

Introduction to  
Postural Restoration®



Jennifer Platt, DPT, ATC, PRC  
Executive Director and  
Director of Education & Credentialing

- The Postural Restoration Institute® (PRI), located in Lincoln, NE, was established in 2000 by Ron Hruska, to explore and explain the science of postural adaptations, asymmetrical patterns and the influence of polyarticular chains of muscles on the human body.
- PRI's mission is based on the development of an innovative treatment approach that addresses the primary contributions of postural kinematic movement dysfunction.

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- The human body is not symmetrical. The neurological, respiratory, circulatory, muscular and vision systems are not the same on the left side of the body as they are on the right, and vice versa.
- They have different responsibilities, function, position and demands on them. This system asymmetry is a good thing and an amazing design.

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- The human body is balanced through the integration of system imbalances. The torso, for example, is balanced with a liver on the right and a heart on the left. Extremity dominance is balanced through reciprocal function; i.e. left arm moves with right leg and vice versa.
- PRI credentialed providers recognize these imbalances and typical patterns associated with system disuse or weakness that develops because of dominant overuse.

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- When these normal imbalances are not regulated by reciprocal function during walking, breathing or turning, a strong pattern emerges creating structural weaknesses, instabilities, and musculo-skeletal pain syndromes.

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What is posture?

Defined by Ron Hruska, MPA, PT

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- Posture is the reflection of patterned airflow.
- Airflow is a reflection of the “position” of many systems that are regulated, determined and created through limited functional patterns. These patterns reflect our ability and inability to breathe, rotate and rest symmetrically.

Polyarticular Muscle Chains

A muscular chain is a set of polyarticular muscles that follow each other and overlap in the same direction with no break in continuity.  
- Francoise Mezieres



**Anterior Interior Chain (AIC)**  
*Diaphragm, Psoas, Iliacus, TFL, Vastus Lateralis, Biceps Femoris*

AIC

- There are 2 anterior interior polyarticular muscular chains that have a significant influence on respiration, rotation of the trunk, rib cage, spine and lower extremities
- Composed of muscles that attach to the costal cartilage and bone of rib 7-12 to the lateral patella, head of the fibula and lateral condyle of the tibia
- One is on the left side of the interior thoraco-abdominal-pelvic cavity and one is on the right
- Muscles include the diaphragm and the psoas
- This chain provides the support and anchor for abdominal counter force, trunk rotation and flexion movement

**OPTIMAL POSITION**



**SUB-OPTIMAL POSITION**



Brachial Chain (BC)

*Anterior-Lateral Intercostals, Deltoid-Pectoral Muscle, Sibson's Fascia, Triangularis Sterni, Sternocleidomastoid, Scaleni, Diaphragm*





BC

- There are 2 brachial polyarticular muscular chains lying over the anterior pleural and cervical area
- These chains influence cervical rotation, shoulder dynamics, and apical inspirational expansion
- Composed of muscle that attach to the costal cartilage and bone of ribs 4-7 and xiphoid to the posterior, inferior occipital bone, anterior, inferior mandible and coracoid process of scapula
- They provide the support and anchor for cervical-cranial orientation and rotation and rib position

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OPTIMAL POSITION      SUB-OPTIMAL POSITION



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Brachial Chain (BC)

Anterior Interior Chain (AIC)

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Left AIC/Right BC Pattern



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Zone of Apposition (ZOA)

