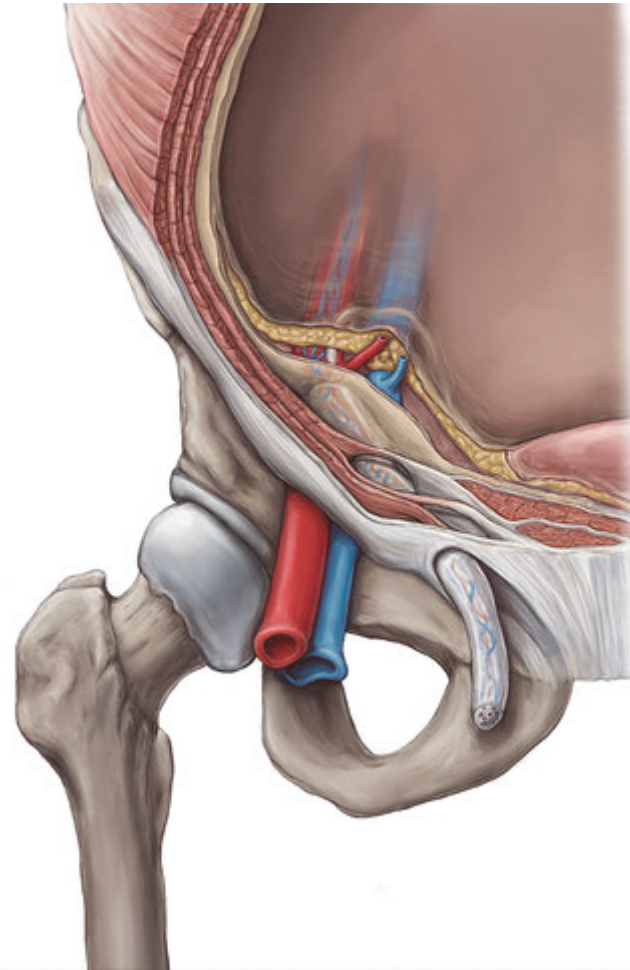


# Muscles of back, abdomen, inguinal canal

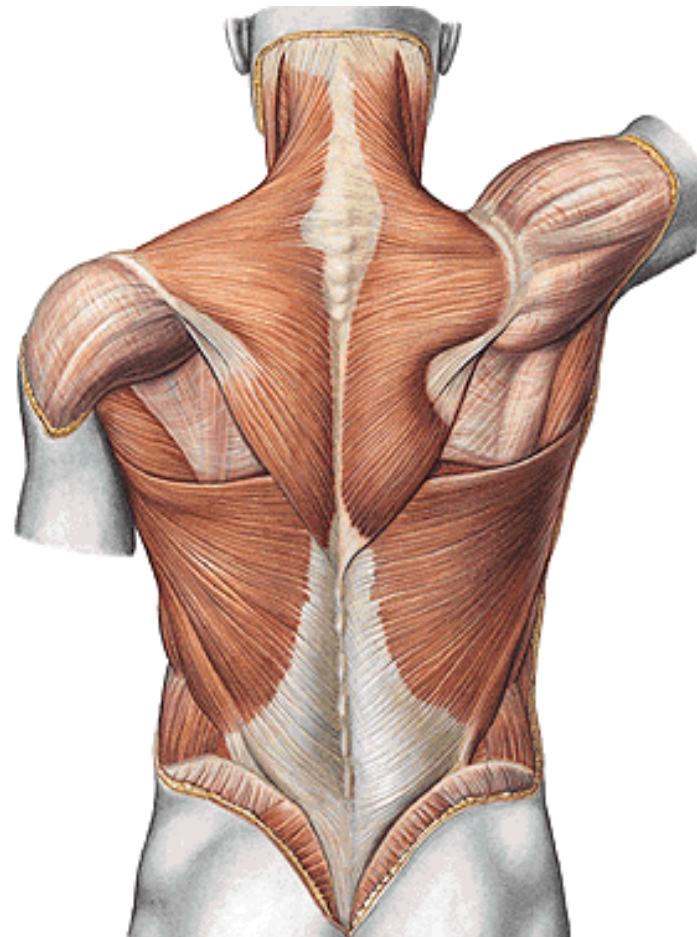
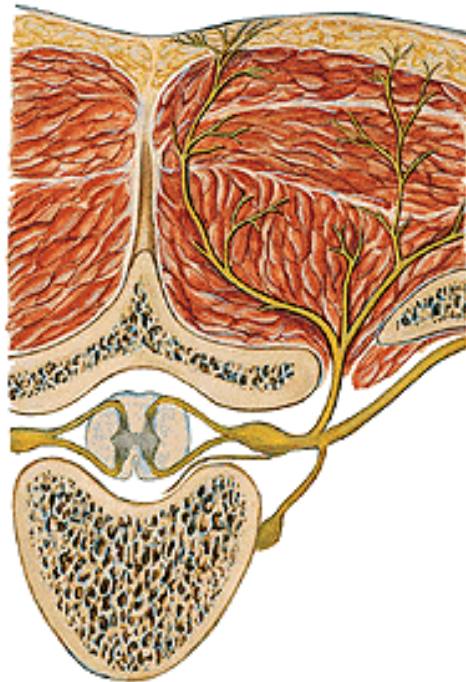


# Muscles of the back



**A) Heterochtonous muscles**– they have been moved from the anterior side of the body, ***innervation*** anterior branches of spinal nerves

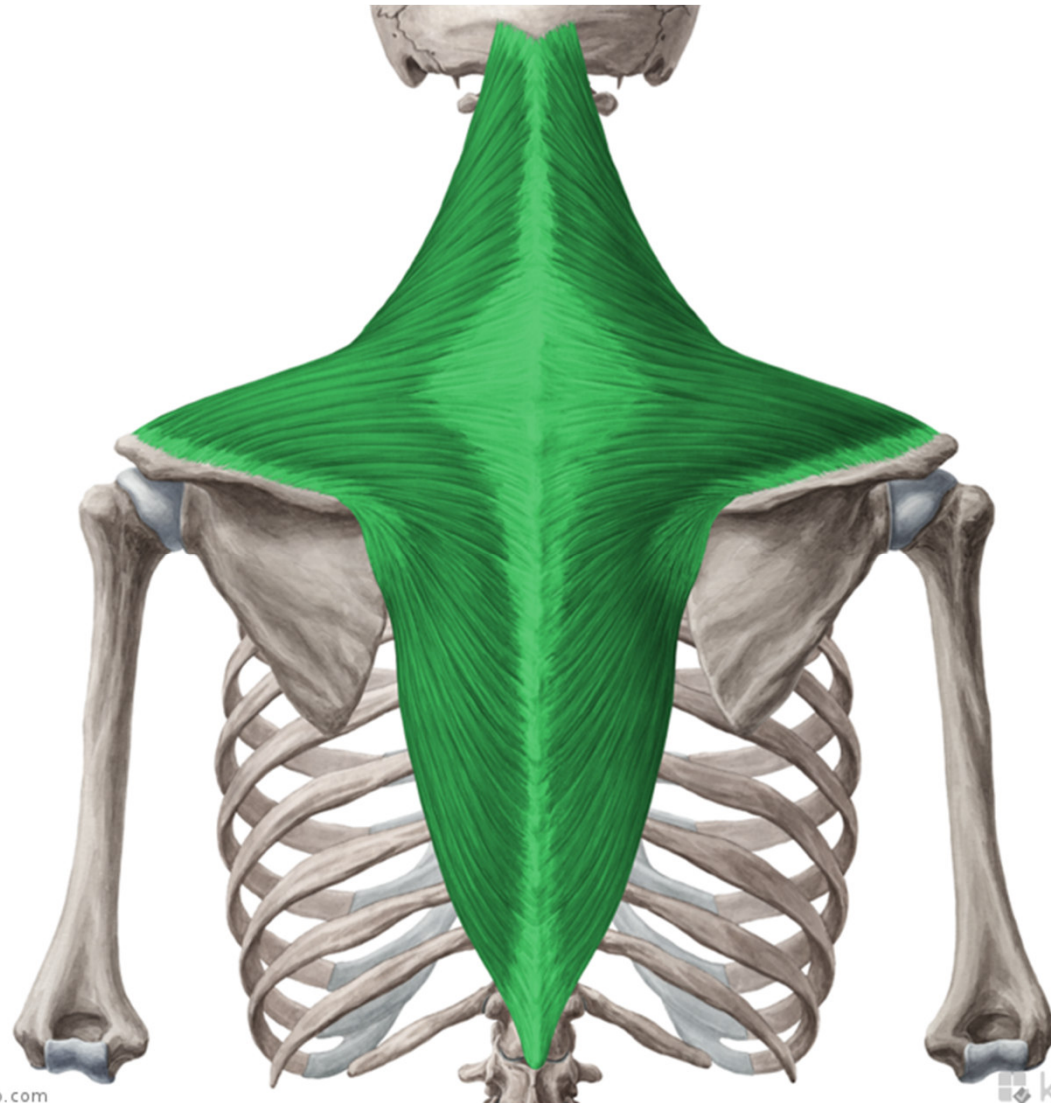
Classification: **spinohumeral group of muscles**  
**spinocostal group of muscles**



# Spinohumeral group of muscles



# M. trapezius



## ***M. Trapezius***

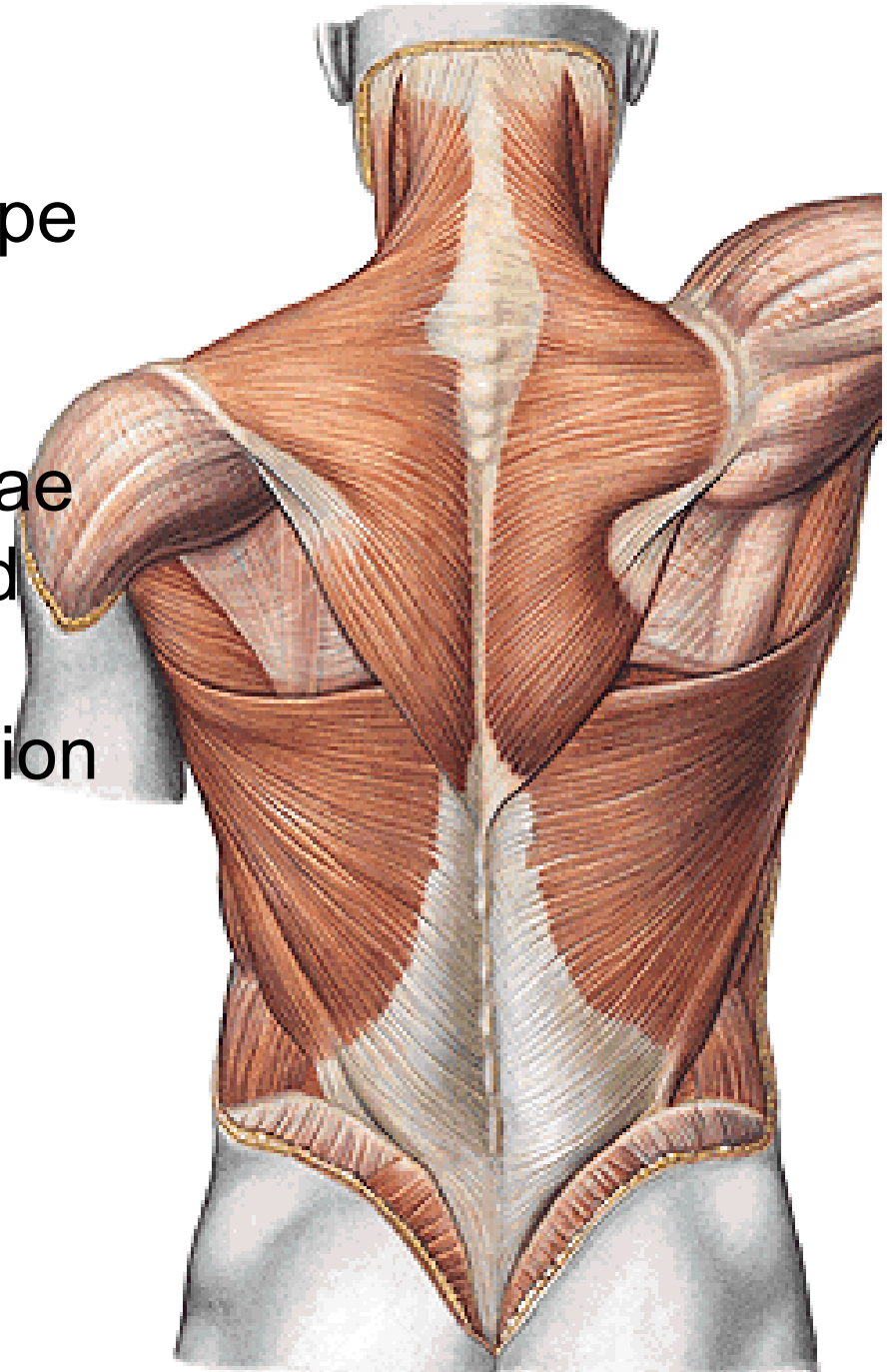
- Flat muscle of triangular shape

**O:** squama ossis occipitalis,  
spinous processes of all  
cervical and thoracic vertebrae

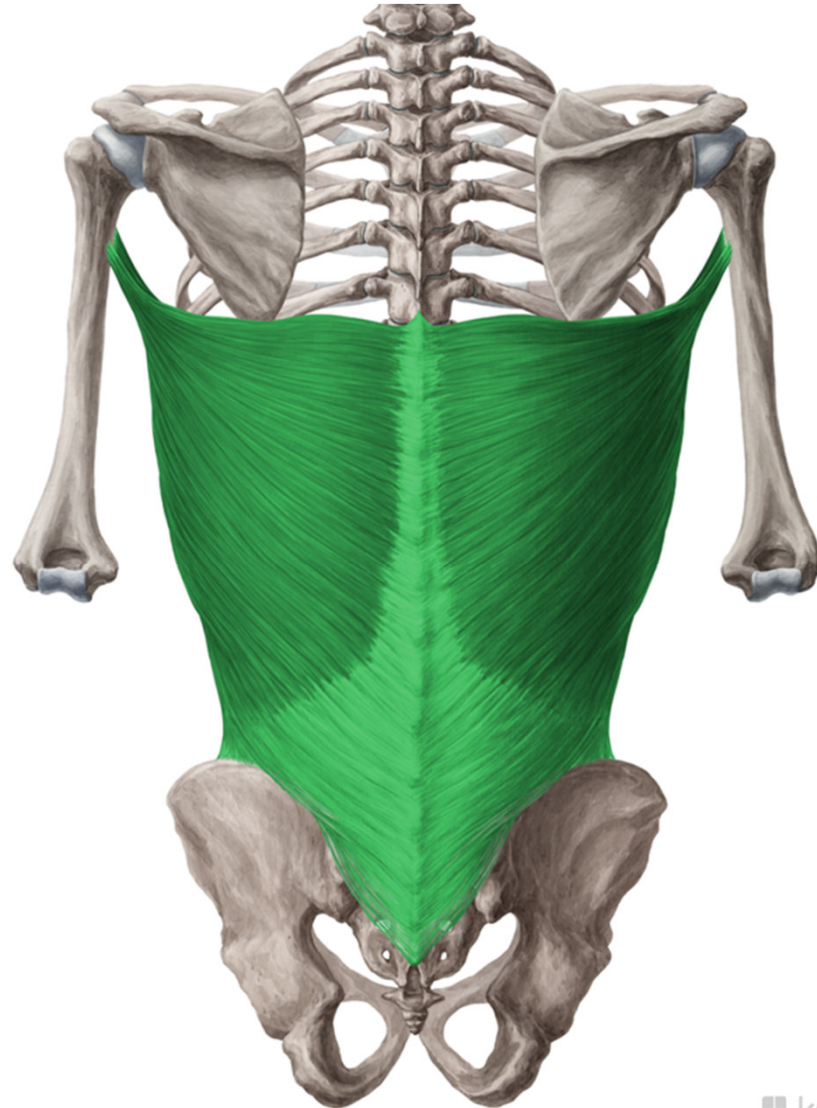
**I:** spina scapulae, acromion and  
acromial end of clavicle

