

#ideaworld



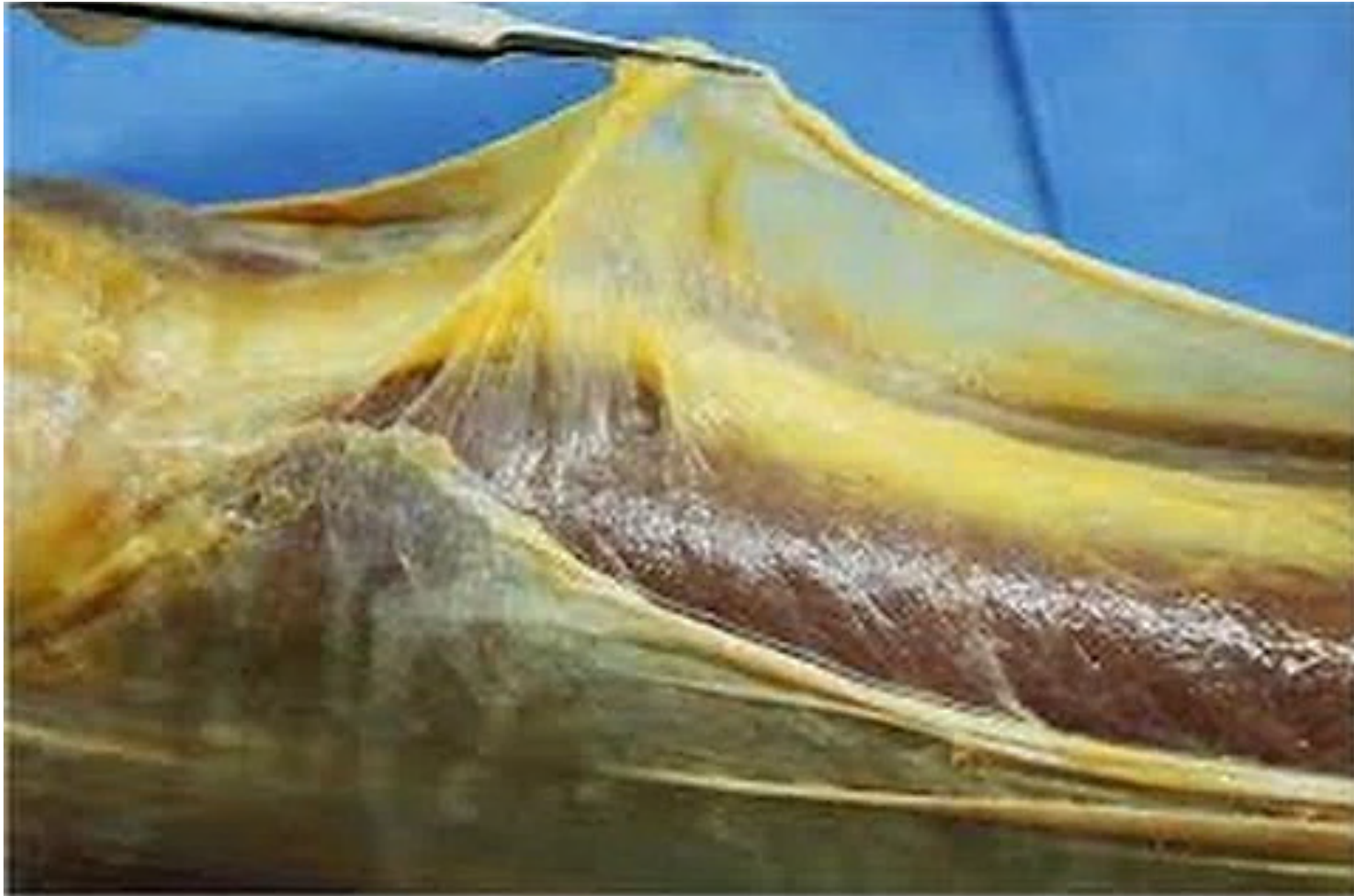
LIMITLESS

Anatomy in Three Dimensions™:
Fascial Connections in the Core

PRESENTED BY

Brian Richey B.S. MES
Balanced Body Faculty

Fascia



What is Fascia?

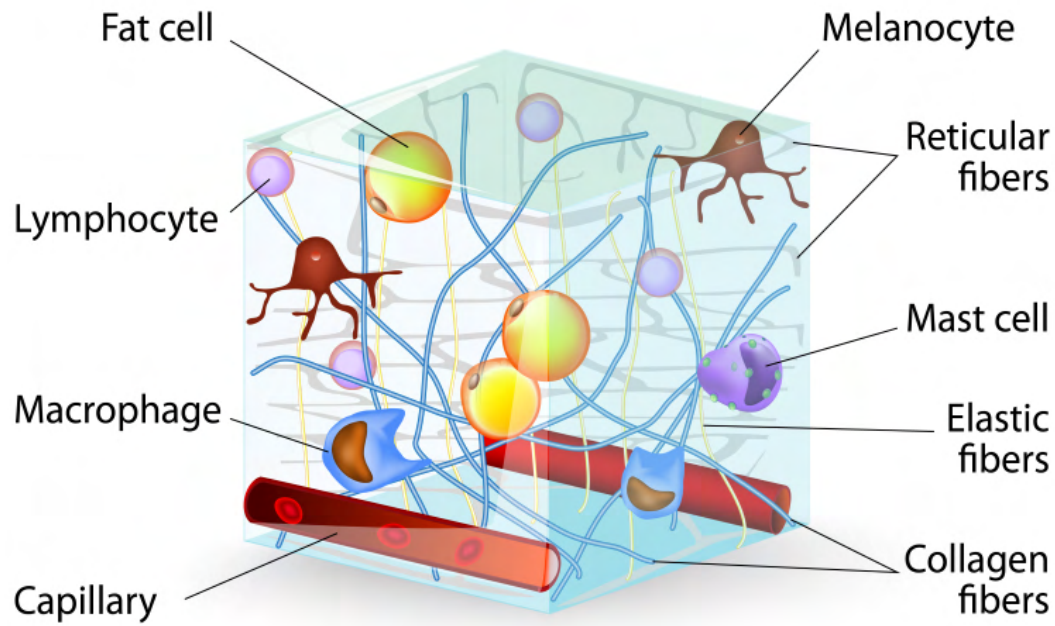
Fascia includes all the different kinds of connective tissue that create support and structure the body:

- Bones
- Ligaments
- Tendons
- Muscle Structure
- Structure for Organs



What is Connective Tissue?

CONNECTIVE TISSUES



Tissue that supports, surrounds, and binds together other tissues.

It includes loose and dense forms (such as adipose tissue, fascia, tendons, ligaments and cartilage) and specialized forms (such as blood and bone).

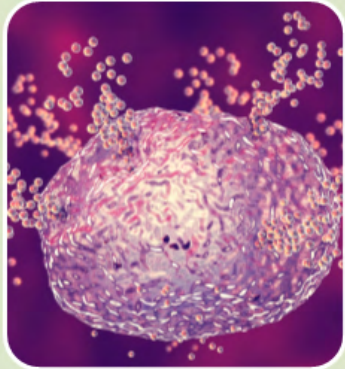
What does CT do?

It surrounds and penetrates all the structures fo the body to:

- Create Structure
- Transfer Force
- Allow glide between structures
- Provide proprioception and nociception
- Pathway for:
 - Cellular Nutrition
 - Immune System
 - Hydration
 - Healing and Recovery

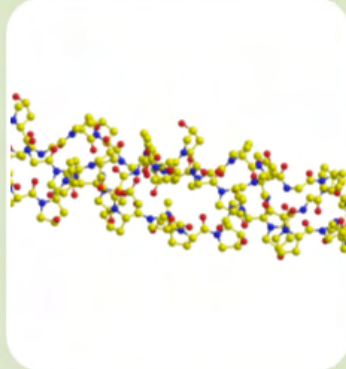


Components of Fascia



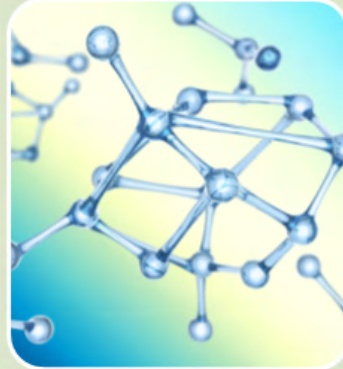
Fibroblasts and mast cells:

- Produce the various components of fascia.



Fibers:

- Collagen, reticulin and elastane provide structure.



Chemicals:

- Heparin, hyaluronic acid and fibronectin provide “glue” for the fibers.



Glycosaminoglycans (mucus)

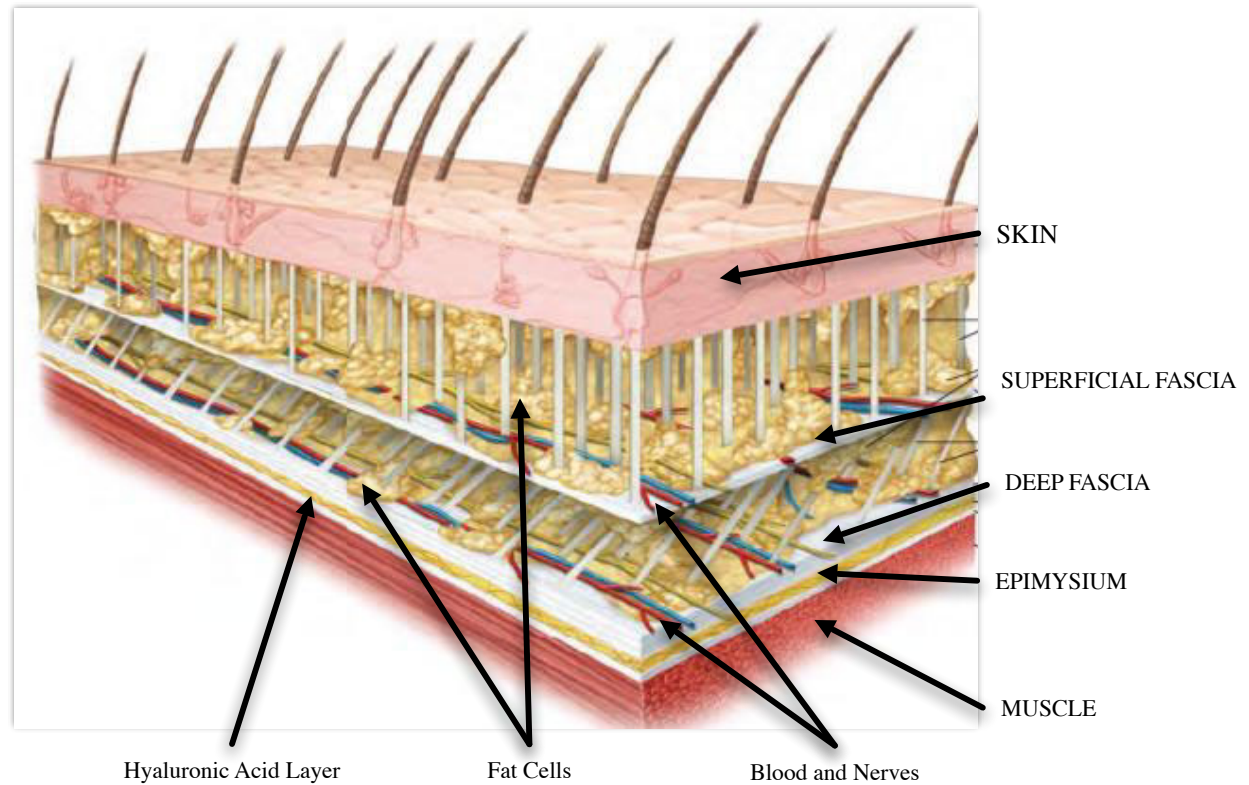
- Provide glide or stickiness.



