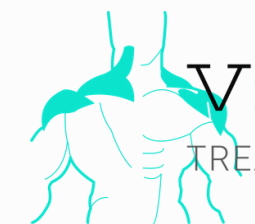


GROW

The Spine



Victoria Roper

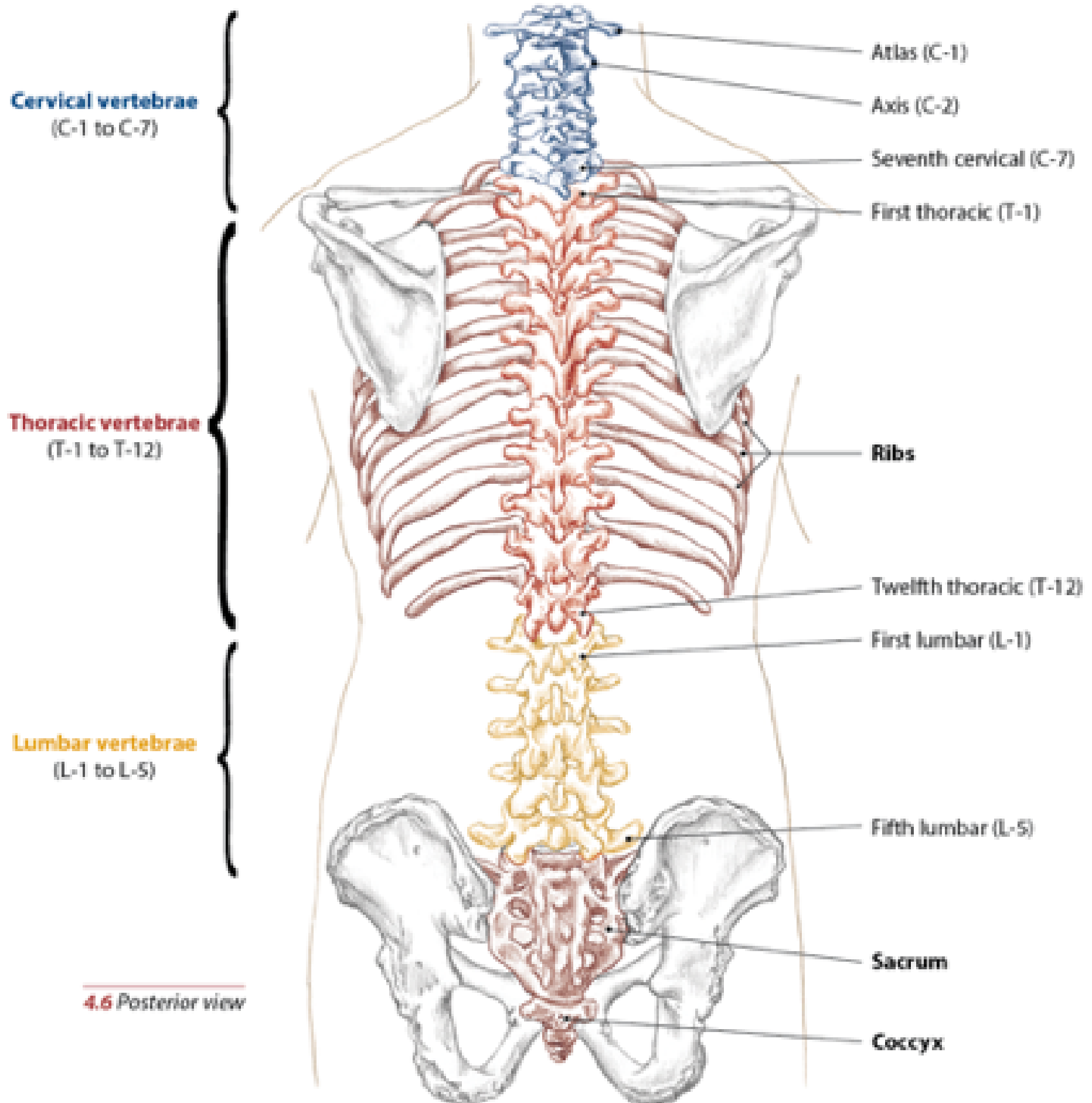
TREAT - TRAIN - TEACH

Common misconceptions

- Pain isn't always a result of Pathology and is rarely a reason for people to cease movement.
- Different posture profiles do not cause lower back pain
- "I have a disc, I can't do that."
- The need to stretch, my back/glutes/piriformis is tight.
- Heavy loads cause LBP

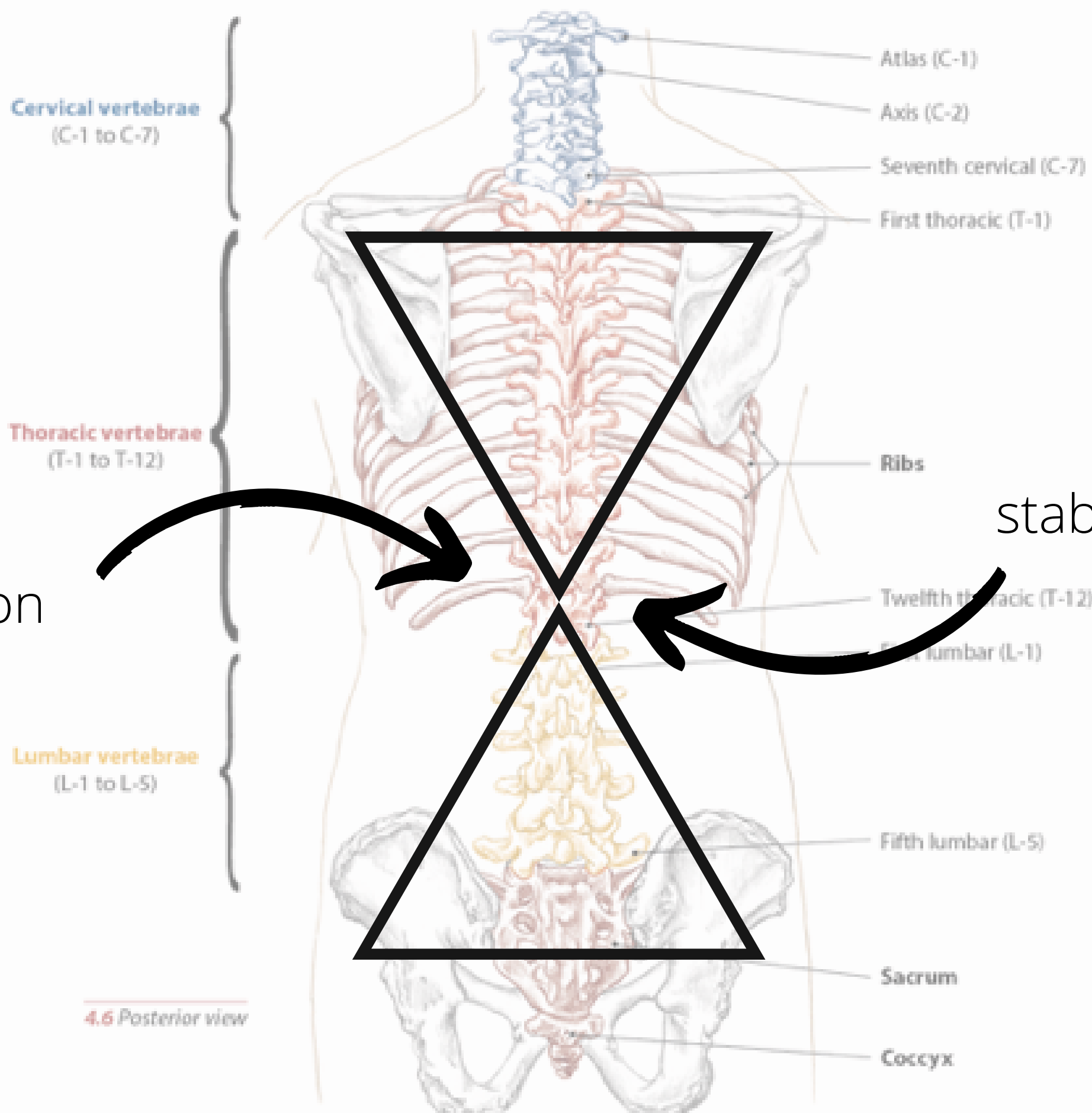
Bony Anatomy and structural demands

Bones of the Spine and Thorax



4.6 Posterior view

Bones of the Spine and Thorax



Thoraco-lumbar junction

stability and pivot point

4.6 Posterior view

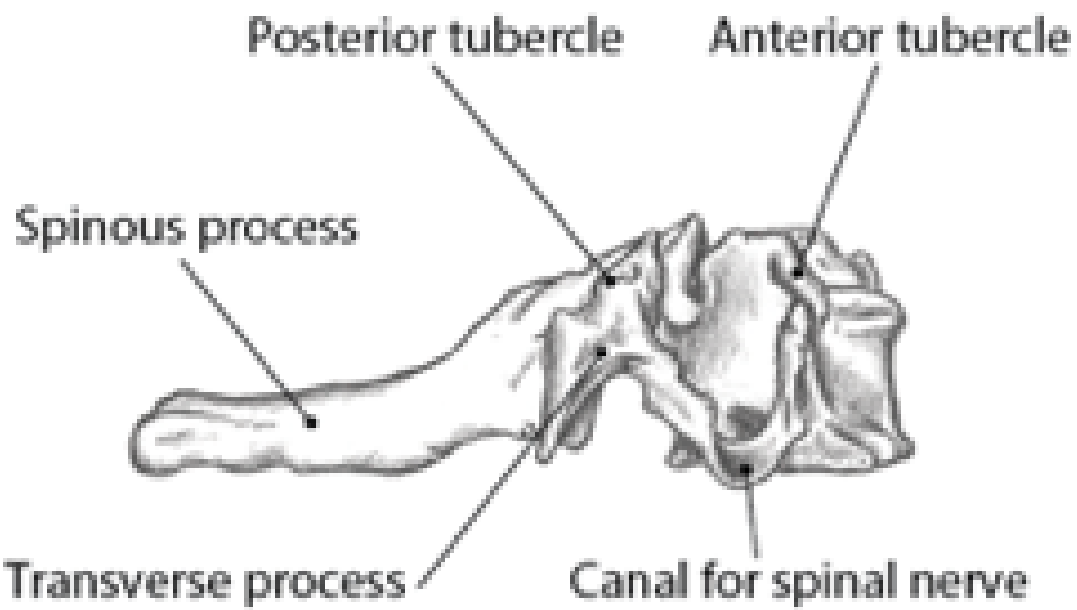
Pivot point and the lumbar-pelvic region have to carry the weight of the upper body and balance it with the stability needed to achieve functional and athletic movements.

This is depicted in the shape and size of the vertebra in each area of the spine

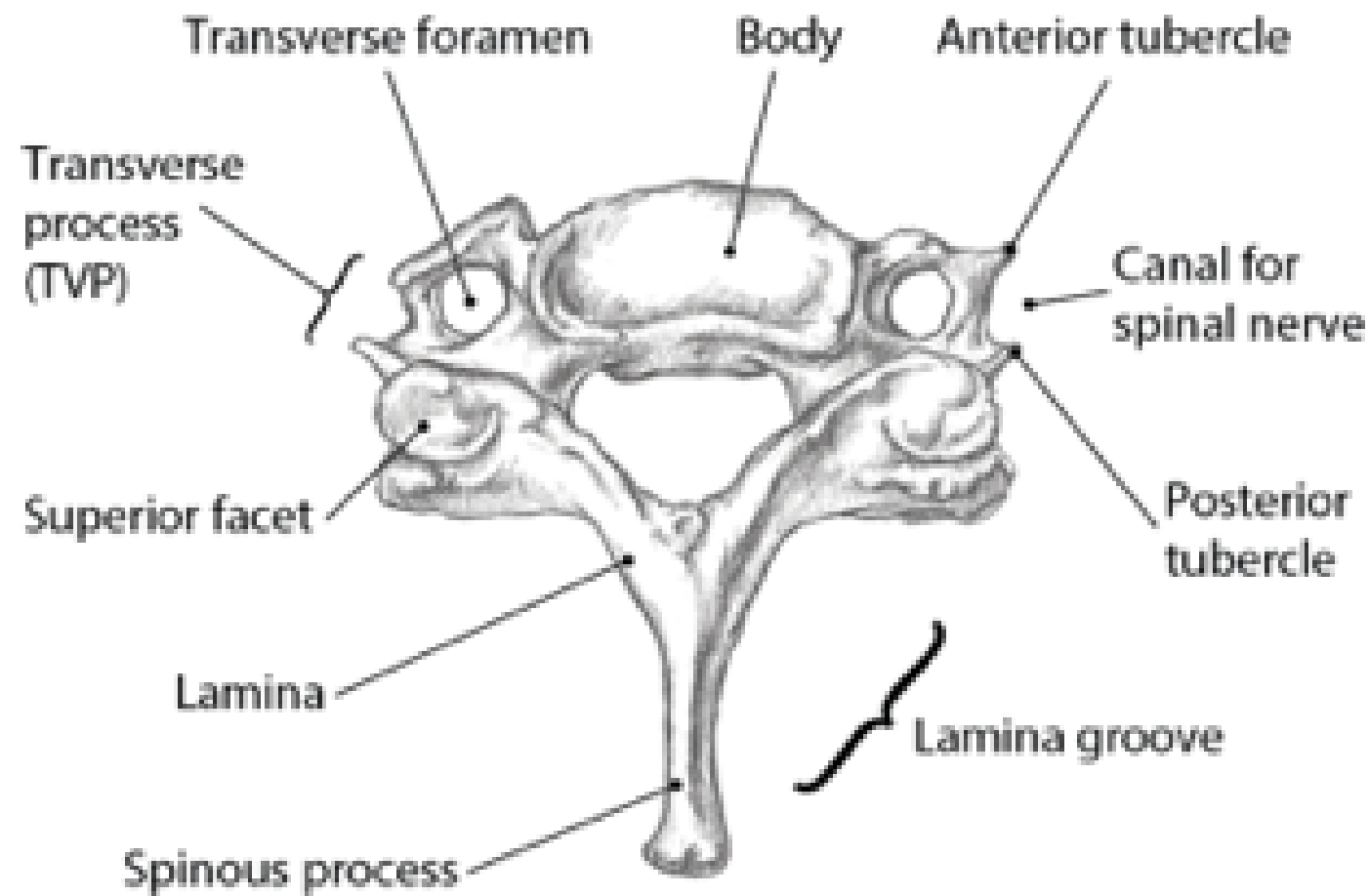
Force transmission via the Sacroiliac Joint and Lumbar vertebrae along with tension aide with stability.



