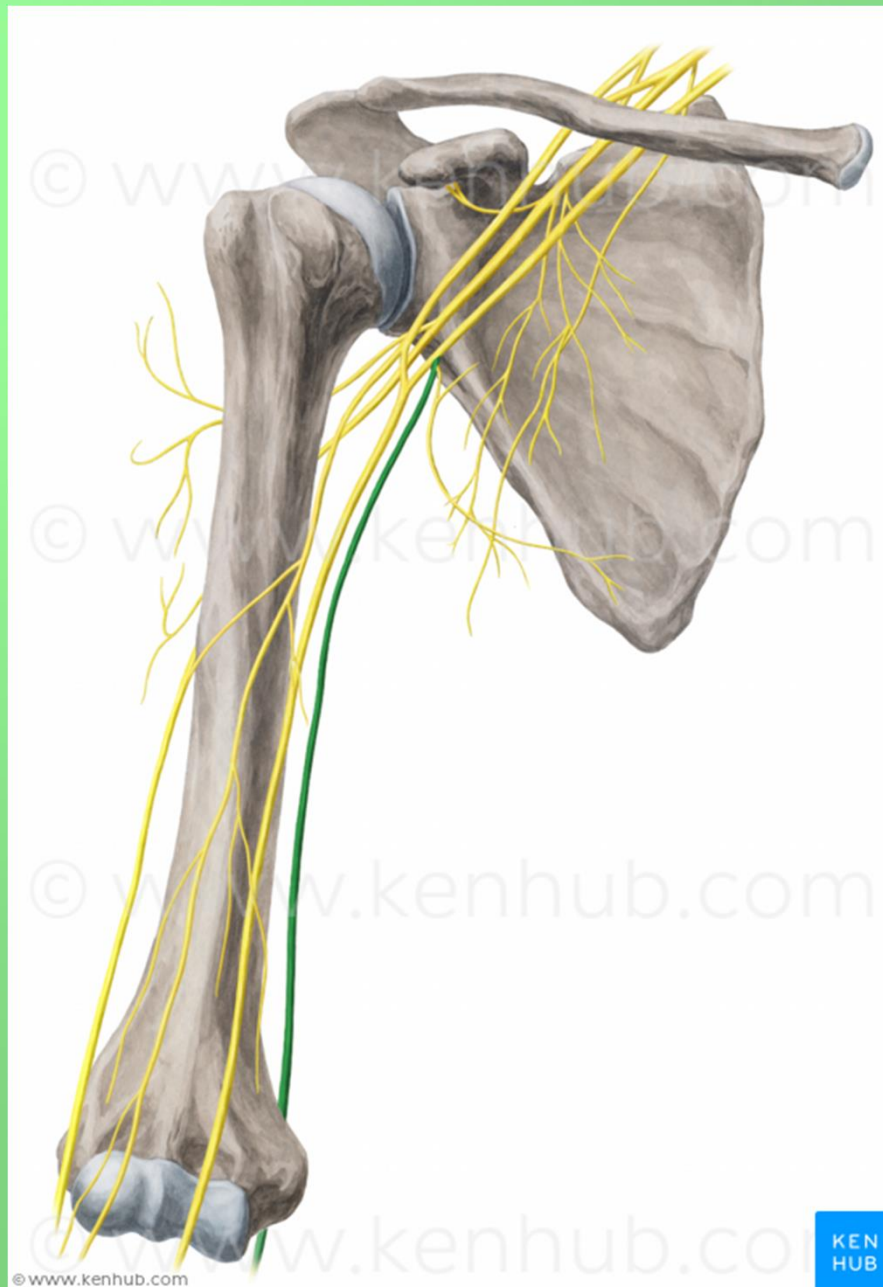
Motor innervation: m. flexor carpi ulnaris, m. flexor digitorum profundus (for 4th and 5th finger), muscles of hypothenar, m. adductor pollicis and m. flexor pollicis brevis (caput profundum), mm. interossei, mm. lumbricales (III. and IV.)

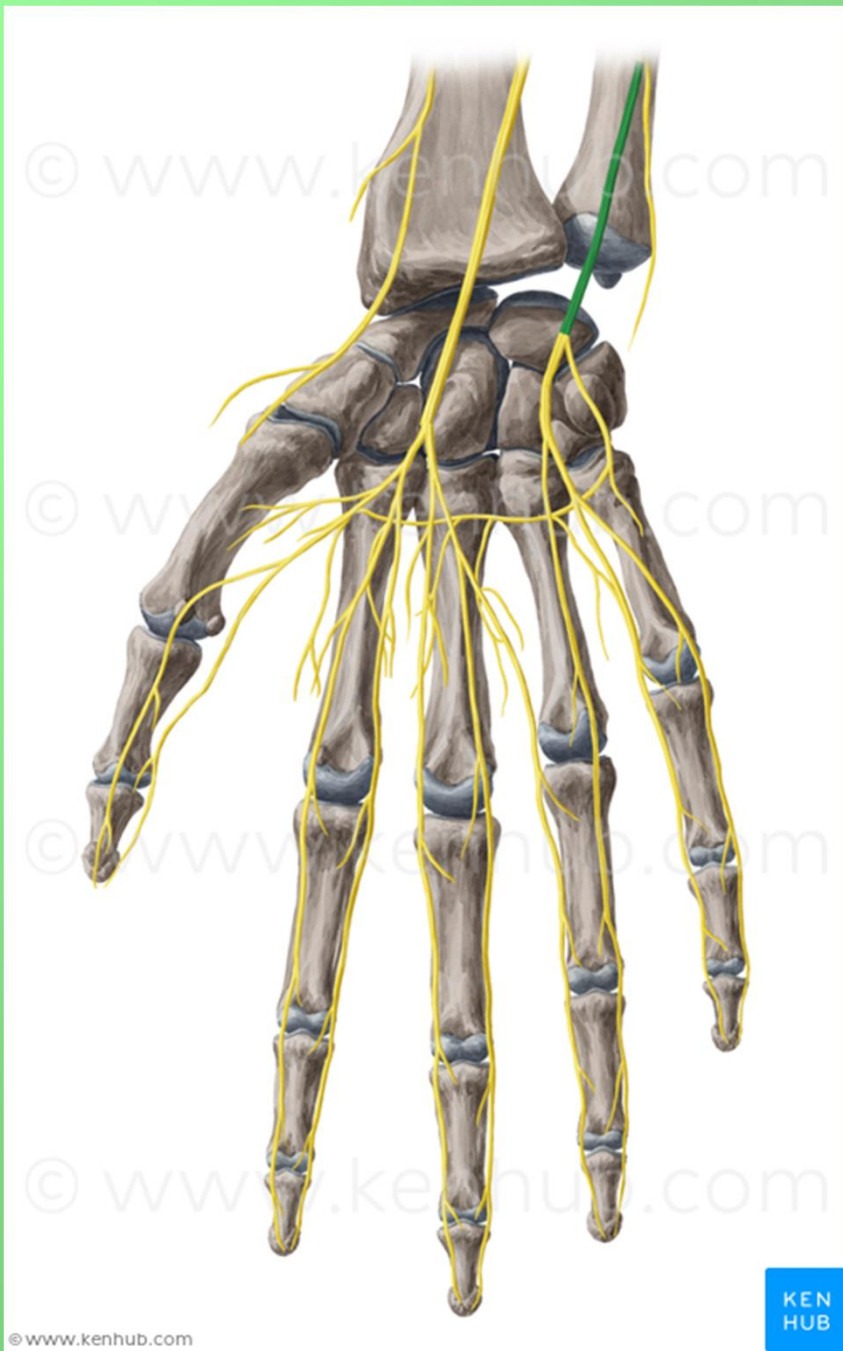
Sensory innervation: on the palm: 5th and half of 4th finger
on dorsum: 5th, 4th and half of 3rd finger





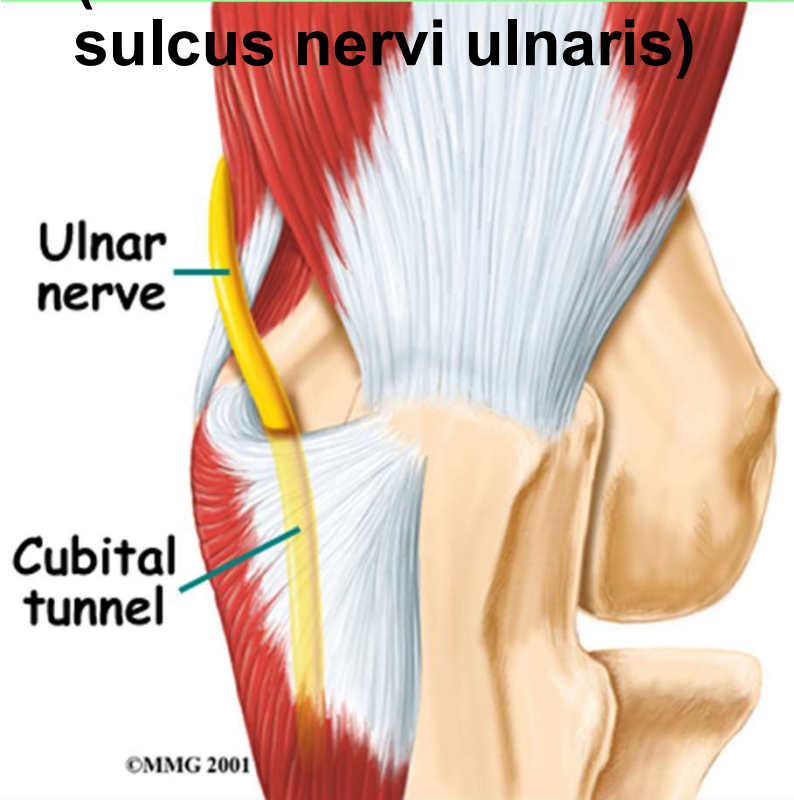




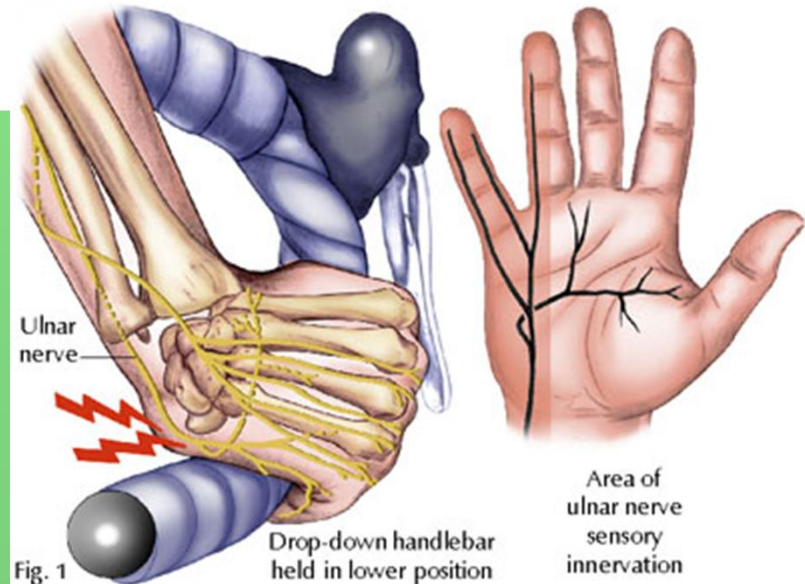
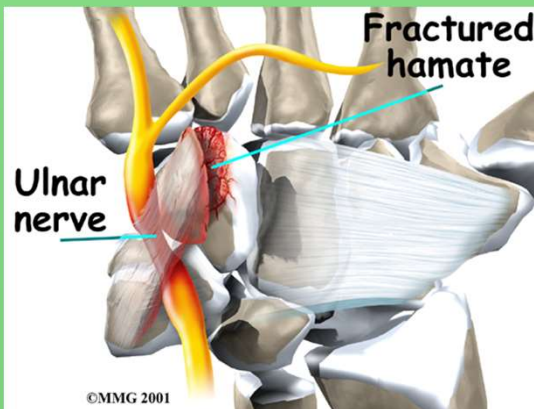