Water!

Structure of Fascia

- » Fascia takes on many different shapes and textures depending on where it is in the body.
 - » Superficial fascia occurs between the skin and the underlying muscles and is a very loose structure that allows gliding between the muscles and the skin.
 - » It also provides a matrix in which veins, arteries and nerves are flexibly supported.
 - » Deep fascia is a stiffer and more structured version of fascia that surrounds and separates muscle bellies, creates tendons and ligaments and provides stiffness.



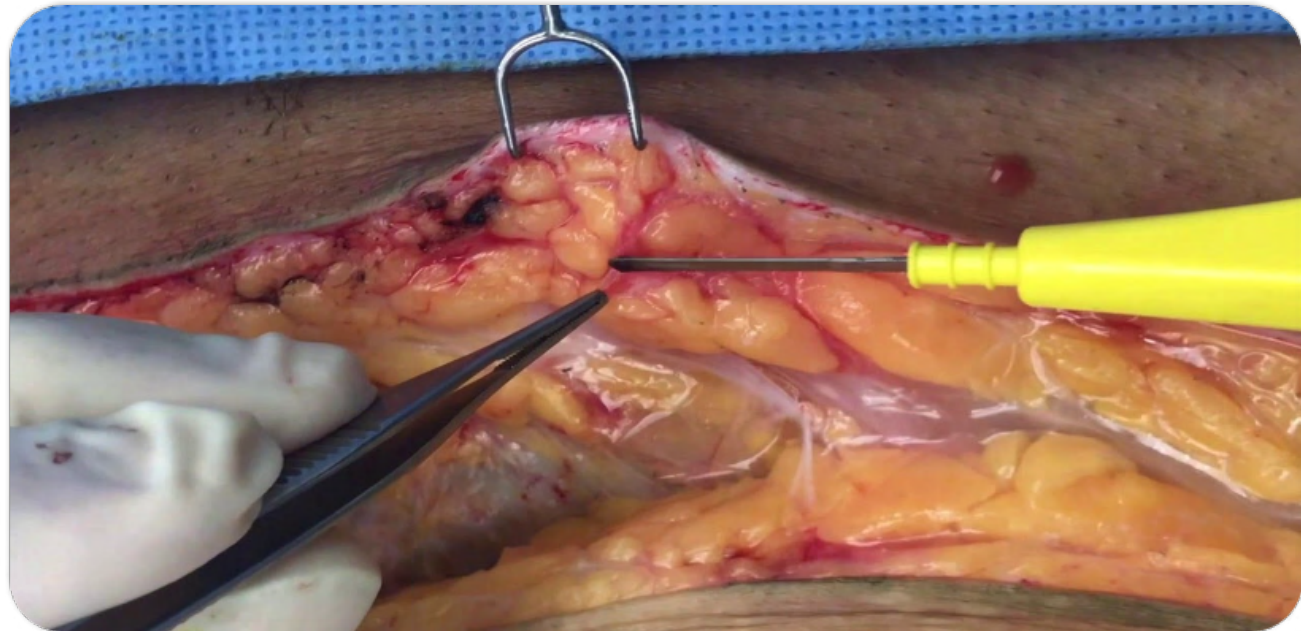
Occurs between the bottom of the skin and the underlying muscles.

Allows gliding between muscles and skin.

Provides a matrix in which veins, arteries and nerves are flexibly supported.

Forms a loose, flexible structure that supports fat cells.

Superficial Fascia



Dense fibrous connective tissue which surrounds individual muscles.

Divides groups of muscles into fascial compartments (anatomy trains, myofascial slings)

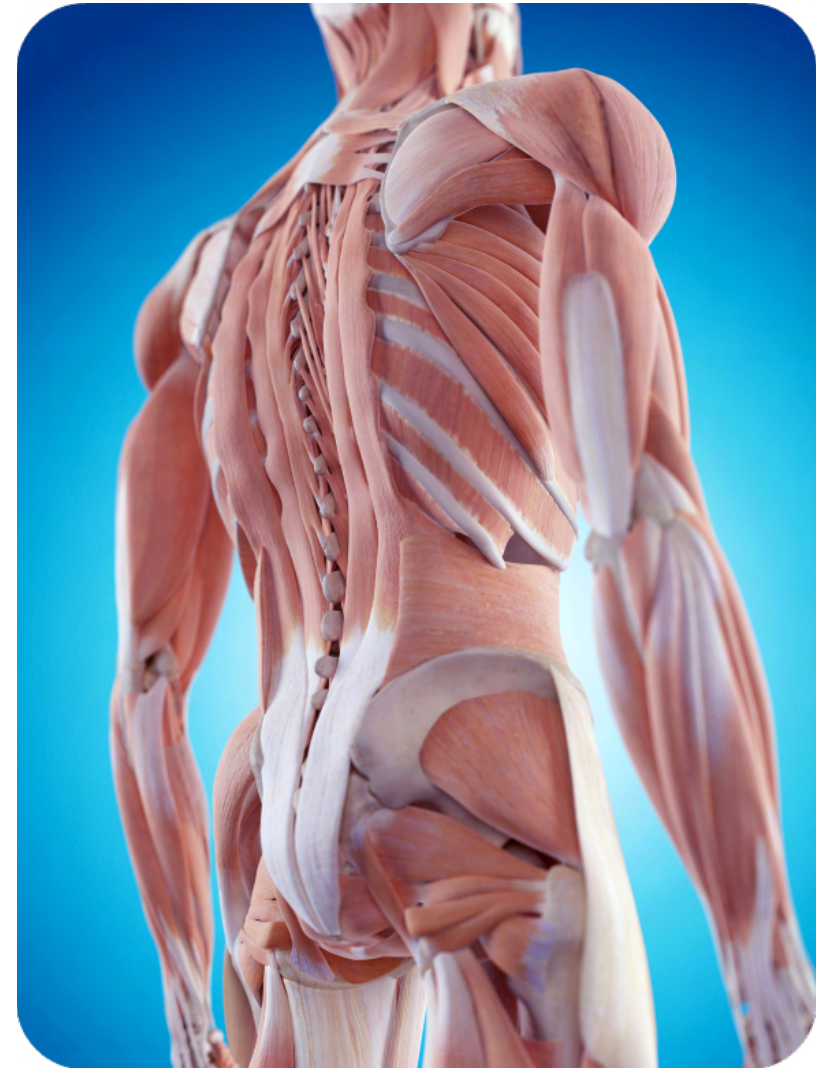
Creates tendons, ligaments, aponeuroses and cartilage.

Transfers force and creates stiffness.

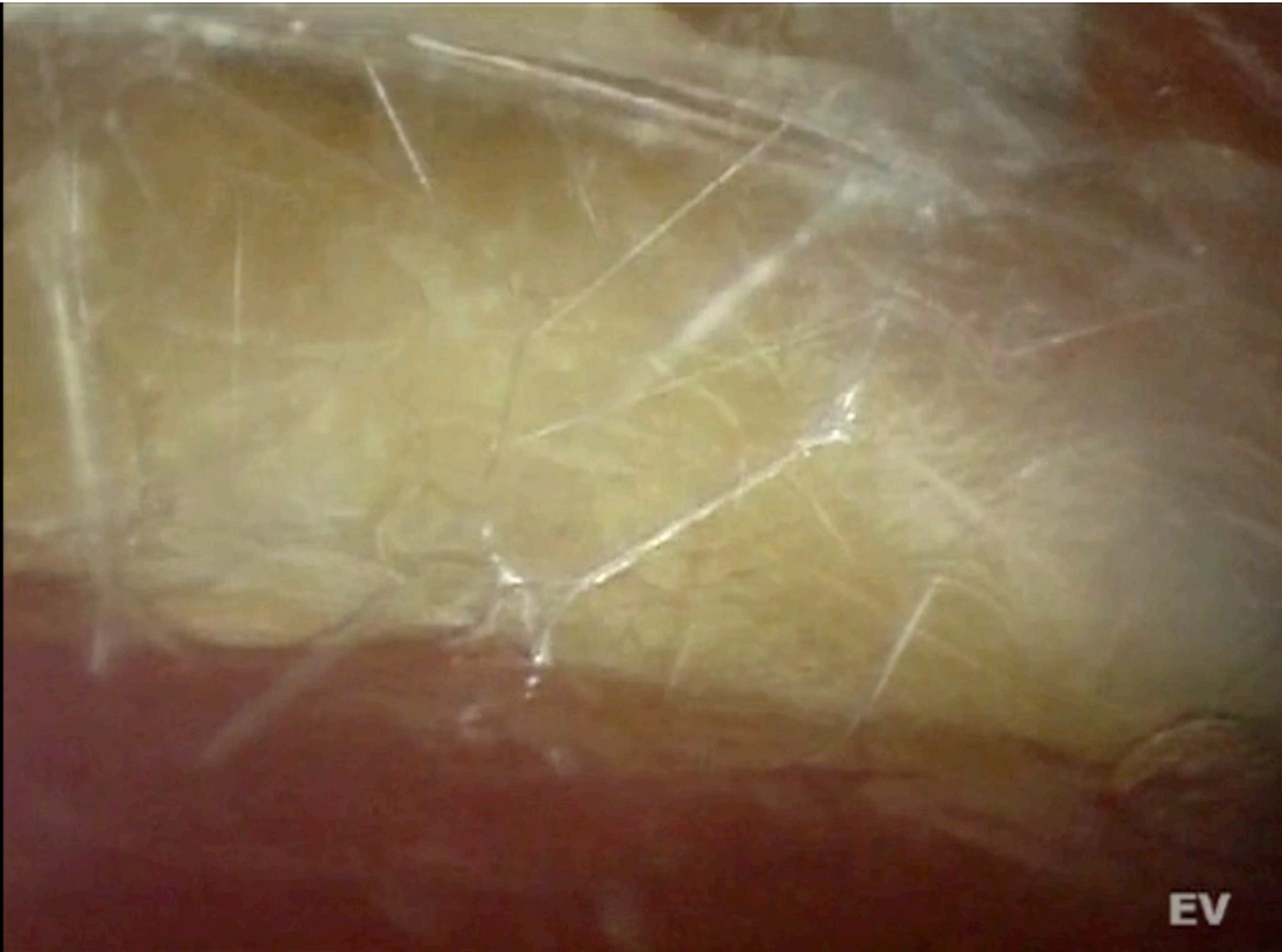
Is elastic and resilient due to high density of elastin fibers.