Cervical Spine

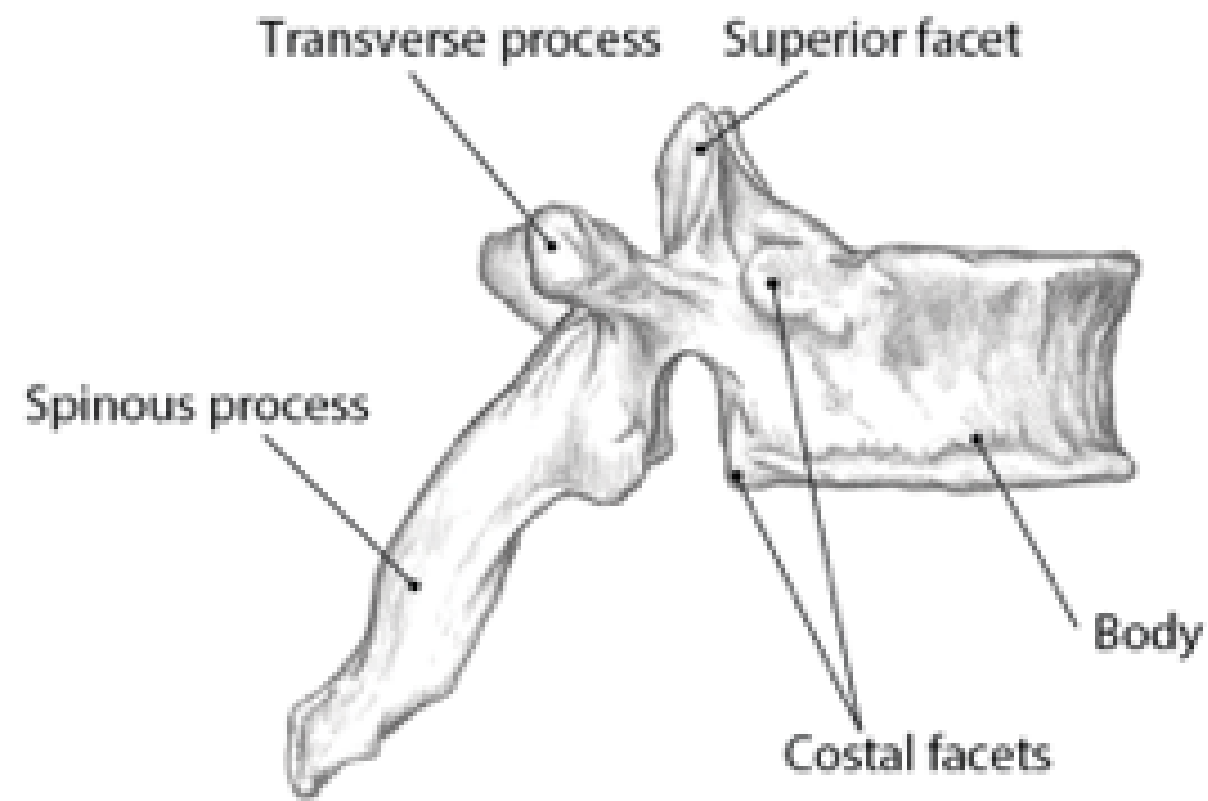


4.12 Lateral view

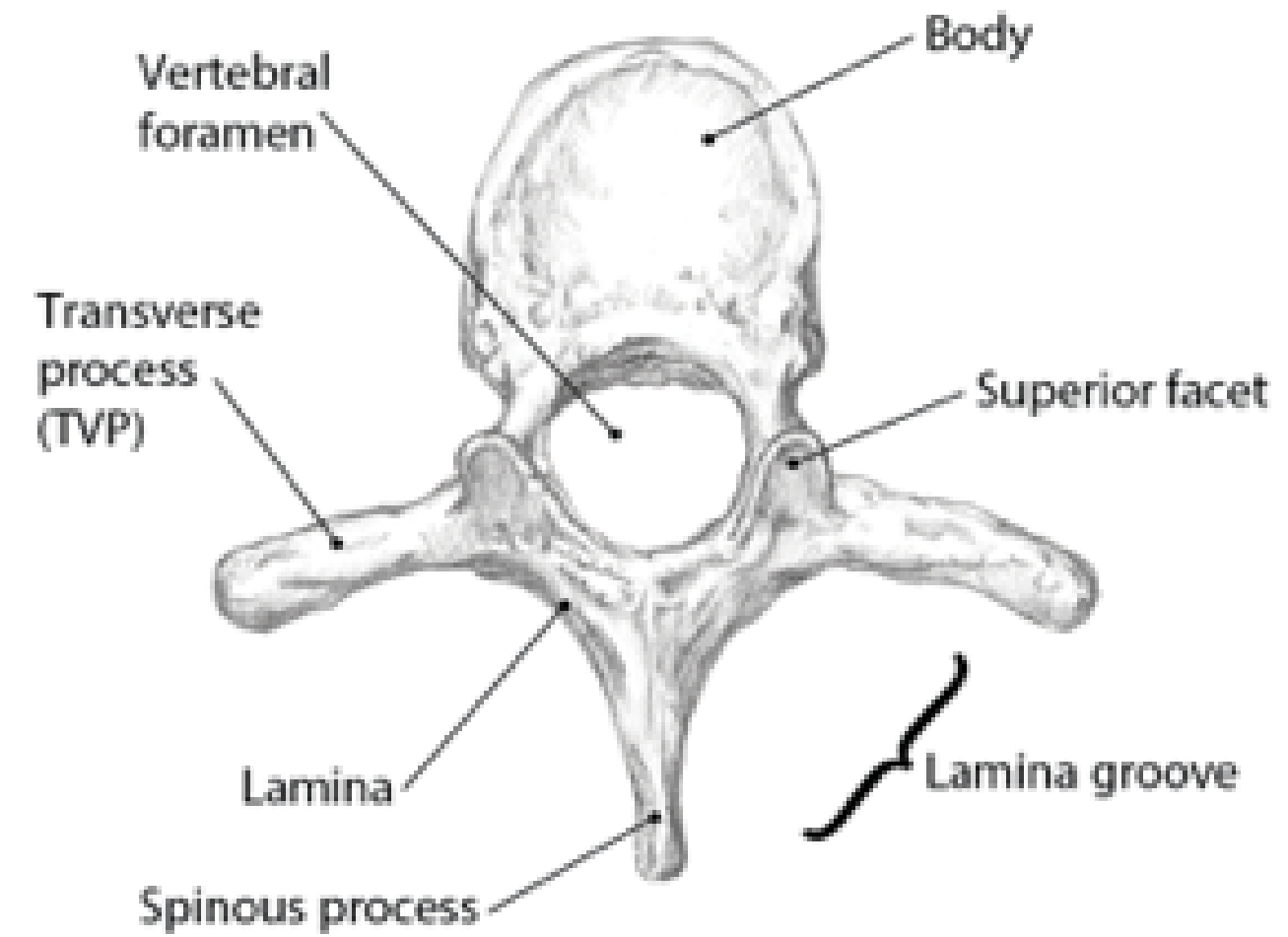
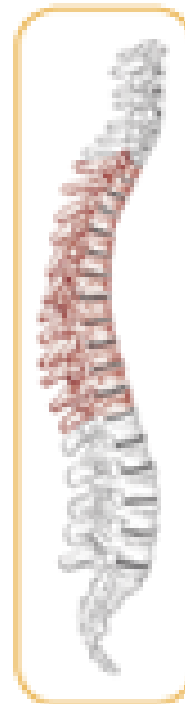


4.13 Superior view

Thoracic Spine

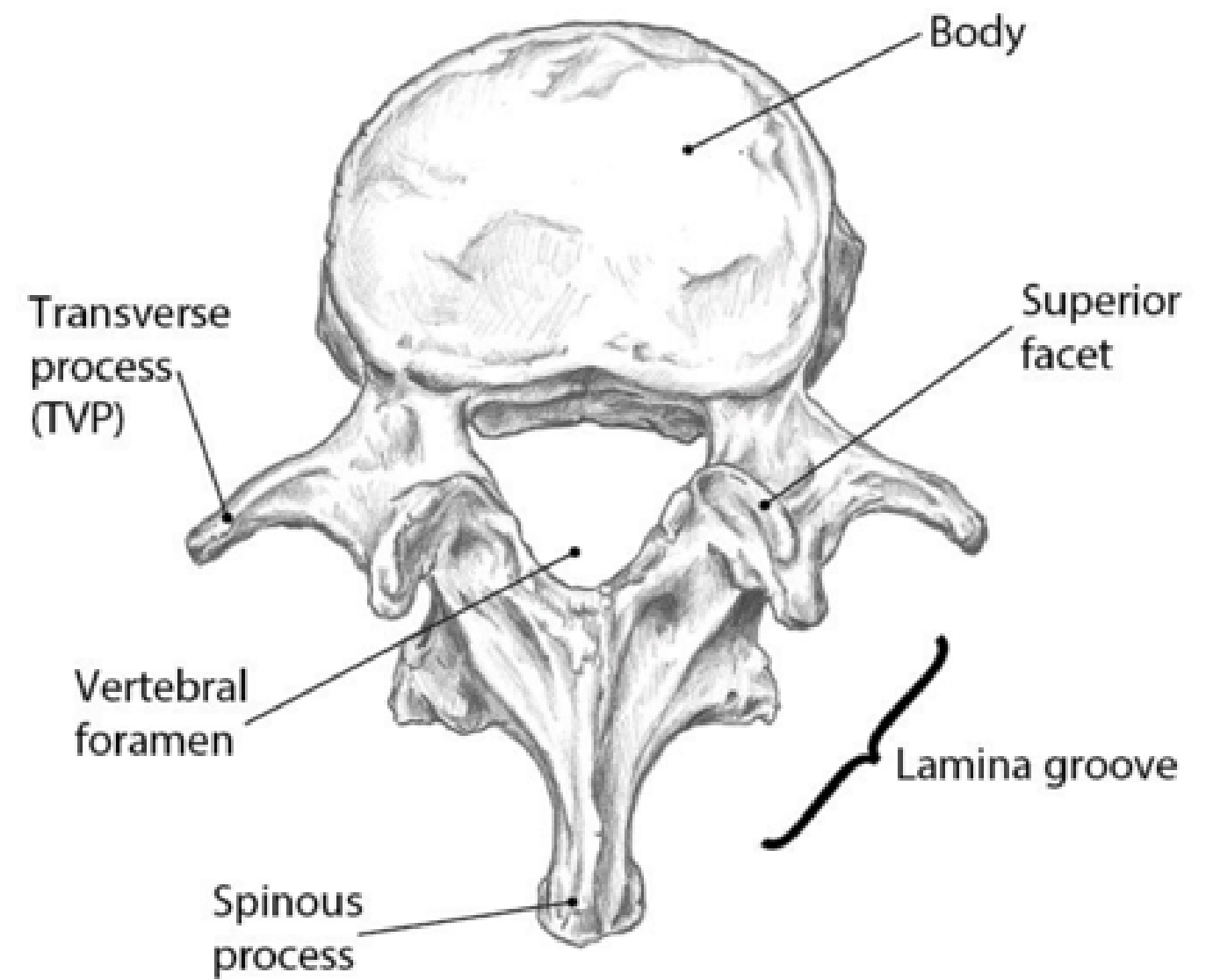
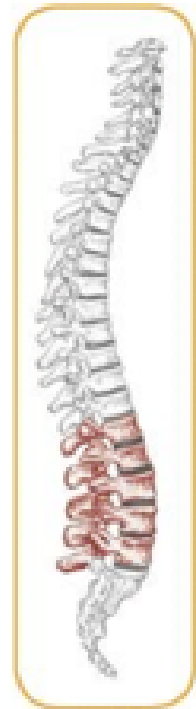
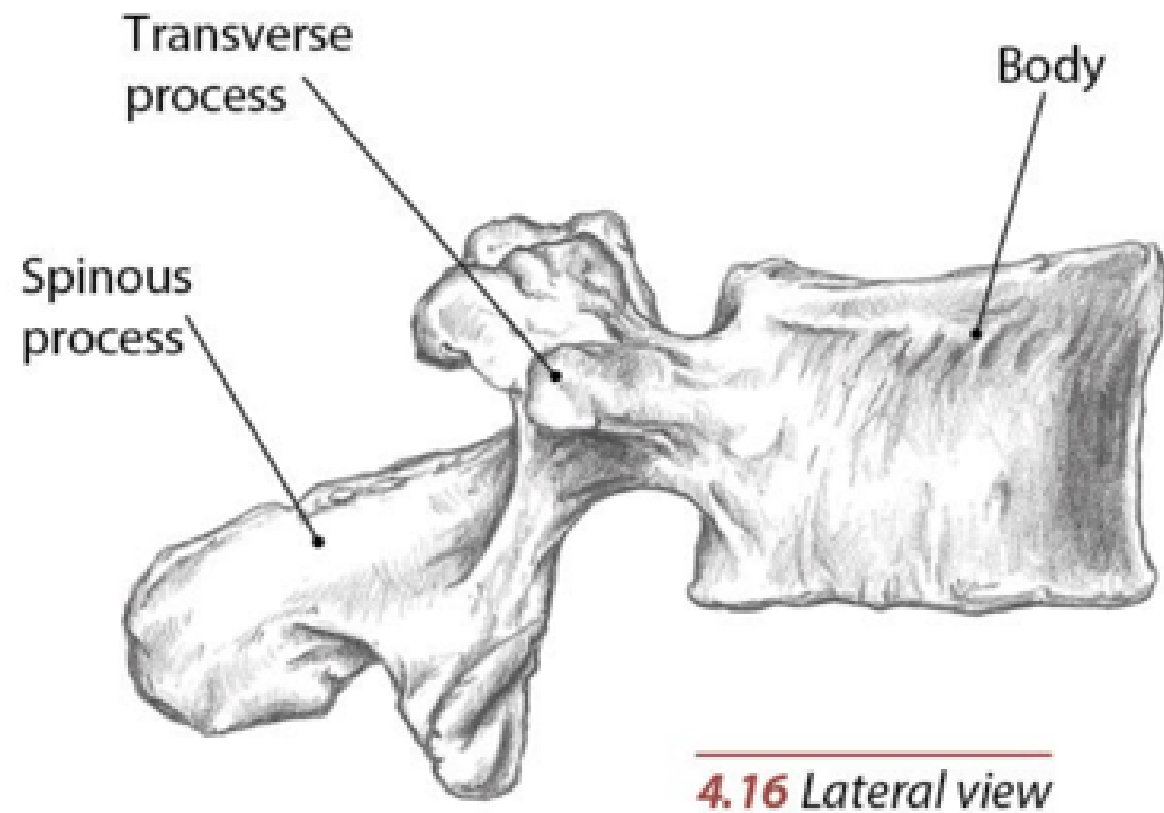