Canalis cubitalis

-Cubital tunelle syndrome
(lesion of n. ulnaris within
sulcus nervi ulnaris)



Guyon's canal (between os pisiforme and hamulus ossis hamati)





Claw hand



n. medianus

mixed(C5–Th1) – *radix med.* (C8–Th1), *radix lat.* (C6-8)

it passes along a. brachialis, between m. pronator teres and flexor digitorum superficialis and then between the deep and superficial flexor (into the palm below retinaculum flexorum)

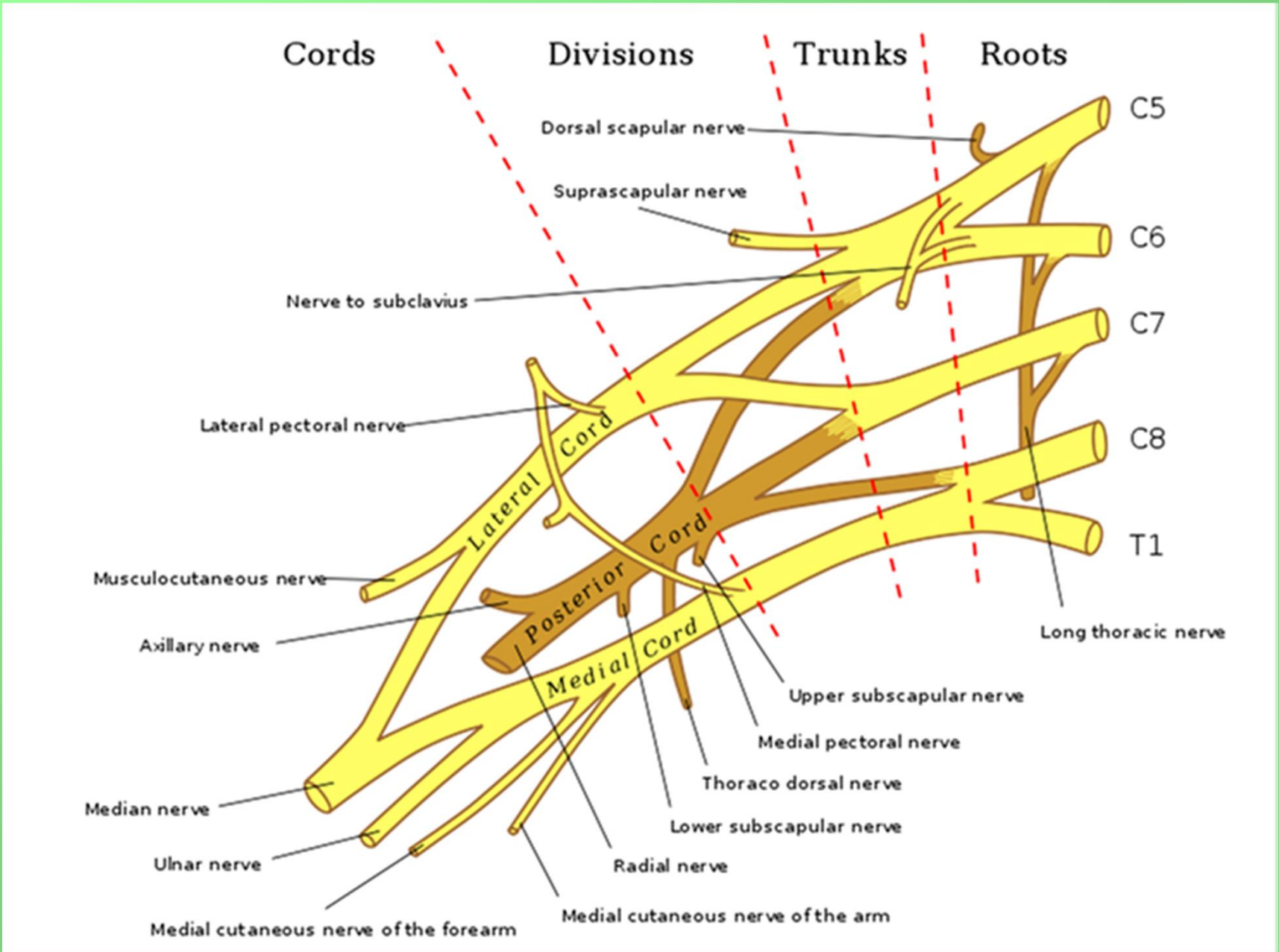
- rr. musculares, rr. articulares
- **n. interosseus antebrachii anterior**
- **r. palmaris**

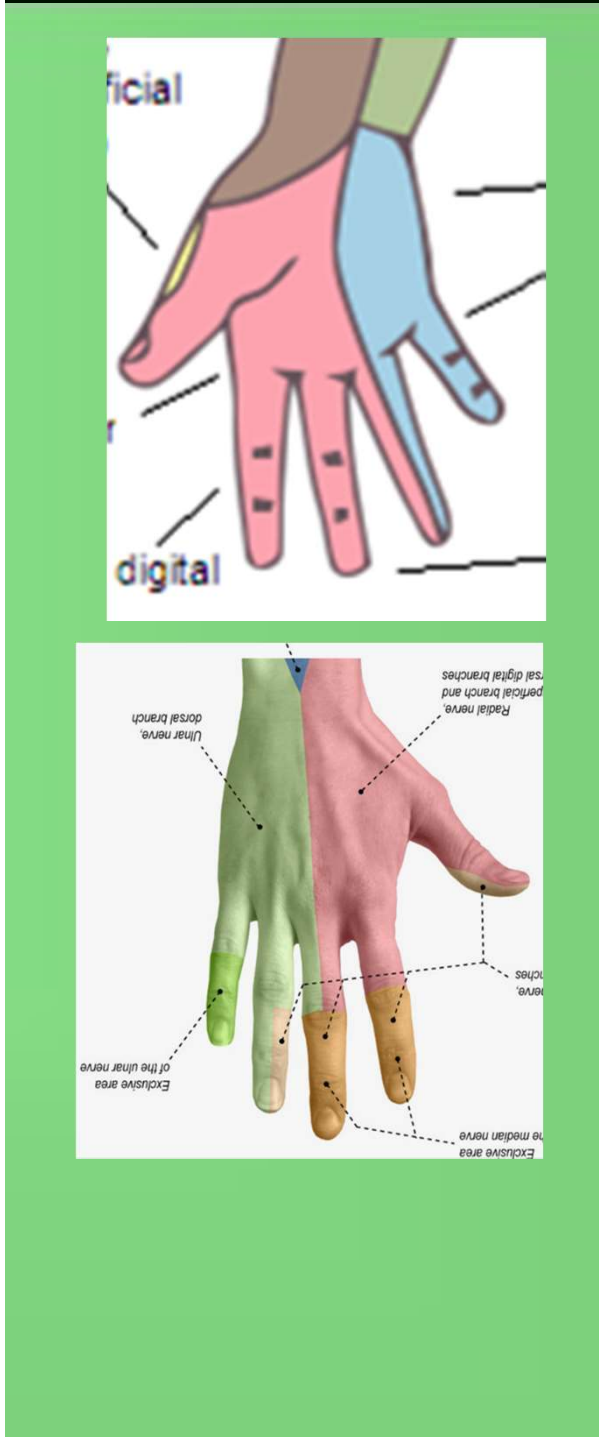
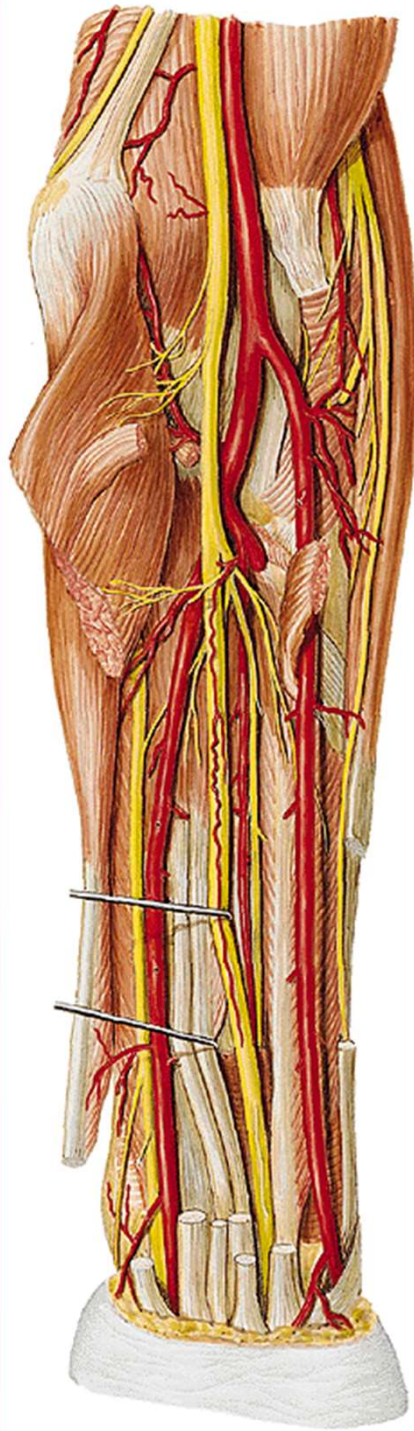
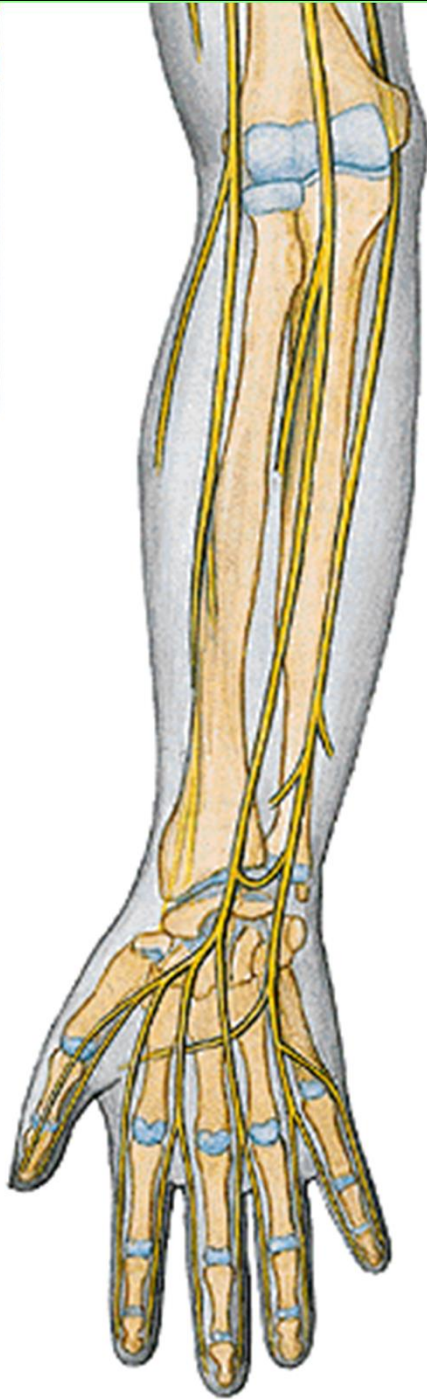
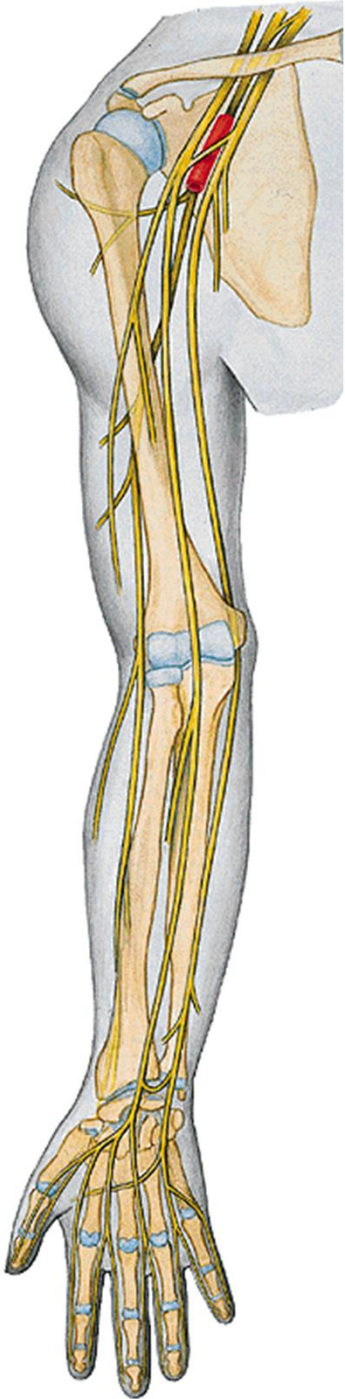
Within the palm:

- **r. communicans cum nervo ulnari** (at the level of canalis carpi)
- **r. thenaris** (rr. musculares)
- **nn. digitales palmares comm.- nn. digitales palmares proprii**

Motor innervation: muscles of the anterior group of forearm (except m. flexor carpi ulnaris and part of m. flexor digitorum profundus), m. abductor pollicis brevis , m. opponens pollicis, m. flexor pollicis brevis (caput superficiale)

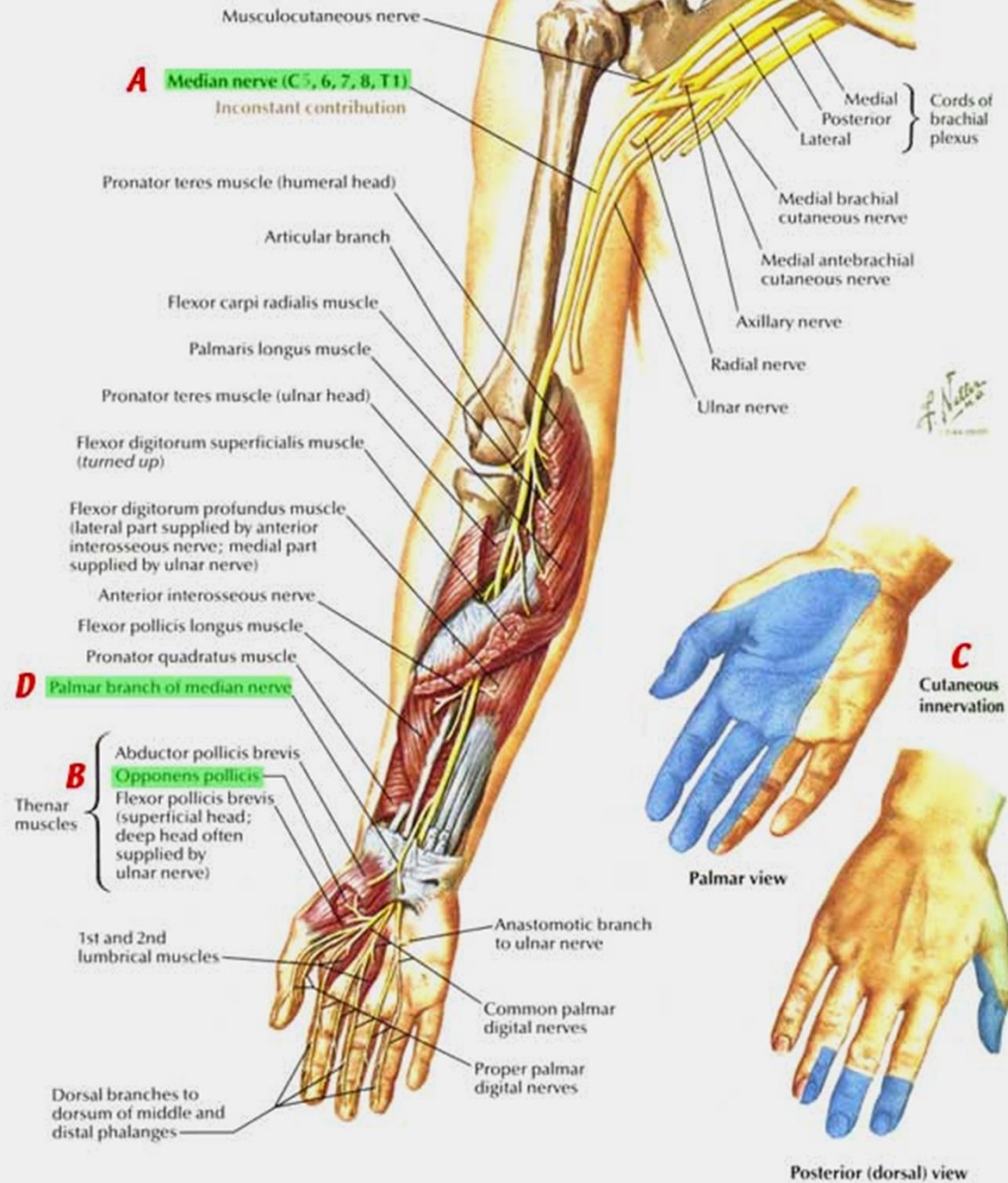
Sensory innervation: thenar part of the palm and palmar part of fingers till the borderline which lies in the middle of 4th finger

