Bridging the Gap for the PRI™ Science into the Fitness and Sports Industry

Introduction to Postural Restoration®

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Postural Restoration®

- PRI™ is a neurological based movement approach
- Taught by the Postural Restoration Institute® out of Lincoln, NE and was founded by Ron Hruska
- First certified class of PRI™ clinicians came out in 2004. To date there are just over 100 of us across the United States. If you visit the PRI™ website and click on "find a provider" you can hopefully locate one of us near you to connect with
- The science is bringing integrative information forward
  - Putting an up to date twist and organization for incorporating respiratory and neurological principles into treatment of postural kinematic movement dysfunction

HRUSKA CLINIC
Restorative Physical Therapy Services

www.posturalrestoration.com

Postural Restoration®

- PRI™ is 100% the application of our human anatomy and biomechanics
- It provides an objective framework to look at movement and various anatomical relationships
- It is a head-to-toe philosophy and engages the clinician to be aware of ascending and descending influences contributing to various postural adaptations and symptoms
- It is about neuromotor balance between the left and right halves of the body

Benefits of Treatment with Postural Restoration®

- Decrease pain and irritation
- Eliminate unwanted muscle tension
- Increase mobility and flexibility
- Improve spinal stabilization and core strength
- Improve movement patterns and motor control
- Improve athletic and movement efficiency
- Improve INTEGRATIVE system function
- Improve the ability to "REST"

"Effortless" Movement

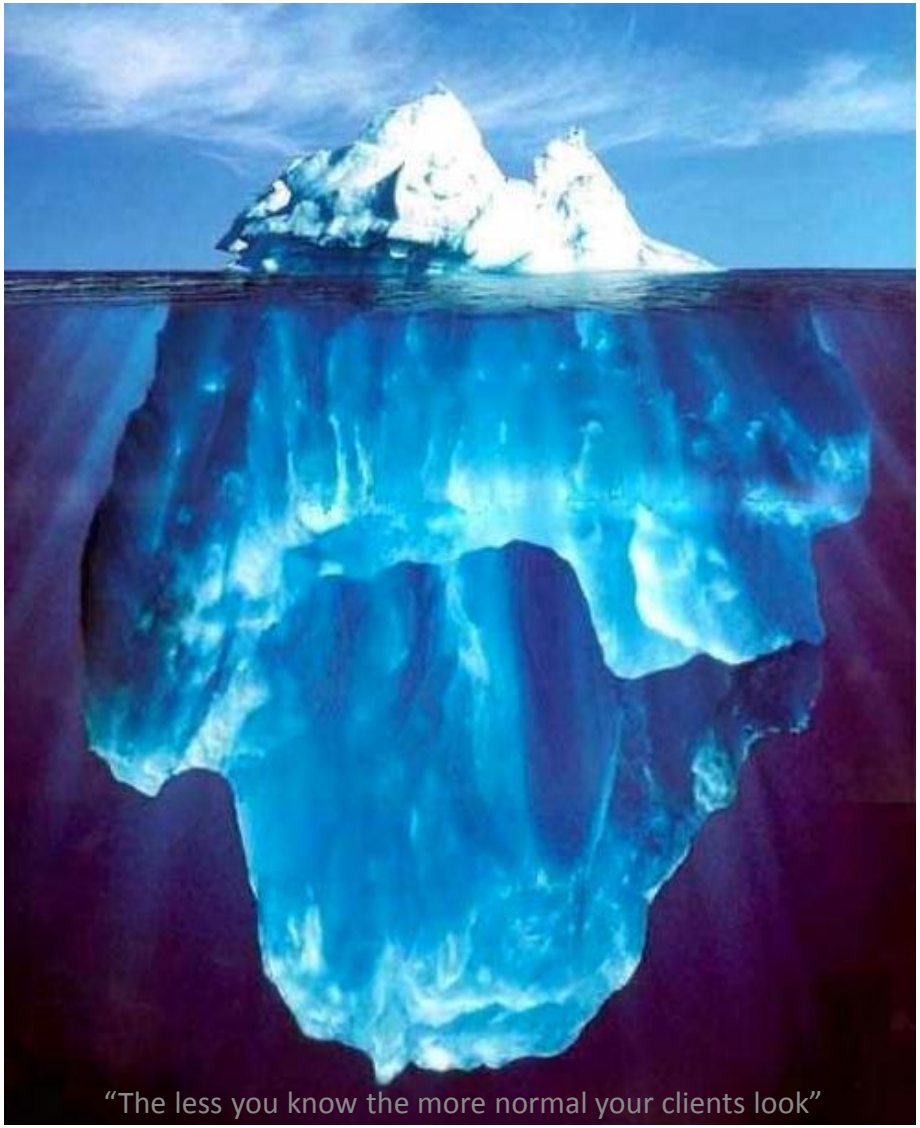
Postural Restoration®

- PRI teaches you to respect asymmetrical function, side dominance, and our internal asymmetrical design.
  - extremely valuable in helping to develop the “balanced athlete” and achieve the “neutral spine”
  - Everybody is dominate on one side of their body or the other. This dominance is often exaggerated by the jobs we do or the sports we play… We never use our bodies equally on each side.
    - undesirable asymmetrical activity when not balanced with contralateral or antagonistic overuse can create structural imbalances and nagging injuries
    - This theory can often explain how a person develops an insidious onset of pain only on one side or why a joint on one side wears out before the other

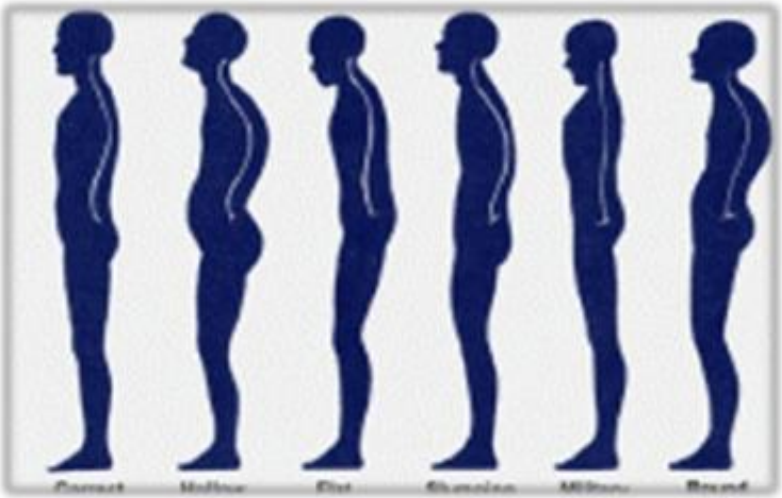
- Achieving symmetrical, neutral, or balanced function is not only beneficial for those involved in rehab or injury prevention, but also for those looking to enhance functional or athletic performance and create movement efficiency

Objective to keep the 2 halves of the body balanced with reciprocal and tri-planar function

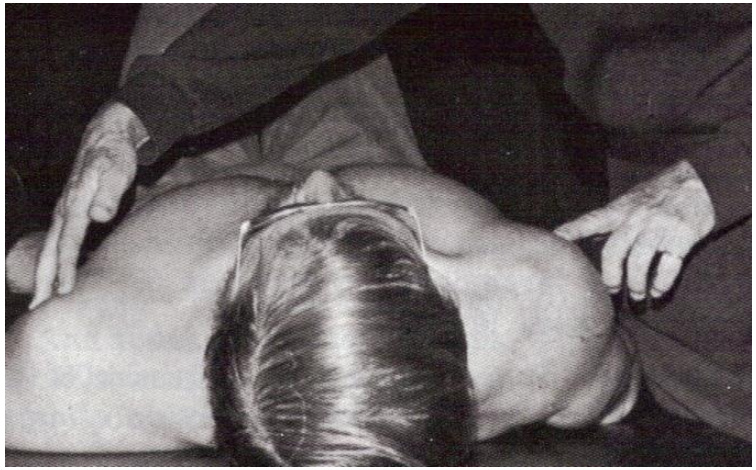
Keep it simple – keep it real

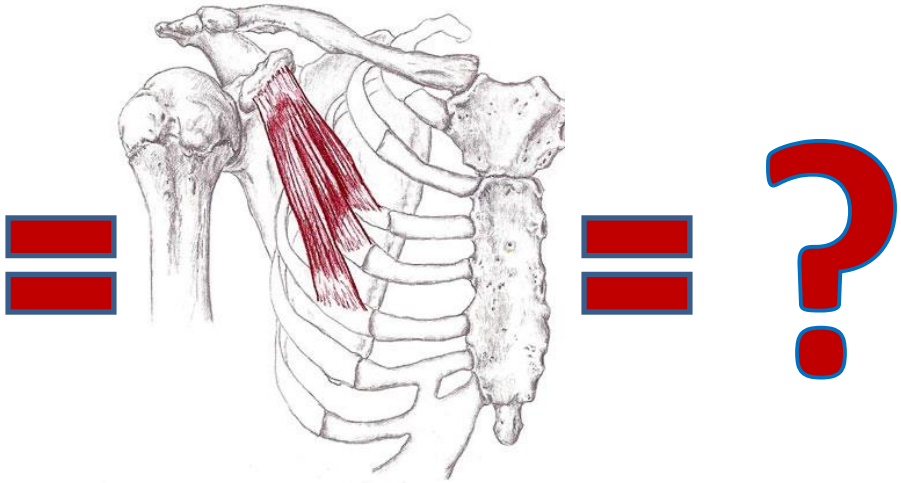


What is “good” posture?



- The conventional definition of good posture is the correct alignment of body parts supported by the right amount of muscle tension
- A poorly aligned body uses inappropriate muscle activity to function resulting in mechanically inefficient movement of the joints.





What is good posture?

Posture is something that is neuro-reflexively regulated and based on the brains control on many systems, its not just based off of length tension relationships of a musculoskeletal system.