4.14 Lateral view



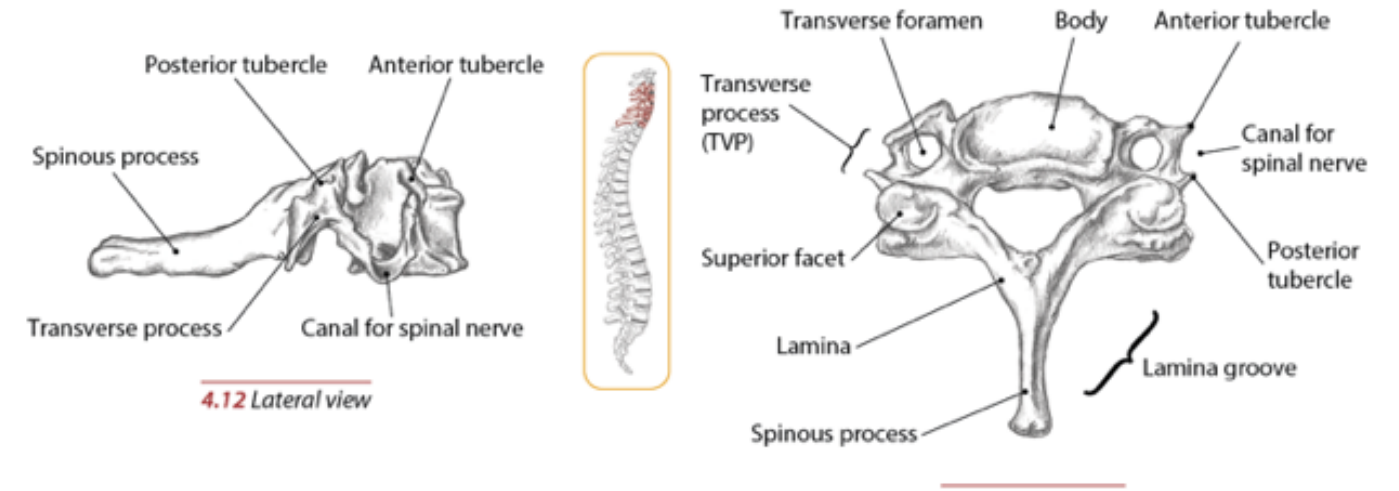
4.15 Superior view

Lumbar Spine



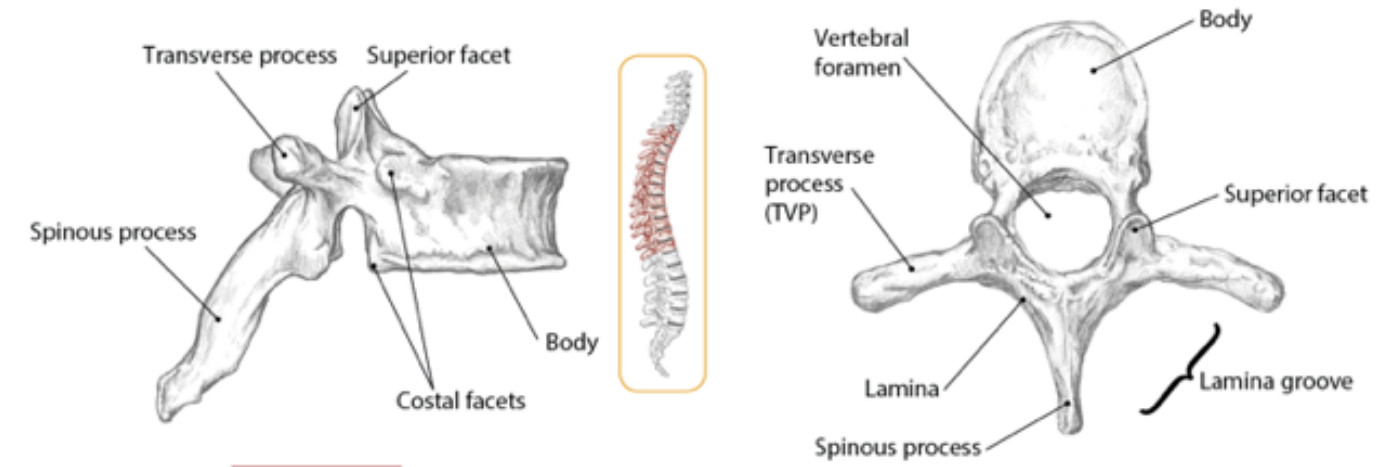
C/Sp

Smaller bodies
Little to no TP's
Large ROM



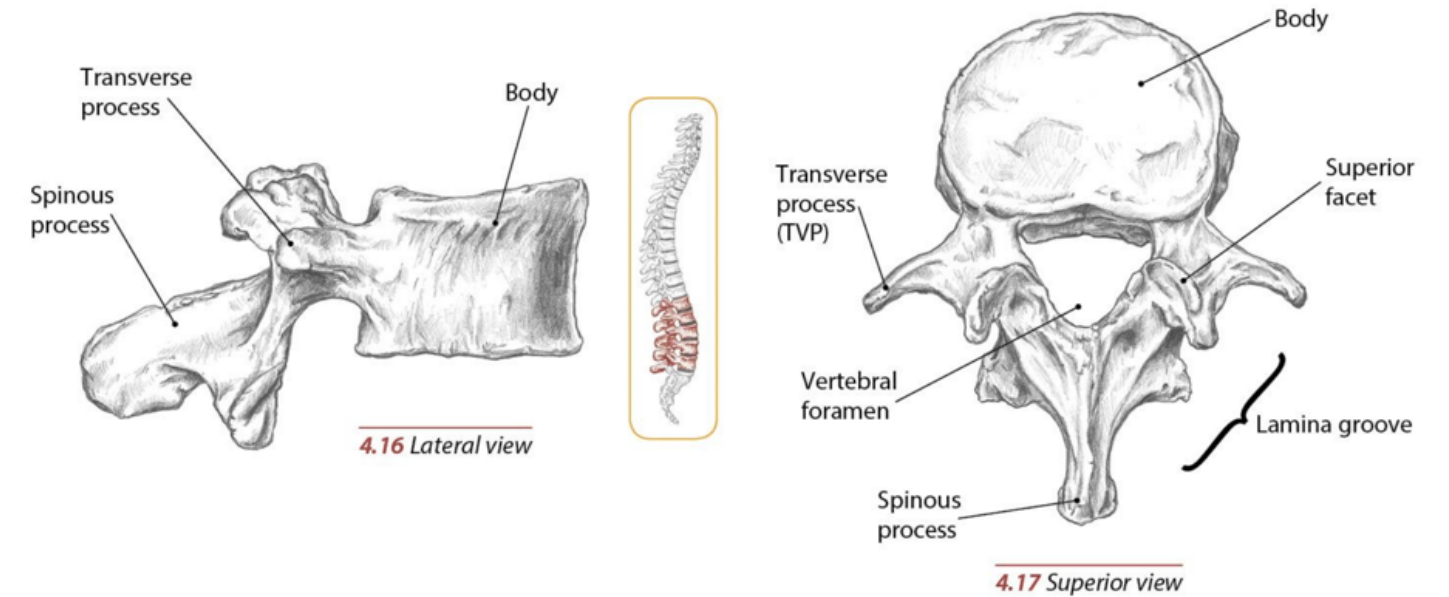
T/Sp

Larger bodies
Largest TP's
Large ROM



L/Sp

Largest bodies
Small TP's
increased stability
decreased ROM



Discs, forces and spinal flexion

- Anyone over the age of 30 is likely to have one of these
- It is completely normal and part of the aging process

"You are not your MRI"

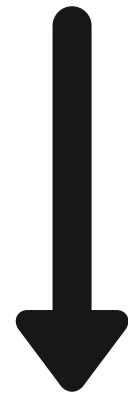


Pain often has no pathology.

"pain is in the brain"

Pathology often has no pain.

