

Introduction to Clinical Skills

Practical – Lumbar Spine and Sacro-Iliac Joint

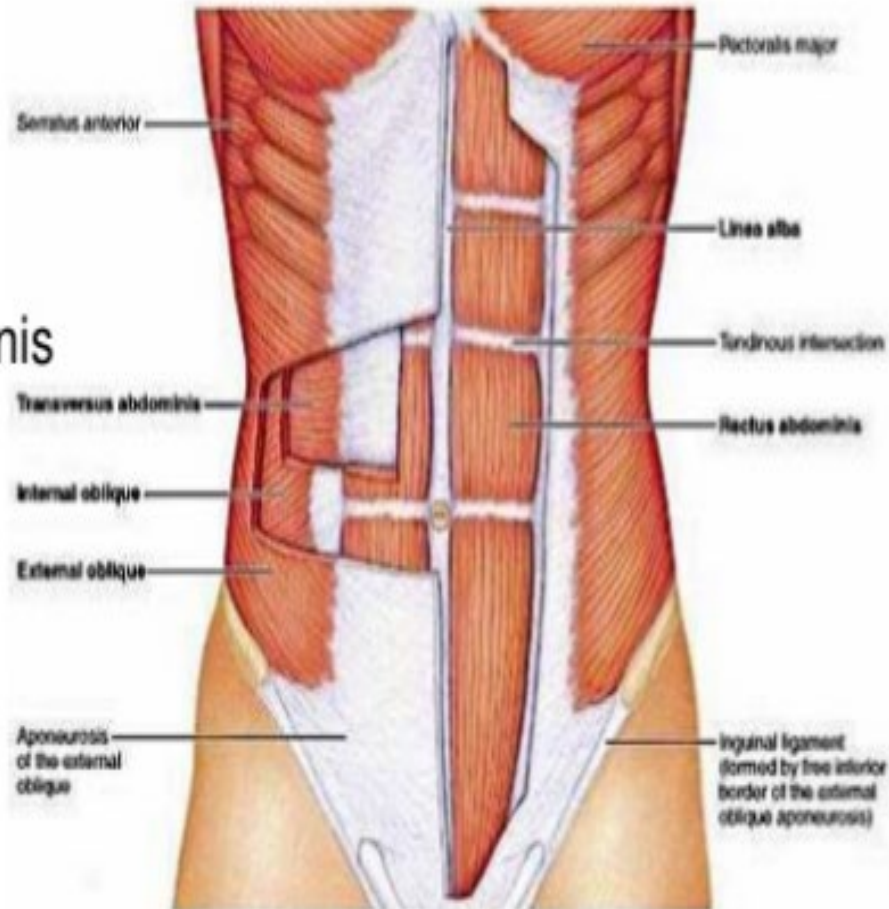
Introduction

- Structures of pelvic and core muscles perform are involved in a vast amount of movements
- Synergistic effect
- The design of a muscles will relate to its function