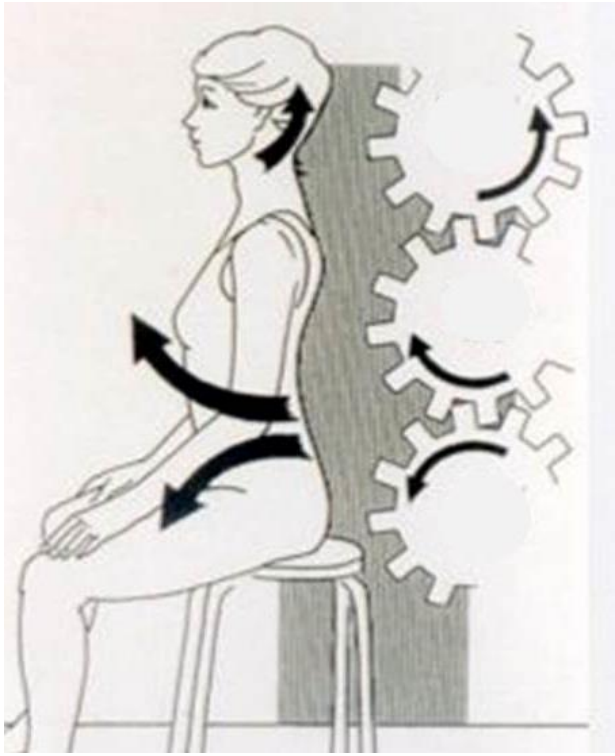
The regulation works like a system of gears throughout the axial skeleton.
Rotation of one section will affect the other sections.

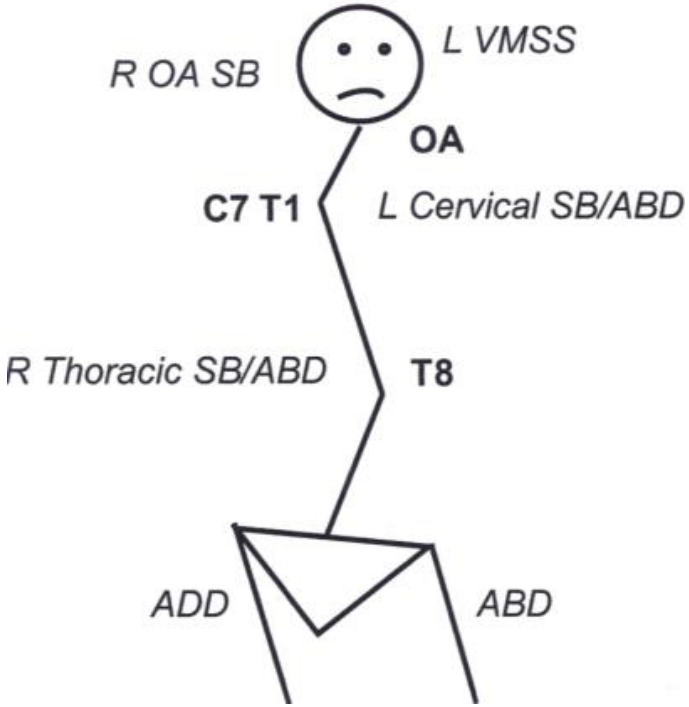
- Anterior tilt, lumbar extension
- Rib ER and thoracic extension
- Cervical curve flattens out, OA flexion
- Hyperinflated

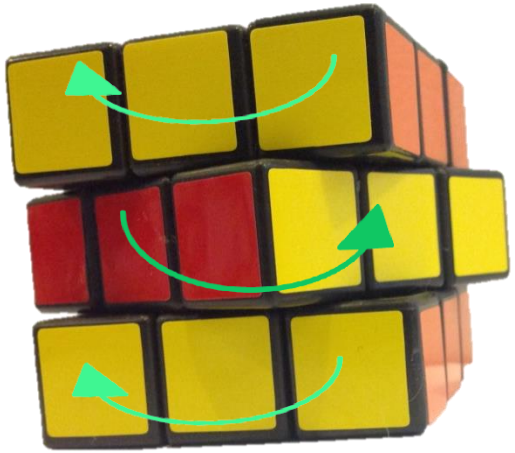
- Posterior tilt, lumbar flexion
- Rib IR and thoracic flexion
- Cervical lordosis, OA extension
- Exhalation

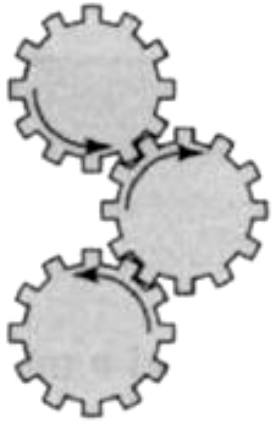
What is good posture?

Neuro-reflexively balancing Tri-planar relationships
(notice adjacent segment move in opposite direction)

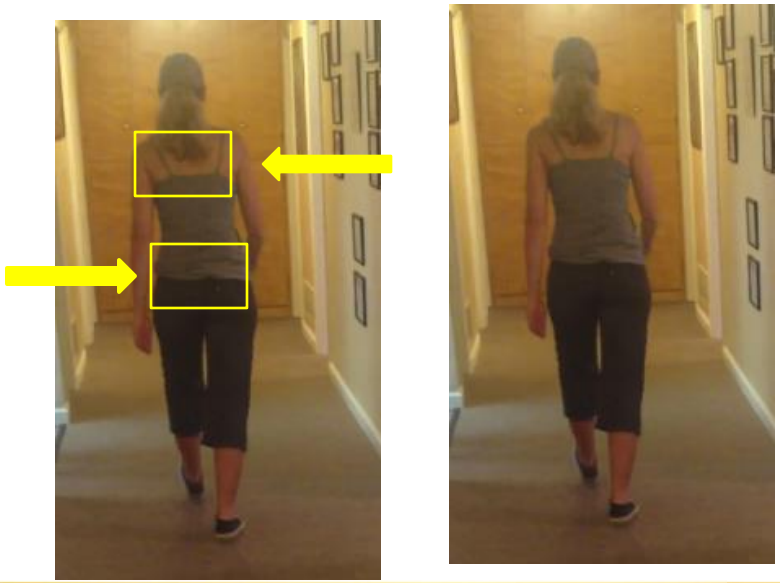








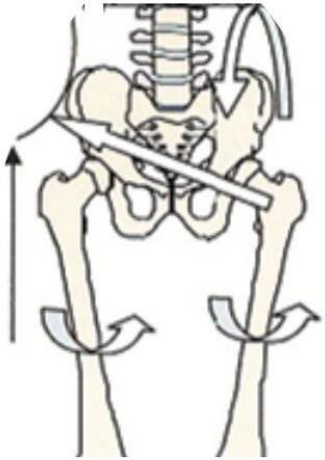
Our bodies are constantly balancing anatomical relationships.

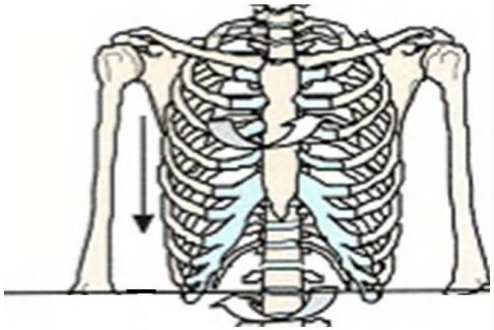


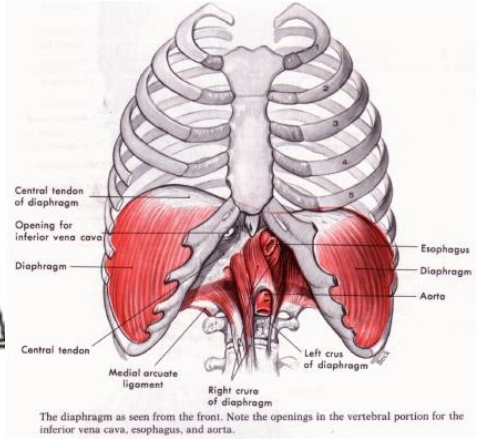
Framework for looking at posture and movement

- Where is the pelvis?
- Where is the ribcage?
- Where is the head and neck?
- How does right half match up with left?