Contains blood supply and sensory nerves.

Deep Fascia

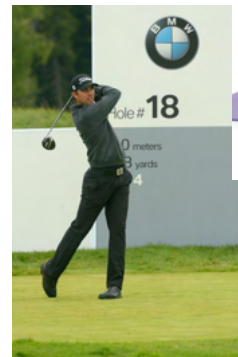
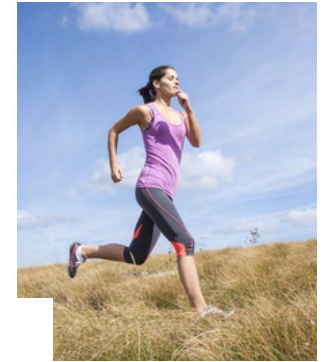






Fascia and Movement

- » Fascia is a key element of every kind of physical training we do including:
 - » Strength training
 - » Agility and speed work
 - » Flexibility
 - » Coordination
 - » Recovery



Thoracolumbar Fascia



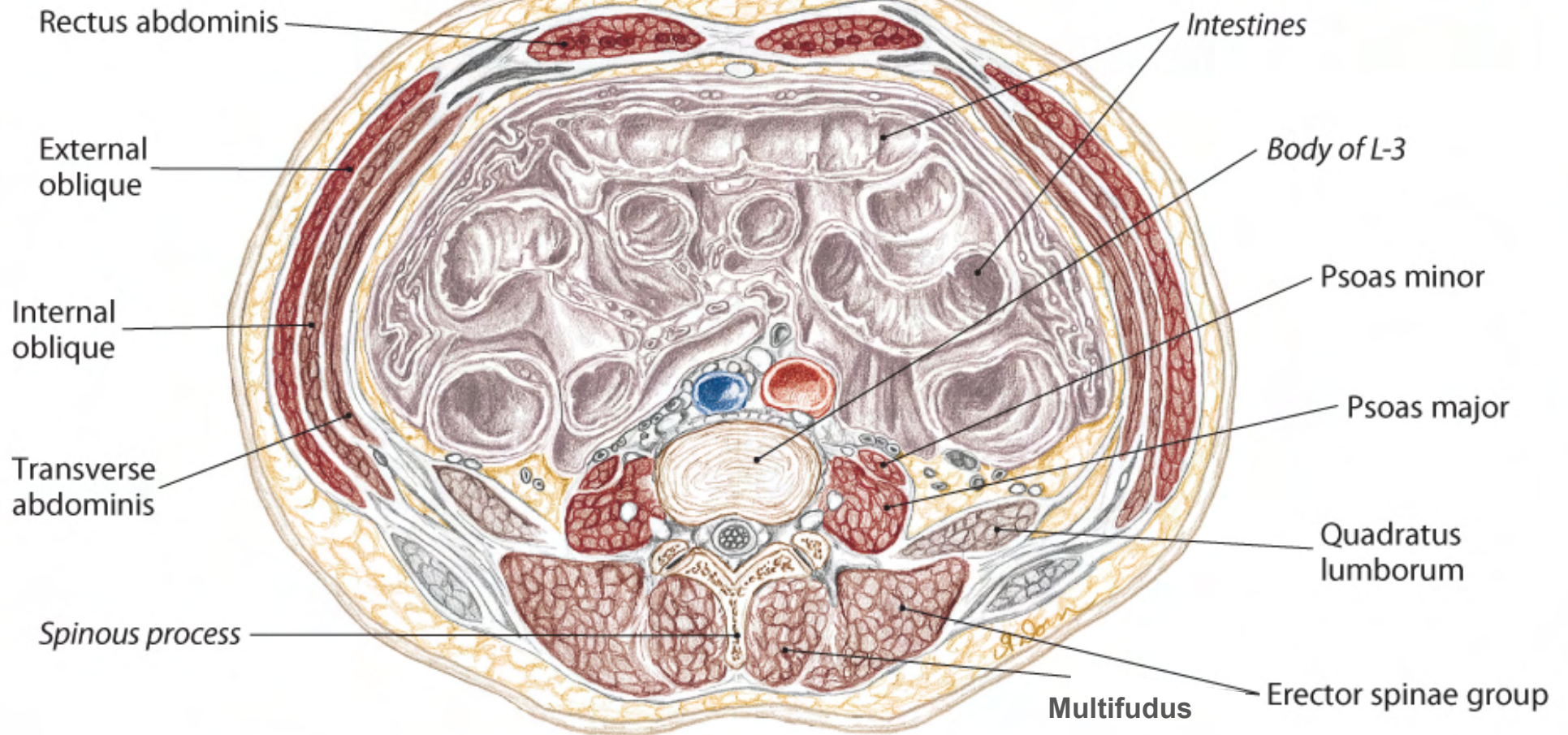
Thoracolumbar Fascia

The thoracolumbar fascia is the primary structure that transmits force between the upper and lower body.

- » It absorbs and distributes forces moving through the spine in any plane. (Tensegrity)
- » It exhibits elastic recoil by “winding up” and releasing energy in movements like running or throwing.
- » It contains a large number of proprioceptive nerve endings (Pacini and Ruffini corpuscles) so it plays a strong role in proprioception and in pain perception.

Cross Section at the level of L3

Anterior surface

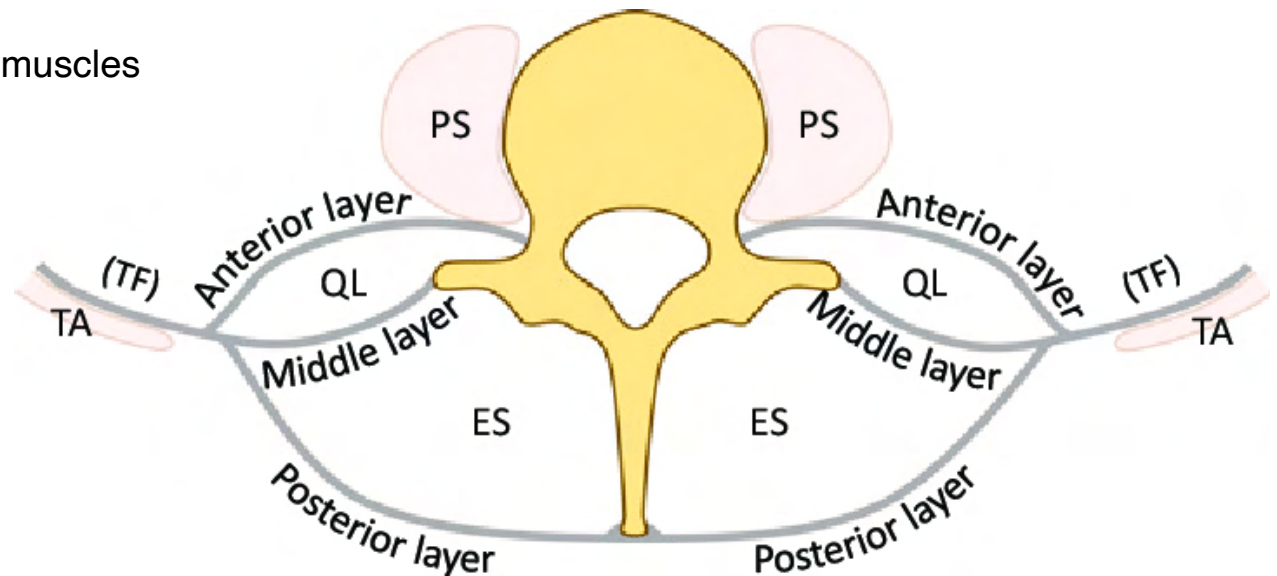


4.59 Cross section of the abdomen at the level of the third lumbar vertebra

Thoracolumbar Fascia (TLF)

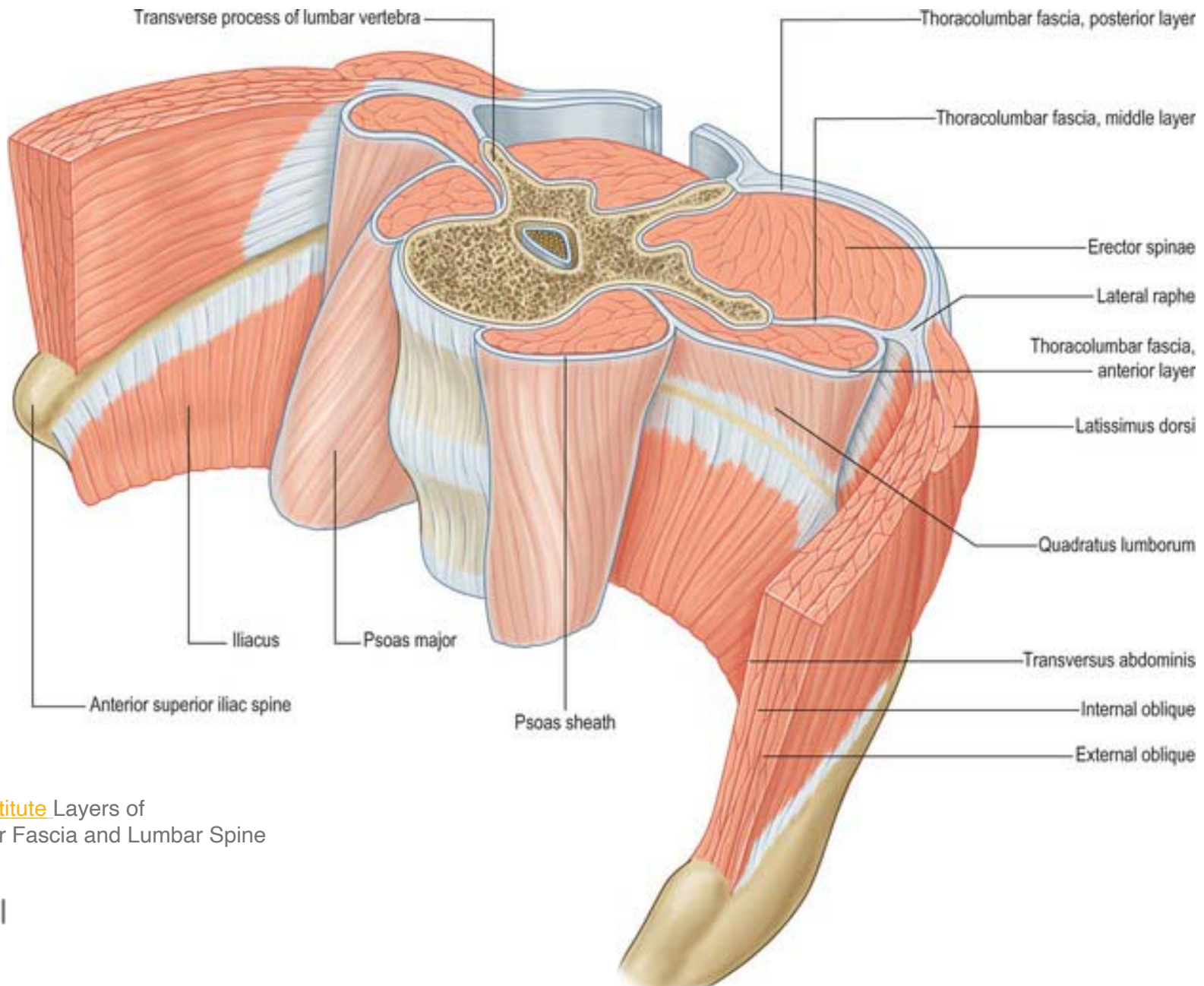
The thoracolumbar fascia consists of three layers:

- Anterior layer -
 - anterior surface of the lumbar transverse processes
- Middle layer -
 - From the tips of the lumbar transverse processes
- Posterior layer -
 - From the midline and covers the back muscles



(Bogduk and MacIntosh 1984)

Thoracolumbar Fascia



Brookbush Institute Layers of Thoracolumbar Fascia and Lumbar Spine musculature

Thoracolumbar Fascia (TLF)

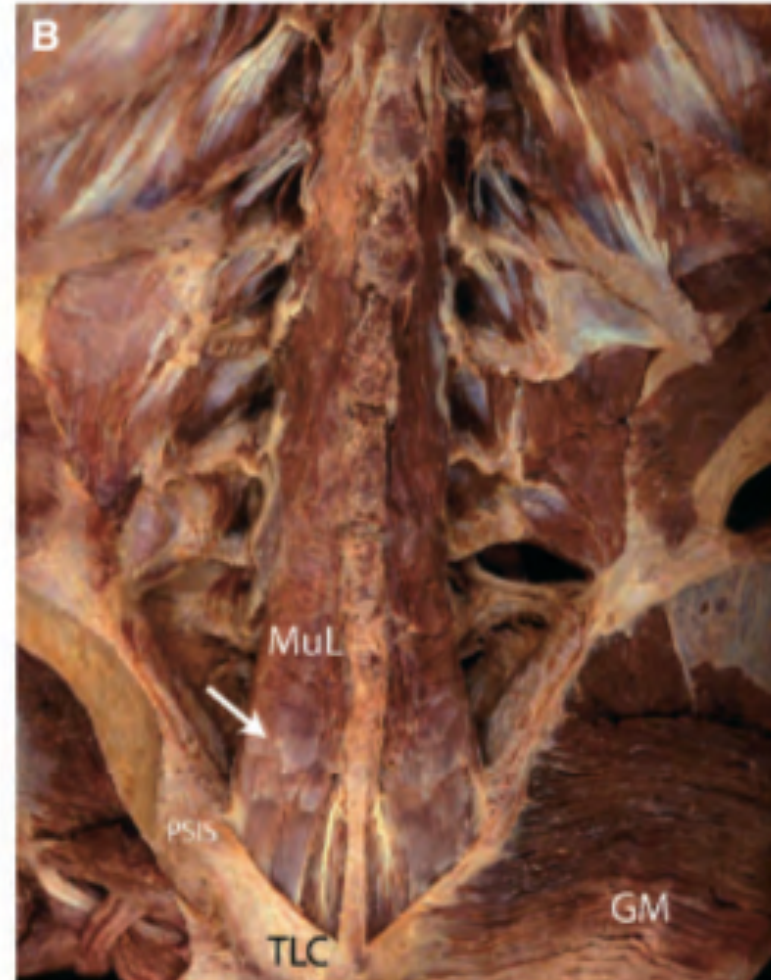
What is traditionally labeled as TLF is a complex arrangement of multilayered fascial planes and aponeurotic sheets

This complex composite of fascia and aponeurotic tissue is continuous with paraspinal fascia in the thoracic and cervical regions, eventually fusing to the cranial base.

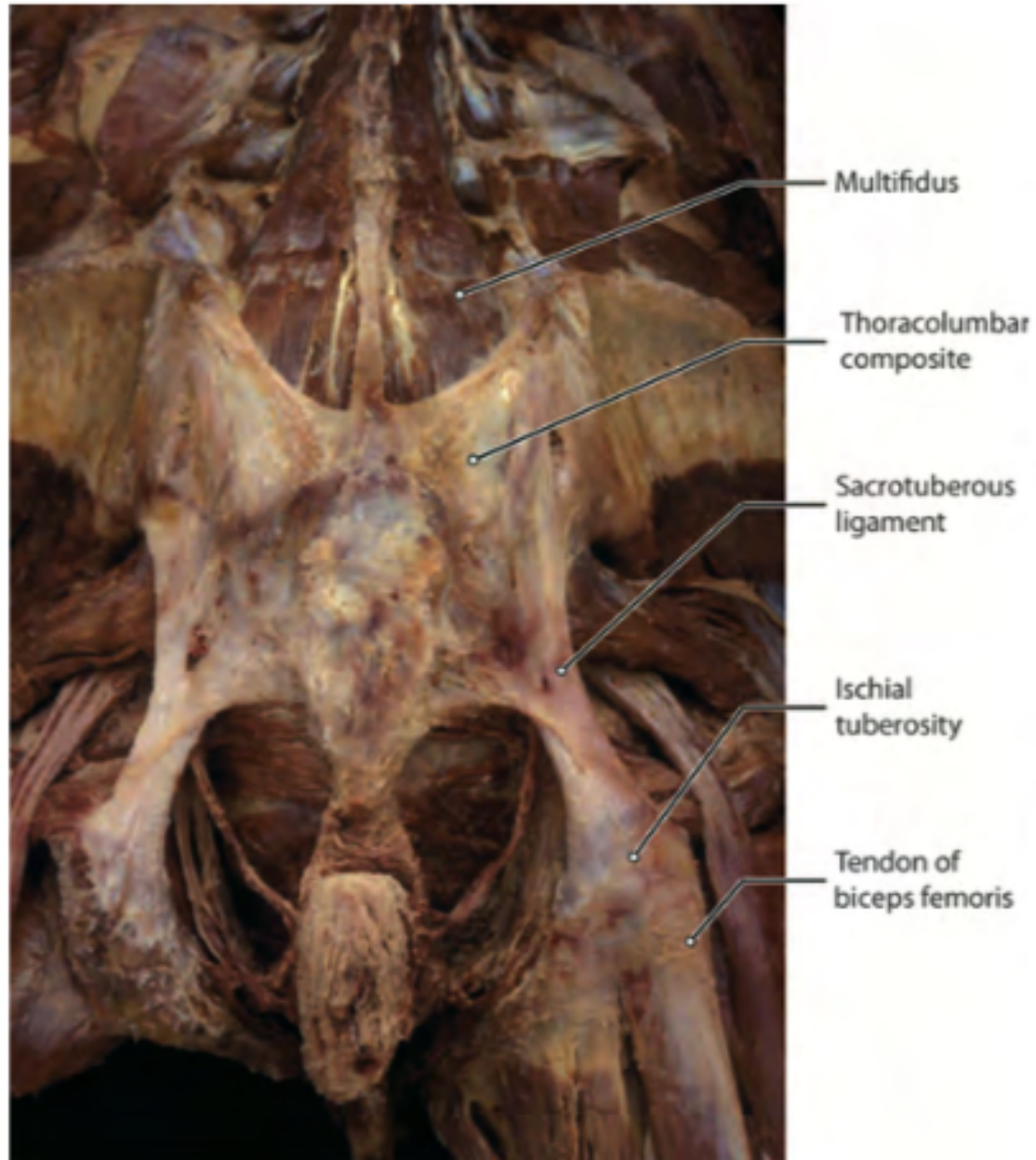
At the base of the lumbar spine all of the layers of the TLF fuse together into a thick composite that attaches firmly to the posterior superior iliac spine and the sacrotuberous ligament.

This thoracolumbar composite (TLC) is in a position to assist in maintaining the integrity of the lower lumbar spine and the sacroiliac joint

