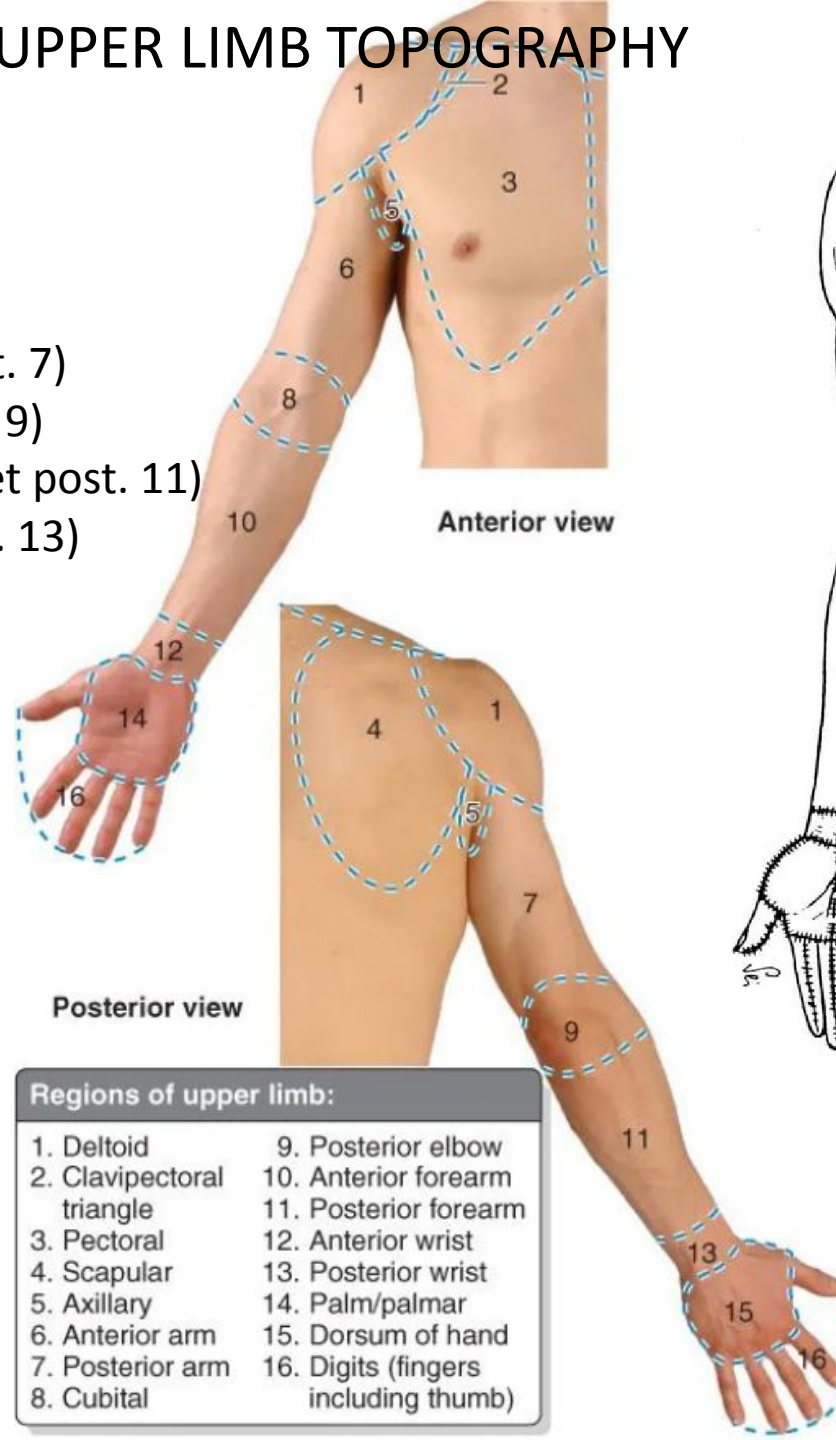


OVERVIEW OF THE UPPER LIMB TOPOGRAPHY

regiones

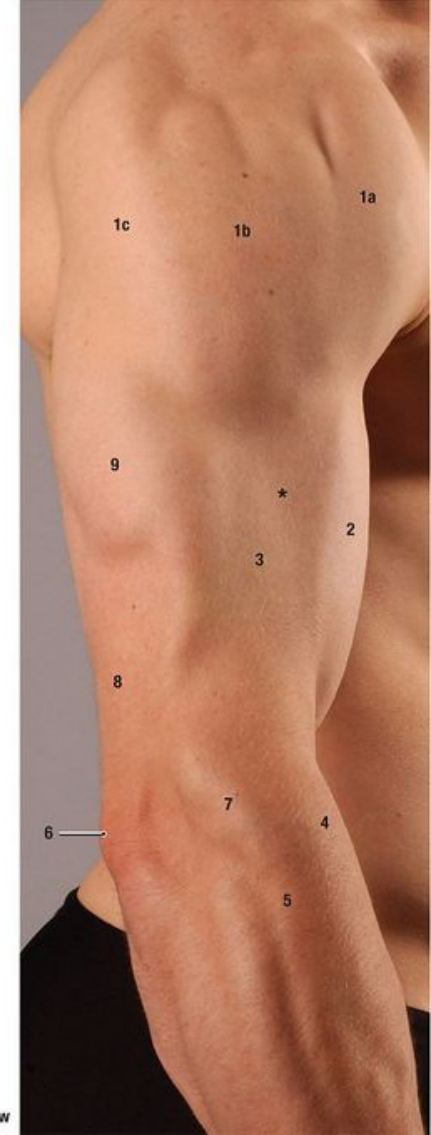
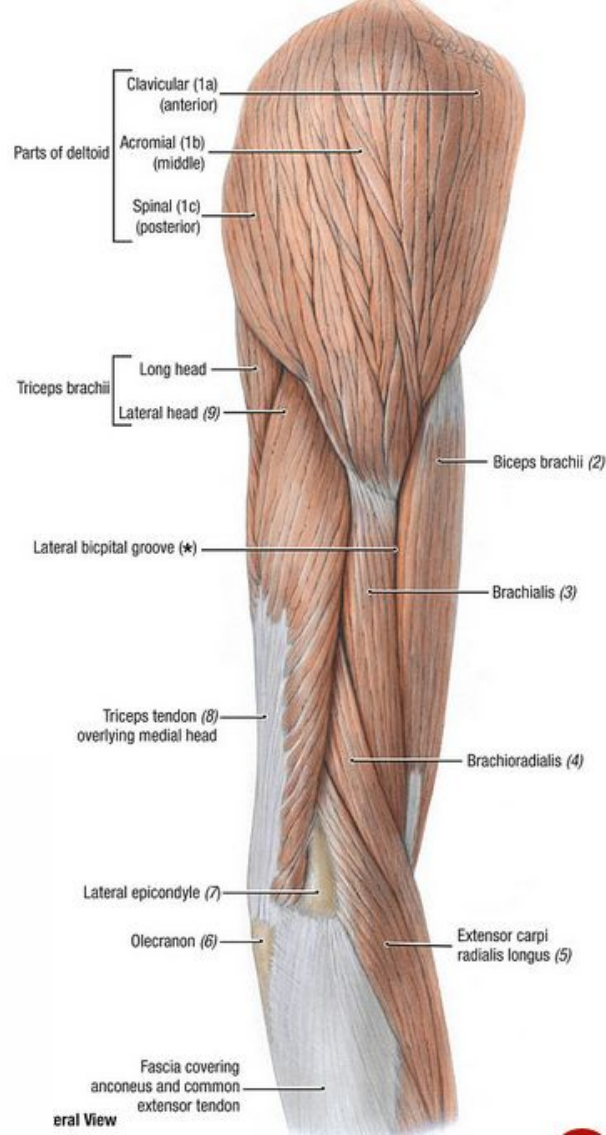
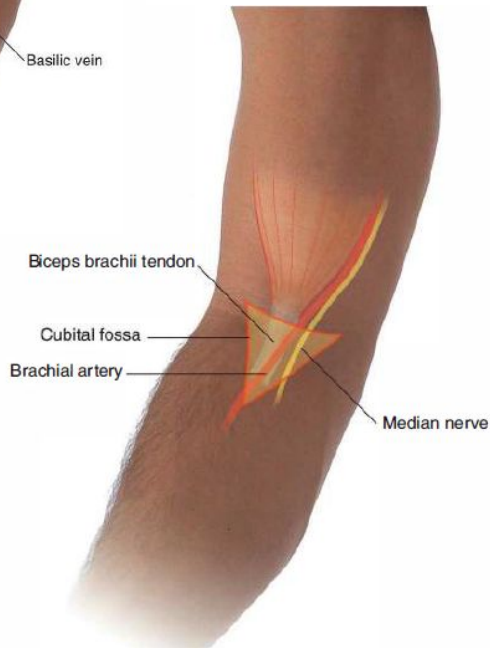
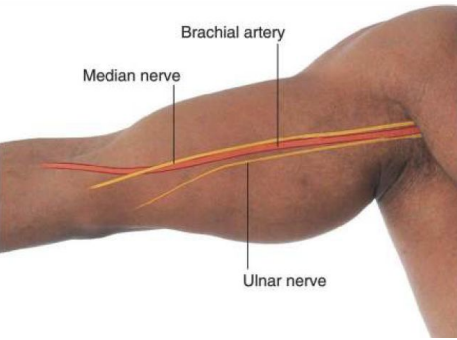
- scapularis 4
- deltoidea 1
- axillaris 5
- brachialis (ant. 6 et post. 7)
- cubitalis (ant. 8 et post. 9)
- antebrachialis (ant. 10 et post. 11)
- carpalis (ant. 12 et post. 13)
- palmaris 14
- dorsi manus 15

- trigonum deltoideopectorale
- sulcus deltopectoralis
- incisura scapulae
- foramen omotricipitale
- foramen humerotricipitale
- canalis carpi
- canalis ulnaris (of Guyon)
- foveola radialis

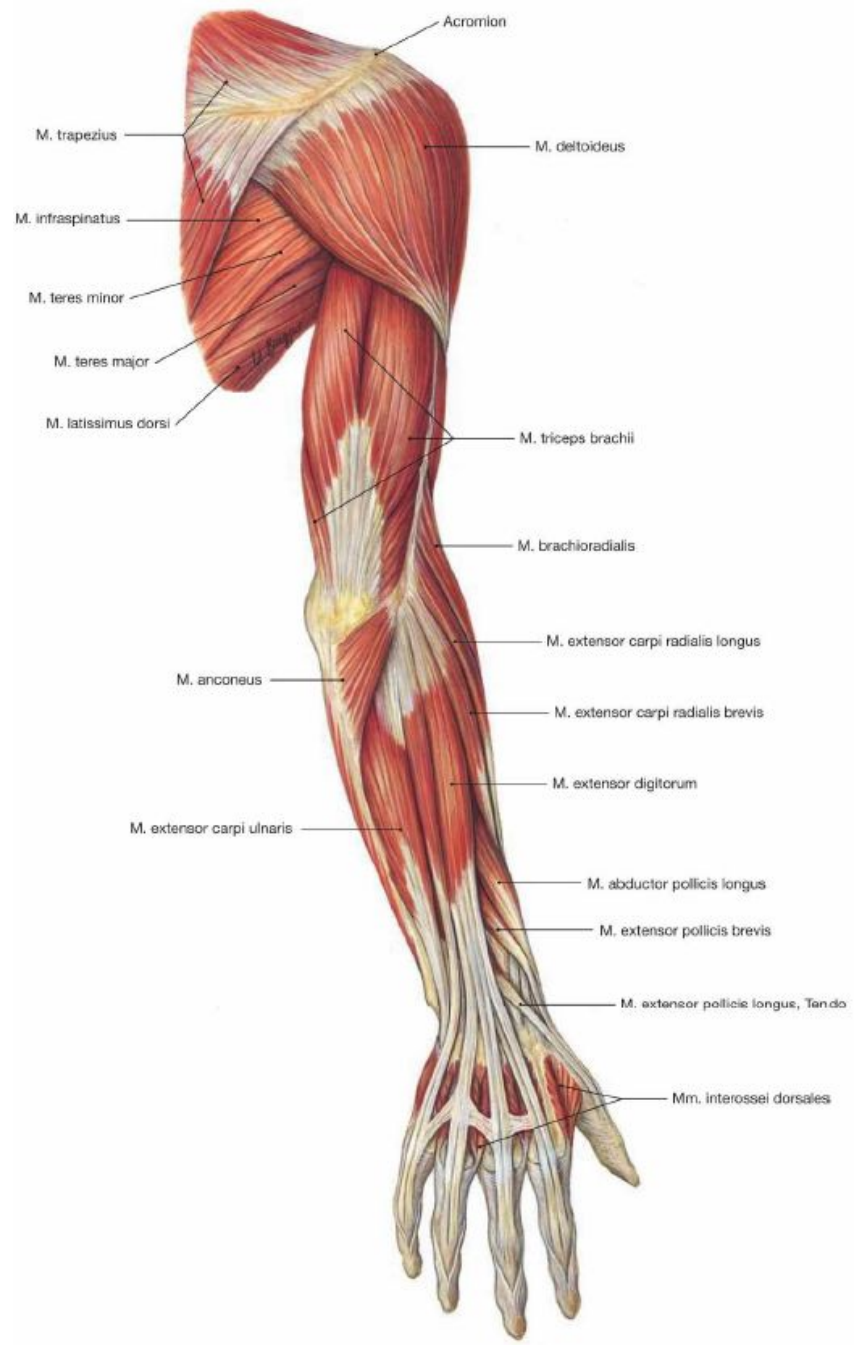
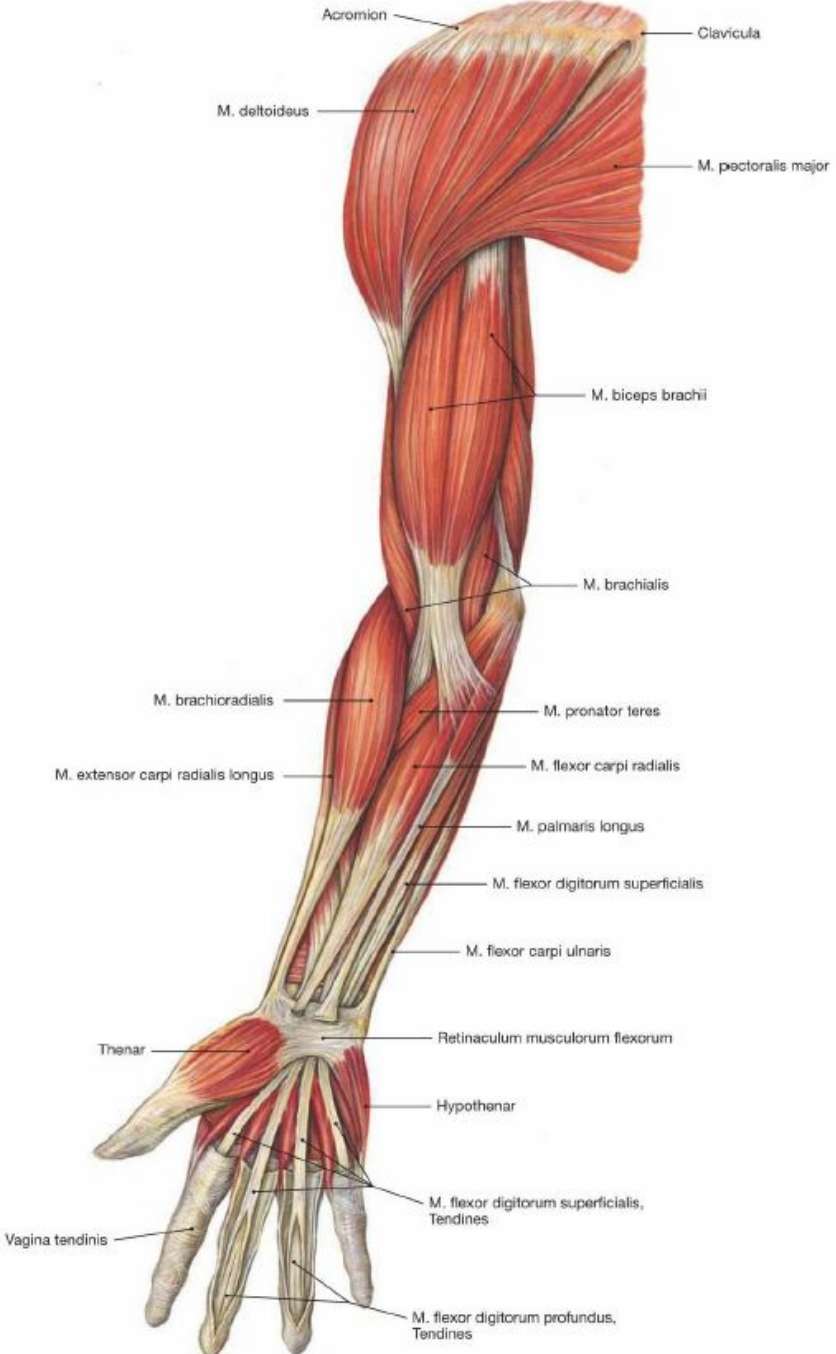


Regions of upper limb:	
1. Deltoid	9. Posterior elbow
2. Clavipectoral triangle	10. Anterior forearm
3. Pectoral	11. Posterior forearm
4. Scapular	12. Anterior wrist
5. Axillary	13. Posterior wrist
6. Anterior arm	14. Palm/palmar
7. Posterior arm	15. Dorsum of hand
8. Cubital	16. Digits (fingers including thumb)

SURFACE ANATOMY

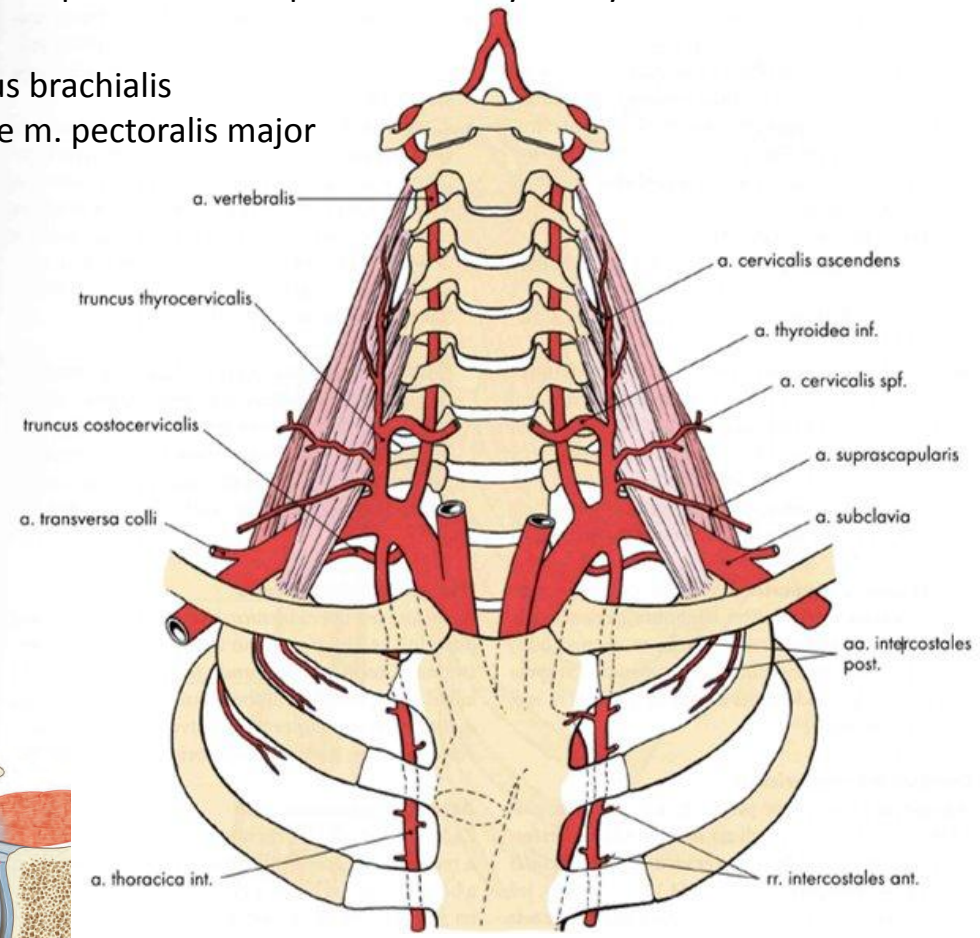
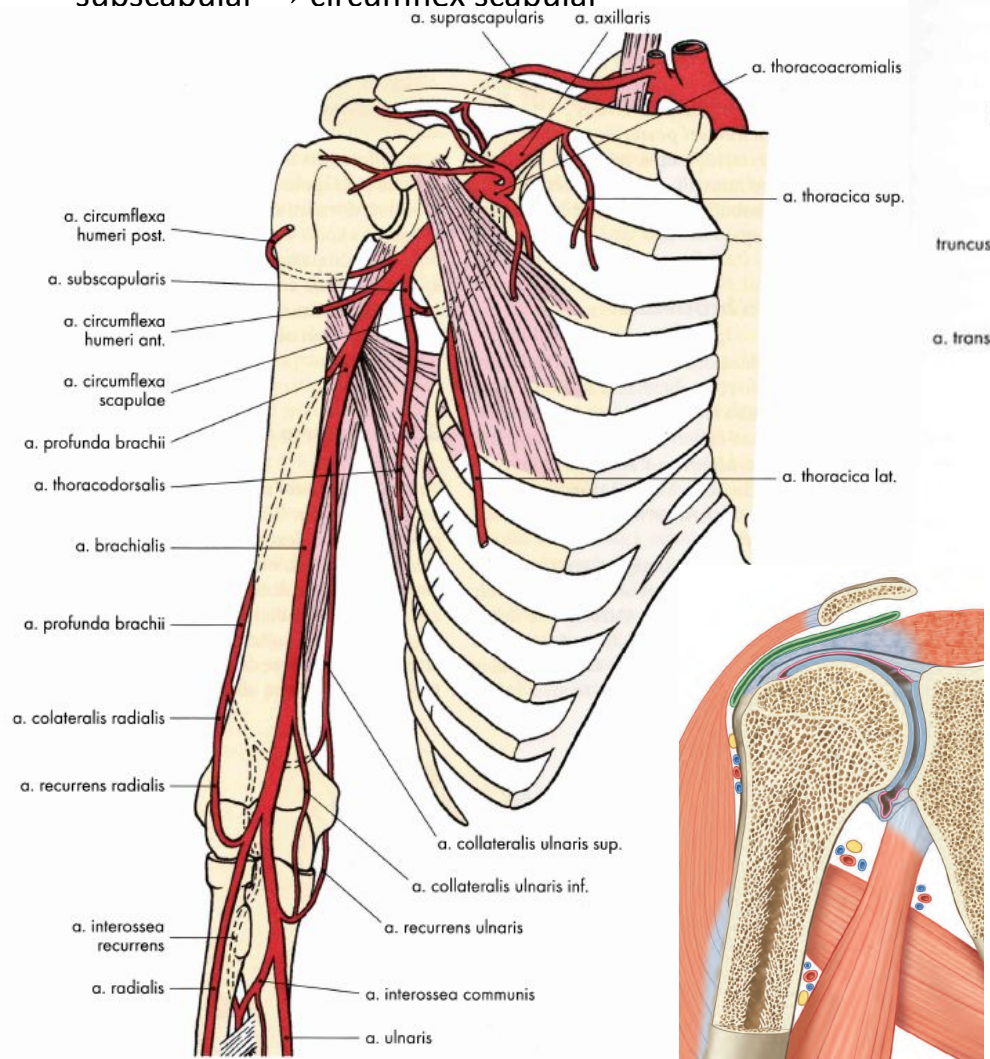


OVERVIEW OF THE UPPER LIMB MUSCLES



Overview of the upper limb arteries

- a. subclavia
 - suprascapular branch anastomosing with the circumflex scapular of subscapular of axillary artery
- a. axillaris
 - under the clavicle behind the m. pectoralis minor; plexus brachialis
 - along the collum chirurgicum humeri/caudal edge of the m. pectoralis major
 - subscapular → circumflex scapular



Overview of the upper limb arteries

- **a. brachialis**

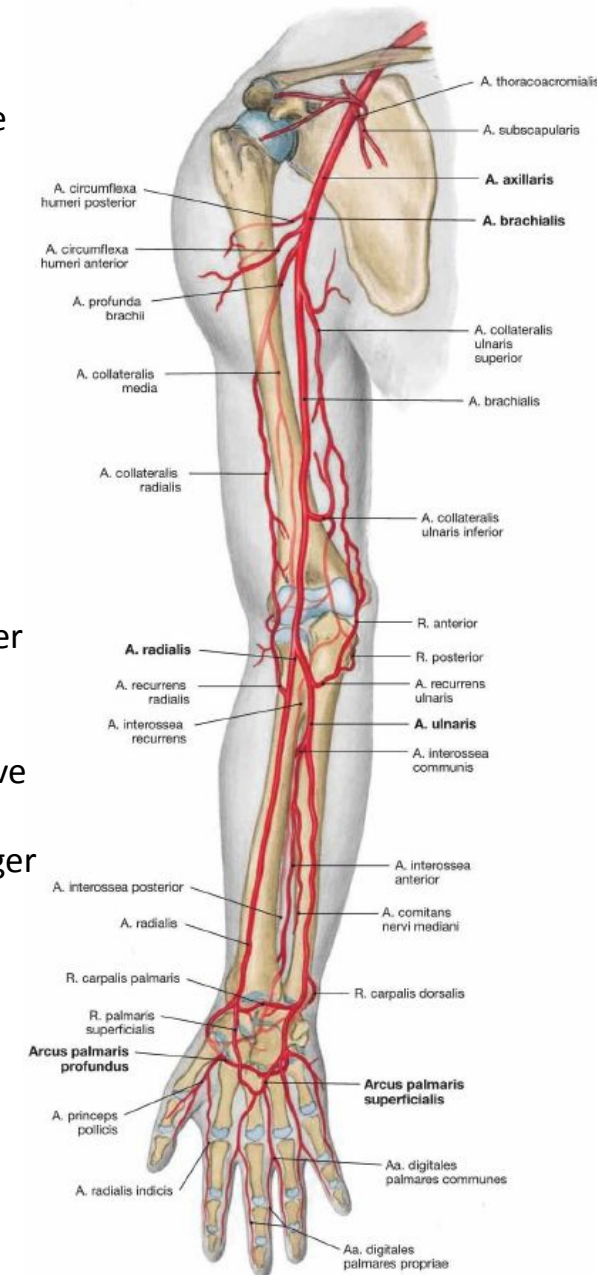
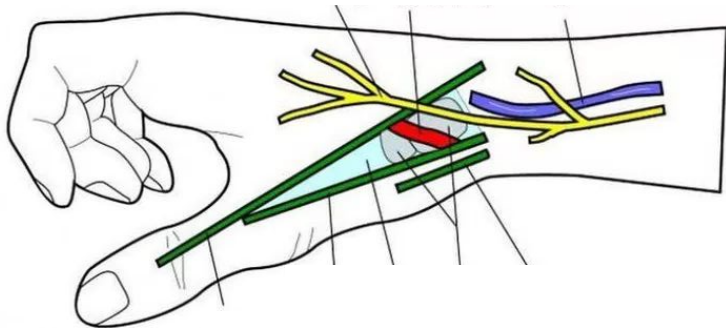
- under the sulcus bicipitalis medialis in the septum intermusculare brachii mediale into the fossa cubiti
- under the lacertus fibrosus, it divides into the a. radialis and a. ulnaris
- a. profunda brachii – with n. radialis, ends as a. collateralis radialis

- **a. radialis**

- after m. brachioradialis under m. pronator teres and m. flexor carpi radialis
- under m. abductor pollicis longus into foveola radialis
- under m. extensor pollicis longus to the back of the hand
- through foveola radialis first metacarpal space to the palm under flexor tendons, arcus palmaris profundus (between mm. interossei and flexor tendons)

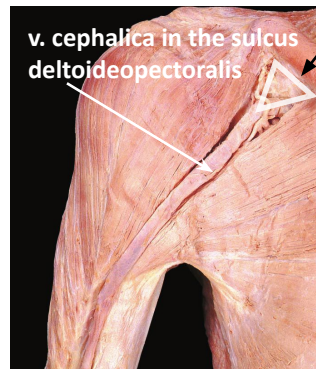
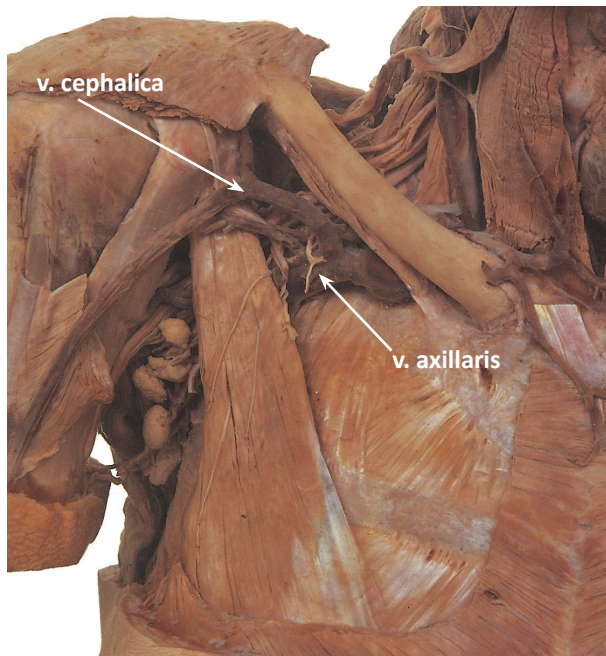
- **a. ulnaris**

- under the aponeurosis of the m. bicipitis brachii, along the m. brachialis and under the caput commune ulnare
- with the n. ulnaris under the m. flexor carpi ulnaris
- into the palm through the retinaculum mm. flexorum through Guyon's canal above the flexor tendons
- radially from the pisiform bone, it divides into a weaker deep branch and a stronger superficial branch
- r. palmaris superficialis → connection with a weak branch of a. radialis → arcus palmaris superficialis (between the flexor tendons and the palmar aponeurosis)