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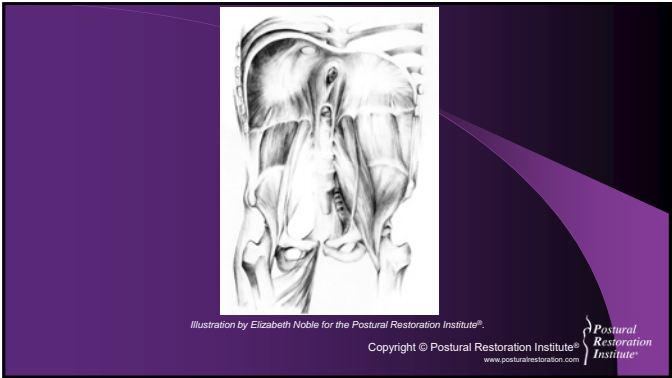
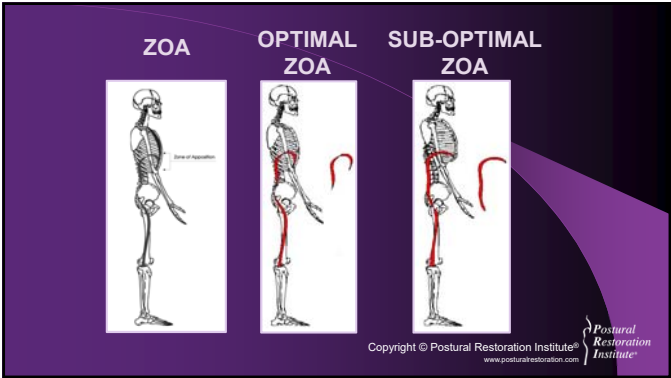
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ZOA

- The diaphragm's mechanical action and respiratory advantage depends on its relationship and anatomic arrangement with the ribcage
- The cylindrical aspect of the diaphragm that apposes the inner aspect of the lower mediastinal (chest) wall, constitutes the zone of apposition (ZOA).
- The zone of apposition, for the most part is not influenced by height of diaphragm dome, but rather by the orientation of the ribcage.
- Individuals with elevated anterior, externally rotated ribs will have a decrease in their ZOA on one or both sides, depending on their pattern of diaphragm opposition, diaphragm weakness and use.

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**Right hemi-diaphragm**  
*The right hemi-diaphragm has the following characteristics in comparison to the left:*

- Larger diameter
- Thicker central tendon
- Larger central tendon
- Higher central dome
- Better able to maintain its domed shape (placement over domed liver)
- More crura fibers and fascia
- Has crura that attach lower on the lumbar vertebral bodies (1 to 1 ½ lumbar levels lower)
- Better abdominal eccentric opposition
- Concentrically effective for respiration
- The right phrenic nerve is more vertical, with less length, and possesses faster electrical conduction (Bordoni et al, 2013)

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For these reasons listed above, the right hemi-diaphragm is powerfully positioned to serve as a respiratory muscle to coordinate inhalation from a state of ZOA.

This dominant respiratory activity over the right half of the diaphragm centers our core of stabilization and neurological control laterally over to the right, and feeds a pattern of right dominant muscle activity that can be difficult to overcome.

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These muscles become chronically over worked, hypertonic, and feel tight to the patient.

They often lack flexibility in lateral flexion of the thorax to the left or rotating the thorax to the right.

But the reality is that these muscles are neurologically overused and require muscle inhibition techniques rather than traditional stretches.

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**Left hemi-diaphragm**  
*The left hemi-diaphragm has the following characteristics in comparison to the right:*

- Smaller diameter
- Thinner central tendon
- Smaller central tendon
- Lower central dome
- Less able to maintain its domed shape (placement under the heart)
- Less crura fibers and fascia
- Has crura that attach higher on the lumbar vertebral bodies (1 to 1 ½ lumbar levels higher)
- Poorer abdominal eccentric opposition
- Concentrically effective for left thoracic rotation and extension

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For these reasons, the left hemi-diaphragm is not as well positioned to serve as a respiratory muscle to coordinate normal inhalation, because the left hemi-diaphragm is more challenged in attaining ZOA activity.

Thus, the flatter left diaphragm becomes more of a postural stabilizer to the spine and core axial skeleton as it assists the back extensors and moves the lumbar spine into more of a state of extension.  
(Hodges et al, 2001).

