



# PERFORMANCE VOLLEYBALL CONDITIONING

A NEWSLETTER DEDICATED TO IMPROVING VOLLEYBALL PLAYERS

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## Postural Restoration Institute™ Presents the New Off-Season: Balanced Regeneration Series #4 Gluteus Medius Facilitation

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Lisa was a member of the University of Nebraska volleyball team from 1995-1997. She was introduced to the science of Postural Restoration as a patient under the care of Ron Hruska. She had suffered from long-standing injuries sustained during her collegiate volleyball career and found success with the treatment techniques she learned at the Hruska Clinic and later received from the Postural Restoration Institute. Lisa returned to practice physical therapy at the Hruska Clinic Restorative Physical Therapy Services in Lincoln, Nebraska after completing her Doctorate of Physical Therapy from the University of Nebraska Medical Center in Omaha. Lisa is a member of the American Physical Therapy Association.



Lisa Bartels

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elcome to the new off-season: Balanced Regeneration- a series of articles dedicated to creating balanced athletes participating in a side dominate sport. A side dominate sport is defined as a sport in which skills are performed utilizing a "preferred" side of the body on a repeated basis. Each issue of this publication will present a new installment that develops a progressive step-by-step plan, based on Postural Restoration Institute® (PRI) concepts and methodology. This plan is designed to create a balanced athlete who can manage asymmetrical sports demands without pain and injury. The first installment of the Balanced Regeneration series explained AF IR performance testing that can be utilized to measure core stability and identify imbalanced athletes. The second and third installments initiated the first two steps in the Balanced Regeneration program; correct left hamstring facilitation followed by recruitment of the left ischio-condylar adductor. Left gluteus medius training application is the next step in the program.

### The Problem-Anatomy of Imbalance

If the members of an athletic team were instructed to stand shoulder to shoulder in a straight line with their arms at their sides, it would appear that the pelvis and trunk of all players was neutral, facing straight ahead. Despite appearances, the pelvis may not be in a neutral resting position in several of those athletes. Most competitive athletes that are evaluated with PRI methodology initially present with significant left side versus right side differences; differences in bony position, differences in muscle strength/function, and differences in the integrity of various joint sockets. Asymmetrical sports demands coupled with uncontrolled right side dominance can produce these postural imbalances. The most common postural presentation is left pelvic torsion with compensation via the trunk and upper extremities. The most common functional strength impairment is inability to achieve left AF IR when the left leg and hip is loaded during upright activity.

Acetabular (socket) femoral (ball) internal rotation (AF IR) is a term that PRI has coined as an individual's ability to shift their weight into one side of the pelvis. The pelvis is comprised of a pair of innominate bones that sit on either side of the sacrum (Figure 1). When discussing gait mechanics it is appropriate to divide the pelvis into halves; the left hemi pelvis and the right hemi pelvis. The hemi pelvis should achieve a maximum and appropriate amount of AF IR when the same side leg is in a midstance position of gait. When a leg and hip are loaded during gait, muscles on that side of the body must activate to support the weight of the body as the opposite leg clears the ground. The position