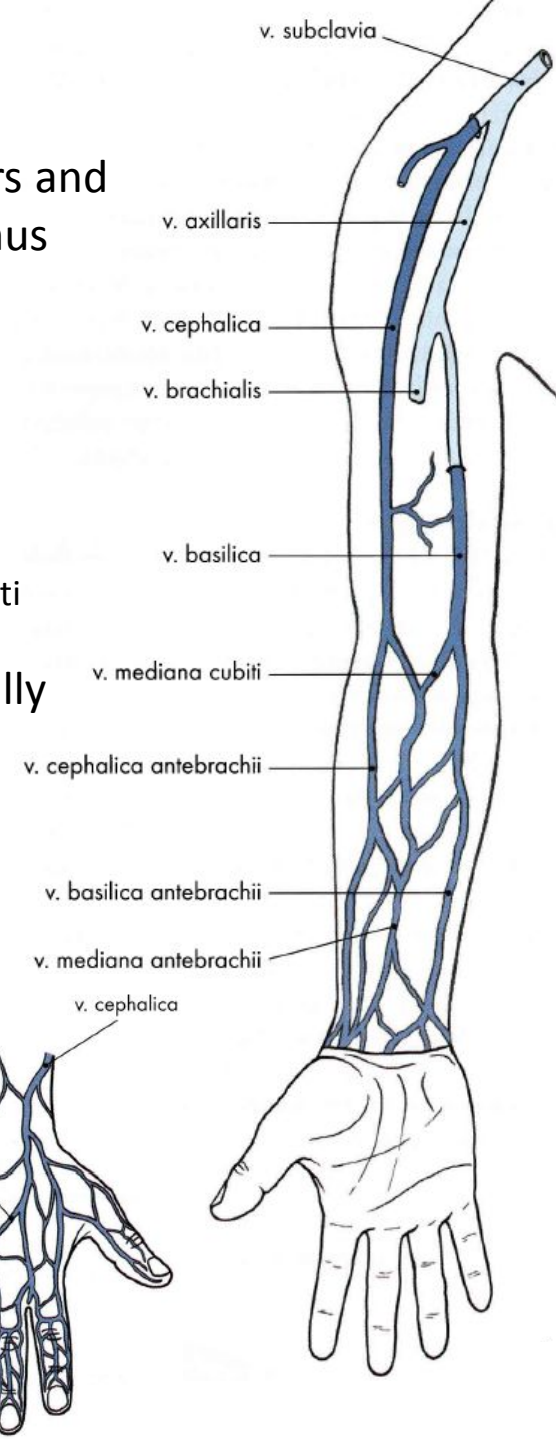
OVERVIEW OF THE VEINS OF THE UPPER LIMB

- deep and superficial venous system (with valves) connected by trans fascial junctions
- superficial veins originate from a network of fine veins in the fingers and pass to the dorsum of the hand into the rete venosum dorsale manus
- v. cephalica
 - radially, runs in the sulcus bicipitalis lateralis on the arm
- v. basilica
 - ulnarly, on the arm runs in the sulcus bicipitalis medialis
 - in the hiatus basilicus pierces the fascia and flows into the v. brachialis
- v. mediana cubiti
 - connection (variable shape: M, N, V) v. cephalica and v. basilica in the fossa cubiti
- deep veins of the same name accompany the arteries and are usually paired

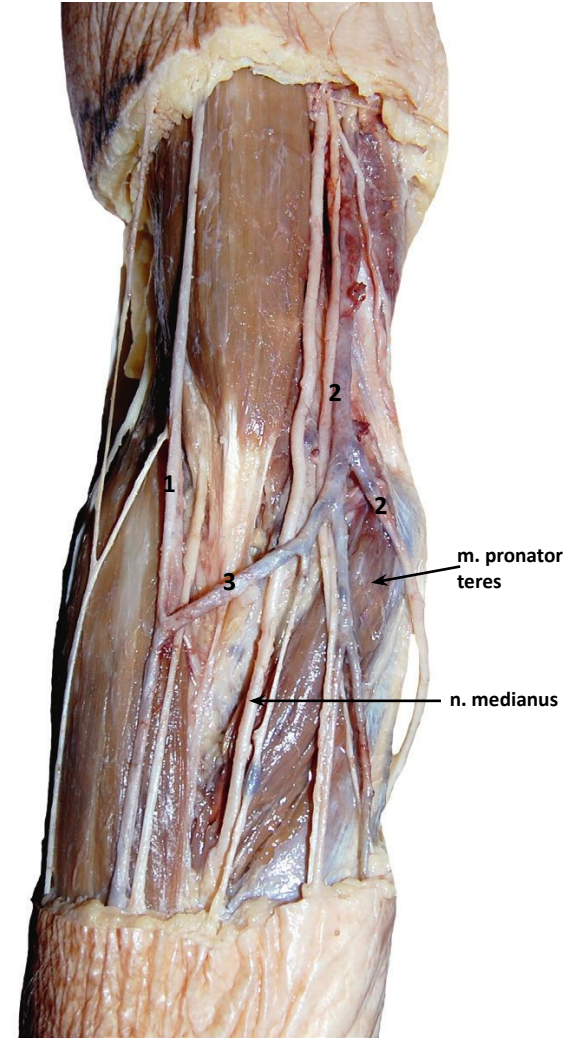
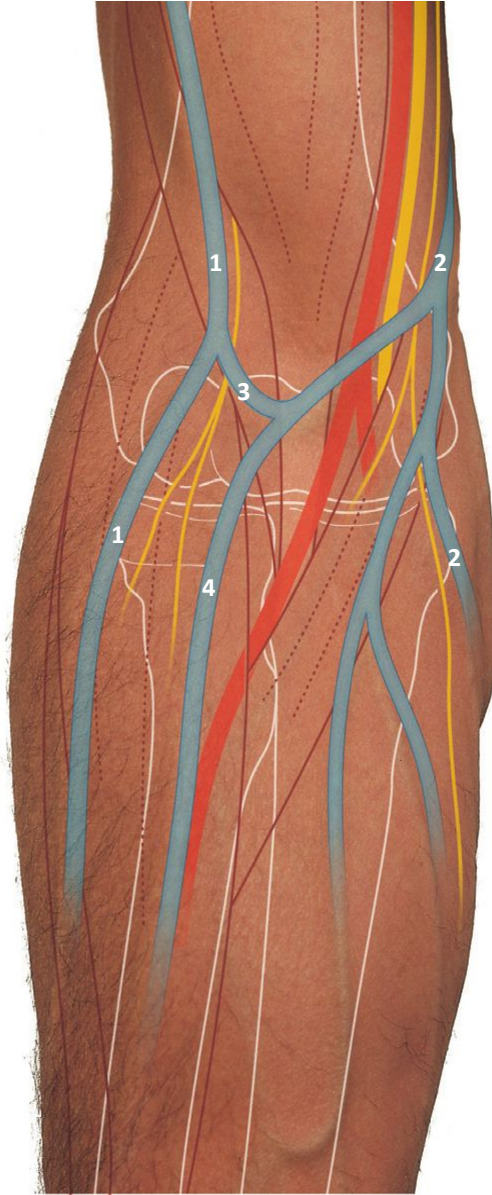


trigonum clavipectorale

v. basilica
rete venosum dorsale manus

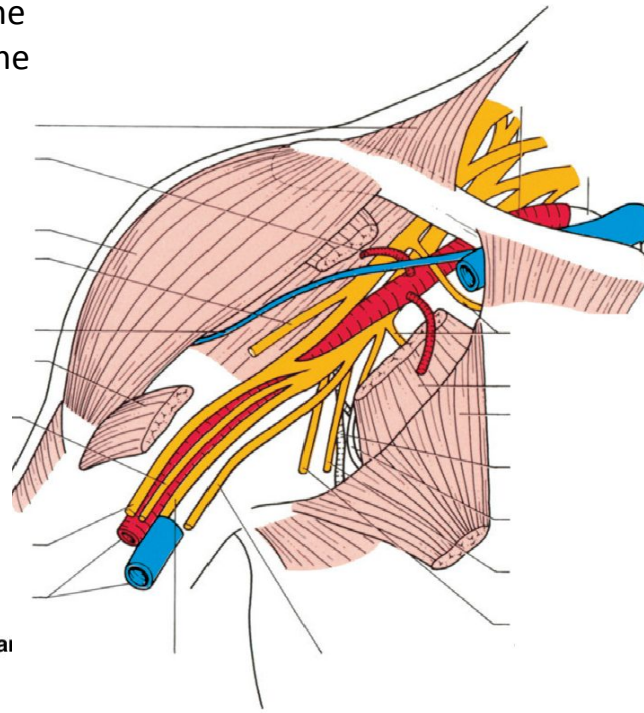
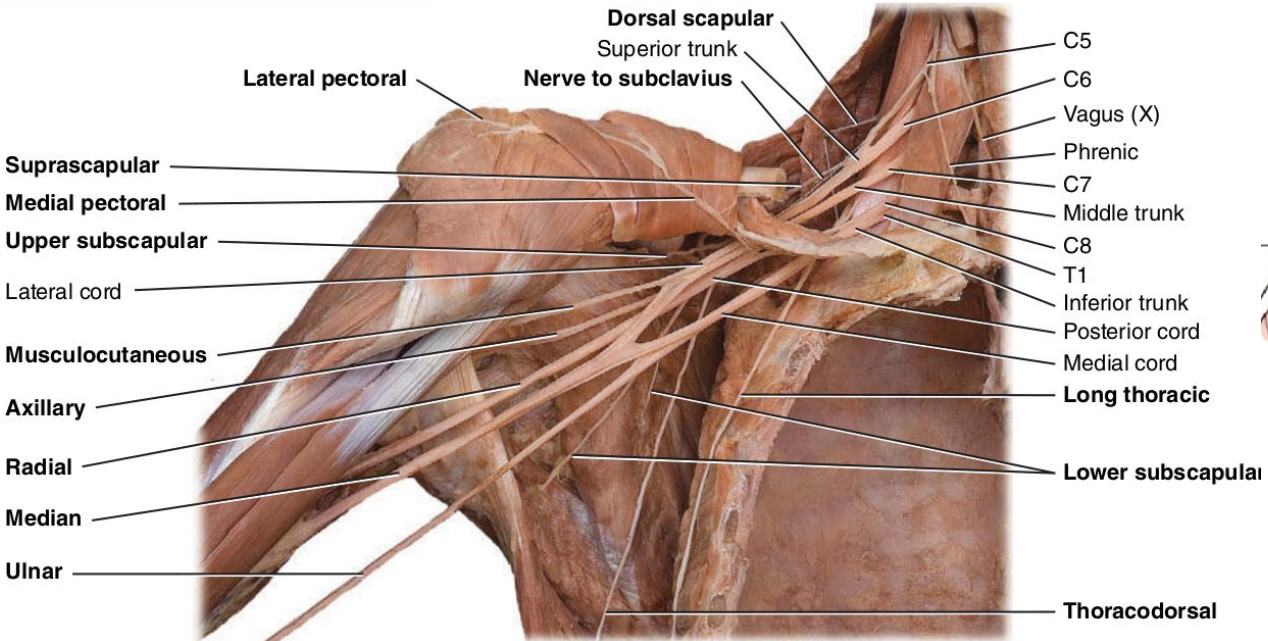
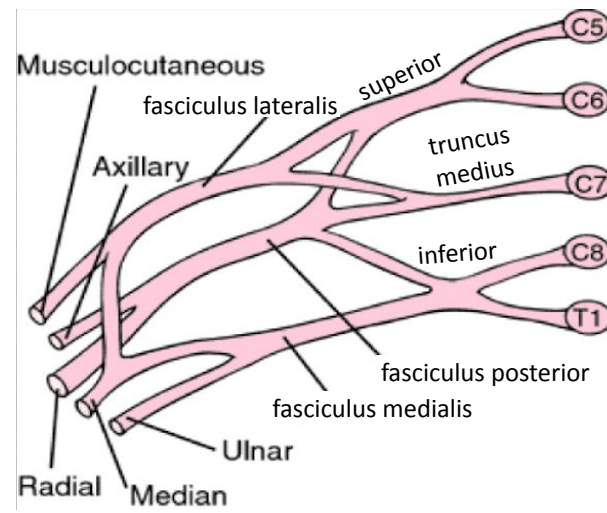


OVERVIEW OF THE VEINS OF THE UPPER LIMB



MOTOR INNERVATION OF THE UPPER LIMB MUSCLES

- plexus brachialis (C5–Th1)
 - from the cervical spine to the axilla
 - the clavicle divides it into the supraclavicular and infraclavicular parts
1. the ventral roots of the spinal nerves C5 to Th1 join to form three primary bundles (trunks)
 2. the trunks pass through the fissura scalenorum together with the subclavian artery and under the clavicle (the trunks pass above the subclavian artery sulcus on the 1st rib)
 3. each trunk divides into anterior and posterior branches, which join to form secondary bundles (fasciculi)
 4. The subclavian artery is renamed the axillary artery laterally from the first rib
 5. The fasciculi are located under the pectoralis minor muscle and surround the axillary artery – depending on their position relative to the axillary artery, the fasciculi are divided into lateral, medial, and posterior
 6. The fasciculi supply nerves to the upper limb

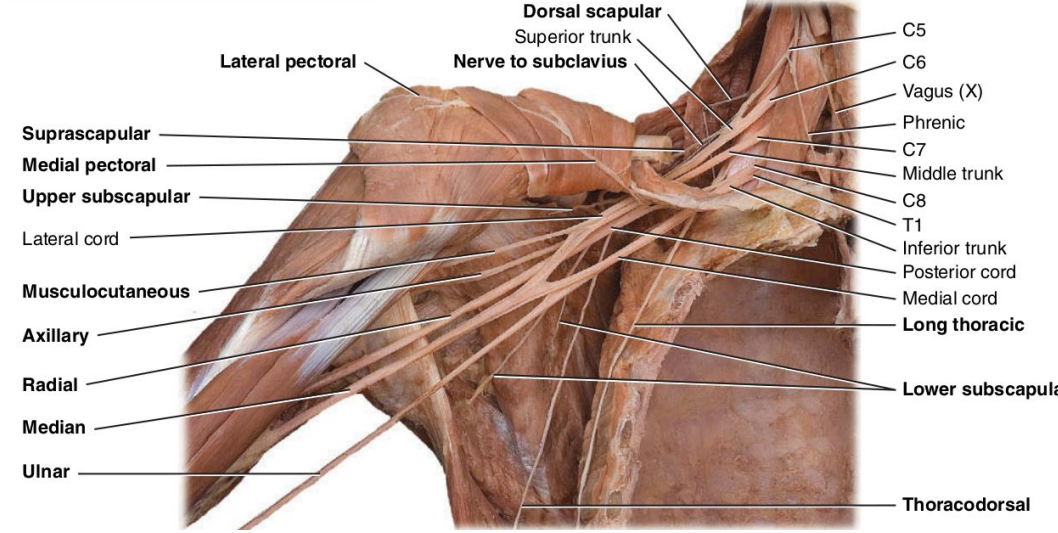
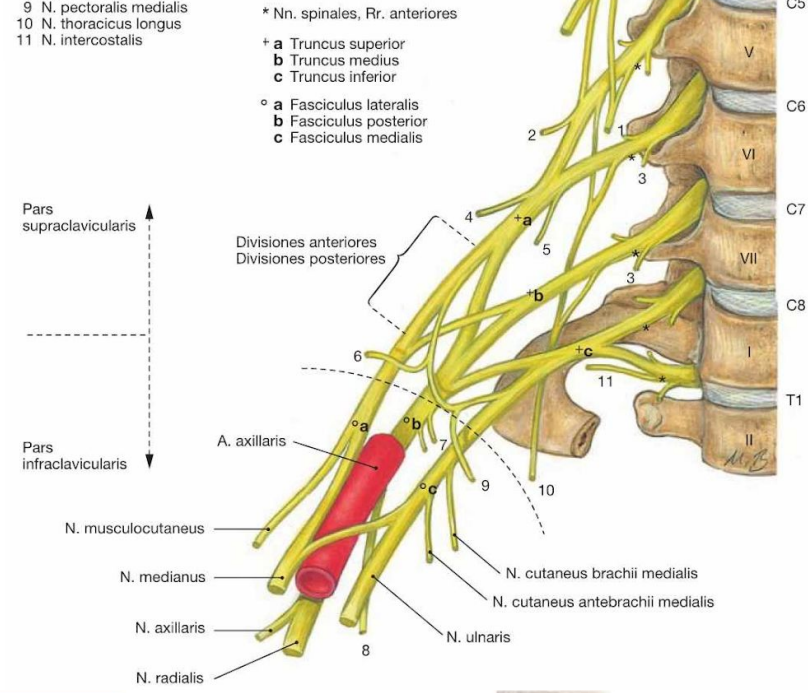


MOTOR INNERVATION OF THE UPPER LIMB

from the supraclavicular part

- n. dorsalis scapulae
 - through m. scalenus medius and posterior and through m. levator scapulae to margo medialis scapulae
- n. thoracicus longus
 - runs in the mid-axillary line along m. serratus anterior
- n. subclavius
 - weak nerve, under clavícula
- n. suprascapularis
 - along m. omohyoideus to incisura scapulae
- n. pectoralis medialis and lateralis
 - between mm. pectorales
- n. subscapularis
 - several branches
- n. thoracodorsalis
 - along the inner surface of m. latissimus dorsi
- rr. musculares
 - for mm. scaleni and m. longus colli

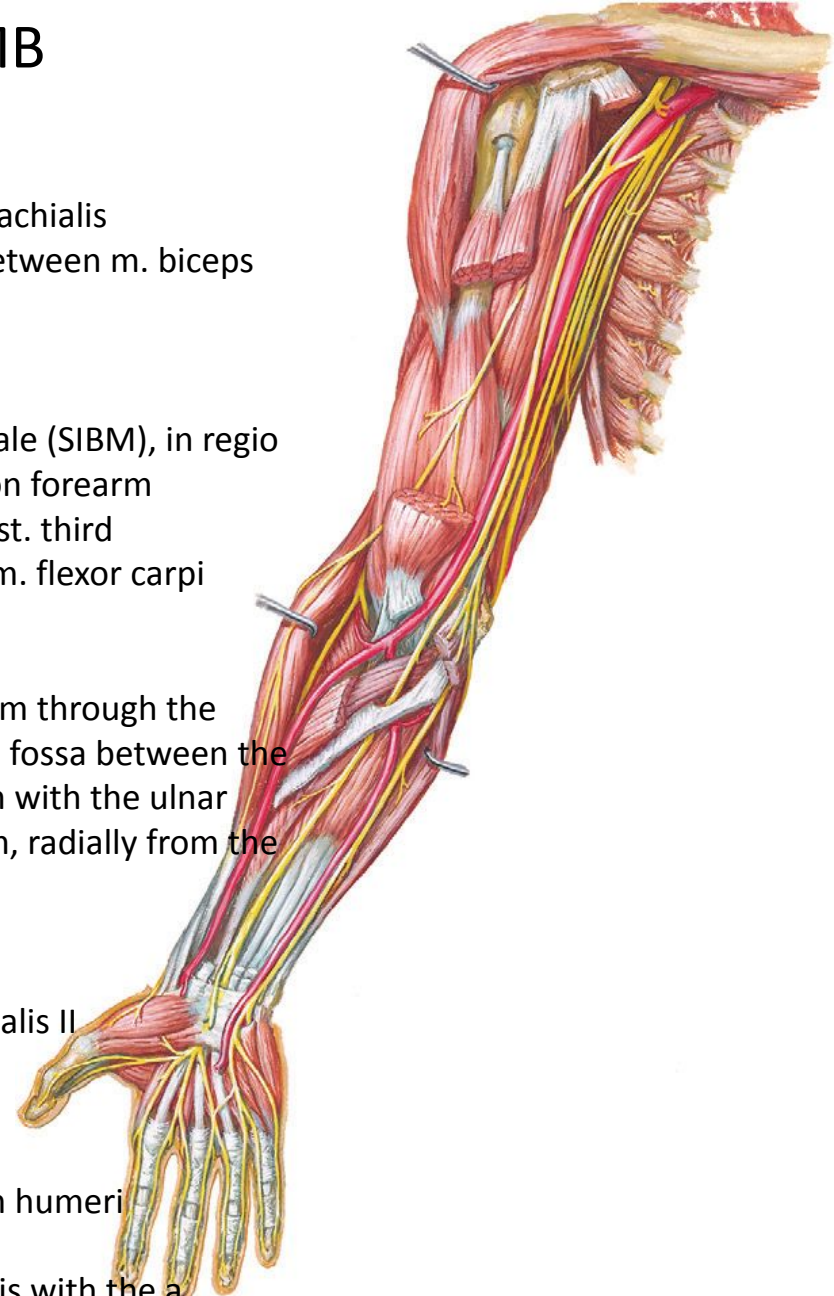
- 1 N. phrenicus (Plexus cervicalis)
- 2 N. dorsalis scapulae
- 3 Rr. musculares
- 4 N. suprascapularis
- 5 N. subclavius
- 6 N. pectoralis lateralis
- 7 N. subscapularis
- 8 N. thoracodorsalis
- 9 N. pectoralis medialis
- 10 N. thoracicus longus
- 11 N. intercostalis



MOTOR INNERVATION OF THE UPPER LIMB

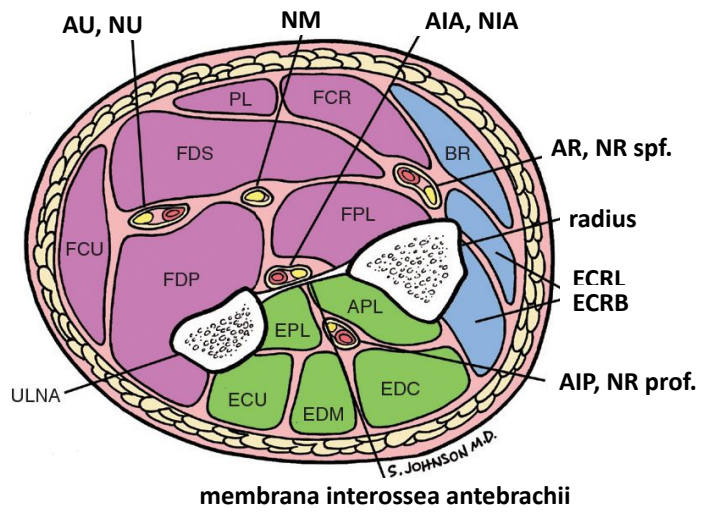
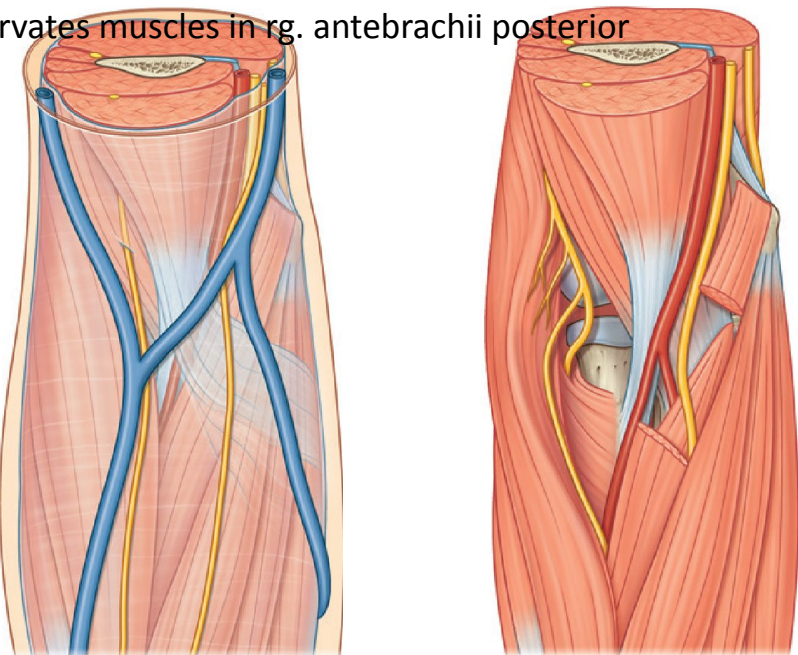
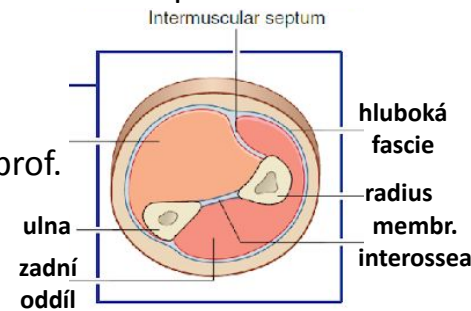
from the infraclavicular part

- **n. musculocutaneus**
 - through m. coracobrachialis, between m. biceps brachii and m. brachialis
 - continues on the forearm as m. cutaneus antebrachii lateralis – between m. biceps and m. brachialis, pierces the fascia, joins v. cephalica
- **n. medianus**
 - by joining radix medialis and lateralis
 - along a. brachialis in front of septum intermusculare brachii mediale (SIBM), in regio cubiti between heads of m. pronator teres (canalis pronatorius), on forearm between m. flexor digitorum superficialis and profundus and in dist. third superficially between the tendons of the m. palmaris longus and m. flexor carpi radialis, into the canalis carpi
- **n. ulnaris**
 - with the median nerve and brachial artery, in the middle of the arm through the SIBM behind the medial epicondyle of the humerus, in the cubital fossa between the heads of the flexor carpi ulnaris muscle (canalis cubitalis), forearm with the ulnar artery, into the palm above the retinaculum musculorum flexorum, radially from the pisiform bone it divides into two terminal branches
- **n. cutaneus brachii medialis**
 - through the fascia axillaris/brachii into the subcutis
 - n. intercostobrachialis – connection with r. lateralis nervi intercostalis II
- **n. cutaneus antebrachii medialis**
 - with v. brachialis, through the hiatus basilicus into the subcutis
- **n. axillaris**
 - into the foramen humerotricipitale behind the collum chirurgicum humeri
- **n. radialis**
 - behind the a. axillaris and a. brachialis, into the sulcus nervi radialis with the a. profunda brachii, through the septum intermusculare brachii laterale into the fossa cubiti, here between the m. brachioradialis and m. brachialis, where it divides into two terminal branches

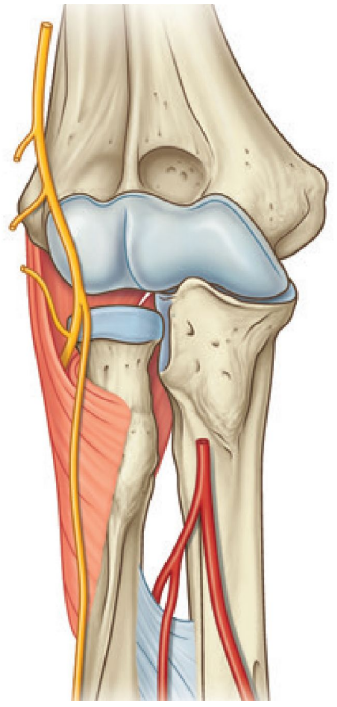
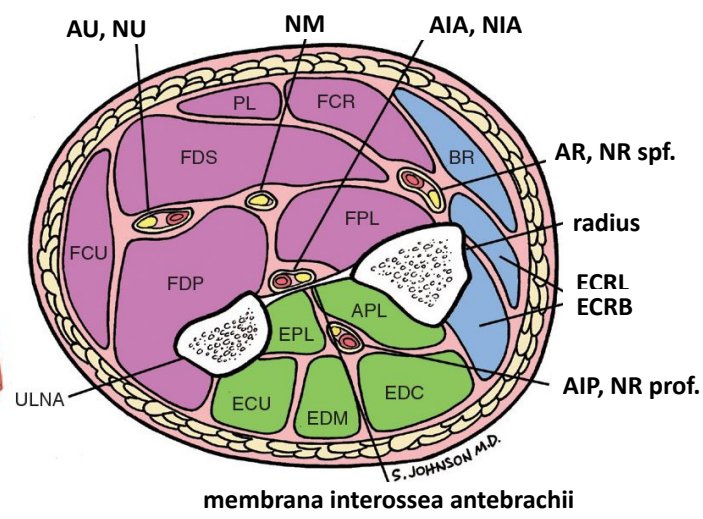
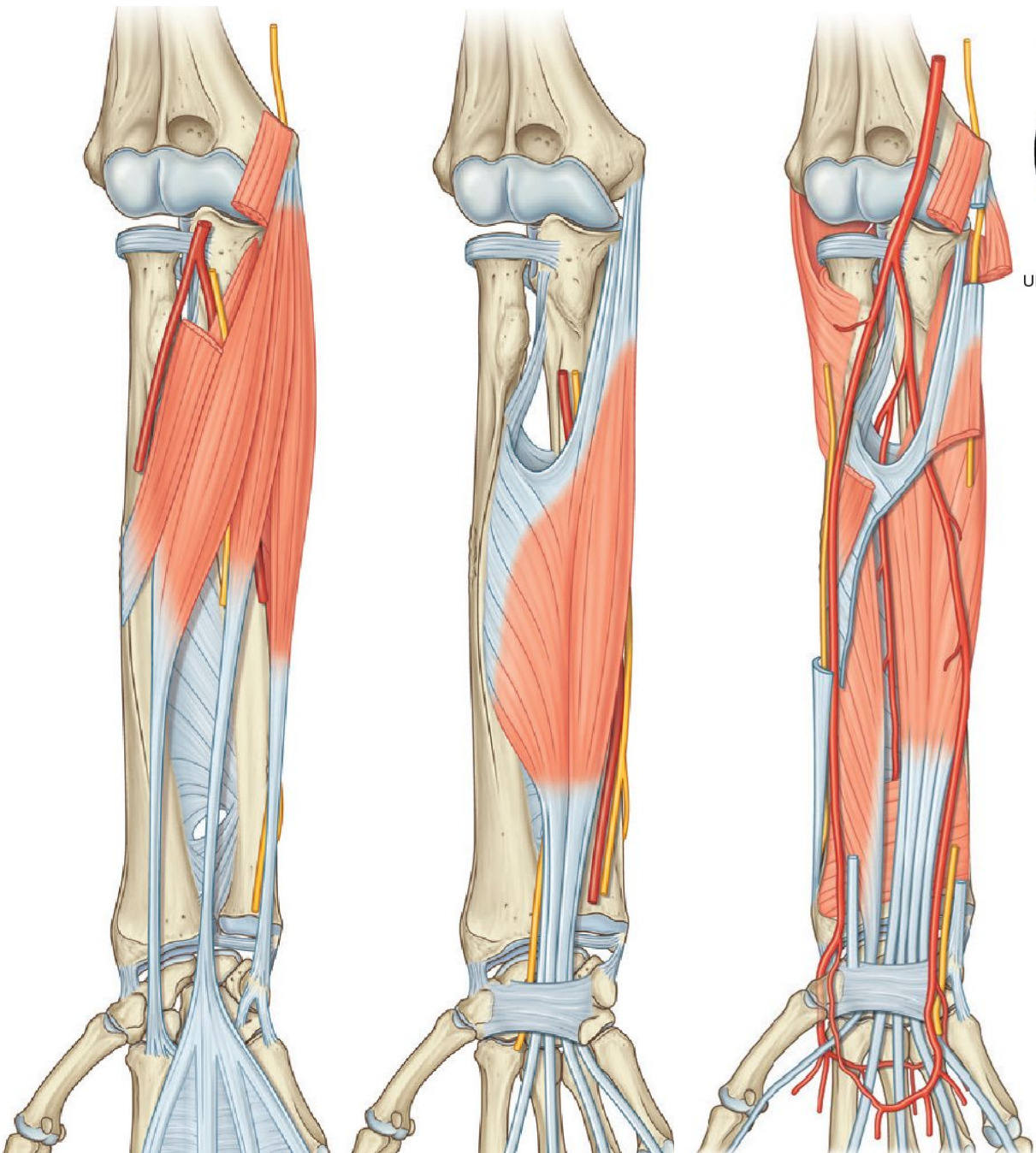