PRI™ introductory courses
Myokinematic & Pelvis Restoration
Postural Respiration



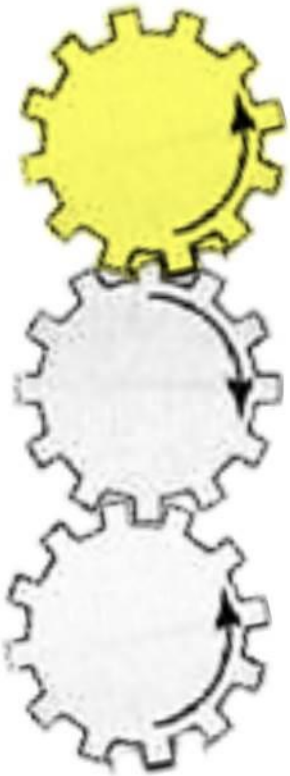


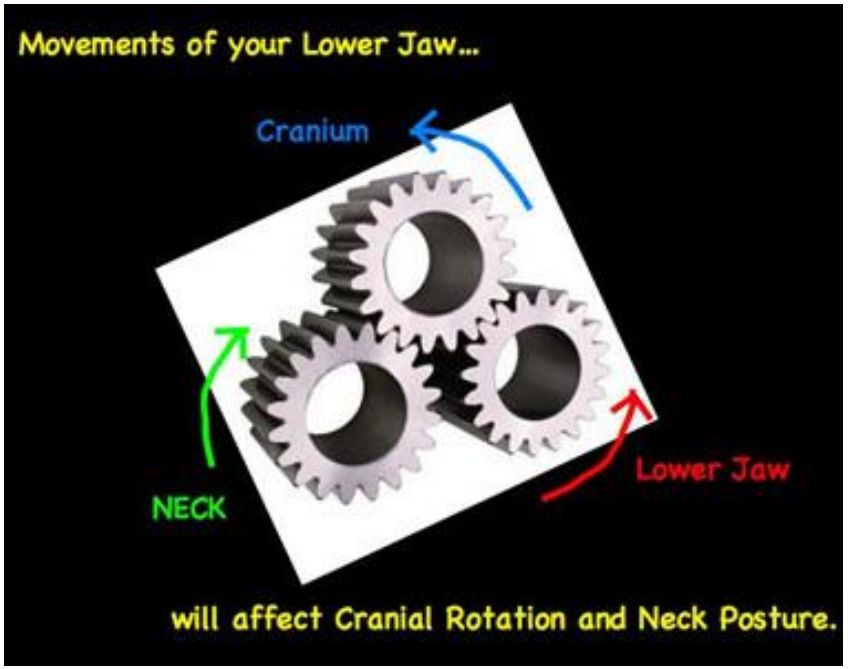


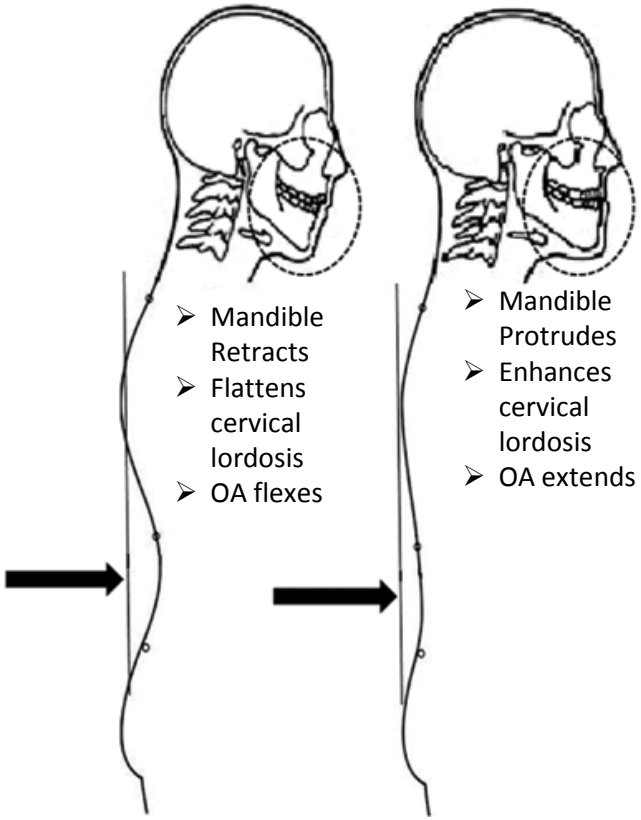
The diaphragm as seen from the front. Note the openings in the vertebral portion for the inferior vena cava, esophagus, and aorta.

- Patterned LPHC dysfunction
  - Myokin – discusses more AF/FA relationships
  - Pelvis Restoration – discusses more pelvic outlet/inlet relationships
- Patterned thoraco-abdominal dysfunction
  - Postural Respiration

PRI™ secondary course
Cervical-Cranio-Mandibular Restoration







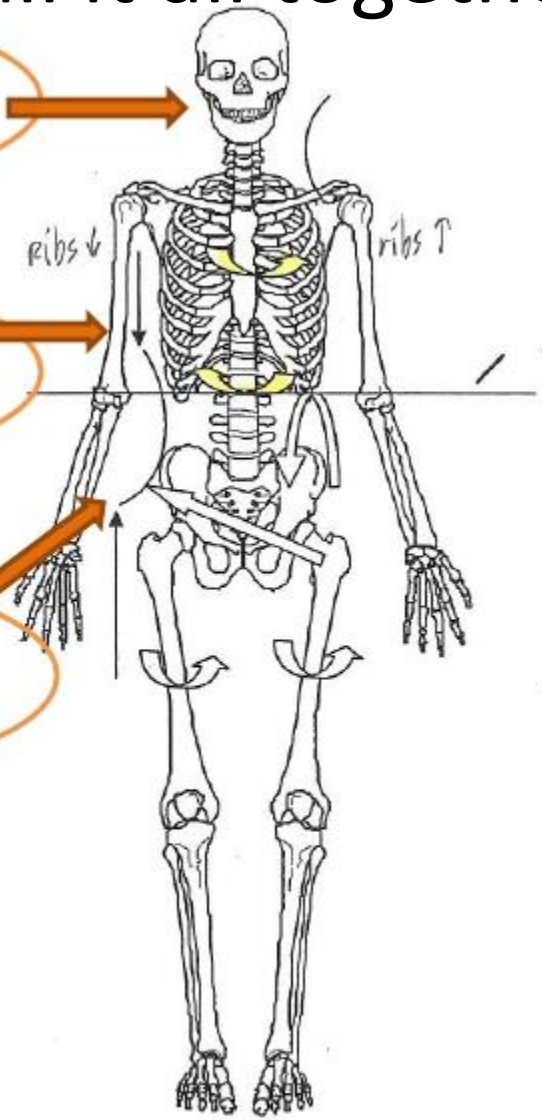
This course explains why sometimes we have to work with dental specialists

PRI™ secondary courses
Pull it all together

Patterned temporomandibular and cervical dysfunction

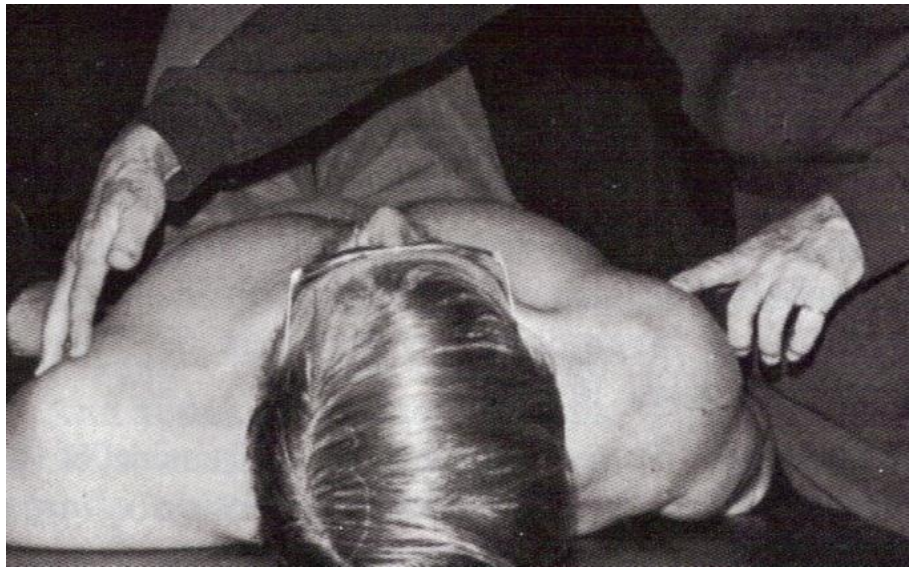
Patterned thoraco-abdominal pathomechanics

Patterned lumbo-pelvic-femoral pathomechanics



1. **Learn how to objectively identify the patterned pathomechanics**
2. **Reposition** and **Restore** symmetry
3. **Retrain** and get **RECIPROCAL** movement back to keep the right and left side of the body balanced.

Its all a matter of perspective…



- There may be a lateralization pattern affecting pelvic and rib cage balance, therefore contributing to a respiratory imbalance that locks up a ribcage and ribcage is no longer moving reciprocally.
  - Thoraco-shoulder muscles adapt around a ribcage that's imbalanced.
- This could be a pelvis orienting to the right, causing a thoracic cage to be orienting to the left. These ribs could be stuck in ER on a hyperinflated left side & stuck in IR on the deflated right side
  - due to insufficient respiratory activity from a left diaphragm
- This thorax could have lost its reciprocal movement needed to breath without compensation.
- Need to do PRI objective tests to find out

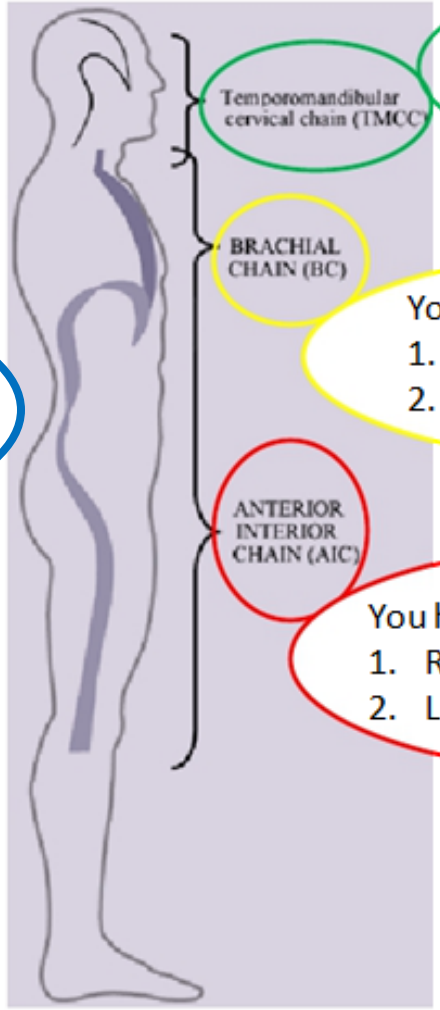
Postural Restoration®

- Balancing "Three S bones" - that is the sacrum, the sternum, and sphenoid.
- These three S bones are interdependent and their balanced function is extremely powerful in regulating multiple systems of the human body.
- Around each of the three S bones are paired bones
  - the innominate or coxal bones
  - the scapula
  - and the temporal bones
- Each S bone forms an integrated complex that is ring shaped and interconnected via polyarticular chains of muscle
  - the pelvic girdle, the thorax cage and shoulder girdle, and cranium.
  - These complexes regulate and influence one another, meaning abnormal movement or lack of movement on one side of the complexes will influence balance on one side in the other two.

This viewpoint presents a new twist on balancing postural integrity and kinetic chain relationships

PRI™ polyarticular chains of muscle

You have 2 PEC chains in your body
1. Right PEC
2. Left PEC



You have 2 TMCC chains in your body
1. Right TMCC
2. Left TMCC

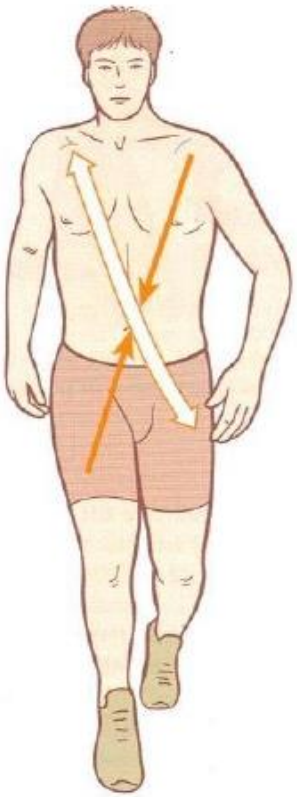
You have 2 BC chains in your body
1. Right BC
2. Left BC

You have 2 AIC chains in your body
1. Right AIC
2. Left AIC

PRI™ polyarticular chains of muscle

Ron Hruska has defined 4 paired chains that affect movement and control of the axial skeleton (i.e. that gear system)