Thoracolumbar Fascia



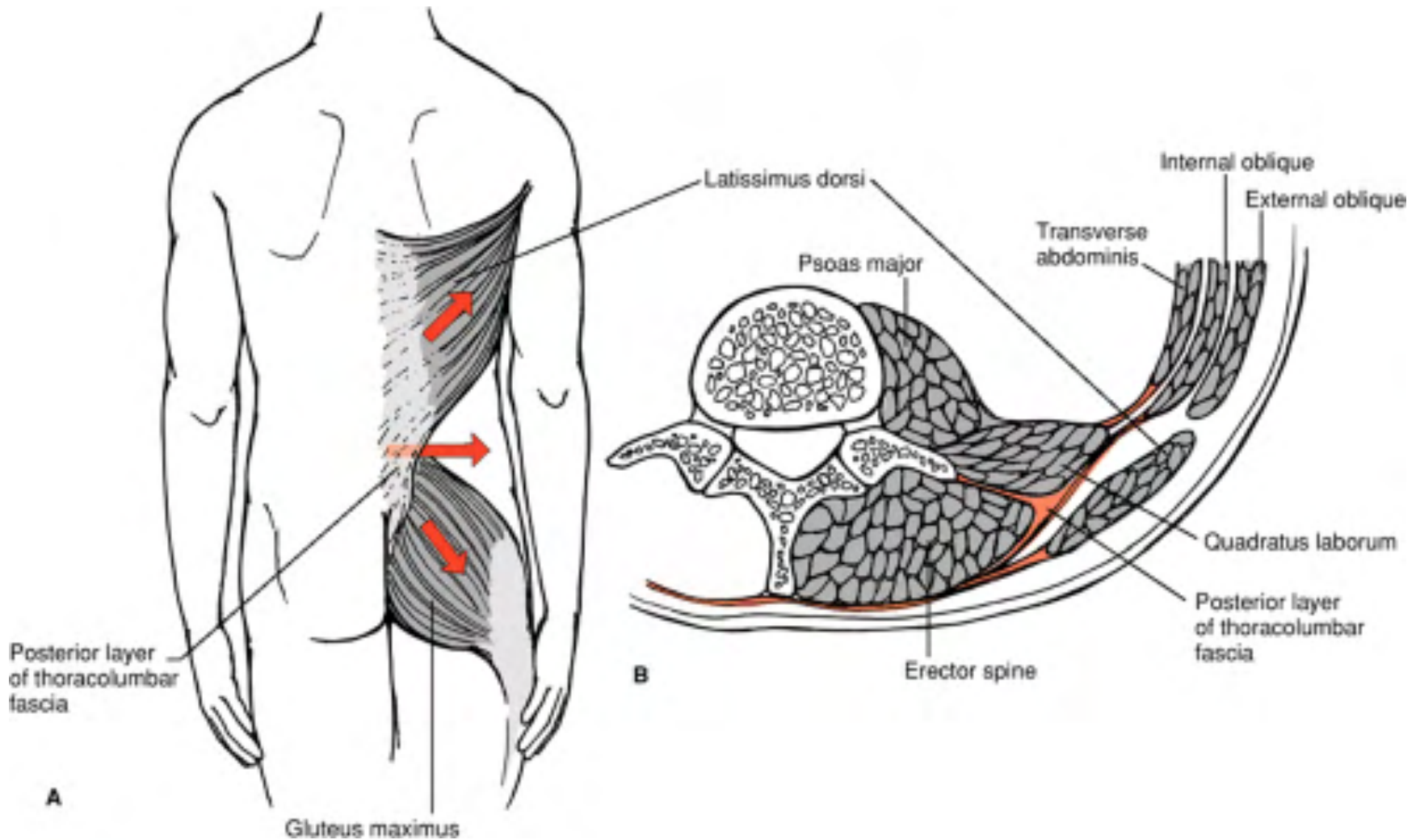
Thoracolumbar Fascia



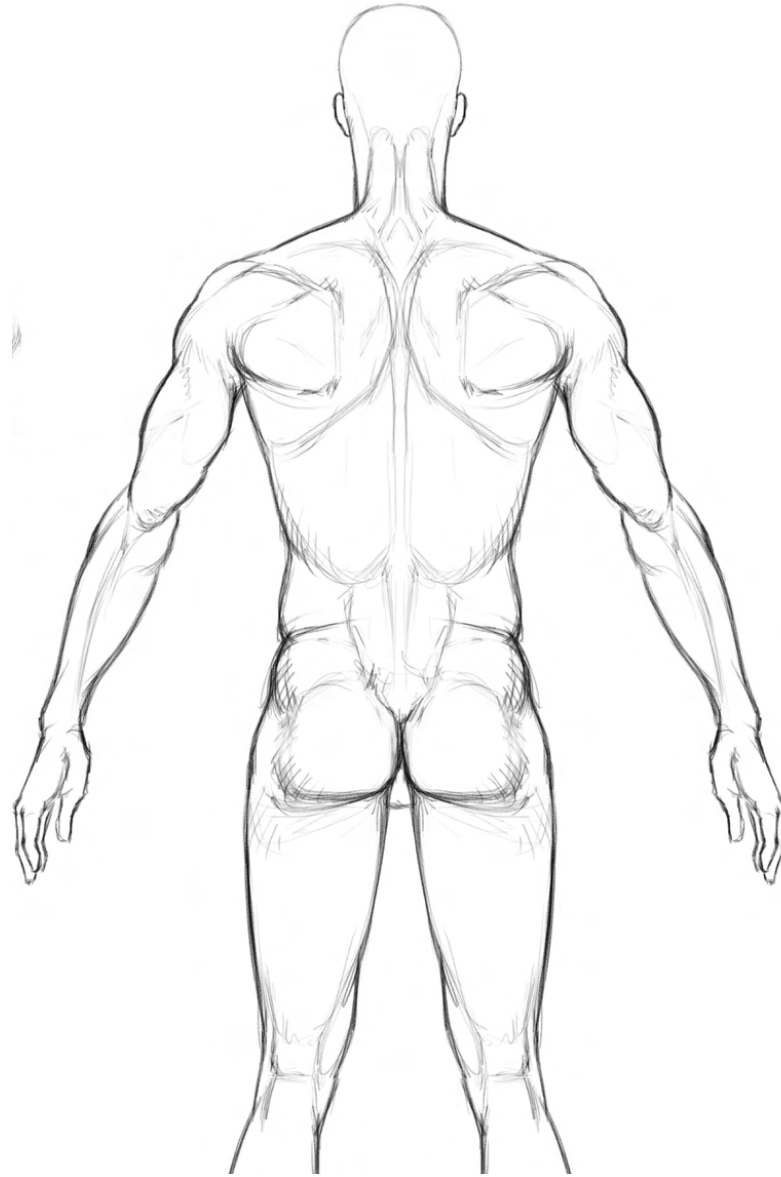
Thoracolumbar Fascia



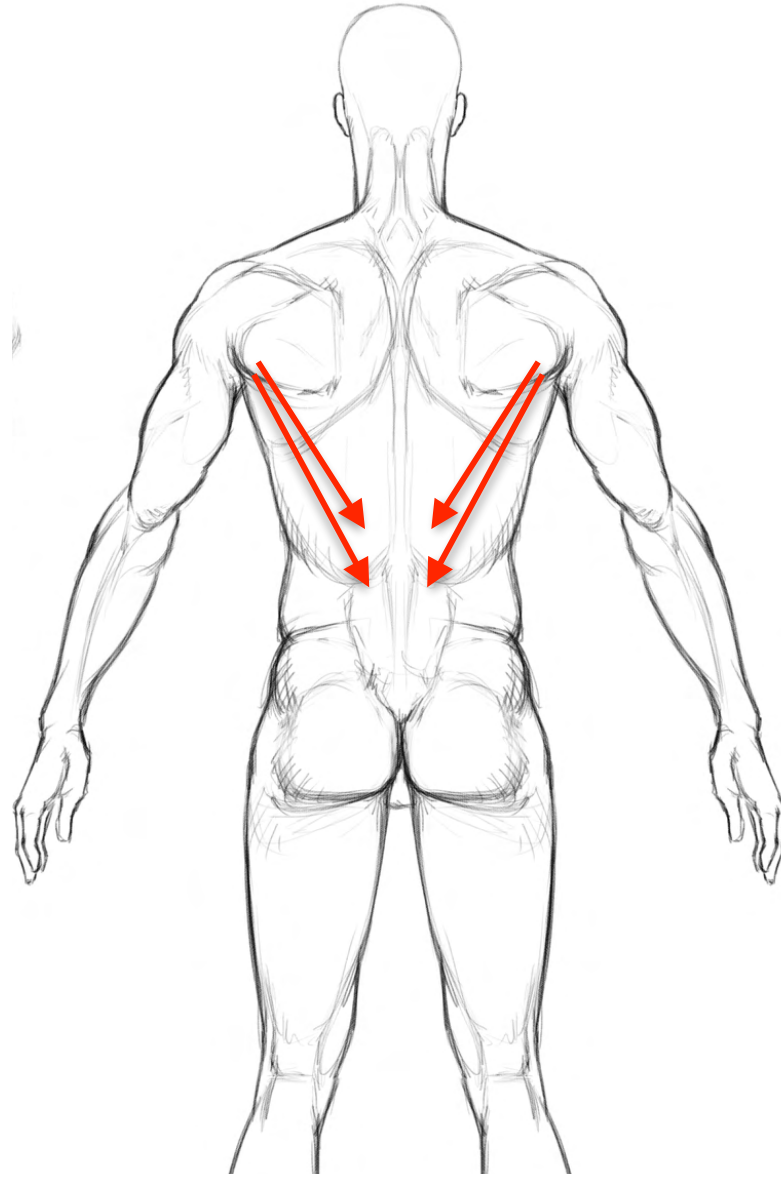
Thoracolumbar Fascia



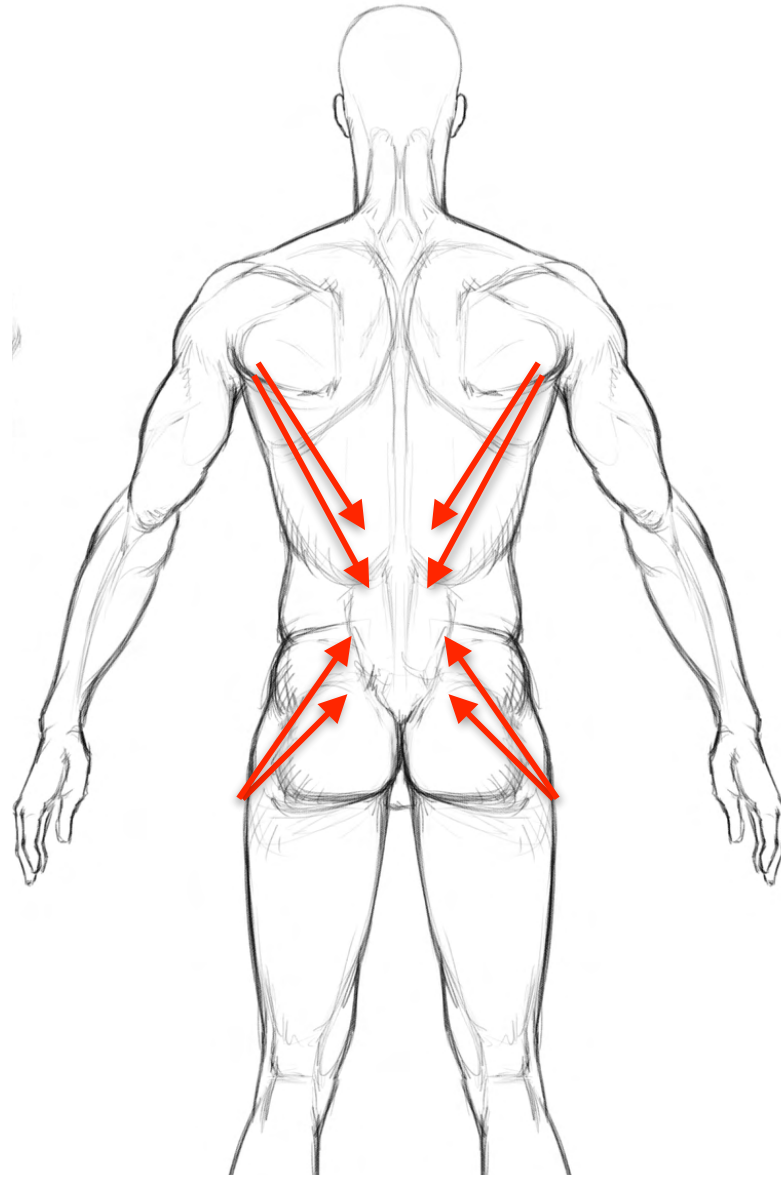
Thoracolumbar Fascia



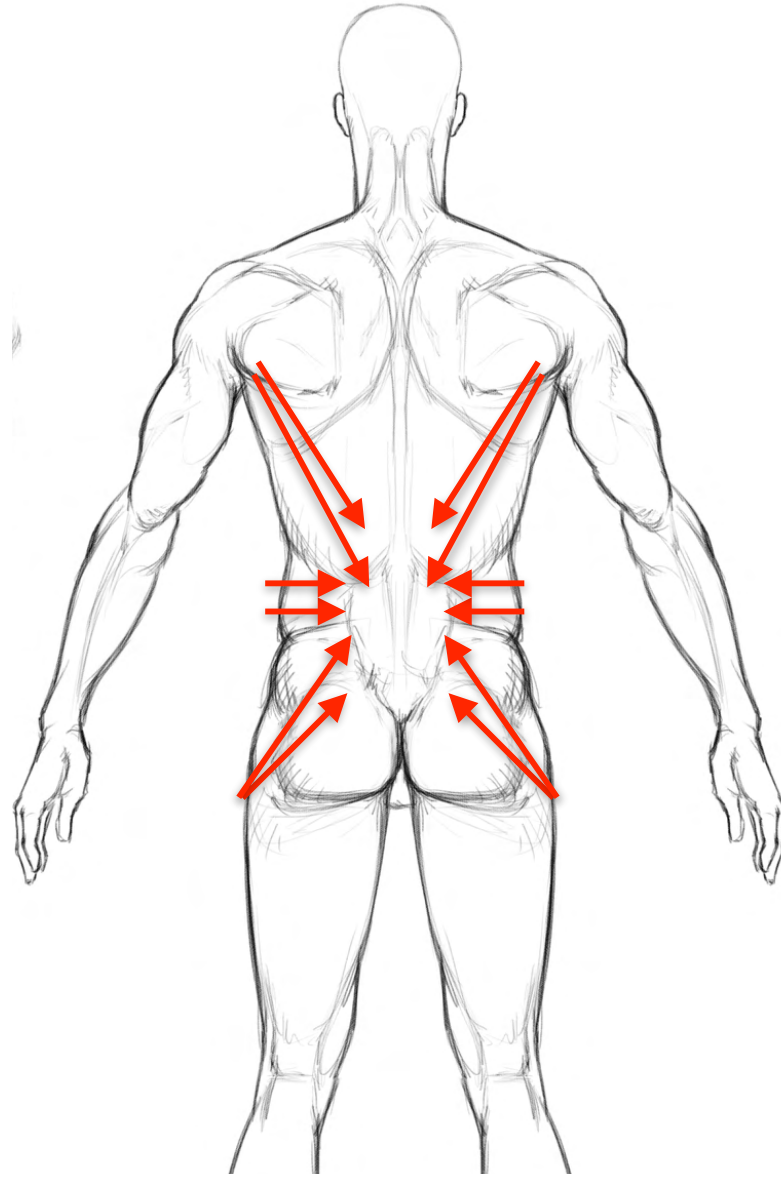
Thoracolumbar Fascia



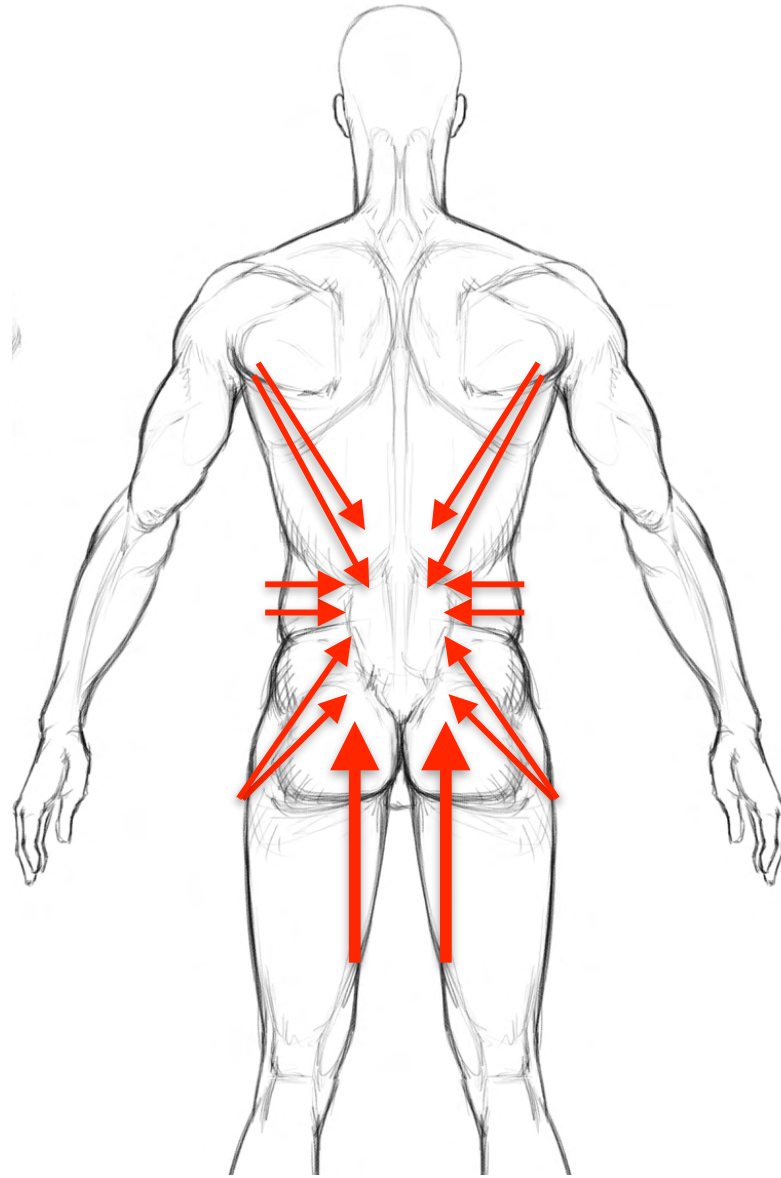
Thoracolumbar Fascia



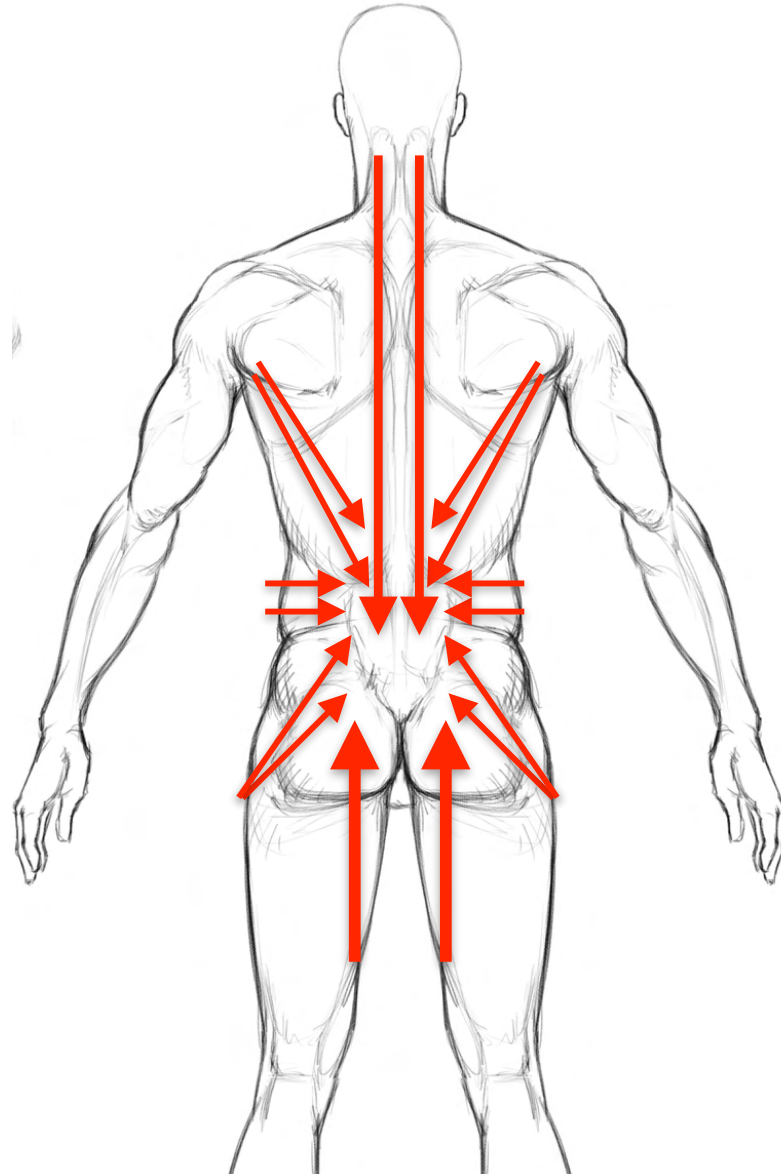
Thoracolumbar Fascia