**F:** adduction of scapula, elevation  
of shoulder, it also pulls  
shoulder down

**IN:** n. accessorius



# M. latissimus dorsi



## ***M. latissimus dorsi***

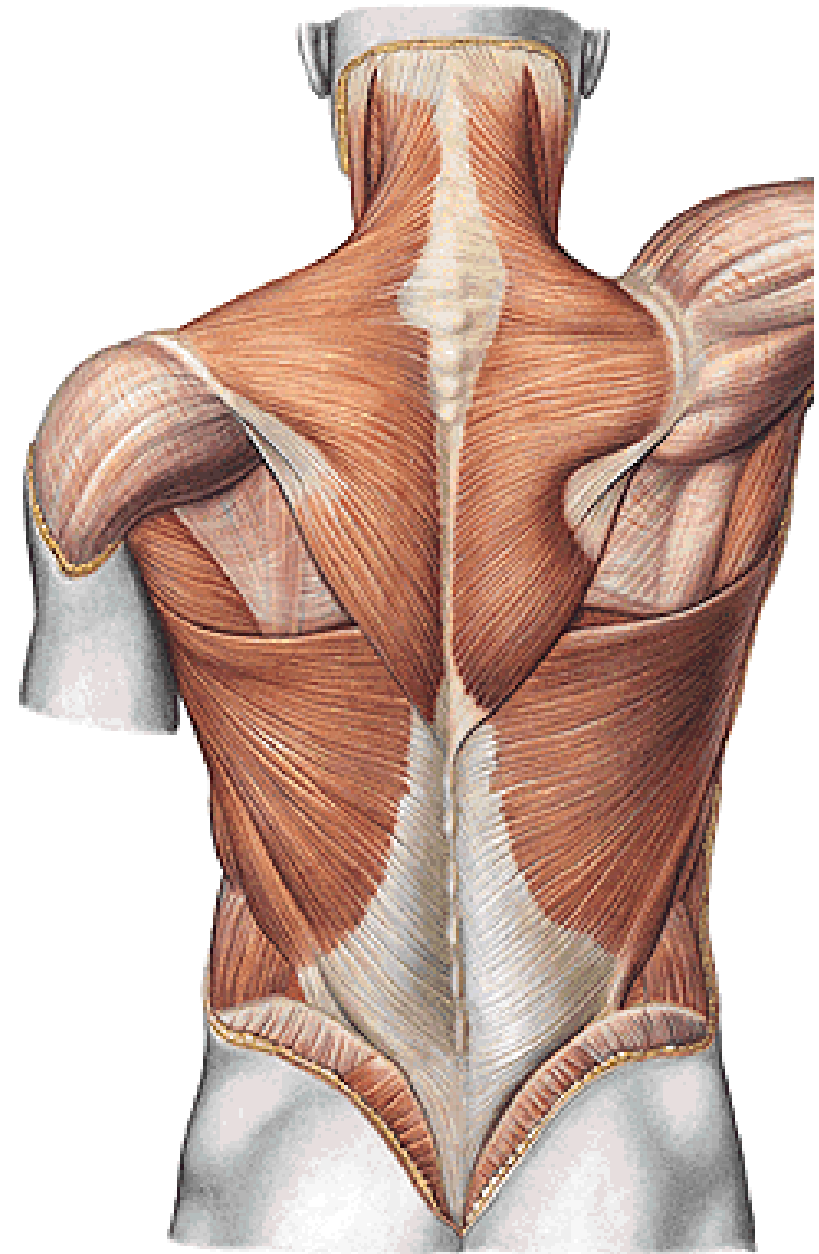
- flat wide muscle

**O:** spinous processes of caudal half of thoracic and all lumbar vertebrae, dorsal surface of sacrum

**I:** crista tuberculi minoris humeri

**F:** adduction, humeral extension, pronation- digging with a hoe

**IN:** n. thoracodorsalis





***M. levator scapulae***

**O:** transverse processes C1-4

**I:** angulus superior scapulae

**F:** elevation of scapula

***M. rhomboideus major***

**O:** spinous processes Th1-4

**I:** margo medialis scapulae opposite fossa infraspinata

**F:** pulls scapula medially and cranially

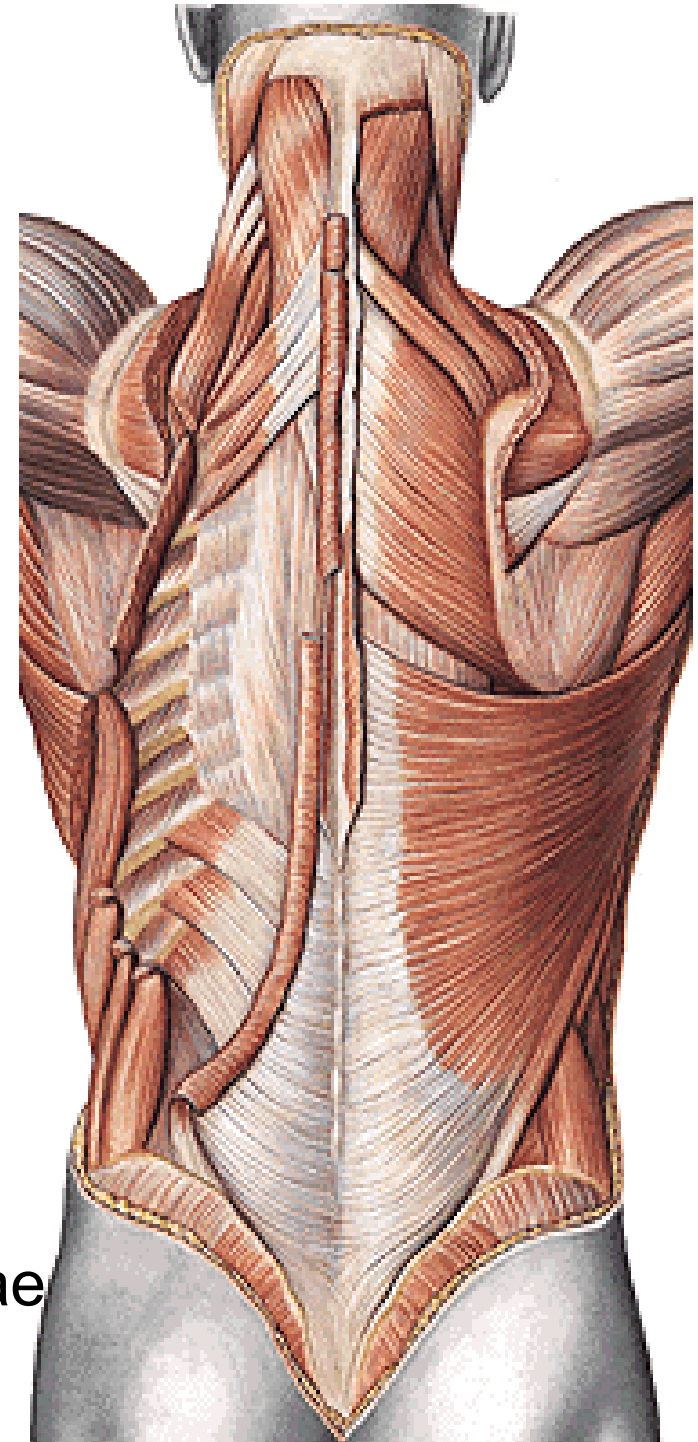
***M. rhomboideus minor***

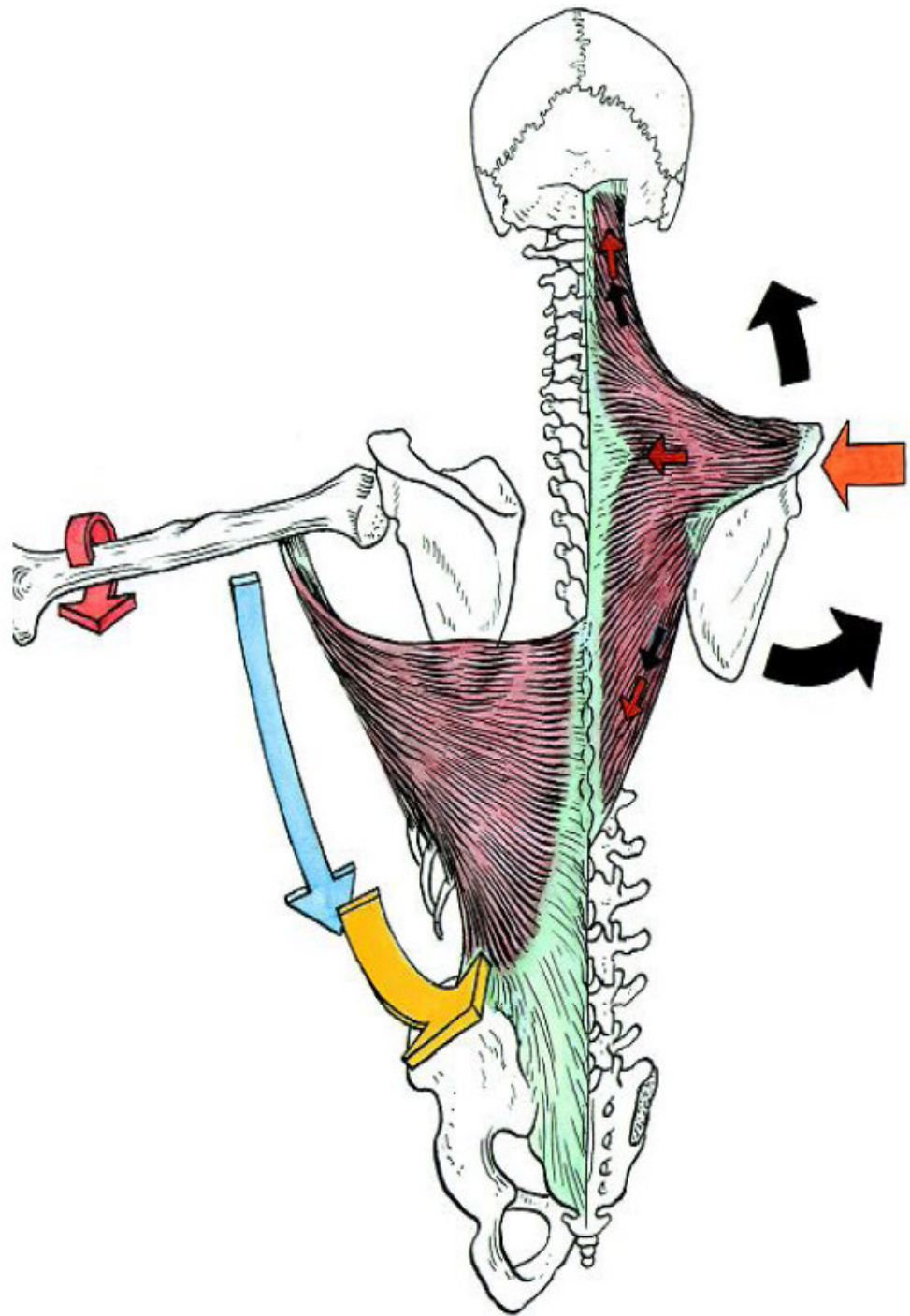
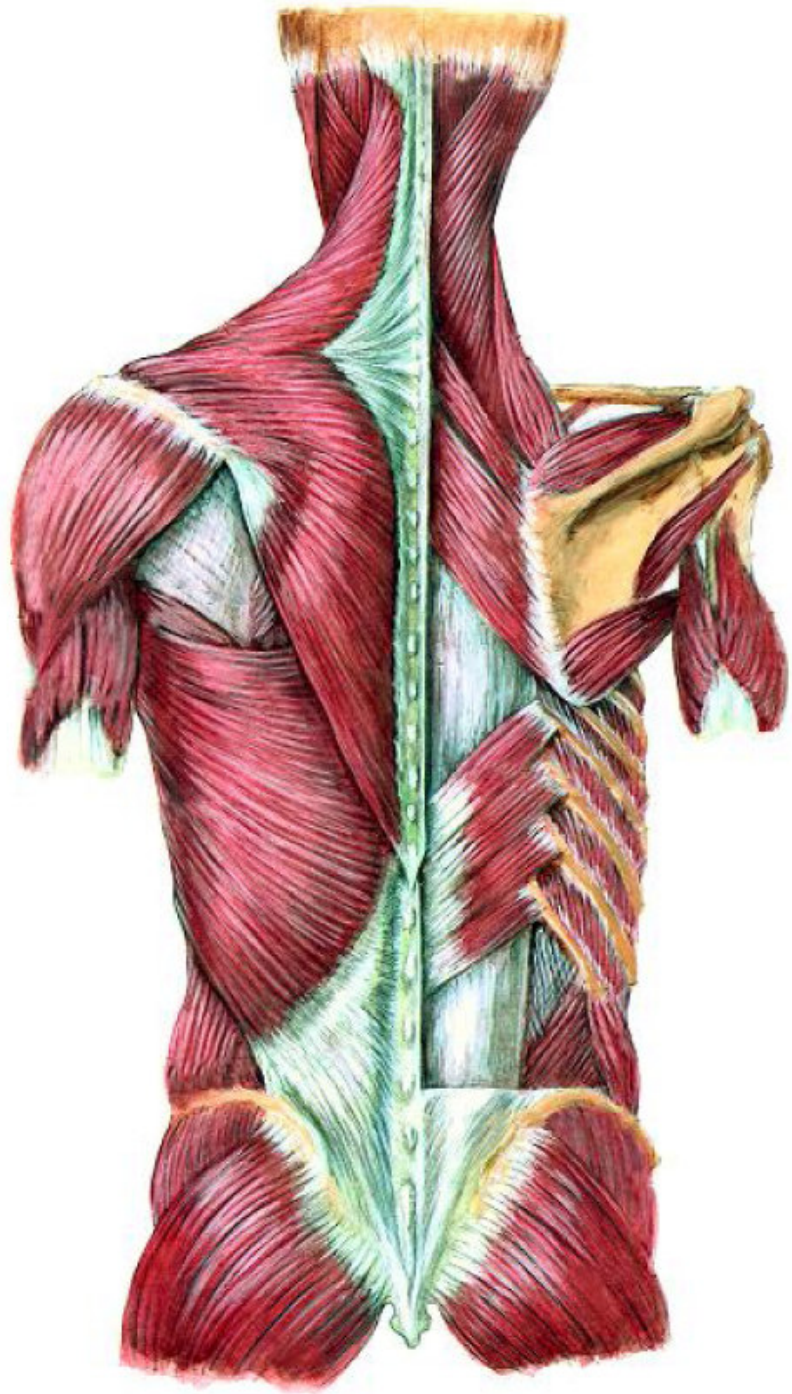
**O:** spinous processes C6-7

**I:** margo medialis scapulae opposite fossa supraspinata

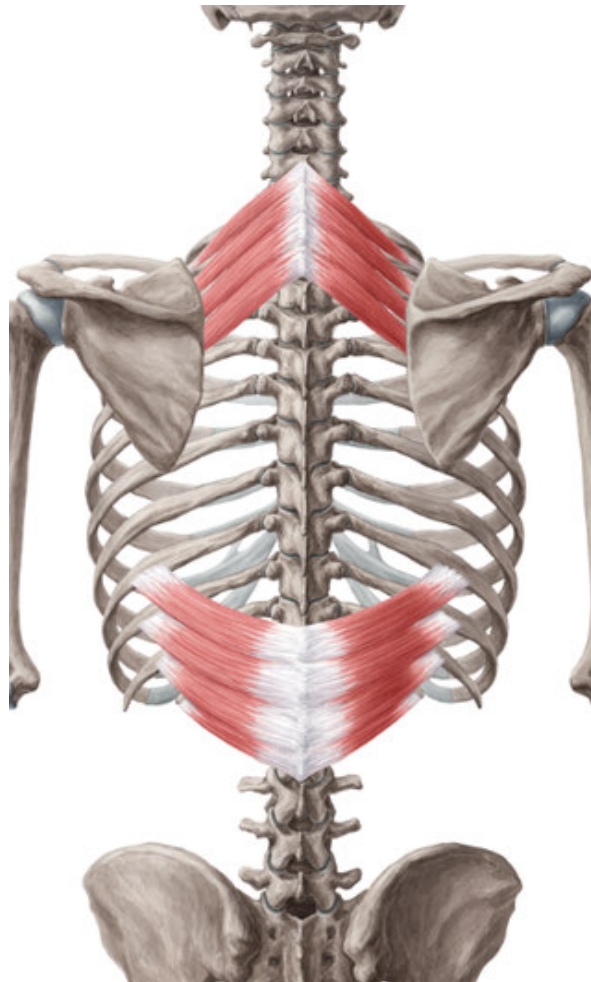
**F:** pulls scapula medially and cranially

**Common innervation:** N. dorsalis scapulae





- Spinocostal group of muscles



***musculus serratus posterior superior***

***O:*** C6- Th4

***I:*** 2nd-5th rib

***F:*** auxilliary inspiratory muscle

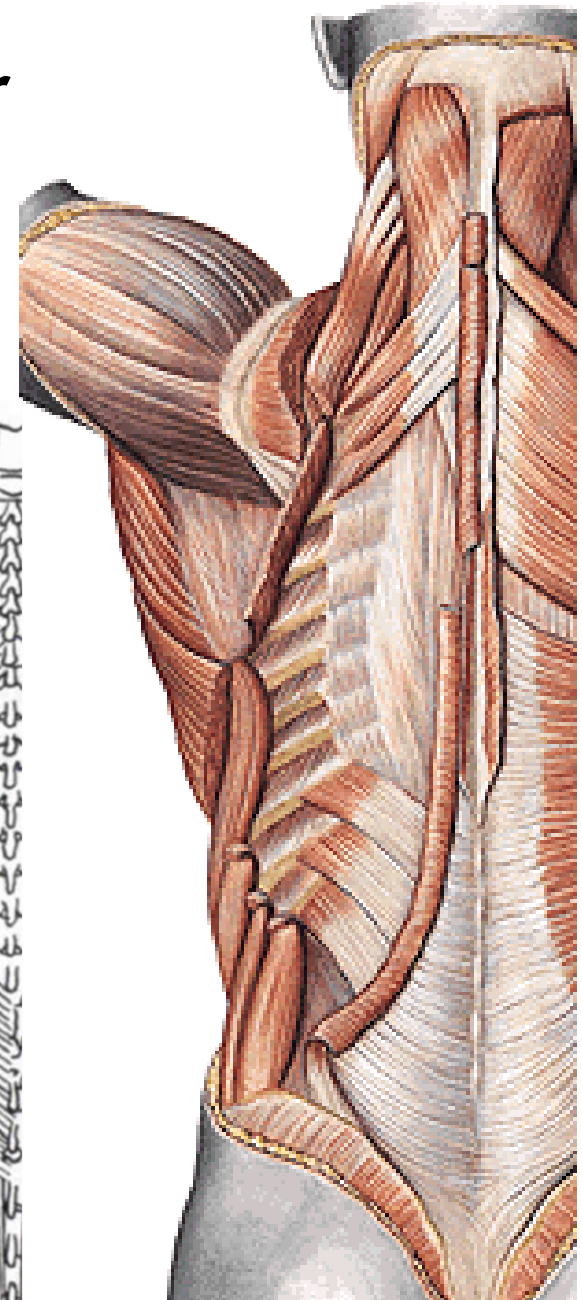
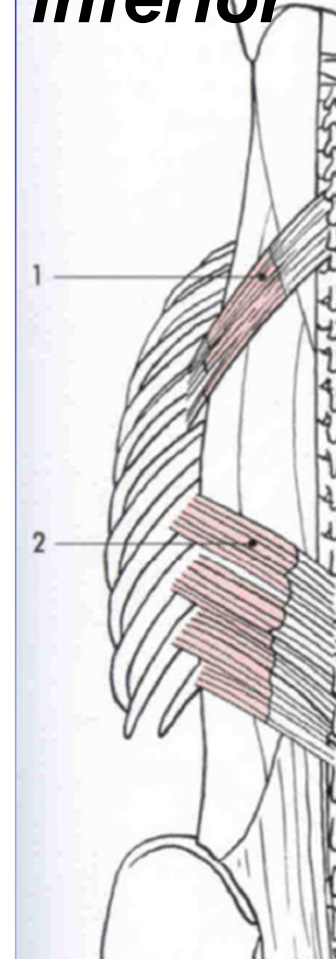
***musculus serratus posterior inferior***

***O:*** Th11-12

***I:*** last four ribs

***F:*** auxilliary expiratory muscle

**IN:** Nn. intercostales



## B) Autochthonous muscles

Original intrinsic back muscles, *innervation*: posterior branches of spinal nerves