Introduction

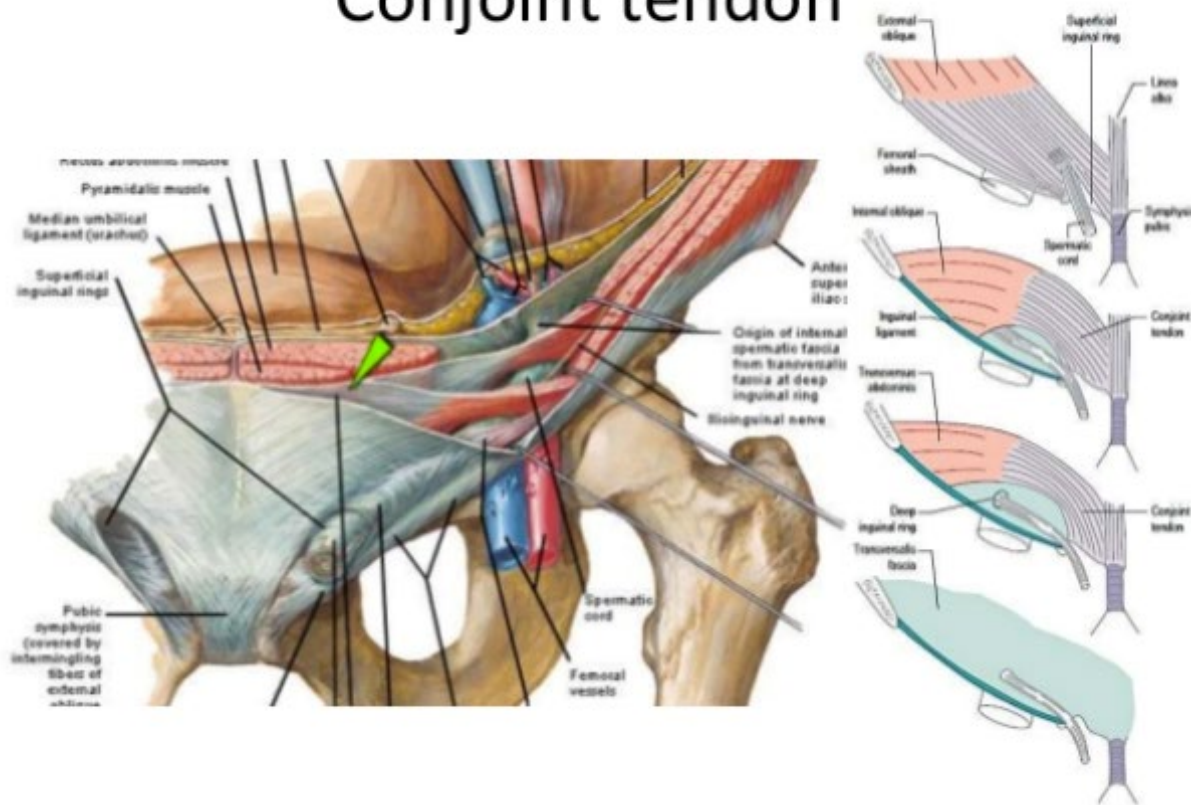
Muscles

- External oblique
- Internal oblique
- Transversus abdominis
- Rectus abdominis
- Pyramidalis