- Compressive force

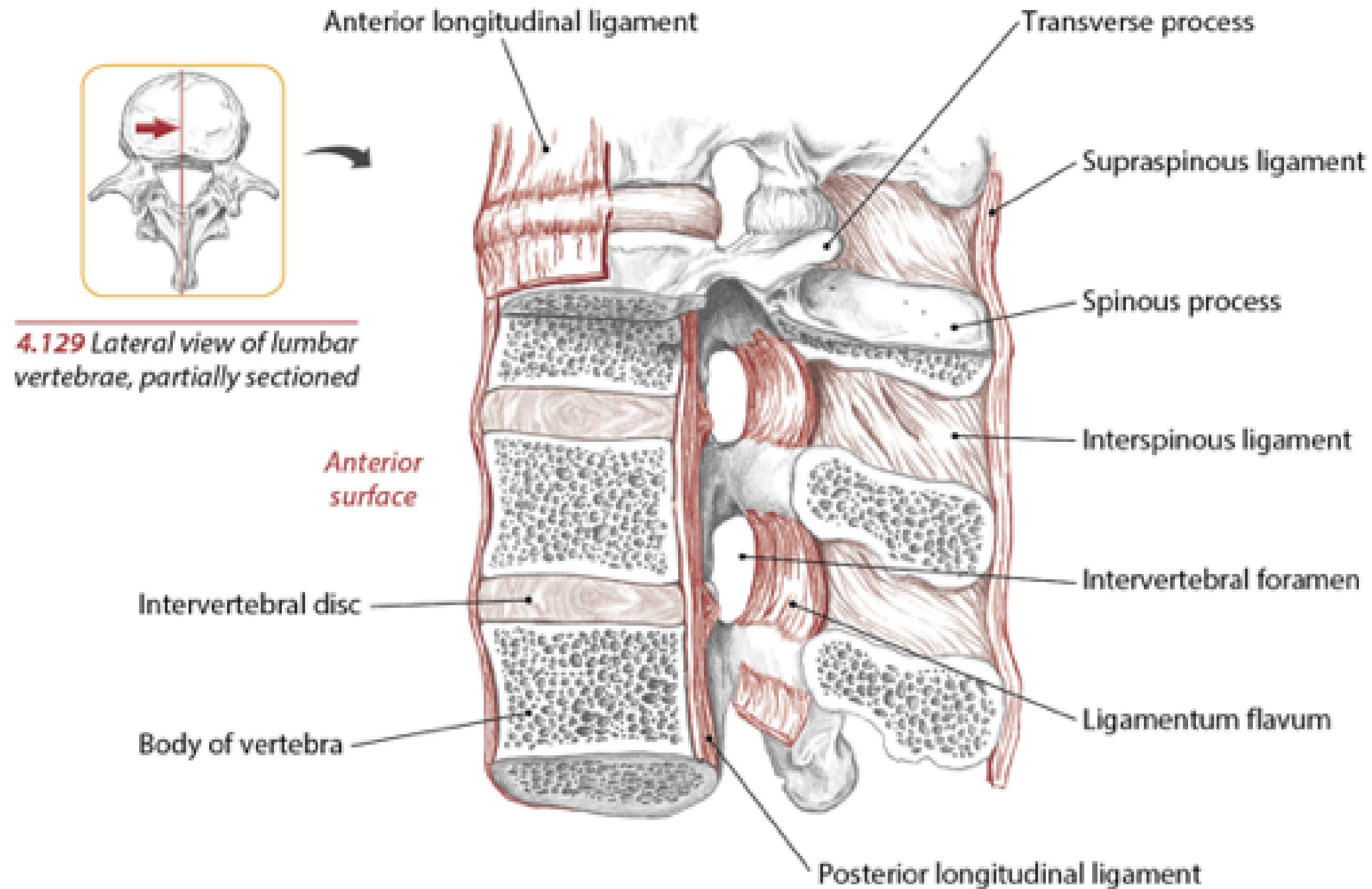


- shear force

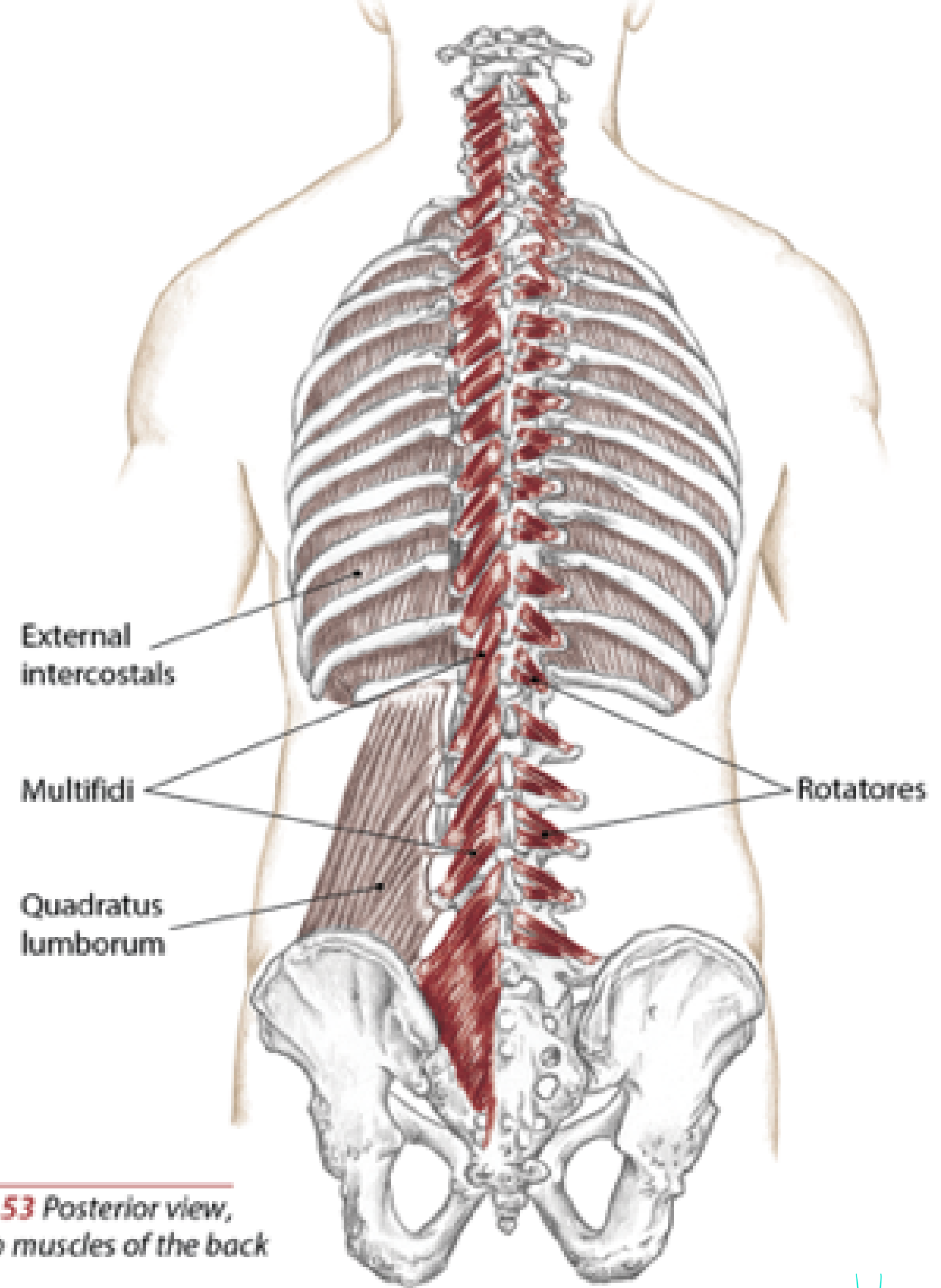
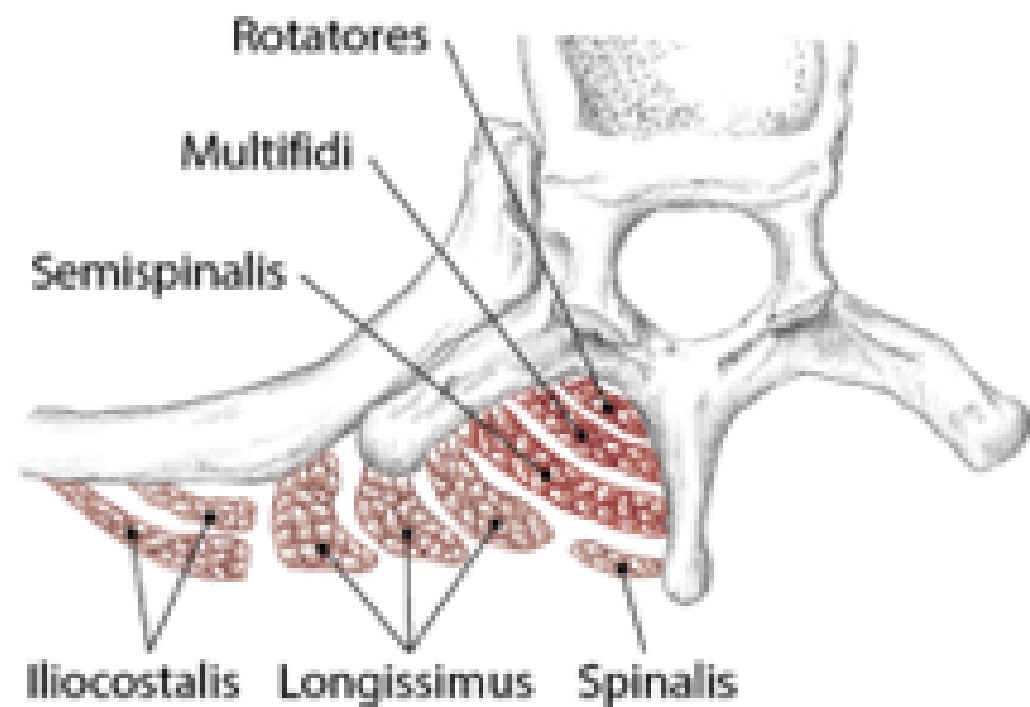


Compressional and shear forces tend to cancel each other out.