- Reciprocal balance of these chains are needed for healthy respiration and reciprocal gait
- Through the PRI objective tests, we can tell when one chain is more active than its mate. When this occurs it causes undesirable rotational patterns to act on the axial skeleton.
  - Through the repetitive overuse of one chain, postural habits, and side dominance a biomechanical adaption pattern develops.
    - Movement will become limited in functional patterns
    - Posture will adapt, form and function around the limited functional pattern.
    - Leads to various compensatory strategies, degeneration, inefficient movement
  - The axial skeleton changes position and there is an asymmetrical pattern of muscle pull that is acting across the axial skeleton. Now the postural orientation, range of motion of joint availability, and the resting position of one half of the body, does not match the resting position of the other.
- Once we determine the axial skeleton is locked up, we categorize the client into a pattern named by the overactive chain involvement.
  - Ex. A Left AIC is a client with a overactive left AIC chain (orienting into right stance)



The AIC chain works with opposite BC chain, for contralateral global patterns (i.e. gait)
Pelvis goes one way, thorax goes the other

PRI™ polyarticular chains of muscle

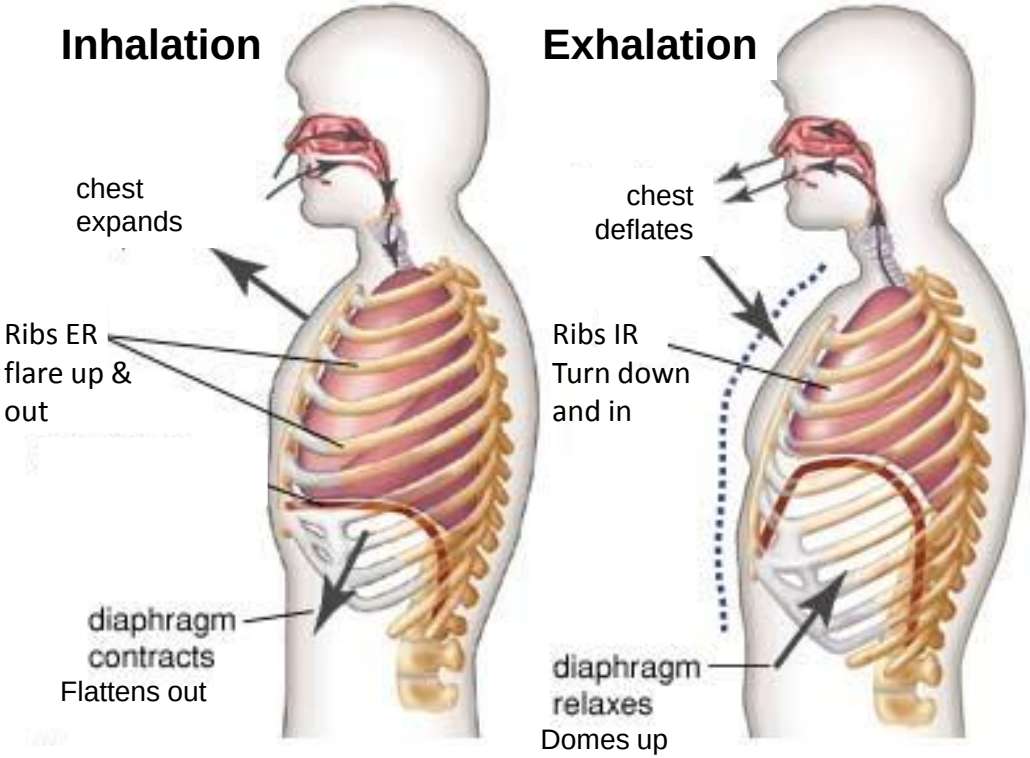
Anterior Interior Chain (AIC)
Muscles: Diaphragm, Psoas, Iliacus, TFL, Vastus Lateralis, Biceps Femoris
Opposition Muscles: Hamstrings, Gluteals, Internal Obliques

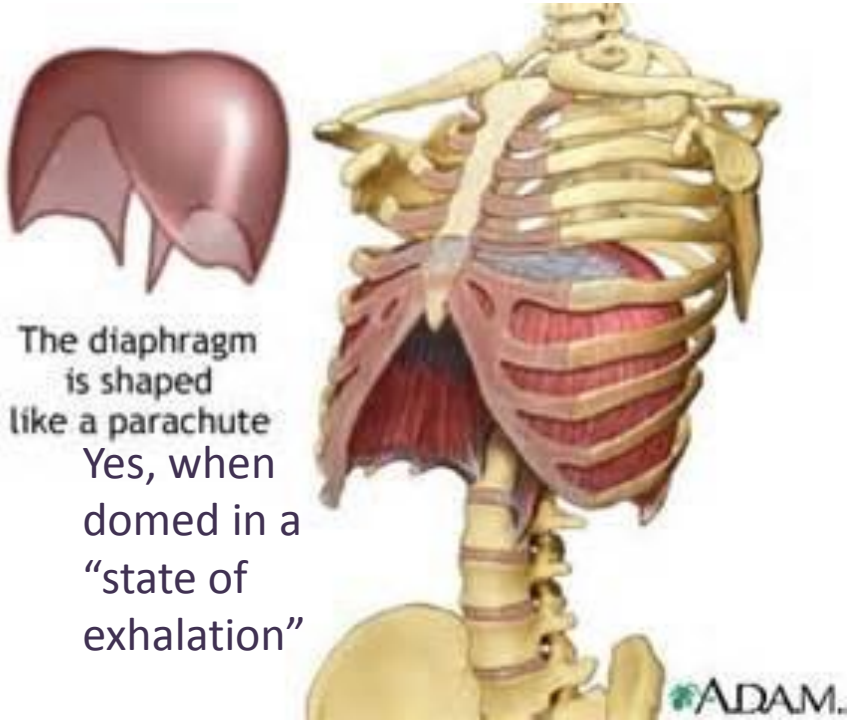
Posterior Exterior Chain (PEC)
Muscles: Latissimus Dorsum, Quadratus Lumborum, Posterior Intercostals, Serratus Posterior, Iliocostalis Lumborum
Opposition Muscles: Abdominal Obliques (ZOA & respiratory diaphragm)
Note: A PEC chain is active with an AIC.

Brachial Chain (BC)
Muscles: Anterior-Lateral Intercostals, Deltoid-Pectoral, Sibson's Fascia, Triangularis Sterni, Sternocleidomastoid, Scaleni, Diaphragm
Opposition Muscles: Triceps, Lower Trapezius, Abdominal Obliques

Temporomandibular Cervical Chain (TMCC)
Muscles: Temporalis (ant. fiber), Masseter, Medial Pterygoid, Rectus Capitis Posterior Major, Obliquus Capitis, Rectus Capitis Anterior, Longus Capitis, Longus Colli
Opposition Muscles: Levator Scapula, Lower Trapezius, Anterior Cranial Cervical Muscle (Rectus Capitis Anterior, Rectus Capitis Lateralis, Logus Capitis, Stylohyoid, Styloglossus, Stylopharyngeus), Mandibular Cervical Muscle (Glossus, Digastrics), Lateral Pterygoids

The Big D

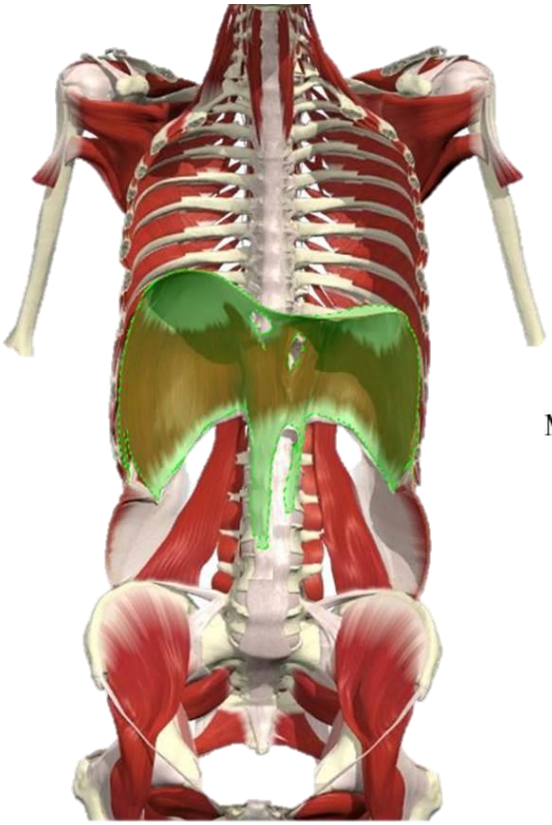


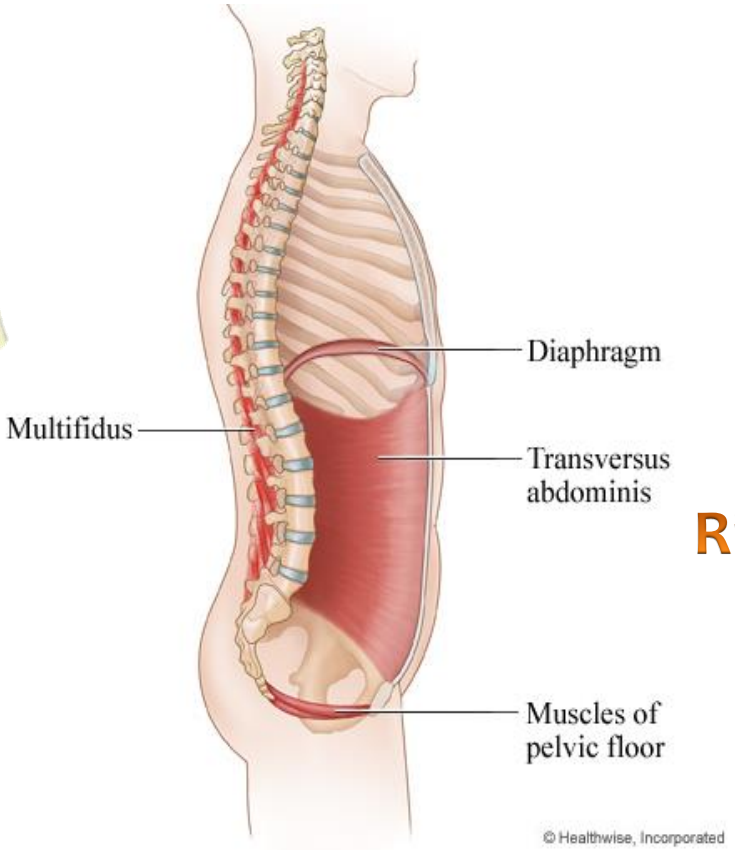


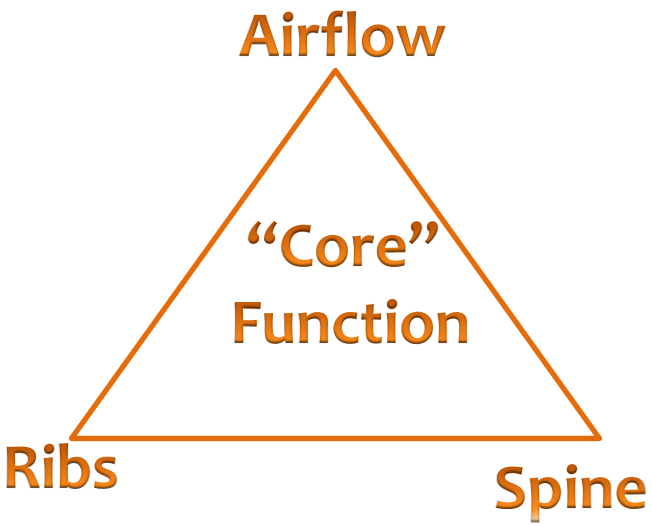
Yes, when domed in a "state of exhalation"

