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The Relationship between Postural Asymmetry and Cycling Injuries Part III- Treatment

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Lori completed her Bachelor of Biology degree from Nebraska Wesleyan University in Lincoln, Nebraska and her Master of Physical Therapy from the University of Nebraska Medical Center. Her 11 years of clinical experience has resulted in a strong passion for the Postural Restoration science and patient interventions. Lori has recently moved back to the Lincoln area from North Dakota where she enjoyed providing in-services to physicians, chiropractors, physical therapists, coaches and athletes in the implementation of Postural Restoration in their practices. She currently practices at the Hruska Clinic, Restorative Physical Therapy Services in Lincoln, Nebraska. Lori is a member of the American Physical Therapy Association. Lori has earned the designation of Postural Restoration Certified (PRC) as a result of advanced training, extraordinary interest and devotion to the science of postural adaptations, asymmetrical patterns, and the influence of polyarticular chains of muscles on the human body as defined by the Postural Restoration Institute™.



Lori Thomsen

causing him to be side bent to the right with his right shoulder below the left. His ribs were up (externally rotated) on the left and down (internally rotated) on the right with his upper trunk rotated to the left resulting in left lung hyperinflation and decreased lung (apical) expansion on the right.

Triplanar Activity

As a result of this postural asymmetry, muscle and breathing imbalances occurred on both sides of the body. Treatment involved integrating the pelvis, hip, and trunk with correct breathing activity to challenge the entire kinetic chain. The importance of this treatment approach is implementing three dimensional movements in all planes of the body. Our bodies should work in all three planes in order for normal biomechanics of the body to occur with something as simple as walking or more active as cycling. These planes include sagittal, frontal, and transverse (See figure 1)

Sagittal Plane

The fitness community and this cyclist are sagittal plane driven. The sagittal plane involves flexion and extension activity (bending and straightening). For example, think about weight lifting. How many machines incorporate flexion and extension? Almost all of them; lat pull downs, leg press, knee extension, shoulder press, chest press, prone hamstring curls, seated rows, squats, etc. Please do not misunderstand that I am opposed to weight lifting, however, in anyone's fitness routine if the sagittal plane is worked all of the time, the frontal and transverse planes are weakened and lost, therefore, affecting the bodies ability to work in a triplanar fashion resulting in injuries.

Our cyclist loves working out in the sagittal plane. He sits on his bike for 200-350 miles per week...bending and straightening his hip, knee and ankle while he is positioned in extension of his low back on the left (article one). In the sagittal plane, hip flexors (IT band) and back extensors (paravertebrals) are a "family" of muscles that extend the back and flex the hip at the same time. Trunk or back flexors (abdominals) and hip extensors (glutes and hamstrings) are another "family" of muscles that flex or round the back and extend the hip and leg when you walk or run at the same time. Treatment recommendations for the cyclist in the sagittal plane would be exercises that keep the glutes and hamstrings working with activities that extend the hip, not the back especially on the left side. This in turn will turn "off" (inhibit) his left TFL and back extensors. The hamstrings on the left also oppose the forward position of the pelvis on the left. Remember that the hamstrings attach on either side of the

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Upon re-evaluation, the 34 year old cyclist noticed improvement in his performance. Subjectively, he reported no left knee, left TFL or low back pain with improved ability to breathe and significantly decreased tightness in his right side. He had the ability to feel his glutes and hamstrings both cycling and running and feels both of his "seat bones" (ischial tuberosities) on his cycling seat with increased power stroke using his left leg. Consequently, the cyclist has reported improved left power stroke with cycling competitions and ran a 5:30 mile – his best time in years! The change in his fitness routine did not include weight training, yoga stretching or core stabilization activity. Implementation of Postural Restoration with triplanar activity was the key to his success with pain management and improved activity performance.

Review of Postural Asymmetry in the Cyclist

In the previous two articles, a thorough discussion was proposed for the asymmetrical pattern and compensations for the cyclist contributing to his impaired biomechanics resulting in pain and poor performance. He presented with a forwardly rotated and anteriorly tipped left pelvis causing his center of gravity to be directed over his right leg. The asymmetrical pattern on the left caused the left leg to be out (abducted) and turned out (externally rotated) and the right leg to be in (adducted) and turned in (internally rotated) with right forefoot varus (article one). This forward positioned pelvis also oriented his spine and sacrum to the right and his upper trunk to the left

knee and the ischial tuberosity (Figure 2). Many people recognize that the hamstrings will flex the knee and extend the hip; however, many fail to note that it also keeps the pelvis upright (or neutral).