FORELIMB TOPOGRAPHY

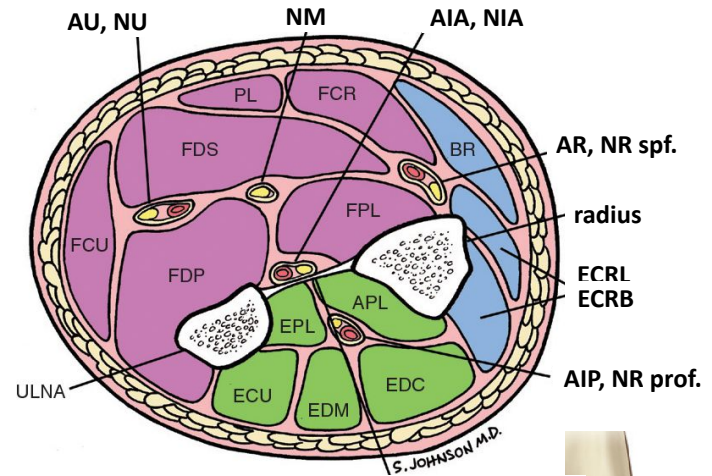
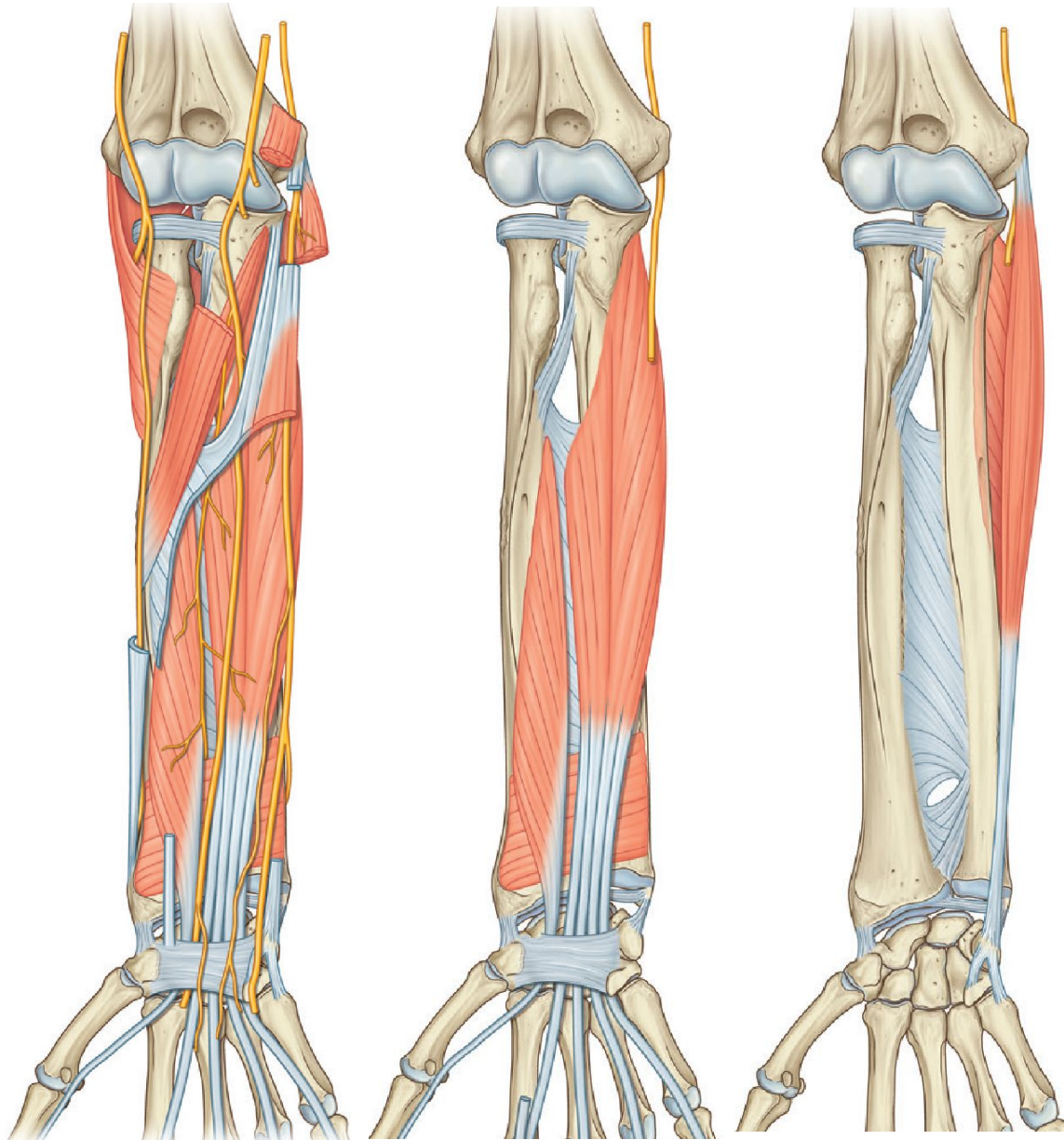
- vasa radialis and r. spf. nervi radialis
 - between m. pronator teres and m. brachioradialis, then between m. brachioradialis and m. flexor carpi radialis
 - vasa in the distal third to the superficial fascia between the tendons B and FCR
 - nerve under tendon B and on the back of the hand
- n. medianus
 - between the heads of PT, then under the beginning of FDspf. and between FDspf. and FDprof.
 - in the distal part to the superficial fascia between FCR and PL
- vasa ulnaria
 - runs mediodistally
 - under n. medianus, then between FDspf. and FDprof., then between FDspf. and FCU
- n. ulnaris
 - between the heads of FCU, distally under FCU and joins vasa ulnaria from the medial side
- r. prof. nervi radialis
 - through S (canalis supinatorius), then branches into rr. musculares, the deepest branch is n. interosseus posterior
 - innervates muscles in rg. antebrachii posterior



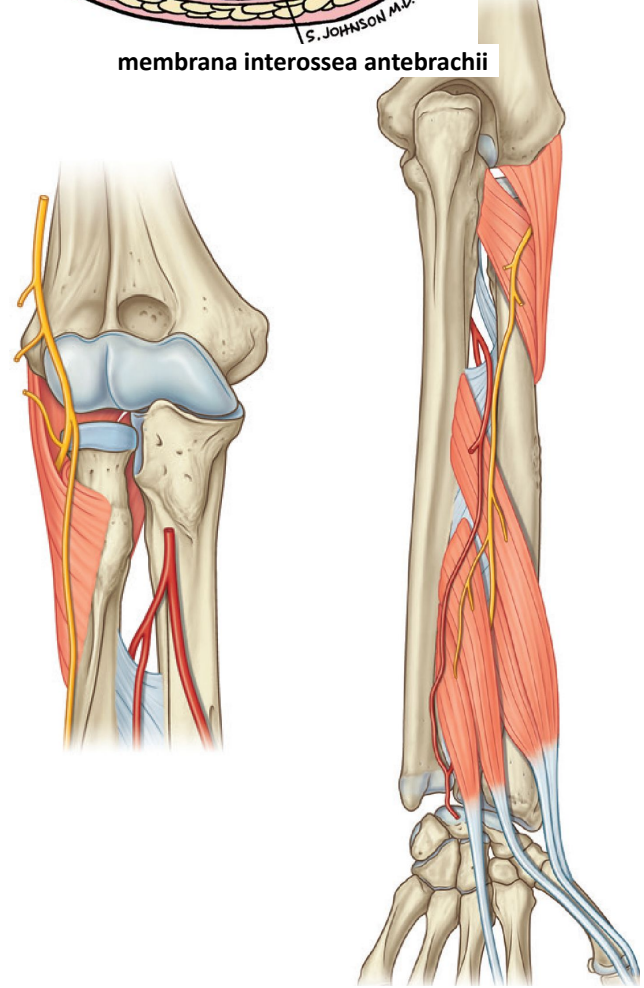
FORELIMB TOPOGRAPHY



FORELIMB TOPOGRAPHY

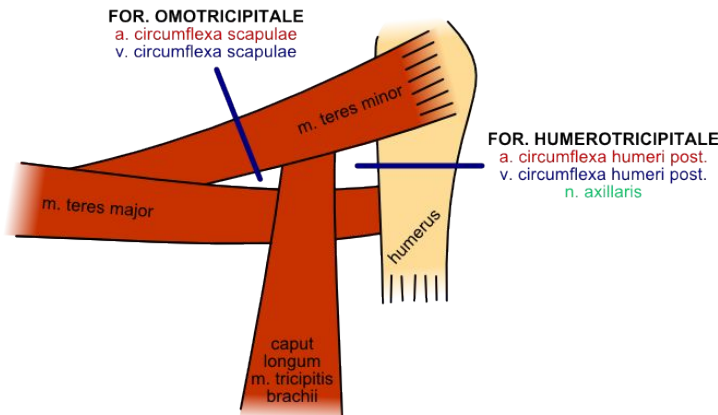


membrana interossea antebrachii



REGIO SCAPULARIS

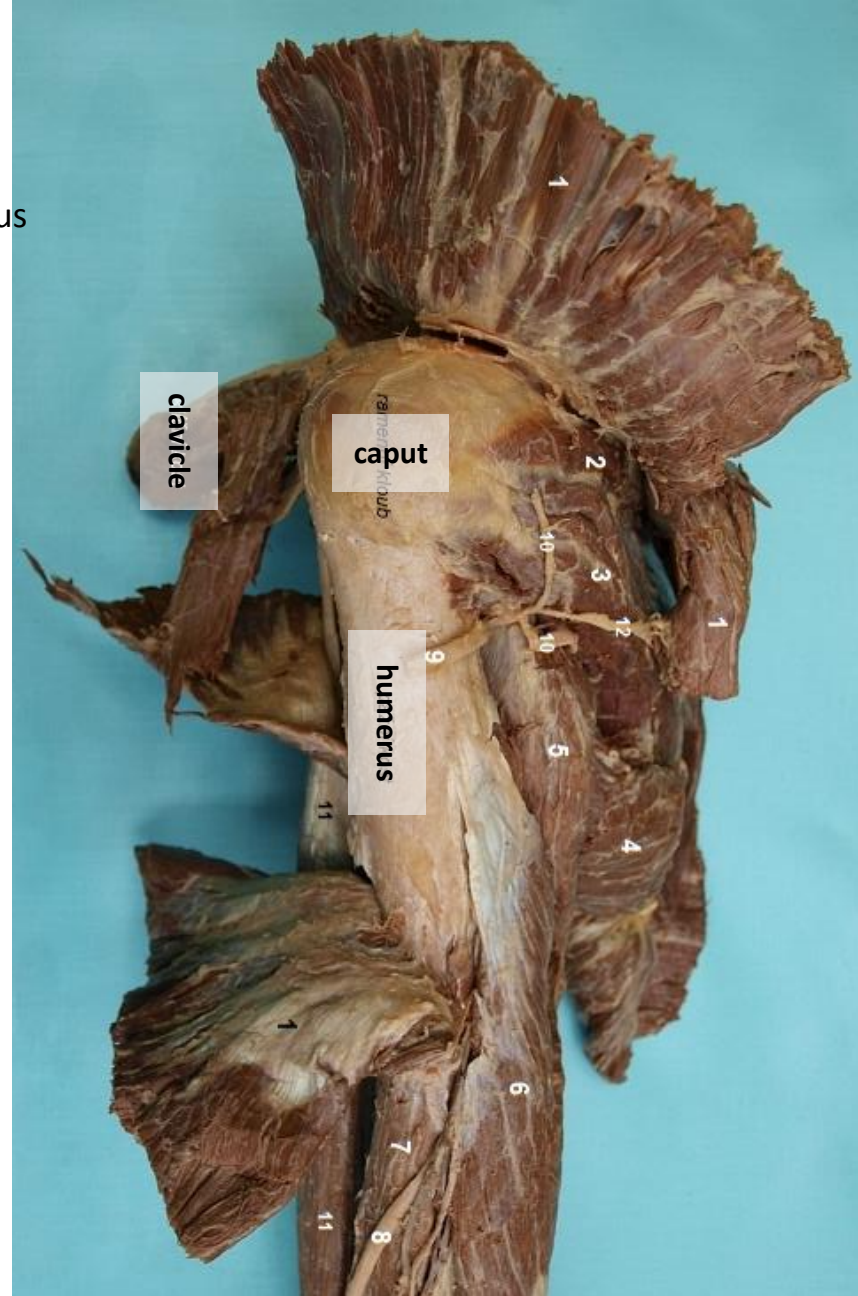
- borders: scapula
- contents: scapula, mm. supraspinatus, infraspinatus, teres minor, teres major
- palpable: spina scapulae, margo medialis, angulus inferior
- incisura scapulae – n. suprascapularis, vasa suprascapularia above lig. transversum scapulae
- foramen omotricipitale – vasa circumflexa scapulae
- foramen humerotricipitale – n. axillaris, vasa circumflexa humeri posteriora
- m. subscapularis



1 - m. trapezius, 2 - m. infraspinatus, 3 - m. teres minor, 4 - m. teres major, 5 - m. deltoideus, 6 - m. triceps brachii (caput longum), 7 - m. triceps brachii (caput laterale), 8 - n. axillaris from foramen humerotricipitale, 9 - rr. musculares (branches of n. axillaris)

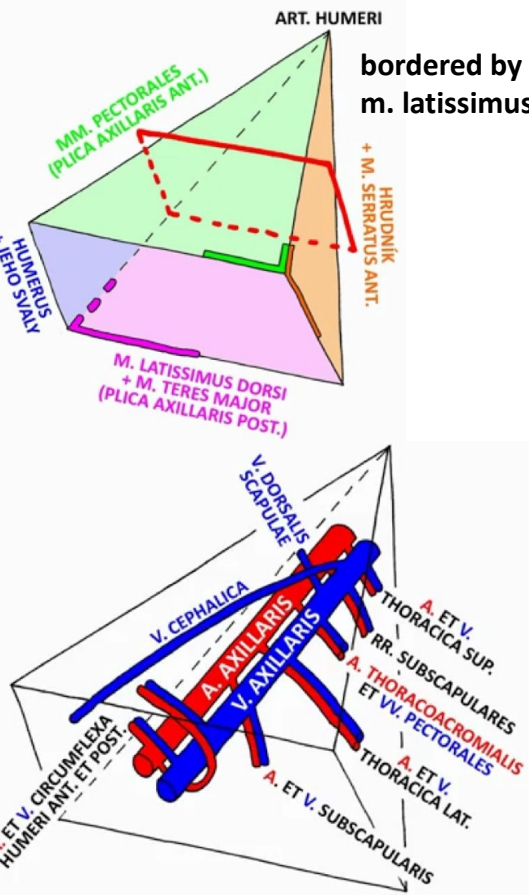
REGIO DELTOIDEA

- borders: m. deltoideus
- contents: m. deltoideus, shoulder joint with muscles
- palpable: lateral part of clavicle, spina, acromion, proc. coracoideus
- trigonum deltoideopectorale – v. cephalica proráží fascia clavipectoralis
- sulcus deltoideopectoralis – v. cephalica
- nn. supraclaviculares
- n. cutaneus brachii lateralis
- bursa subdeltoidea
- tendon of the long head of m. biceps brachii
- n. axillaris
- vasa circumflexa humeri posteriora
- long head of m. triceps brachii

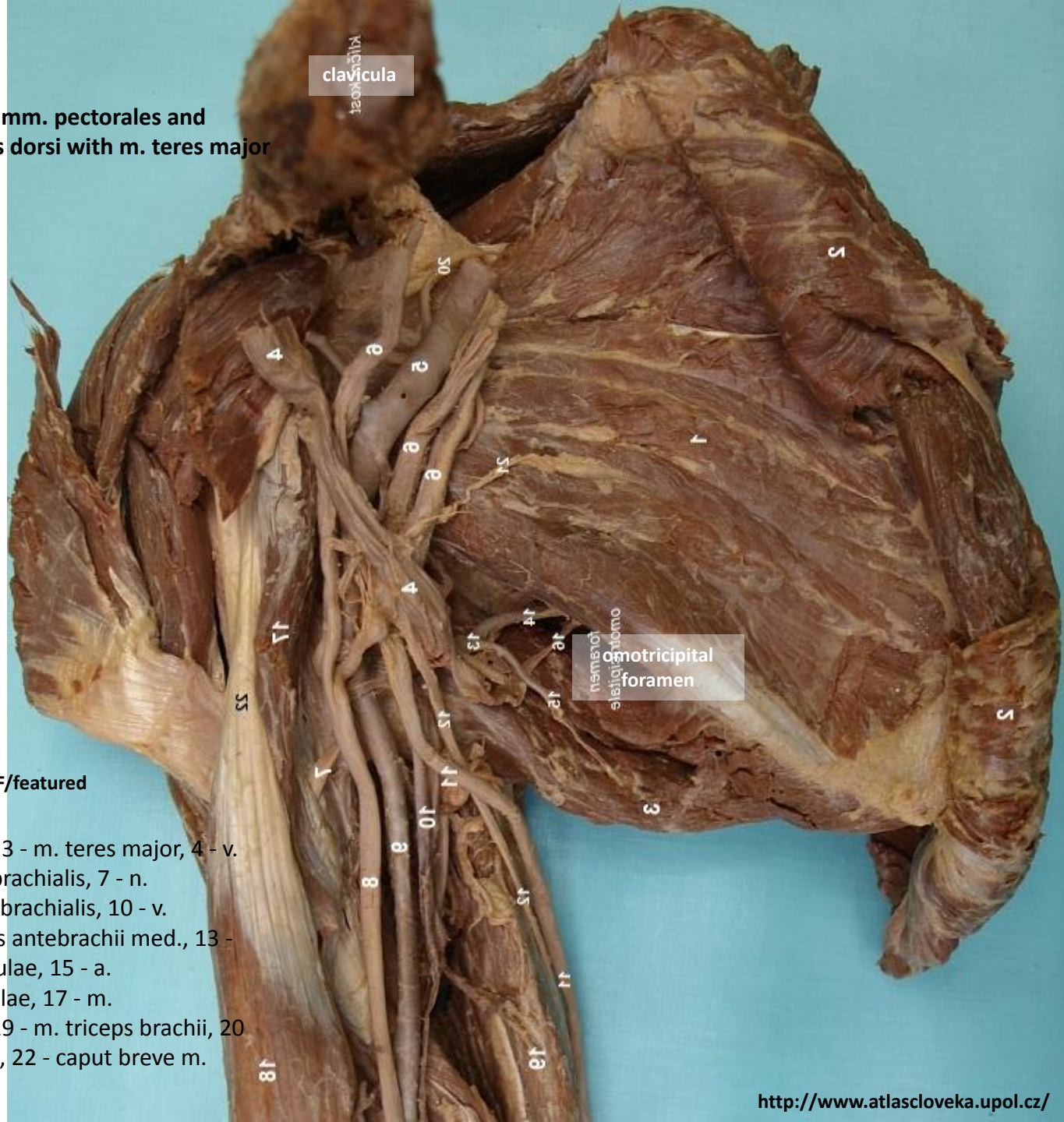


1 - m. deltoideus, 2 - m. infraspinatus, 3 - m. teres minor, 4 - m. teres major, 5 - m. triceps brachii (caput longum), 6 - m. triceps brachii (caput laterale), 7 - m. brachialis, 8 - n. radialis, 9 - n. axillaris, 10 - rr. musculares (branches of n. axillaris), 11 - m. biceps brachii, 12 - n. cutaneus brachii lat. sup.

FOSSA AXILLARIS



bordered by mm. pectorales and m. latissimus dorsi with m. teres major

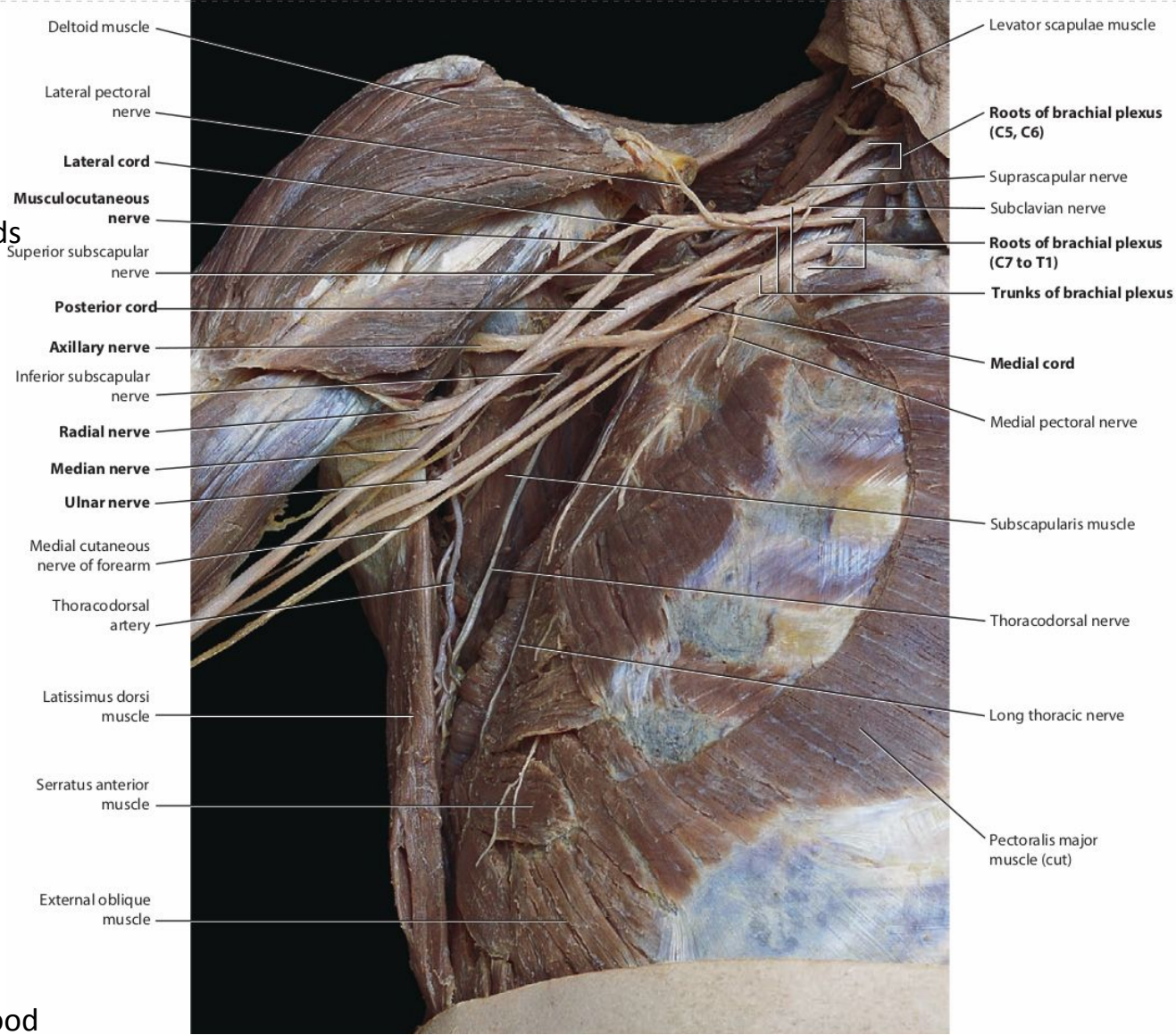


<https://www.youtube.com/user/zimnipitevna3LF/featured>

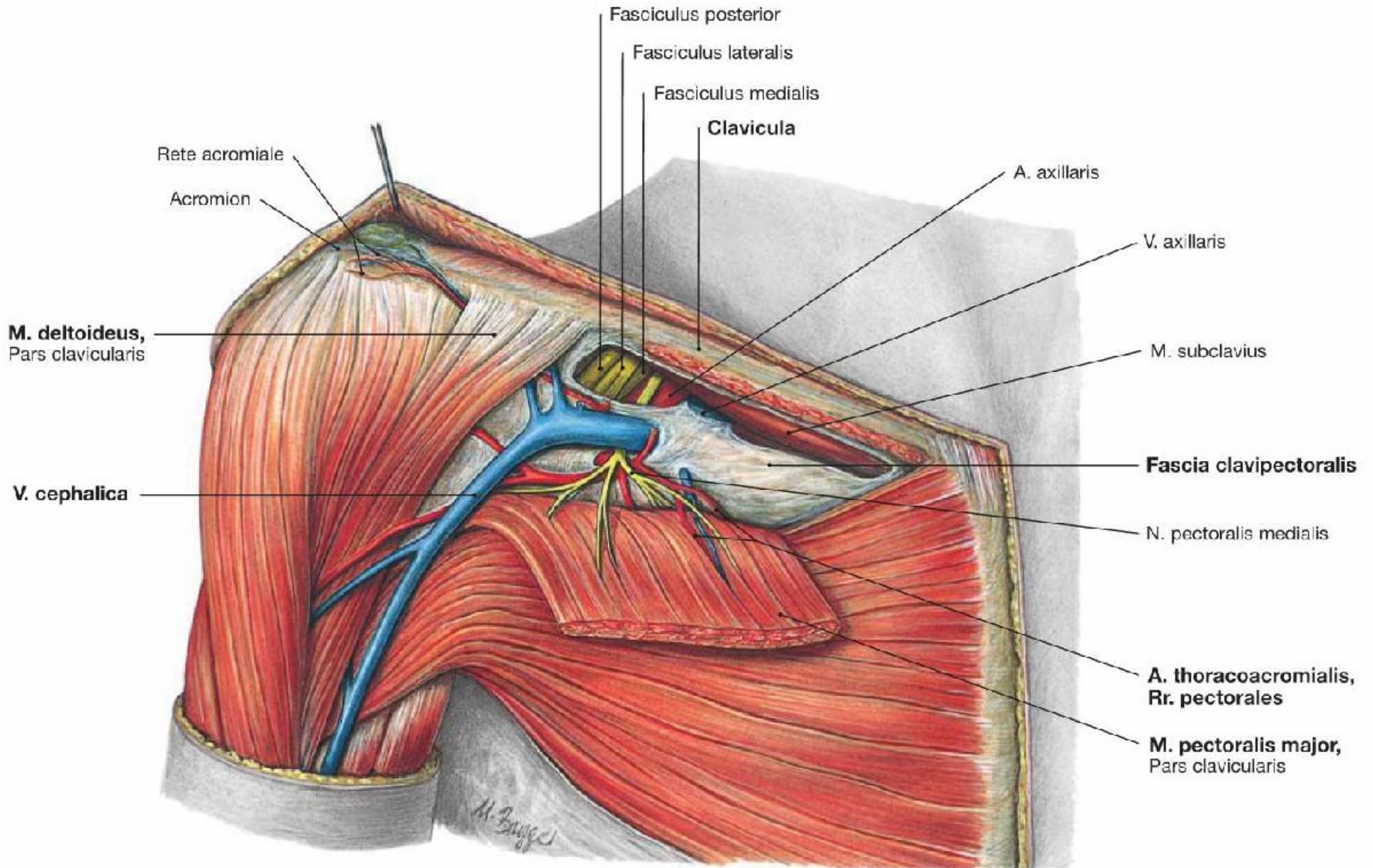
- 1 - m. subscapularis, 2 - m. serratus ant., 3 - m. teres major, 4 - v. axillaris, 5 - a. axillaris, 6 - fasciculi plex. brachialis, 7 - n. musculocutaneus, 8 - n. medianus, 9 - a. brachialis, 10 - v. brachialis, 11 - n. ulnaris, 12 - n. cutaneus antebrachii med., 13 - a. subscapularis, 14 - a. circumflexa scapulae, 15 - a. thoracodorsalis, 16 - v. circumflexa scapulae, 17 - m. coracobrachialis, 18 - m. biceps brachii, 19 - m. triceps brachii, 20 - n. suprascapularis, 21 - n. subscapularis, 22 - caput breve m. bicipitis brachii

