General myology, muscles of the back and upper extremity I

Active locomotor system

Active part of locomotor system

App. 600 muscles (1/3 of weight, ♂ 35%, ♀ 32%

Postural system

Sensitive system (position of body)

Termoregulation

Blood and lymphatic circulation

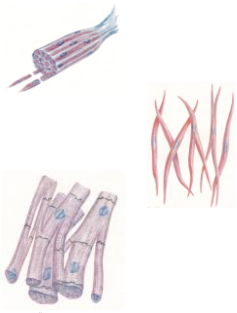
Verbal and nonverbal communication

Logistic system (breathing, food intake)

Muscle tissue

Muscle tissue is characterized by the ability to contract when stimulated.

1. Skeletal muscle: long, multinucleate cells with visible striations, voluntary muscle
2. Smooth muscle: short, cylindrical cells, involuntary muscle; e.g. digestive tract, walls of blood vessels
3. Cardiac (heart) muscle: short, branched, striated cells, with one nucleus at the center of each cell, joined to their neighbors by intercalated discs, involuntary muscle



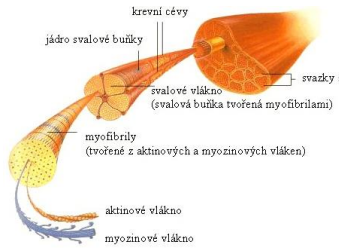
Čihák, 2001

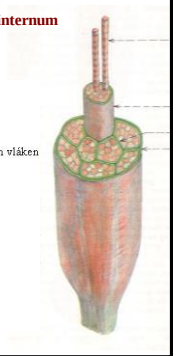
Morphology of the skeletal muscles

Striated muscular fibers- endomysium

primary and secondary muscular bundles - perimysium internum

Surface - perimysium externum – fascia propria musculi





Composition of skeletal muscles

fascia (covering of muscle)

tendo, aponeurosis - tendon

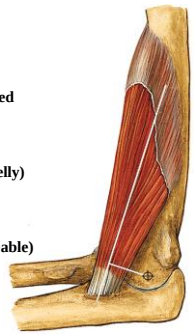
origo - origin (begging) - fixed

caput musculi

venter musculi (muscular belly)

cauda musculi

insertio – attachment (moveable)

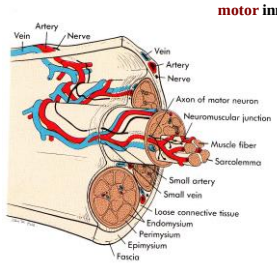


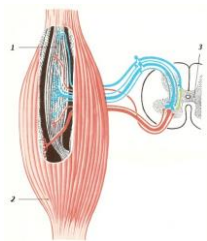
Vascularization and innervation of the skeletal muscle

Hilus – nerves and vessels

sensory innervation – muscle and tendon spindles

motor innervation



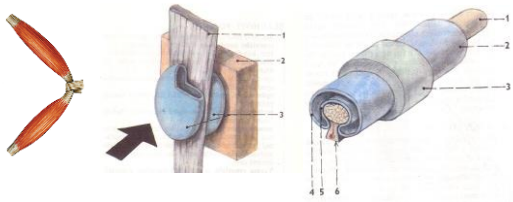


Special apparatus

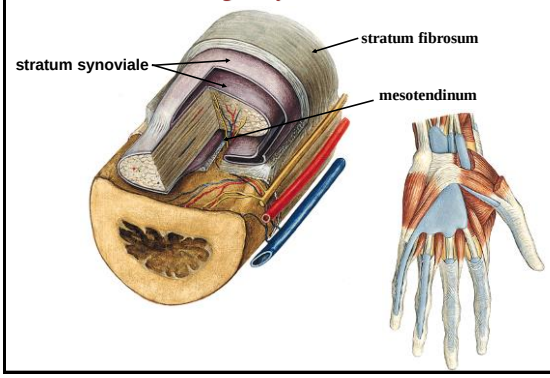
Fascia - osteofascial septa, compartments