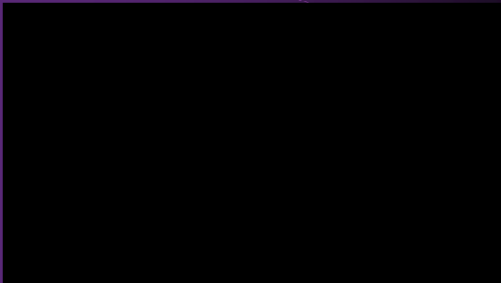
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The flatter position of the left hemi-diaphragm causes it to be overactive. This over activity is ineffectual, because it is not properly supported and opposed by the unilateral abdominal muscles, and therefore cannot maintain the ZOA required for proper respiration.

The muscles across the left side of the body need neuromuscular repositioning and retraining to properly position both the left hemi-diaphragm and all the muscles associated with the left hip and pelvis.

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3D View of the Diaphragm



<https://www.youtube.com/watch?v=hp-gCvW8PRY>

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ZOA Restoration

- Apposition of the diaphragm can be lost unilaterally, almost always on the left or bilaterally; resulting in a Left Anterior Interior Chain (L AIC), or a Bilateral Anterior Interior Chain (B AIC) which is considered a Bilateral Posterior Exterior Chain pattern (B PEC).

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ZOA Restoration

- Reducing physical and physiological symptoms associated with hyperinflation, paradoxical breathing and accessory respiratory muscle overuse requires repositioning and re-training of the diaphragm for normal zone of apposition activity.
- PRI Manual and Non-Manual Techniques can be used to position the ribcage and diaphragm so that the left leaflet of the diaphragm regains proper mechanical advantage to efficiently contract the central tendon for respiratory activity, reducing the need for the diaphragm to act for postural stabilization.

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Visible Signs of Dysfunction as  
Related to a Left AIC/Right BC  
Pattern

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1. One or both legs turn out when sitting, standing and lying



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2. Overdevelopment of compensatory muscles



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3. Favorable standing position is on the right leg while rotating their upper body to the left



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4. Walk with little or no arm swing on the right, and lower right shoulder.



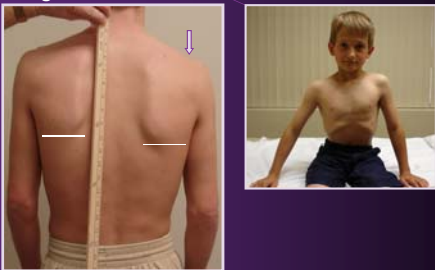
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5. Elevated anterior ribs on the left



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6. Lowered, depressed shoulder and chest on the right



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7. Asymmetry of the head and face



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8. Curvature of the spine



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Objective Findings for a  
Left AIC/Right BC Pattern

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1. Inability to adduct the left femur



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2. Inability to extend the left hip



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3. Limited trunk rotation to the right  
(legs to the left)



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4. Limited apical expansion on the right



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5. Limited humeral glenoid internal rotation (HG IR) on the right



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6. Limited shoulder horizontal abduction on the left



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Clinical Assessment  
Left AIC / Right BC Pattern

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- The left pelvis is anteriorly tipped and forwardly rotated.
- The forwardly rotated left innominate causes the lower spine to orient to the right with the upper spine to the left.
- This directional, rotational influence on the low back and spine to the right, mandates compulsive compensatory movement in one or more areas of the trunk, upper extremities and cervical-cranial-mandibular muscle.
- The greatest impact is on rib alignment and position, therefore influencing breathing patterns and ability.