The Big D

- Diaphragm is the “spine director” and often driving postural imbalances
- The diaphragm is one of your main core muscles
- Abdominals control diaphragmatic tension, orientation, and position
- Key components of “core” function is the integration of spine position, rib position, and airflow

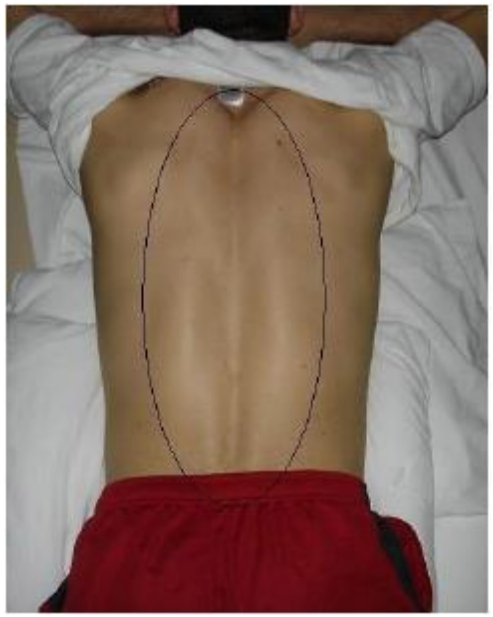


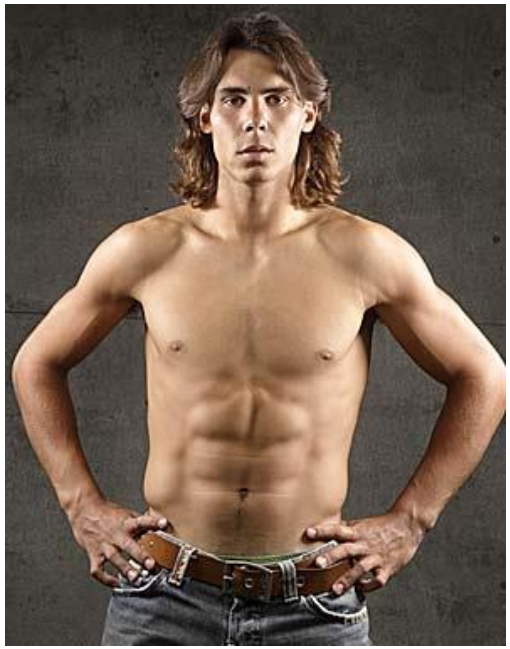


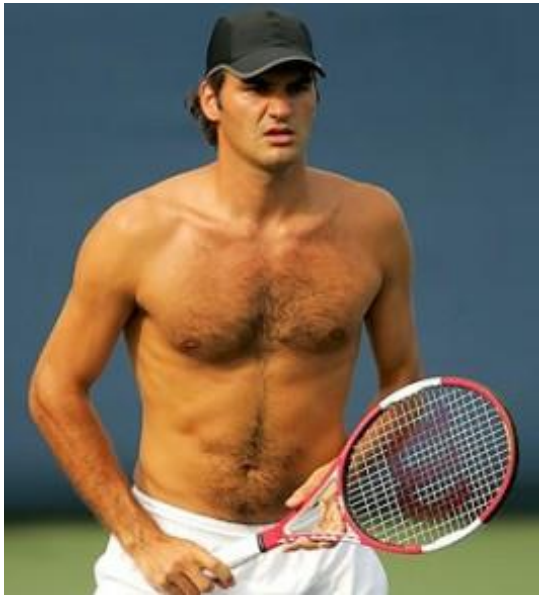


Gotta keep core function dynamic

Otherwise will get locked up in the Sagittal plane







Diaphragm is the spine director

- Because of its interconnection via polyarticular chains of muscle that link the upper and lower extremities together and its attachments to spine and ribcage

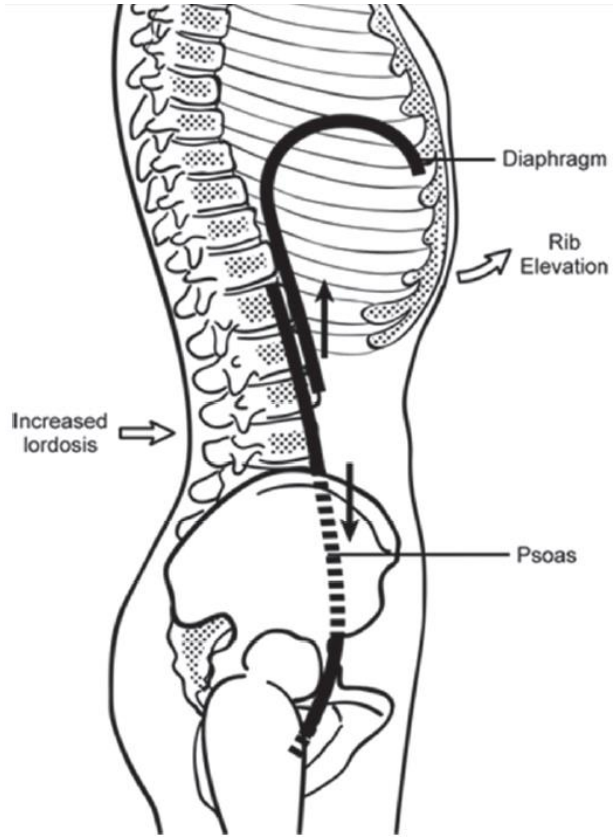


Figure 1. ***Sagittal view of the Diaphragm.*** *Note the psoas pull on the spine contributing to increased lordosis and faulty rib position. Copyright © Kyndall Boyle, 2007*

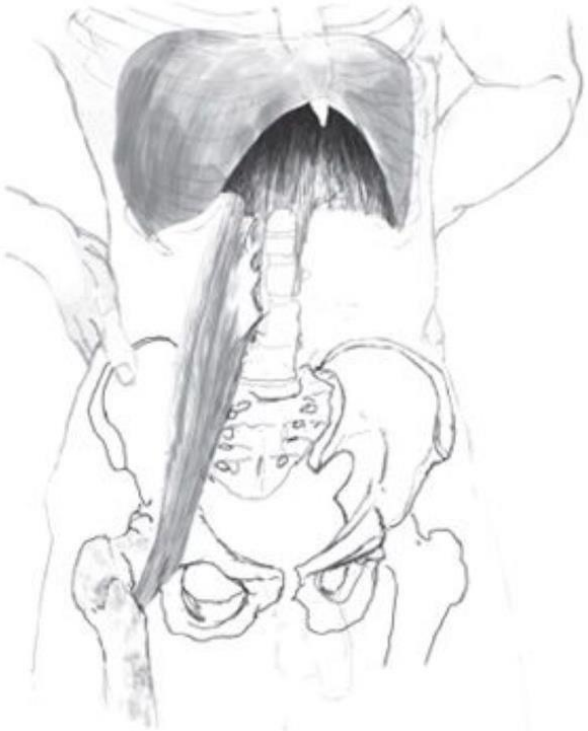
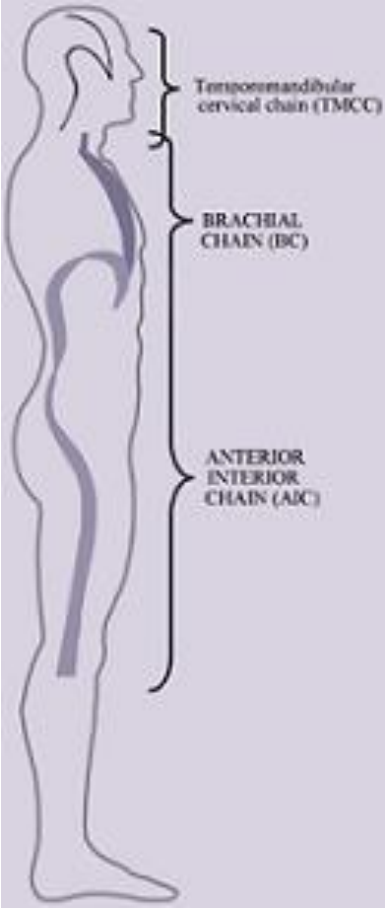


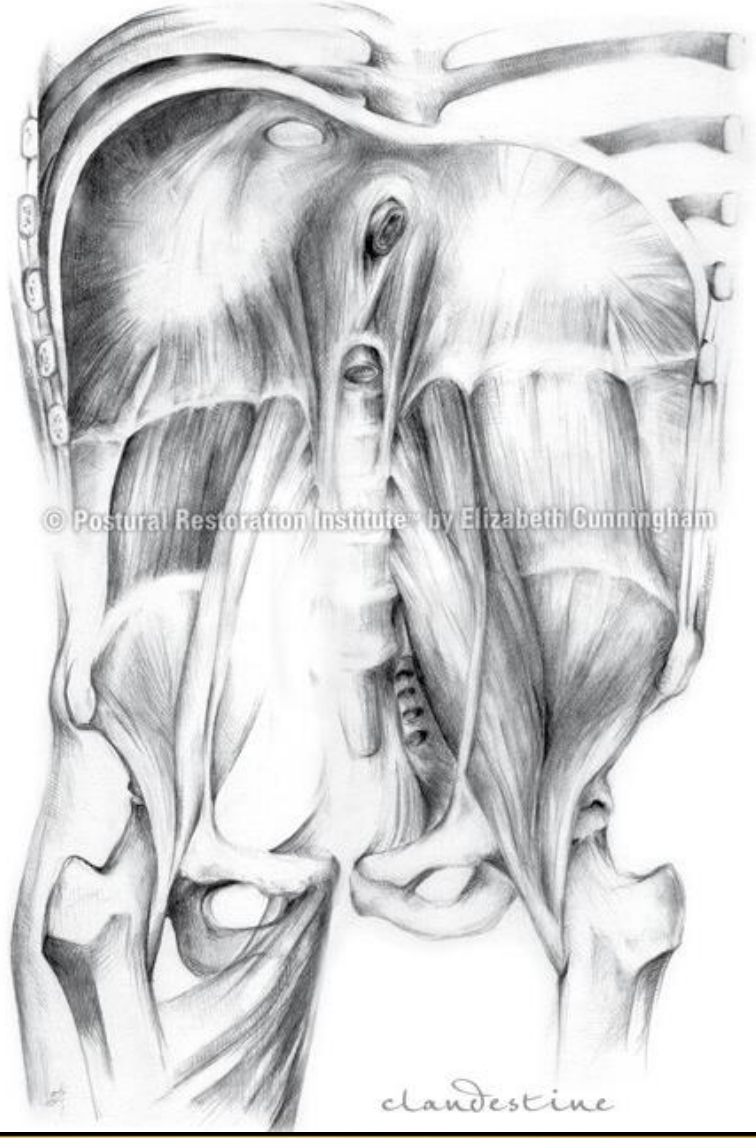
Fig. 9.1. The fascia of the crura of the diaphragm blends into the upper fibers of the psoas. This "suspender muscle" is the only muscle that directly connects your legs to your spine.