Trochleae musculares, **sesamoid bones**, **bursae synoviales**

Vaginae tendinum - stratum fibrosum, stratum synoviale, mesotendineum



Vagina synovialis



Long

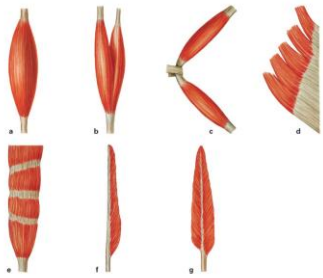
Flat

Short

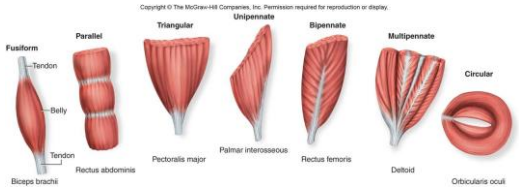
Simple

Complex

Pennate



Types of muscles according to shape



http://www.studyblue.com/notes/note/n/ch-10--11-muscle--tissue/deck/81728

Types of muscles according to function

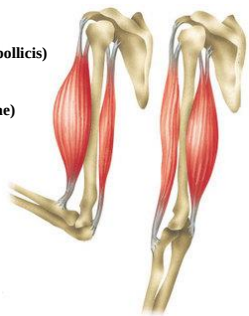
antagonists x synergists

flexors x **extenzors**
(m. biceps brachii x m. triceps brachii)

abductors x **adductors**
(m. abductor pollicis brevis x m. adductor pollicis)

dilatators x **sfincters**
(m. dilatator pupillae x m. sphincter pupillae)

supinators x **pronators**
(m. supinator x m. pronator teres)



Special myology

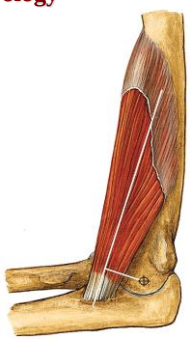
Description of the muscle:

Origo

Insertio

Functio

Inervatio

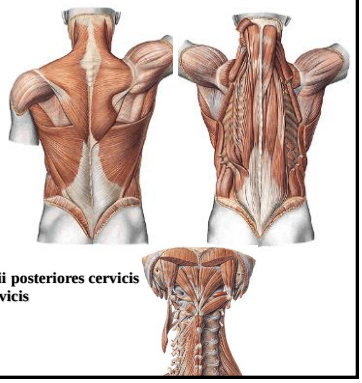


Musculi dorsi

Heterochtonous muscles
- Spinohumeral muscles
- Spinocostal muscles

Autochtonous muscles
- Spinotransversal system
- Sakrospinal system
- Spinospinal system
- Transversospinal system

Short dorsal muscles
- Musculi nuchae profundi
- Musculi intertransversarii posteriores cervicis
- Musculi interspinales cervicis



Spinohumeral muscles

Musculus trapezius

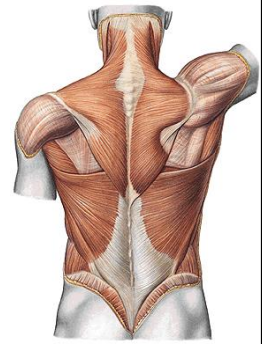
o: protuberantia occipitalis ext., lig. nuchae, procc. spinosi of all Th vertebrae

i: clavicula, acromion, spina scapulae

f: bilateral contraction – extension of the head, pulls scapula medially

unilateral contraction – lateroflexion of the head and spine

i: n. accesorius (n. XI.), plexus cervicalis



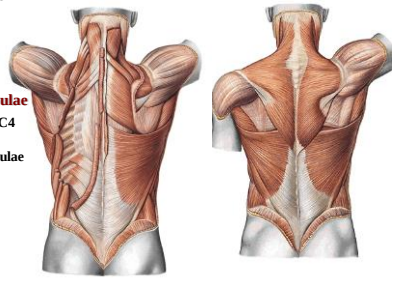
Musculus latissimus dorsi

o: fascia thoracolumbalis - procc. spinosi of caudal Th and all L vertebrae, os sacrum, crista iliaca, caudal ribs