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Anterior View of an Anterior & Forward Positioned Left Innominate with Accompanying Right Sacral Torsion



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Posterior View of an Anterior & Forward Positioned Left  
Iliac Crest with Accompanying Right Sacral Torsion



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Treatment Approach

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RESTORE Pelvic Position &  
Muscular Balance



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RESTORE a ZOA and Apical Chest  
Wall Expansion

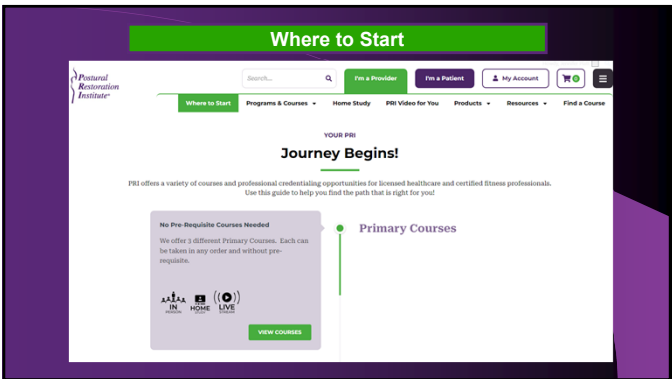
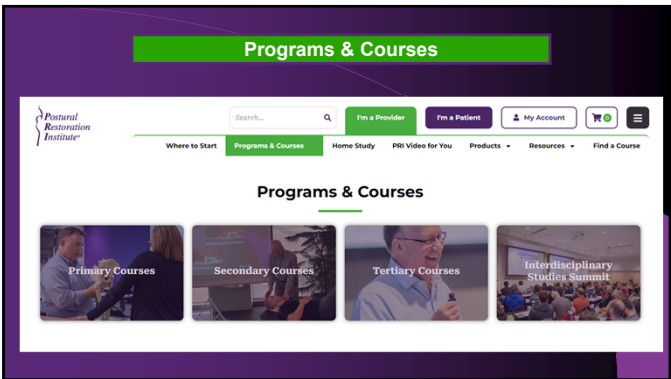
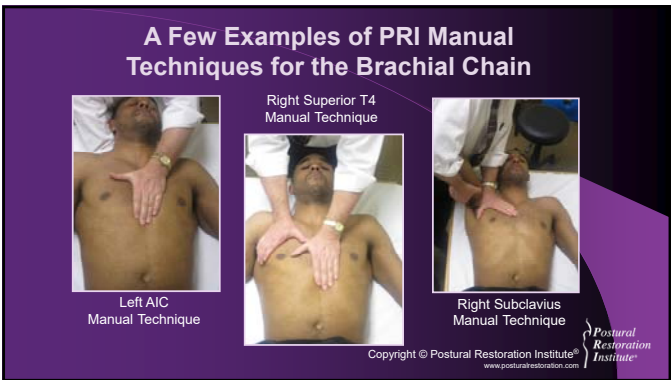


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RESTORE Diaphragmatic  
Breathing



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Primary Courses

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Myokin in Brunswick, ME Oct 5-6<sup>th</sup> \*\*\*\*\*



**Myokinetic Restoration**

This advanced lecture and lab course explores the biomechanics of compensatory and postural adaptation strategies through a series of treatment approaches. The restoration of pelvic, thoracic, and cervical alignment and function of the spine is essential to reduce symptoms, provide stability, and improve the quality of life for patients with postural dysfunction. This course will focus on the integration of manual therapy, exercise, and lifestyle changes to achieve optimal results.



**Pelvic Restoration**

This advanced lecture and lab course is designed to assist clinicians with those complex patients that are struggling to restore normal function of their pelvis. The course will give an appreciation for the influence of an asymmetrical pelvis and how this imbalance contributes to posture dysfunction. We will explore in detail the function of the pelvic unit and how it relates to anatomy, respiratory, and sensory systems. Participants will be able to restore pelvic and respiratory mobility through a treatment approach while keeping individual activities of daily living in mind.



**Postural Restoration**

This advanced lecture and lab course is designed to assist clinicians with those complex patients that are struggling to restore normal function of their pelvis. The course will give an appreciation for the influence of an asymmetrical pelvis and how this imbalance contributes to posture dysfunction. We will explore in detail the function of the pelvic unit and how it relates to anatomy, respiratory, and sensory systems. Participants will be able to restore pelvic and respiratory mobility through a treatment approach while keeping individual activities of daily living in mind.

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