Female Pelvis  
Measurements - Anterior View

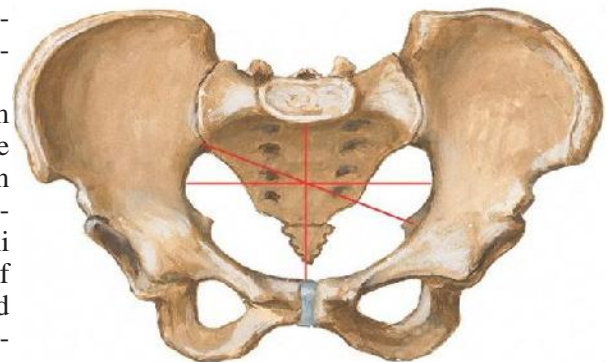


Figure 1

the pelvis is in dictates which muscles will function in this capacity. In a hip with healthy AF IR ability the primary force couple that should be active at midstance to support the weight of the body is the left ischiocondylar adductor and the left gluteus medius. Many athletes lose this ability because their right lower extremity dominance coupled with asymmetric sports demands has lead to an acquired position of left pelvic torsion. Left pelvic torsion is rotation that should occur when the right leg is loaded into stance phase of gait. The opposite should occur when the left leg is loaded into stance phase; right pelvic torsion should occur when the left leg is loaded. Athletes malpositioned in left pelvic torsion are remaining in a shifted state on the right hip. They have no problem achieving right AF IR during right stance phase, but when they load the left leg they can not shift into the left hip despite transferring all weight to the left leg. This is because of adaptive weakening of some muscles and adaptive shortening of others. To simplify, this improper bony position essentially eliminates the ischio-condylar adductor and the left gluteus medius. The remaining muscles that possess abductor leverage across the hip will compensate. The top two muscles that will likely increase their tonic activity are the tensor fascia latae and the lateral quad group, vastus lateralis. Interesting to note, the vastus lateralis does not cross the hip joint. In a closed chain position, muscles do not have to cross the hip joint to rotate or abduct the hip. When the left lateral quad begins functioning as a primary hip abductor you can develop pain syndromes such as lateral knee pain, iliotibial band restriction, and patellar tracking issues that are not typically resolved with bracing and surgical interventions such as the lateral release.

### The Solution

Conditioning programs need to have a built in counter mechanism that significantly reduces an athlete's tendency towards left pelvic torsion. The important concept to review is the likelihood of altered muscle function with changed bony position. The potential of a muscle to generate force across a joint in a given plane of motion depends upon its position and length. Paired muscles of the body may have significant differences in levels of strength, tone, and endurance relative to one another if bony position has altered the position and length of one of them. In the case of left pelvic torsion, the left hip flexors will adaptively shorten, the left hamstrings will lengthen and weaken and correct proprioceptive ability of the left hip is lost. The solution is to asymmetrically train and isolate musculature that restores AF IR ability to the left hemipelvis. The initial training focus should emphasize posterior pelvic rotation, i.e. sagittal repositioning via hamstring facilitation, followed by recruitment of the ischio-condylar adductor. Left hamstrings reposition the pelvis so the hip socket (acetabulum) is oriented at the correct angle and direction. The ischio-condylar adductor functions to pull and seat the femoral head into the hip socket. The next step is to begin retraining the left gluteus medius to enable restoration of the ischio-condylar adductor/gluteus medius force couple.

There are three primary hip abductors that provide abduction leverage as the pelvis internally rotates and adducts from heel strike to midstance; gluteus medius, gluteus minimus, and tensor fascia latae. Gluteus medius is classified into three independent and functional sets of fibers: anterior, middle and posterior (Figure 2). All fibers contribute to abduction but the anterior fibers internally rotate the hip and the posterior fibers extend and externally rotate. In addition to functioning as a primary anti-gravity single leg support muscle, the gluteus medius also functions to keep the hip socket congruently aligned. When pelvic and femoral position are correct the gluteus medius approximates the hip joint by pulling the acetabulum (socket) onto the femur. This function automatically occurs when the gluteus medius is active during gait.

In many athletes, as soon as you have repositioned the pelvis with the left hamstrings and they strongly perceive the ischio-condylar adductor, you can try and recruit the left glut med. The best way to begin training the left gluteus medius is in standing. If athletes can engage the left ischio-condylar adductor in a standing position, most will also automatically turn on the left gluteus medius secondary to neuromuscular feed forward activation in an anti-gravity position. The first training technique that should be attempted is Retro Stairs (Figure 3). Retro stairs could be considered the standing version of the Right Sidelying Left Adductor Pullback activity that was explained in the last article. **Net Link:** For the how-to do the exercise click [HERE!](#)

This exercise is basically an exaggeration of stance phase of gait. It is also a very effective way to stretch the posterior hip capsule. The first step with Retro Stairs is to stand backwards so both heels are touching the rise of the step. The left foot is then placed on the next step up. Instruct your athletes to push the heel down. Make sure they do not bend over when they do this; many will feel the heel cords stretch. Now they shift into the hip by pulling the thigh/knee straight back. The actual amount of motion is very small, two to three inches. If this step is performed correctly it should look like the left knee