i: crista tuberculi minoris

f: extension, adduction and pronation of arm

i: n. thoracodorsalis



Musculus levator scapulae

o: procc. transversi C1-C4

i: angulus superior scapulae

f: elevation of scapula

i: n. dorsalis scapulae

Musculus rhomboideus minor

o: procc. spinosi C6-C7

i: margo medialis scapulae

f: pulls scapula mediocranially

i: n. dorsalis scapulae

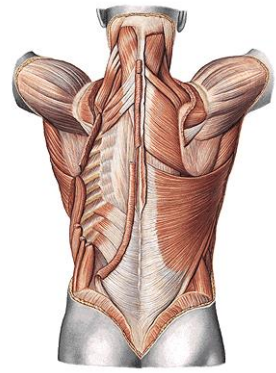
Musculus rhomboideus major

o: procc. spinosi Th1-4

i: margo medialis scapulae

f: pulls scapula mediocranially

i: n. dorsalis scapulae



Spinocostal muscles

Musculus serratus posterior superior

o: procc. spinosi of caudal C and cranial Th vertebrae

i: 2. - 5. rib

f: elevates the ribs (inspiration)

i: nn. intercostales

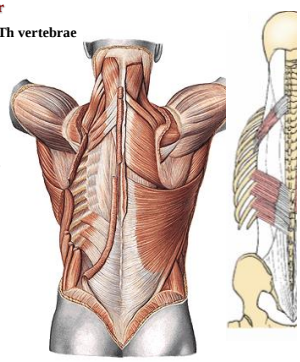
Musculus serratus posterior inferior

o: procc. spinosi of caudal Th and cranial L vertebrae

i: four caudal ribs

f: depresses the ribs (exspiration)

i: nn. intercostales



Autochtonous muscles –spinotransversal system

Musculus splenius capitis

o: procc. spinosi of caudal C and cranial Th vertebrae

i: linea nuchae sup., proc. mastoideus

f: extension, lateroflexion, ipsilat rotation

i: rr. dorsales nervorum spinalium

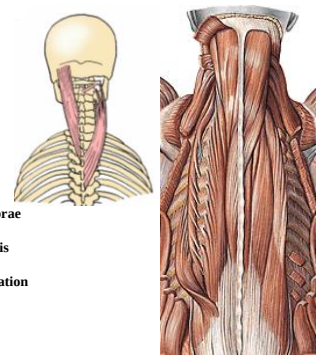
Musculus splenius cervicis

o: procc. spinosi of cranial Th vertebrae

i: proc. transversi of the atlas and axis

f: extension, lateroflexion, ipsilat rotation

i: rr. dorsales nervorum spinalium



Sacrospinal system

Musculus erector spinae

o: procc. Spinosi of L vertebrae, os sacrum, crista iliaca and cranial Th vertebrae

Musculus longissimus dorsi et cervicis

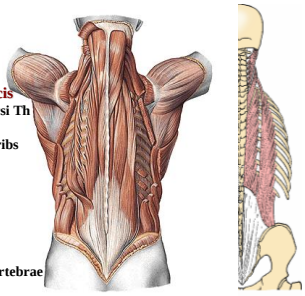
i: med. – procc. accesorii L and transversi Th and C vertebrae
lat. – procc. costarii L vertebrae and ribs