Thoracolumbar Fascia



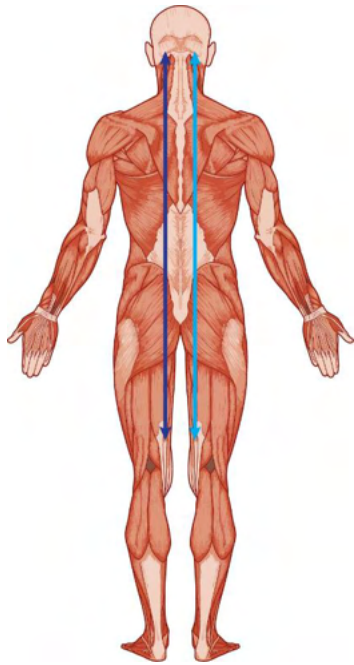
Thoracolumbar Fascia





Los Angeles: Pregerson Interchange

The 4 Outer Units

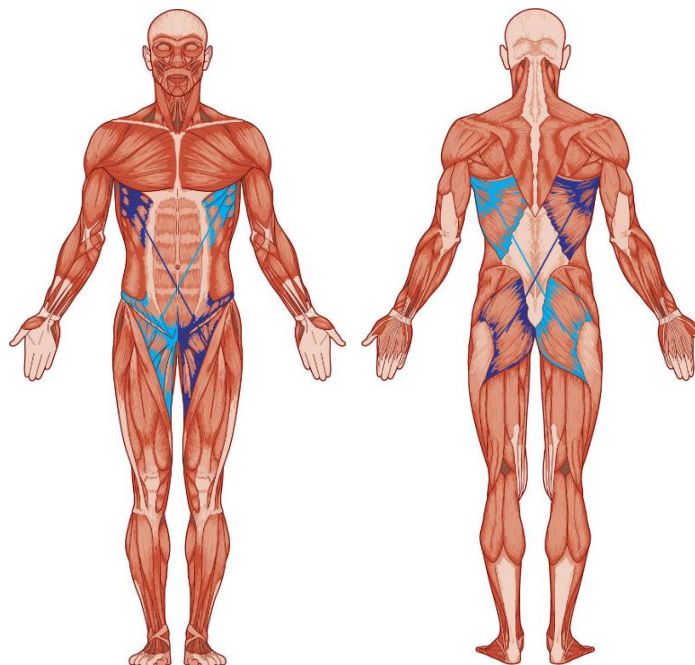


Deep Longitudinal System

- Erector Spinae, Quadratus Lumborum, Thoracolumbar Fascia, Sacrotuberous Ligament and the Biceps Femoris, Gastrocnemius, Plantar Fascia and Toe Flexors

Function

- This system holds us upright against gravity and creates spinal extension.