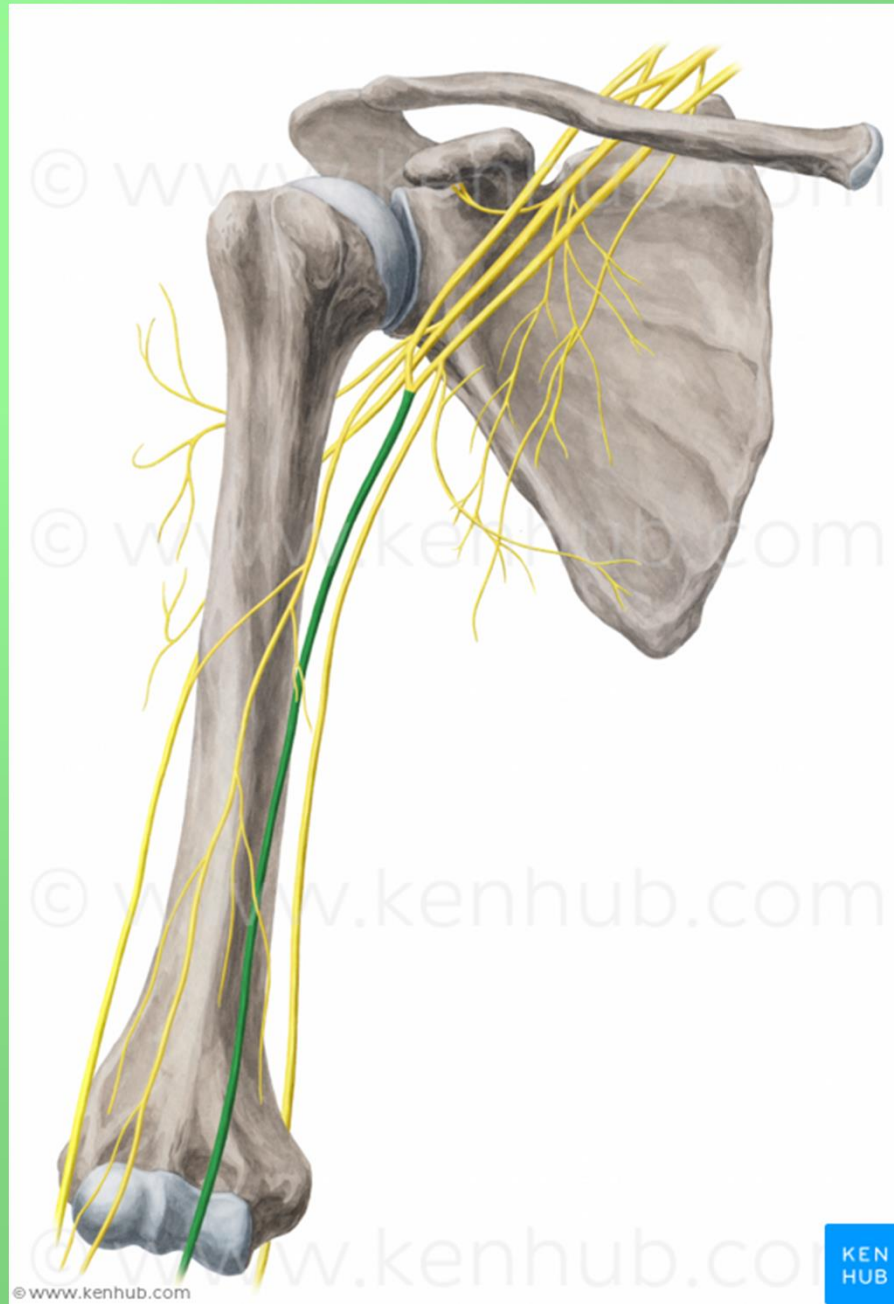


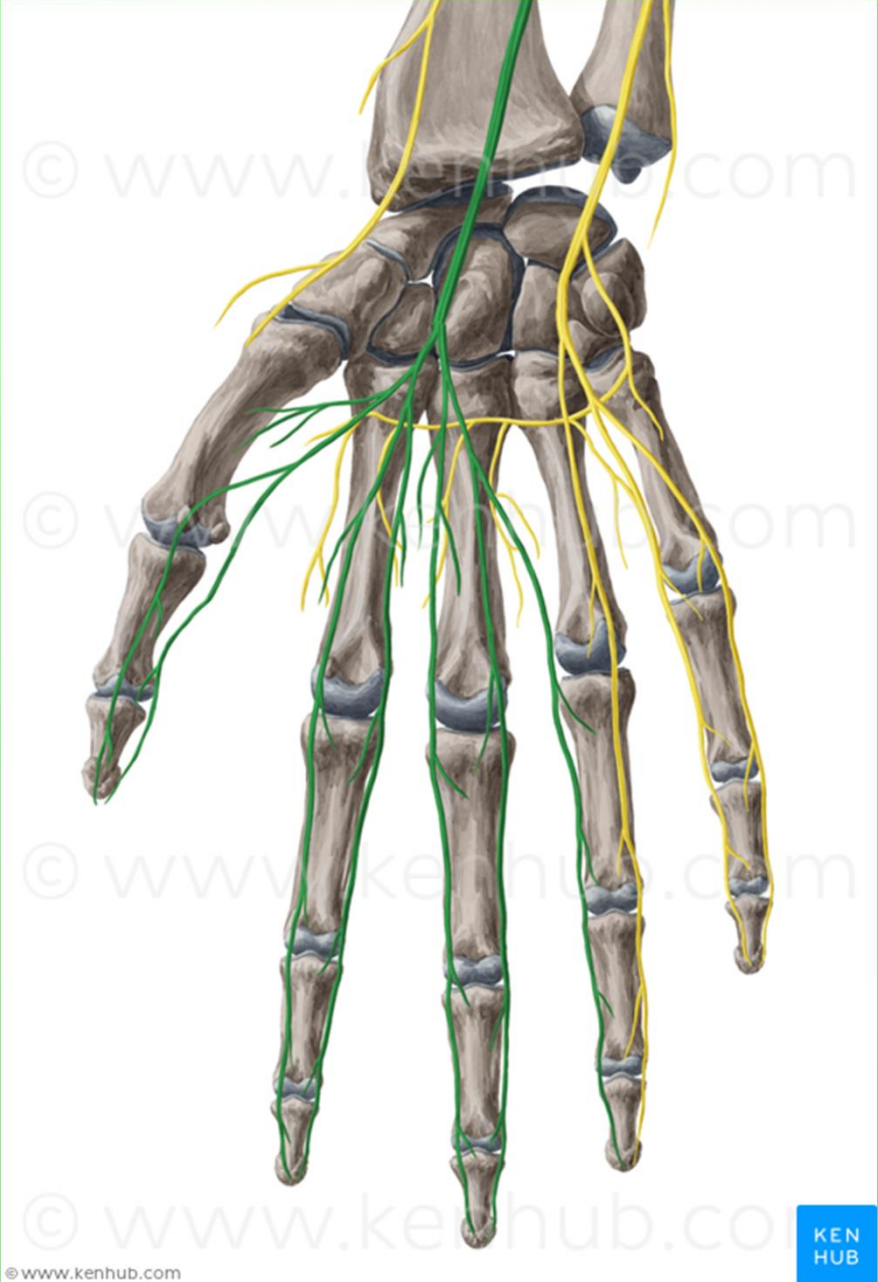


Anterior view

Note: only muscles innervated by median nerve shown

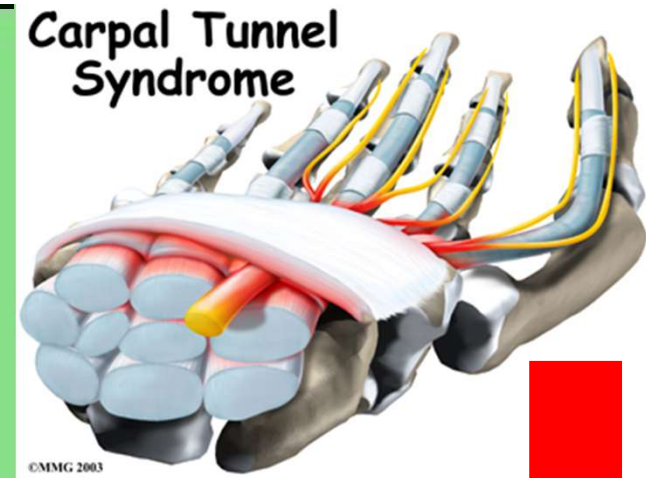






The injury of the nerve:

- suicide attempts (gashes)
- pathological changes within carpal tunnel
- gripping movement is missing

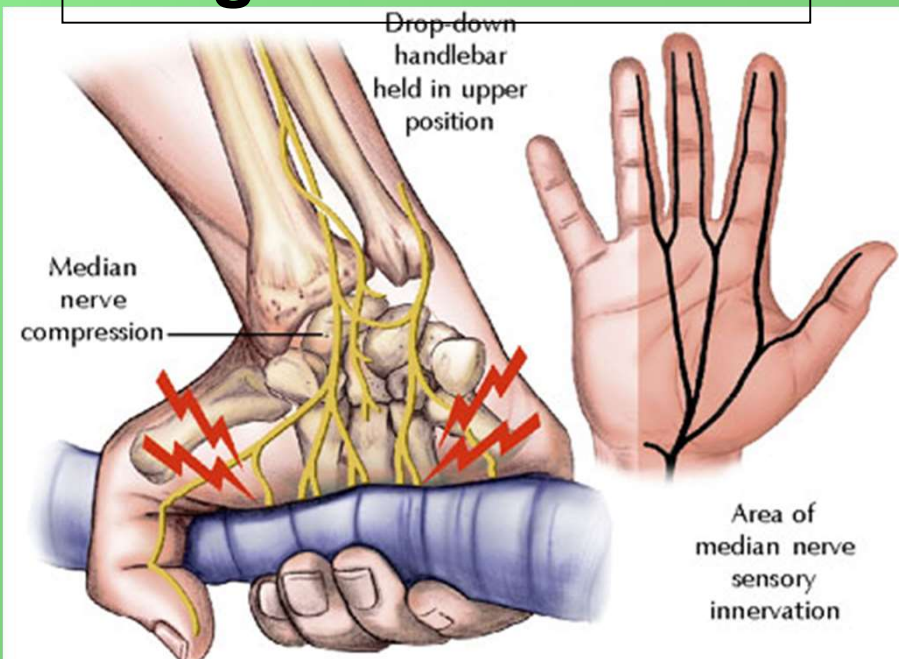


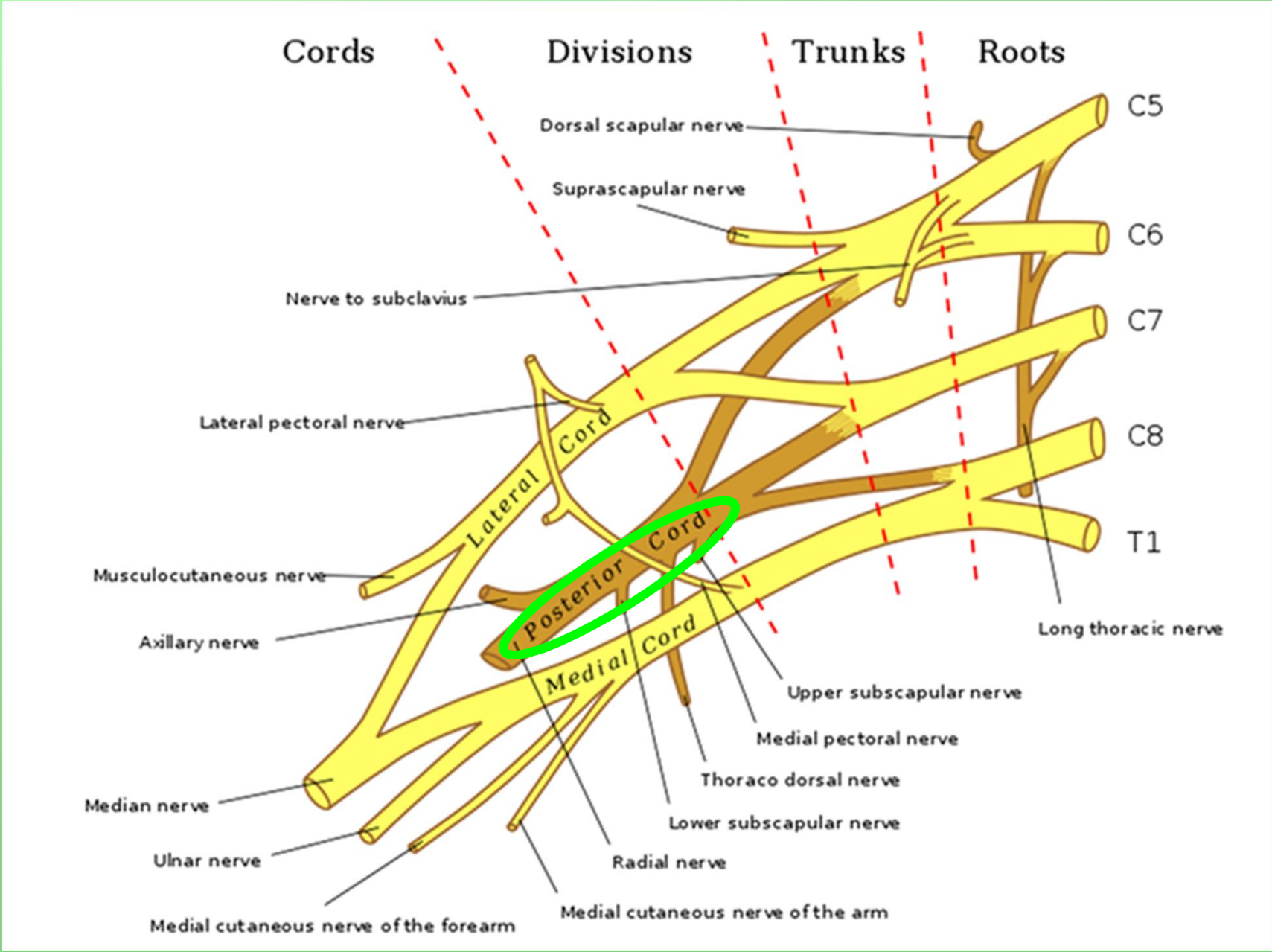
**Ape hand -
Opposition of thumb
stagnates**



Hand of benediction

(inability of opposition of thumb and flexion of 2nd and 3rd finger)





Cords

Divisions

Trunks

Roots

C5

C6

C7

C8

T1

Dorsal scapular nerve

Suprascapular nerve

Nerve to subclavius

Lateral pectoral nerve

Lateral Cord

Posterior Cord

Medial Cord

Musculocutaneous nerve

Axillary nerve

Long thoracic nerve

Upper subscapular nerve

Medial pectoral nerve

Thoraco dorsal nerve

Lower subscapular nerve

Median nerve

Ulnar nerve

Radial nerve

Medial cutaneous nerve of the forearm

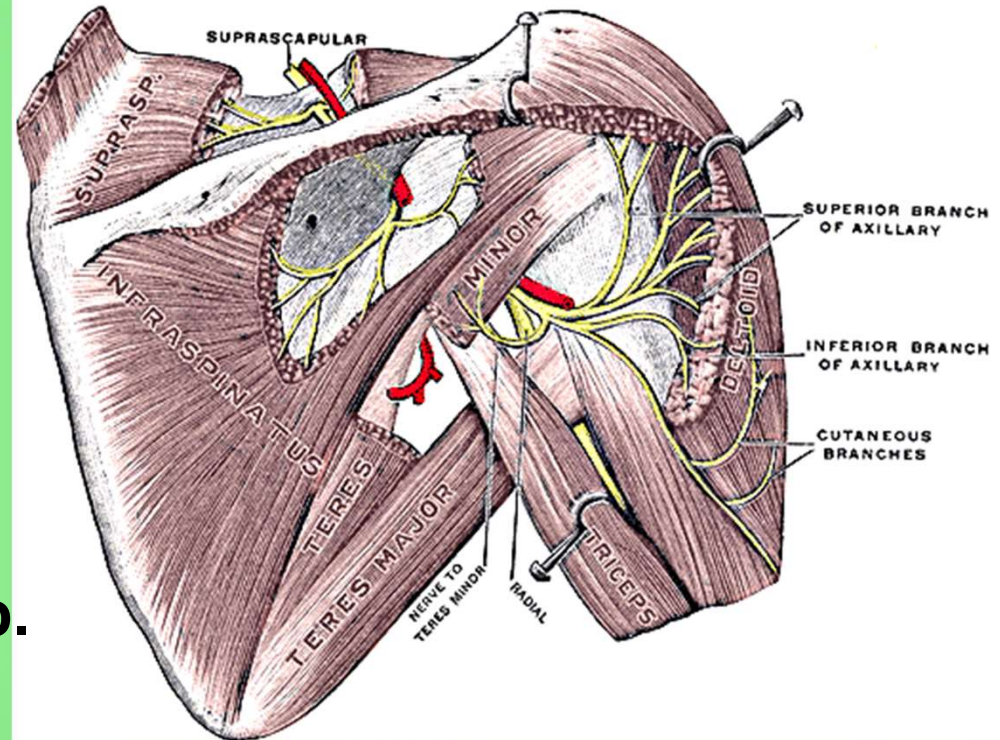
Medial cutaneous nerve of the arm

Fasciculus posterior

n. axillaris

foramen humerotricipitale
(mixed) (C5–6)

- rr. musculares
- rr. articulares
- n. cutaneus brachii lat. sup.