Myology – Core and Pelvis

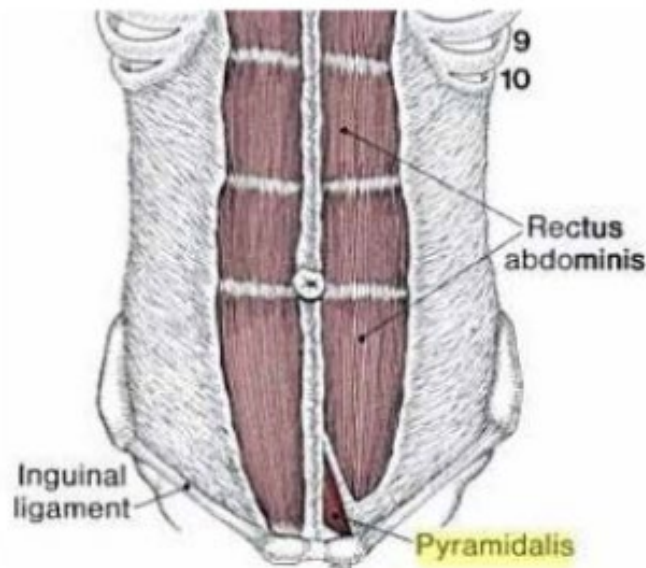
Conjoint tendon



Myology – Core and Pelvis

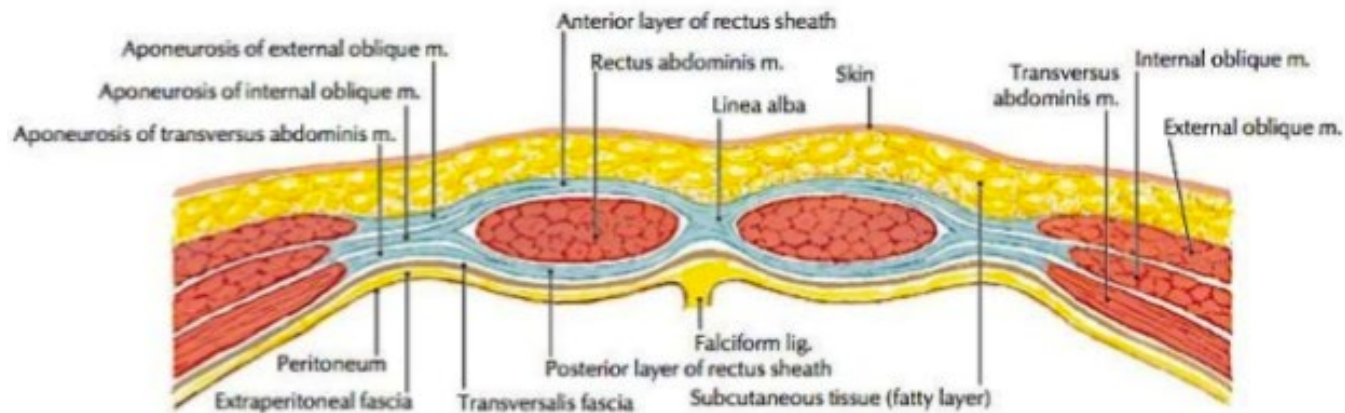
Pyramidalis

- Inconsistent muscle, within rectus sheath
- **Origin:** pubic symphysis and pubic crest
- **Insertion:** linea alba
- **Nerve supply:** T12