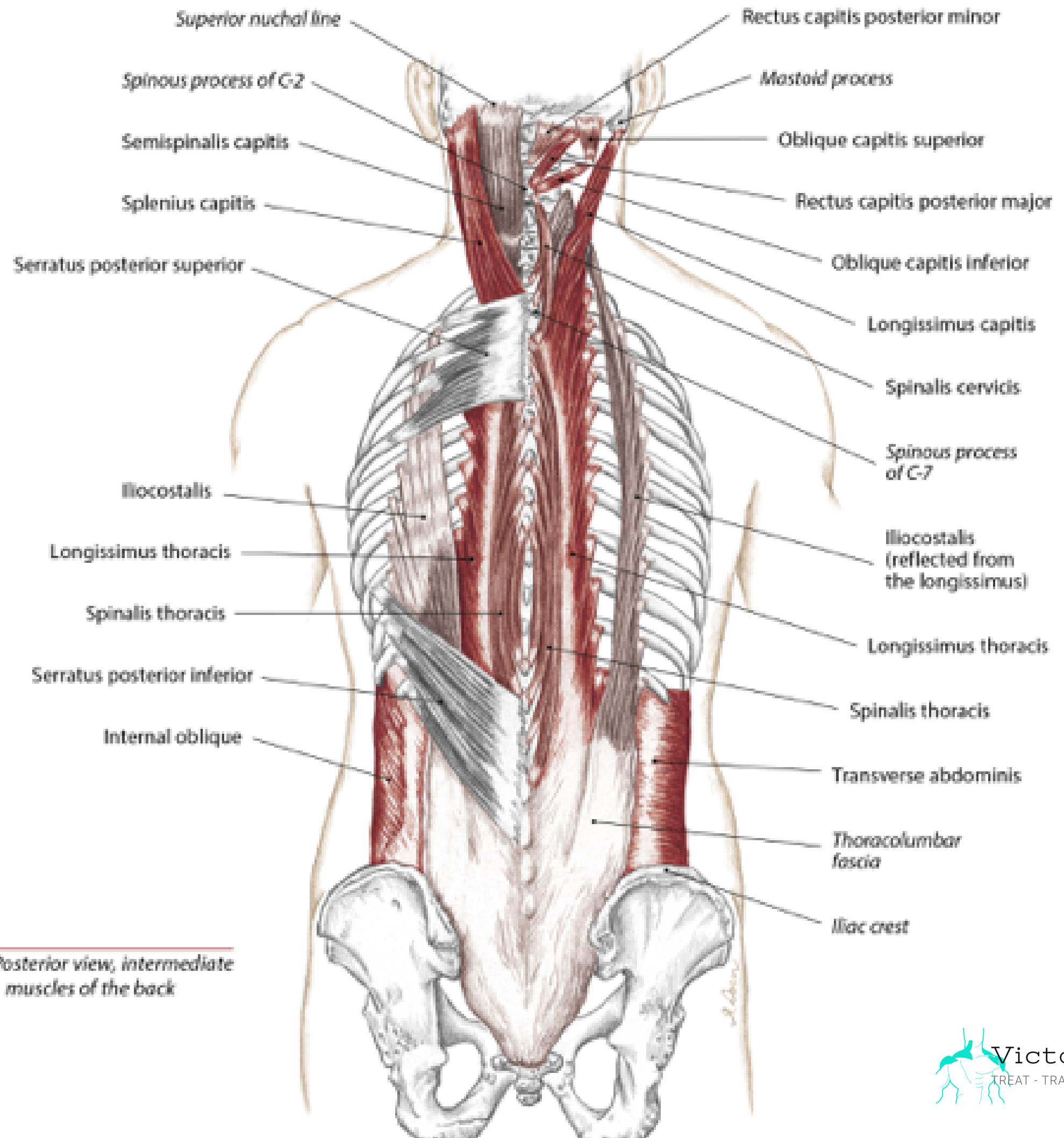


After the ligaments, come the muscles.
Deep stabilizing muscles

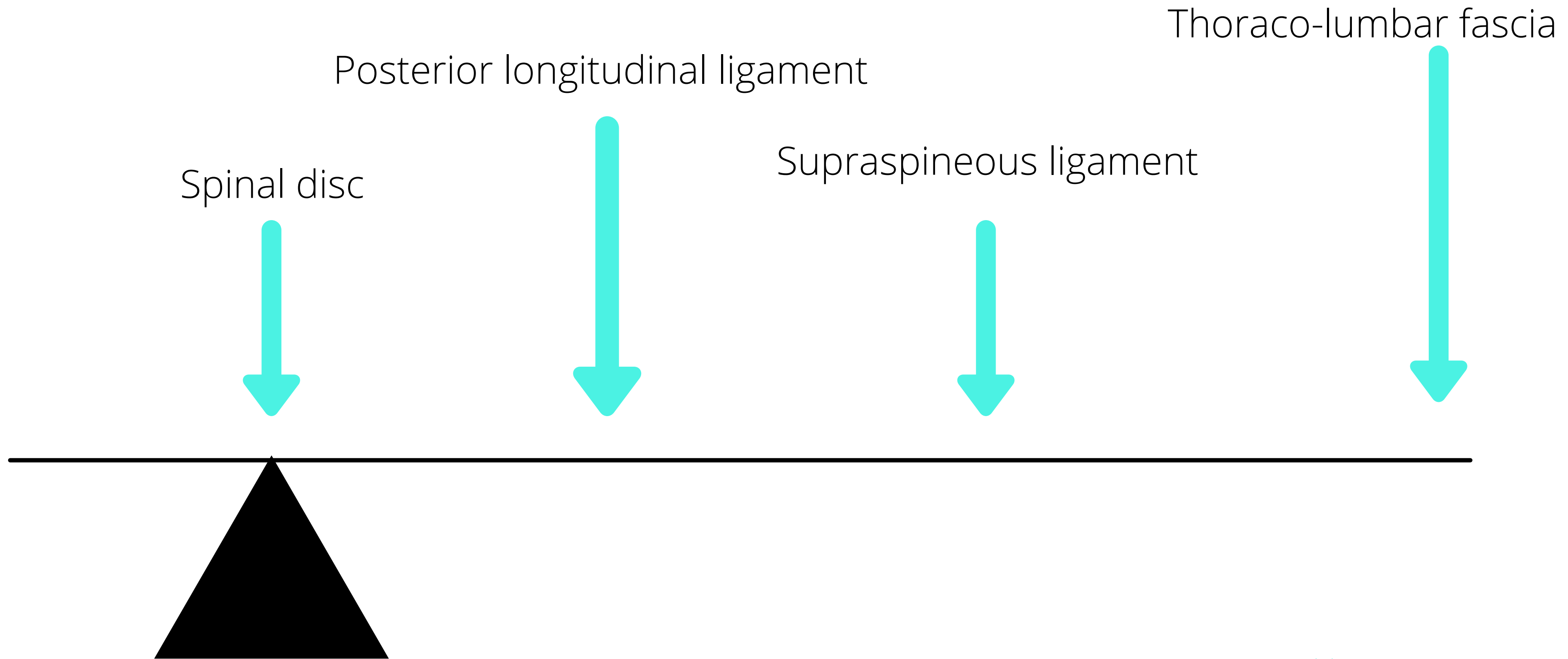


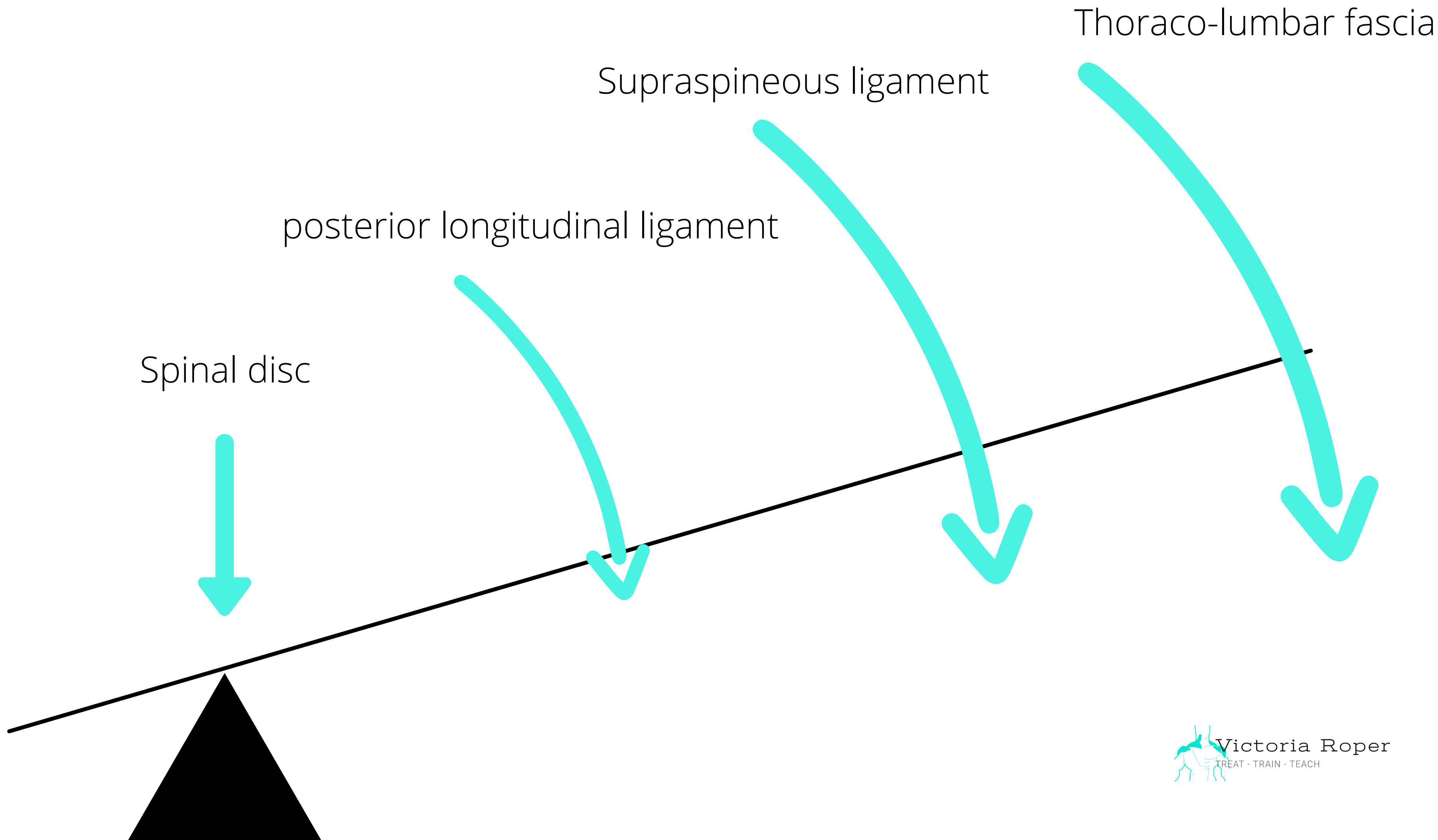
4.53 Posterior view,
deep muscles of the back

Muscles of the Spine and Thorax



4.51 Posterior view, intermediate muscles of the back





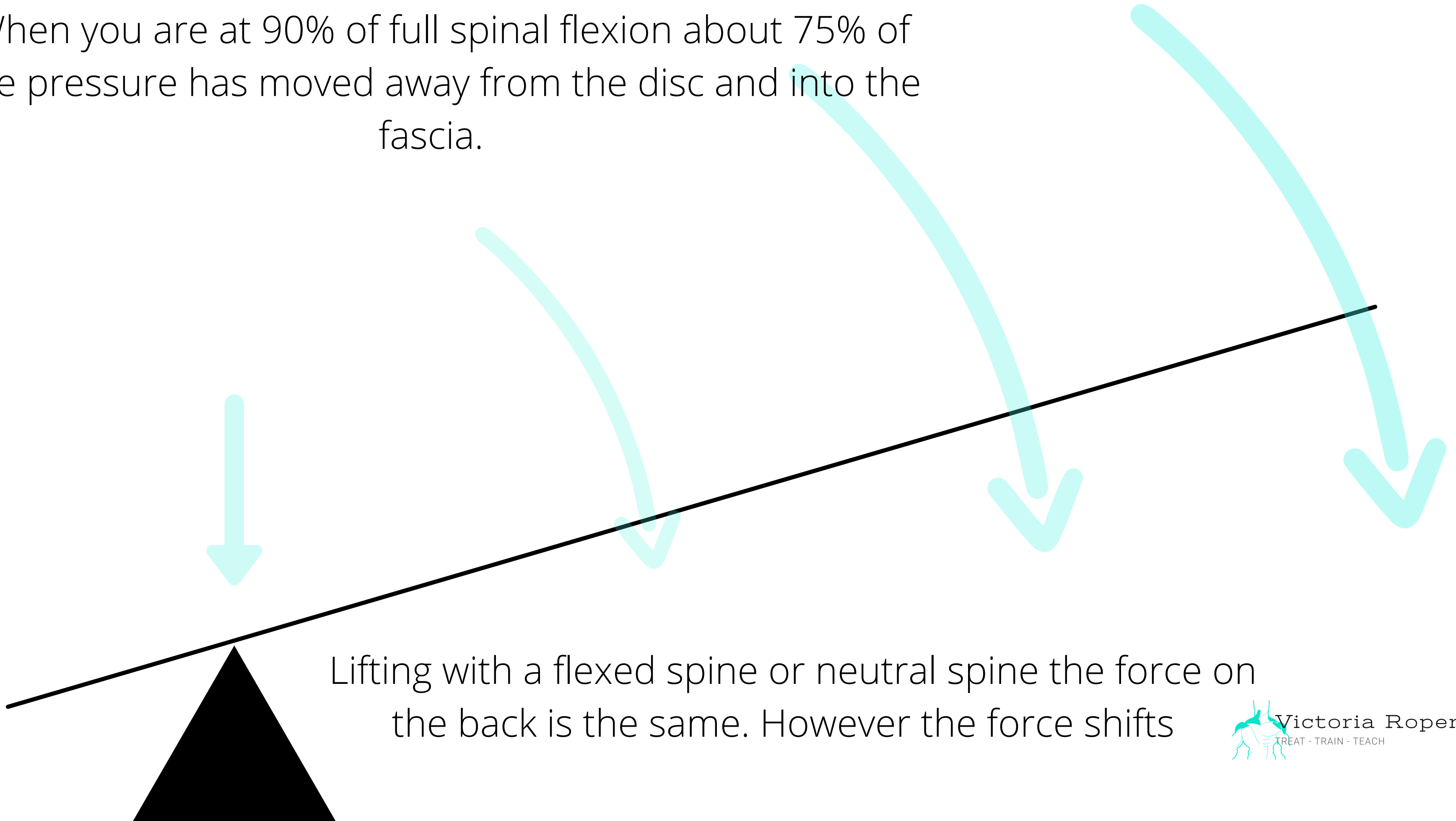
Spinal disc

posterior longitudinal ligament

Supraspinous ligament

Thoraco-lumbar fascia

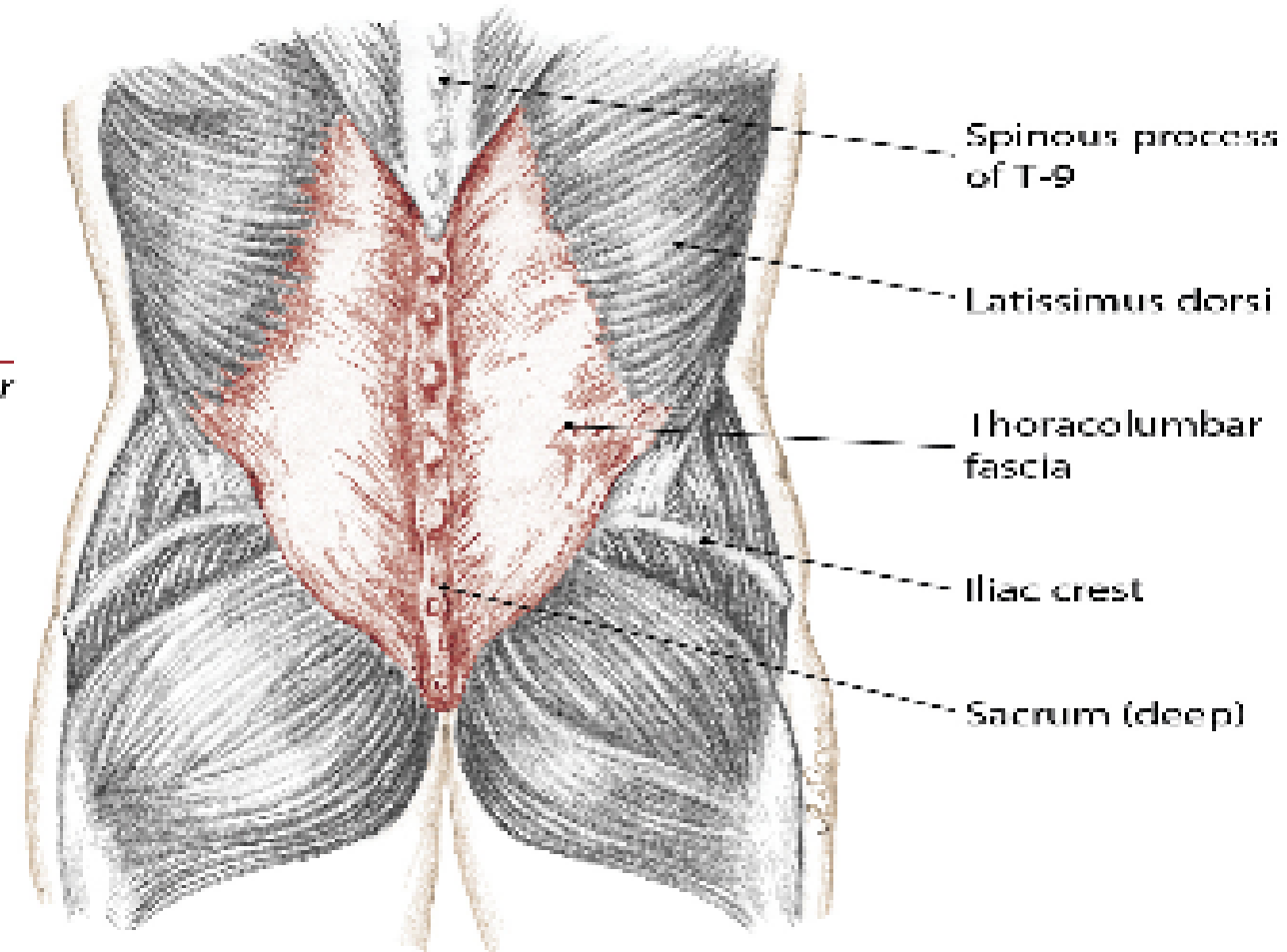
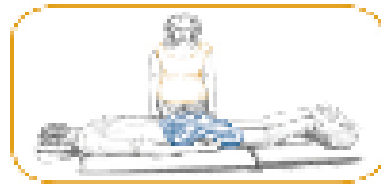
When you are at 90% of full spinal flexion about 75% of the pressure has moved away from the disc and into the fascia.



Lifting with a flexed spine or neutral spine the force on the back is the same. However the force shifts

Thoraco-lumbar fascia

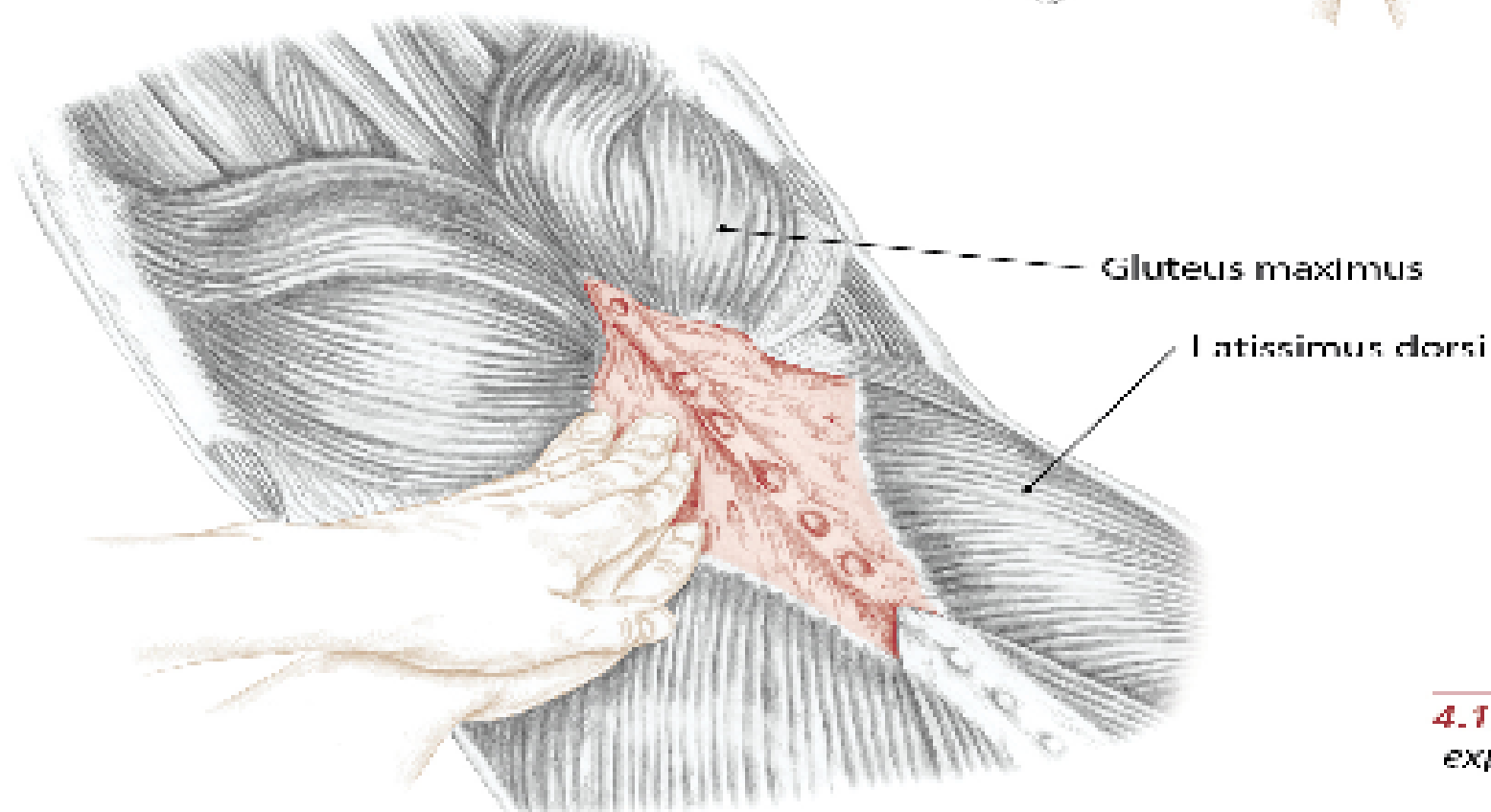
4.123 Posterior view of lower thorax and pelvis



Fascia has a range of density and stiffness

high density
high stiffness
WHY?