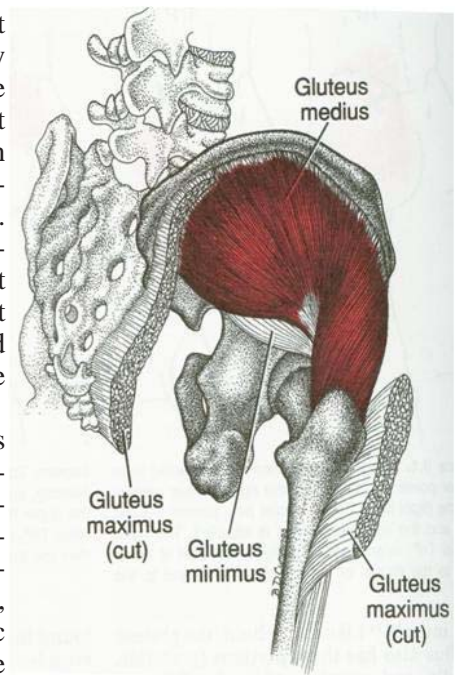


Figure 2



Figure 3



pistons backwards as the zipper/seam, knee, and foot align vertically. The right leg and pelvis remain motionless. Don't let your athletes twist or lean back; this is not true AF IR motion. The left quads will also engage, but the athlete should strongly feel the left inner thigh with the left outer hip. They should have 80-90% of their bodyweight on the left leg and hip. You can dampen the quad activity by telling your athletes to push via the heel. Once you are confident your athletes are consistently engaging the left gluteus medius, you can have them stand up from the shifted position. Instruct them to maintain the piston pull on the thigh as they push via the heel to stand. The glut med should remain engaged until the knee begins to terminally extend. Have your athletes perform 10-12 sets primarily on the left. If you are using stairs, just have your athletes work themselves up the flight.

Most athletes will be able to correctly perceive and facilitate the left gluteus medius with the first attempt at Retro Stairs. There will be athletes however who will only perceive the quads. In this situation you will need to use the Standing Passive Left AF IR technique (Figure 4). Have your athlete begin by standing with 90% of their weight on the right side with the left knee very bent and the left foot on a 1.5 inch block. Instruct them to pull the left hip straight up as the left knee straightens and their weight shifts to the left. Have them hold the position for 20-30 seconds with 70% of their weight on the left, making sure they don't lock the knees or let the right heel come off the ground. Both feet stay flat at all times during this activity. After a 30 second hold have them shift off the left, back to the starting position. Repeat this activity several times. Standing in double limb support with a block under the left foot is a passive left AF IR position. The theraband is the integral piece that forces neuromuscular facilitation of the gluteus medius. If you anchor theraband around the back of the knee so it is essentially pulling the knee forward (placing flexion torque via the knee joint), the gluteus medius will engage as they pull the hip vertically and extend the knee. The gluteus medius fibers lengthen and engage with the adductors. Not all athletes will feel the gluteus medius work, but tell them to be patient. The gluteus medius is working; they just don't feel it because the proprioceptive ability of that hip and the muscles are impaired. The theraband would pull the knee forward if the gluteus medius was not turned on. Use this activity daily if possible for 1-2 weeks, and then reattempt the stairs. If the gluteus medius is now correctly perceived, focus on shifting and holding for several days before you add the lift.

There are several other exercises in both standing and gravity eliminated positions that are effective for gluteus medius strengthening that will be introduced later. The majority of these require correct right gluteus maximus integration. Right AF ER, acetabular femoral external rotation, is a new concept that will be introduced in the next installment. Right AF ER is the gait function of the right glute max. If the right glute max is severely impaired, consistent AF IR ability on the left hemi-pelvis will be difficult. **O**

**Figure 1 credit:** Netter Presenter Image Copyright 2008, Elsevier Inc., All rights reserved.

**Figure 2 credit:** Myofascial pain and dysfunction, the trigger point manual, the lower extremities, Volume 2, Travell and Simons, 1992, by permission of the publisher Williams & Wilkins.

**Figure 3 & 4:** Postural Restoration Institute®.

*Please note that techniques provided in Figures 3 and 4 are only examples of the many non-manual Postural Restoration Institute™ techniques that could be considered appropriate for addressing the underlying biomechanical deficit described. For more information and references, please visit [www.posturalrestoration.com](http://www.posturalrestoration.com).*

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Figure 4