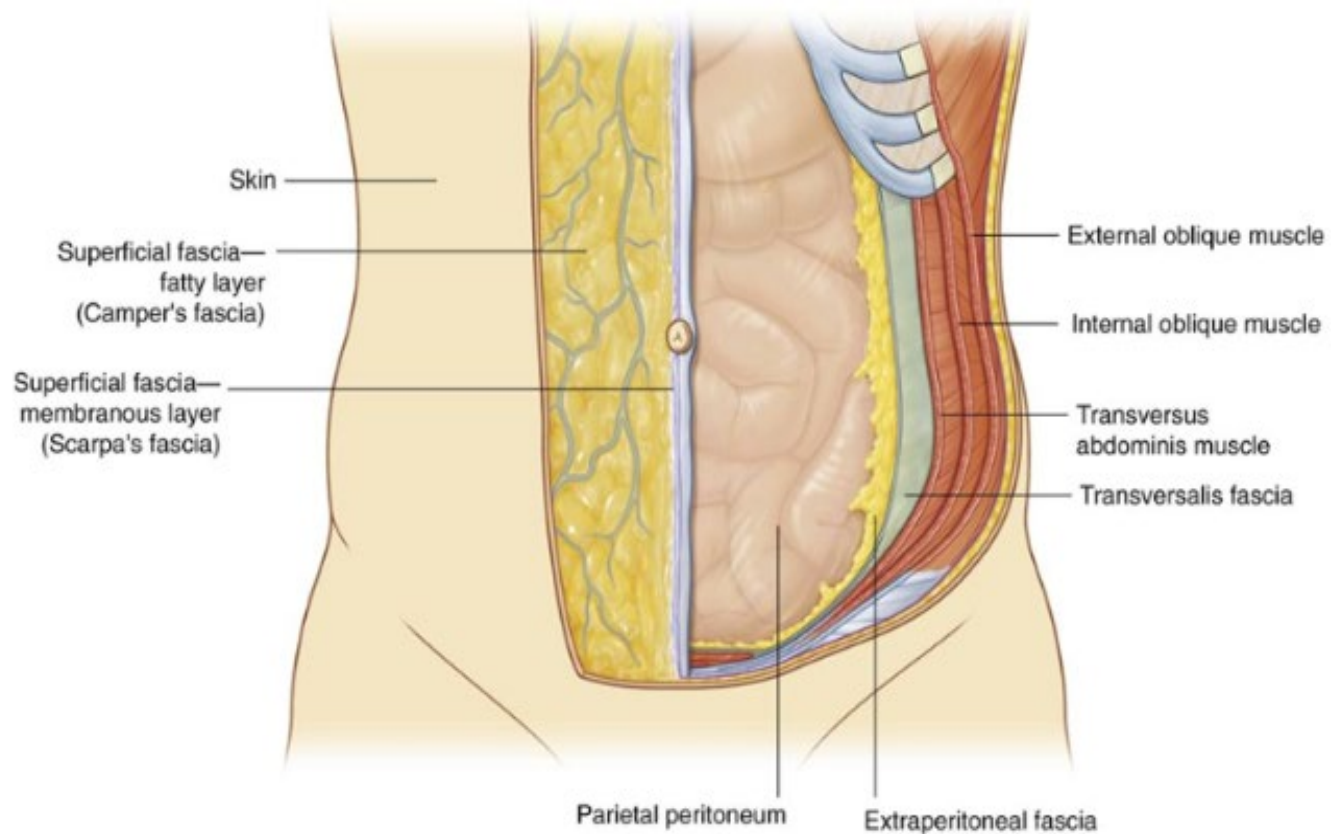


Myology – Core and Pelvis

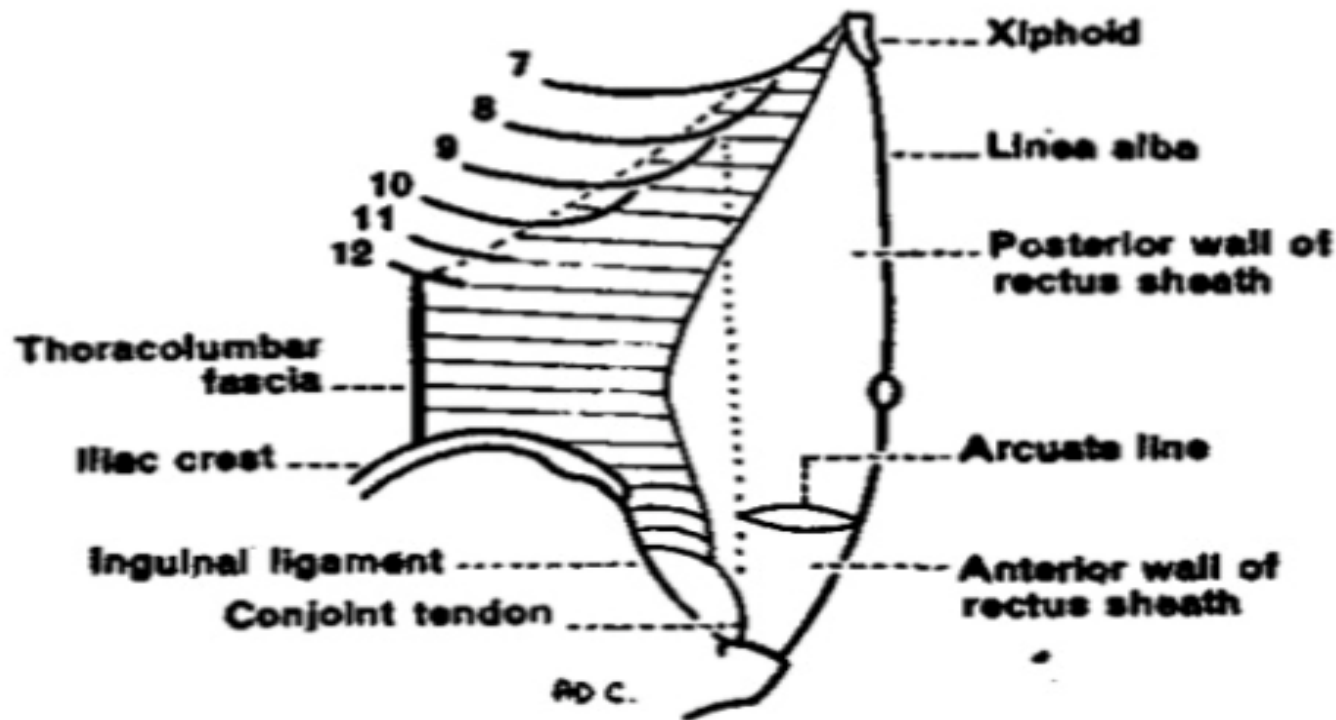
Linea alba and rectus sheath