Picture from book by Mary Bond

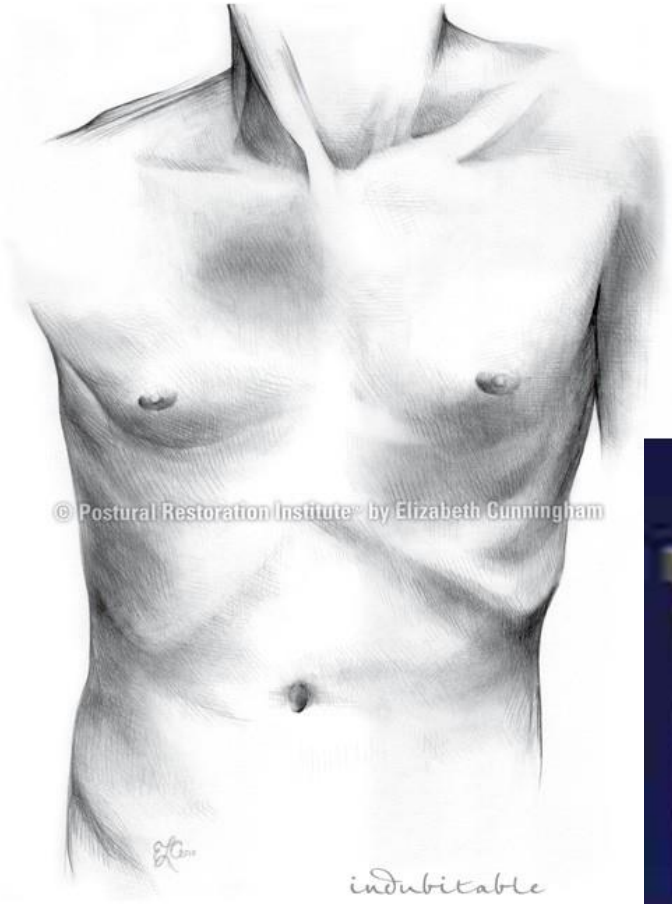


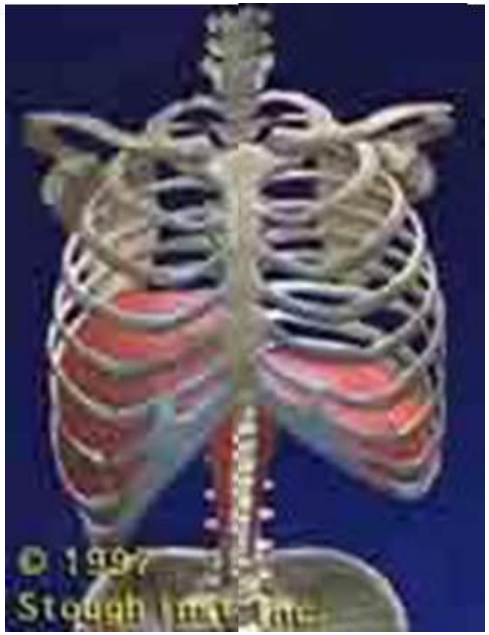
Postural Restoration®

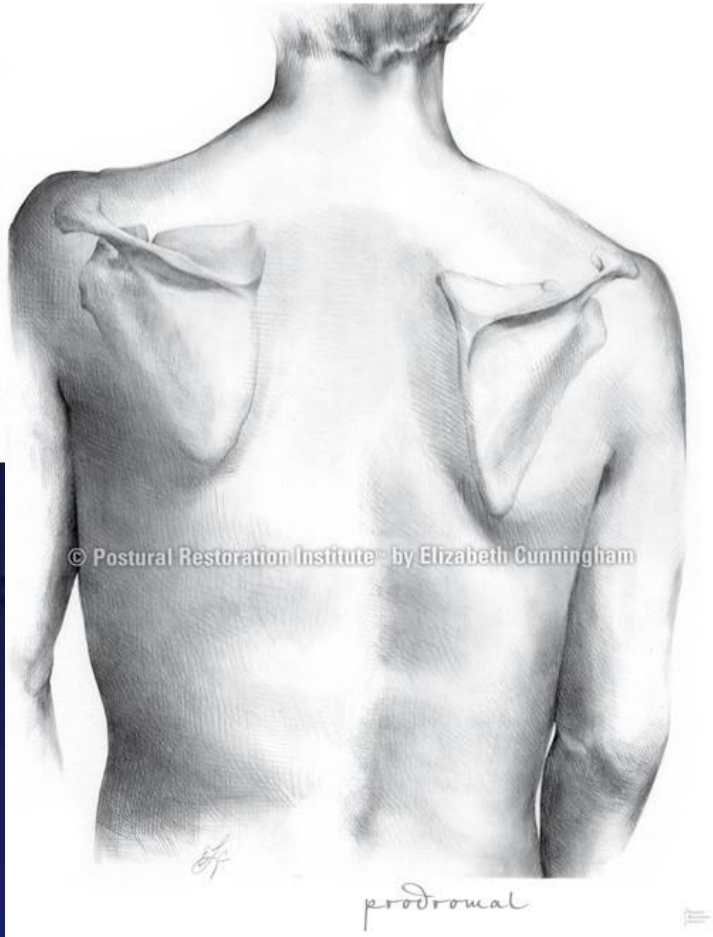
- 2 halves of the diaphragm are NOT the same
  - Right diaphragm
    - is stronger, larger & longer central tendon (attaching lower on L spine)
    - Better positioned for respiration and domes easier because of location of the liver
    - Easier to achieve a ZOA on the right, so goes into lengthened state to relax better
    - Right diaphragm fills left chest wall with air. Airflow moves easier into the left half of the rib cage, so we often see left side of rib cage more hyperinflated than right
  - Left diaphragm
    - Smaller, less muscle mass
    - Has a disadvantage and flattens out more because of the heart above it
    - More biomechanically challenged to achieve a ZOA, so often in a tonic flattened state
    - Left diaphragm fills right chest wall with air. Airflow restrictions often found restricted into right half of rib cage.



What we really see in real life is not perfect “egg” symmetry and a ribcage that has lost its reciprocal balance



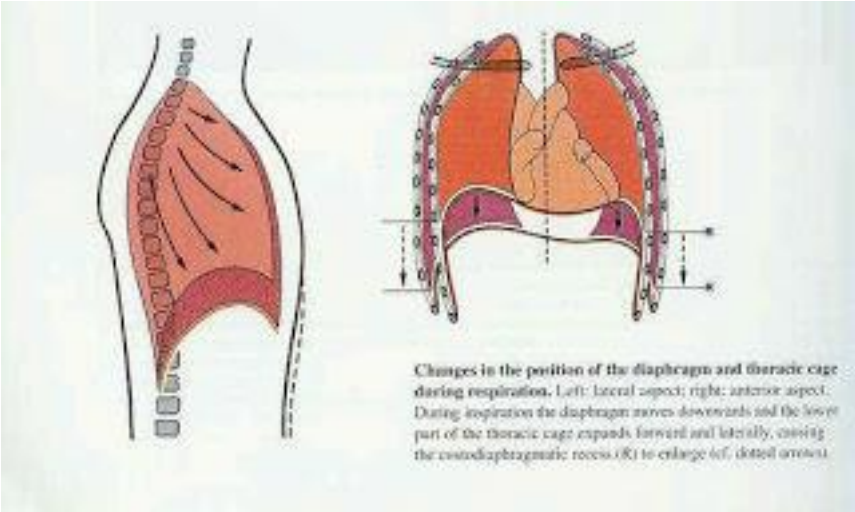


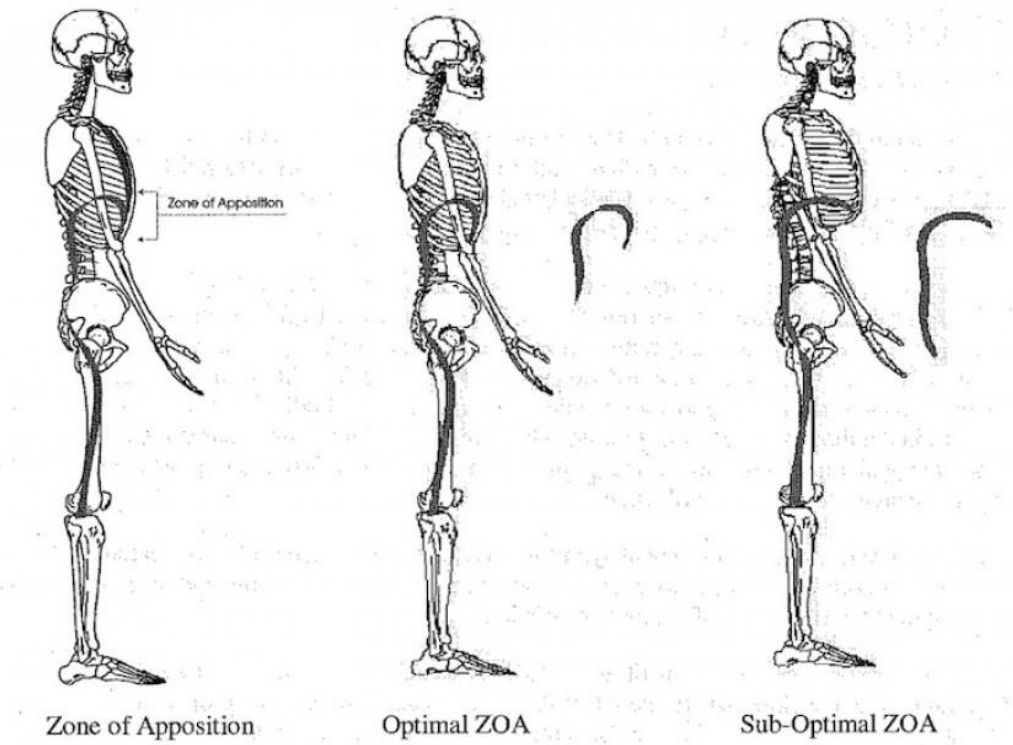


We see ribcages stuck in hyperinflation.
Ribcages that have lost their pliability and mobility to deflate and move in the frontal and transverse plane

