

# **Muscles of back, abdomen, inguinal canal**

# Muscles of the back

**A) Heterchtonous 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 pull shoulder  
down

**IN:** n. accesorius

**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 hoe

**IN:** n. thoracodorsalis



***M. levator scapulae***

**O:** spinous processes C3-4

**I:** angulus superior scapulae

**F:** elevation of scapula

***M. rhomboideus minor***

**O:** spinous processes C6-7

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

**F:** pulls scapula medially and cranially

***M. rhomboideus major***

**O:** spinous processes Th1-4

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

**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 till axis and ribs and pr. costarii

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

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

### 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:** úklon, záklon, otočení na svoji stranu

***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 significant**

**The superficial sheet is aponeurosis of *m. latissimus dorsi*; the deep sheet is extended 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 and elevation of pelvis, unilateral contraction – contralateral rotation of trunk, 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



### **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

Inuinal ligament= reinforced caudal edge of aponeurosis of *m. obliquus abdominis externus* (fromSIAS 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 *false 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)

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

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

**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.

# 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*

Inervation: 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*)

# **Fossa ischioirectalis**

**medially – m. levator ani**

**laterally – m. obturatorius internus**

**dorsally – lig. sacrotuberale and m. gluteus maximus**

**content: adipose tissue, nerves and vessels (canalis pudendalis=Alcocki)**

Thank you for your  
attention!