Myology – Layers



Myology – Core and Pelvis

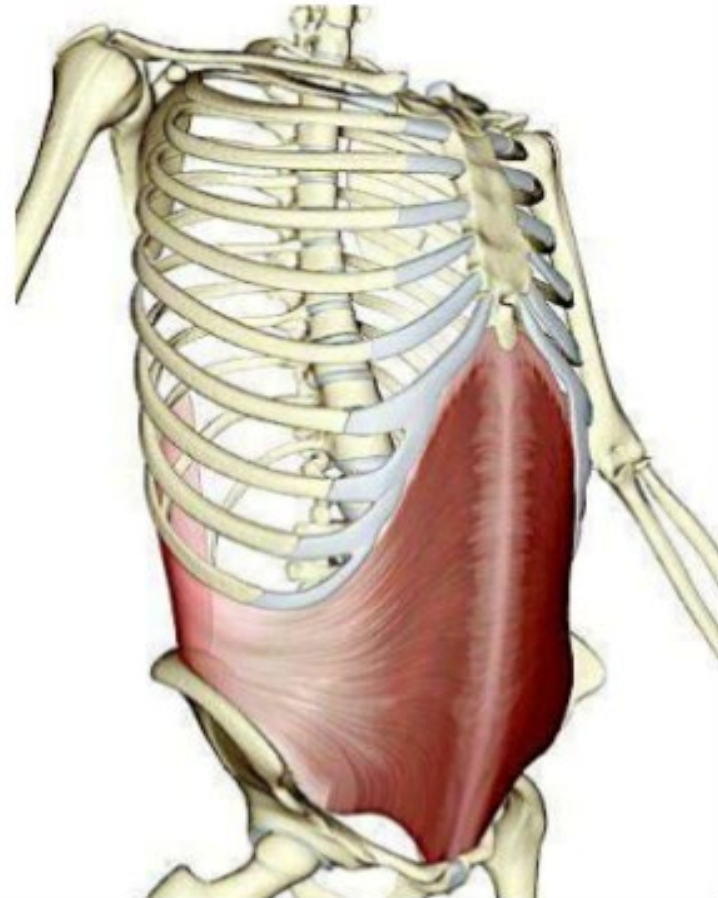


Right transversus abdominis muscle.