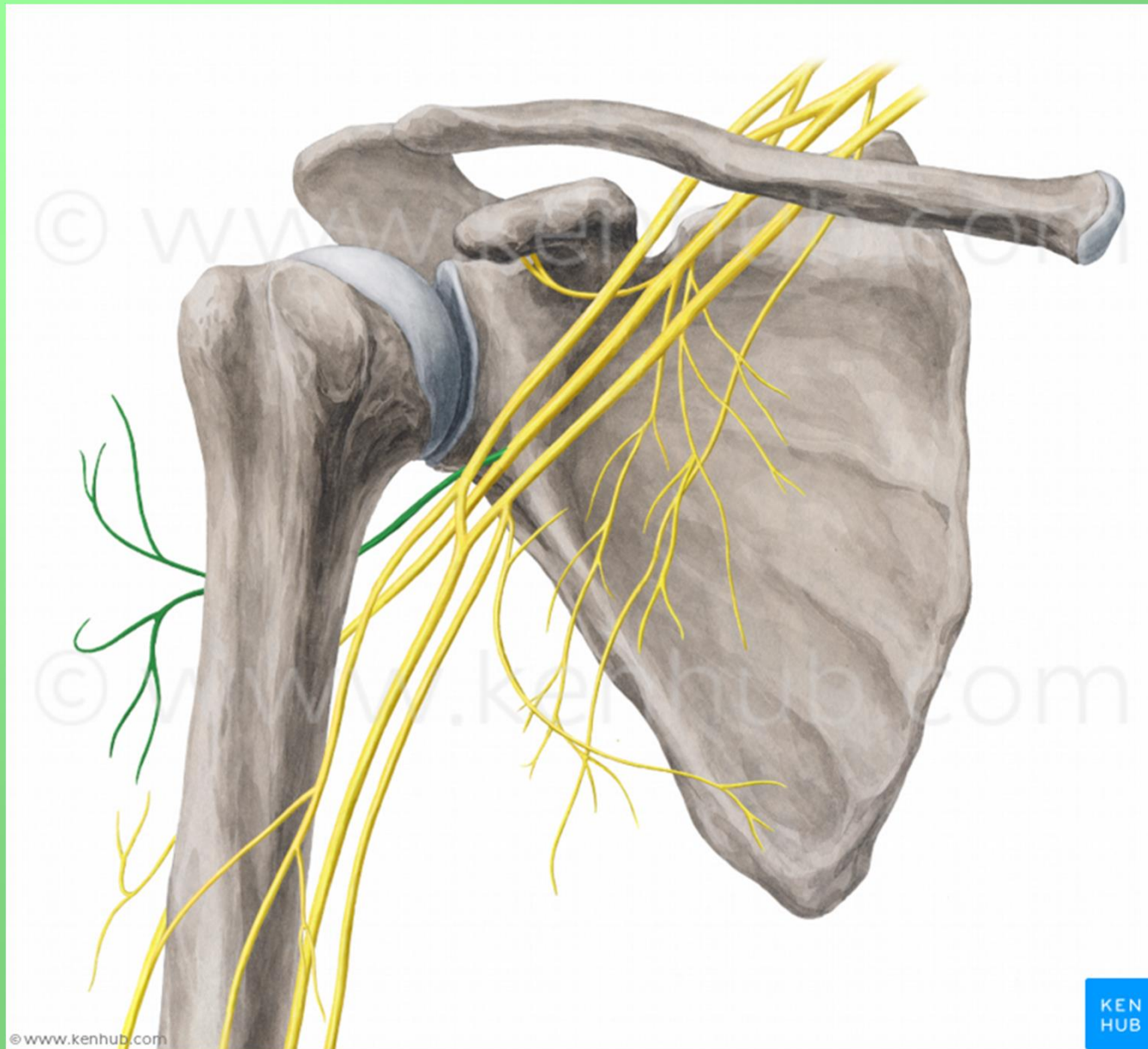


Motor innervation: m. deltoideus, m. teres minor

Sensory innervation: the area around the shoulder

The injury of the nerve (luxation, fracture of collum chirurgicum)

- supination and abduction of the arm till horizontal are missing



n. radialis

(mixed) (C5–Th1)

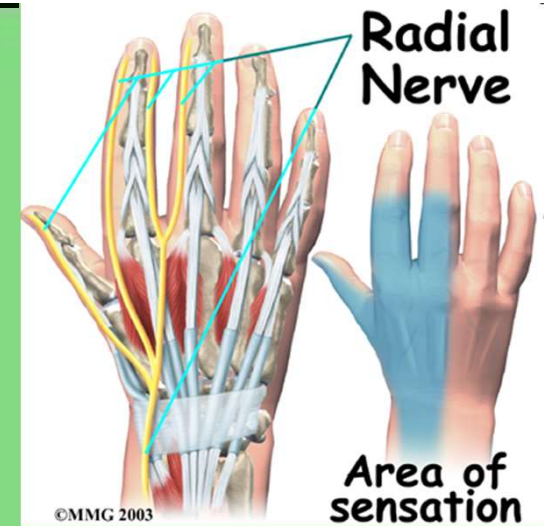
- n. cutaneus brachii posterior
- n. cutaneus brachii lateralis inferior
- rr. musculares
- n. cutaneus antebrachii posterior

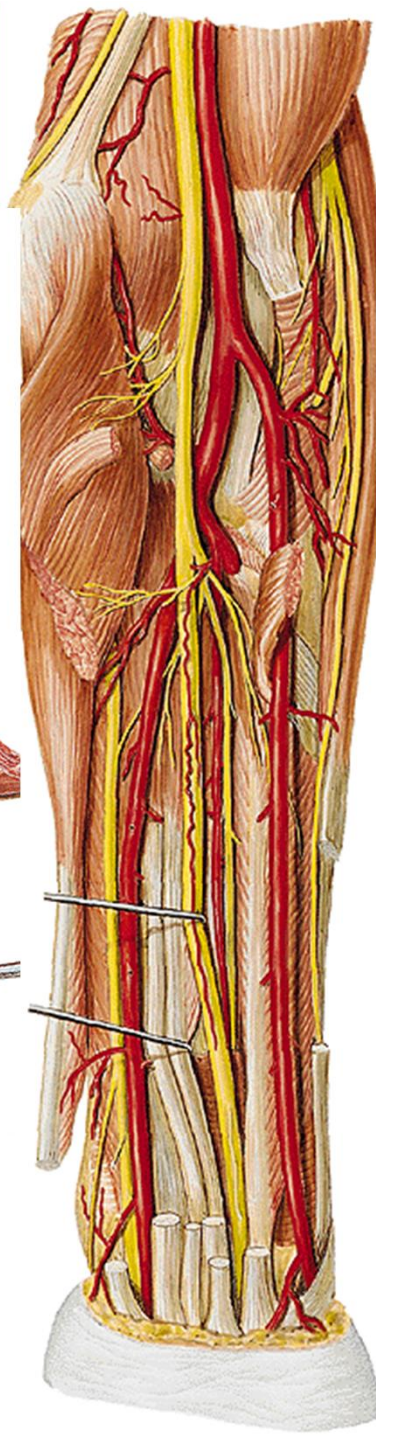
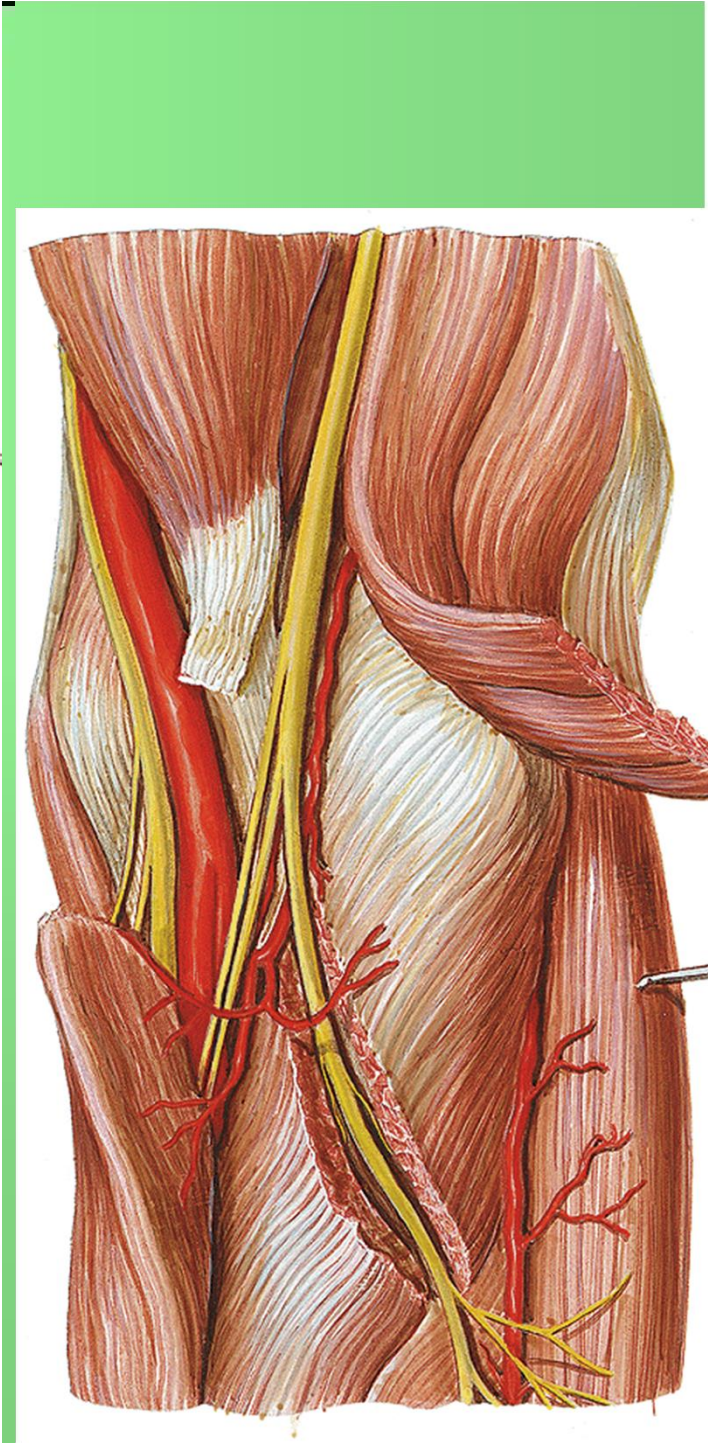
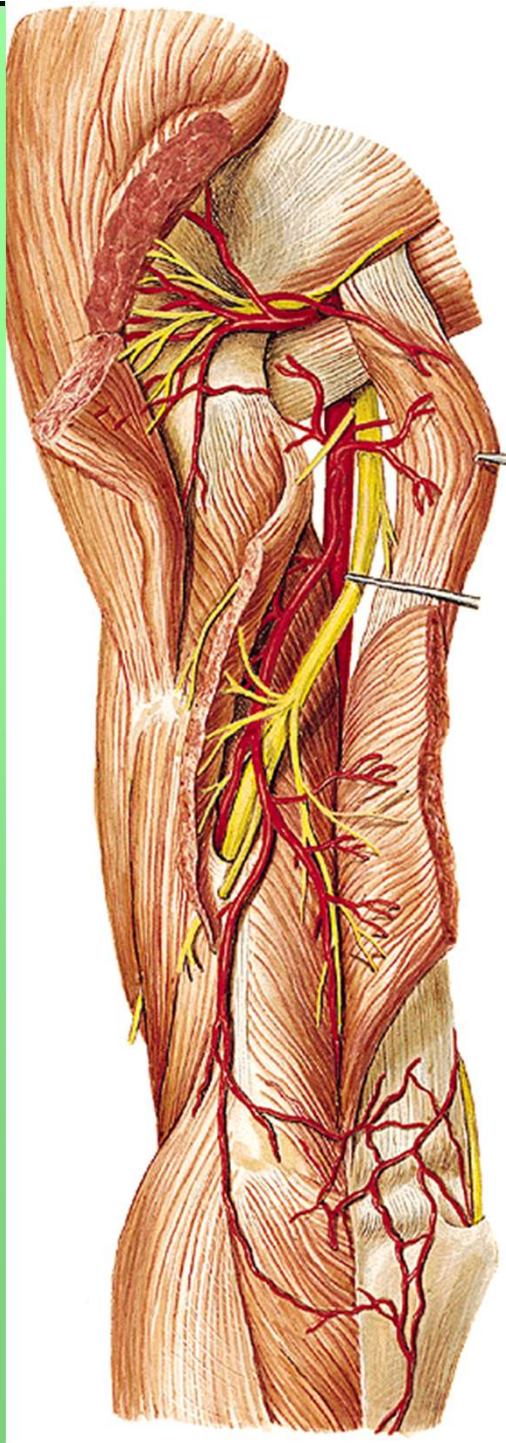
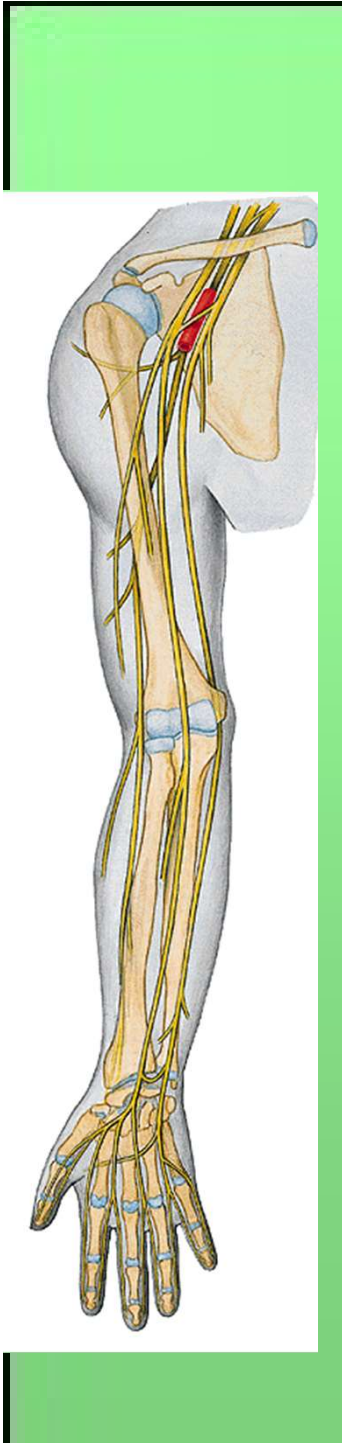
Branching within cubital area(between m. brachialis and m. brachioradialis)