Neither side has ZOA
Both sides stuck elevated and stuck in ER

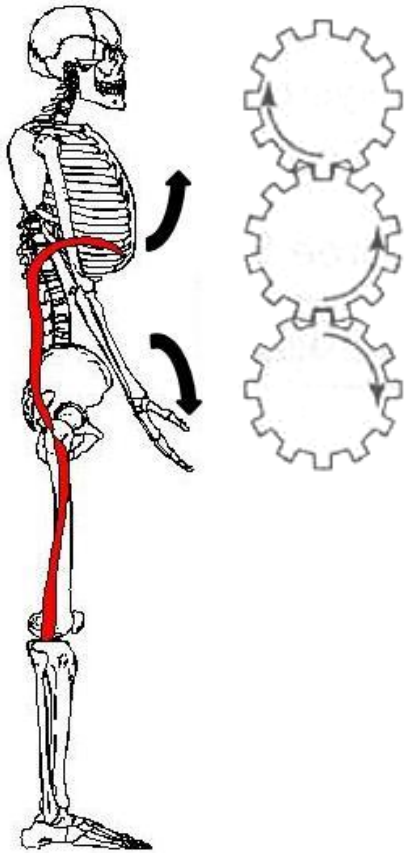
Zone of Apposition



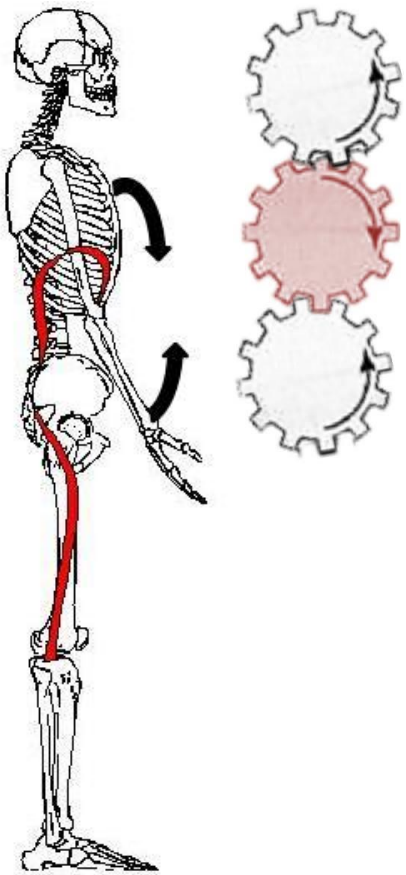


- The ZOA is the zone of healthy diaphragm movement a thorax should have the capacity to move through.
  - When you inhale, the diaphragm contracts the fibers shorten to flatten out or descend a diaphragm.
  - When you exhale, the diaphragm lengthens to ascend and dome up inside of a thorax cage.
  - So as you exhale, your rib cage and spine should have the available motion to move downward so the diaphragm can dome up inside.
- When the ribs lose the ability to move in and out of the ZOA and the ribs lose the ability to reciprocally move and rotate, and your spine loses its ability to flex and rotate.
- So the assessment of the how the ribcage moves as unit and how the ribcage moves in and out of inhalation and exhalation is important for flexion and rotation based exercises.
- ZOA is T8 to L1. (Domes up to T8 level if flexibility is in ribcage and back)

Zone of Apposition



Suboptimal ZOA
Forward pelvic tilt
and elevated ribcage

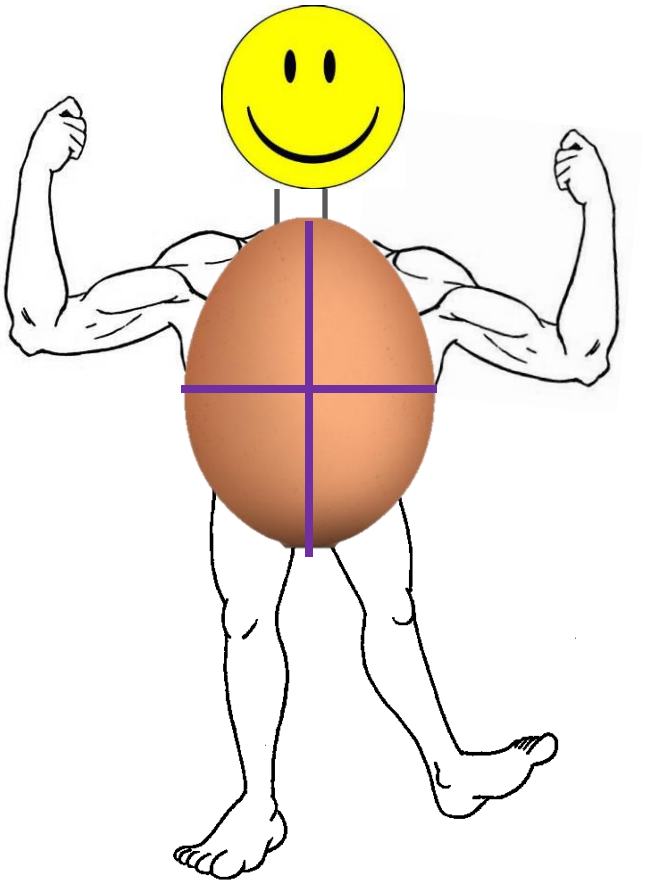


Optimal ZOA
Neutral pelvic tilt and
neutral ribcage

- Properly positioned diaphragm with an optimal ZOA allows the spine and ribcage to stack in a better "neutral" pattern
- Suboptimal or flattened ZOA lifts the ribcage up and encourages a hyperinflated spinal pattern
  - more torque and compression at CT, TL and LS junctions

Neutrality

Goal to get the “egg” neutral and balanced with reciprocal function.



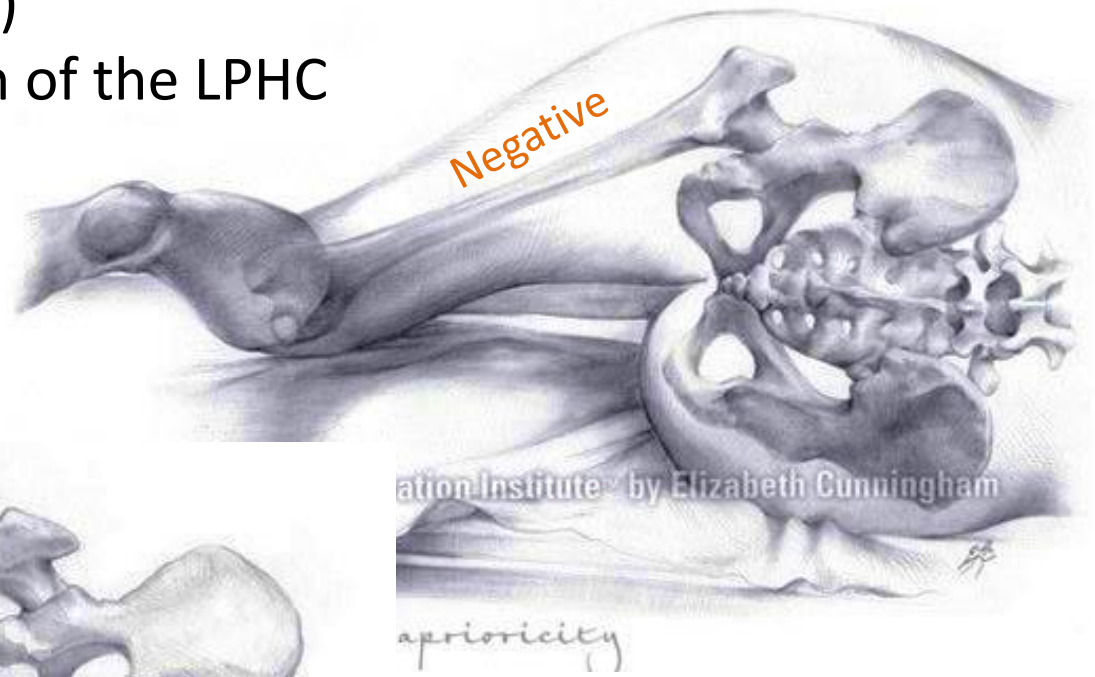
Neutrality is our way of objectively communicating about balance, rest, and reciprocal function of the “three S bones” and the 2 halves of the body.