Frontal Plane

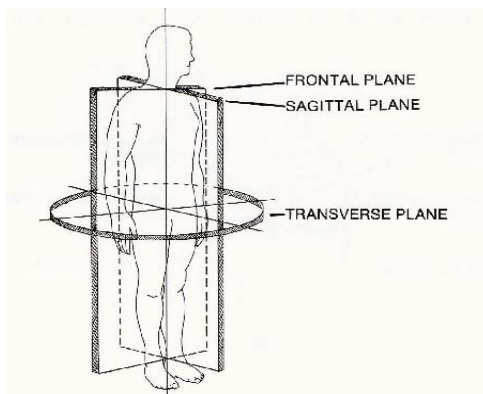
In the frontal plane, our body moves in and out (adduction and abduction) and side bends the trunk to the left and the right. Muscles include hip adductors (inner thigh) and abductors (outer thigh) and lateral abdominals and intercostals (trunk side-benders). The cyclist in his asymmetrical pattern is abducted on the left and adducted on the right with his trunk side bent to the right. Recommendations in the frontal plane include keeping the left adductors and lateral abdominals working and right abductors working. After repositioning the pelvis, this plane is the number one goal to restoring triplanar activity with the cyclist. This is his weakest plane and typically is for the majority of people. Little fitness routines and equipment develop and strengthen this plane.

Transverse Plane

The transverse plane involves the body's ability to rotate through the hips and trunk. Hip rotators (glute max externally rotates and the glute med internally rotates the thigh bones) and trunk rotators (abdominal obliques) are a "family" of muscle that depend on symmetry of the pelvis to work correctly. If athletes have good sagittal and frontal plane control the transverse plane will follow, however, if the body loses its ability to have good trunk flexion and hip extension with adductor and abductor control, integrated reciprocal motion at all three planes will be lost. The cyclist, who had pelvic asymmetry, demonstrated his left thigh actively turning out (external rotation) and right thigh turning in (internal rotation) with his upper trunk rotated to the left. Recommendations in the transverse plane would be keeping his left glute med, right glute max and left obliques active.

Breathing Treatment Recommendations

Article number two discussed the importance of synchronous breathing using the diaphragm while strengthening the obliques for postural symmetry of the pelvis and upper trunk. Remember that this will be emphasized on the left side of our cyclist to help increase the dome shape of the diaphragm and to assist with trunk rotation to the right with left front rib internal rotation and right front rib external rotation. Left rib internal rotation will assist with getting air "out" of the left lung and right rib external rotation will assist with getting air "in" on the right lung. The exercise examples that follow will emphasize these points: **1)** Inhaling through the nose **2)** Exhaling through pursed lips or "sighing out" the air reinforcing the ribs and the sternum moving down and in with internal rotation **3)** Pausing 3-4 seconds after the exhalation to allow the diaphragm to set for inhalation **4)** Exhalation should be two to three times longer than the inhalation and **5)** Inhalation should expand the chest with-



Frontal (coronal or longitudinal), sagittal, and transverse (horizontal) planes in the human body.

Figure 1

out pulling air in through the shoulder, neck, or back.

Postural Restoration Treatment Examples for the Cyclist

Treatment goals for the cyclist involves training him in movement patterns that integrate multiple muscles, quality of movement versus quantity, all three planes of movement, breathing in through the nose and out through the mouth, and ending with upright static and dynamic control. Here are some examples of activities performed:

Sagittal Plane:

- 1) Standing Resisted Wall Reach** (emphasized weight through heels promoting hamstrings and posterior pelvis tilt, back rounded with sternum and ribs down and "back" and chest expansion during inhalation) Figure 3.
- 2) PRI Squat with Balloon** (emphasized weight through left heel, squeezing ball with left knee, feeling left abs, shifting into left hip, feeling right chest wall expand) Figure 4.

Frontal Plane:

- 1) Left Flex Add with Right Extended Abduction** (emphasized left abs, left inner thigh, right abductors with right ankle eversion) Figure 5.
- 2) Left Lateral Supported Dip** (emphasized weight through left heel, keeping left hip back, left knee slightly turned in and left trunk side bent with left obliques) Figure 6.