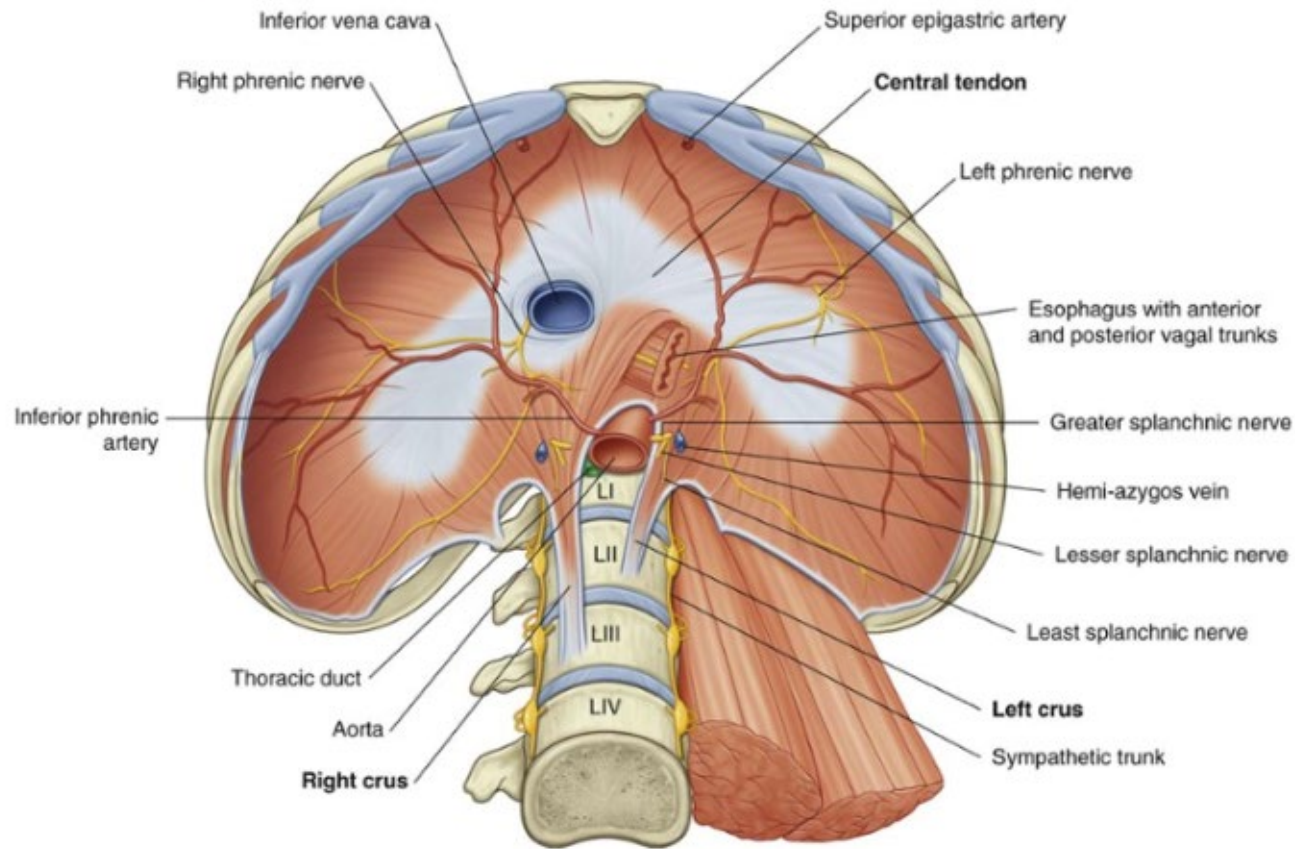
Myology – Core and Pelvis

Transversus abdominis

- **Origin:** thoracolumbar fascia, Iliac crest, lat ½ of inguinal ligament, and costal cartilages 7-12
- **Insertion:** Xiphoid process, linea alba, pubic crest and pecten pubis via conjoint tendon
- **Direction:** transverse
- **Nerve supply:** T6-L1



Diaphragm



Manual Muscle Testing

- **Iliopsoas**

- Psoas Major

- O: bodies of T12-L5 and anterior aspect of all Lx Transverse processes
 - I: lesser trochanter of femur
 - A: flexes hip and flexes/laterally flexes trunk

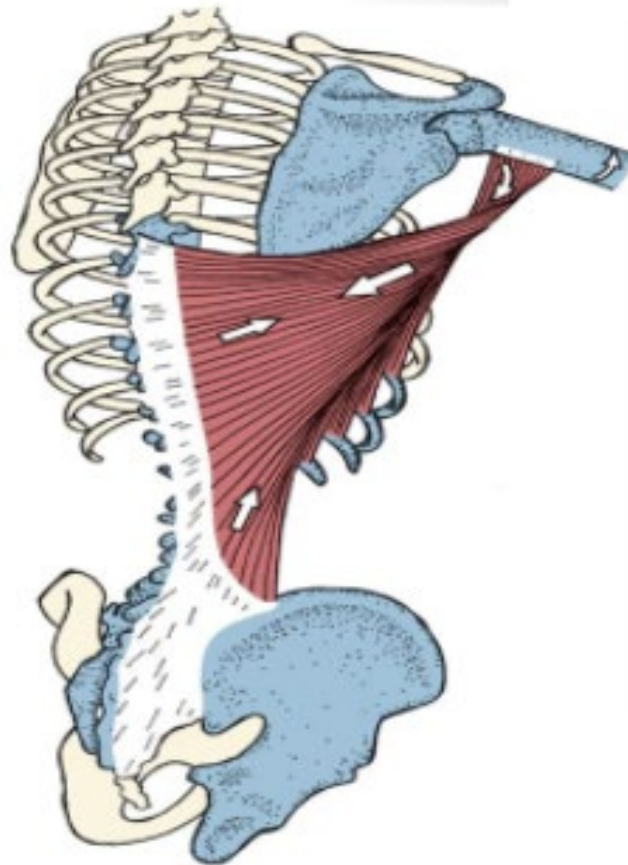
- **Iliacus**

- O: iliac fossa, sacrum and anterior sacroiliac ligament
 - I: lesser trochanter
 - A: Hip Flexion