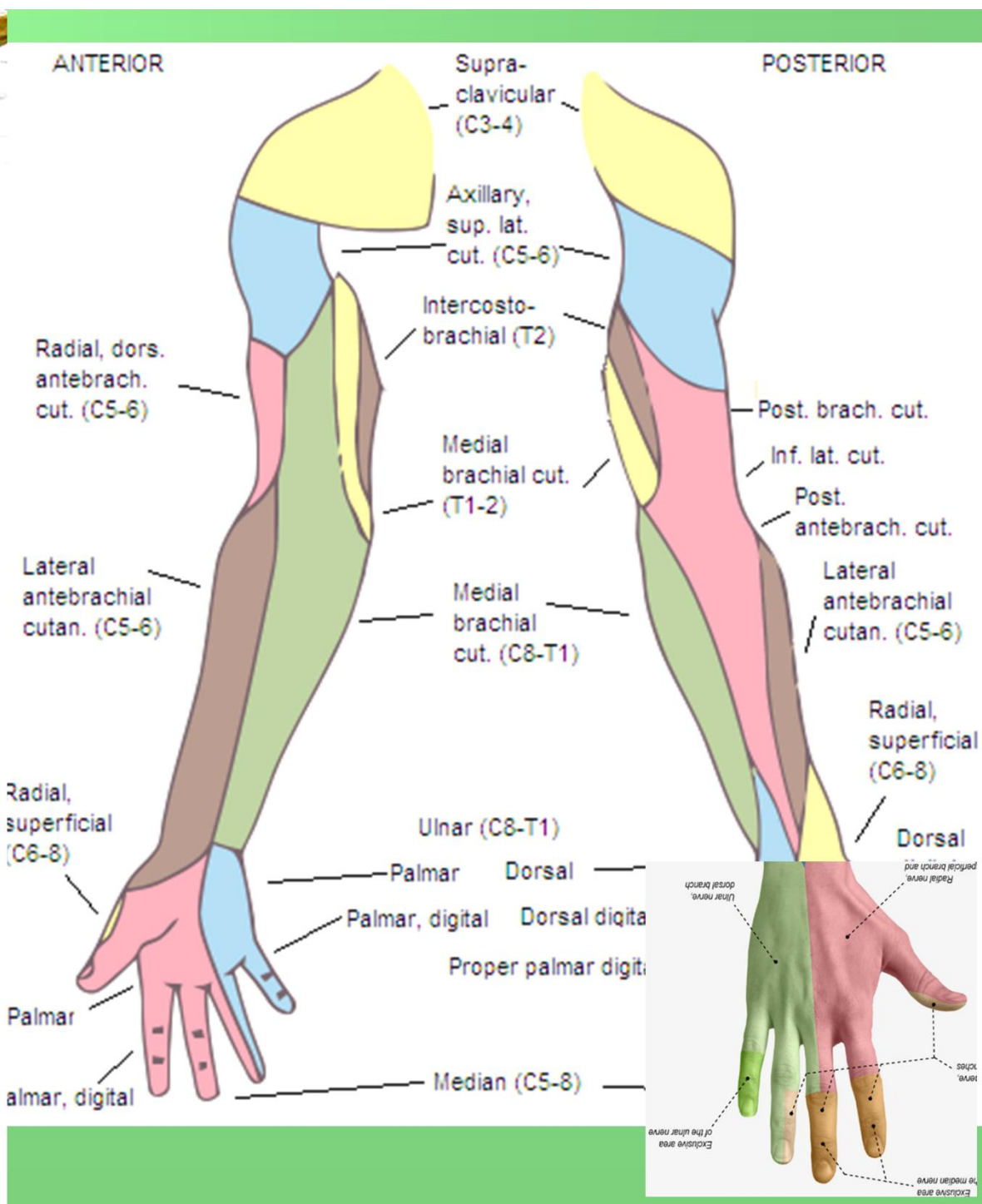
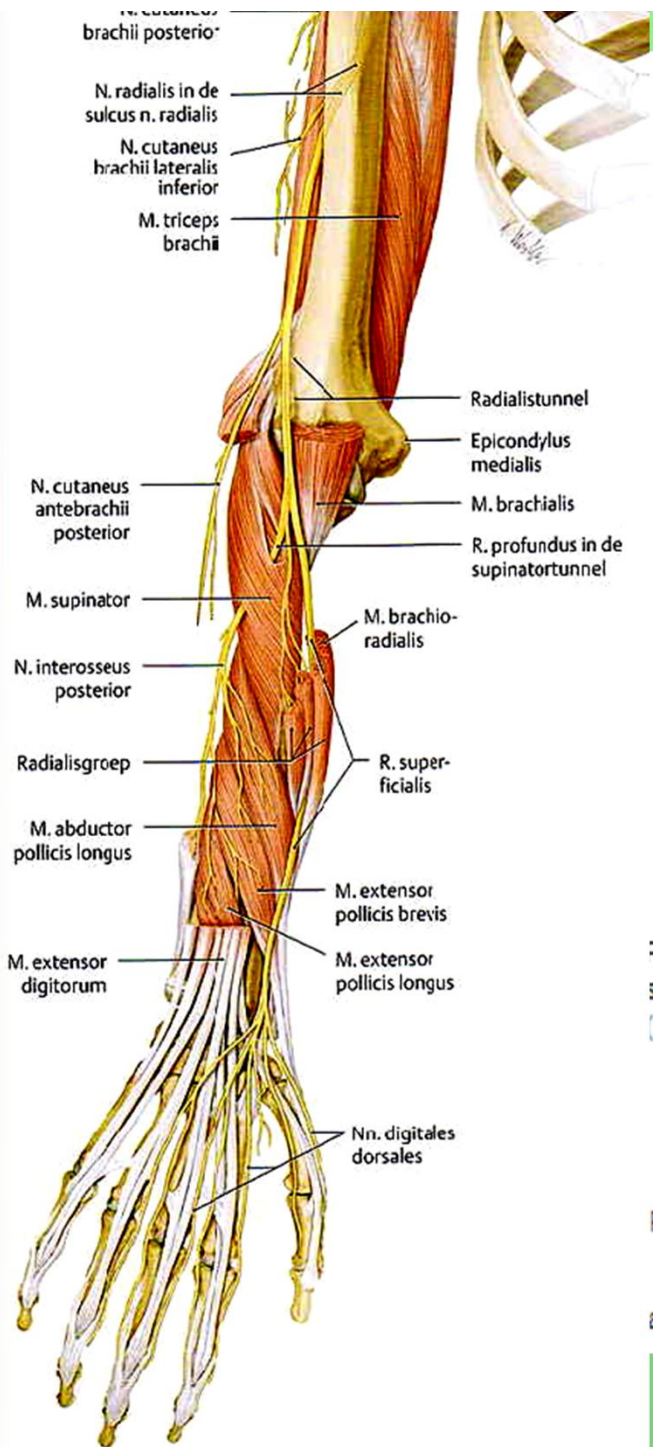
- r. profundus (muscles of the dorsal group of forearm)
 - n. interosseus antebrachii posterior (sensory nerve)
- r. superficialis (below m. brachioradialis onto dorsum manus)
 - nn. digitales dorsales