Extensors of the spine

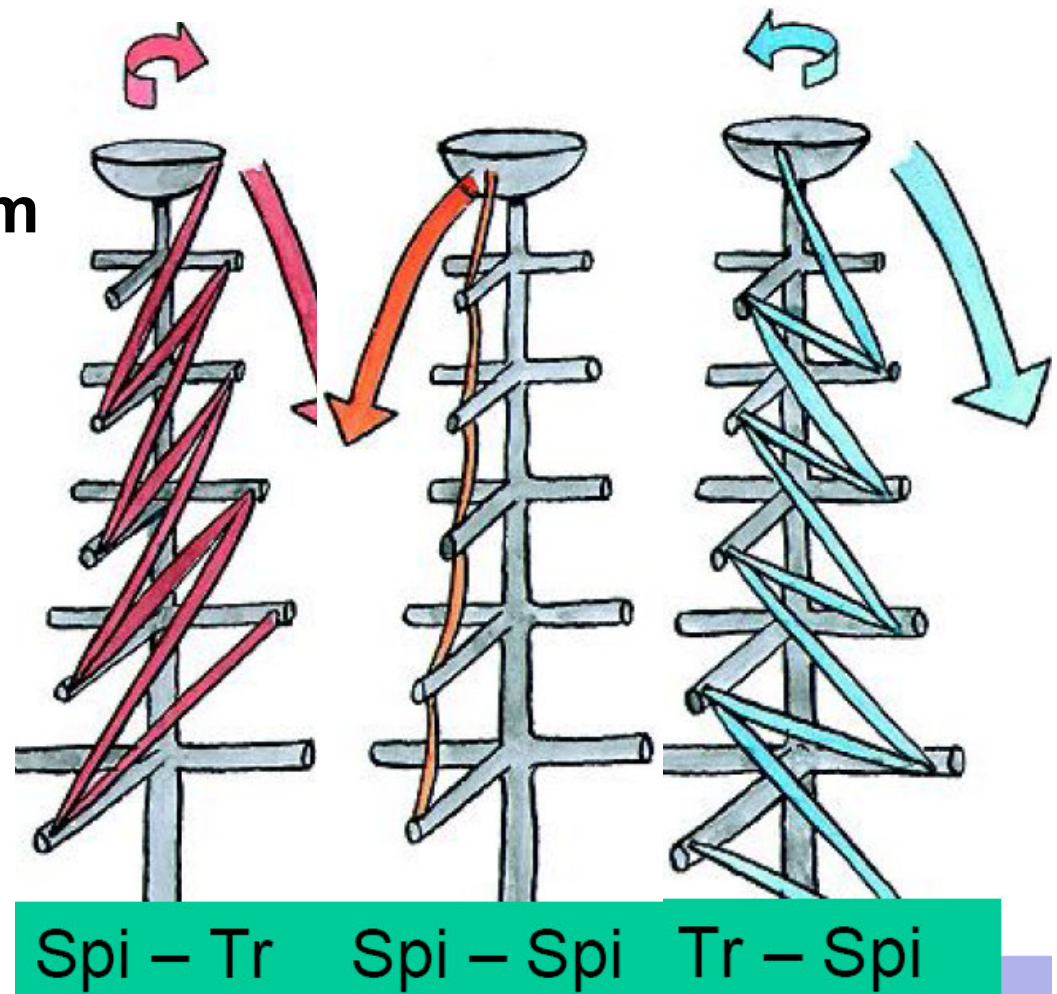
I. Spinotransversal system

II. Sacrospinal system

III. Spinospinal system

IV. Transversospinal system

V. Short dorsal muscles



# I. Spinotransversal system

## *m. splenius capitis*

**O:** spinous processes of caudal cervical and cranial thoracic vertebrae

**I:** lateral part of linea nuchae suprema and pr. mastoideus

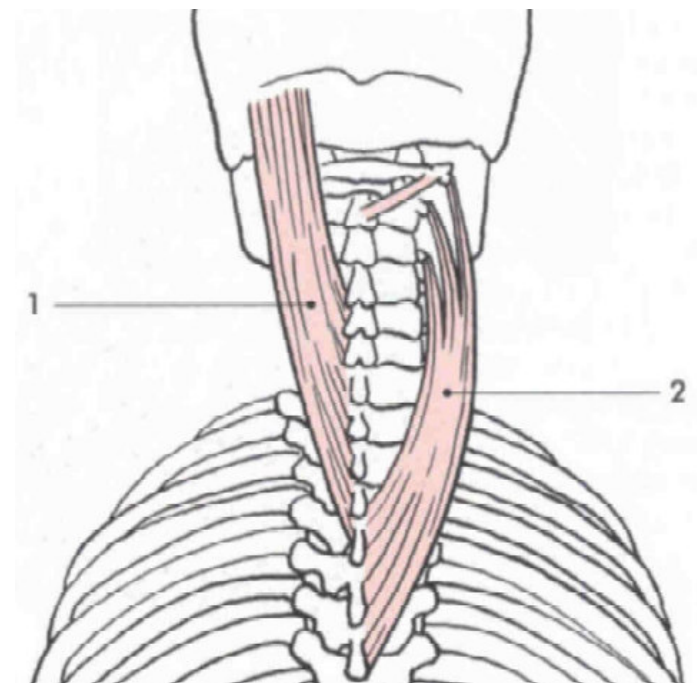
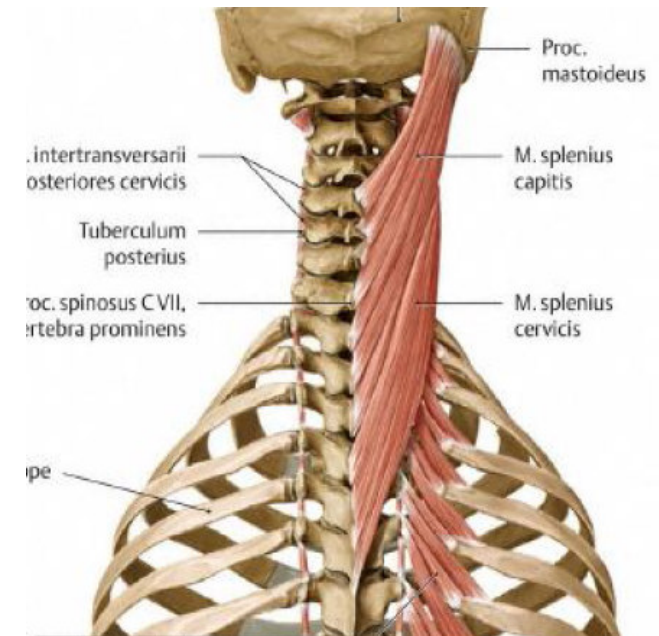
## *m. splenius cervicis*

**O:** spinous processes of Th4-6

**I:** transverse processes of atlas and axis

**F:** bilateral contraction – head dorsiflexion,

Unilateral contraction – lateroflexion and rotation



## II. Sacrospinal system (*m. erector spinae*)

**F:** bilateral contraction- dorsiflexion of the spine

unilateral contraction- lateroflexion of the spine

### ***m. erector spinae:***

Uniform in its caudal part

**O:** spinous pr. of lumbar vertebrae, dorsal side of os sacrum and crista iliaca, it continues cranially as three muscles:

### ***m. longissimus capitis:***

**O:** transverse pr. of C4-Th5

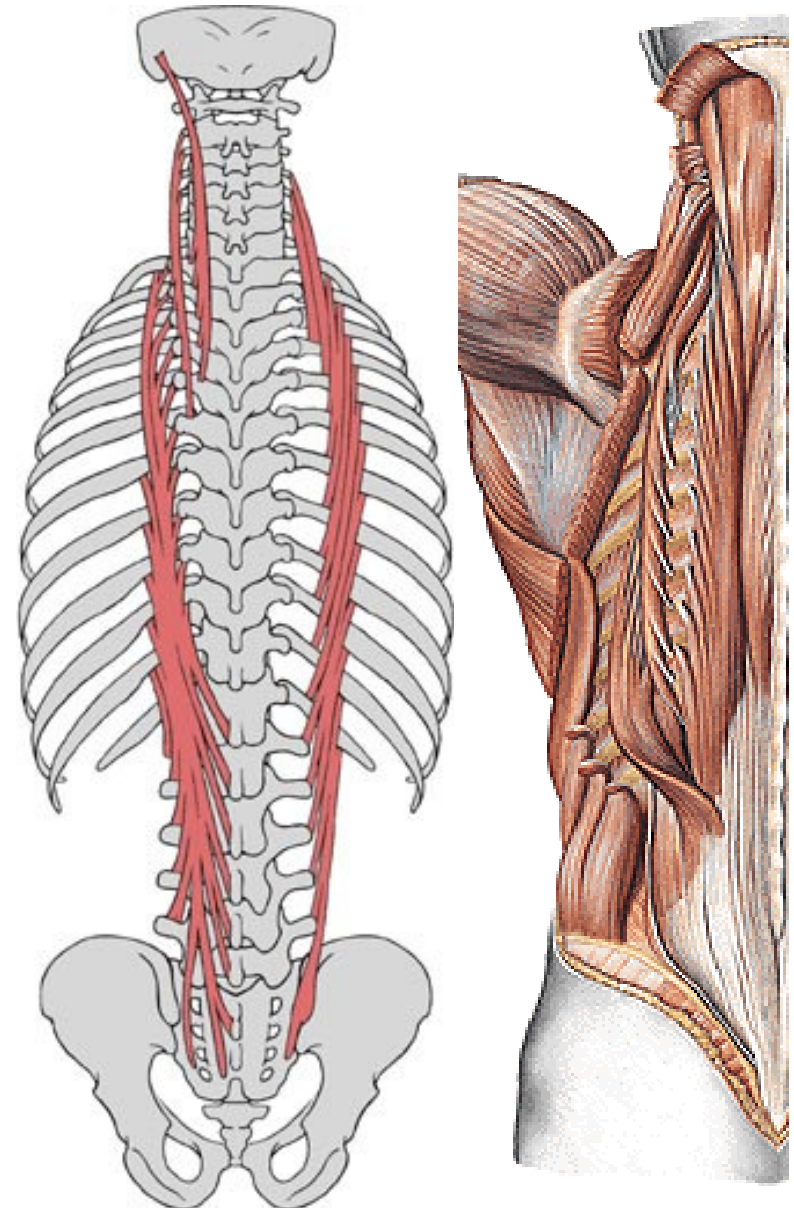
**I:** pr. mastoideus

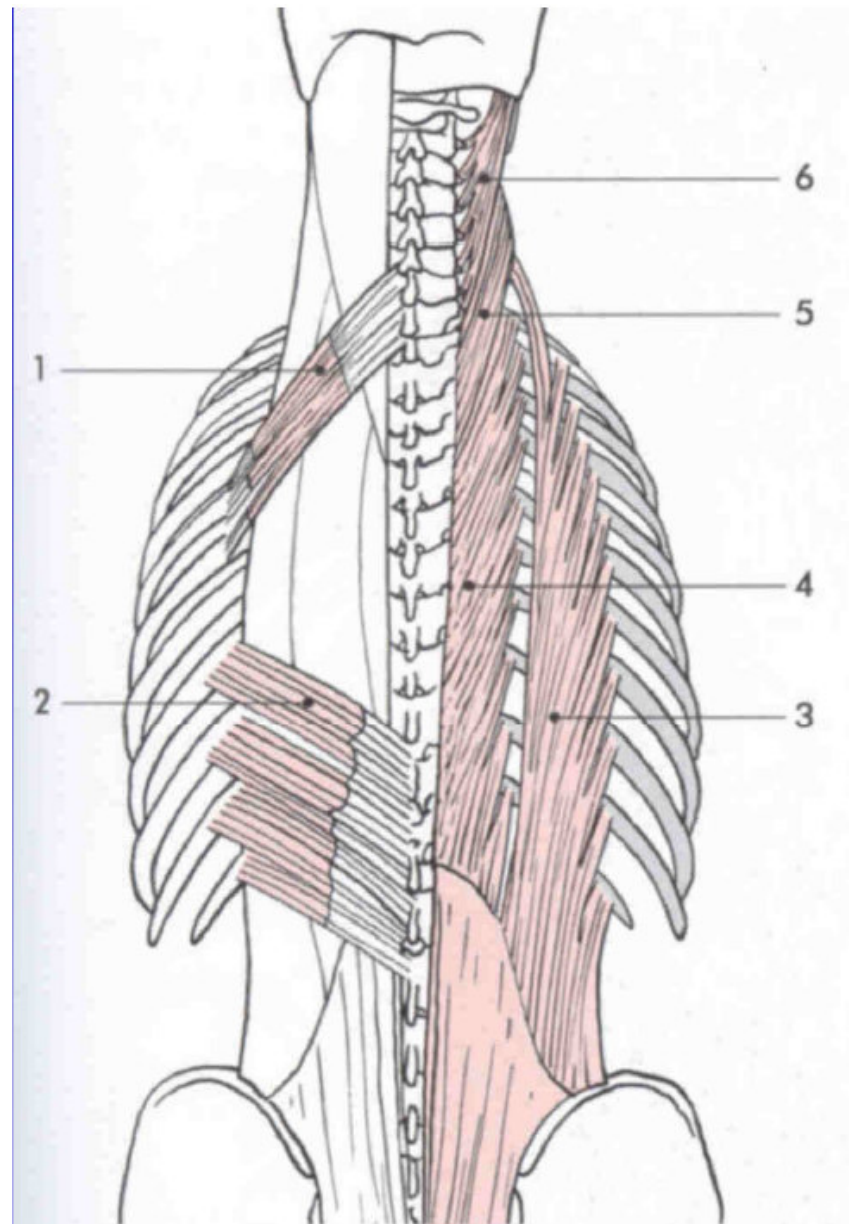
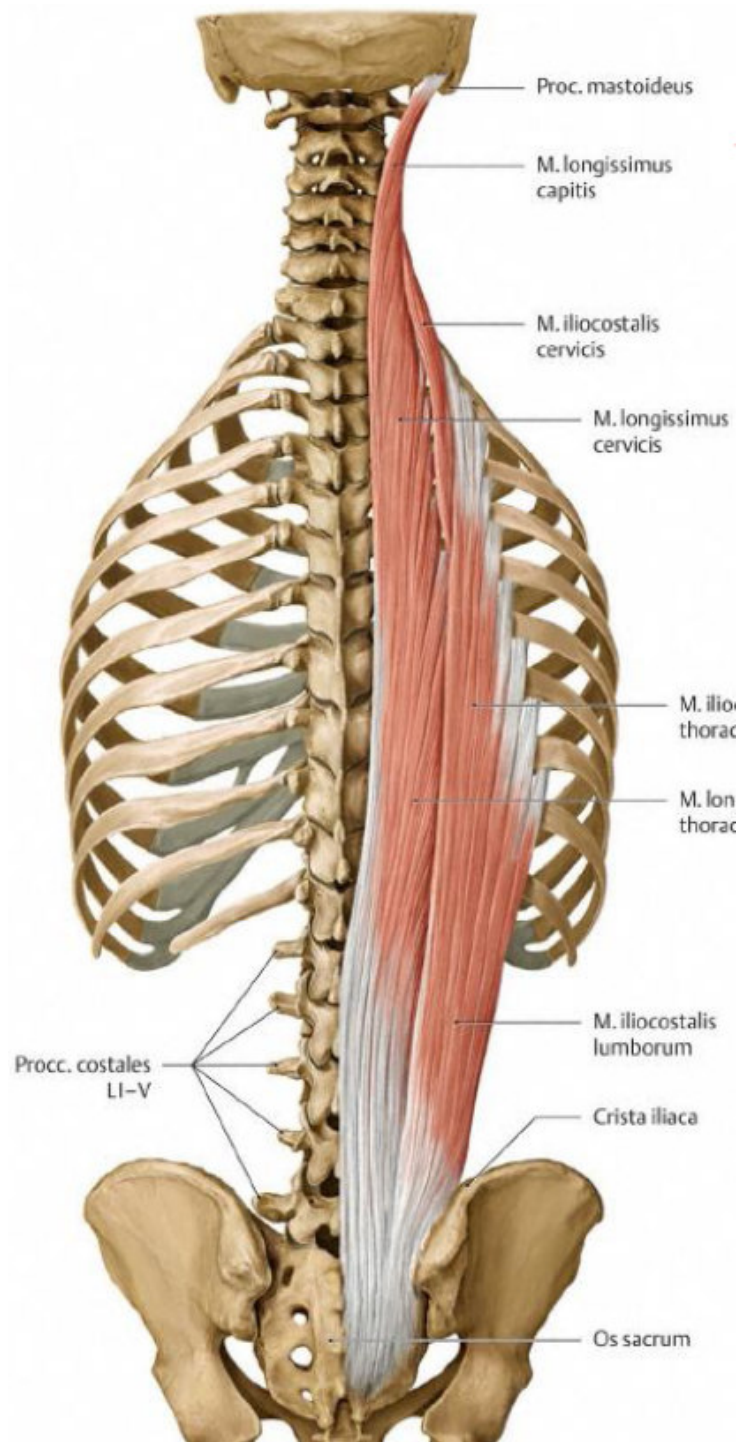
### ***m. longissimus dorsi et cervicis:***

**I:** pr. accesorius and pr. transversi of ribs up to axis and ribs and pr. costarii

### ***m. iliocostalis:***

**I:** ribs and transverse pr. of caudal cervical vertebrae





Obr. 2.6. Mm. dorsi, systémy spinokostální (vlevo) a sakrospinální (vpravo). 1 – m. serratus post. sup., 2 – m. serratus post. inf., 3 – m. iliocostalis, 4 – m. longissimus thoracis, 5 – m. longissimus cervicis, 6 – m. longissimus capitis



### III. Spinospinal system

*m. spinalis thoracis*

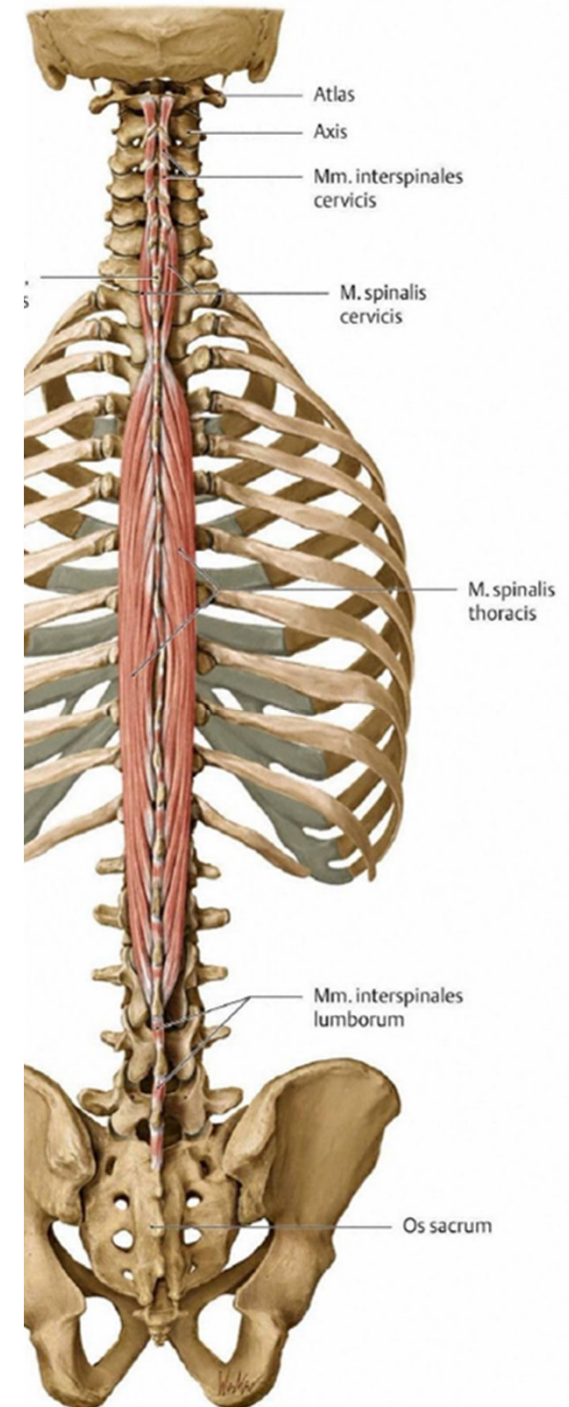
*m. spinalis cervicis*

***Function of the system:***

Bilateral contraction: dorsiflexion of spine

Unilateral contraction: lateroflexion of spine

- it is not present in lumbar part of the spine
- it often grows together with *m. longissimus*