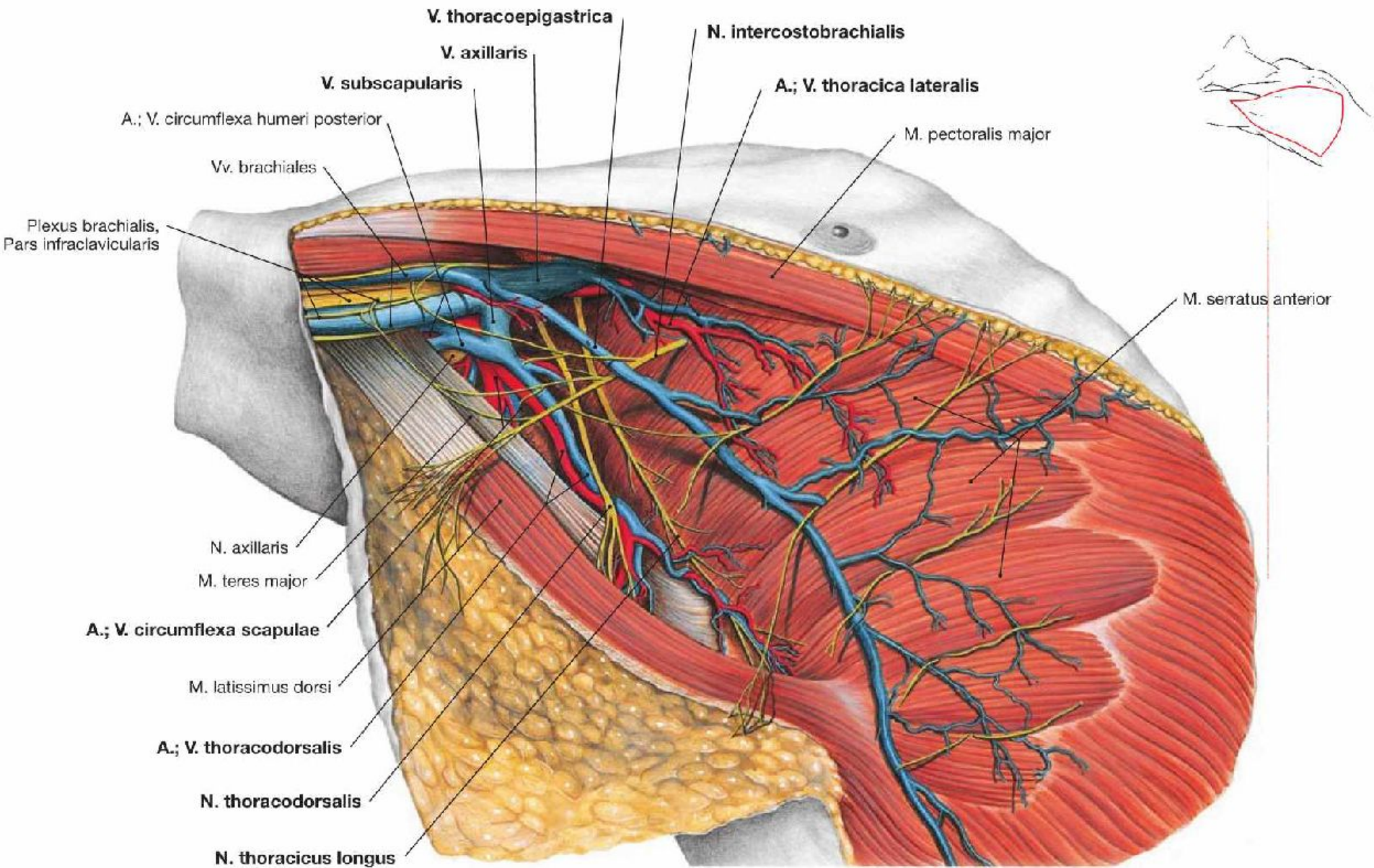
FOSSA AXILLARIS

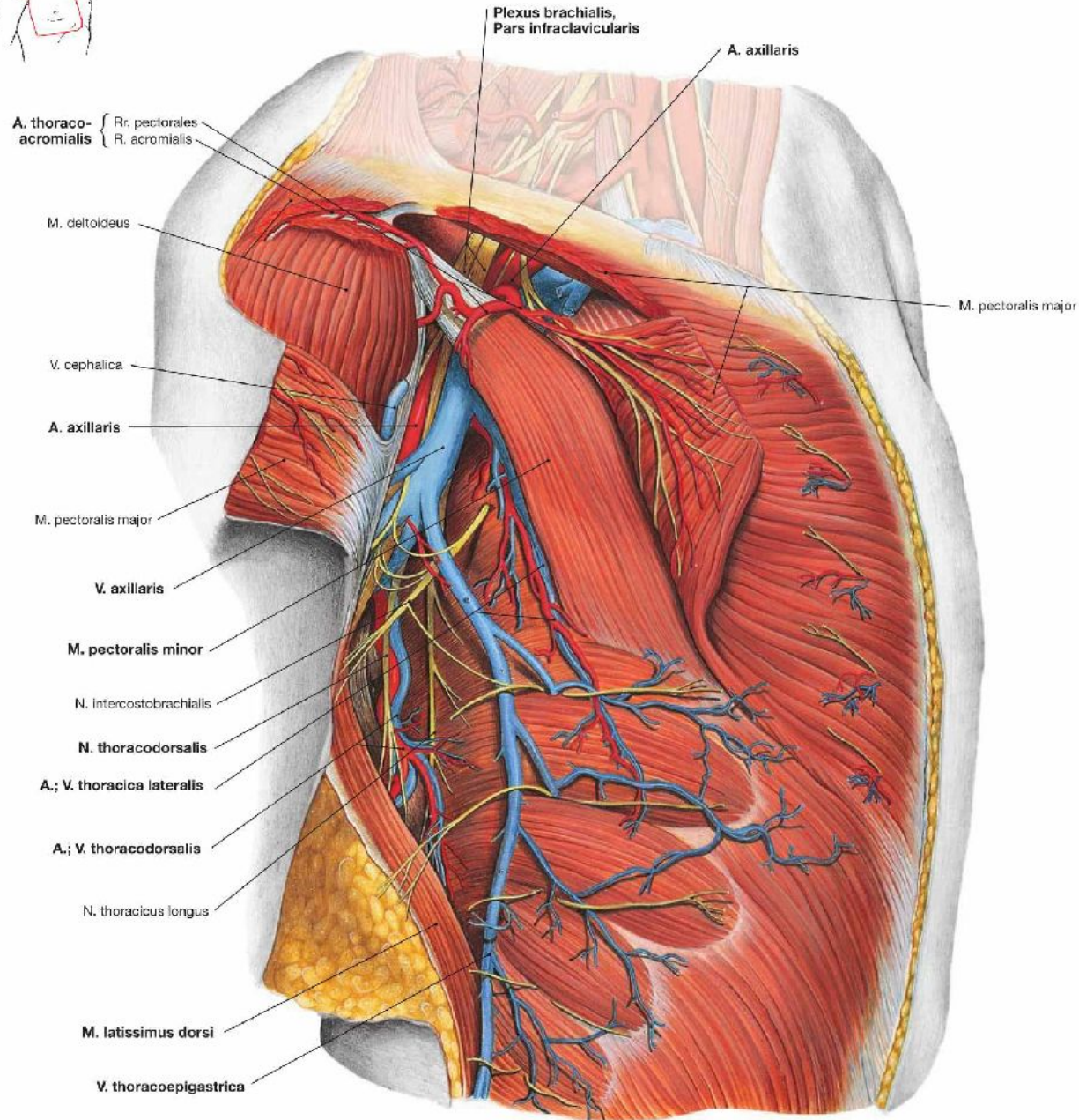
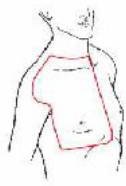
- vasa axillaris and branches
- nerves of fasciculi plexus brachialis
- nodi lymphatici
- n. intercostobrachialis z Th2 towards n. cutaneus brachii medialis



- anterior and posterior axillary fold
- skin covered with “hrici” in adulthood
- nodi lymphatici spf.
- lymph from the upper limb drains along the axillary artery and its main branches, where the lymph nodes are located:
 - nodi lymphatici brachiales, interpectoriales, subscapulares, centrales, apicales
 - then to nodi lymphatici supraclaviculares, then to truncus subcalvius

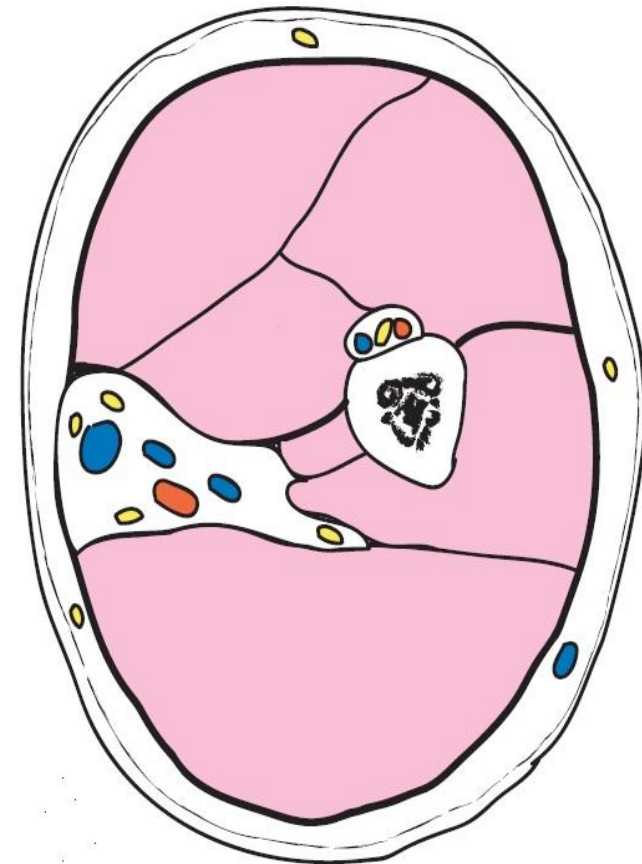
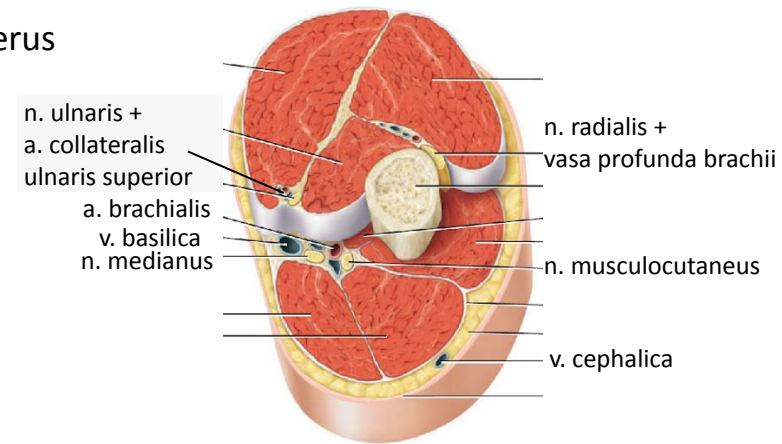






REGIO BRACHIALIS

- borders: form the axillary folds till the 3 cm above epicondyles of humerus
 - divided by sulci bicipitales – underlain by intermuscular septa septy, and by the humerus into the anterior and posterior osteofascial space
 - septum intermusculare brachii mediale from the insertion of m. coracobrachialis till the medial epicondyle of humerus
 - SIB laterale from the insertion of m. deltoideus till epicondylus lateralis humeri
- contents
 - m. biceps brachii, m. brachialis a m. coracobrachialis; m. triceps brachii
 - v. cephalica, v. basilica, vasa profunda brachii, vasa brachialis, a. collateralis ulnaris superior (penetrating SIBM)
 - n. cutaneus brachii medialis, n. cutaneus brachii lateralis, n. radialis (penetrating SIBL, gives off sensory branches n. cutaneus brachii posterior and n. cutaneus brachii lateralis inferior), n. cutaneus antebrachii medialis, n. ulnaris (pierces SIBM), n. medianus, n. musculocutaneus (continues on the forearm as n. cutaneus antebrachii lateralis)



REGIO BRACHIALIS

- 1 - caput longum musculi tricipitis brachii,
- 2 - caput laterale musculi tricipitis brachii,
- 3 - n. radialis
- 4 - a. profunda brachii + veins
- 5 - n. cutaneus antebrachii post.
- 6 - rr. musculares nervi radialis
- 7 - m. brachialis
- 8 - n. cutaneus brachii lat. inf.

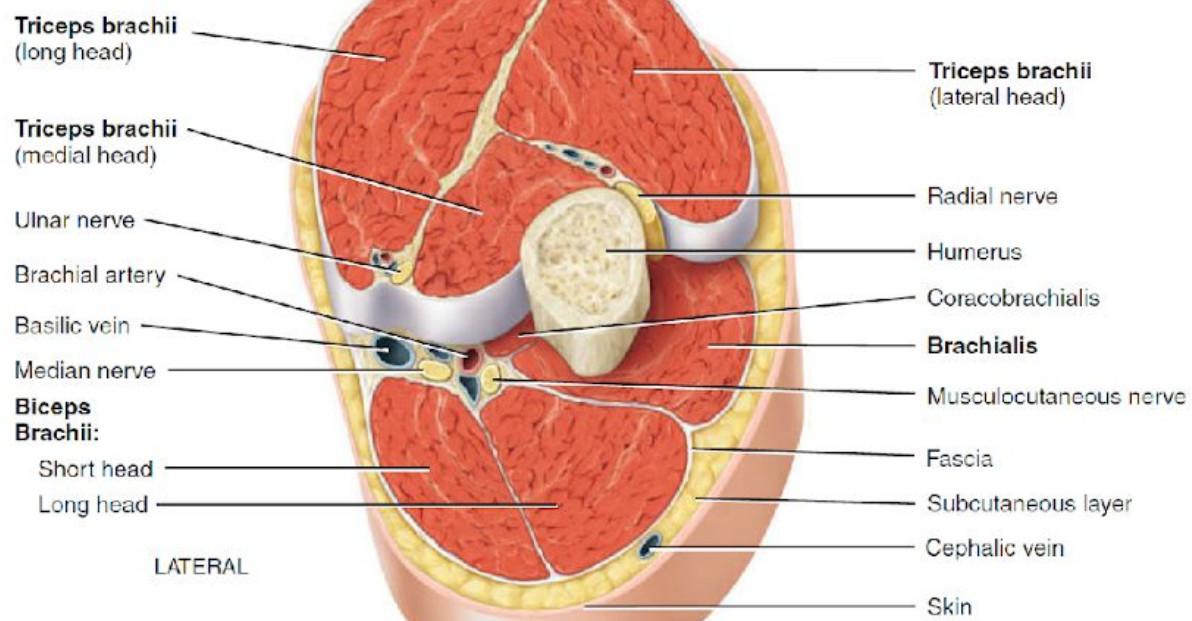


- 1 - fasciculus post.
- 2 - fasciculus lat.
- 3 - v. axillaris
- 4 - a. axillaris
- 5 - n. axillaris
- 6 - a. subscapularis
- 7 - fasciculus med.
- 8 - n. musculocutaneus
- 9 - a. brachialis
- 10 - v. brachialis
- 11 - n. cutaneus antebrachii med.
- 12 - n. medianus (moved aside)
- 13 - n. ulnaris
- 14+15 - muscular branches
- 16 - n. radialis
- 17 - a. profunda brachii (+ vein)
- 18 - a. bicipitalis
- 19 - a. brachialis + vv. brachiales
- 20 - m. teres major
- 21 - m. coracobrachialis
- 22 - m. biceps brachii
- 23 - m. pectoralis major
- 24 - m. triceps brachii



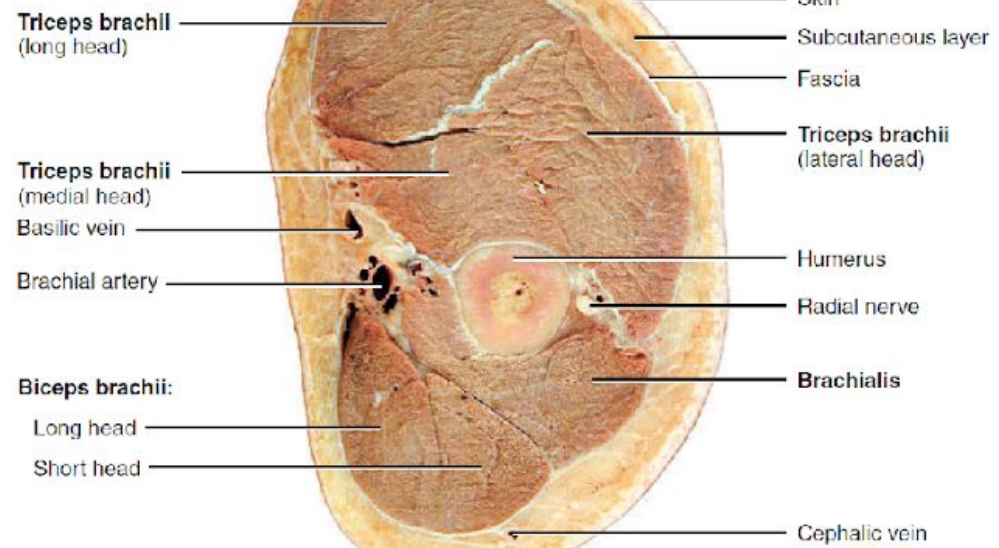
TRANSVERSE SECTION THROUGH THE ARM

LATERAL



LATERAL

ANTERIOR

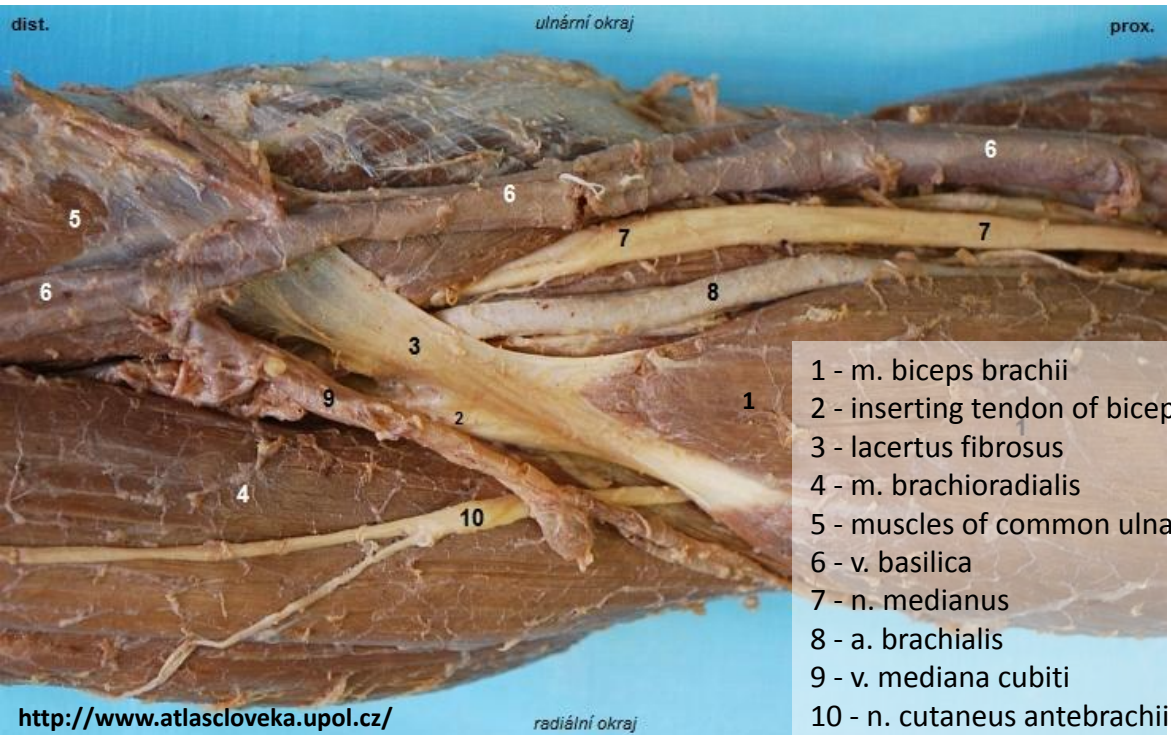
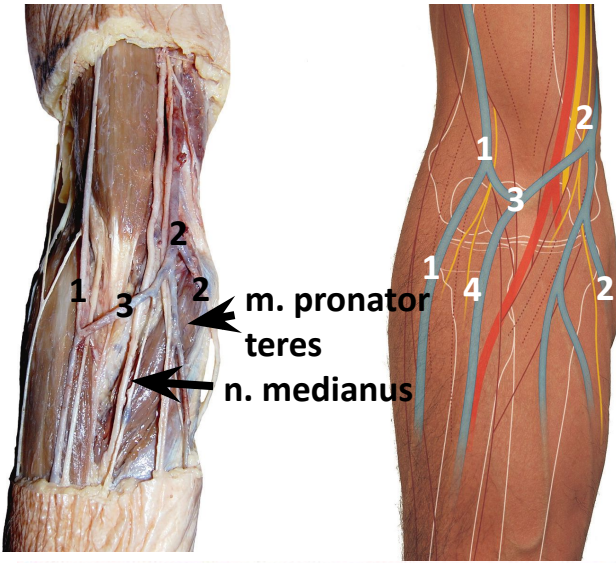


ANTERIOR

REGIO CUBITALIS

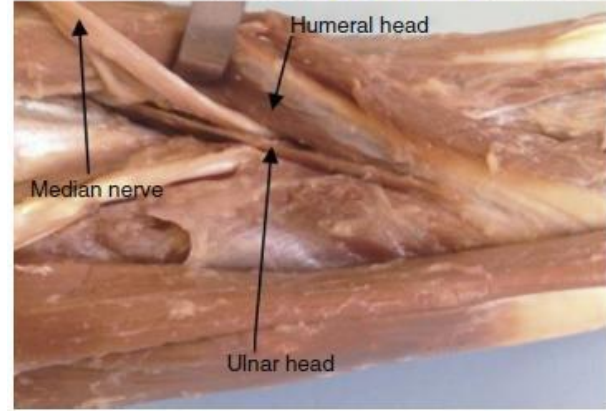
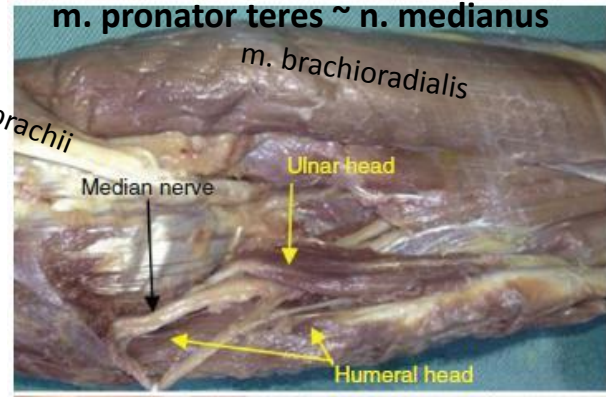
- borders: three finger widths proximal and distal from humeral epicondyles
- contents:
 - v. cephalica, v. basilica, variable v. mediana cubiti, n. cutaneus antebrachii medialis (branching along the branches of v. basilica) et lateralis (v. cephalica), lacertus fibrosus inserts into fascia
 - medial to the insertion of biceps brachii run vasa brachialia (a. after running under the lacertus fibrosus divides into a. ulnaris – under the pronator and a. radialis – between pronator and brachioradialis), n. medianus (between the heads of pronatoru), n. radialis into fossa cubitalis through the slit between m. brachioradialis and m. brachialis, splits into superficial (along a. radialis) and deep (through supinator)
 - posterior: palpable humeral epicondyles, olecranon, slit of the radiohumer joint; n. ulnaris (sulcus, heads between the heads of m. flexor carpi ulnaris)

+ muscles



- 1 - m. biceps brachii
- 2 - inserting tendon of biceps
- 3 - lacertus fibrosus
- 4 - m. brachioradialis
- 5 - muscles of common ulnar head
- 6 - v. basilica
- 7 - n. medianus
- 8 - a. brachialis
- 9 - v. mediana cubiti
- 10 - n. cutaneus antebrachii lat

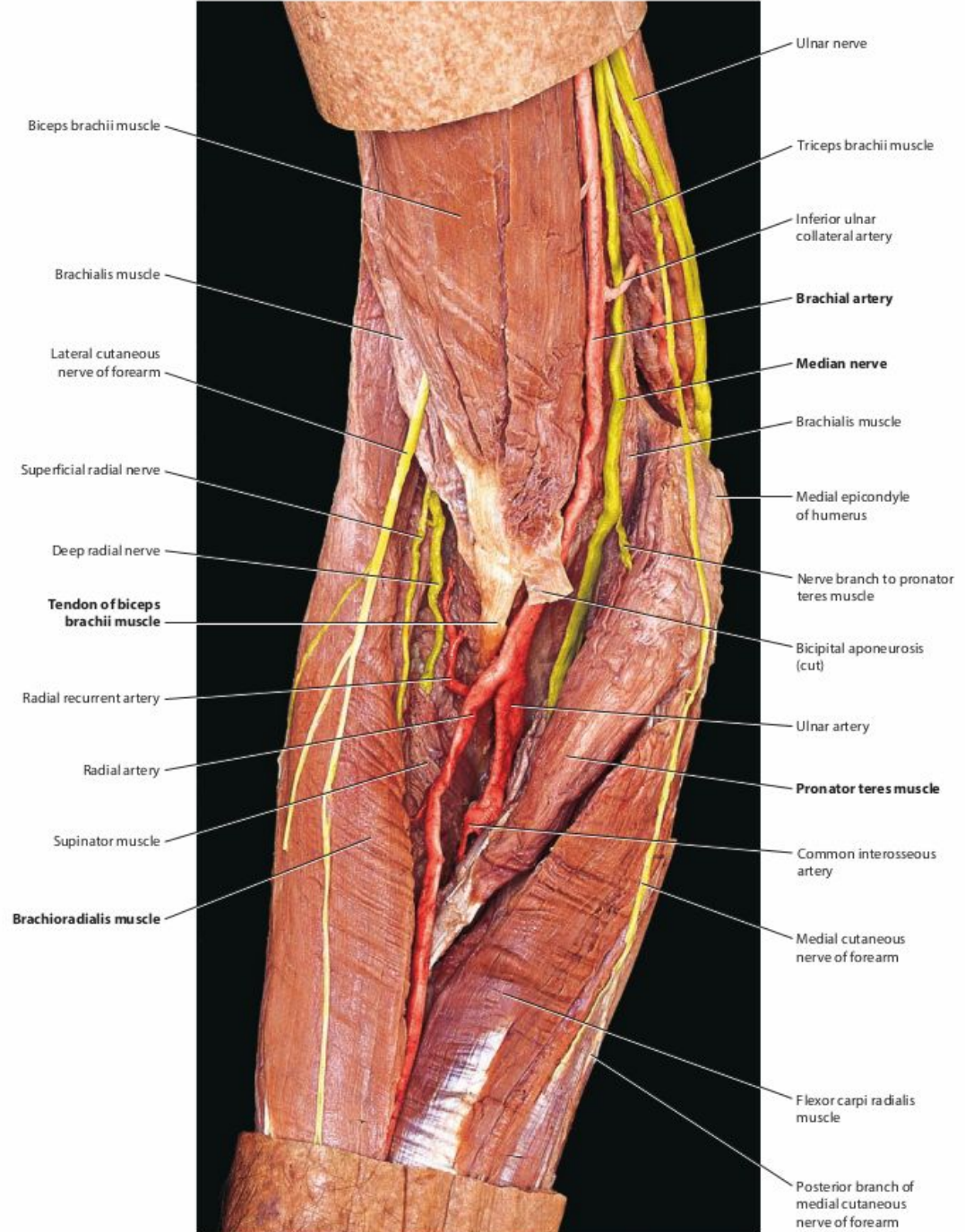
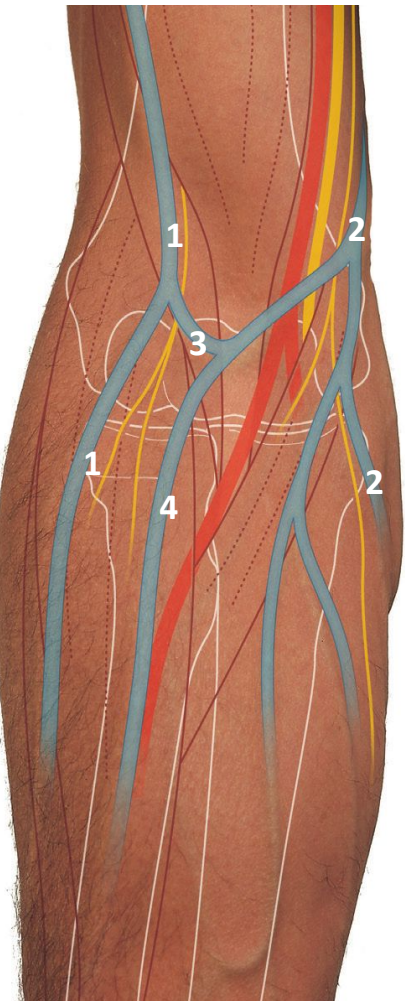
m. biceps brachii



- 1 - n. medianus
- 2 - rr. musculares nervi mediani
- 3 - n. interosseus antebrachii ant.
- 4 - n. ulnaris
- 5 - a. brachialis
- 6 - a. radialis
- 7 - a. ulnaris
- 8 - vv. brachiales
- 9 - vv. ulnares
- 10 - vv. radiales
- 11 - v. cephalica
- 12 - v. basilica (moved radially)
- 13 - muscles of common ulnar head
- 14 - m. flexor carpi ulnaris
- 15 - m. flexor digitorum prof.
- 16 - a. interossea comm.