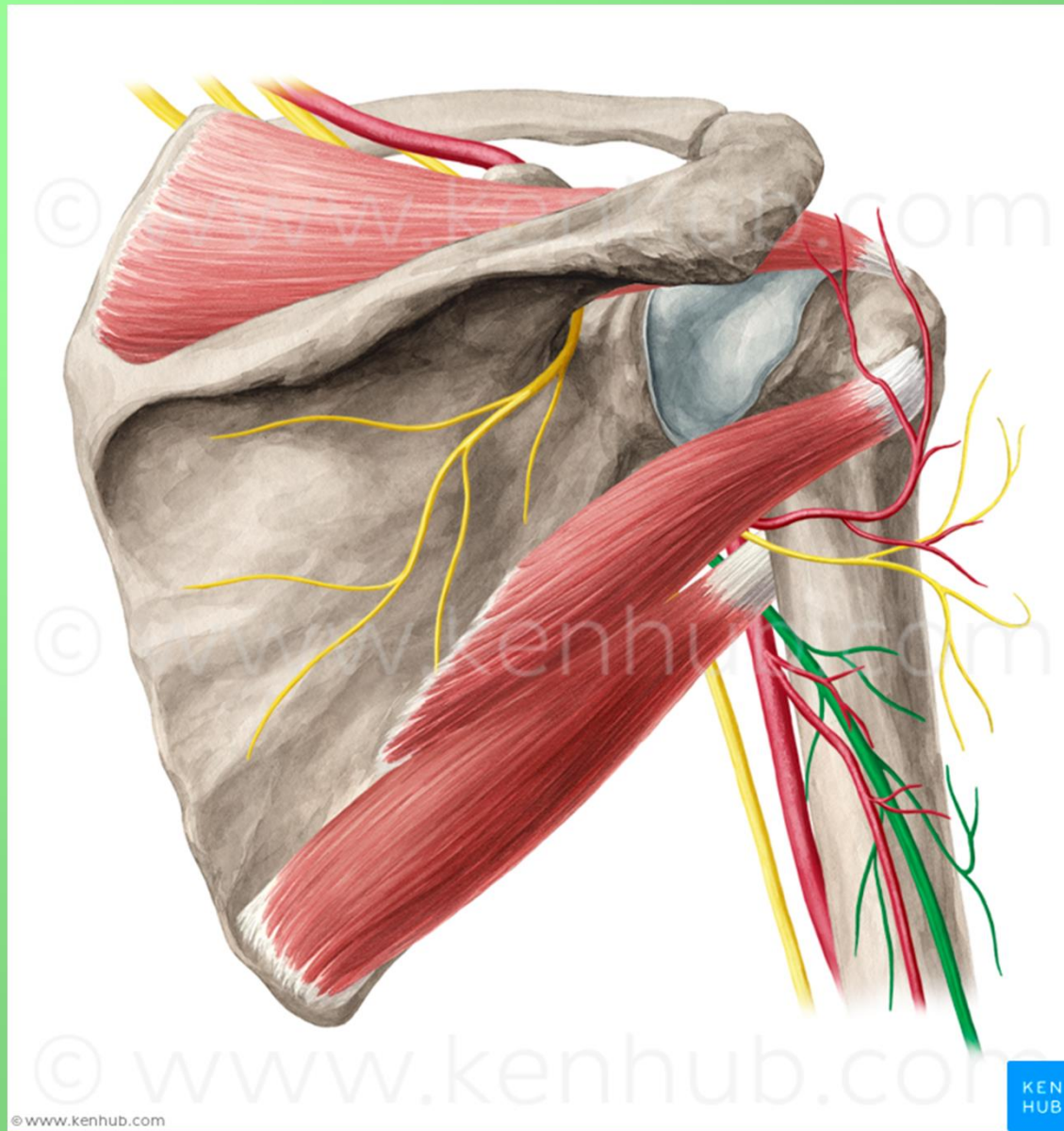
Motor innervation: m. triceps brachii, lateral group of forearm muscles, m. supinator, muscles of the posterior side of forearm

Sensory innervation: dorsal surface of wrist and 1st, 2nd and half of 3rd finger





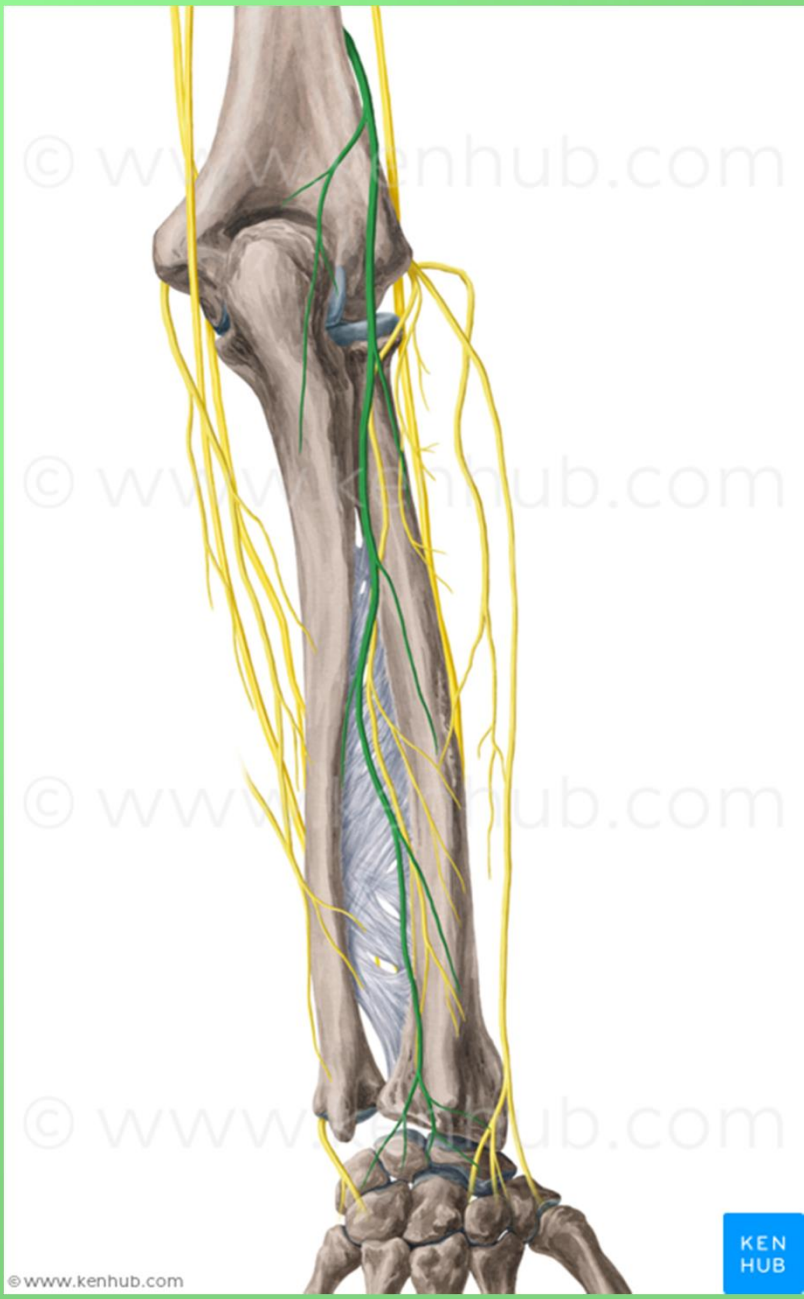






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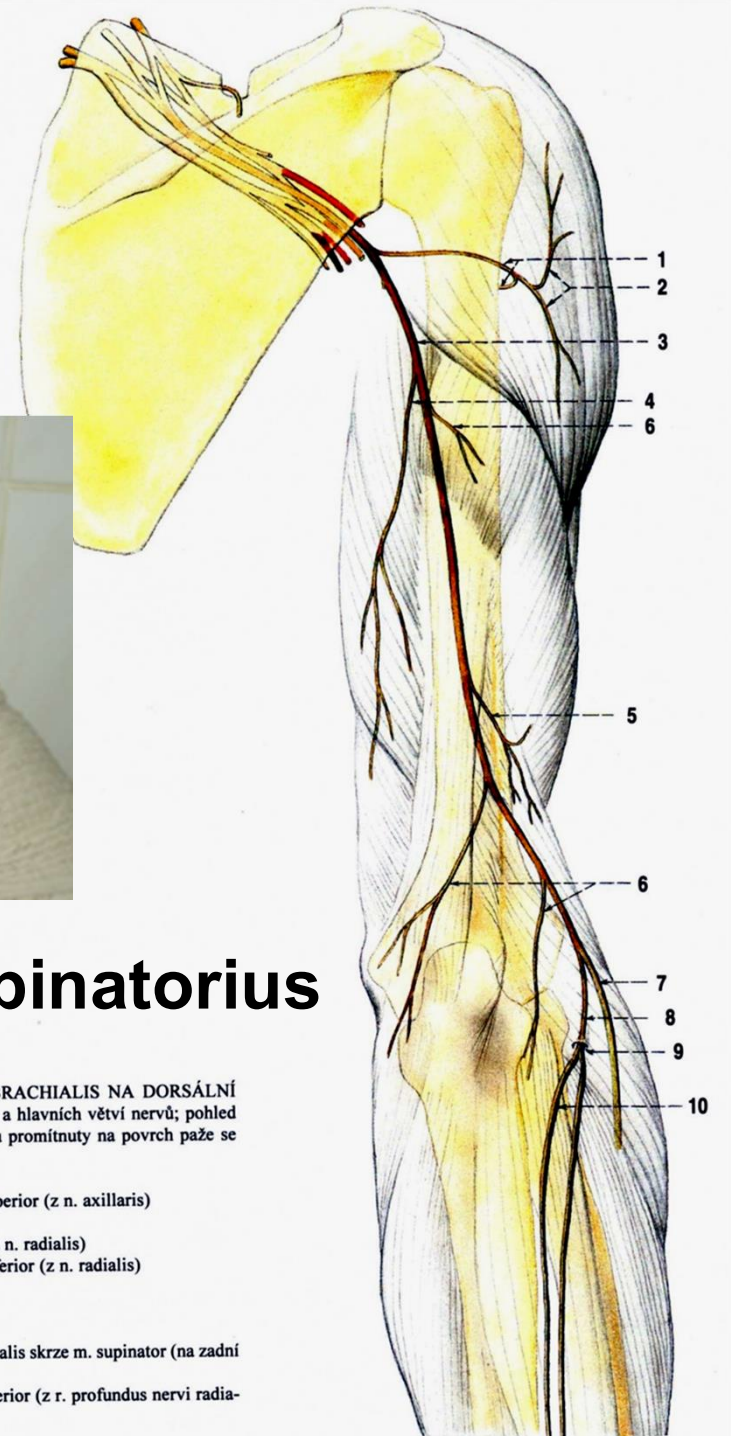


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The injury of the nerve: on the arm (fractures)

- palsy of extensors of hand – it drops in palmar direction



Canalis supinatorius

Obr. 292. NERVY Z PLEXUS BRACHIALIS NA DORSÁLNÍ STRANĚ PAŽE; schéma průběhu a hlavních větví nervů; pohled zezadu na pravou paži; nervy jsou promítnuty na povrch paže se znázorněným skeletem