## IV. Transversospinal system

### 1. *m. semispinalis thoracis et cervicis*

**O:** transverse pr. of thoracic vertebrae

**I:** spinous pr. up to axis

### 2. *m. semispinalis capitis*

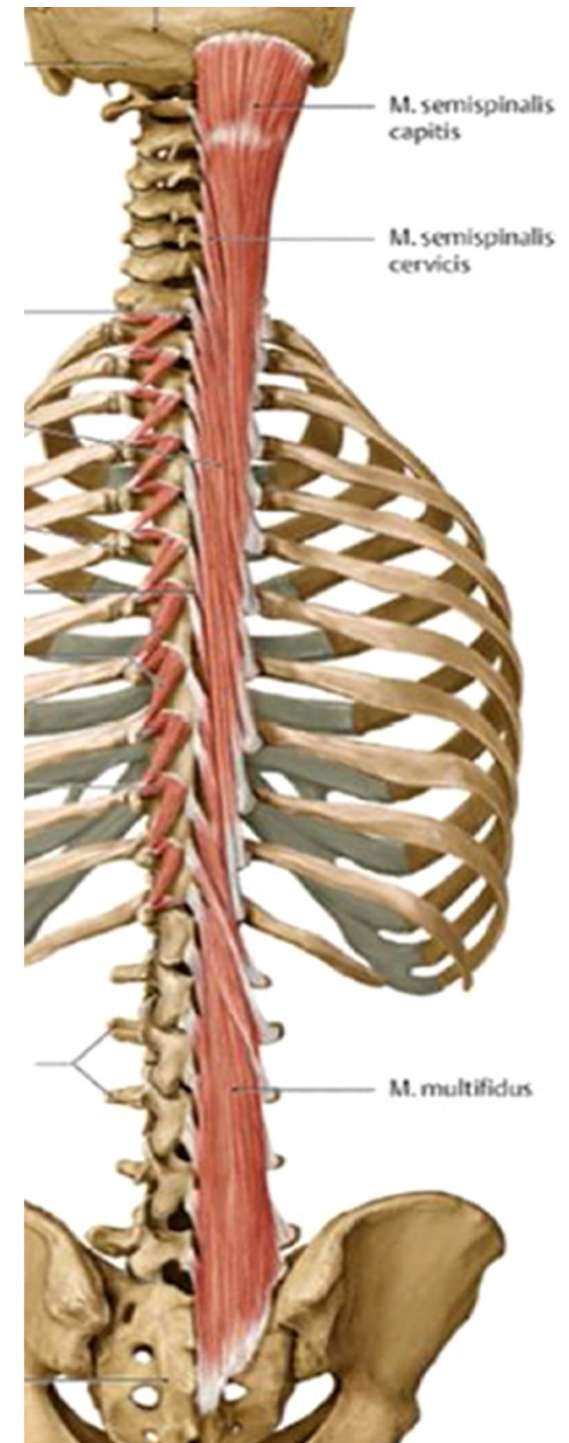
**O:** transverse pr. of cranial thoracic and articular pr. of caudal cervical vertebrae

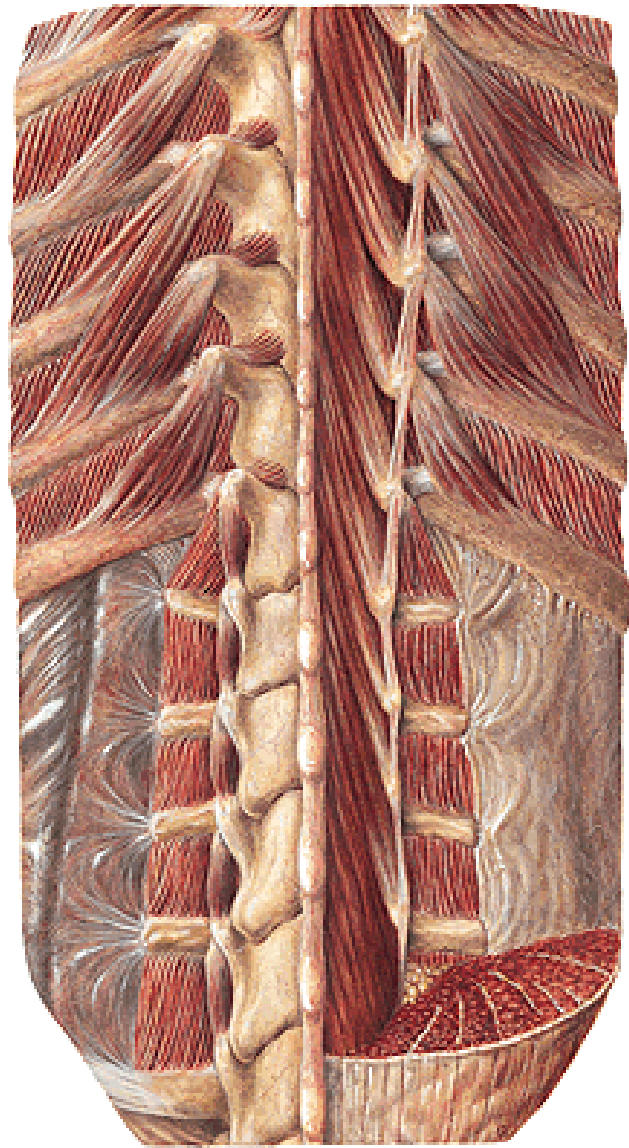
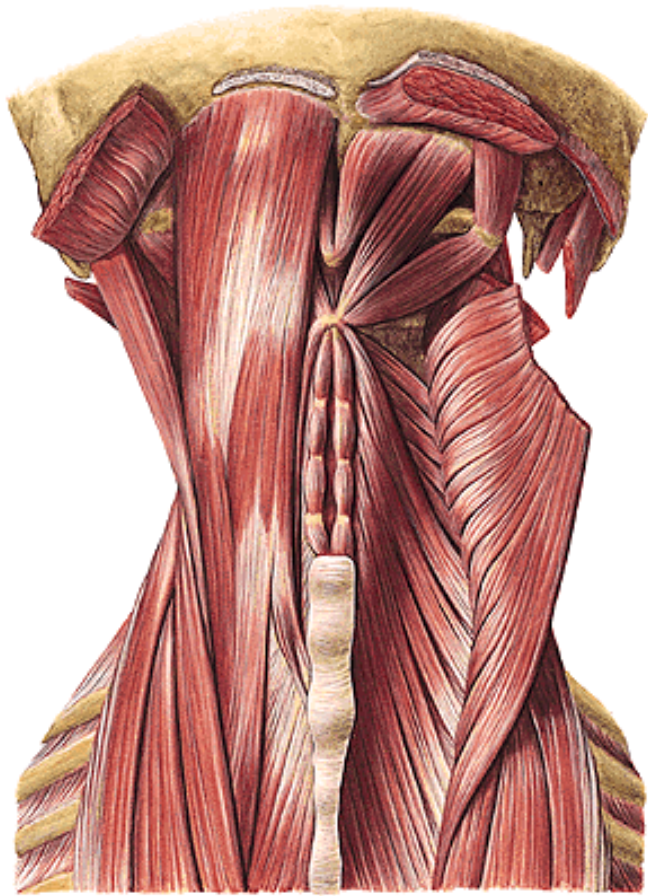
**I:** squama ossis occipitalis- between linea nuchae superior et inferior.

3. *Mm. multifidi* – between transverse and spinous pr., most developed at lumbar spine

4. *Mm. rotatores* – between spinous pr. and vertebral arches, constant at Th spine

**F:** bilateral contraction– dorsiflexion of spine  
unilateral contraction –lateroflexion and rotation of spine





# Short back muscles (*mm. nuchae profundi*)

**F:** lateroflexion, dorsiflexion, rotation

***m. rectus capitis posterior minor***

**O:** tuberculum posterius atlantis

**I:** medial part of linea nuchae inferior

***m. rectus capitis posterior major***

**O:** pr. spinosus axis

**I:** middle part of linea nuchae inferior

***m. obliquus capitis superior***

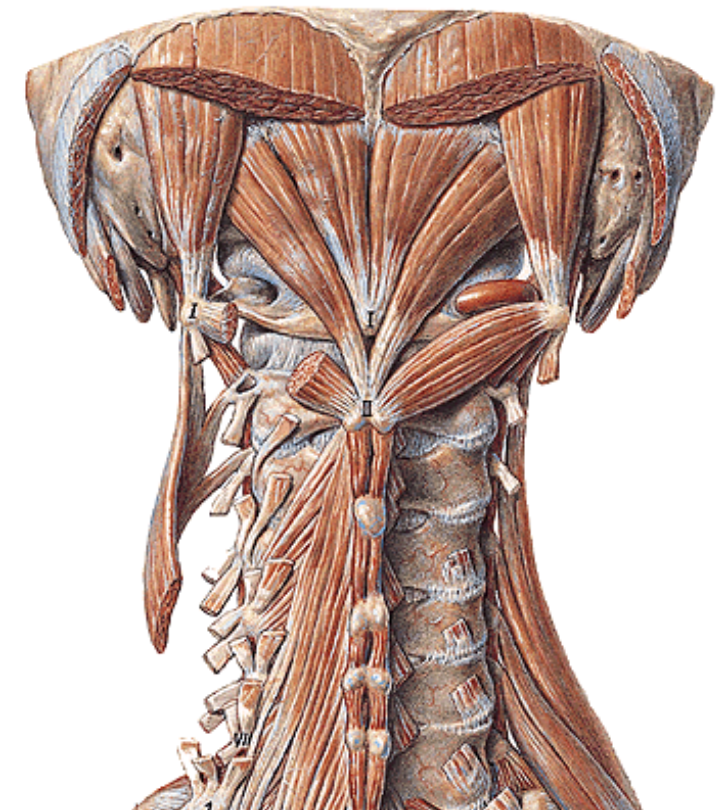
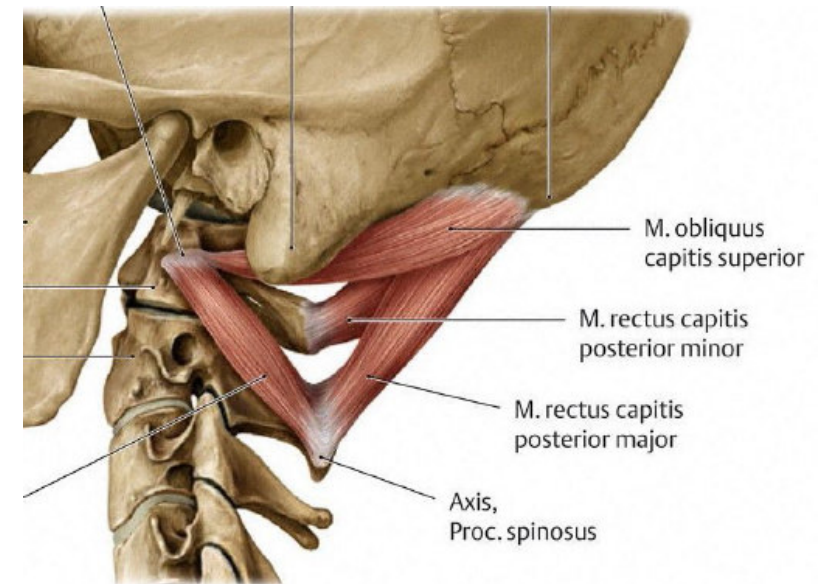
**O:** pr. transversus atlantis

**I:** lateral part of linea nuchae inferior

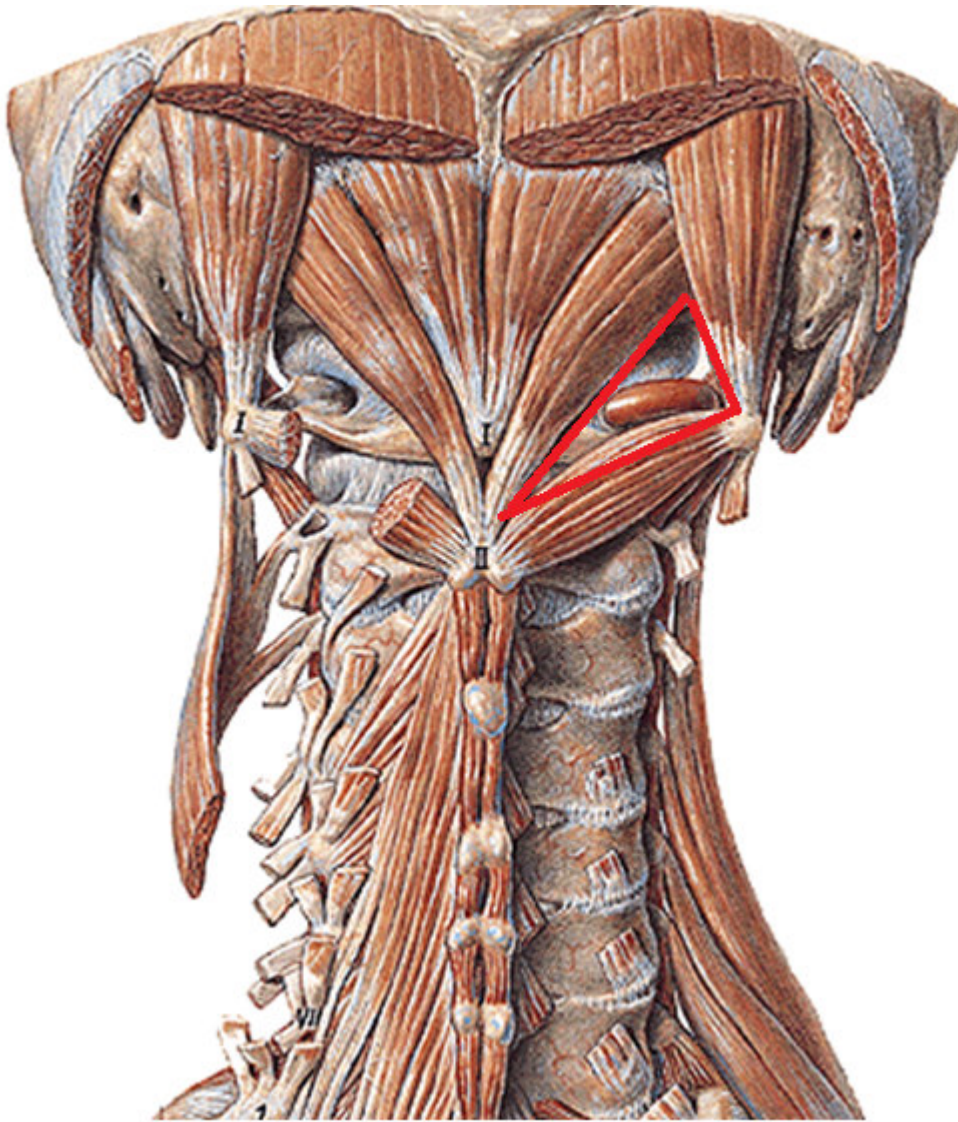
***m. obliquus capitis inferior***

**O:** pr. spinosus axis

**I:** pr. transversus atlantis



**Function:** lateroflexion, dorsiflexion, rotation



## **Trigonum suboccipitale**

Borders:

**m. rectus capitis**

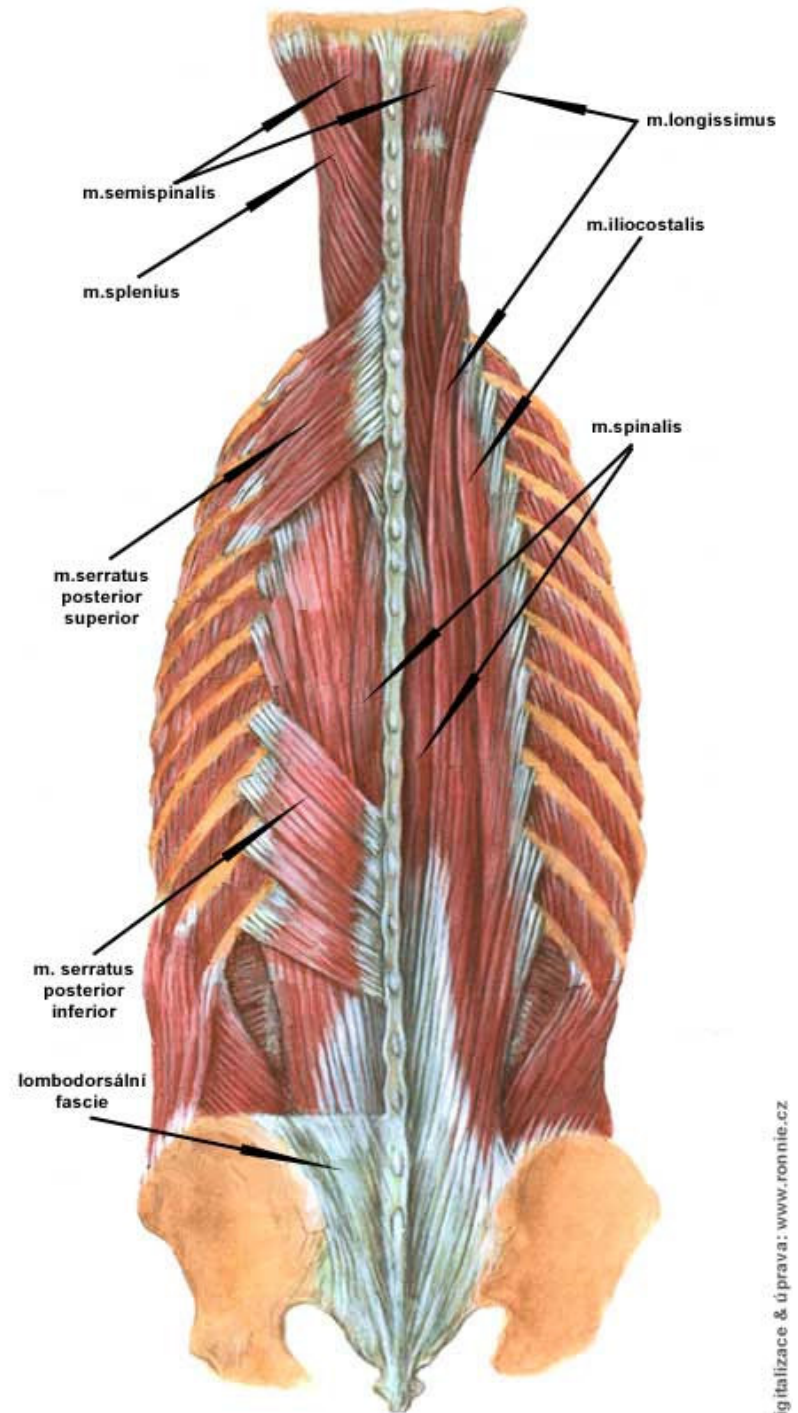
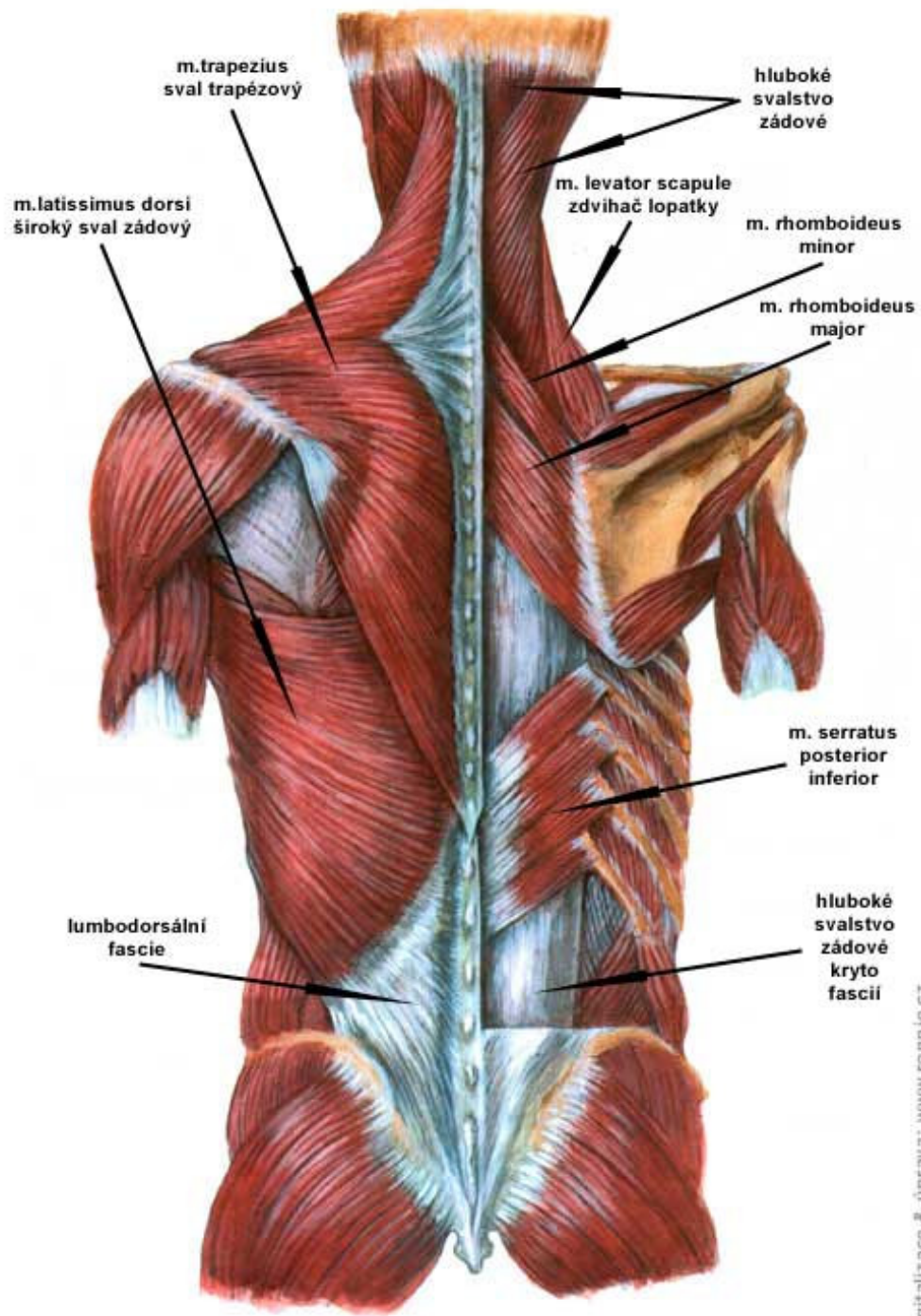
**posterior major**

**and both mm. obliqui**

Content is arcus posterior

atlantis, a. vertebralis, n.

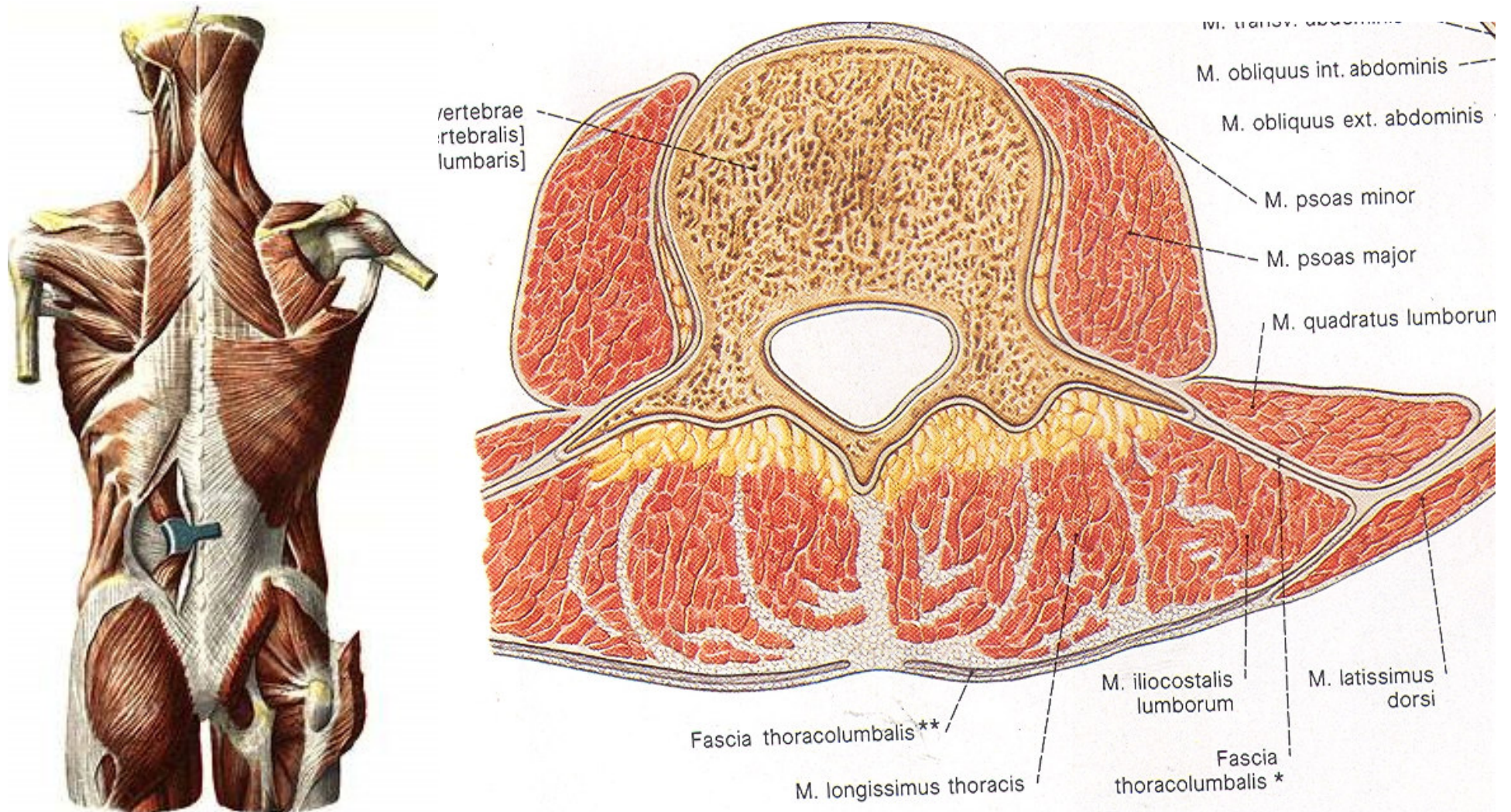
suboccipitalis



## Fasciae of back muscles

*fascia thoracolumbalis* (aponeurosis) is important

The superficial sheet is aponeurosis of *m. latissimus dorsi*; the deep sheet is stretched between 12th rib and *crista iliaca*, it forms borderline between *m. erector spinae* and *m. quadratus lumborum* – *aponeurosis lumbalis*.



# Abdominal muscles



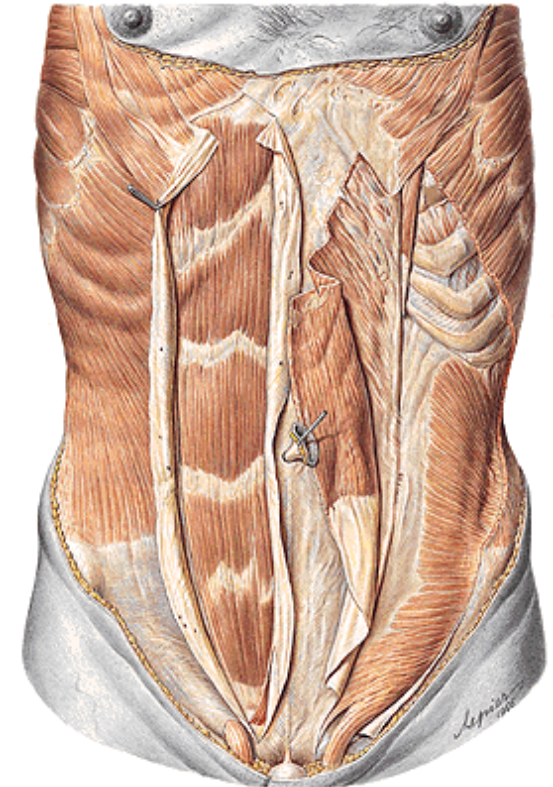
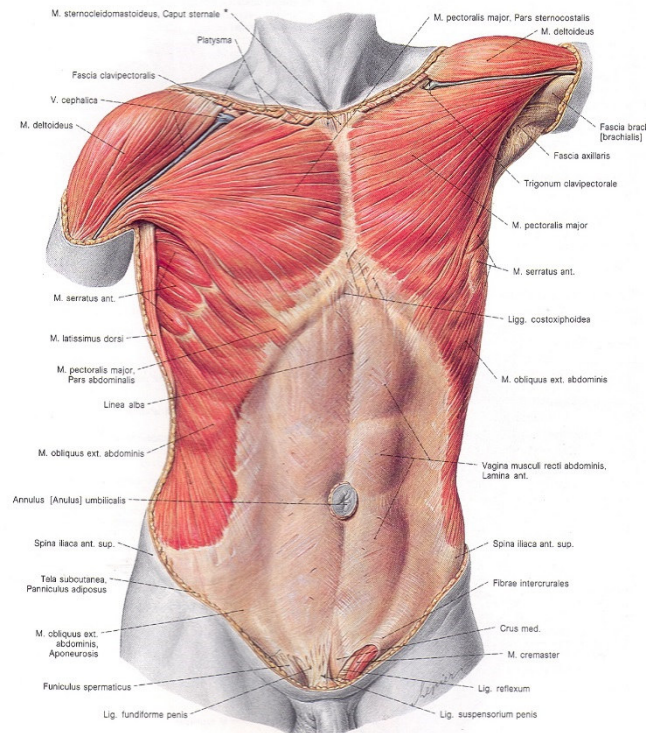
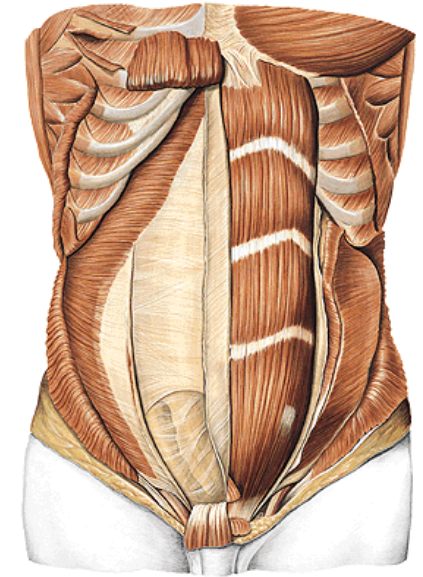


# Abdominal muscles (*mm. abdominis*)

## I. Ventral group:

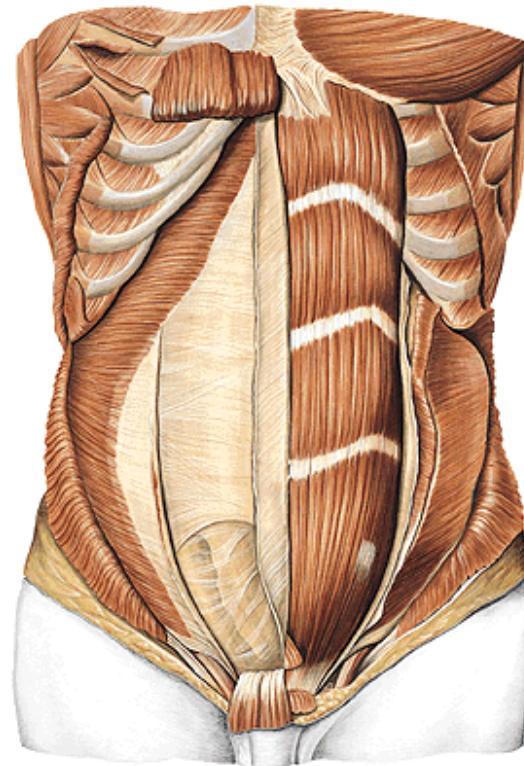
**1. *M. rectus abdominis*** – intersectiones tendineae, it pulls the ribs down  
– expiratory muscle, anteflexion of the trunk.  
It participates in abdominal press.

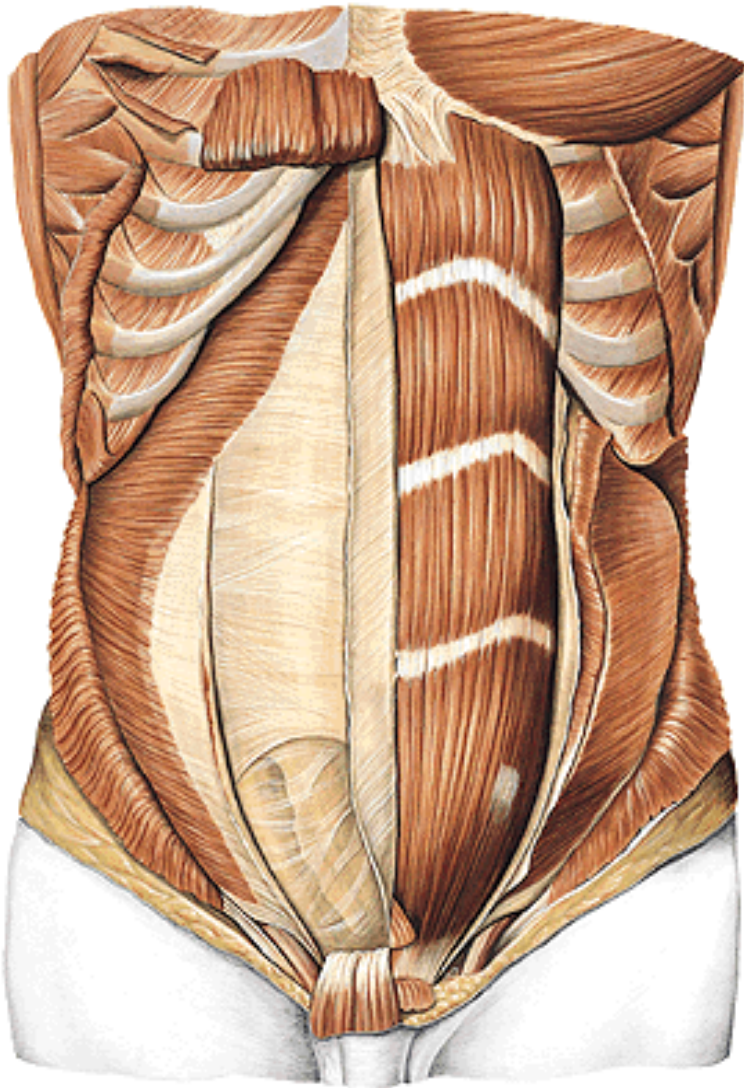
**2. *M. pyramidalis*** – rudimentary



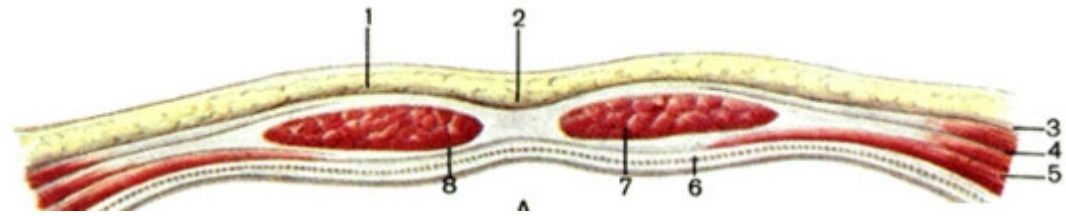
## II. Lateral group

1. ***M. obliquus externus abdominis*** – anteflexion of spine, elevation of pelvis, unilateral contraction – contralateral rotational abdominal press
2. ***M. obliquus internus abdominis*** – the same function
3. ***M. transversus abdominis***  
abdominal press, expiratory muscle

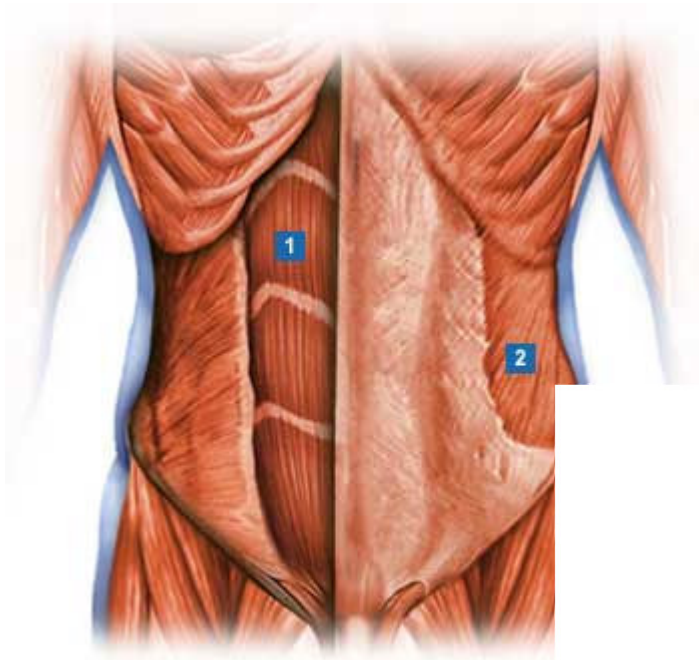




**Vagina m. recti abdominis**

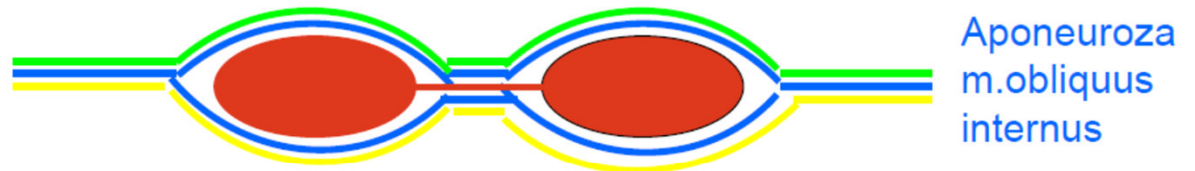


# VAGINA MUSCULI RECTI ABDOMINIS



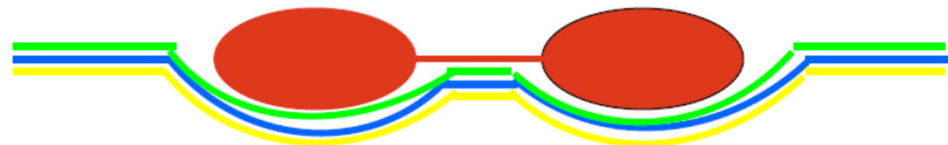
Vagina m.recti abd.