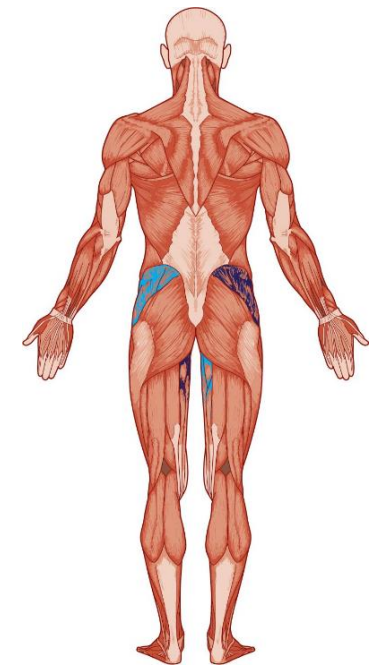


Anterior and Posterior Sling

- Anterior = Anterior serratus, External oblique, Contralateral internal oblique and adductors
- Posterior = Latissimus dorsi and Contralateral glutes

Function

- Together stabilize the torso and in opposition create flexion, lateral flexion and rotation of the torso



Lateral System

- Hip abductors and adductors
- Quadratus Lumborum

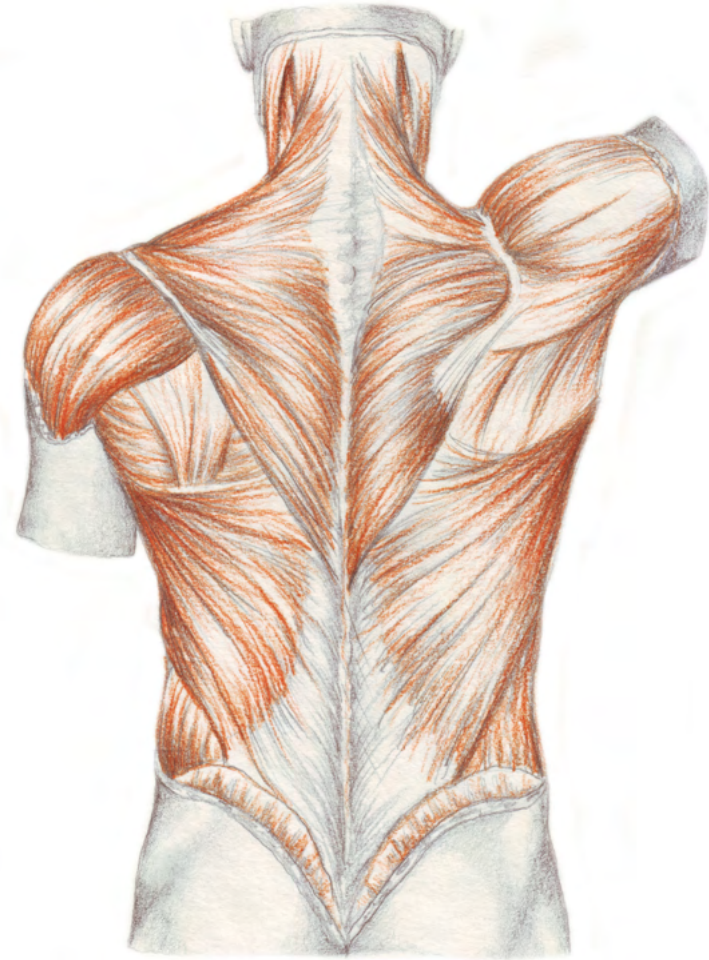
Function

- Keeps the pelvis balanced over the femurs when walking, running or balancing on one leg.
- Imbalances lead to an un-level pelvis when standing on both legs.

Thoracolumbar Fascia

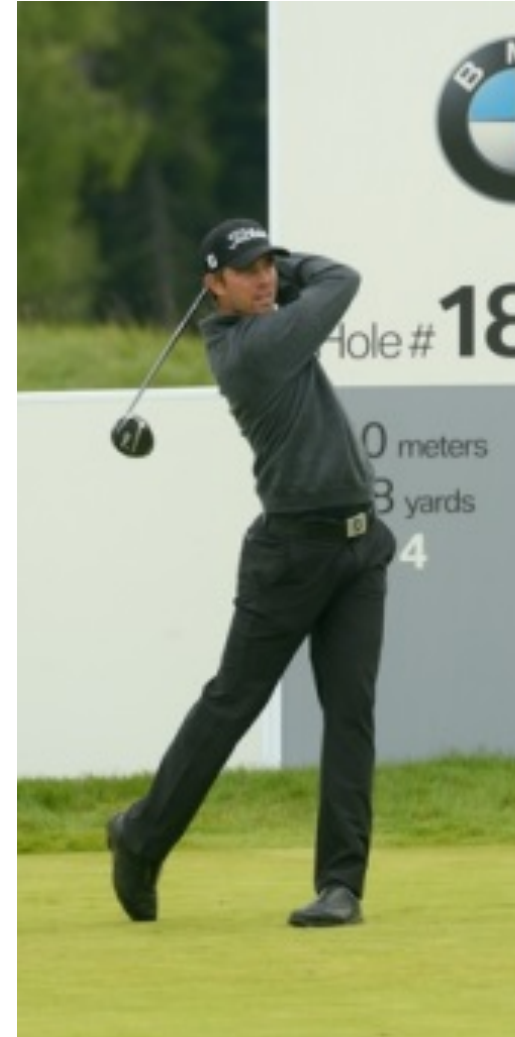
Layers from outside to inside are latissimus dorsi, quadratus lumborum, abdominals and psoas major

The multiple layers of the thoracolumbar fascia need to glide and coordinate to support the lumbar spine.



Muscles of the TLF

- » The muscles that directly influence the thoracolumbar fascia include:
 - » Deep spinal muscles
 - » Erector spinae
 - » Quadratus lumborum
 - » Psoas major and minor
 - » Latissimus dorsi
 - » Transversus abdominis
 - » Internal obliques



Lets Build!!!



Gluteus Medius



Origin:

- External surface of ilium between iliac crest and posterior gluteal line.

Insertion:

- Lateral surface of greater trochanter of femur.

Actions:

Anterior fibers

Fixed Pelvis

- Hip abduction, flexion, and medial rotation.

Fixed Leg

- Anterior pelvic tilt.

Posterior fibers:

Fixed Pelvis

- Hip abduction, extension and lateral rotation

Fixed Leg

- Posterior pelvic tilt.
- Pelvic down slip.



Gluteus Maximus



Deep Fibers



Superficial Fibers

Origin:

- Posterior gluteal line of ilium and a portion of bone superior and posterior to it.
- Posterior surface of lower part of sacrum, side of coccyx.
- Aponeurosis of erector spinae, sacrotuberous ligament and gluteal aponeurosis.

Insertion:

- Deep fibers insert into the gluteal tuberosity of femur.
- Proximal and superficial fibers inserts into iliotibial band.

Actions:

- Fixed pelvis - Hip extension, lateral rotation, adduction and abduction.
- Fixed leg - Posterior pelvic tilt.

Quadratus Lumborum



Origin:

- Inferior border of 12th rib.
- Transverse processes of L1 - L5.

Insertion:

- Superior border of iliac crest.

Actions:

- Bilaterally: Spinal extension.
- Unilaterally: Lateral spinal flexion and pelvic upslip.

Multifidi



Origin:

- Superior border of transverse process of all vertebrae from the sacrum to C2

Insertion:

- Inferior border of spinous process 3 to 5 levels above

Actions:

Bilaterally

- Spinal extension

Unilaterally

- Lateral spinal flexion to same side
- Spinal rotation to opposite side

Spinalis



Spinalis Cervicis

Origin:

- Spinous processes of C5 to T2.

Insertion:

- Spinous process of C2 to C5.

Spinalis Thoracis

Origin:

- Spinous processes of T10 to L3.

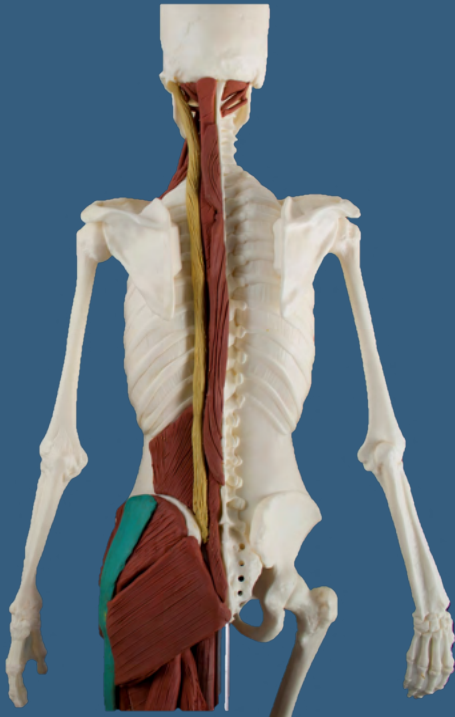
Insertion:

- Spinous process of T2 to T8.

Actions:

- Bilaterally creates spinal extension.
- Unilaterally creates spinal lateral flexion to same side.

Longissimus



Longissimus Capitis

Origin:

- Transverse processes of upper thoracic and lower cervical vertebra.

Insertion:

- Mastoid process of temporal bone.

Longissimus Cervicis

Origin:

- Transverse processes of upper thoracic vertebra.

Insertion:

- Transverse processes of C2-C6.

Longissimus Thoracis

Origin:

- Lumbar transverse processes.

Insertion:

- Thoracic transverse processes and ribs 9 and 10.

Actions:

- Bilaterally:
Spinal extension
- Unilaterally:
Spinal lateral flexion and spinal rotation to same side

Iliocostalis



Iliocostalis Cervicis

Origin:

- Ribs 3 - 7.

Insertion:

- Transverse processes of C5 - 7.

Iliocostalis Thoracis

Origin

- Ribs 7 - 12.

Insertion

- Ribs 1 - 6.

Iliocostalis

Lumborum

Origin:

- Iliac crest via lumbar fascia. Iliac crest via lumbar fascia.

Insertion:

- Ribs 6 - 12, thoracolumbar fascia, transverse processes of upper lumbar vertebrae.

Actions:

- Bilaterally: Spinal extension.
- Unilaterally: Spinal lateral flexion and spinal rotation to same side.