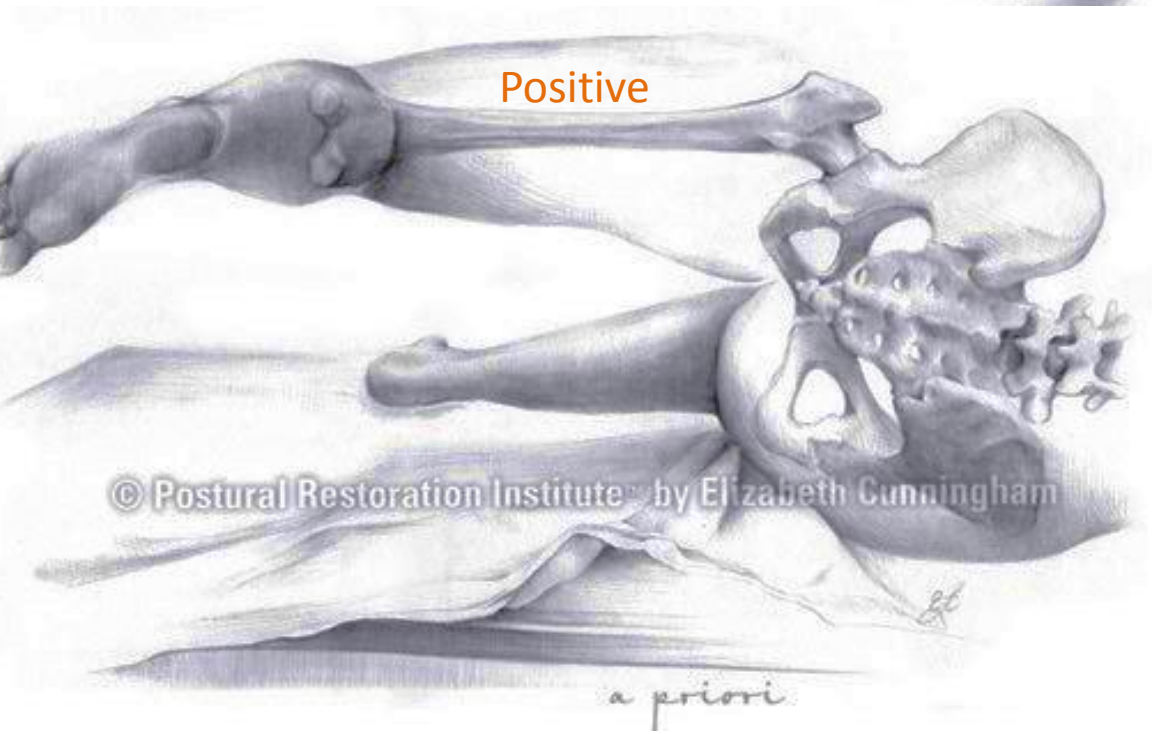
- The tests we do in PRI™ are used to assess triplanar position of the body, and to determine if there is any soft tissue/bony pathology as a result of compensation.
- With respect for integrative function and kinetic relationships, we want to understand how the underlying position and limited patterns within the axial skeleton may be contributing to the pathomechanics or impaired movement patterns.
- The state of neutrality helps us communicate about tone, muscle balance, and improved joint position.
- Most importantly, neutrality objectively gives us a way to determine when there is neuromotor balance between the right and left sides of the body

Adduction drop test

(modified Obers)

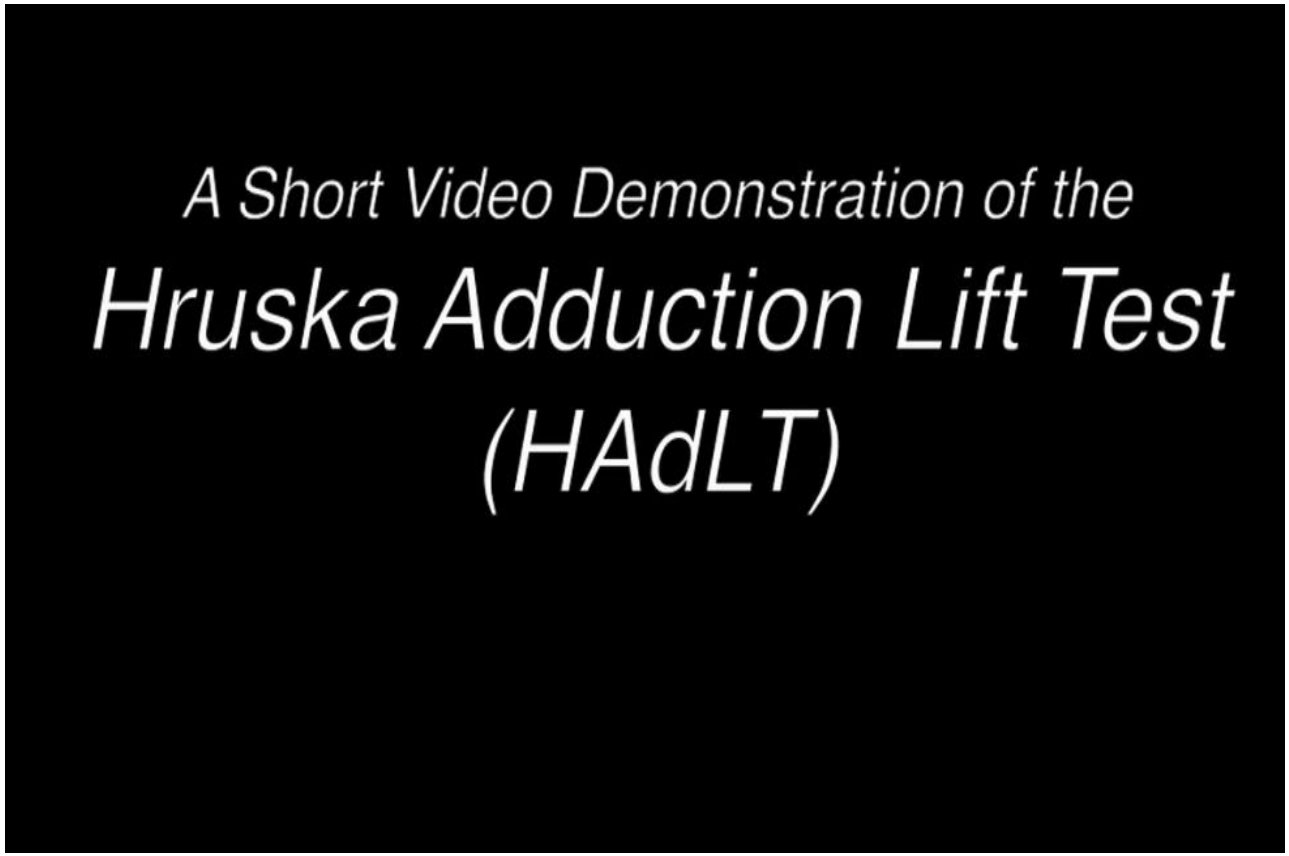
Assess frontal plane position of the LPHC





Hruska Adduction Lift test

(Assessing frontal plane kinematic organization)

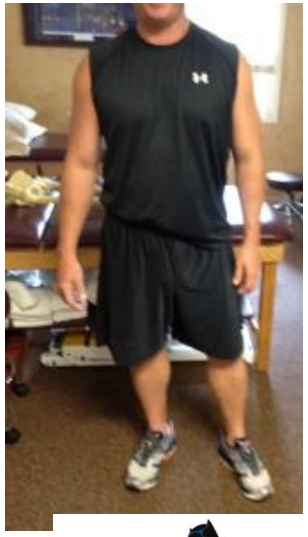


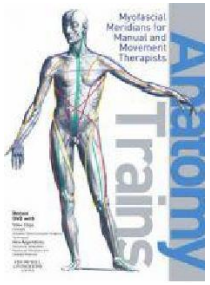
Courtesy of Mike Cantrell, PT, PRC
The Cantrell Center
Warner Robins, GA

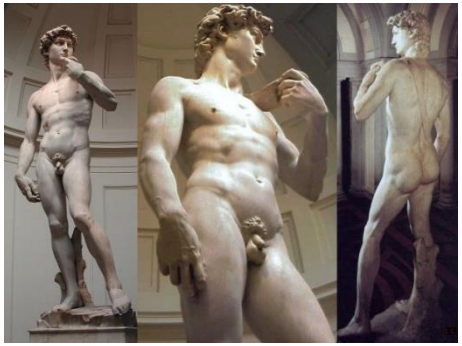
Mike's article is available on PRI™ website: "Refining your ability to execute an accurate Hruska adduction lift test"

Postural Restoration®

- What does a right stance posture look like?
  - Center of gravity shifts pelvis to right of midline
    - Because of how left AIC pulls left half of pelvic girdle ahead of the right (to orient sacrum right)
  - Counter back left rotation at the thorax (left arm in front of right)
    - Right diaphragm fills up left chest wall







- PRI™ has a place in function and sport specific conditioning because it teaches a systematic way to attack and maximize triplanar movement and neuromuscular balance for athletes to move more efficiently.
  - Besides incorporating PRI into an athlete's rehab program, we can apply PRI™ principles into team prehab and warm up drills
    - help organize and promote symmetrical form and function of proximal muscle groups before practice or intense workouts
  - Evaluate the training routines you are designing – most sports have a pelvis going one way, while a thorax goes the other.
    - Sagittal plane strength moves like squat, clean & jerk, or bench are not going to prepare or help athletes maximize reciprocal relationships and transverse kinetic activity.
  - Great adjunct in post workout recovery and cool down routines.
    - So you can help an athlete/client achieve a better "rest" position

What is the best way to learn PRI™?

- Attend a LIVE course.
- Its really important to understand each PRI™ course builds off of the others - no one course is exclusive to introduce how to use the system.
- The Respiration course is probably one of the most important courses to attend, because it's the course that talks about the ribcage and diaphragm the most and it introduces some of the main manual techniques we use to keep a thorax mobile for healthy reciprocal movement.
- I recommend planning to attend at least 3 courses - 2 introductory courses and one secondary course to wrap your head around the material. Then plan to learn and study on your own - practice the tests regularly on various body types and always remember objective measures drive intervention choices.
- Home study courses also available
- Affiliate courses coming soon
- Connect with a PRC/PRT in your area
- Also visit the PRI™ and Hruska Clinic website
  - Blogs, recent emails, resources
  - CDs/DVDs
- Be open to be challenged and have paradigm shifts

Introductory Courses

The following courses are without pre-requisite and can be attended in any order.

- Myokinematic Restoration
- Pelvis Restoration
- Postural Respiration

Secondary Courses

The following courses require prior attendance of one or more Introductory Courses.

- Cervical-Cranio-Mandibular Restoration
- Impingement & Instability
- Advanced Integration

Home Study Courses

The following introductory courses are offered on DVD for home study. They can be taken to fulfill PRC or PRT requirements.

- Myokinematic Restoration (Home Study)
- Postural Respiration (Home Study)
- Pelvis Restoration (Home Study)

Annual Symposium

Each year this symposium will cover a different topic or topics of interest.

- Interdisciplinary Integration

Connect with us on Facebook

My passion is to help get the word out and bridge the gap between the science and clinical application

Everything in this presentation is based on my extensive training with PRI™ along with other methodologies and the clinical application I see for the sports and fitness industry

I am a translator of the PRI™ material presented and my opinions do not necessarily represent that of Ron Hruska, PRI™, or every PRC/PRT out there.

You can contact me directly at julie@integrativecoredynamics.com

Please visit www.posturalrestoration.com to learn more about PRI™

THANK YOU!