Aponeuroza m.transversus abdominis



Aponeuroza  
m.obliquus  
internus

Aponeuroza m.obliquus externus

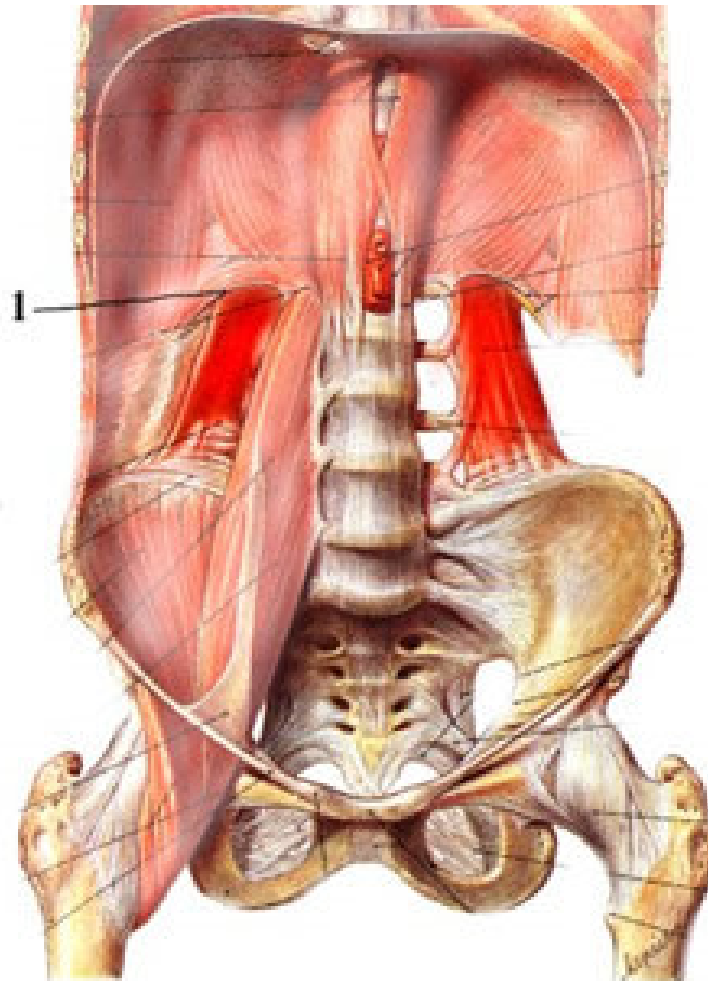
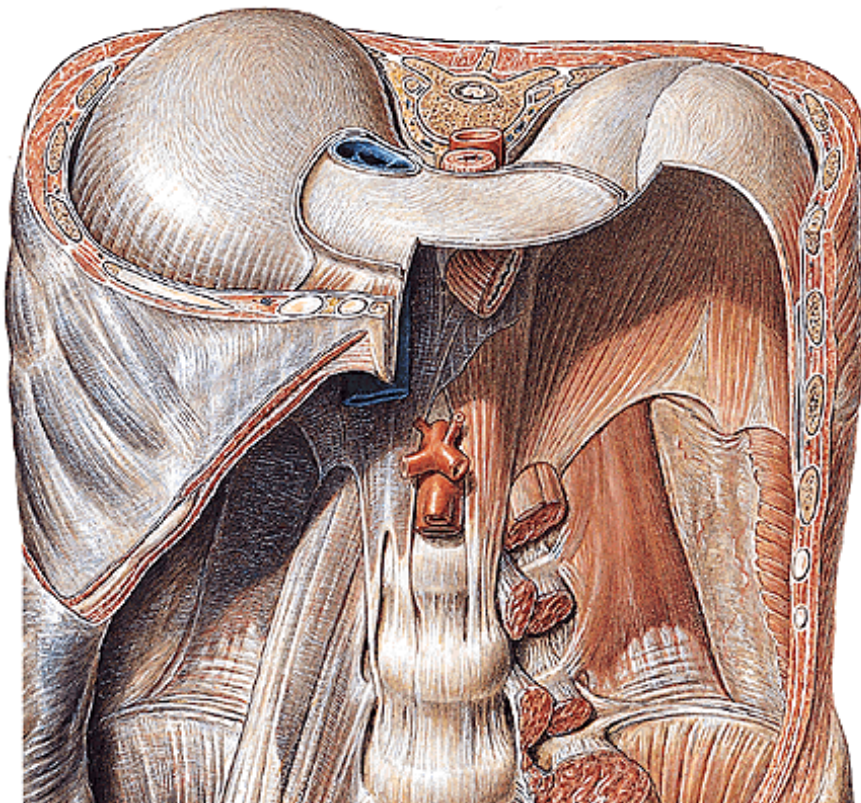


### III. Dorsal group

1. *Mm. intertransversarii laterales lumborum* – six pairs

2. *M. quadratus lumborum* – unilateral contraction – lateroflexion of spine,  
bilateral – extension of lumbar spine and fixation of 12th rib.

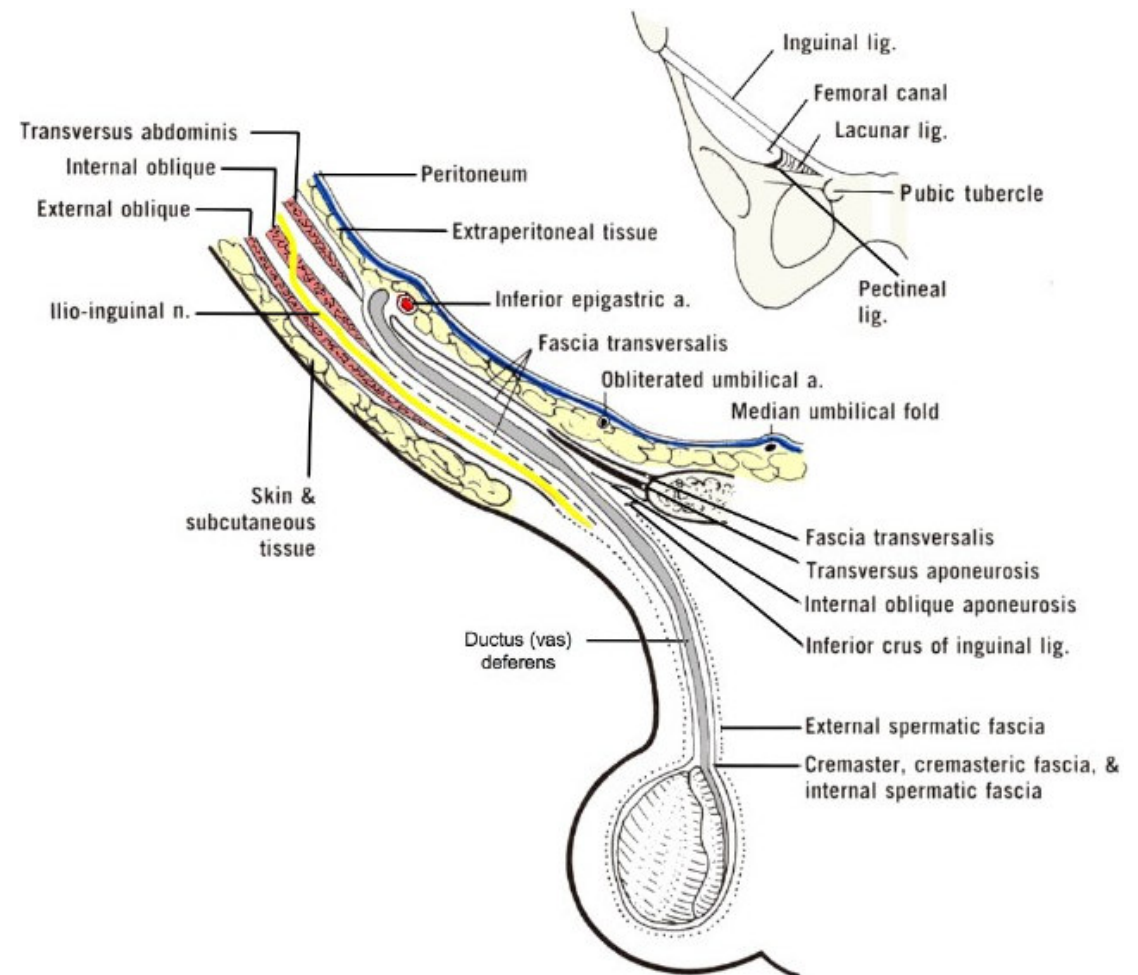
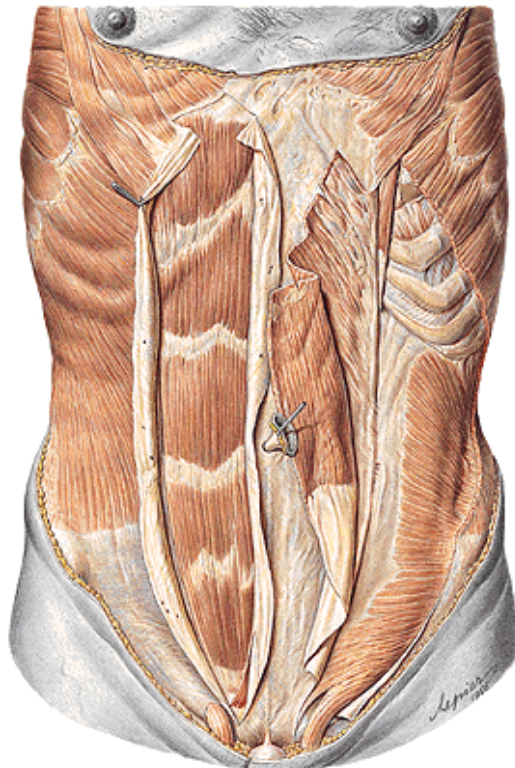
Innervation: nn. intercostales  
plexus lumbalis

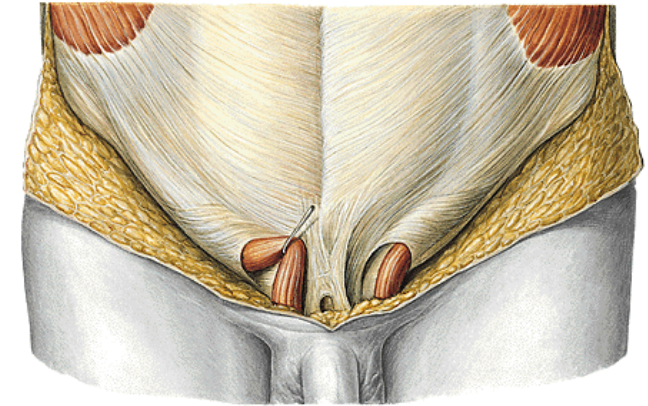


# Abdominal fasciae

**Fascia abdominis superficialis** (continues to funiculus spermaticus)

**Fascia transversalis** (continues to funiculus spermaticus)





## **Inguinal canal (*canalis inguinalis* – CI)**

It is located above *lig. inguinale* – it is weakened area in abdominal wall

Inguinal ligament= reinforced caudal edge of aponeurosis of *m. obliquus abdominis externus*

(from SIAS to *tuberculum pubicum*)

CI starts in abdominal cavity as *anulus inguinalis profundus* and opens out into subcutaneous area as *anulus inguinalis superficialis* (borders – *crus mediale* and *laterale* and *fibrae intercrurales*)

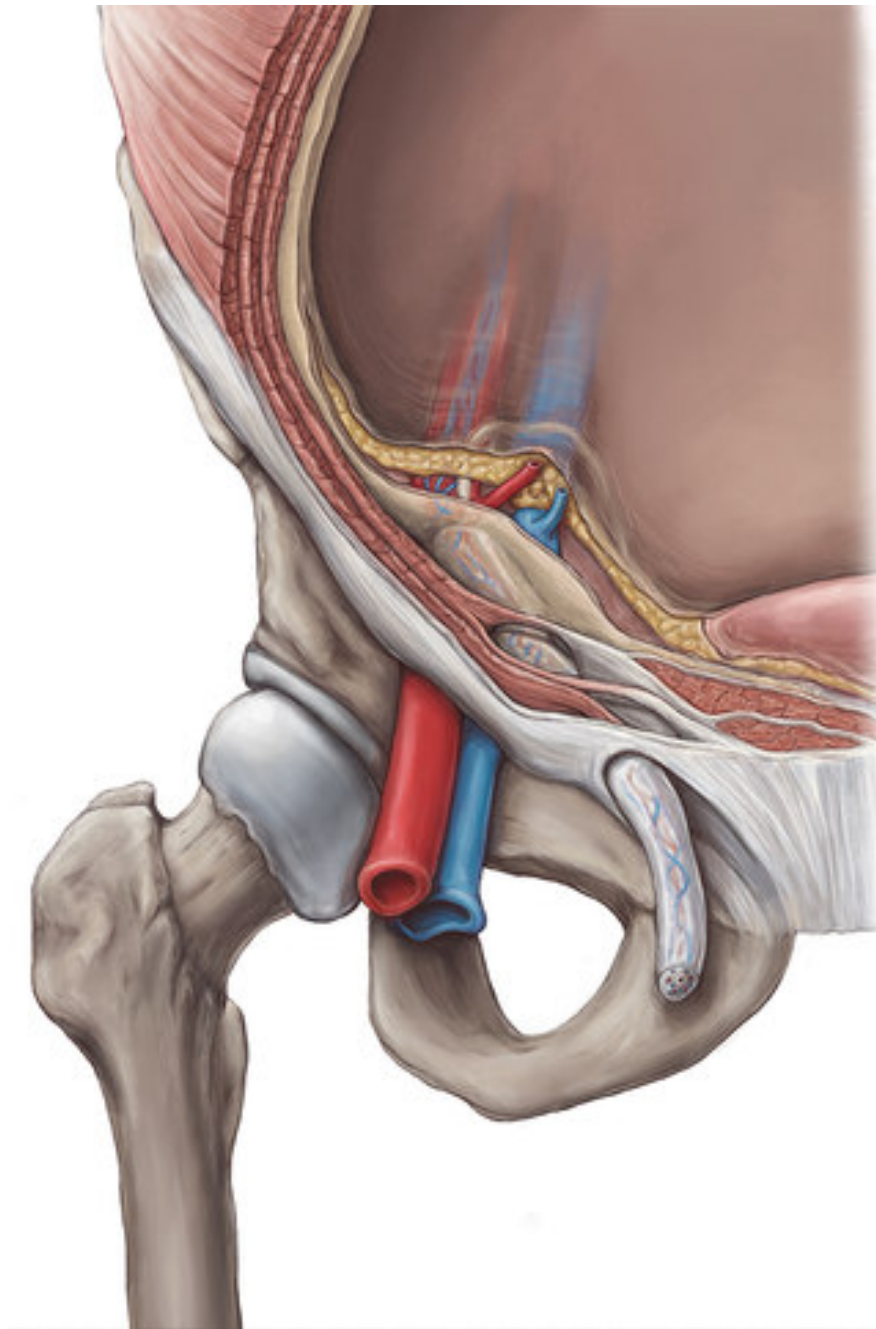
Anterior wall CI – aponeurosis of *m. obliquus abdominis externus*

Posterior wall CI – *fascia transversalis* (reinforcements *falx inguinalis* and *lig. interfoveolare*)