What happens when we stretch this?

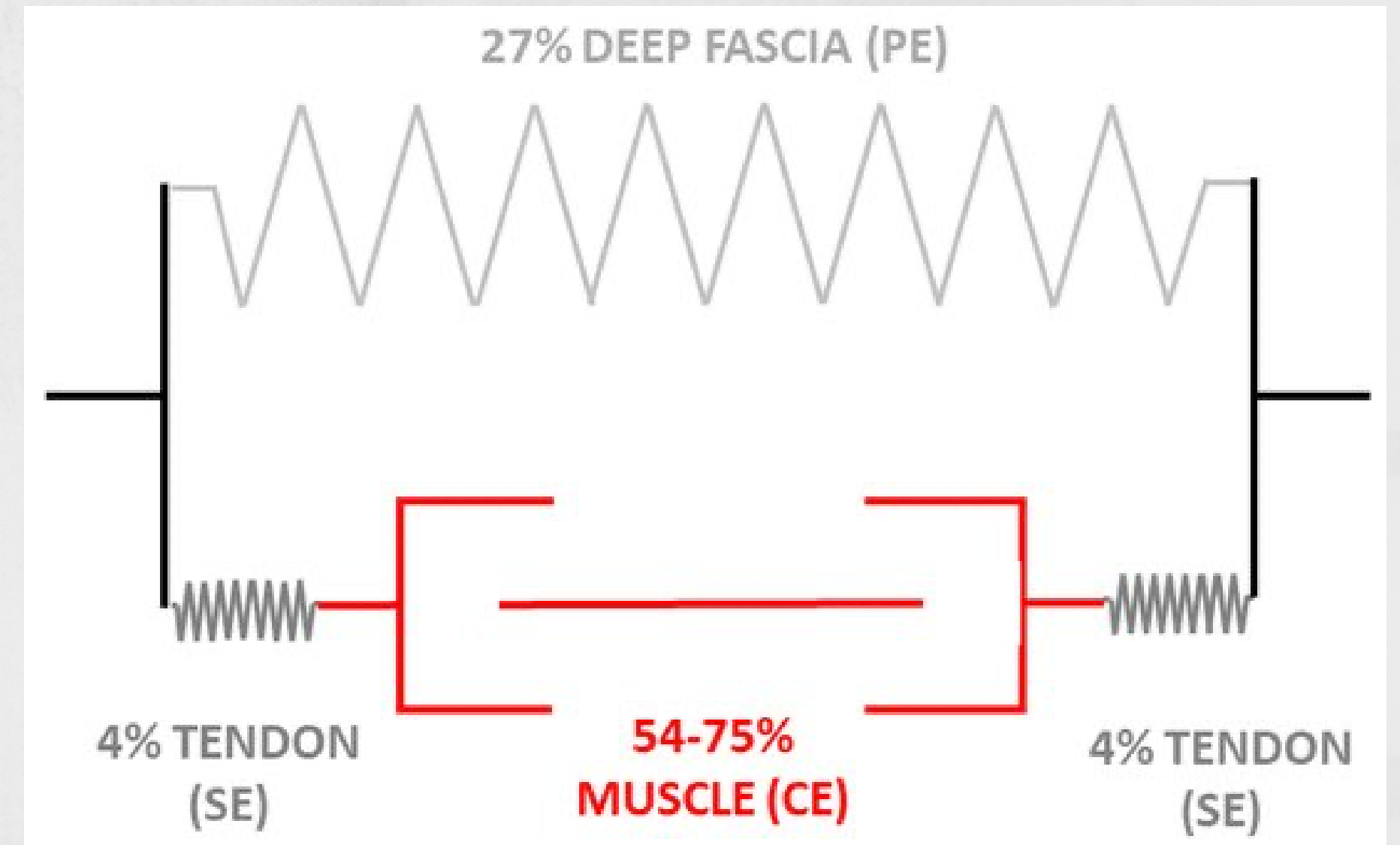


4.124 Partner prone, exploring the fascia

What happens when we stretch?

Fascia, tendons and muscles all have viscoelastic properties

"During stretching, the bulk of the mechanical work is done on the aponeurotic fascia that is the first one that is stretched when the muscles are not in isometric contraction. Only secondarily muscle and tendon are involved."



What happens when we stretch?

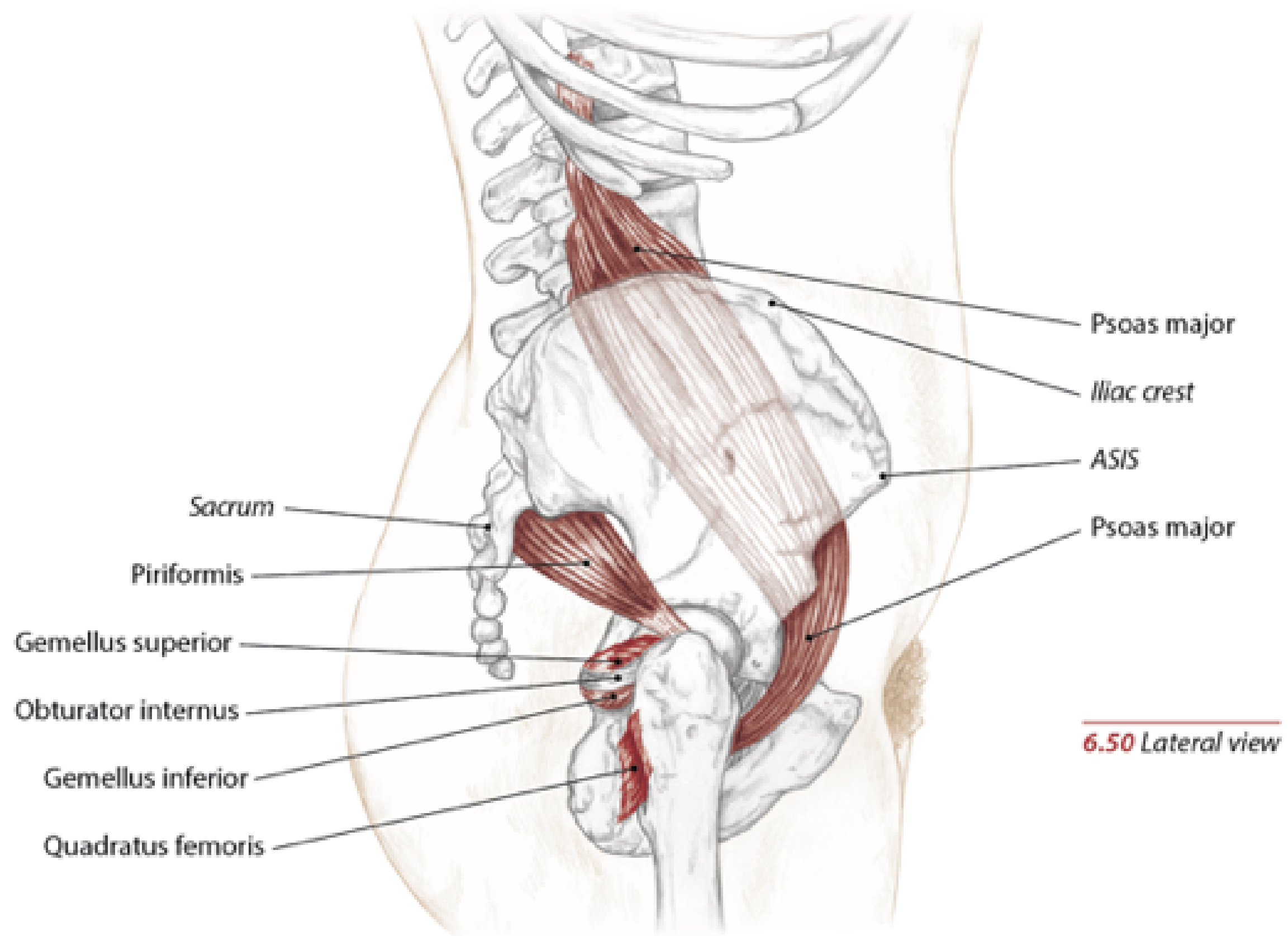


Which structures are stretching first?

What might be a better way of stretching the glutes?

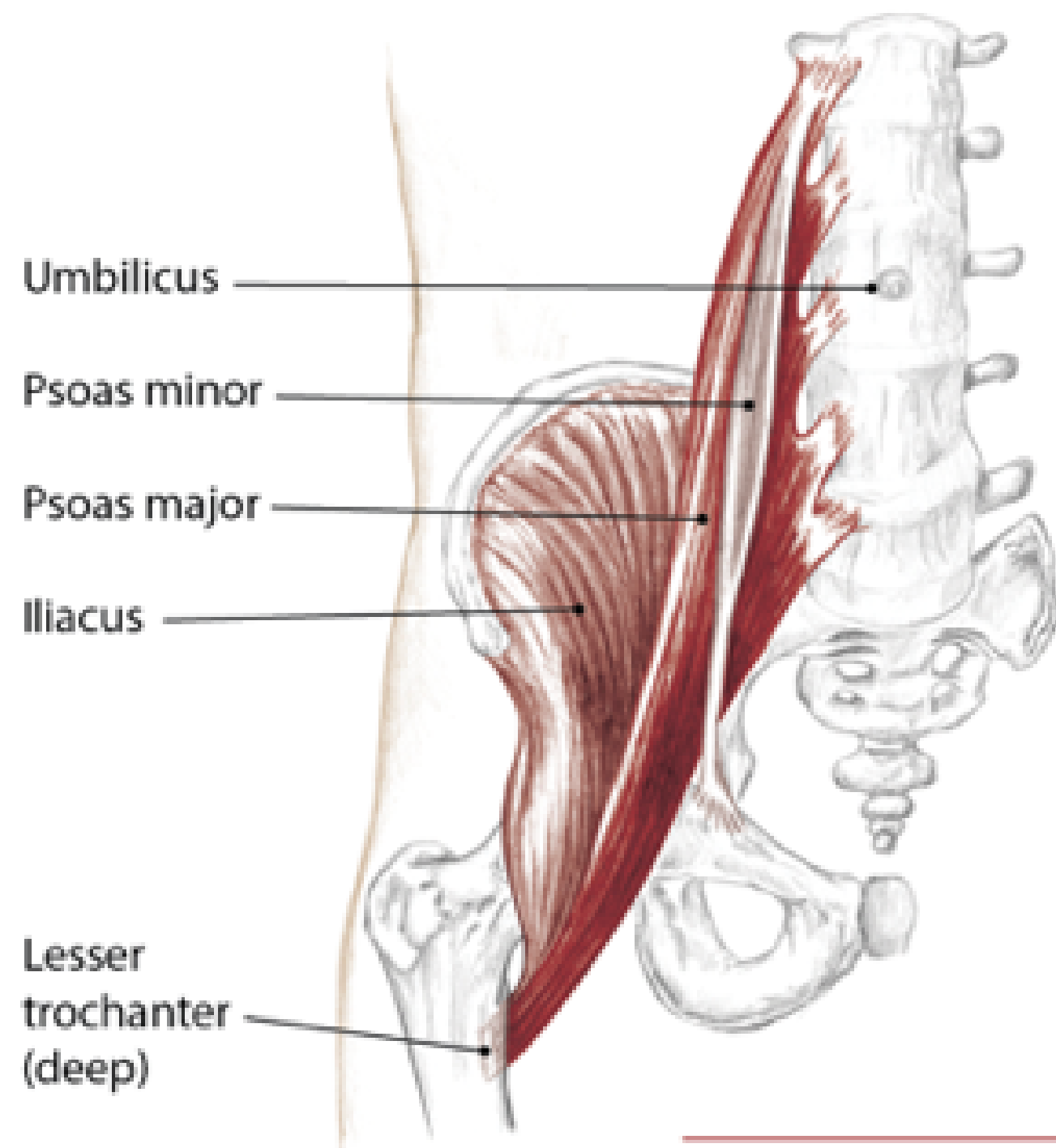
What do most people require in this area?