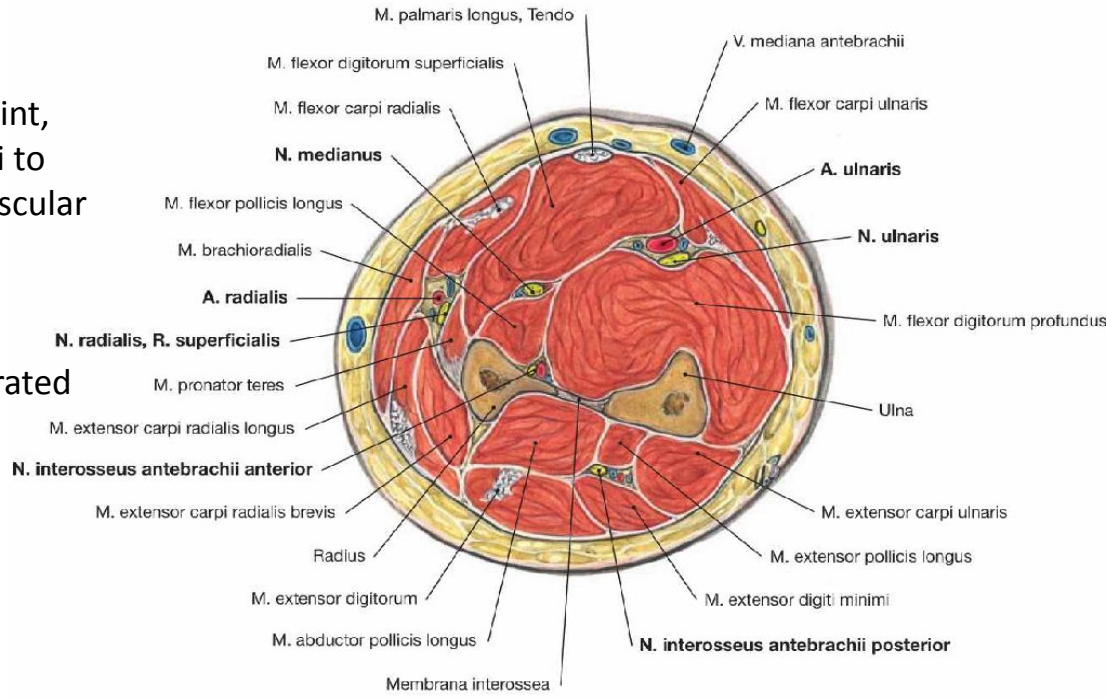


REGIO CUBITALIS

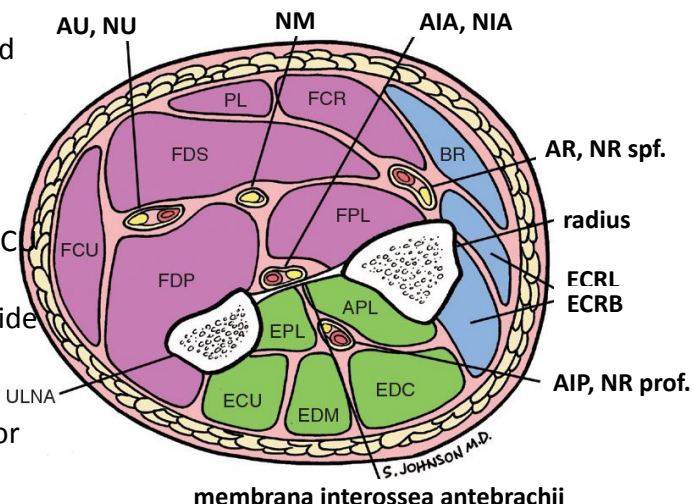


REGIO ANTEBRACHIALIS

- boundaries: three finger widths below the epicondyles of the humerus to the radiocarpal joint, medially the attachment of the fascia antebrachii to the dorsal edge of the ulna, laterally the intermuscular septum between the dorsal and lateral groups, dorsally the interosseous membrane of the antebrachium
- contents: medial and lateral muscle groups separated by a septum, vessels, and nerves (see figure)



- vasa radialis a r. spf. nervi radialis
 - between m. pronator teres and m. brachioradialis, then between m. brachioradialis and m. flexor carpi radialis
 - vasa in the distal third to the superficial fascia between the tendons B a FCR
 - nerv under the tendon of B and to the dorsum of the hand
- n. medianus
 - between the heads of PT, than under the orgidin of FDspf. and between FDspf. and FDprof.
 - in the distal part of the superficial fascia between the FCR and PL
- vasa ulnaria
 - mediodistally
 - under n. medianus, then between FDspf. and FDprof., then between FDspf. and FCU
- n. ulnaris
 - between the heads of FCU, distally under the FCU and is added from the medial side to the vasa ulnaria
- r. prof. nervi radialis
 - through S, then splits to rr. musculares, the deepest branch is interosseus posterior
 - innervates the muscles in rg. antebrachii posterior



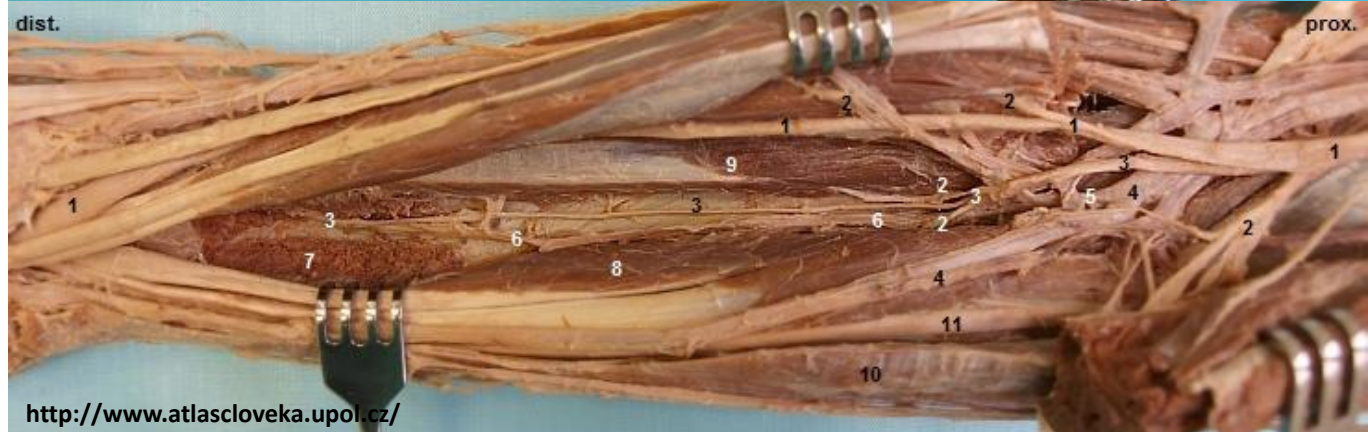
- 1 - m. biceps brachii
- 2 - m. pronator teres
- 3 - m. flexor carpi radialis
- 4 - m. palmaris longus
- 5 - m. brachioradialis
- 6 - m. flexor digitorum spfc.
- 7 - v. cephalica
- 8 - v. basilica
- 9 - n. medianus
- 10 - n. ulnaris
- 11 - area of the carpal tunnel



- 1 - n. medianus
- 2 - rr. musculares nervi mediani
- 3 - n. interosseus antebrachii ant.
- 4 - n. ulnaris
- 5 - a. brachialis
- 6 - a. radialis
- 7 - a. ulnaris
- 8 - a. interossea comm.
- 9 - vv. ulnares
- 10 - vv. brachiales
- 11 - v. cephalica
- 12 - v. basilica
- 13 - v. cephalica accessoria
- 14 - m. brachioradialis
- 15 - muscles of the common ulnar head
- 16 - m. flexor carpi ulnaris
- 17 - m. flexor digitorum prof.

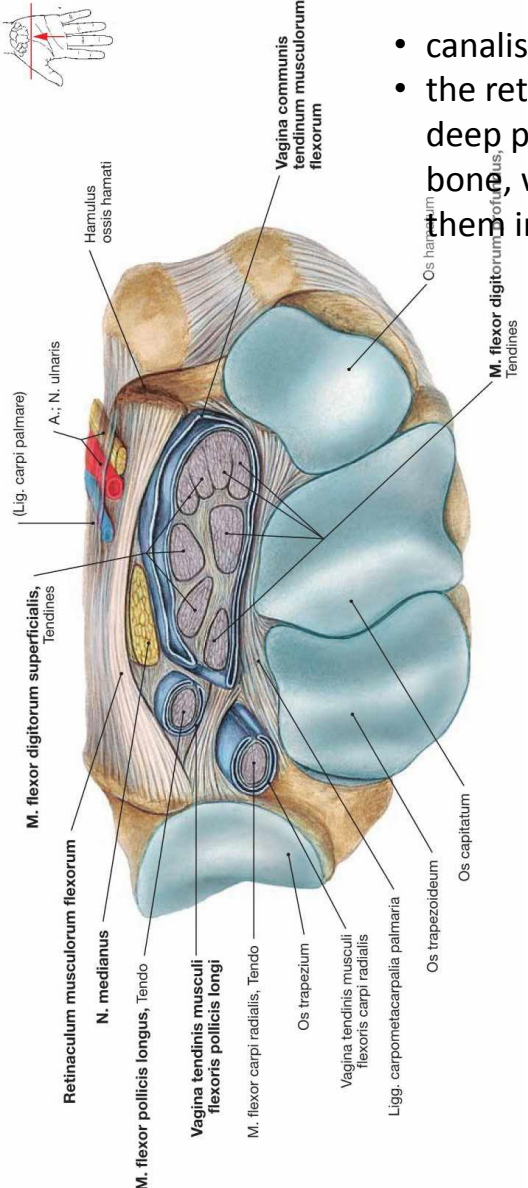


- 1 - n. medianus
- 2 - rr. musculares
- 3 - n. interosseus antebrachii ant.
- 4 - a. ulnaris (+ veins)
- 5 - a. interossea comm.
- 6 - a. interossea ant. (+ veins)
- 7 - m. pronator quadratus
- 8 - m. flexor digitorum prof.
- 9 - m. flexor pollicis longus
- 10 - m. flexor carpi ulnaris
- 11 - n. ulnaris

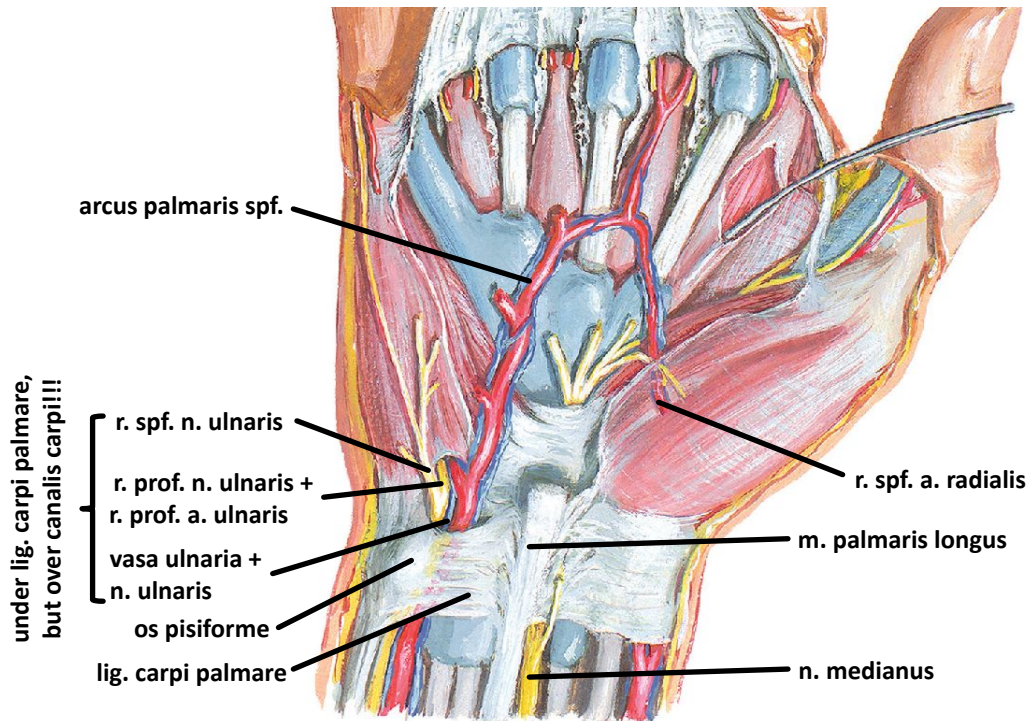
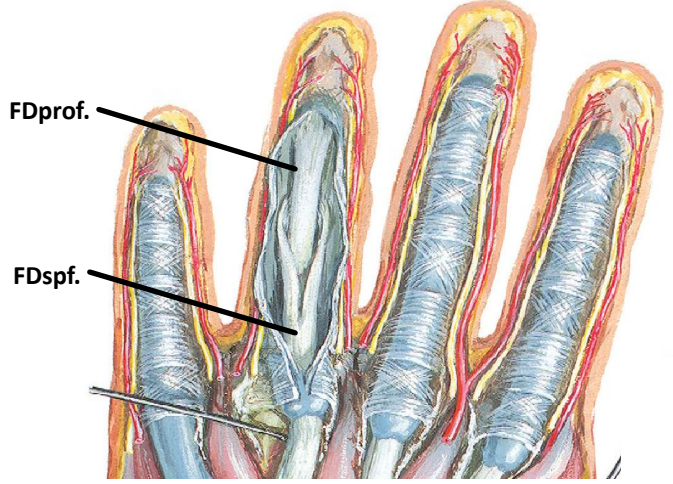


REGIO CARPALIS

- range of carpal bones (length approx. 2 cm)
- palpable: distal epiphyses of the ulna and radius, flexor tendons (anterior), extensor tendons (posterior), radiocarpal joint space (posterior)



- canalis carpi: retinaculum + carpal bones
- the retinaculum splits into a superficial and deep part at its attachment to the trapezium bone, with the FCR tendon passing between them in a groove on the trapezium bone



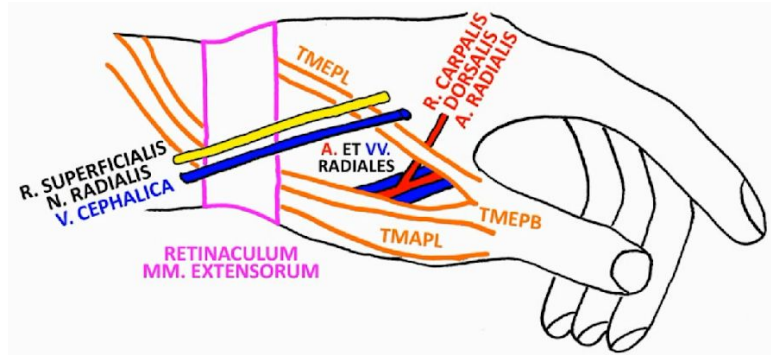
under lig. carpi palmare, but over canalis carpi!!

ULNAR CANAL (OF GUYON)

- proximally: hiatus proximalis (opening in the ligamentum carpi palmare, approximately at the level of the proximal edge of the pisiform bone, through which the ulnar nerve and vessels pass from beneath the superficial fascia of the forearm into the subcutaneous tissue). The superficial edge of the opening is reinforced by the crus superficiale, while the deeper edge is bordered by the crus profundum.
 - distally: hiatus distalis (under the ligamentous arch connecting the origin of the m. flexor digiti minimi on the hamulus ossis hamati with the origin of the m. abductor digiti minimi on the pisiform bone), the r. profundus n. ulnaris and rr. profundi vasorum ulnarium penetrate deeply into this opening, while the r. superficialis n. ulnaris and rr. superficiales vasorum ulnarium run across this arch further distally to the IV and V fingers;
 - ulnarly: os pisiforme, further distally also the beginnings of the hypothenar muscles;
 - radially: hamulus ossis hamati;
 - bottom: retinaculum musculorum flexorum (separates Guyon's canal from the carpal tunnel), lig. pisohamatum et pisometacarpale;
 - ceiling: subcutaneous tissue, further distally m. palmaris brevis.
-
- contains n. ulnaris and vasa ulnaria

REGIO CARPALIS

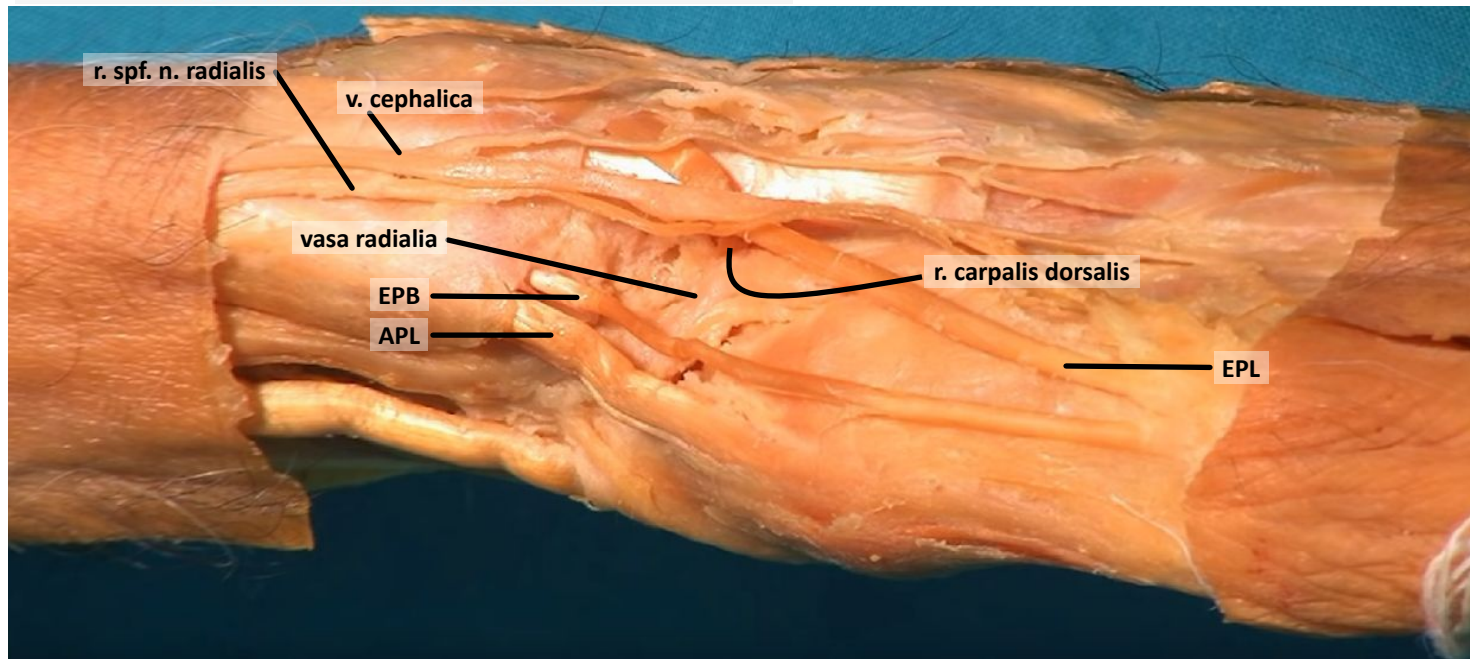
- dorsally: numerous tributaries of the cephalica and basilica veins
- under the layer of veins are the terminal branches of the spf. n. radialis and r. dorsalis n. ulnaris.
- deeper down are tendons and arteries.
- foveola radialis



TMEPL = TENDO M. EXTENSORIS POLLICIS LONGI
TMEPB = TENDO M. EXTENSORIS POLLICIS BREVIS
TMAPL = TENDO M. ABDUCTORIS POLLICIS LONGI

Martin Holek

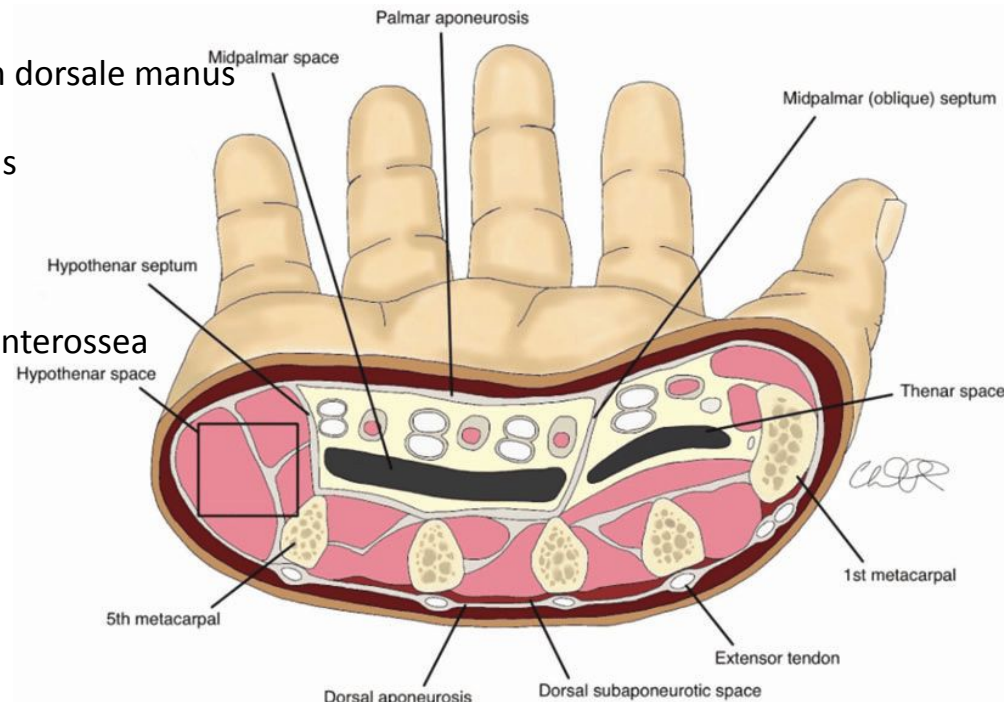
https://www.youtube.com/channel/UCf_WAKufmgCeAq2wQqxrTDw



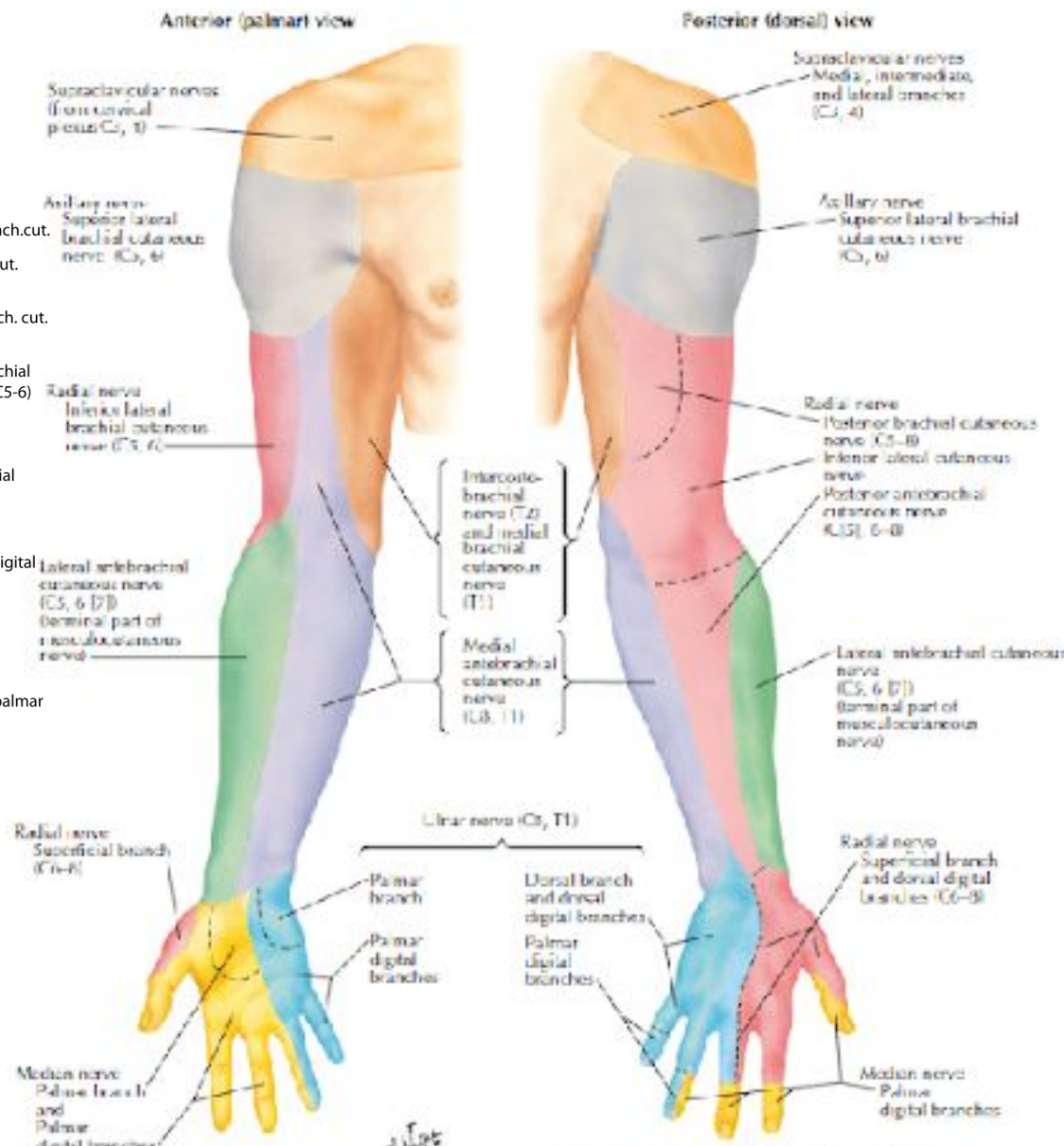
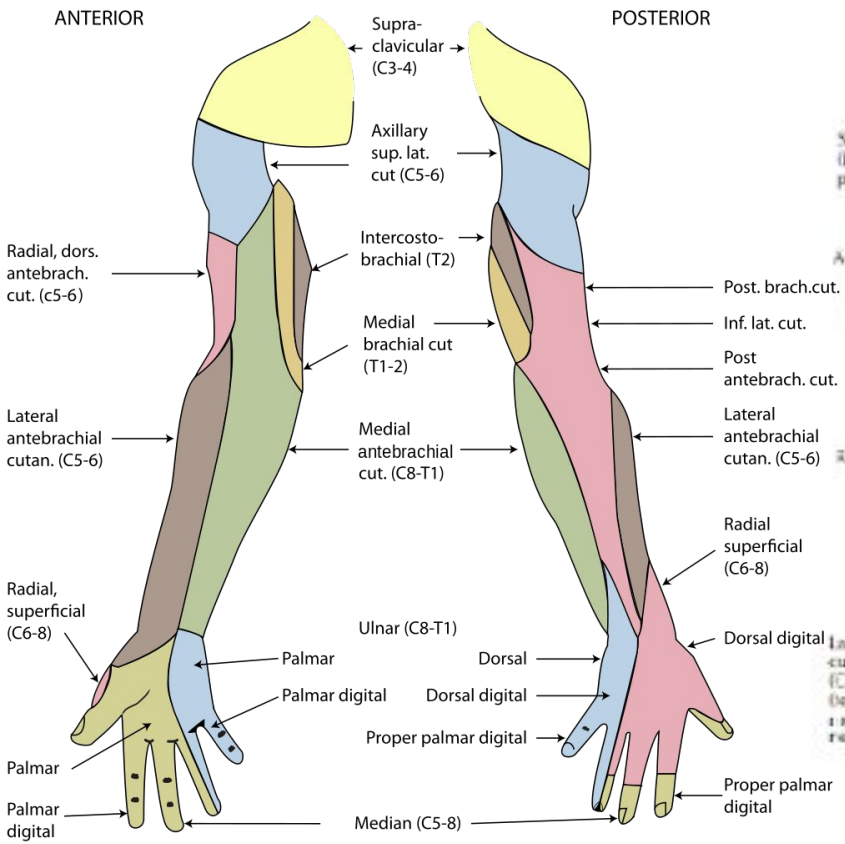
REGIO PALMARIS, REGIO DORSALIS MANUS

- in the range of metacarpals
- thenar – spatium palmare radiale covered by fascia, septum to the 3rd metacarpal
 - thenar muscles + FPL tendon in a fibrous sheath (between the heads of the FPB)
 - r. prof. a. radialis
- spatium palmare mediale, covered by palmar aponeurosis, bottom formed by fascia palmaris interossea
 - under aponeurosis is arcus palmaris spf.
 - then branches of the ulnar nerve and median nerve
 - then tendons (in the common flexor sheath) and lumbrical muscles
 - then palmar and dorsal interosseous muscles, in their palmar interosseous fascia runs the deep palmar arch and ulnar nerve
- hypothenar – spatium palmare ulnare covered by fascia, septum to the 5th metacarpal
 - muscles + r. prof. n. ulnaris
- subcutaneous tissue contains branches of r. palmaris n. ulnaris and n. mediani

- on the dorsum in the subcutaneous tissue rete venosum dorsale manus
- in women and children subcutaneous fat
- then branches of r. spf. n. radialis and r. dorsalis n. ulnaris
- then fascia dorsi manus
- then extensor tendons and connexus internentidnei
- then aa. metacarpales dorsales
- then mm. interossei dorales covered by fascia dorsalis interossea



SENSORY INNERVATION OF THE UPPER LIMB



Note: Division variable between ulnar and radial innervation on dorsum of hand and often splits with middle of 4th digit instead of 3rd digit as shown.