Inferior wall CI – *lig. inguinale*

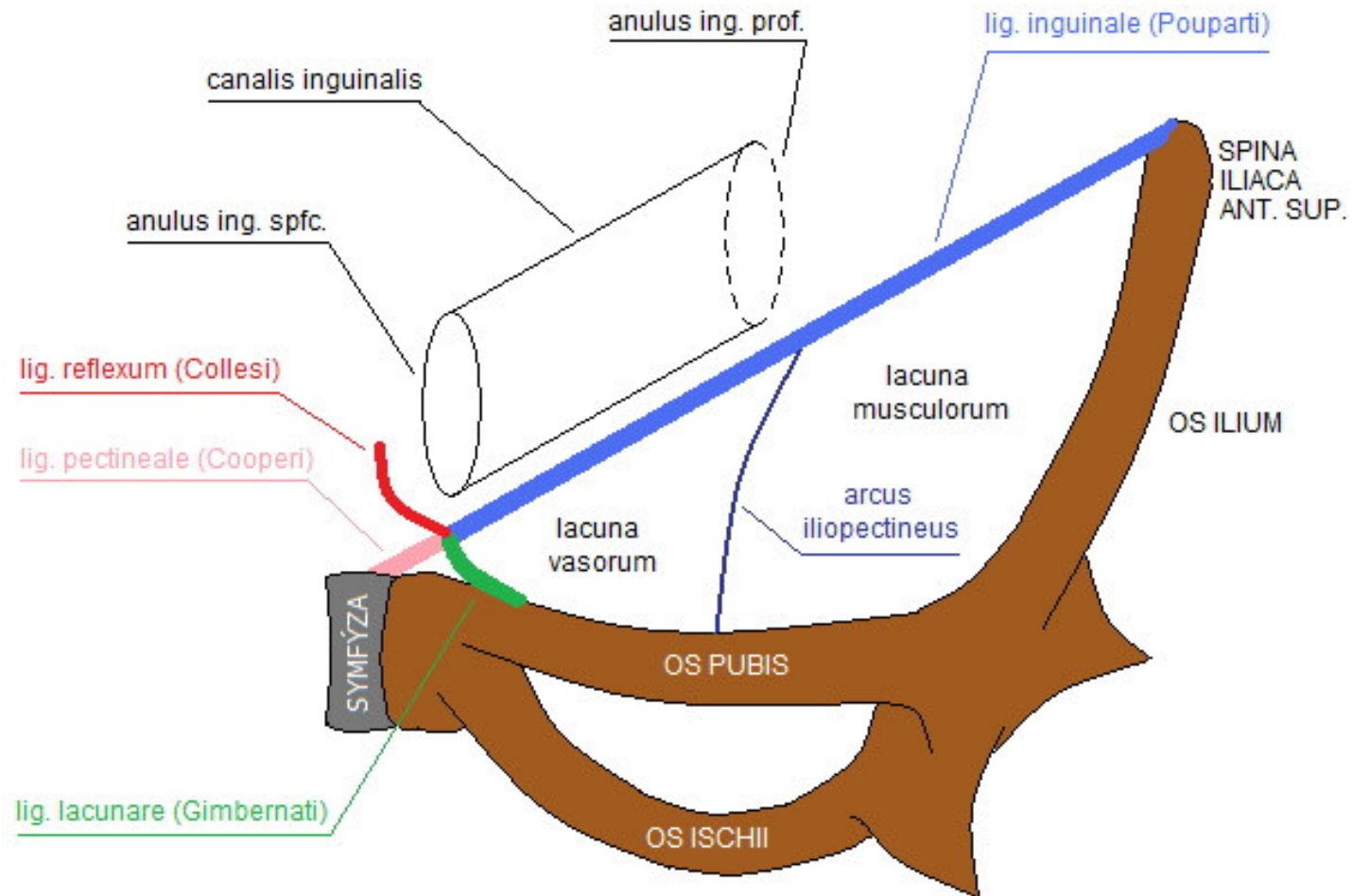
Superior wall CI – bounds of *m. obliquus abdominis int.* and *m. transversus abdominis*

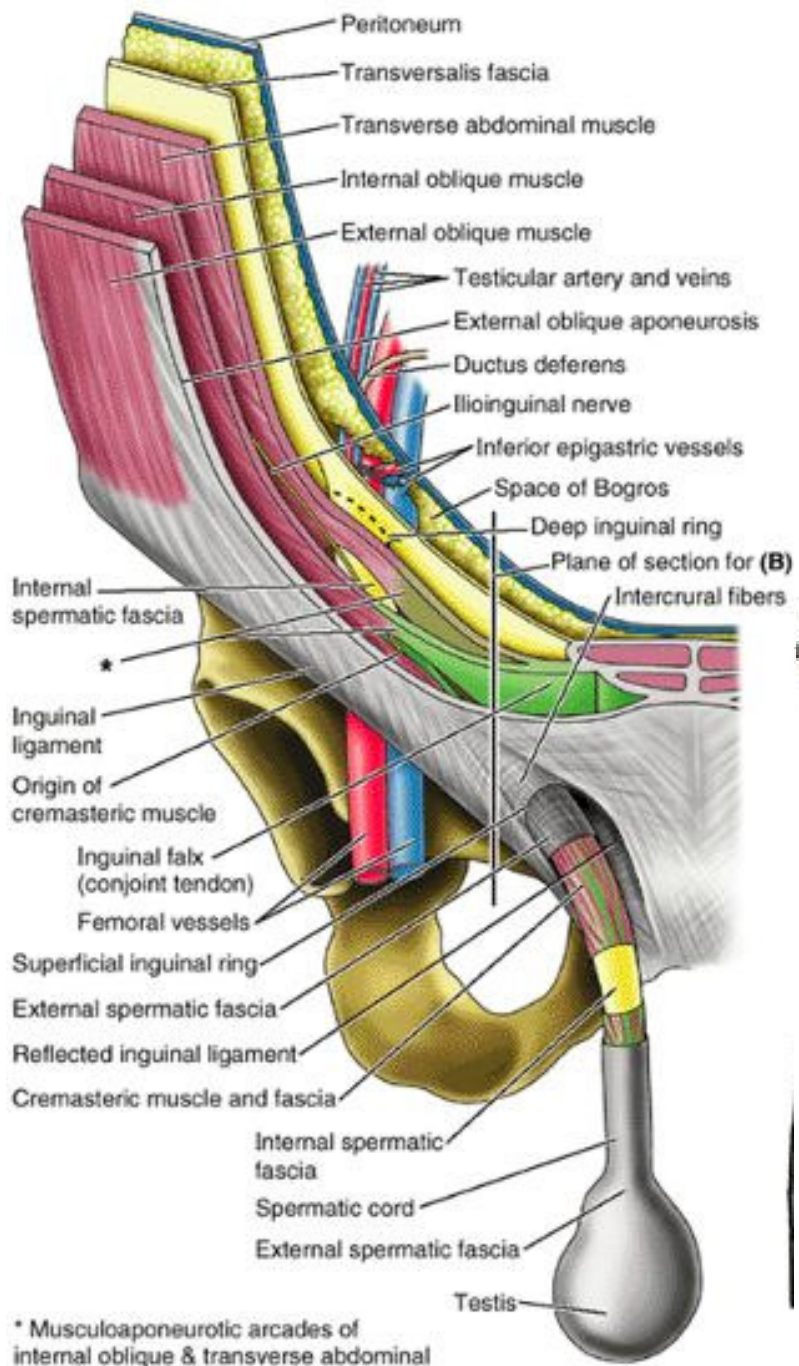
(it forms *m. cremaster* in man)



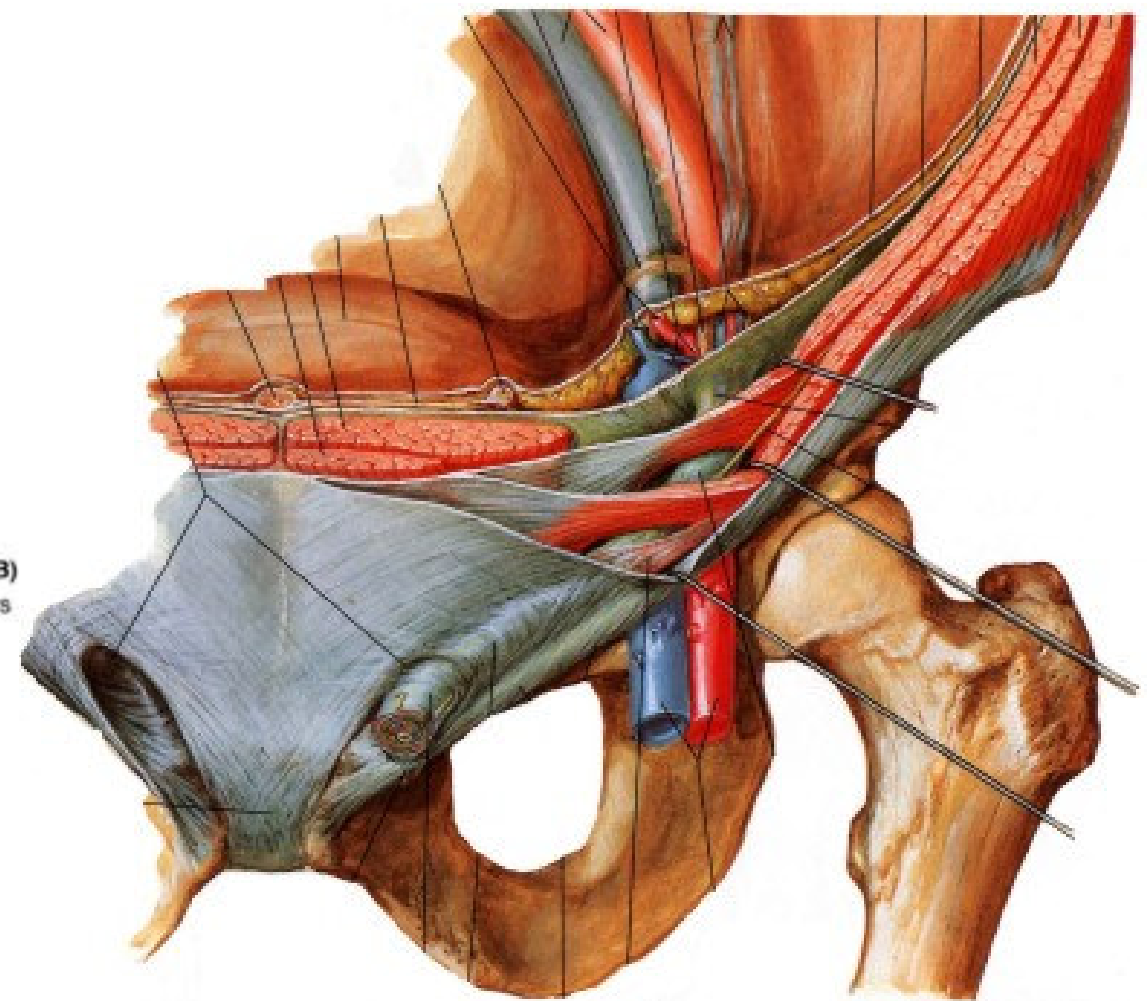


## Schéma tříselného vazu (lig. inguinale Poupartii)





(A) Anterior view



(B)

**Funiculus spermaticus passes through canalis inguinalis in man (during prenatal development – the testes), ligamentum teres uteri in woman.**

**Weakened place– inguinal herniae (direct and indirect).**

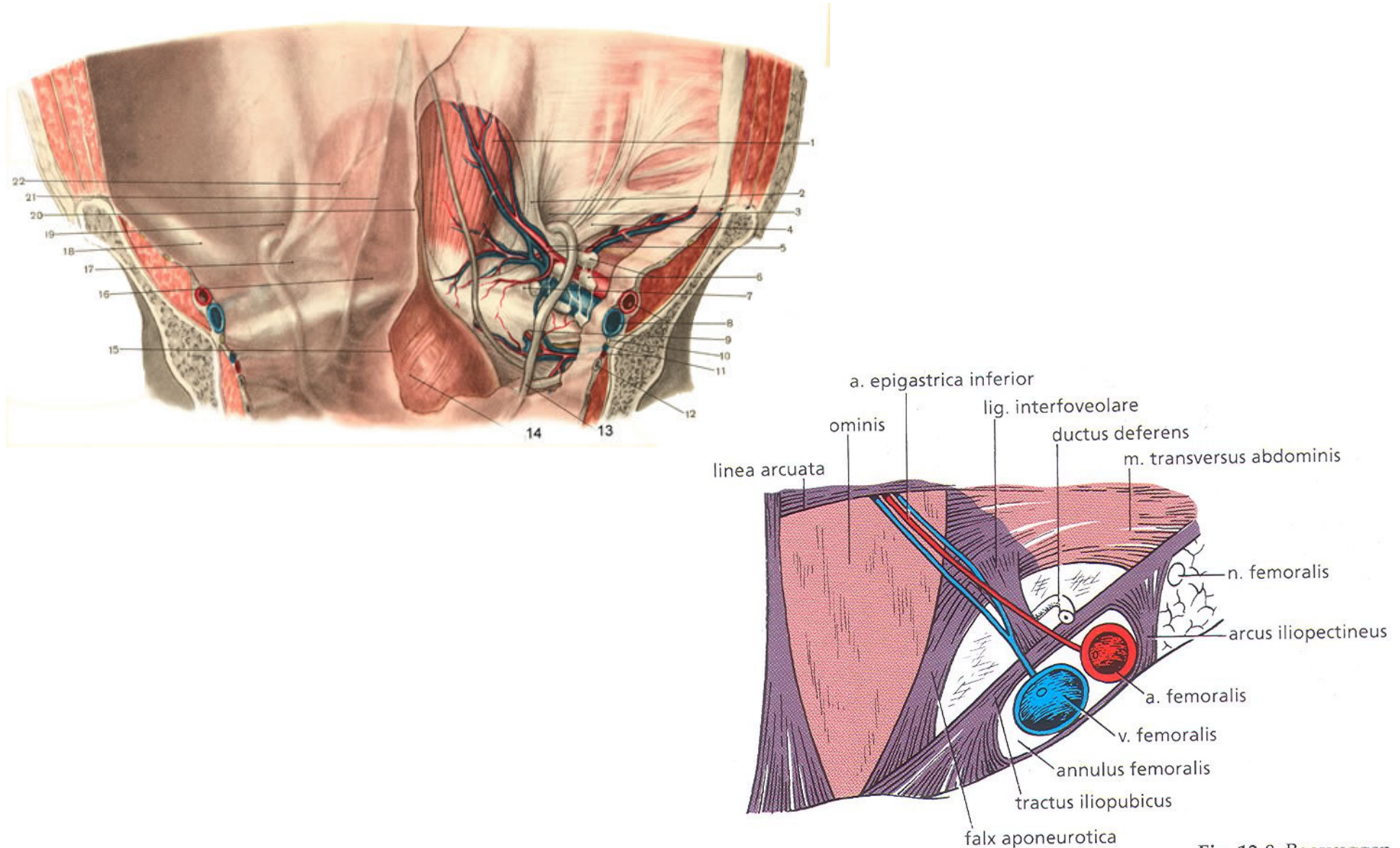
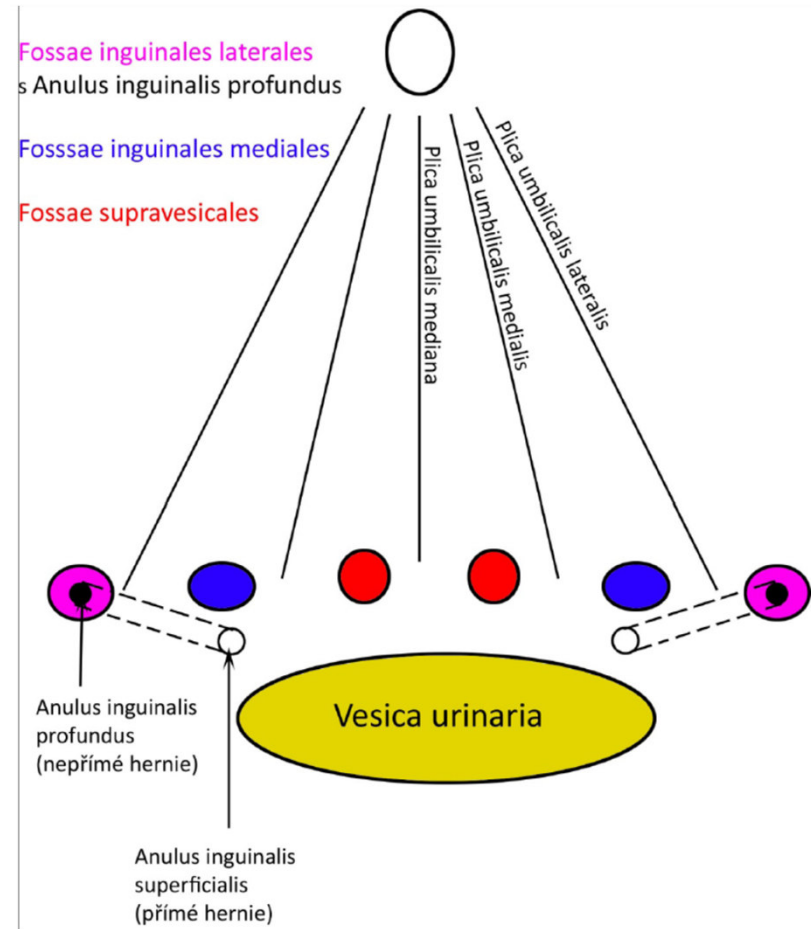
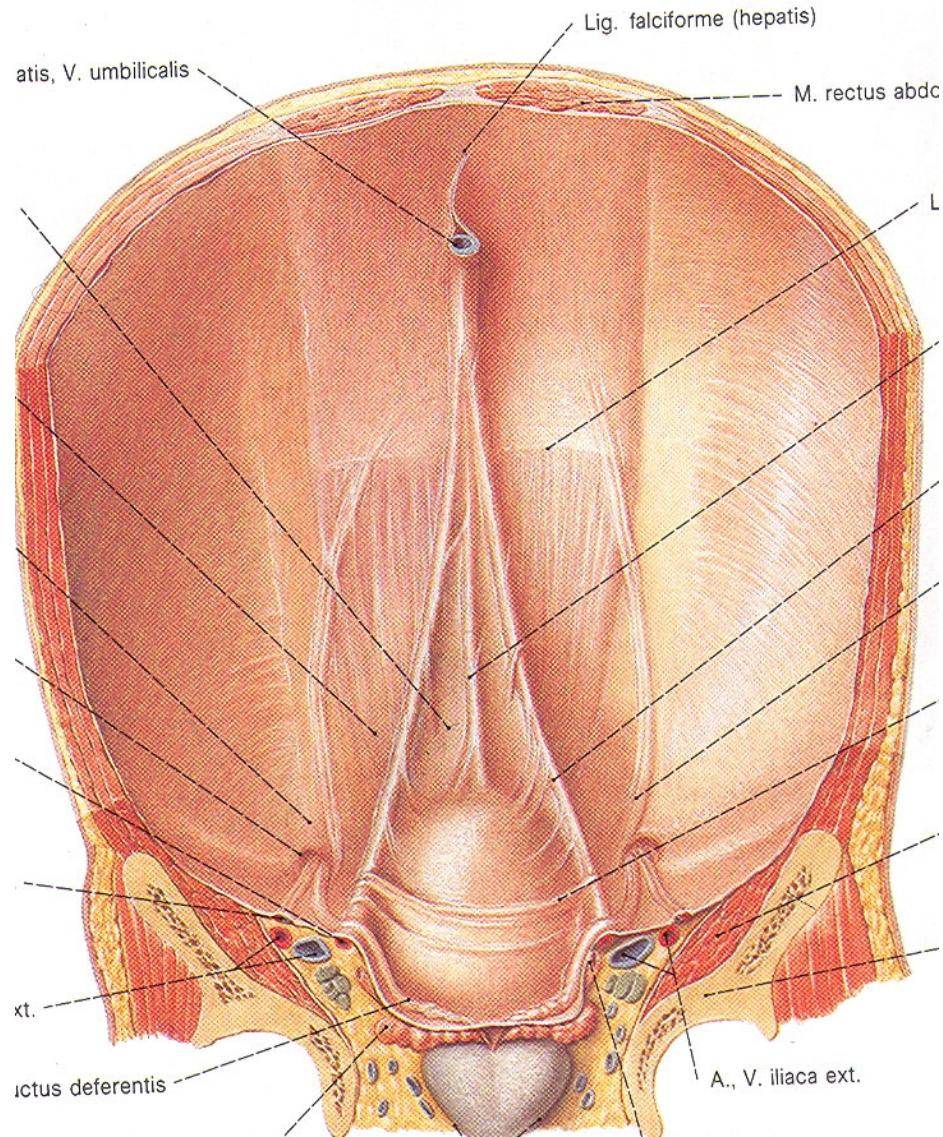
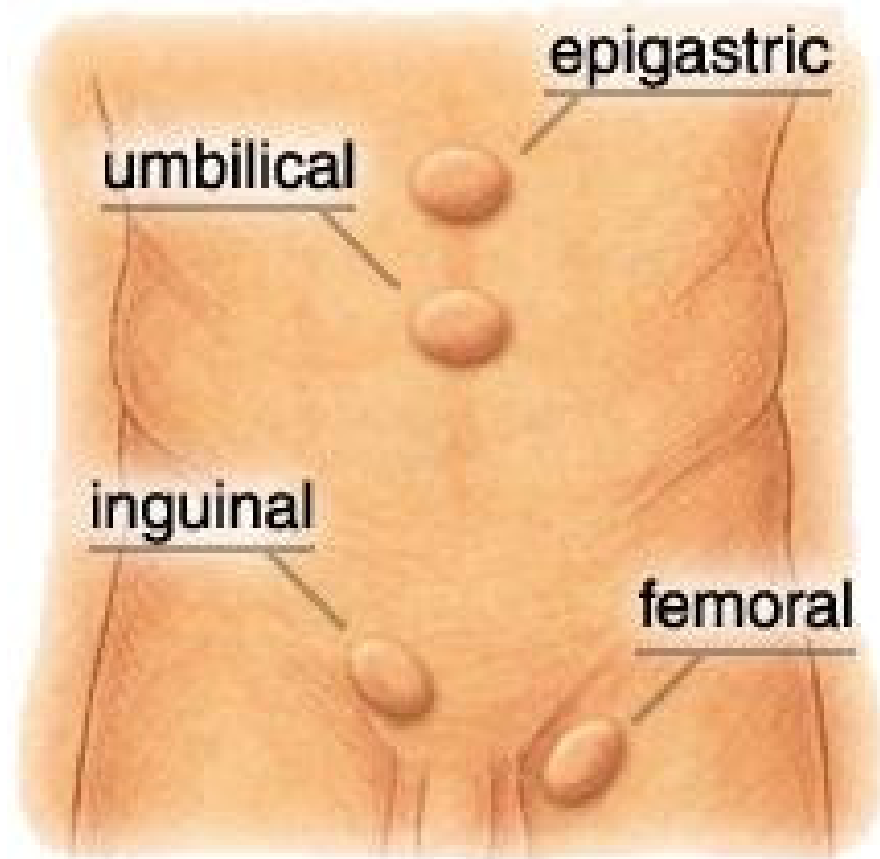