Muscles of the Pelvis and Thigh

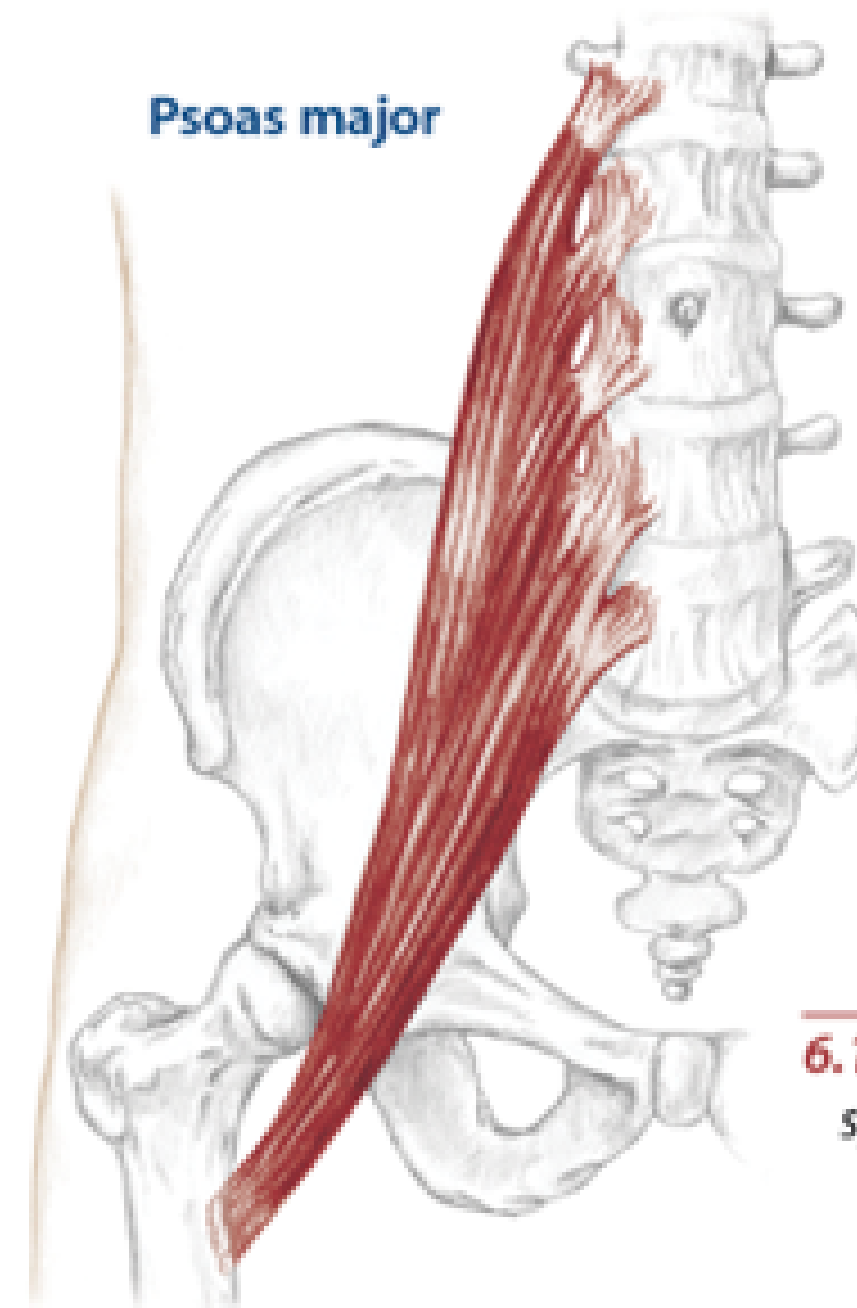


Iliopsoas

Psoas Major



6.126 Anterior view of spine and right hip



6.127 Anterior view of spine and right hip

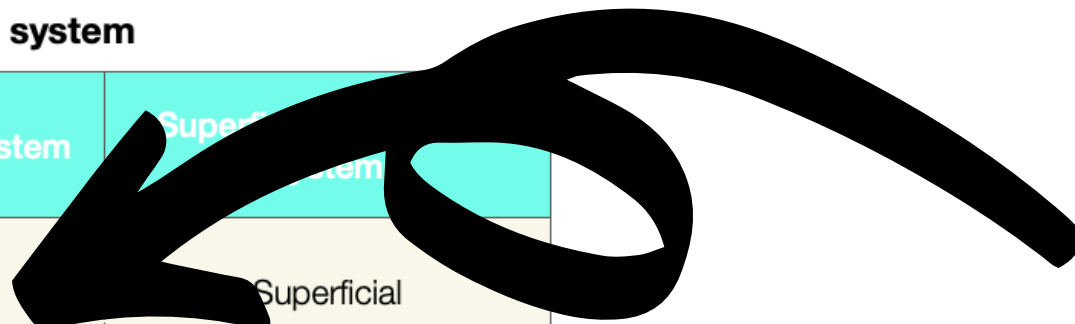
- Psoas helps to create and maintain our natural lumbar lordotic curve.
- By statically stretching them, what is the most likely effect on the lumbar spine?
- How could this knowledge be useful when working with people where we need to restore the spinal curves?
- Two-fold if the Psoas are inhibited, the lumbar spine is flattened, what will this mean for the glute function?

Muscle classification system

Characteristic	Deep myofascial system	Superficial myofascial system
Location	Deep	Superficial
Size	Smaller Slow twitch	Larger Fast twitch
Proprioception	dense Anticipatory	sparse reactive or responsive
Function	low level activity segmental stabilization fine motor control	high level activity gross stabilization or bracing larger movement
Reaction to dysfunction	inhibition decrease endurance atrophy	spasm over activation, inability to relax, hypertonicity

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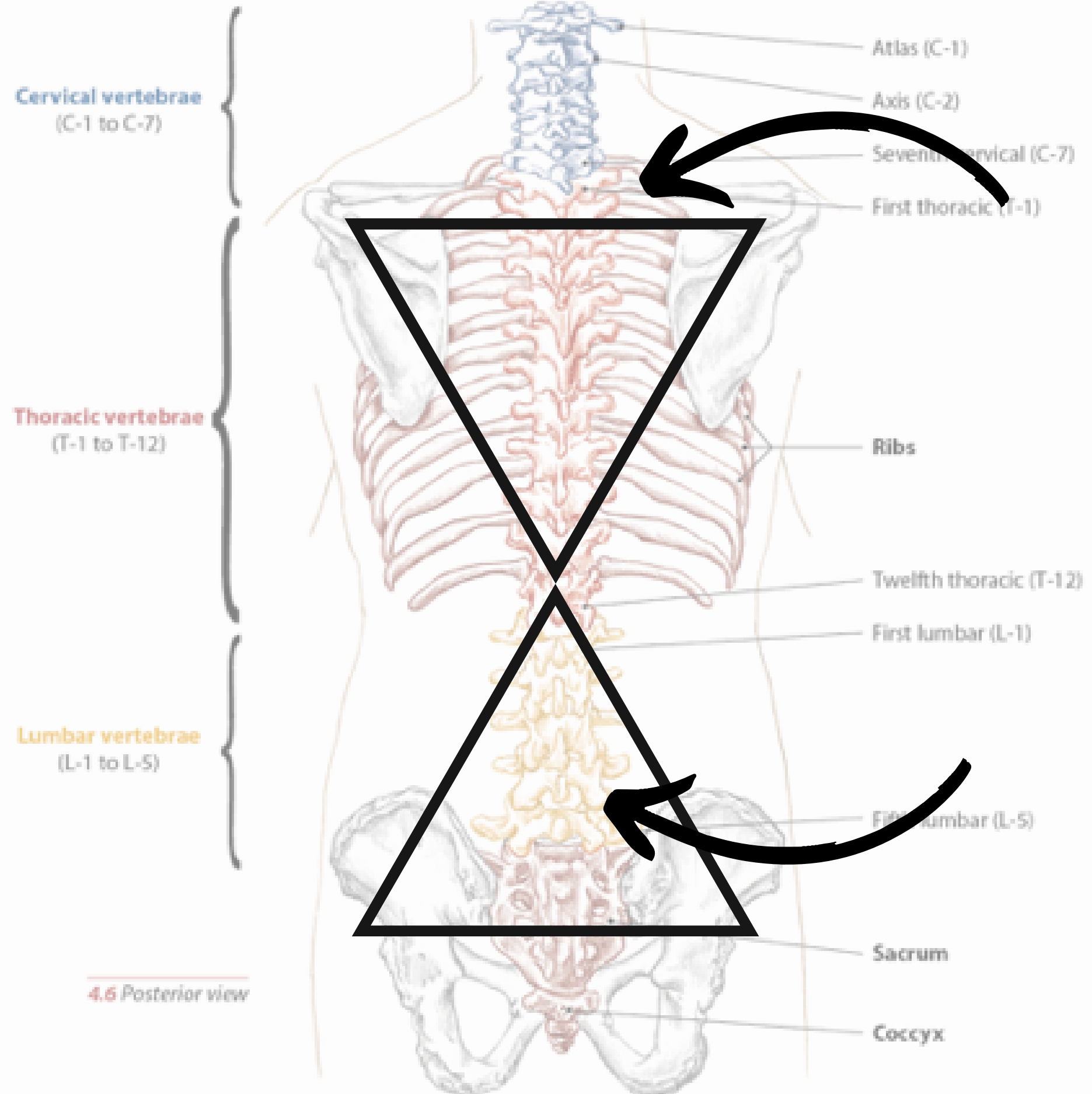
Deep muscles are able to have an effect on the spine due to them being deep



However based on this assumption and what we generally know about deep muscles, how else can we train them?

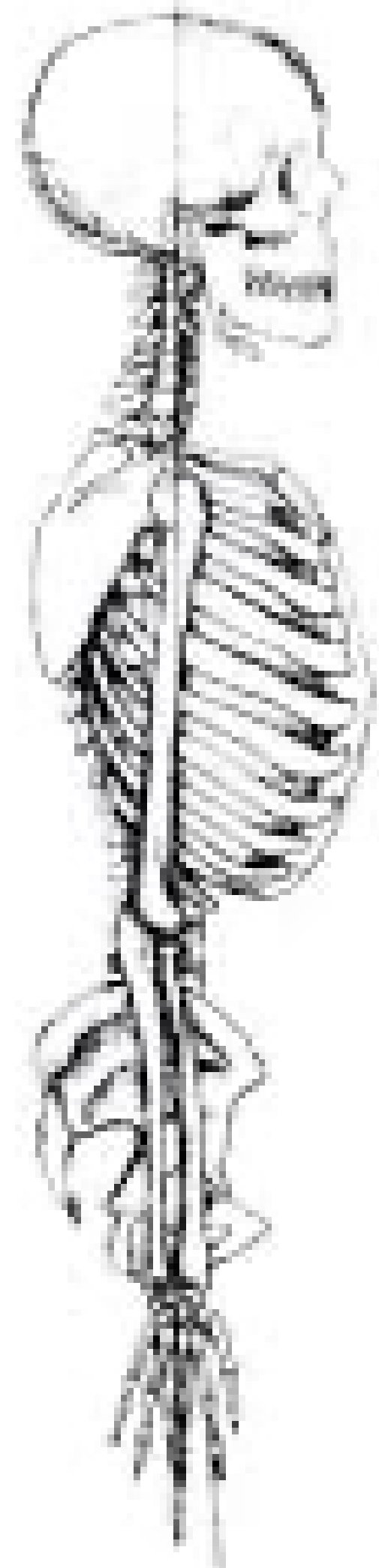
Thoracic and Cervical Spine

Bones of the Spine and Thorax

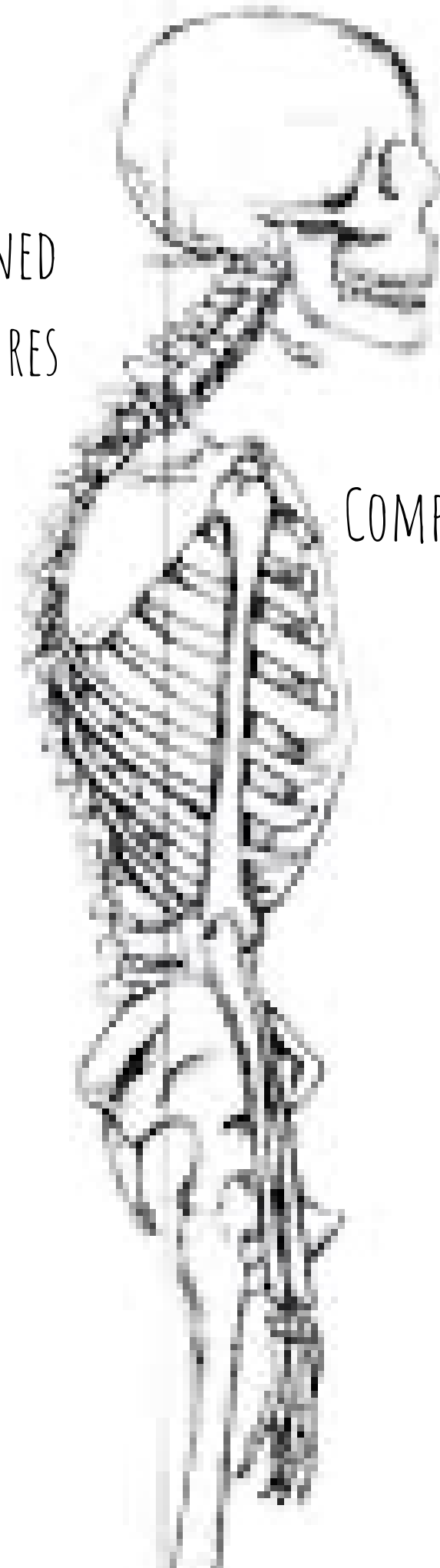


4.6 Posterior view

Mirror effect



TENSIONED
STRUCTURES



COMPRESSED STRUCTURES

Compressed structures under load become harder.

Example: how bone is built!

Tensioned structures will respond to the demand on them and stiffen.

example: hip flexors feeling 'grippy'

BUT they will also become less easy to mobilize!

Practical application

What we often set as goals for clients.....

- Restoring spinal curves
- Regaining neutral
- Restoring hip centration
- finding balance between tensioned and compressed structures.