Triplanar Activity:

- 1) Left Adductor Pull-In** (emphasized weight through left heel, left knee slightly in, and left trunk side bent with left obliques) Figure 6.
- 2) Standing Right Glute Max with Resisted Left Hamstring with ZOA** (emphasized weight through right arch and heel, keeping left hip hiked and left trunk side bent with left obliques) Figure 7.
- 3) Standing Left AFIR with Right Trunk Rotation** (emphasized weight through left heel, left knee turned in and keeping left hip back while rotating upper trunk to the right) Figure 8.

It is beyond the scope of the three articles to fully educate the reader on how to properly treat postural asymmetry. This is taught through the Postural Restoration Institute™ in a multitude of courses. Instead, I hope the reader has a new understanding of asymmetry that exists in all of us, the importance of diaphragmatic breathing and how critical triplanar activity is for the professional or recreational athlete.

More Information Please!

There are several of references that support the information discussed in all three articles. They can be found at www.posturalrestoraton.com.

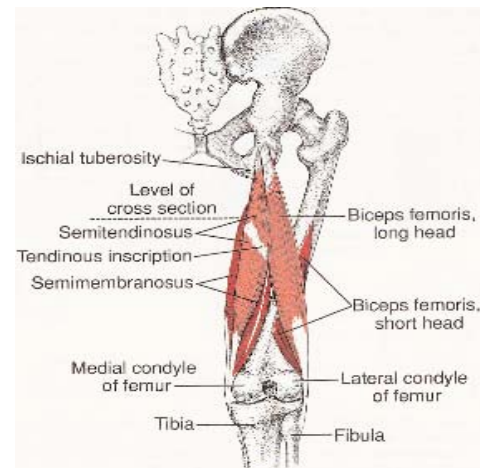


Figure 2



Figure 3

Standing Resisted Wall Reach

1. Place tubing securely in door slightly below shoulder level.
2. Stand with your heels 7-10 inches away from the wall.
3. Stand up straight with a ball between your knees and feet lined up with each other.
4. Place your hands through the loops of the tubing with your palms facing down.
5. Straighten your arms out in front of you and round your back, engaging your abdominals.
6. Once you can feel your abdominals working begin to squat as you squeeze the ball.
7. Squat down until your bottom touches the wall (do not fall back into wall).
8. Inhale through your nose.
9. As you exhale through your mouth reach forward and downward as your back stays rounded.
10. Hold arms steadily in this position as you inhale again and expand your back.
11. Exhale and reach forward further with your arms.
12. Complete 2 more breaths in and out reaching further each time you exhale.
13. Stand up while keeping arms straight, back rounded, abdominals and inner thigh muscles engaged.
14. Relax and repeat 4 more times.



Figure 4

PRI Wall Squat with Balloon

1. Stand with your heels 7-10 inches away from the wall.
2. Place a 4-6 inch ball between your knees and a balloon in your left hand.
3. Keeping your back rounded, begin to squat until your bottom touches the wall.
4. Once you are against the wall shift your left hip back. Your left knee will be slightly behind your right and you will feel your left outside hip engage.
5. Squeeze the ball between your knees and inhale through your nose. As you exhale reach forward and across the midline of your body with your right hand.
6. Maintaining the above position, inhale again through your nose this time slowly exhaling into the balloon.
7. Pause 3 seconds with your tongue on the roof of your mouth to prevent airflow out of the balloon.
8. Without pinching the neck of the balloon and keeping your tongue on the roof of your mouth, inhale again through your nose.
9. Slowly blow out again into the balloon as you also reach further across the midline of your body with your right arm.
10. Do not strain your neck or cheeks as you blow.
11. Inhale again through your nose. Slowly exhale into the balloon as you reach further with your right arm.
12. You should feel a stretch across your right chest wall. You will also feel your left abdominal wall and your left outside hip engaging.
13. After your fourth inhalation, pinch the balloon neck, remove it from your mouth and let the air out as you slowly stand up
14. Relax your legs and repeat sequence 4 more times.

