

## The Posterior Chain: It's All in the Hips

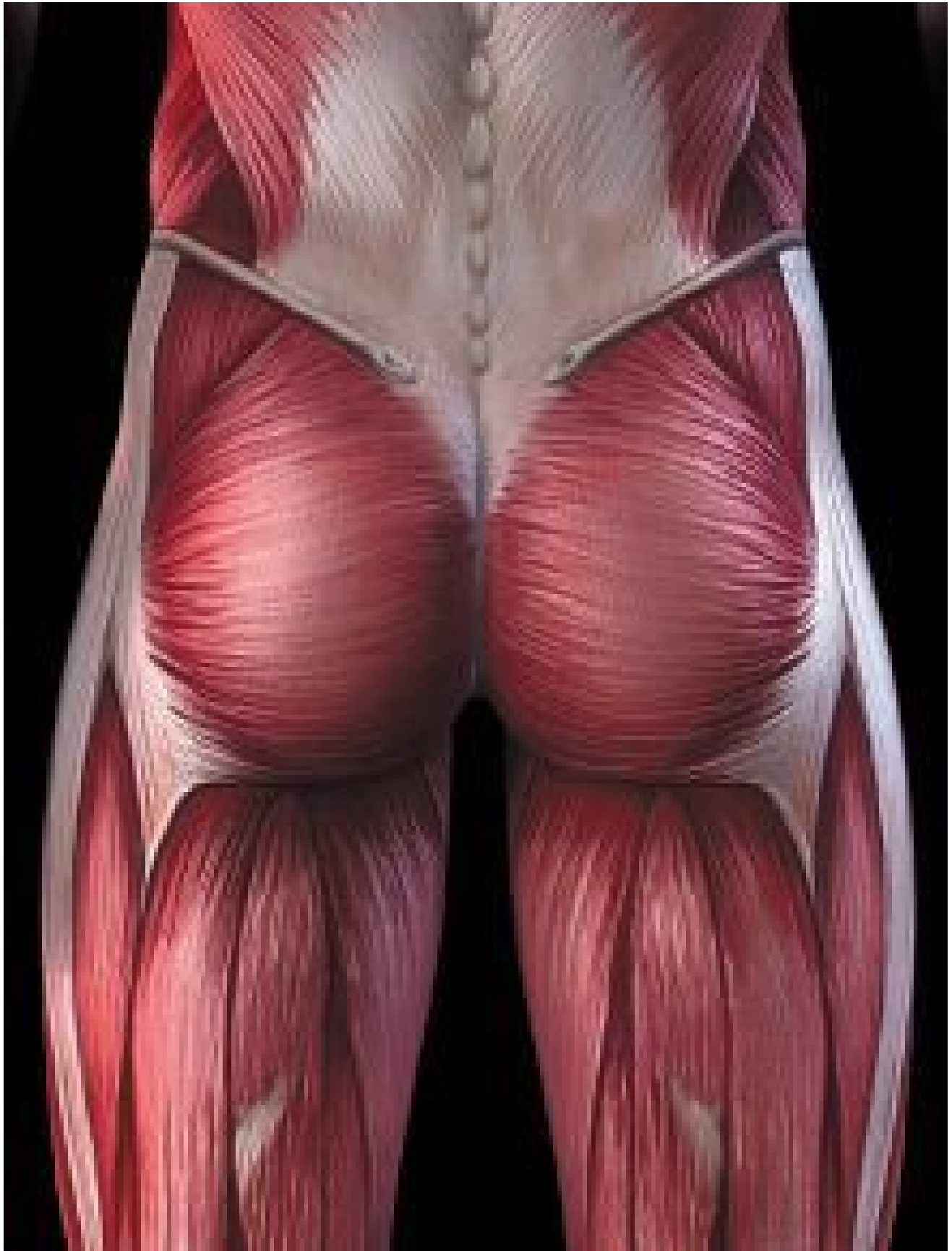
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So, what exactly is [the posterior chain](#)? It's only one of the most important sets of muscles you will need to assess on every patient. Primary muscles included in the chain are the *lower back*, *glutes*, *hamstrings*, and *calves*. Unfortunately, the posterior chain is all too often a neglected region. Why? Two reasons.

First, most people sit on their glutes all day, leading to quad dominance; in essence, their butt now becomes their feet. The glutes lose their primary role of hip stabilization and extension. Second, none of the primary muscles is a mirror muscle. It's the out-of-sight, out-of-mind theory. Even people leading an active fitness lifestyle that includes strength training, usually overwork anterior muscles. They end up neglecting the more important posterior ones.

The quadriceps take a back seat to the posterior chain (hip and lumbar extensors) when it comes to performance, strength and power. Compared to the quads, the glutes and hamstrings are more powerful muscles for stabilization. Sedentary lifestyles and lack of proper exercise lead to suboptimal muscular activation patterns within the posterior chain due to [lower crossed syndrome](#) (LCS).