Musculus longissimus capitis

o: proc. trans. C4-Th5
i: processus mastoideus

Musculus iliocostalis

i: ribs and procc. Transversi of the C vertebrae



Spinospinal system

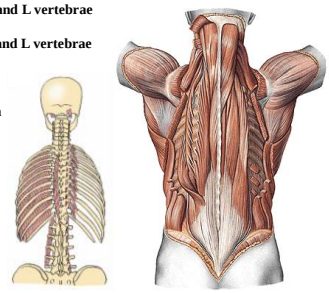
Musculus spinalis thoracis et cervicis

o: procc. Spinosi of caudal C, Th and L vertebrae

i: procc. Spinosi of cranial C, Th and L vertebrae

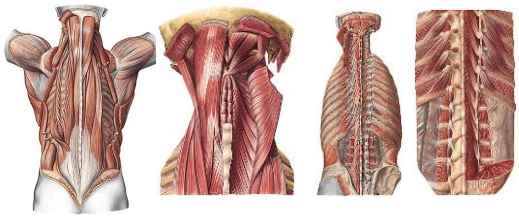
f: extension, lateroflexion

i: rr. dorsales nervorum spinalium



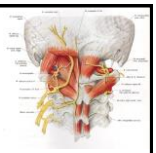
Transversospinal system

1. M. semispinalis thoracis et cervicis
2. M. semispinalis capitis
3. Mm. multifidi



V. Short muscles of the back

1. Mm. interspinales cervicis
2. Mm. intertransversarii posteriores cervicis

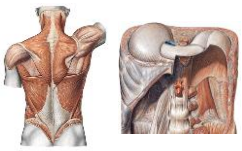


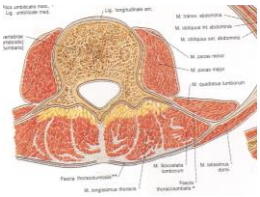
3. Mm. nuchae profundi
a) M. rectus capitis posterior minor
b) M. rectus capitis posterior major
c) M. obliquus capitis superior
d) M. obliquus capitis inferior

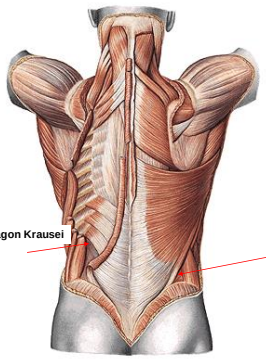
Trigonum suboccipitale

Fasciae of the back

Fascia dorsalis superficialis
Fascia nuchae
Fascia thoracolumbalis
Aponeurosis lumbalis







Musculi humeri

Musculus deltoideus

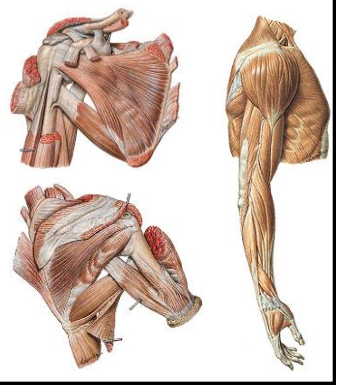
Musculus supraspinatus

Musculus infraspinatus

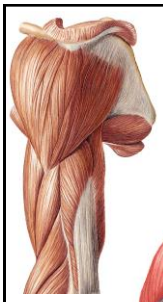
Musculus teres minor

Musculus teres major

Musculus subscapularis



Musculus deltoideus

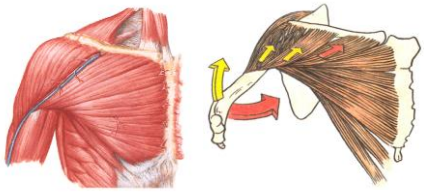


o: clavicula, acromion, spina scapulae

i: tuberositas deltoidea humeri

f: adduction, anteflexion, extension

i: n. axillaris



Musculus supraspinatus

o: fossa supraspinata

i: tuberculum majus humeri

f: abduction, humeral supination

i: n. suprascapularis

Musculus infraspinatus

o: fossa infraspinata

i: tuberculum majus humeri

f: abduction, humeral supination

i: n. suprascapularis

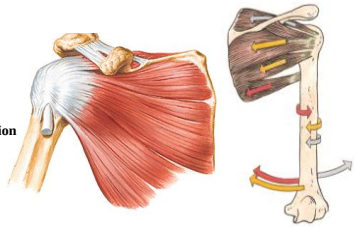
Musculus teres minor

o: margo lat. scapulae

i: tuberculum majus humeri

f: humeral supination, adduction

i: n. axillaris



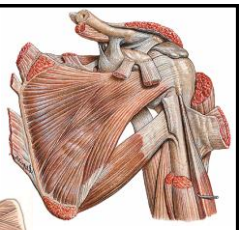
Musculus subscapularis

o: fossa subscapularis

i: tuberculum minus humeri

f: pronation

i: n. subscapularis



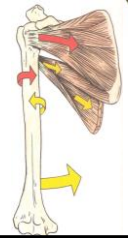
Musculus teres major

o: angulus inferior scapulae

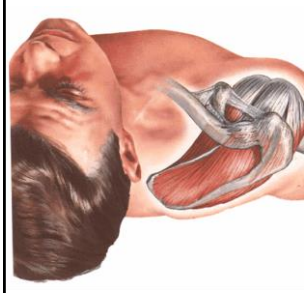
i: crista tuberculi minoris

f: adductione, extension, pronation

i: n. suprascapularis



Rotator cuff



Tendons of:

m. supraspinatus

m. infraspinatus

m. teres minor

m. subscapularis

Musculi brachii

Ventral group

Musculus biceps brachii

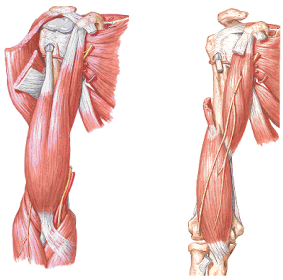
Musculus coracobrachialis

Musculus brachialis

Dorsal group

Musculus triceps brachii

Musculus anconeus



Ventral group

Musculus biceps brachii

o: caput longum – tuberculum supraglenoidale

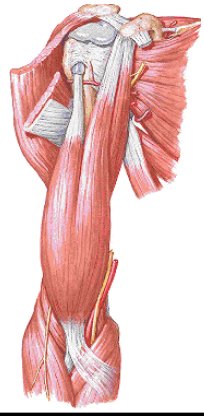
caput breve – processus coracoideus scapulae

i: tuberositas radii, aponeurosis bicipitalis

f: flexion and supination in elbow,

abduction, anteflexion in shoulder

i: n. musculocutaneus



Musculus coracobrachialis

o: processus coracoideus scapulae

i: medial side of humerus (in the middle)

f: adduction, anteflexion

i: n. musculocutaneus

Musculus brachialis

o: ventral side of the humerus (distal half)

i: tuberositas ulnae

f: flexion in elbow

i: n. musculocutaneus

pronation – flexion by m. brachialis

supination – m. brachialis + m. biceps brachii.

Musculus triceps brachii

o: caput longum – tuberculum infraglenoidale

caput mediale – prox sulcus n. radialis humeri

caput laterale – dist sulcus n. radialis humeri

i: olecranon ulnae

f: adduction and extension in shoulder j.,
Extension of the forearm

i: n. radialis

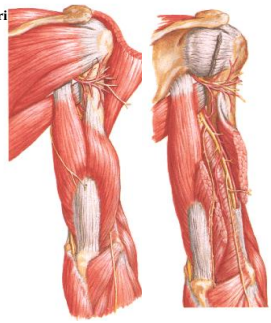
Musculus anconeus

o: epicondylus lateralis humeri

i: olecranon ulnae

f: extension of the forearm

i: n. radialis



Foramen humerotricipitale

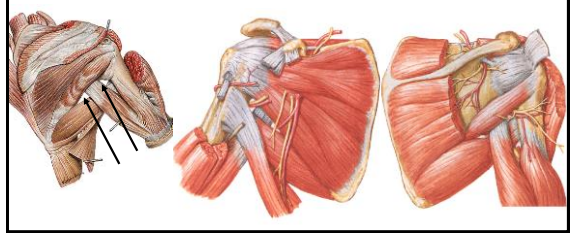
boarders: m. teres major et minor, caput longum m. tricipitis brachii, humerus

content: n. axillaris, a. circumlexa humeri posterior

Foramen omotricipitale

boarders: m. teres major et minor, caput longum m. tricipitis brachii

content: a. circumlexa scapulae



Fossa axillaris

Ventral wall:
Tendon of the m. pectoralis major

Dorsal wall:
m. latissimus dorsi and m. teres major

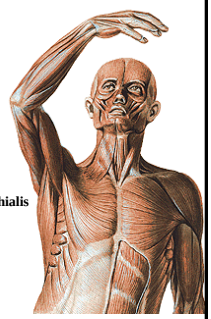
Medial wall:
Chest and m. serratus anterior

Lateral wall:
humerus, caput breve m. bicipitis brachii, m. coracobrachialis

Base - fascia axillaris

apex- 1. rib, lateral part of the clavicle and scapula

Content: plexus brachialis, a. axillaris

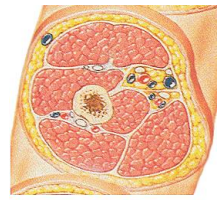


Fascia brachii

septum intermusculare mediale et laterale

sulcus bicipitalis medialis et lateralis
(vasa brachialia, n. medianus, n. ulnaris)

hiatus basilicus



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