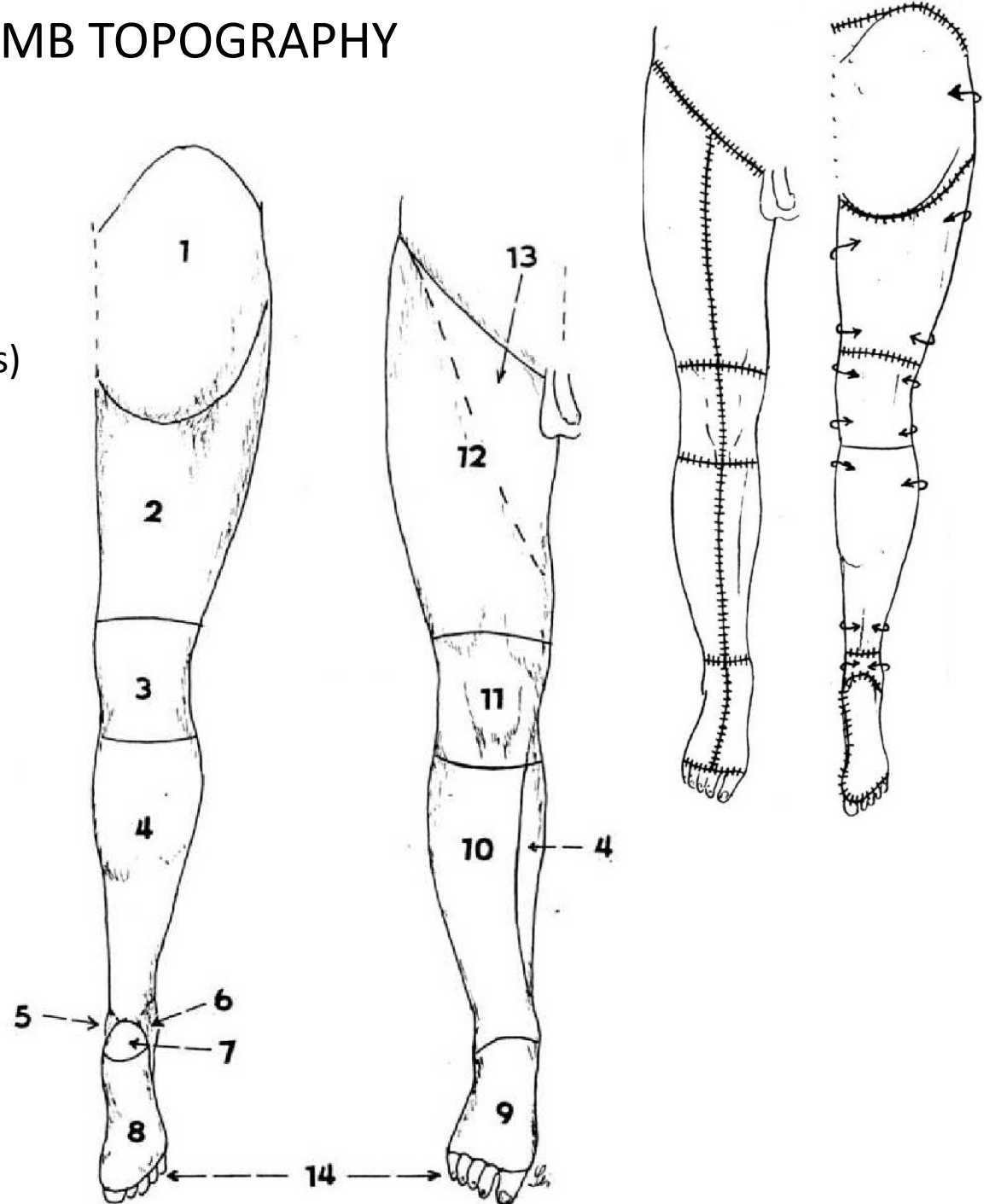
OVERVIEW OF THE LOWER LIMB TOPOGRAPHY

regiones

- glutealis
- femoris (anterior et posterior)
- genus (ant. et post.)
- cruris (ant. et post.)
- retromalleolaris (medialis et lateralis)
- dorsum pedis
- planta pedis

- lacuna musculorum et vasorum
- trigonum femorale s fossa iliopectinea
- canalis a hiatus adductorius
- fossa poplitea
- canalis musculofibularis (Hyrtl)

- | | | |
|----|---|------------------------------------|
| 1 | – | regio glutaea |
| 2 | – | regio femoris post. |
| 3 | – | regio genus post. (fossa poplitea) |
| 4 | – | regio cruris post. |
| 5 | – | regio retromaleolaris med. |
| 6 | – | regio retromaleolaris lat. |
| 7 | – | regio calcanea |
| 8 | – | regio plantaris (planta pedis) |
| 9 | – | regio dorsi pedis (dorsum pedis) |
| 10 | – | regio cruris ant. |
| 11 | – | regio genus ant. |
| 12 | – | regio femoris ant. |
| 13 | – | trigonum femorale |
| 14 | – | digiti (regio digitorum pedis) |



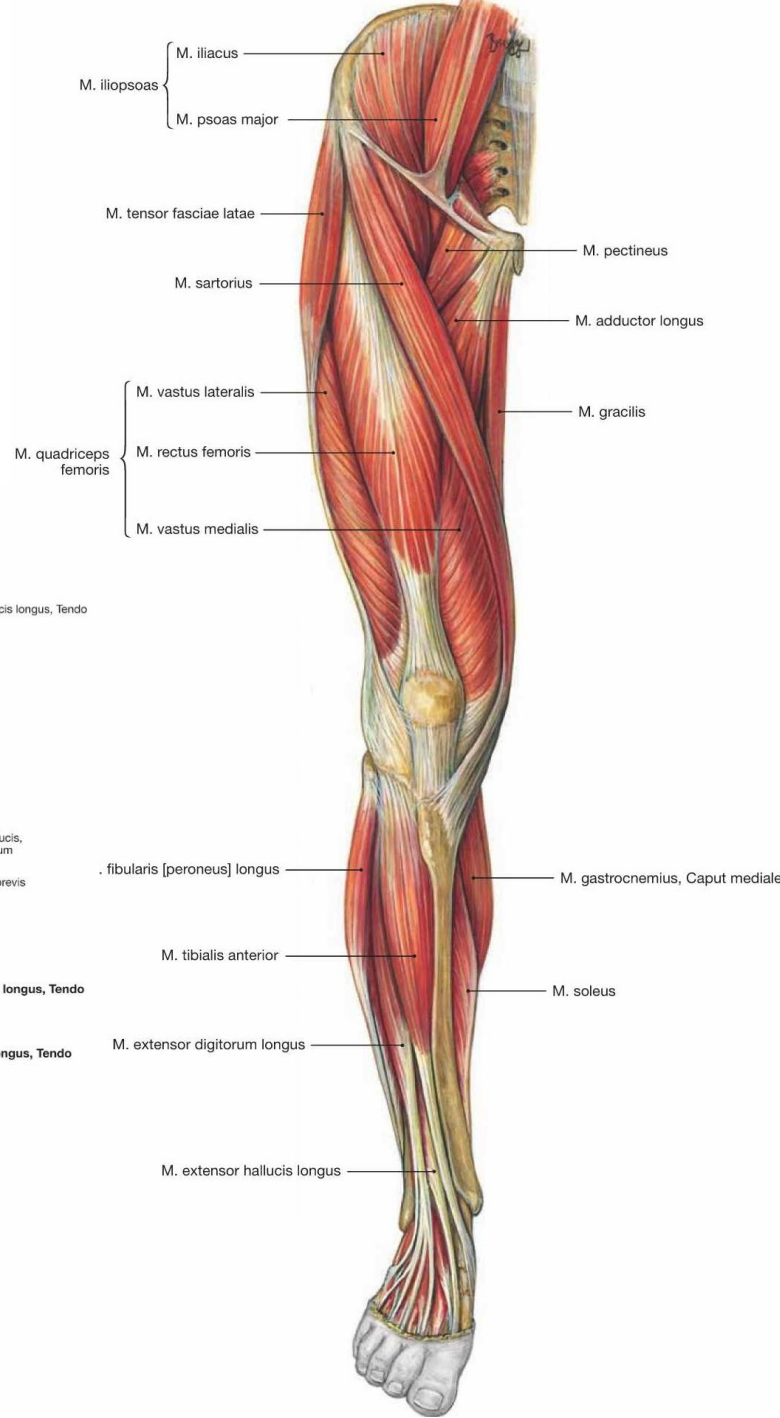
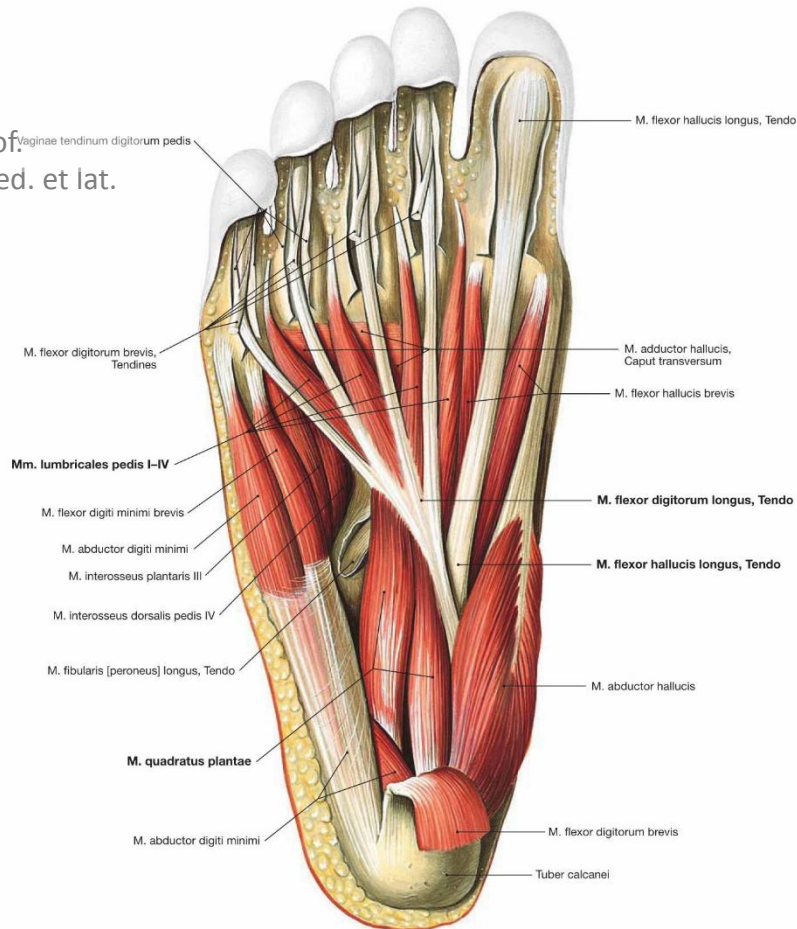
LOWER LIMB MUSCLES

- hip joint
- anterior plexus lumbalis, n. femoralis
 - posterior n. gluteus superior/inferior
 - mm. glutei
 - pelvitrochanteric plexus sacralis

- thigh
- ventral n. femoralis
 - medial n. obturatorius, +femoralis, +ischadicus
 - dorsal n. ischiadicus (depends on splitting height)

- leg
- anterior n. fibularis profundus
 - lateral n. fibularis superficialis
 - dorsal
 - superficial n. tibialis
 - deep

- foot
- dorsum n. fibularis prof.
 - planta n. plantaris med. et lat.
 - thenar
 - hypothenar
 - middle group
 - mm. interossei



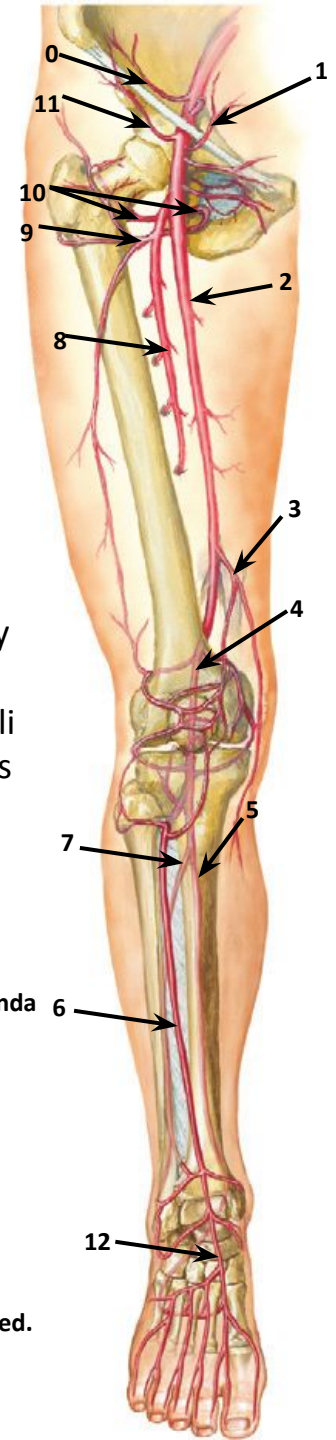
OVERVIEW OF THE ARTERIES OF LOWER EXTREMITY

- femoral artery

- continuation of a. iliaca externa in lacuna vasorum, from trigonum femorale through canalis adductorius to fossa poplitea
- with v. femoralis and n. femoralis
- projection of the course on the line connecting the center of lig. inguinale and medial condyle of femur

- popliteal artery

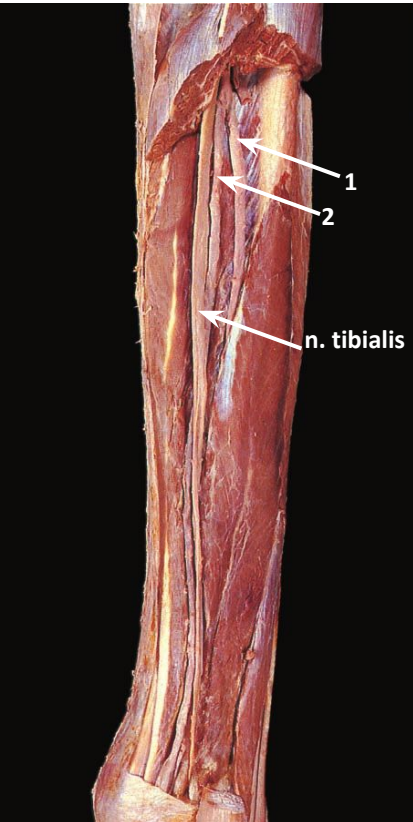
- continuation of the femoral artery from the adductor hiatus to the distal edge of the popliteus muscle
- with the popliteal vein and tibial nerve
- **anterior tibial artery** – through the interosseous membrane of the leg between the extensors, runs with two veins and the deep peroneal nerve, continues as the dorsal artery of the foot
- **posterior tibial artery** – from the distal edge of m. popliteus under arcus tendineus musculi solei, runs along the deep layer of flexors behind malleolus medialis into canalis malleolaris with two vv. and n. tibialis where it divides into medial and lateral plantar **arteries**; into canalis Hyrtl it gives **fibular artery**



- 0 a. circumflexa ilium profunda
- 1 a. epigastrica superficialis
- 2 a. femoralis
- 3 a. genus descendens
- 4 a. poplitea
- 5 a. tibialis posterior
- 6 a. tibialis anterior
- 7 a. fibularis
- 8 a. profunda femoris
- 9 a. cirumflexa femoris lat.
- 10 a. circumflexa femoris med.
- 11 a. circumflexa ilium spf.
- 12 a. dorsalis pedis

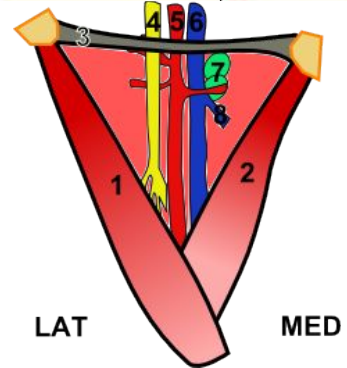
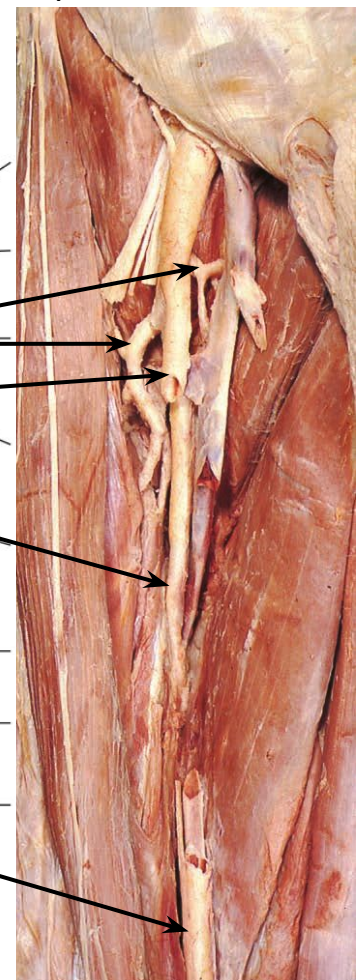
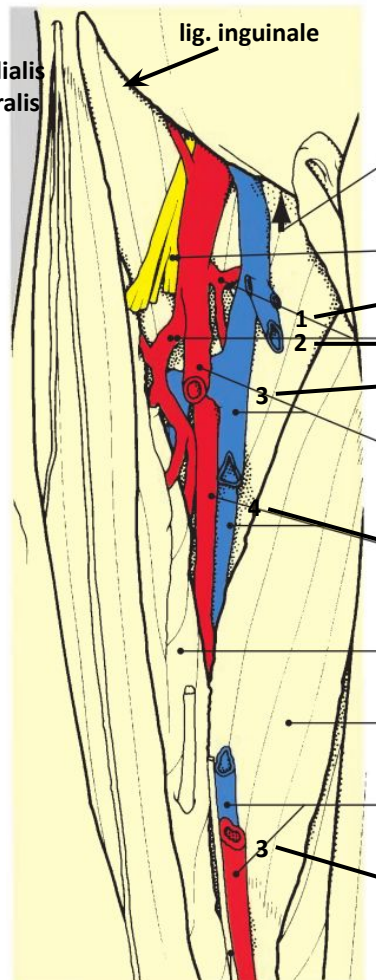
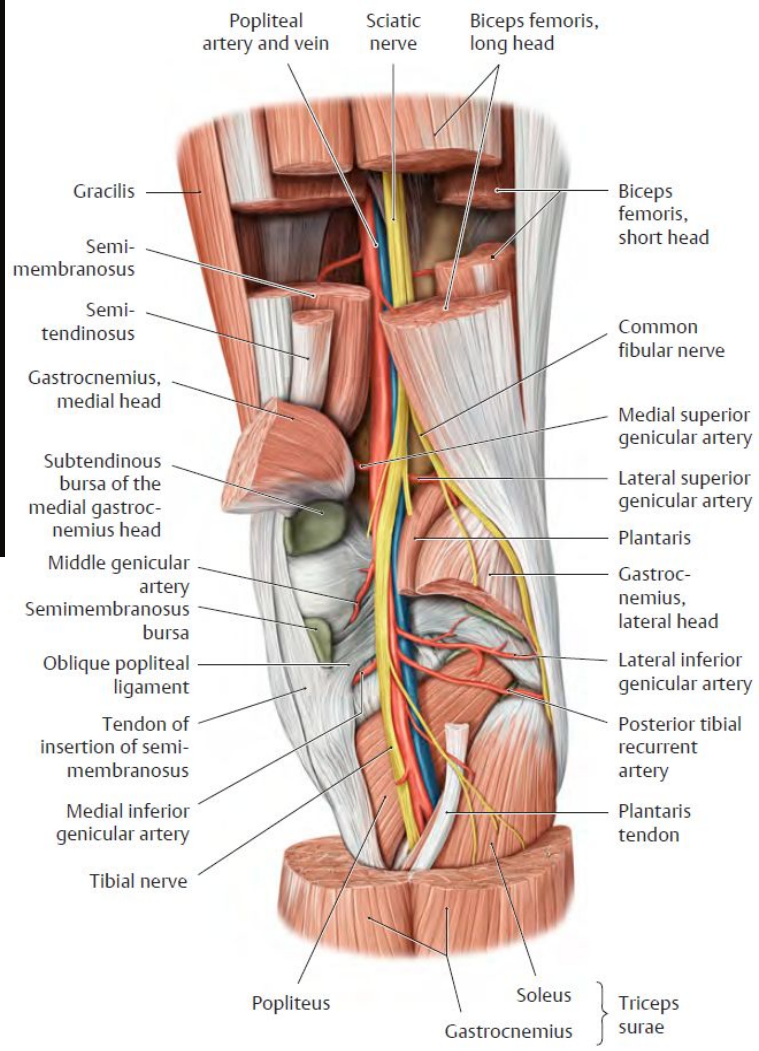
OVERVIEW OF THE ARTERIES OF LOWER EXTREMITY

trigonum femorale dextrum
and fossa iliopectinea



right leg
1. a. fibularis
2. a. tibialis posterior

1 a. circumflexa femoris medialis
2 a. circumflexa femoris lateralis
3 a. femoralis
4 a. profunda femoris



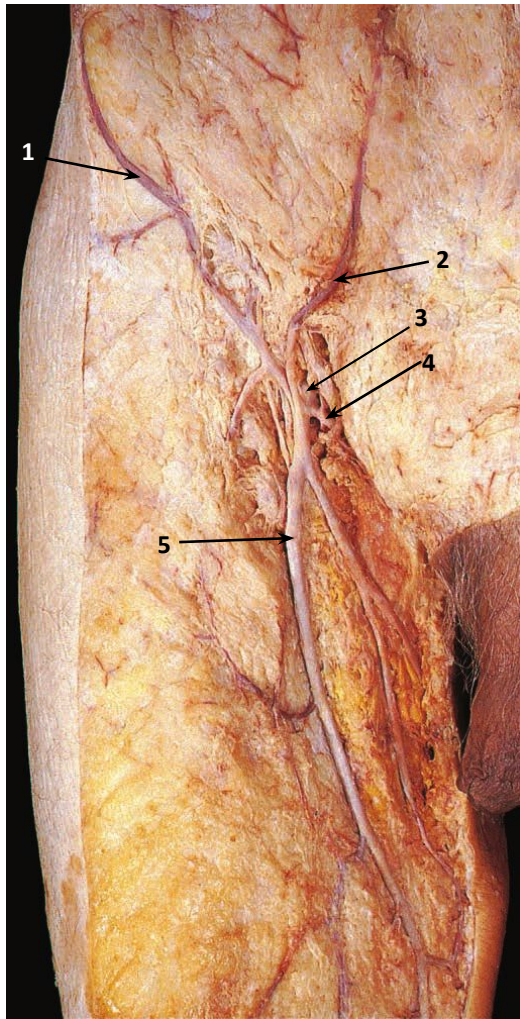
1 – m. sartorius
2 – m. adductor longus
3 – lig. inguinale
4 – n. femoralis
5 – a. femoralis
6 – v. femoralis
7 – nodi lymphatici inguinales profundi
8 – v. saphena magna



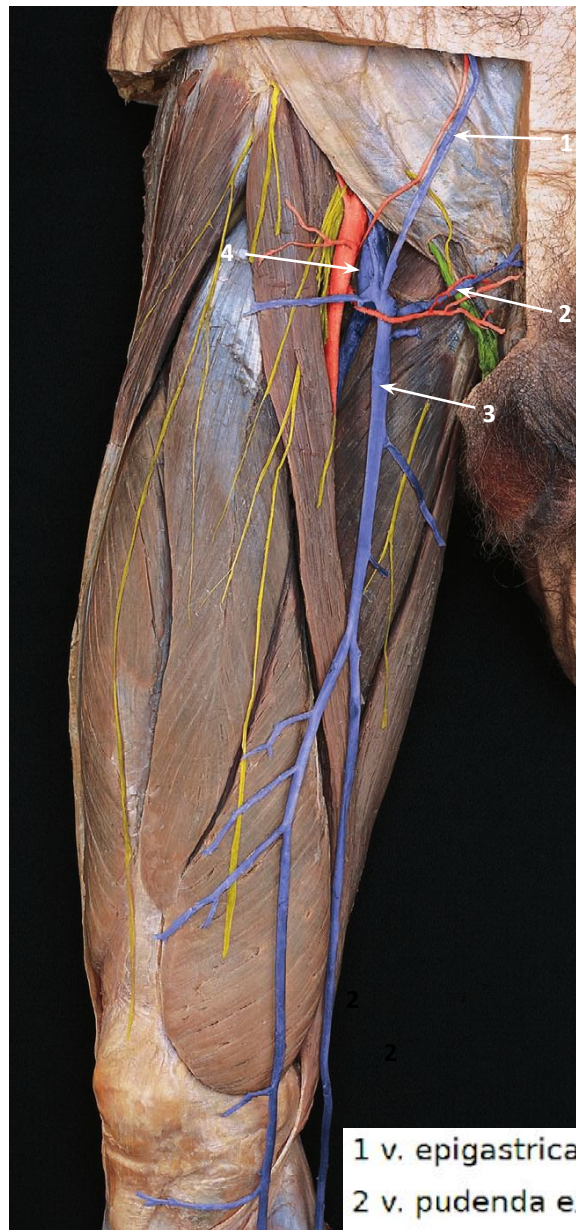
OVERVIEW OF THE VEINS OF THE LOWER LIMB

- superficial and deep system with valves
- **superficial system**
 - drained from the leg via the great saphenous vein (GSV) and small saphenous vein (SSV)
 - rete venosum dorsale pedis → arcus venosus dorsalis pedis → medial marginal vein (GSV) and lateral marginal vein (SSV)
 - VSM – begins in front of the medial malleolus, runs along the ventromedial side of the lower leg (with n. saphenus) to the knee, then to the hiatus saphenus through the fascia lata femoris to the v. femoralis
 - VSP – begins behind the lateral ankle, runs down the center of the back of the calf with the sural nerve, pierces the superficial fascia at the level of the popliteal fossa and flows into the popliteal vein between the heads of the gastrocnemius muscle
- **deep system**
 - accompanies arteries, often doubled
 - begins from vv. digitales plantares and vv. metatarsales plantares → (lower leg) vv. tibiales posteriores et anteriores and vv. fibulares → (thigh) v. profunda femoris and v. femoralis
- **perforating veins**
 - transfascial connections between the superficial and deep systems
 - mostly on the medial side of the lower leg

OVERVIEW OF THE VEINS OF THE LOWER LIMB

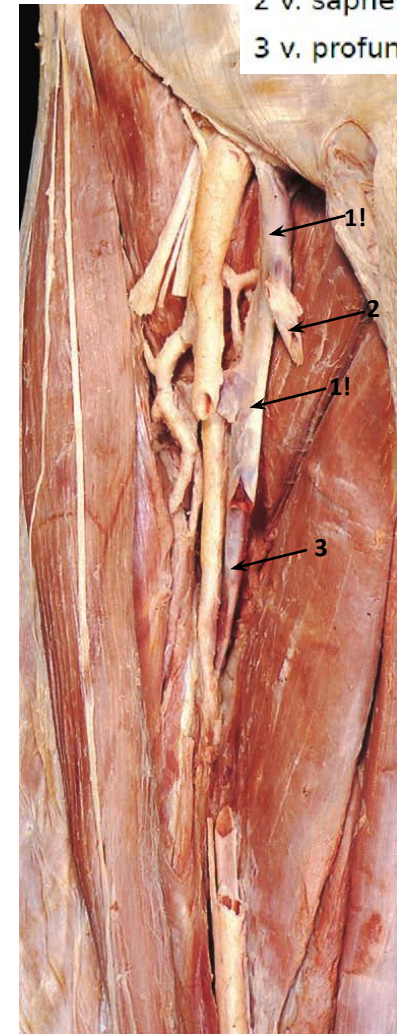


- 1 v. circumflexa ilium superficialis
- 2 v. epigastrica superficialis
- 3 v. femoralis
- 4 v. pudenda externa
- 5 v. saphena magna

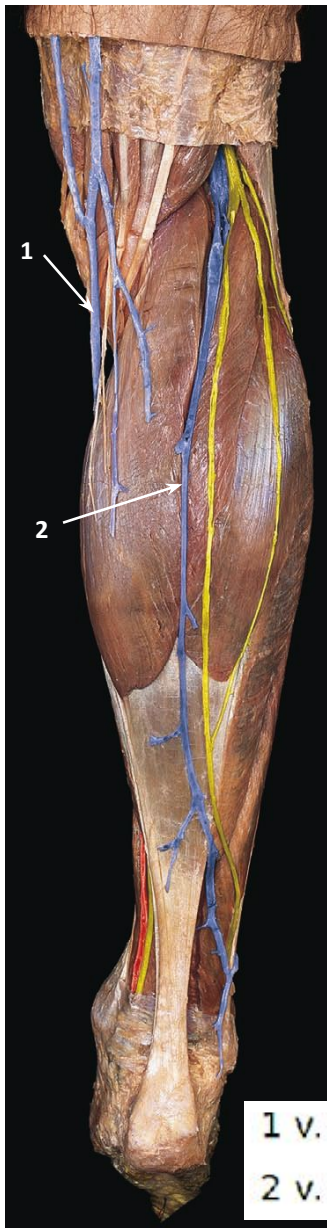


- 1 v. epigastrica superficialis
- 2 v. pudenda externa
- 3 v. saphena magna
- 4 v. femoralis

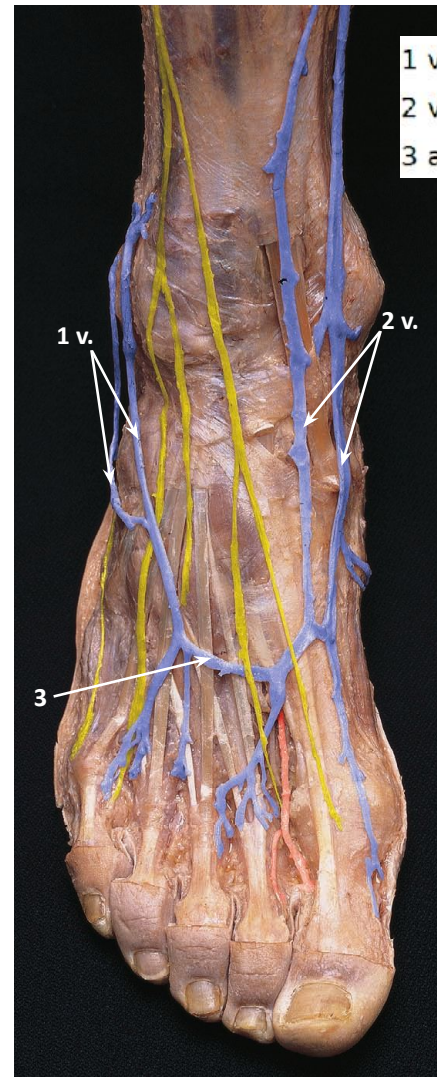
- 1 v. femoralis
- 2 v. saphena magna
- 3 v. profunda femoris