Fig. 13-8: Bagvæggen

# Weakened areas of abdominal wall:





Under *ligamentum inguinale* there are spaces (*lacuna vasorum* and *lacuna musculorum*), through which the nerves and vessels get from pelvic cavity to the thigh.

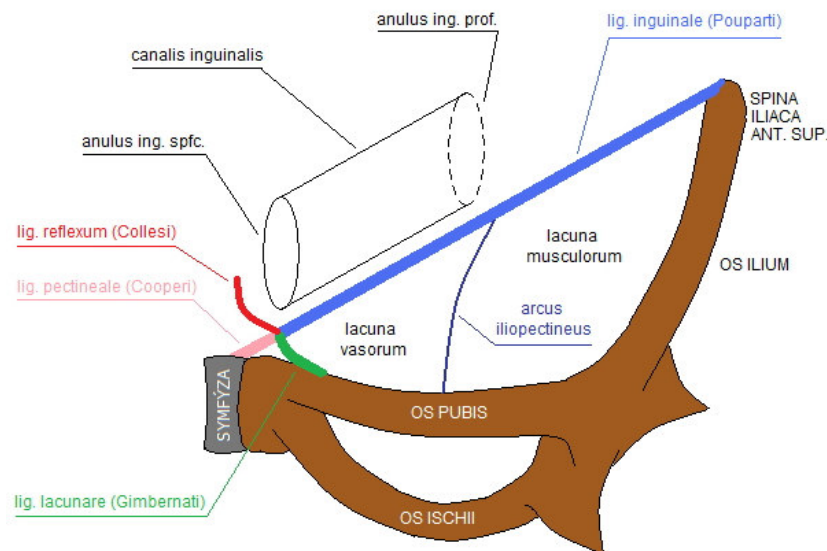
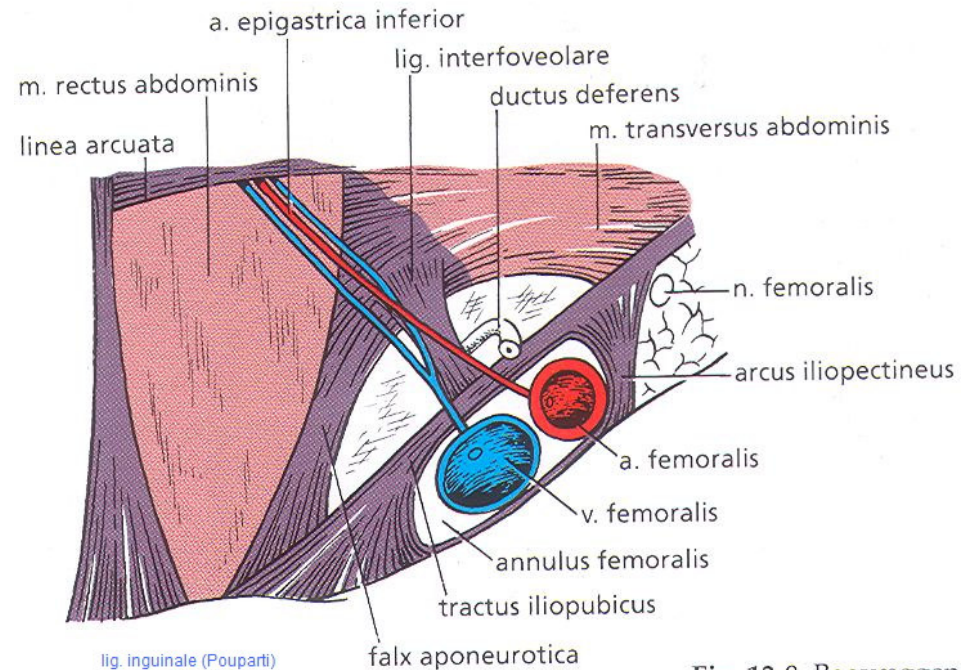
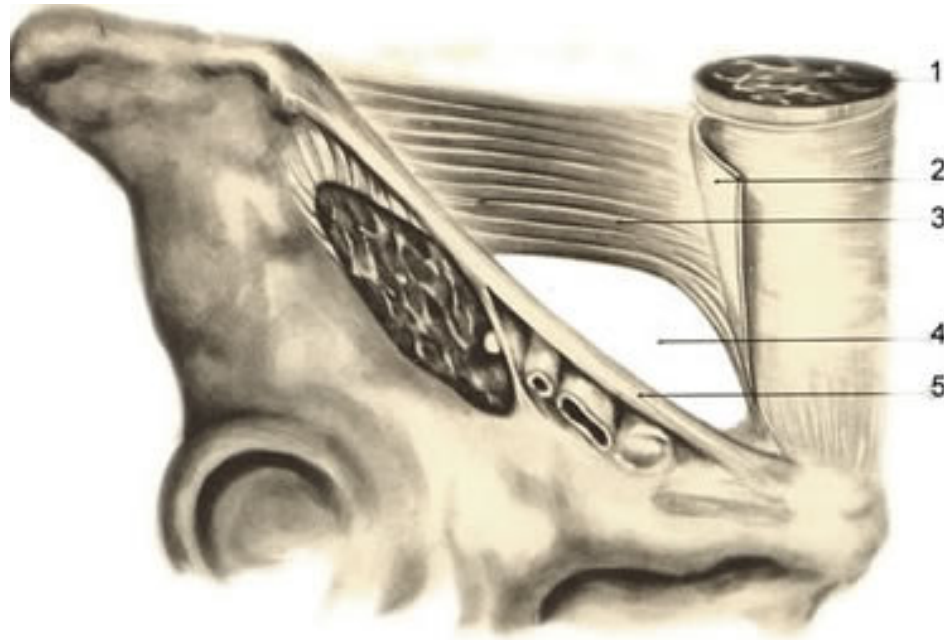
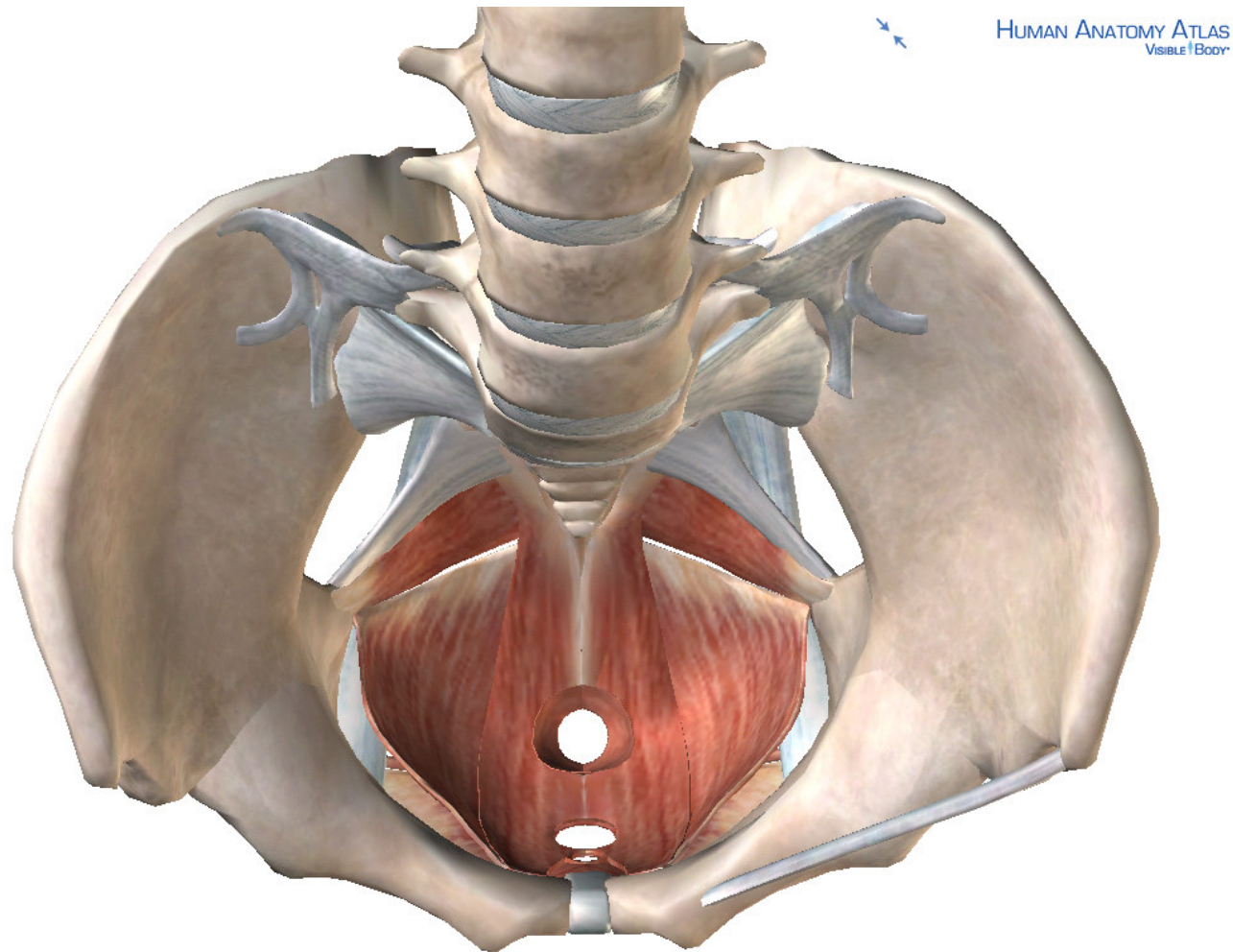


Fig. 13-8: Bagvæggen

# Muscles of pelvic floor

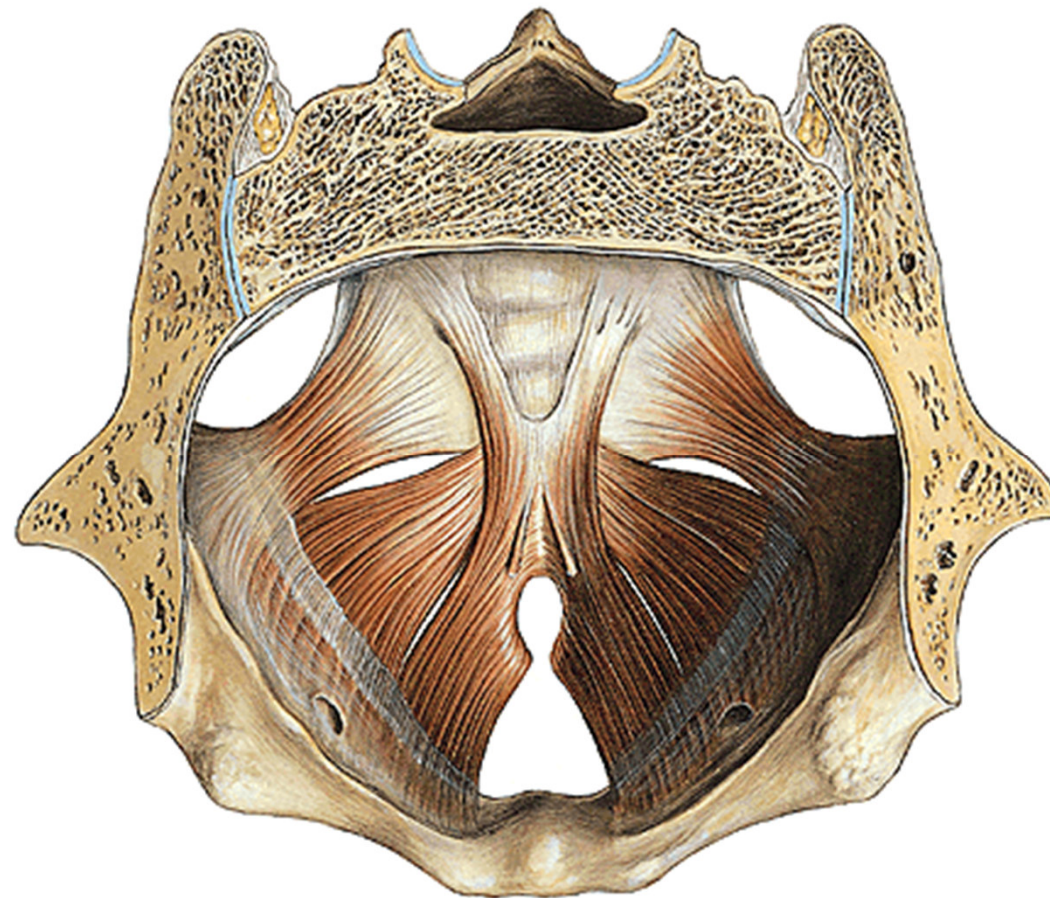


## Diaphragma pelvis

*m. levator ani (m. pubococcygeus, m. iliococcygeus)*

*m. coccygeus*

Elevation and closing of rectum





## Diaphragma urogenitale (ventrally + caudally)

*m. transversus perinei profundus (+ m. sphincter urethrae)*

*m. transversus perinei superficialis*

Innervation: plexus sacralis

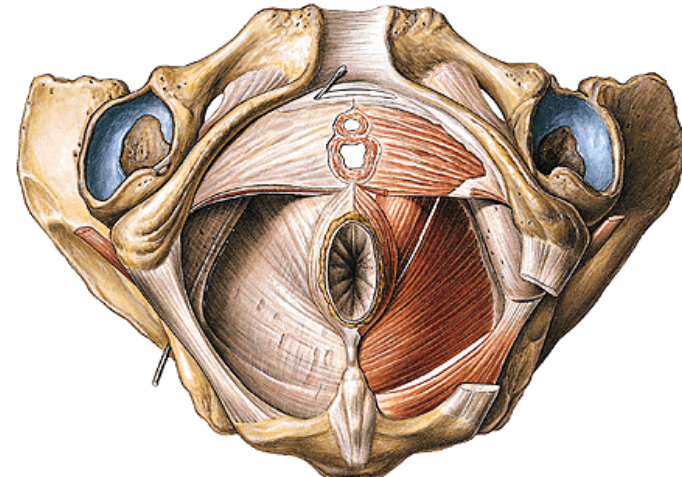
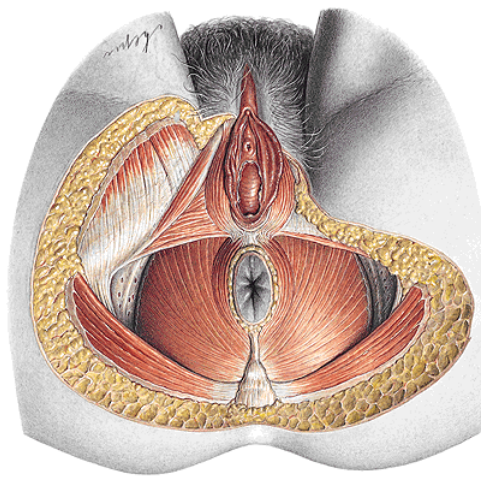
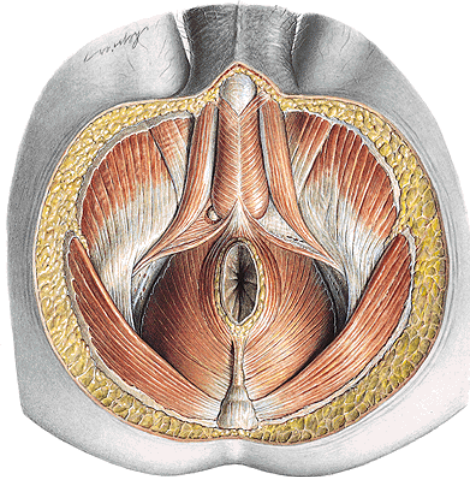
Function: flexible bottom of pelvic cavity, support of organs (uterus)

## Muscles of external genital organs:

*m. ischiocavernosus*

*m. bulbospongiosus*

(*m. sphincter ani externus*)



# Thank you for your attention!

**Pictures:**

**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**