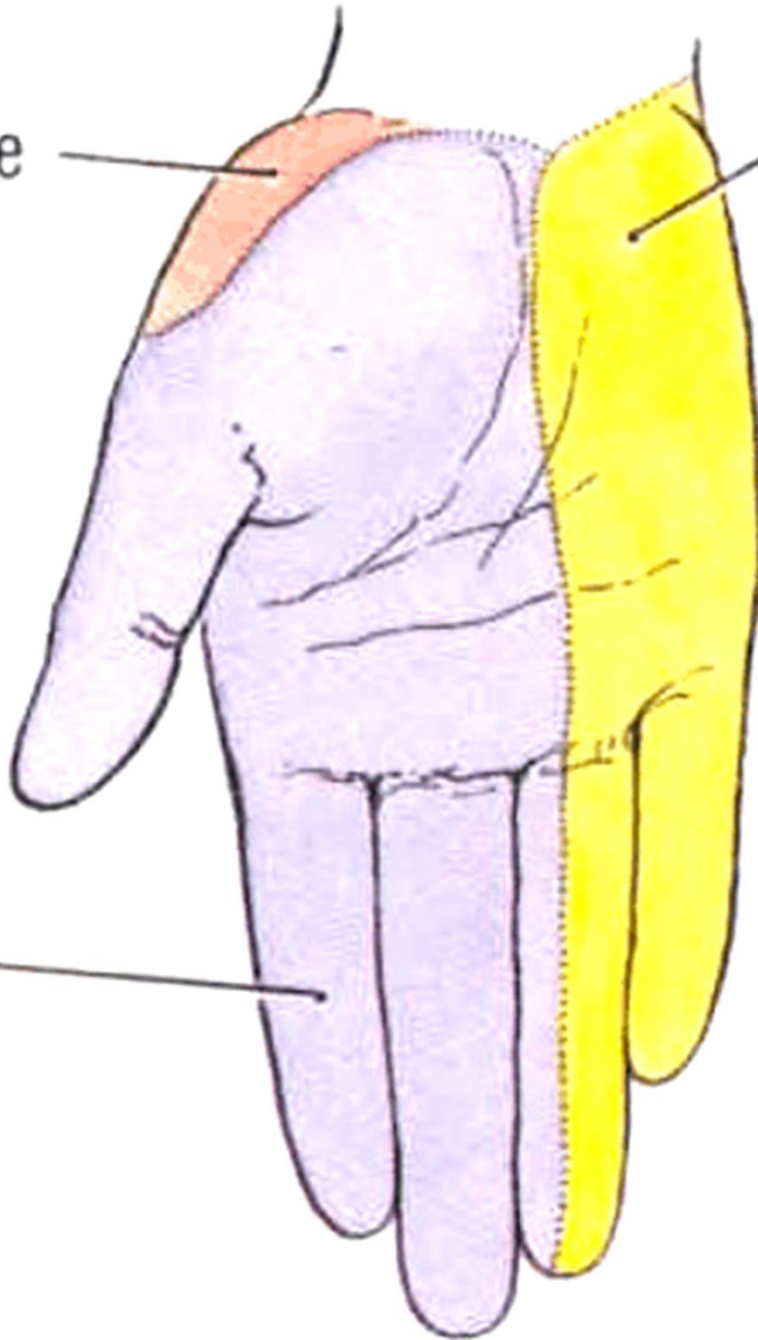
- 1 n. axillaris
- 2 n. cutaneus brachii lateralis superior (z n. axillaris)
- 3 n. radialis
- 4 n. cutaneus brachii posterior (z n. radialis)
- 5 n. cutaneus brachii lateralis inferior (z n. radialis)
- 6 rr. musculares (nervi radialis)
- 7 r. superficialis nervi radialis
- 8 r. profundus nervi radialis
- 9 průchod r. profundus nervi radialis skrze m. supinator (na zadní stranu předloktí)
- 10 n. interosseus antebrachii posterior (z r. profundus nervi radialis)

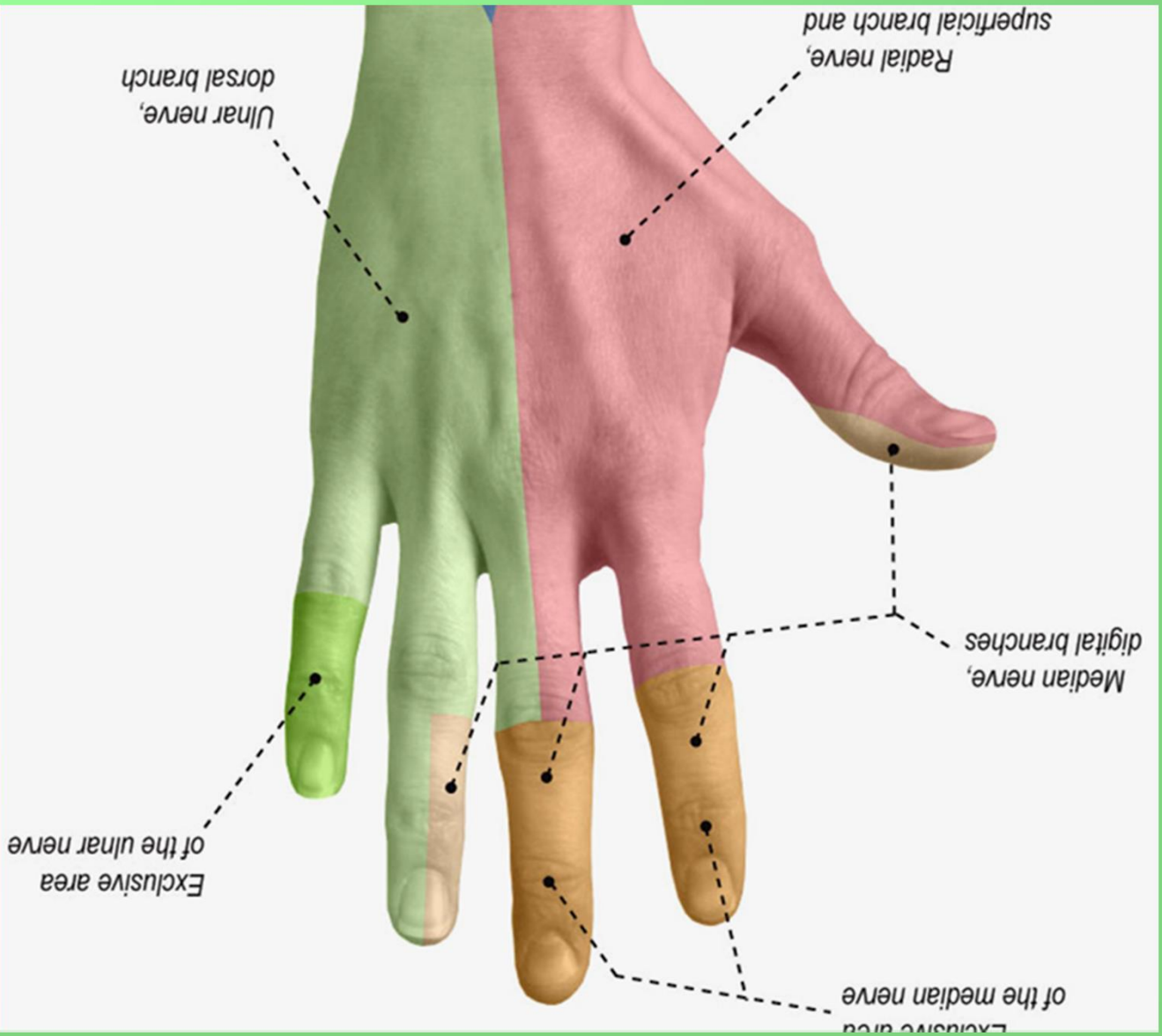
Drop wrist

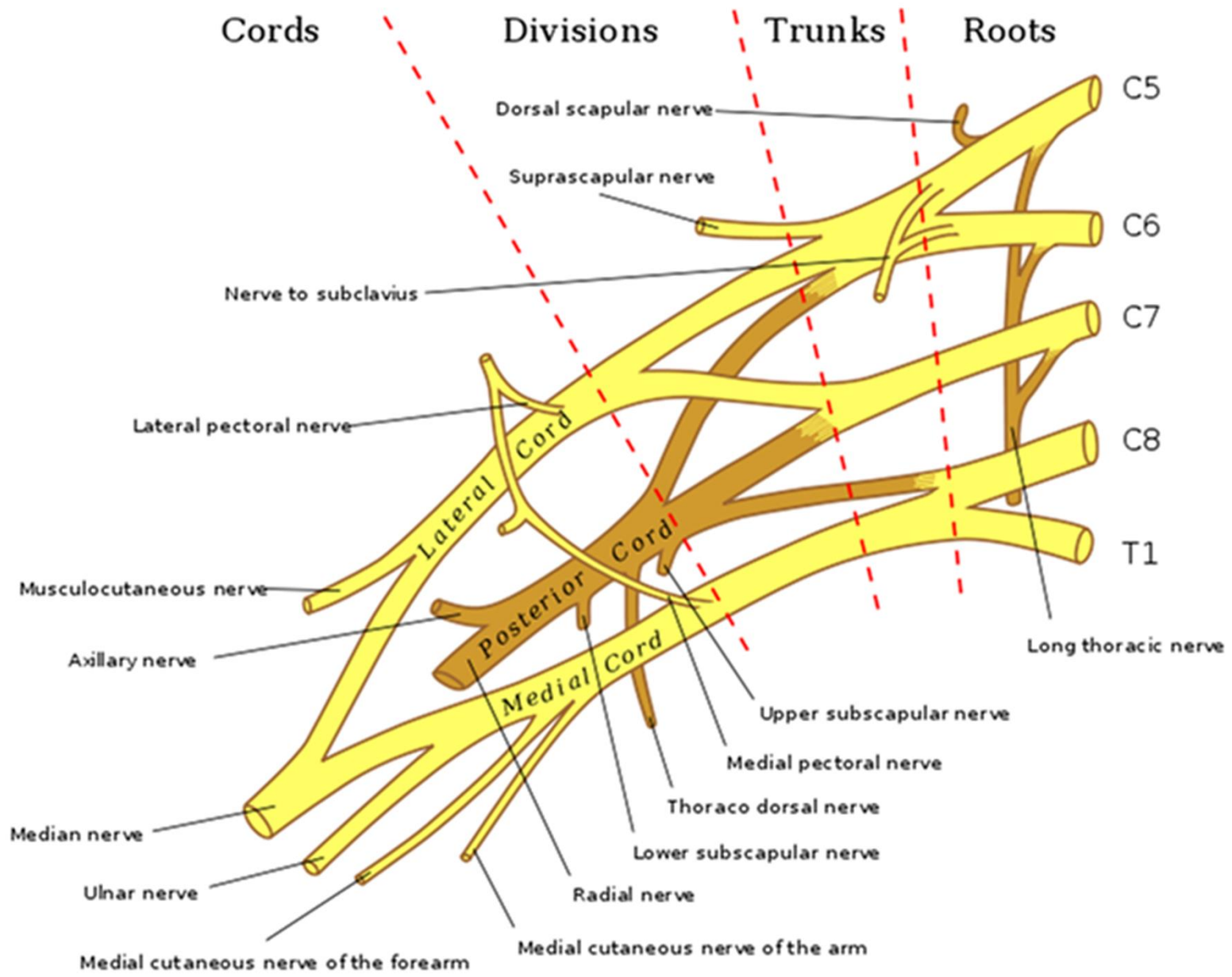
Radial nerve

Ulnar nerve

Median nerve







Cords

Divisions

Trunks

Roots

Dorsal scapular nerve

Suprascapular nerve

Nerve to subclavius

Lateral pectoral nerve

Musculocutaneous nerve

Axillary nerve

Median nerve

Ulnar nerve

Medial cutaneous nerve of the forearm

Posterior Cord

Medial Cord

Lateral Cord

Upper subscapular nerve

Medial pectoral nerve

Thoraco dorsal nerve

Lower subscapular nerve

Radial nerve

Medial cutaneous nerve of the arm

C5

C6

C7

C8

T1

Long thoracic nerve

- **Obrázky:**
- **Atlas der Anatomie des Menschen/Sobotta. Putz,R., und Pabst,R. 20. Auflage. München:Urban & Schwarzenberg, 1993**
- **Netter: Interactive Atlas of Human Anatomy.**
- **Naňka, Elišková: Přehled anatomie. Galén, Praha 2009.**
- **Čihák: Anatomie I, II, III.**
- **Drake et al: Gray´s Anatomy for Students. 2010**

*Thank you for your
attention!*