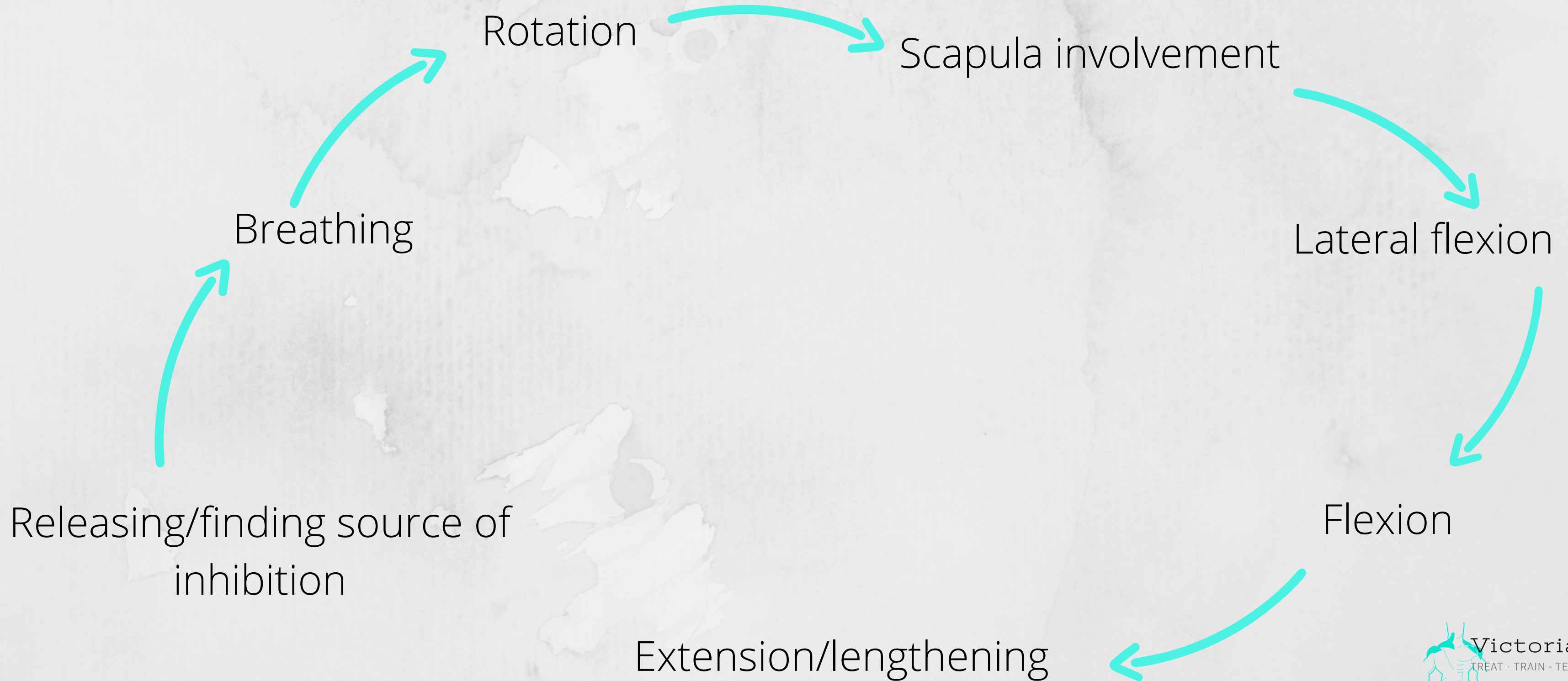
What is neutral?

A position/range where the structural tissues are lax.

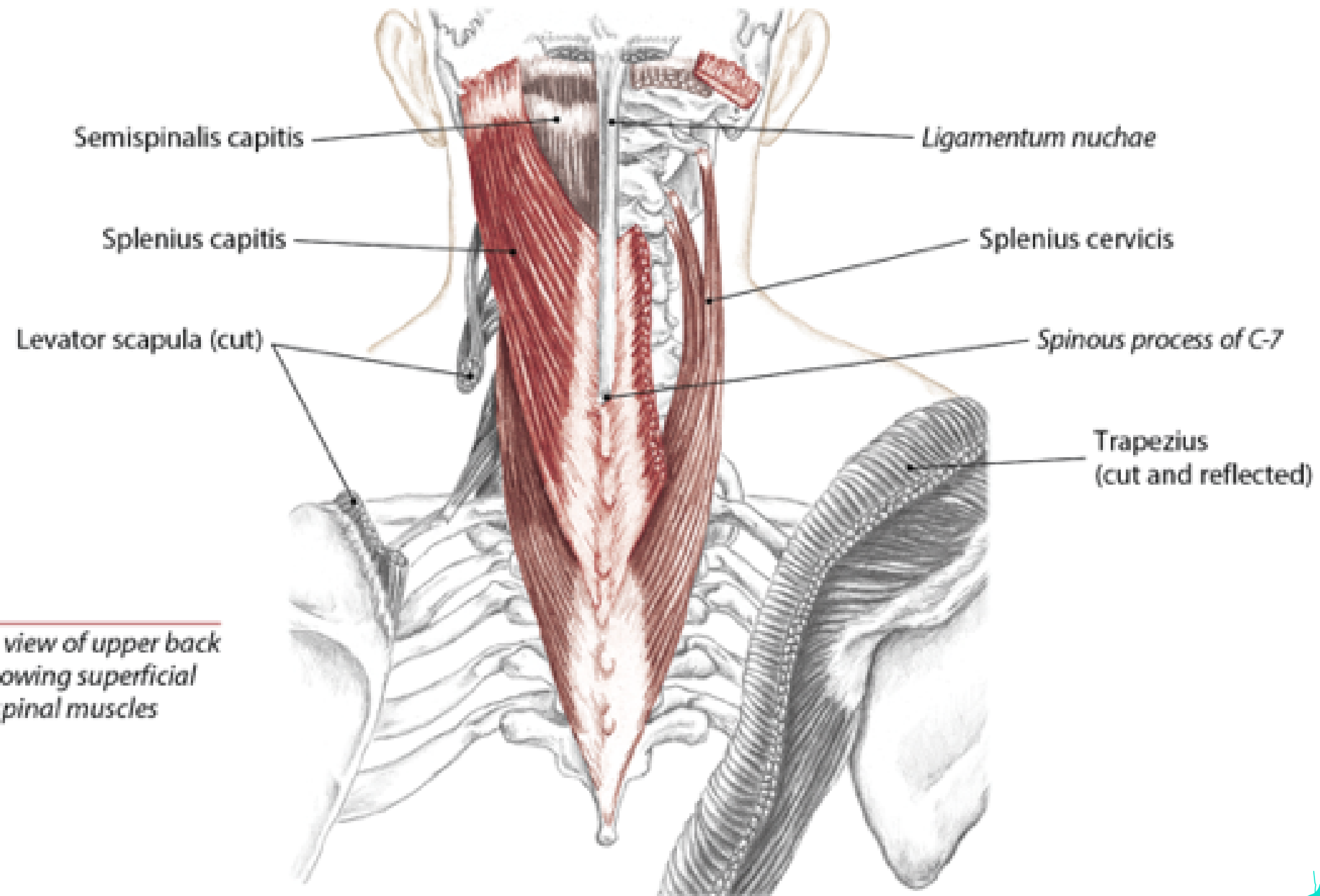
Thoracic Spine

- We often find immobile and "fixed" T/Sp
- The structure itself (unless diagnosed pathology is present) isn't fixed, therefore we can work with the soft tissue to mobilize.
(Very similar to the Psoas in the L/Sp)
- The Rectus Capitus musculature and upper traps are inhibited.
- You cannot strengthen an inhibited muscle/s
- What can we do?

Unlocking the Thoracic Spine

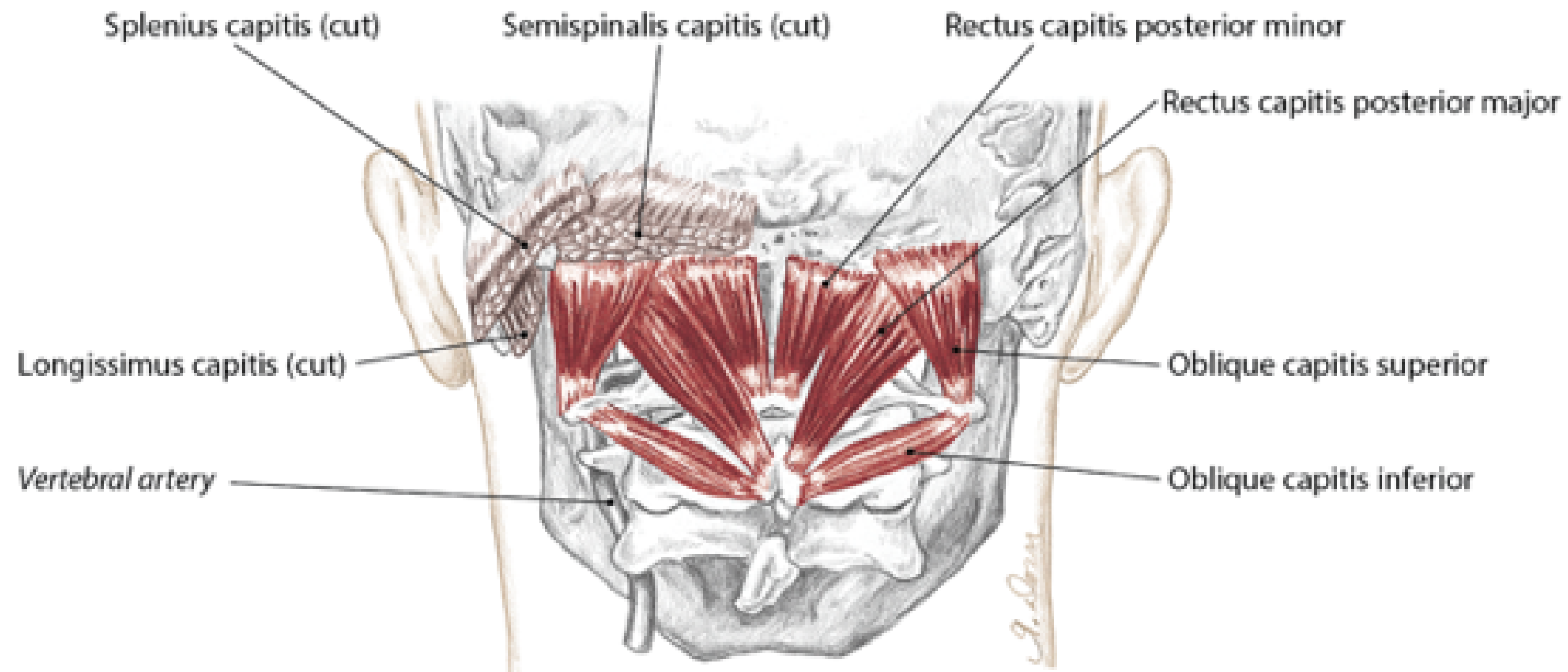


Muscle Layers of the Posterior Neck



4.54 Posterior view of upper back and neck showing superficial layer of spinal muscles

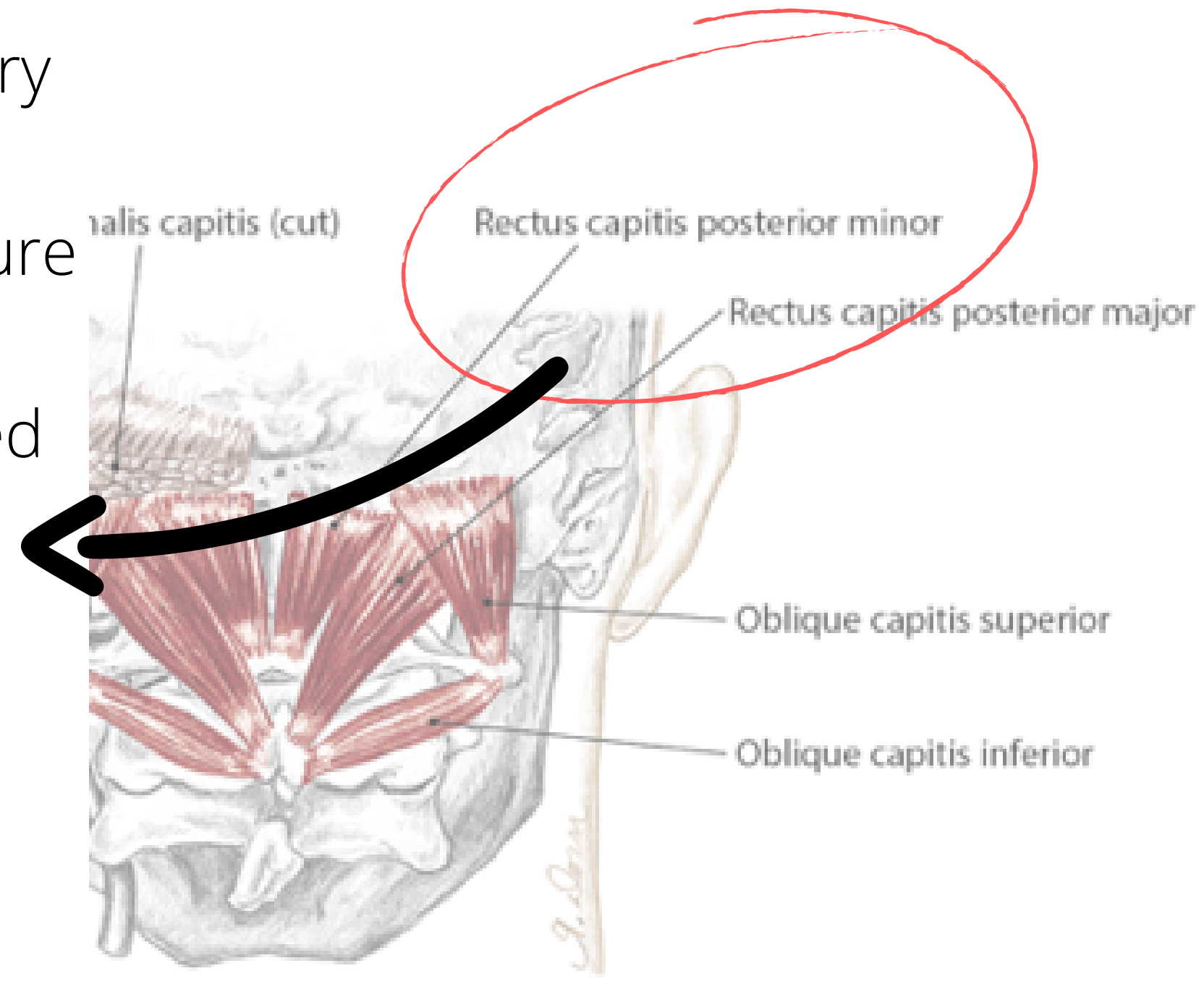
Muscle Layers of the Posterior Neck



4.56 Posterior view of upper neck showing deepest layer of spinal muscles

Muscle Layers of the Posterior Neck

- Has been found to have sensory properties
- Those with forward head posture most affected
- These muscles will be tensioned and inhibited.
- So what can we do?



4.56 Posterior view of upper neck showing deepest layer of spinal muscles

References

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Andrew Biel

Fascial or Muscle Stretching? A Narrative Review

Stecco et al. *Appl. Sci.* **2021**

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