OVERVIEW OF THE VEINS OF THE LOWER LIMB



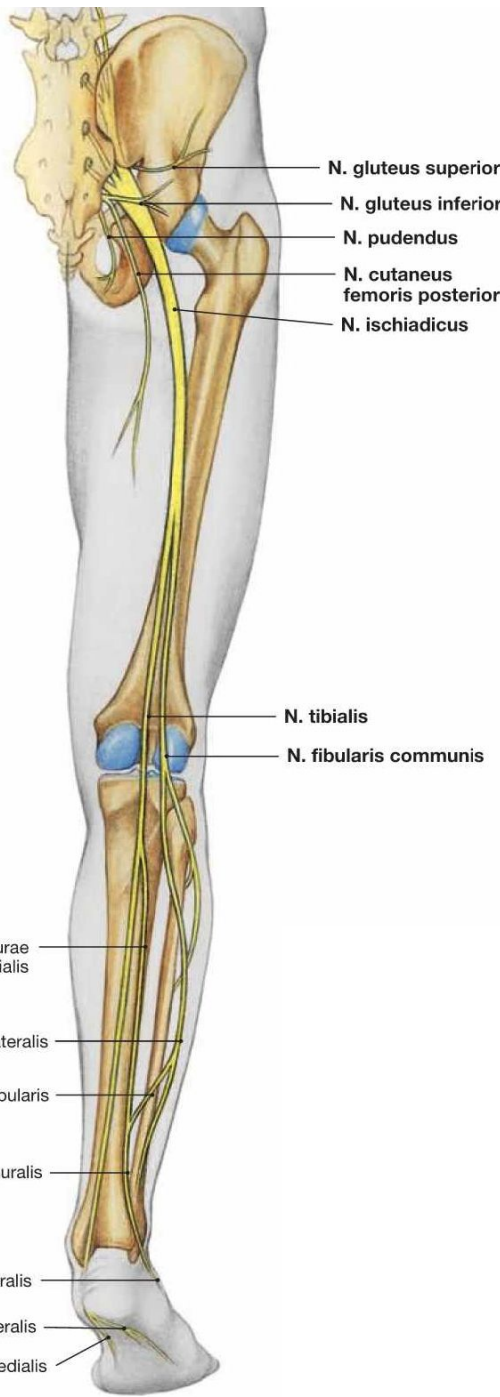
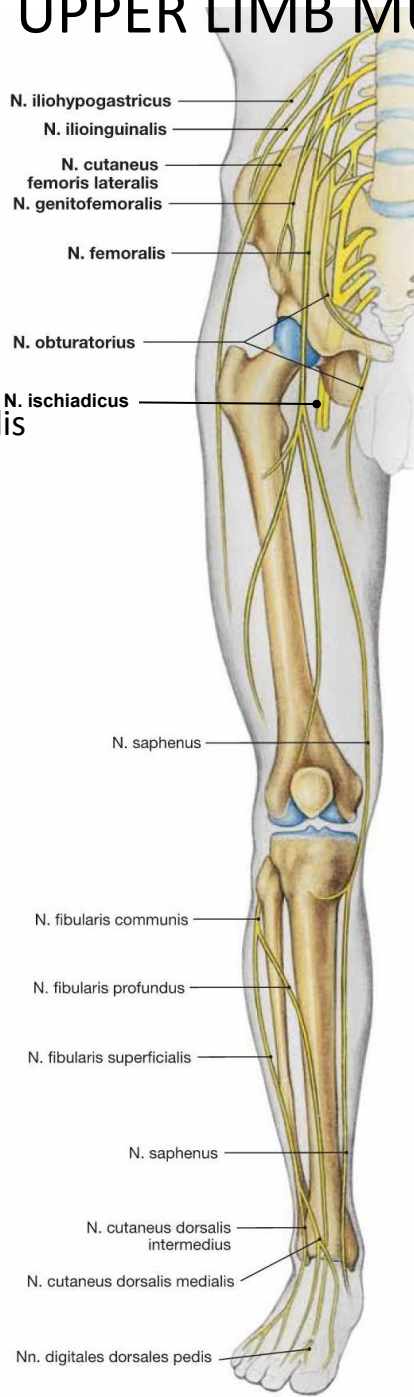
1 v. saphena magna
2 v. saphena parva



1 v. marginalis lateralis
2 v. marginalis medialis
3 arcus venosus dorsalis pedis

MOTOR INNERVATION OF THE UPPER LIMB MUSCLES

- n. femoralis
- n. obturatorius
- n. gluteus superior
- n. gluteus inferior
- n. ischiadicus
 - n. tibialis a n. fibularis communis
 - n. tibialis → n. plantaris medialis et lateralis
 - n. peroneus communis → n. fibularis superficialis et profundus



MOTOR INNERVATION OF THE UPPER LIMB MUSCLES

- **n. femoralis**
 - at the lateral edge of m. psoas major, descends in the groove between m. psoas and m. iliacus, through lacuna musculorum into fossa iliopectinea, where it divides into branches
- **n. obturatorius**
 - the only nerve of the plexus that emerges on the medial side of the m. iliopsoas, passes under the ramus superior ossis pubis into the canalis obturatorius, branches immediately after passing through
- **n. gluteus superior**
 - through the foramen suprapiriforme (with vasa glutea superior)
- **n. gluteus inferior**
 - through the foramen infrapiriforme (with vasa glutea inferior)
- **n. ischiadicus**
 - through the foramen infrapiriforme, descends under the m. gluteus maximus along the pelvitrochanteric muscles, then along the posterior surface of the m. adductor magnus under the flexors of the thigh, above the entrance to the fossa poplitea it divides into n. tibialis and n. peroneus (fibularis) communis
 - **n. tibialis** – through the center of the popliteal fossa, between the heads of the m. gastrocnemius (dorsally from the m. popliteus), passes under the arcus tendineus m. solei, descends with the vasa tibialia and the medial malleolus, passes under the retinaculum flexorum in the canalis malleolaris (anterior-posterior order of structures: m. tibialis posterior, m. flexor digitorum longus, v. et a. tibialis posterior, n. tibialis, m. flexor hallucis longus) and divides into two branches: n. plantaris medialis et lateralis
 - **n. fibularis communis** – after separating from n. ischiadicus, it descends along the medial edge of m. biceps femoris to the muscle attachment on caput fibulae, wraps around the neck of fibula from the outside and enters the beginning of m. fibularis longus, where it divides into final branches: n. fibularis superficialis (to the dorsum pedis) et profundus (anterior group of the lower leg)

n. saphenus

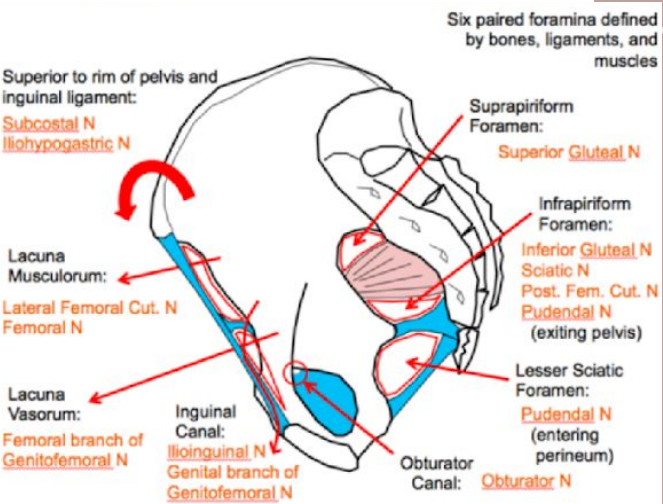
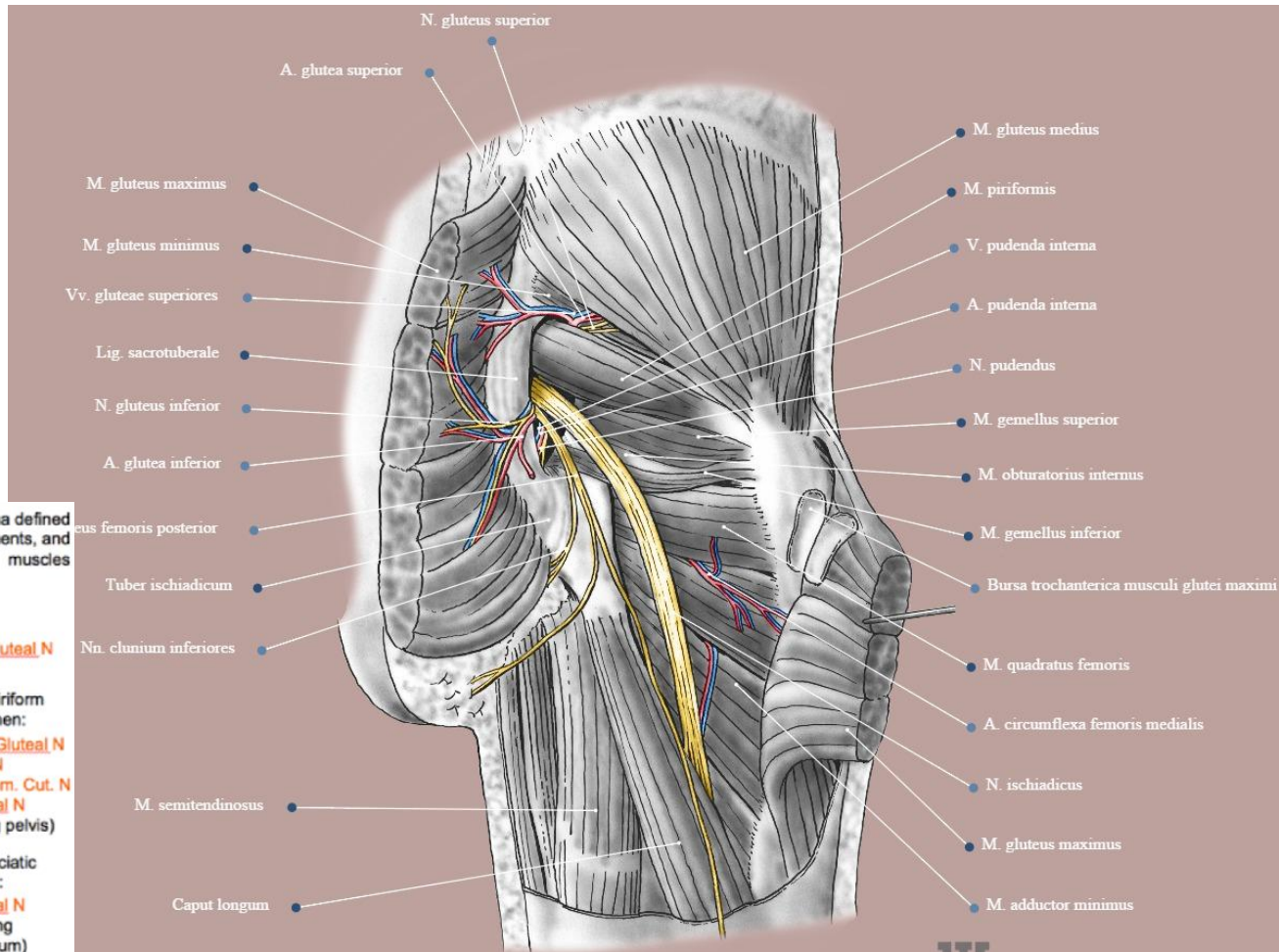
- sensory
- along the thigh together with the femoral artery into the adductor canal, leaving the artery at the level of the tibial tuberosity and piercing the vastoadductor lamina into the subcutaneous tissue, continuing along the anterior medial side of the lower leg, along the great saphenous vein in front of the medial ankle and onto the tarsus up to the navicular bone
- branches: infrapatellar branch, medial cutaneous branches of the leg

n. suralis

- sensory, formed by the union of
 - the fibularis communicans nerve (from the lateral cutaneous nerve of the calf or the common fibular nerve)
 - the medial cutaneous nerve of the calf (from the tibial nerve in the popliteal fossa in the middle of the calf)
- behind the outer ankle to the lateral edge of the foot as the lateral dorsal cutaneous nerve

REGIO GLUTEALIS

- borders: m. gluteus maximus a medius; medial – gluteal cleft, distal – sulcus glutealis, proximal– crista iliaca, lateral – vertical line from spina iliaca anterior superior
- contents: muscles (gluteal, pelvitrochanteric), fat, vessels (vasa glutea sup. et inf., vasa pudenda interna), nerves (n. ischiadicus, n. cutaneus femoris post. s nn. clunium), hip joint, bursa trochanterica m. glutei maximi (between the trochanter and the muscle tendon)
- palpable: spina iliaca ant. sup. and post. sup., trochanter major, tuber ischiadicum
- foramen suprapiriforme et infrapiriforme, foramen ischiadicum minus

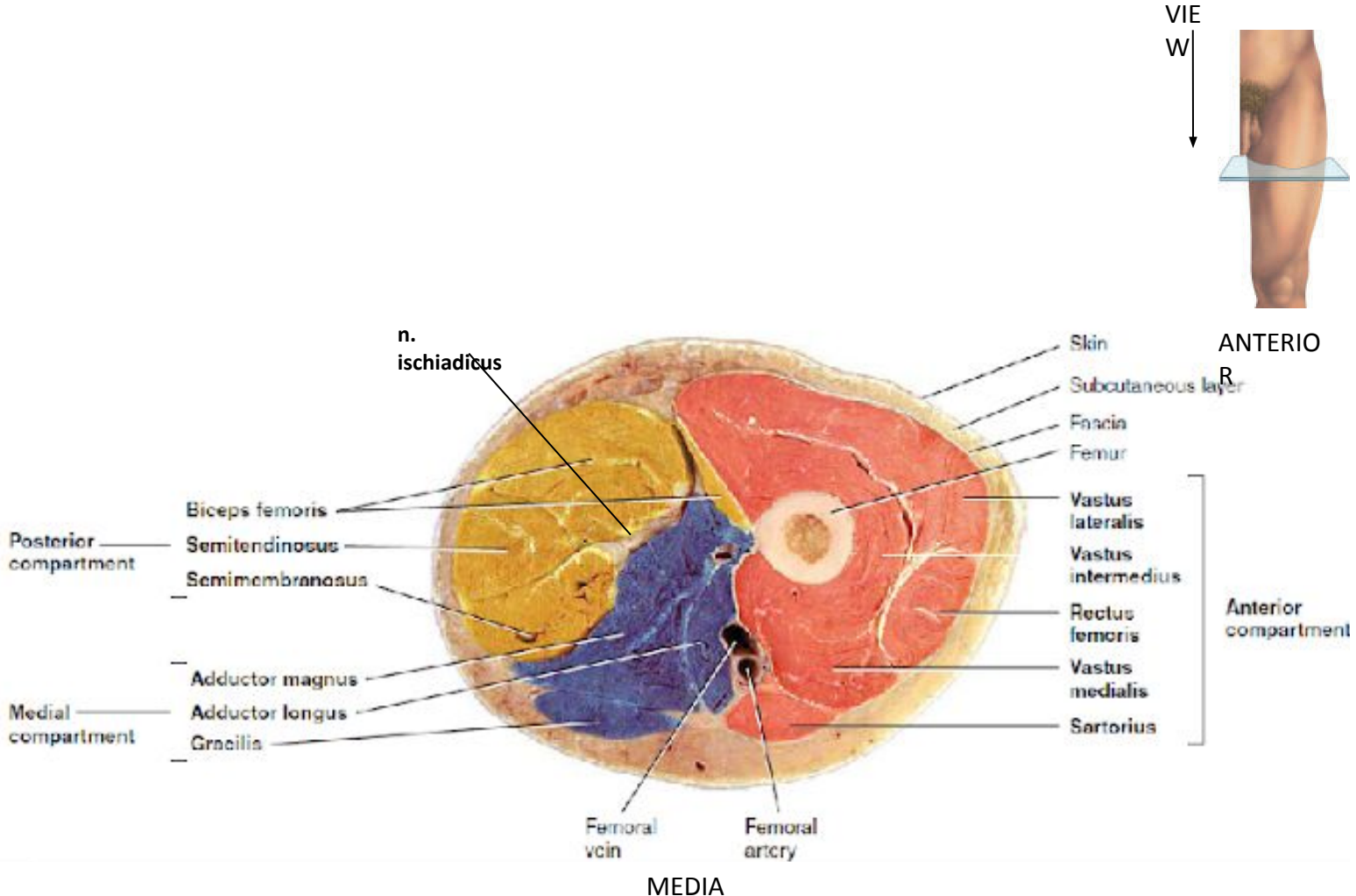


- 1 - m. gluteus max.
- 2 - m. gluteus medius
- 3 - m. gluteus minimus
- 4 - r. sup. a. glutealis sup. (+ veins)
- 5 - r. inf. a. glutealis sup. (+ veins)
- 6 - iliac crest
- 7 - n. ischiadicus (here "high" branching to the tibial nerve and common fibular nerve)
- 8 - n. tibialis
- 9 - m. quadratus femoris
- 10 - m. gemellus inf.
- 11 - m. obturatorius int.
- 12 - common insertion of m. gemellus sup. and m. piriformis
- 13 - m. piriformis
- 14 - vasa glutea inf.
- 15 - n. pudendus

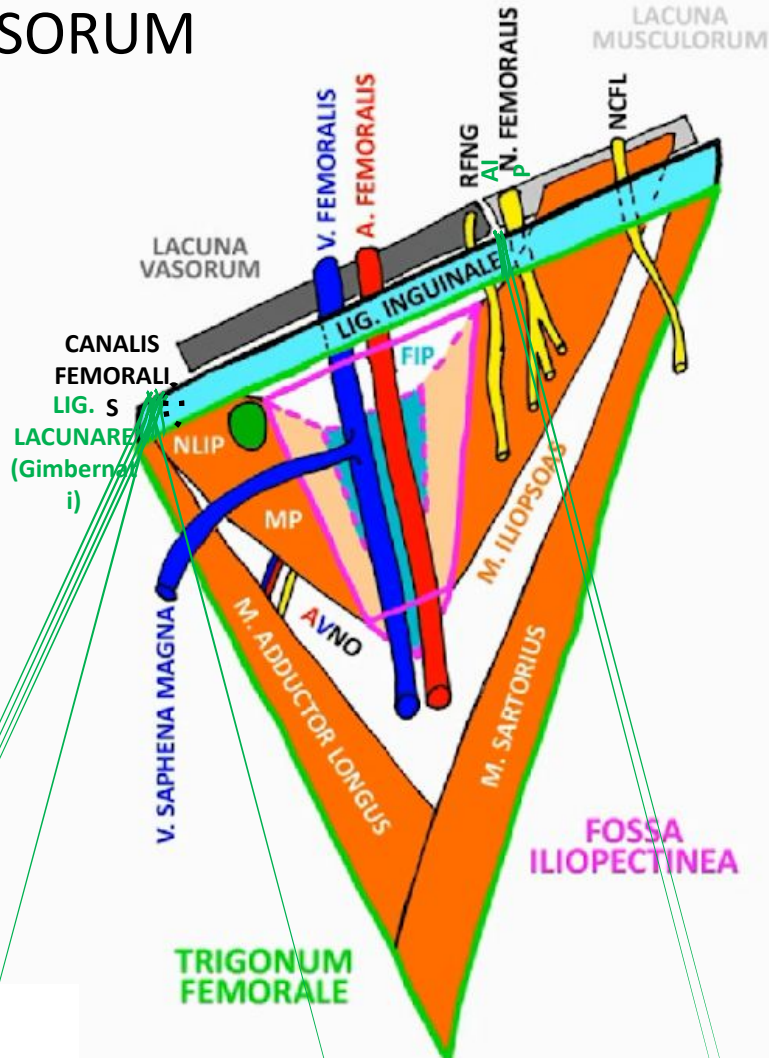
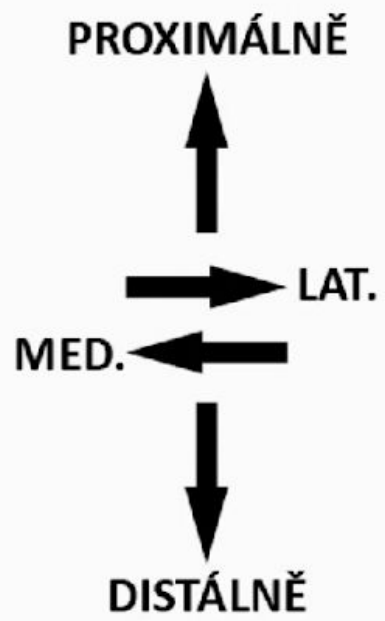


REGIO FEMORIS ANTERIOR ET POSTERIOR

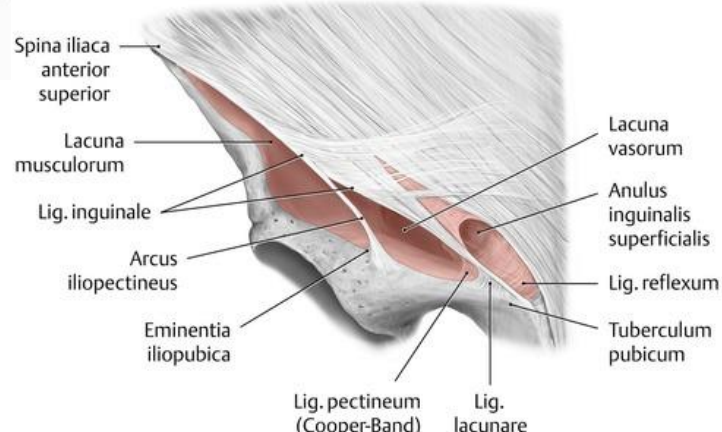
- borders: proximal – sulcus inguinalis, sulcus genitofemoralis, sulcus gluteus, distal – three finger widths above the patella
- divided by the adductor magnus muscle and the lateral femoral intermuscular septum into anterior and posterior parts
- muscles covered by the fascia lata
- lacuna musculorum et vasorum, femoral canal
- femoral triangle, iliopectineal fossa, saphenous hiatus (weakening of the fascia lata), adductor canal (of Hunter)



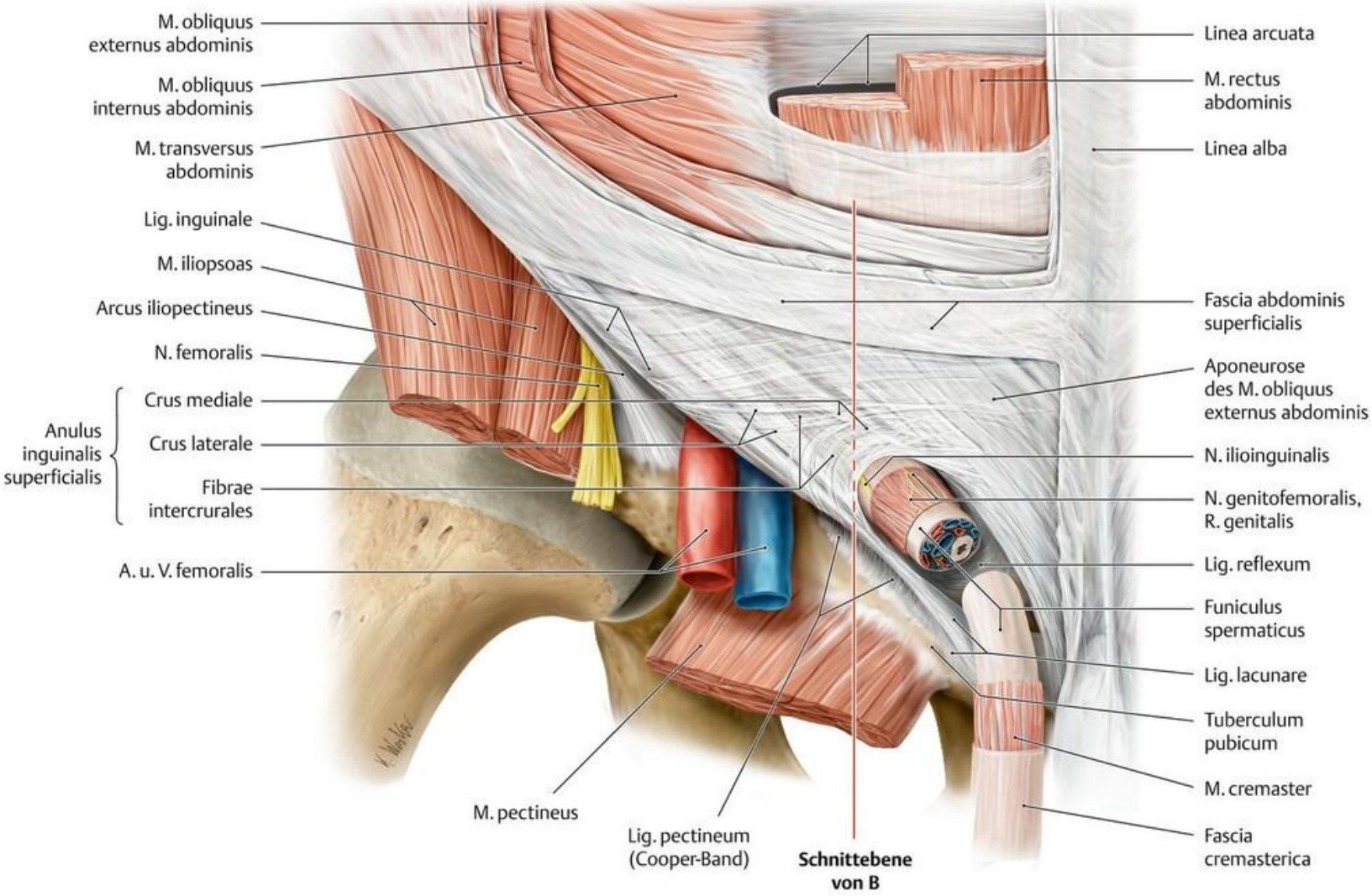
LACUNA MUSCULORUM ET VASORUM



RFNG = R. FEMORALIS N. GENITOFEMORALIS
 NCFL = N. CUTANEUS FEMORIS LAT.
 NLIP = NODI LYMPHOIDEI INGUINALES PROFUNDI
 MP = M. PECTINEUS
 FIP = FASCIA ILIOPECTINEA
 AVNO = A., V. ET N. OBTURATORIUS



LACUNA MUSCULORUM ET VASORUM



M. obliquus externus abdominis

M. obliquus internus abdominis

M. transversus abdominis

Lig. inguinale

M. iliopsoas

Arcus iliopectineus

N. femoralis

Anulus inguinalis superficialis

- Crus mediale
- Crus laterale
- Fibrae intercrurales

A. u. V. femoralis

M. pectineus

Lig. pectineum (Cooper-Band)

Schnittebene von B

Linea arcuata

M. rectus abdominis

Linea alba

Fascia abdominis superficialis

Aponeurose des M. obliquus externus abdominis

N. ilioinguinalis

N. genitofemoralis, R. genitalis

Lig. reflexum

Funiculus spermaticus

Lig. lacunare

Tuberculum pubicum

M. cremaster

Fascia cremasterica

TRIGONUM FEMORALE A FOSSA ILIOPECTINEA



www.atlasloveka.upol.cz

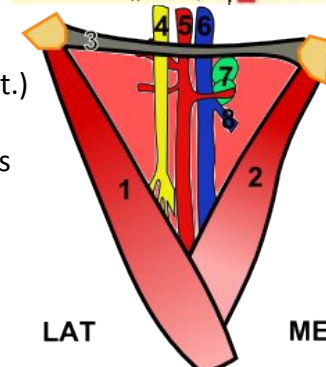
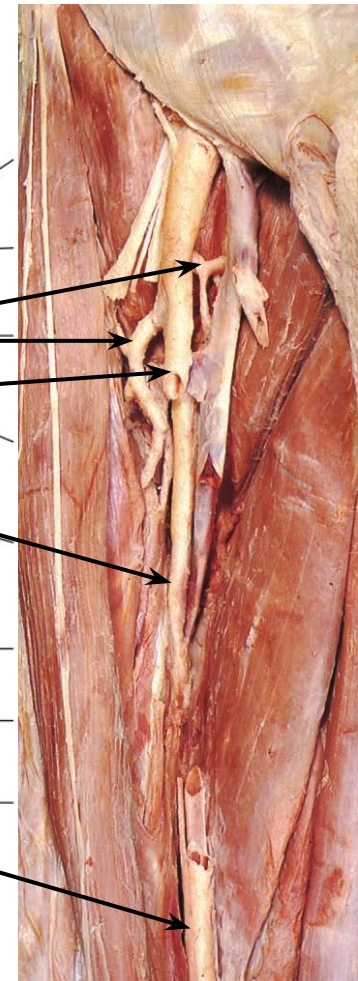
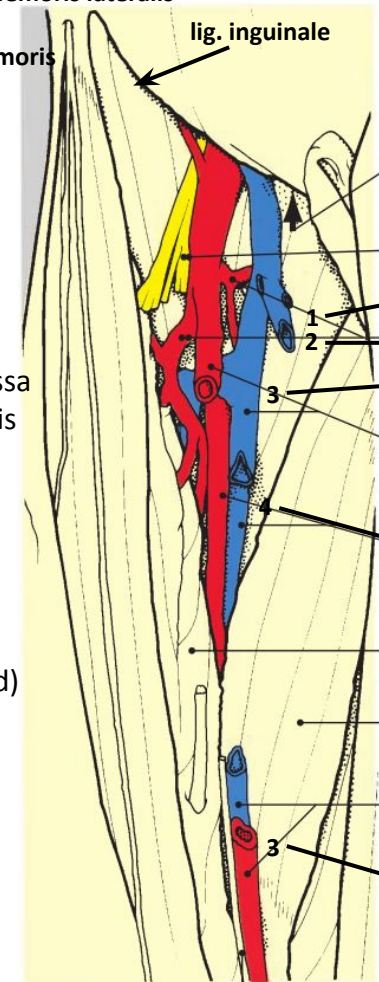
canalis adductorius (Hunteri)

- m. adductor longus (medial)
- m. vastus medialis (lateral)
- m. adductor magnus (dorsal)
- lamina vastoadductoria (ventral)
- over runs m. sartorius
- contents: vasa femoralia (into fossa poplitea, n. saphenus (into subcutis on the leg))