Thoracolumbar Fascia

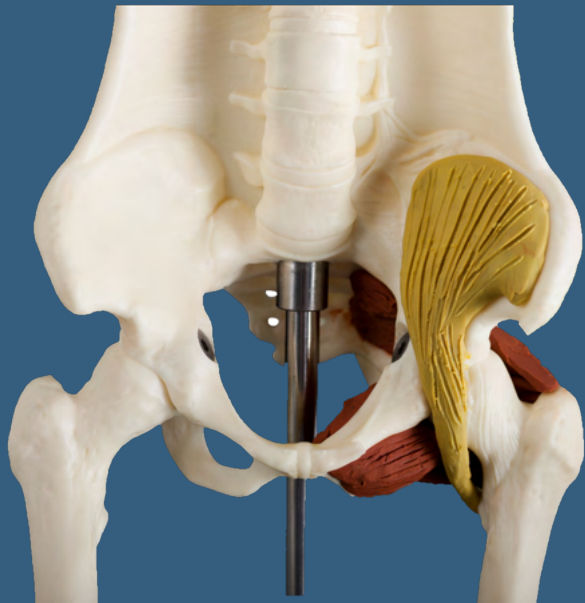


- ✦ The thoracolumbar fascia is a deep fascial membrane of the mid to low back
- ✦ T7-sacrum; ilium and continuous with fascia of glutei and IT Band

- ✦ It is 3 layers thick.
- ✦ The layers of fascia attach to the transverse process and final processes of the spine.

- ✦ Layers form envelopes which invest and surround muscles including erector spinae, serratus posterior inferior, quadratus lumborum and lower fibers of the latissimus dorsi.

Iliacus



Anterior View

Origin:

- Superior two thirds of iliac fossa
- Iliolumbar and ventral sacroiliac ligaments

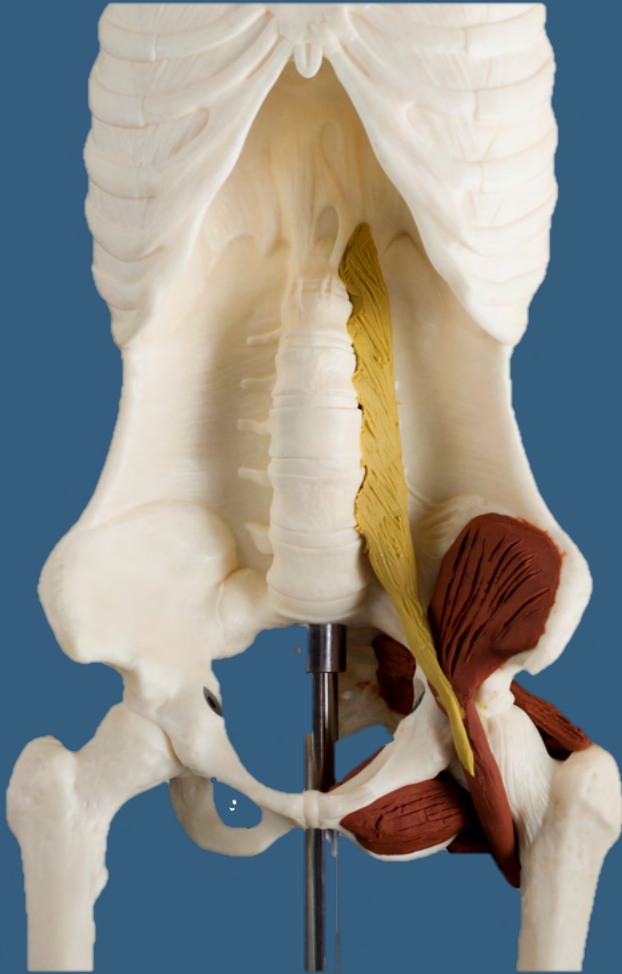
Insertion:

- Lesser trochanter of the femur

Actions:

- Fixed Pelvis:
 - Hip flexion, adduction, lateral rotation
- Fixed Leg:
 - Anterior pelvic tilt

Psoas Major



Anterior View

Origin:

- Bodies, transverse processes and intervertebral discs of T12 to L5

Insertion:

- Lesser trochanter of the femur
- Shares common tendon with iliacus

Actions:

- Fixed Pelvis:
 - Hip flexion, adduction, lateral rotation
- Fixed Leg:
 - Anterior pelvic tilt

Transversus Abdominis



Origin:

- Lateral third of inguinal ligament.
- Along the iliac crest.
- Thoracolumbar fascia.
- Internal surfaces of lower 6 ribs.

Insertion:

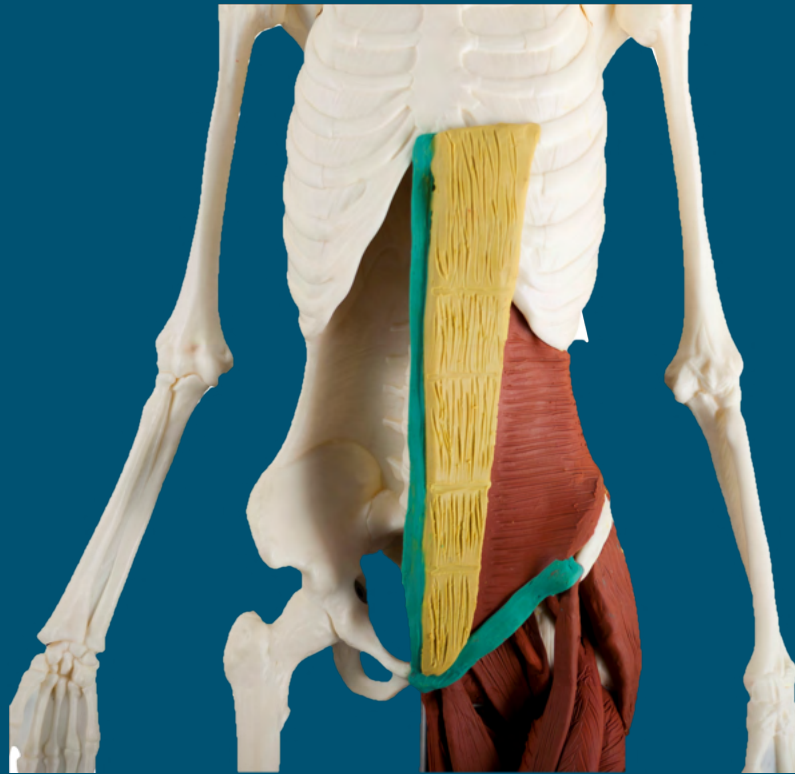
- Abdominal aponeurosis to linea alba.



Actions:

- Compresses contents of abdomen and stabilizes lumbar spine.

Rectus Abdominis



Origin:

- Superior surface of the pubic symphysis.

Insertion:

- External costal cartilage of ribs 5-7 and xiphoid process.

Actions:

- Spinal flexion.
- Lateral spinal flexion.
- Posterior pelvic tilt.

Internal Oblique



Origin:

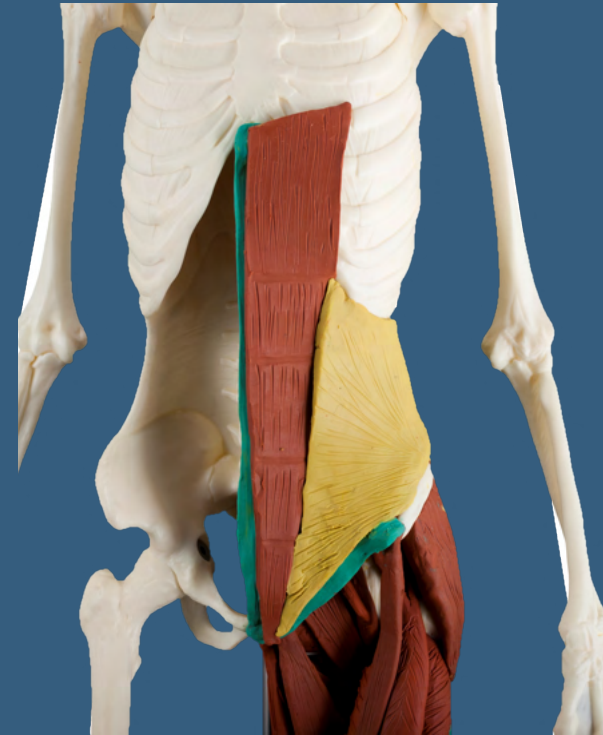
Lateral third of inguinal ligament, iliac crest and thoracolumbar fascia.

Insertion:

Cartilage of ribs 10-12, abdominal aponeurosis to linea alba.

Actions:

- Bilaterally: Spinal flexion.
- Unilaterally: Lateral spinal flexion and spinal rotation to same side.



External Oblique



Origin:

- External surfaces of ribs 5-12 interdigitating with the Serratus anterior.

Insertion:

- Anterior iliac crest.
- Abdominal aponeurosis to linea alba.

Actions:

- Bilaterally: Spinal flexion.
- Unilaterally: Lateral spinal flexion and spinal rotation to opposite side.





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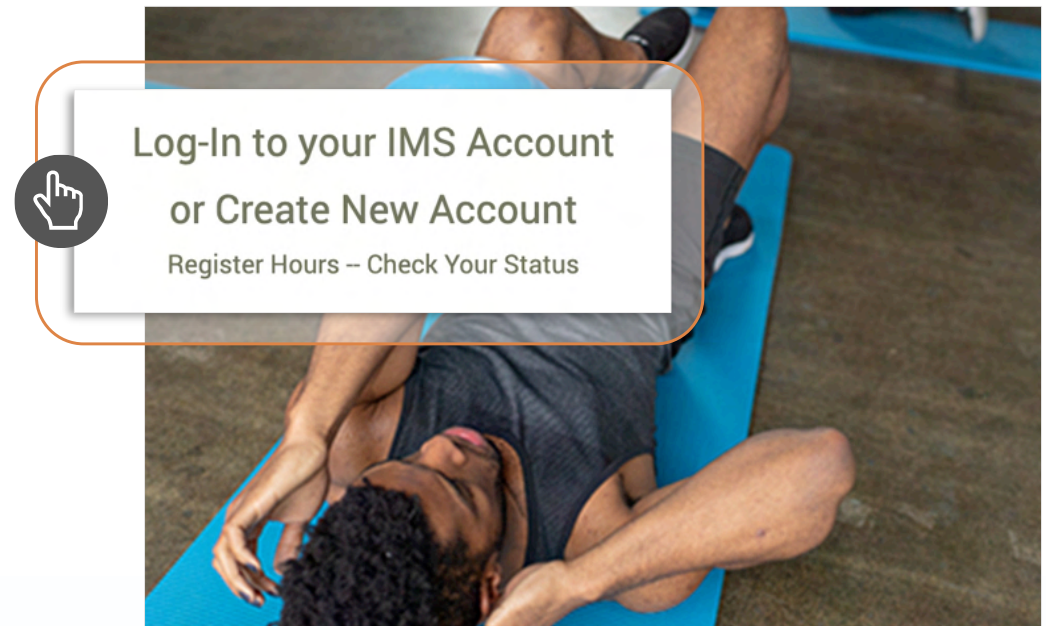
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If you have any comments or questions, please contact Brian Richey at

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