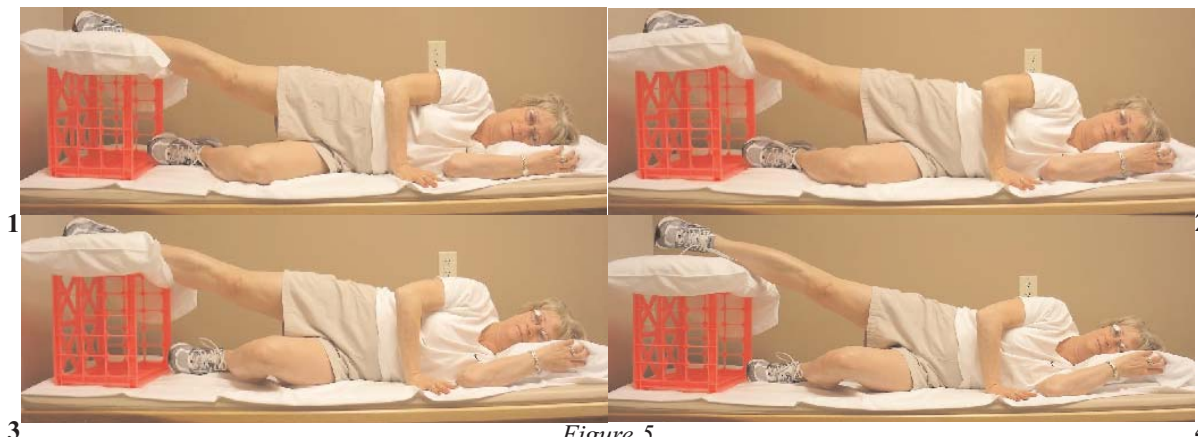


Figure 5

Left Sidelying Left Flexed Adduction with Right Extended Abduction and Left Abdominal Co-Activation

1. Lie on your left side and place a 2-3 inch bolster under your left abdominal wall and 1-2 pillows under your head so that your neck is slightly side bent to the right.
2. Place a crate or a stool that is about 13 inches in height under your right ankle and bend your left knee. Your right ankle hip and shoulder will be lined up.
3. Inhale through your nose and as you exhale through your mouth reach down with your right foot.
4. Push your left hip down firmly into the mat and try to arch your left abdominal wall. You should feel your left abdominal wall engage.
5. With your left abdominal wall engaged and your right leg reaching down, push the outside border of your left foot down into the mat and “turn” your left knee up. You should feel your left inner thigh engage.
6. With your left inner thigh engaged, attempt to pick your right foot off of the stool with your toes turned out to the side. You should feel your right outer hip engage.
7. Hold this position while you take 4-5 deep breaths in through your nose and out through your mouth.
8. Relax and repeat 4 more times.



Figure 6

Standing Supported Left Squat Lateral Dips

1. Stand against a desk or counter and place your left foot on a 2-inch block.
2. Place your hands on the surface in front of you and round your back.
3. Begin to straighten your left knee as you raise your right foot off the floor and turn your right ankle out to the side finding contact with your right shoe arch.
4. Maintaining the above position, slowly squat down by bending your left knee as you bring your right foot out to the side keeping your right foot lower than your left. You should feel the muscles on the front of your left thigh and left hip engage.
5. Hold this position while you take 4-5 deep breaths in through your nose and out through your mouth.
6. Relax and repeat 4 more times.



Figure 7

Standing Right Glute Max with Resisted Left Hamstring and Left ZOA

1. Anchor tubing around a stable structure and place the other end around your left ankle.
2. Round your back and place both hands on a firm surface.
3. Turn your right toes in and shift your body weight onto your right leg.
4. Hike your left leg up as if you were pulling your left foot out of mud. You should feel your left inner thigh engage.
5. Slightly pull back your left leg without using your back. You should feel your right outside hip engage and the muscles in the back of your left leg.
6. Hold the above position as you inhale slowly through your nose and gently push your left hand down into the surface.
7. Maintain the position of your left hand and exhale through your mouth as you gently press your right hand down into the surface.
8. Continue this process for 4 more breaths always pressing down with your left on inhalation and down with the right on exhalation.
9. Relax and repeat the entire sequence 4 more times.



Figure 8

Standing Passive Left AF IR with Right Trunk Rotation

1. Stand facing a desk or a counter top.
2. Place a 2-inch block underneath your left foot.
3. Place your right foot on the ground slightly in front of your left. Position yourself so that the weight of your body is distributed equally between both feet.
4. Round out your back and place both hands into the surface.
5. Shift your hips to the left.
6. Side-bend your trunk to the left bringing your left shoulder lower than your right.
7. Staying sidebent to the left begin to orient your trunk to the right by reaching across the midline of your body with your left arm. You should begin to feel your left abdominal wall engage.
8. Hold this position while you take 4-5 deep breaths in through your nose and out through your mouth, filling your right chest wall with air.
9. Relax and repeat 4 more times.