Latissimus Dorsi

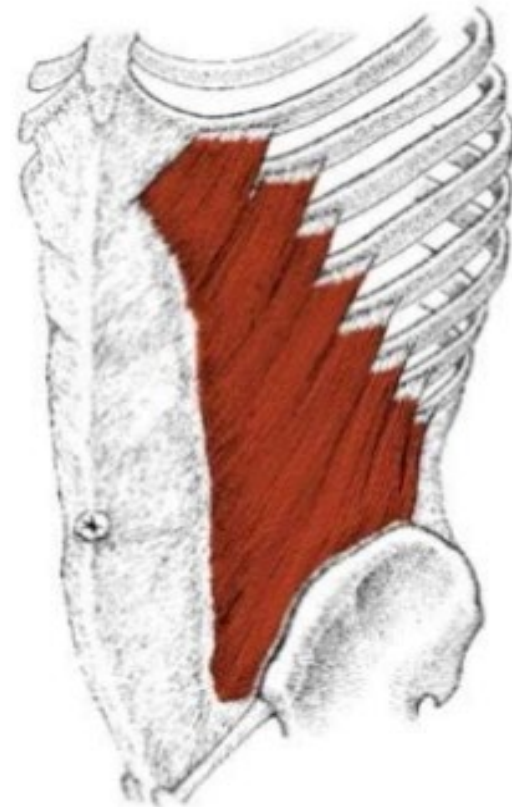
- O: via thoracolumbar fascia to spinous processes T7-T12, all Lx and Sacral vertebrae and their ligaments, posterior part of iliac crest, lower 4 ribs and inferior angle of scapula
- I: long flat tendon twists 180° into floor of intertubercular groove
- A: adducts, medially rotates and extends arm at the shoulder joint.



Myology -

External oblique

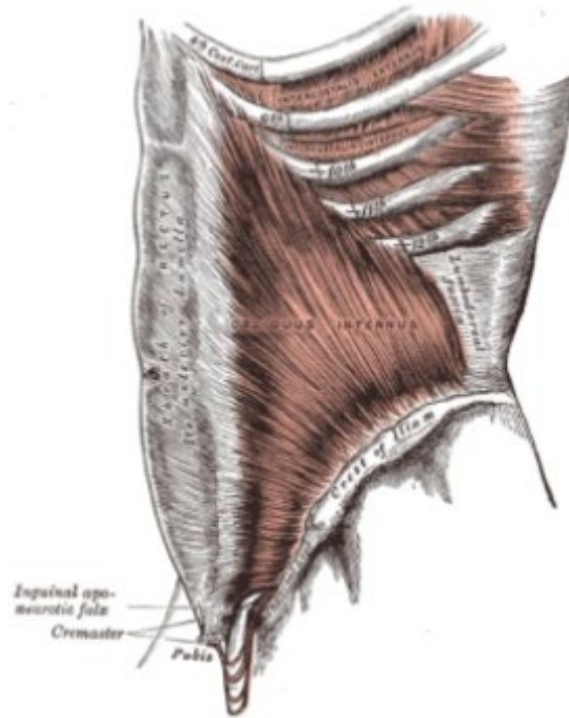
- **Origin:** external surfaces and inferior borders of 5-12 ribs with serr ant and lat dorsi
- **Insertion:** iliac crest, linea alba, forms inguinal ligament
- **Direction:** inferiorly and anteriorly
- **Nerve supply:** T7 – L1