- 1 - m. tensor fasciae latae
- 2 - m. vastus intermedius
- 3 - m. rectus femoris (cut and tilted)
- 4 - m. sartorius (cut and tilted)
- 5 - m. iliopsoas
- 6 - m. adductor longus
- 7 - m. pectineus
- 8 - v. femoralis
- 9 - a. femoralis
- 10 - a. circumflexa femoris lat.
- 11 - r. desc. (a. circumflexa femoris lat.)
- 12 - r. asc. (a. circumflexa femoris lat.)
- 13 - a. profunda femoris
- 14 - confluens venosus subinguinalis (Cockett's venous star)
- 15 - vv. pudendae ext.
- 16 - r. transversus (a. circumflexa femoris lat.)
- 17 - m. vastus lat

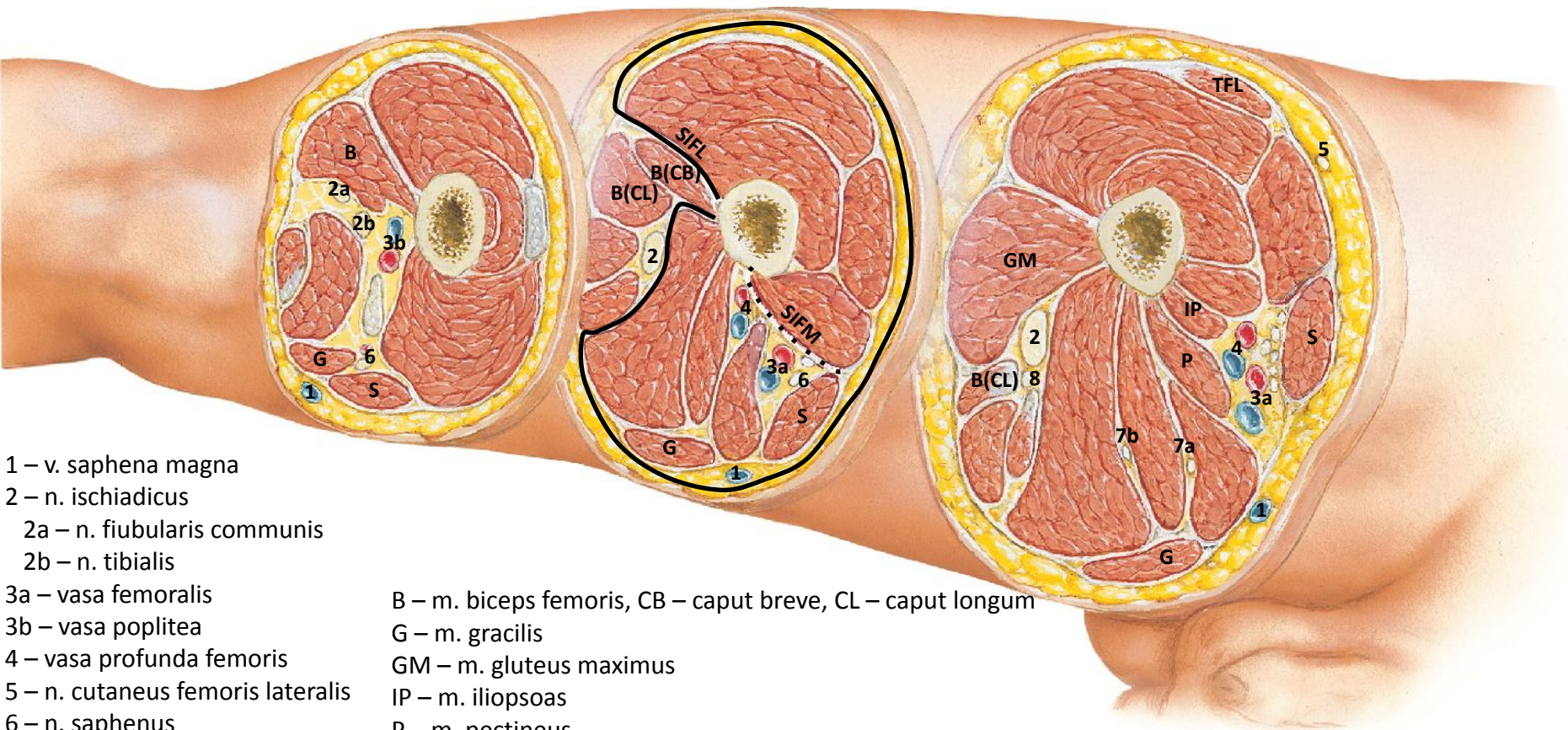
- 1 a. circumflexa femoris medialis
- 2 a. circumflexa femoris lateralis
- 3 a. femoralis
- 4 a. profunda femoris

right trigonum femorale with fossa iliopectinea



- 1 - m. sartorius
- 2 - m. adductor longus
- 3 - lig. inguinale
- 4 - n. femoralis
- 5 - a. femoralis
- 6 - v. femoralis
- 7 - nodi lymphatici inguinales profundi
- 8 - v. saphena magna

REGIO FEMORIS ANTERIOR ET POSTERIOR

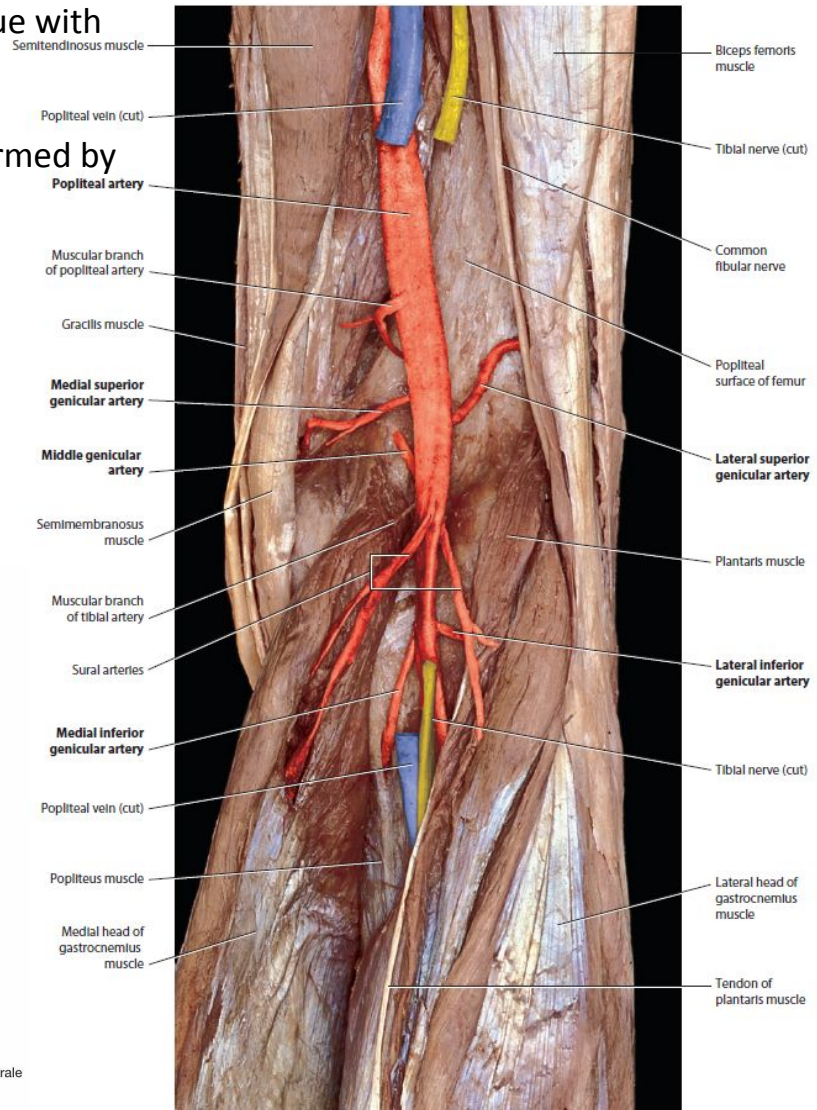
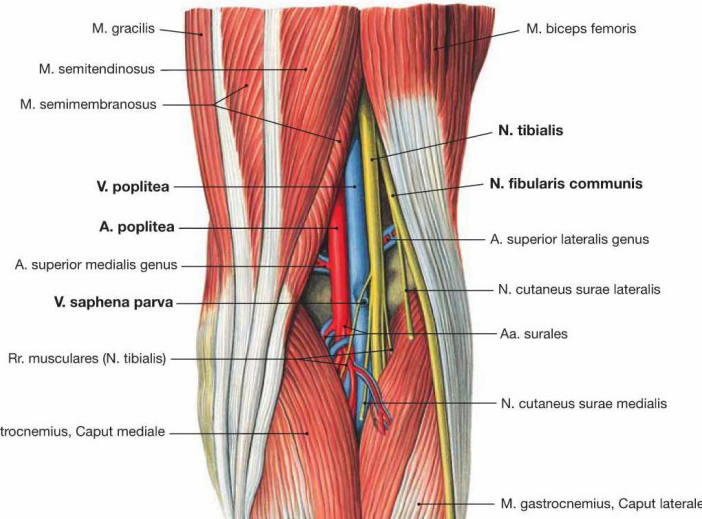
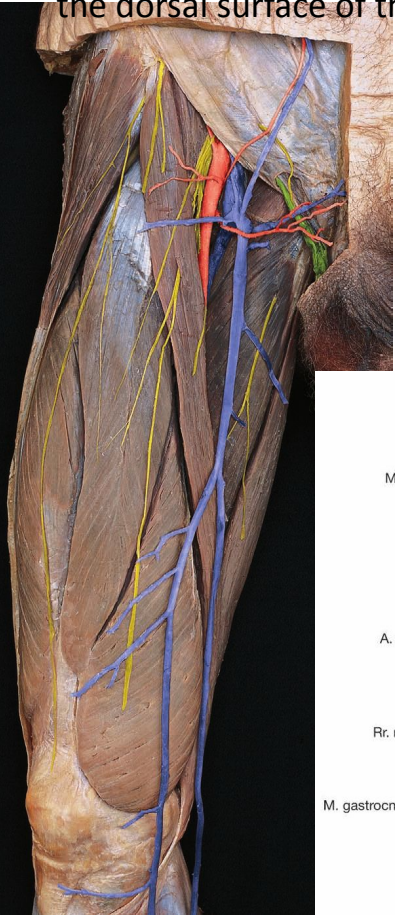


- 1 – v. saphena magna
- 2 – n. ischiadicus
- 2a – n. fibularis communis
- 2b – n. tibialis
- 3a – vasa femoralis
- 3b – vasa poplitea
- 4 – vasa profunda femoris
- 5 – n. cutaneus femoris lateralis
- 6 – n. saphenus
- 7a – n. obturatorius (r. spf.)
- 7b – n. obturatorius (r. prof.)
- 8 – n. cutaneus femoris posterior

- B – m. biceps femoris, CB – caput breve, CL – caput longum
- G – m. gracilis
- GM – m. gluteus maximus
- IP – m. iliopsoas
- P – m. pectineus
- S – m. sartorius
- SIF – septum intermusculare femoris, M – mediale, L – laterale
- TFP – m. tensor fascie late

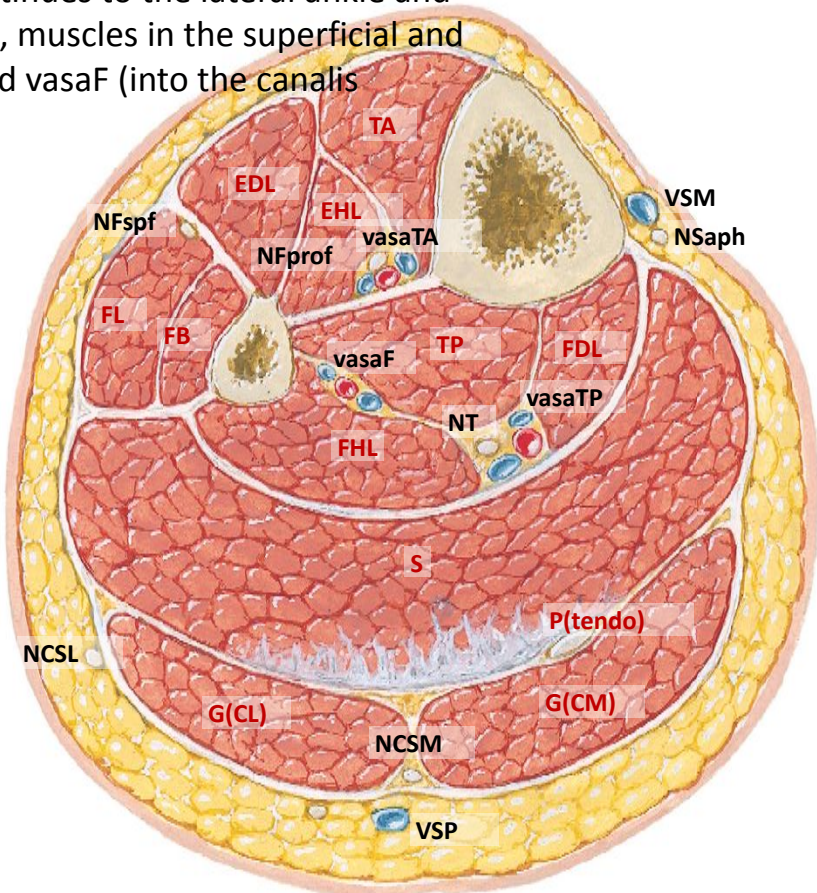
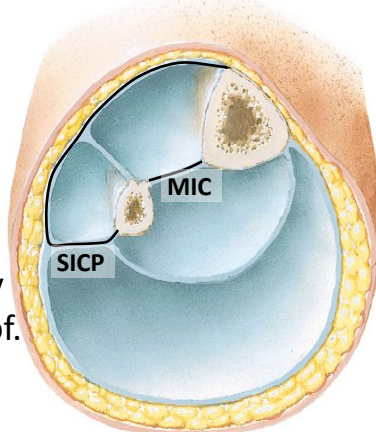
REGIO GENUS ANTERIOR ET POSTERIOR

- boundaries: three fingers above the patella to the tuberositas tibiae
- contents: anteriorly the knee joint, posteriorly the popliteal fossa;
 - anterior: anterior – tendon of the quadriceps femoris with patella, bursa, medial – great saphenous vein with saphenous nerve (at the posterior edge of the sartorius muscle tendon) and pes anserinus, lateral – iliotibial tract
 - posterior: medial and lateral – tendons of the knee flexors (proximally) and the gastrocnemius muscle (distally), in the middle – fatty tissue with v. saphena parva and n. cutaneus surae medialis
- popliteal fossa bordered by the biceps femoris, semitendinosus, semimembranosus, and gastrocnemius muscles; the bottom is formed by the dorsal surface of the knee joint with the popliteus muscle



REGIO CRURIS ANTERIOR ET POSTERIOR

- boundaries: from the tuberosity of the tibia to the upper edge of the ankle, divided by the tibia, interosseous membrane of the lower leg, fibula, posterior intermuscular septum of the lower leg
- contents
 - anterior: v. saphena magna with n. saphenus (both anteromedially), laterally n. fibularis spf., branches of n. cutaneus surrae lateralis, muscles of the anterior and lateral groups separated by septum intermusculare cruris anterius, deep vasa tibialis ant. (through MIC) with n. fibularis prof. (through SICA and EDL, distally to dorsum pedis externally), n. fibularis spf. (through FL, distally piercing the fascia and to dorsum pedis in medial and lateral branches)
 - posterior: v. saphena parva through the fascia with NCSM to fossa poplitea, NCSM receives r. communicans fibularis on the calf – n. suralis is formed, which continues to the lateral ankle and further to the lateral dorsum pedis as n. cutaneus dorsalis lateralis, muscles in the superficial and deep layers separated by septum, in depth vasa TA with NFprof and vasaF (into the canalis musculofibularis Hyrtl)



REGIO CRURIS

- 1 - m. peroneus (fibularis) longus
- 2 - m. peroneus (fibularis) longus tendon
- 3 - m. peroneus (fibularis) brevis
- 4 - m. extensor digitorum longus
- 5 - m. extensor hallucis longus
- 6 - m. tibialis ant.
- 7 - mm. gastrocnemii (part of m. triceps surae)
- 8 - m. soleus (part of m. triceps surae)
- 9 - tendo calcaneus (Achilles tendon)
- 10 - tuber calcanei
- 11 - n. suralis
- 12 - v. saphena parva

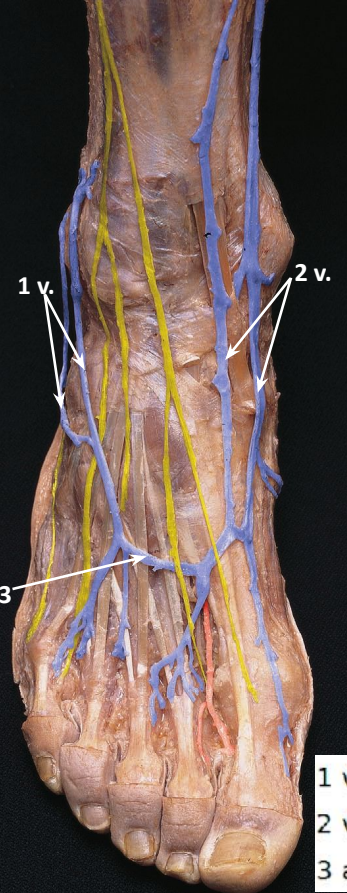


- 1 - tendo calcaneus (Achilles tendon)
- 2 - m. soleus
- 3 - mm. gastrocnemii
- 4 - m. semimembranosus
- 5 - m. sartorius
- 6 - m. flexor digitorum longus
- 7 - m. flexor hallucis longus
- 8 - v. poplitea
- 9 - a. tibialis post.
- 10 - n. tibialis
- 11 - n. saphenus
- 12 - r. infrapatellaris (sensory branch of n. saphenus)



REGIO RETROMALLEOLARIS MEDIALIS ET LATERALIS

- boundaries: the band between the ankles and the Achilles tendon, divided into medial and lateral parts
- **anterior** to the inner ankle, v. saphena magna with n. saphenus
- contents
 - medial: thickened fascia retinaculum musculorum flexorum, below it TiDiVANHa (tendons with muscle sheaths), the bottom is formed by the posterior part of lig. collaterale mediale (deltoideum), at the insertion of the Achilles tendon bursa
 - lateral: v. saphena parva with n. suralis, retinaculum musculorum fibularium superius et inferius, beneath them tendons mm. fibulares in synovial sheaths, the bottom is formed by lig. collaterale laterale



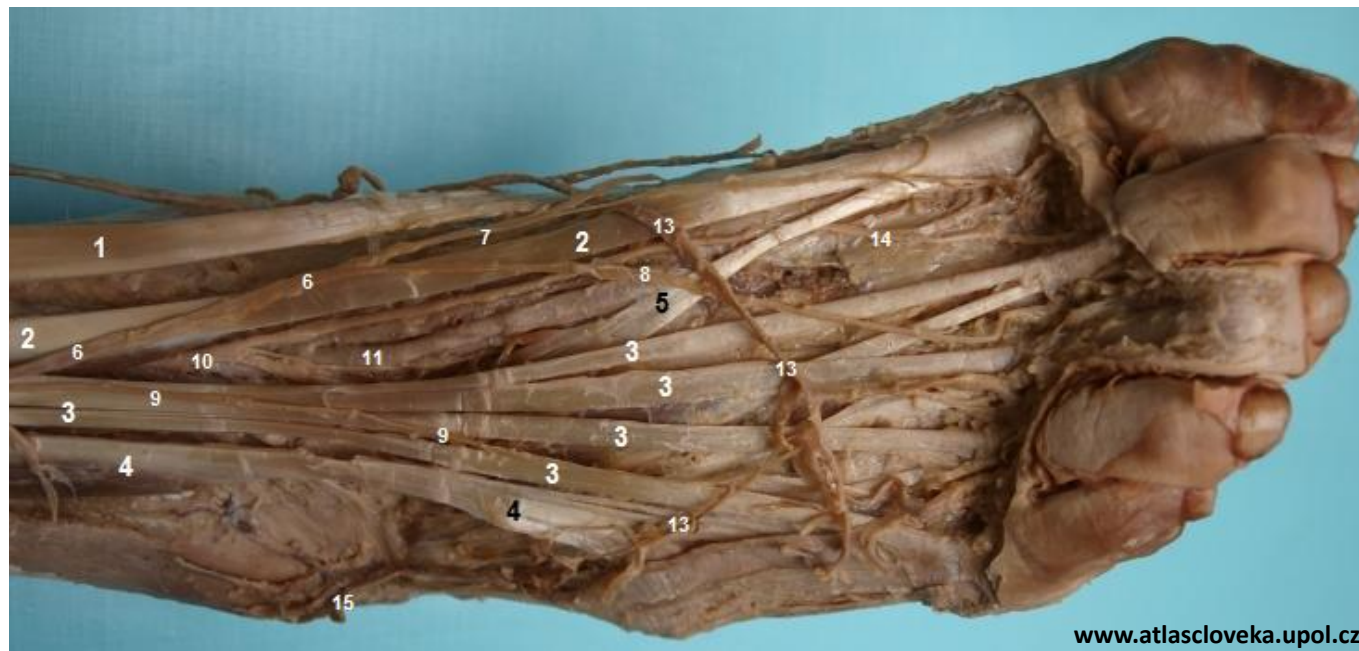
1 v. marginalis lateralis
 2 v. marginalis medialis
 3 arcus venosus dorsalis pedis

- 1 - m. tibialis post.
- 2 - m. flexor digitorum longus
- 3 - n. tibialis
- 4 - n. plantaris med.
- 5 - n. plantaris lat.
- 6 - a. tibialis post.
- 7 - m. flexor hallucis longus
- 8 - vv. tibiales post.



DORSUM PEDIS

- boundaries: from the lower edge of the ankle to the interdigital creases
- palpable: parts of the talus, navicular bone, tuberosity of the fifth metatarsal bone (Chopart and Lisfranc positions)
- contents: rete venosum dorsale pedis (origin of VSM medially and in front of the ankle and VSP laterally and behind the ankle), then sensory nerves (from NFS n. cutaneus dorsalis medialis and intermedius, end of n. suralis: n. cutaneus dorsalis lateralis), fascia thickened in retinaculum mm. extensorum inferius – below it, extensor tendons in synovial sheaths with vasa dorsalis pedis and end of NFP (nn. digitales dorsales pedis) and short extensors, followed by fascia interossea dorsalis pedis (covers mm. interossei dorsales and facies dorsalis metatarsals)



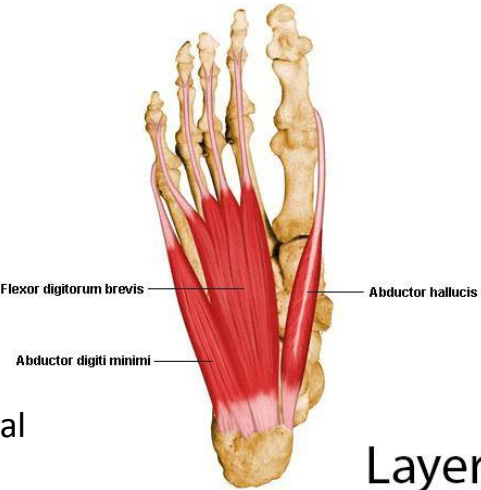
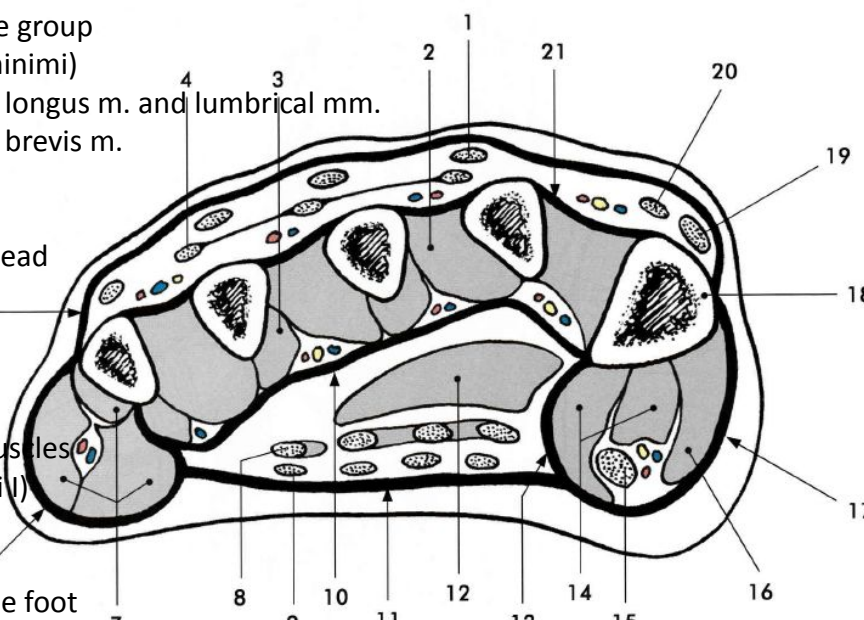
- 1 - m. tibialis ant. tendon
- 2 - m. extensor hallucis longus tendon
- 3 - m. extensor digitorum longus tendons
- 4 - m. peroneus (fibularis) tertius (var.)
- 5 - m. extensor hallucis brevis
- 6 - n. cutaneus dorsi pedis medialis (branch of n. peroneus (fibularis) spf.)
- 7 - nn. digitales dors. (for medial side of the big toe)
- 8 - nn. digitales dors. (for the 2nd interdigital space)
- 9 - n. cutaneus dorsi pedis intermedius (branch of n. peroneus (fibularis) spf.)
- 10 - n. peroneus (fibularis) prof.
- 11 - a. dorsalis pedis
- 13 - arcus venosus dorsalis pedis
- 14 - n. peroneus (fibularis) prof.
- 15 - n. suralis

PLANTA PEDIS

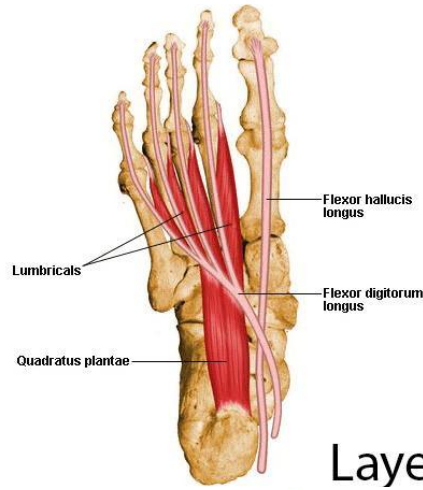
- arched longitudinally and transversely with the apex at the navicular bone
- superficial fascia thickened in the plantar aponeurosis, thin septa (medial and lateral) converge from the aponeurosis to the 1st and 5th metatarsals, supplemented by the muscle fasciae of the little toe and big toe connected in the middle by the plantar interosseous fascia (separating the intermetatarsal space) → sole divided into 3 sections
- medial: thenar muscles with MTP, MFDL, MFHL tendons
- lateral: hypothenar muscles
- middle: muscles and tendons in three layers, two neurovascular bundles (posterior tibial artery and tibial nerve divide into medial and lateral branches behind the medial malleolus)

Cross-section of the foot

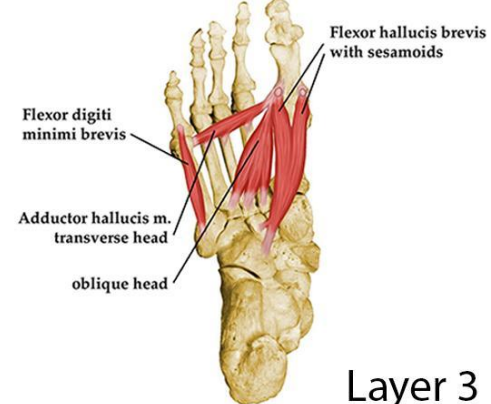
- 1 – tendon of extensor digitorum longus m.
- 2 – dorsal interosseous m. II
- 3 – plantar interosseous m. II
- 4 – tendon layer of extensor digitorum brevis m.
- 5 – subcutaneous dorsal fascia of the foot
- 6 – fascia of the digiti minimi muscle group
- 7 – muscles of the little toe (digiti minimi)
- 8 – tendon layer of flexor digitorum longus m. and lumbrical mm.
- 9 – tendon layer of flexor digitorum brevis m.
- 10 – plantar interosseous fascia
- 11 – plantar aponeurosis
- 12 – adductor hallucis m., oblique head
- 13 – medial septum
- 14 – flexor hallucis brevis m.
- 15 – flexor hallucis longus m.
- 16 – abductor hallucis m.
- 17 – fascia of the big toe (hallux) muscles
- 18 – metatarsal bone I (os metatarsi I)
- 19 – extensor hallucis longus m.
- 20 – extensor hallucis brevis m.
- 21 – interosseous dorsal fascia of the foot



Layer 1



Layer 2



Layer 3

- 1 - tuber calcanei
- 2 - aponeurosis plantaris
- 3 - m. flexor digitorum brevis (cut)
- 4 - m. abductor digiti minimi
- 5 - m. flexor digiti minimi brevis
- 6 - m. abductor hallucis
- 7 - n. plantaris med.
- 8 - nn. digitales plantares comm.
- 9 - nn. digitales plantares proprii
- 10 - a. + vv. + n. plantaris lat.
- 11 - a. plantaris med.
- 12 - m. flexor hallucis brevis



- 1 - a. plantaris lat.
- 2 - r. prof. (a. plantaris lat.)
- 3 - r. spfc. (a. plantaris lat.)
- 4 - n. plantaris lat.
- 5 - r. spfc. (n. plantaris lat.)
- 6 - nn. digitales plantares comm. (n. plantaris lat.)
- 7 - nn. digitales plantares proprii
- 8 - n. plantaris med.
- 9 - nn. digitales plantares comm. (n. plantaris med.)
- 10 - nn. digitales plantares proprii (from n. plantaris med.)
- 11 - m. quadratus plantae
- 12 - m. flexor digitorum longus tendon
- 13 - mm. lumbricales
- 14 - a. plantaris med.
- 15 - m. flexor hallucis brevis (caput med.)
- 16 - m. abductor hallucis