Myology - Core and Pelvis

Internal oblique

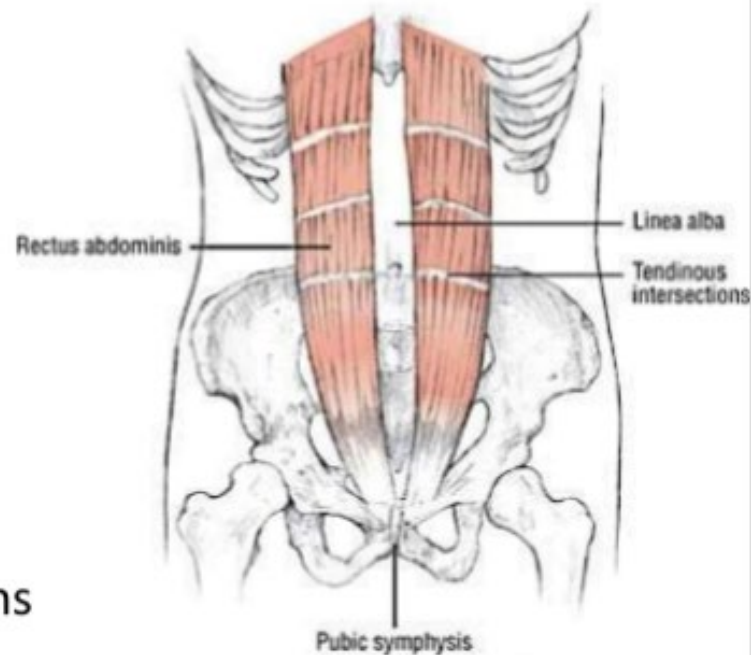
- **Origin:** thoracolumbar fascia, iliac crest, lat 2/3 of inguinal ligament
- **Insertion:** pectan pubis (conjoint tendon), linea alba, 10-12 ribs
- **Direction:** superiorly and anteriorly
- **Nerve supply:** T7 – L1



Myology – Core and Pelvis

Rectus abdominis

- **Origin:** Pubic crest
- **Insertion:** costal cartilage 5-7, xiphoid process
- **Direction:** vertical
- **Nerve supply:** T7-T11
- Tendinous intersections



Myology – Erector Spinae

Spinalis



Origin

- Spinous processes of cervical, thoracic and lumbar vertebrae

Insertion

- Spinous processes of superior vertebrae to origin

Joint crossed

- Vertebrae

Joint action

- Extends the spine

Myology – Core and Pelvis

Iliocostalis



Origin

- Ribs and iliac crest

Insertion

- Transverse processes of cervical vertebrae and ribs superior to origin

Joint crossed

- Vertebrae

Joint action

- Extends the spine

Myology – Core and Pelvis

Longissimus



Origin

- Transverse Processes of cervical, thoracic and lumbar vertebrae

Insertion

- Transverse Processes of superior vertebrae to origin

Joint crossed

- Vertebrae

Joint action

- Extends head and rotates it to same side, extends the spine

Myology – Core and Pelvis

Multifidus



Origin

- Sacrum, and transverse processes of vertebrae.

Insertion

- Spinous processes 2-4 vertebrae superior to origin.

Joint crossed

- Intervertebral joints of vertebral column.

Joint action

- Extension of vertebral column.
- Rotation of vertebral column.
- Important to lumbar spine stability because it is a 'local' muscle, controlling the fine positioning of adjacent vertebrae.

Myology – Core and Pelvis

Quadratus Lumborum



Origin

- Iliac crest and Iliolumbar fascia.

Insertion

- Upper 4 lumbar vertebrae and lower margin of 12th rib.

Joint crossed

- Intervertebral joints of lumbar vertebrae.

Joint action

- Unilateral concentric contraction: lateral flexion of lumbar spine.
- Unilateral isometric contraction: prevents lateral flexion of lumbar spine (e.g. when carrying a heavy suitcase in one hand).
- Bilateral eccentric contraction: assists in preventing hyperflexion of lumbar spine.

Manual Muscle Tests

- Erector Spinae
- Erector Spinae as a Side Flexor
- Rectus Abdominis
- Internal Oblique/ External Oblique
- Latissimus Dorsi
- Iliopsoas

Active ROM

- Flexion
- Extension
- Right Side Flexion
- Left Side Flexion
- Right Rotation
- Left Rotation

Passive ROM

- Flexion
- Extension
- Right Side Flexion
- Left Side Flexion
- Right Rotation
- Left Rotation

Resisted ROM

- Flexion
- Extension
- Right Side Flexion
- Left Side Flexion
- Right Rotation
- Left Rotation