Patterns of Dysfunction



Dr. Vladimir Janda referred to the systems of the posterior chain as the deep longitudinal subsystem

and the posterior oblique subsystem, and demonstrated how critical these muscles are in transferring force from the ground to the upper body. In LCS, the hip flexors are overactive and reciprocally inhibit the gluteus maximus muscles. Without contribution of the gluteus maximus to hip extension, the hamstrings and lumbar erector spinae muscles must work overtime and become synergistic dominant movers. There is marked anterior tilt of the pelvis and an accentuated lordotic curve at the lumbar spine. This is a recipe for acute and chronic lower back pain syndromes.

The "chain of pain" from dysfunctional movement continues, affecting the rectus abdominus, which becomes inhibited by the overactive erector spinae. With the gluteus maximus and rectus abdominus both at a mechanical disadvantage, one cannot optimally posteriorly tilt the pelvis (important to the completion of hip extension), so there is increased lumbar extension to compensate for a lack of complete hip extension. When patients bend over, pick something up or stand from a seated position, they are now at a mechanical disadvantage. Instead of activating muscles in the correct movement pattern (hams-glutes-contralateral erectors-ipsilateral erectors), they compensate and skip right over the glutes. Proper hinging at the hips and pushing the hips forward simultaneously are critical to effective posterior-chain motor control.

You must work the hip to protect the spine. When the hip does not work properly or move the way we need it to, there will be increased spinal motion and potential back problems. The solution to low back pain isn't always found in the back; it's all in the hips! Hip mobility requires the right muscles moving the hip joint to decrease the movement and load of the lumbar spine as a substitute. This means core stability is intimately related to hip mobility.

Remember, a major part of the core is the glutei. The body will take the necessary motion from the lumbar spine if it is not getting it from the hip. Often with back pain, inability to flex the hip past 90 degrees will cause patients to flex the lumbar spine to compensate, giving the illusion of flexing the hips. This dysfunctional movement pattern will ultimately lead to microtraumatic tissue damage.

Glutei muscle activation and proper symmetry are paramount to [proper hip function](#). The ability of the glutes to work is critical, because if the glutes can't work, there will be lower back pain. Weak glutes equals bad back! (Thanks to Stuart McGill for this priceless observation.)

The synergistic dominant hamstrings, which are now primary hip extensors, contribute to chronic tightness, fatigue, stiffness and spasm episodes. Use of the hamstrings as the primary hip extensor changes the vector forces of the femur and can cause anterior capsular pain, mimicking pain symptoms associated with an anterior iliac spine. Always assess the mobility of the hip and glute activation patterns during your lumbopelvic examination.

### Stability / Strengthening Exercises

Once you have removed fixations and restored proper mobility, you then progress to stability and strengthening exercises. What are some of the most effective exercises and fundamental movement patterns you can use to strengthen the posterior chain? Here you go:

[Kettlebell swings](#) are fantastic for glute activation and hip extension. They not only work the front muscles, like the shoulders, chest and biceps; they also give your lower back, hamstrings and hips a really good workout.

[Deadlifts](#): Yes, I said deadlifts! Do not be intimidated by this exercise. In reality, a properly executed

deadlift is the perfect exercise for strengthening your back and teaching hip hinging. This movement pattern is probably the most effective thing you can do to teach proper biomechanics. They are not only the best muscle-building exercise, but are also superb for strengthening the hamstrings and lower back while improving posture by enforcing your rear delts and traps.

*Cook hip lifts:* Named after Gray Cook, hip lifts are a great beginning gluteal activator and are meant to be used as a precursor to the glute bridge, because it solves a problem that the glute bridge does not address very well. One of the main problems people encounter is not being able to tell the difference between lumbar range of motion and hip range of motion. So, when they try to target the glutes and hamstrings, say with a regular glute bridge, they mistakenly use a lot of lumbar extension rather than hip extension. The Cook lift solves this by maintaining the lumbar in a neutral position and effectively isolating the glutes.

*Stability ball leg curl:* A great all-around exercise, the stability ball leg curl combines coordinated movements that work several muscles of the body. The exercise focuses on the back, abdominals, hamstrings, glutes, quadriceps and outer thighs. In addition, the muscles work together to stabilize and balance the body, thereby developing core strength and balance as well as strength in individual muscles.

Strengthening the posterior chain will not only make your clients feel better; it will also improve your treatment outcomes. Progressing to a corrective exercise program after symptomatic management protocols should be the long-term goal. Teaching posterior chain exercises will help empower your clients to improve their quality of life. That's what it's all about.

### *Resources*

- Boyle M. *Advances in Functional Training: Training Techniques for Coaches, Personal Trainers and Athletes*. Santa Cruz, CA: On Target Publications, 2010.
- Cressey E, Fitzgerald M. *Maximum Strength: Get Your Strongest Body in 16 Weeks With the Ultimate Weight-Training Program*. Philadelphia, PA: Da Capo Lifelong, 2008.
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- Sahrman S. *Movement System Impairment Syndromes of the Extremities, Cervical and Thoracic Spines*. St. Louis, MO: Elsevier/Mosby, 2011.
- Voight ML, Hoogenboom BJ, Prentice WE. *Musculoskeletal Interventions: Techniques for Therapeutic Exercise*. New York: McGraw-Hill, Medical Pub. Division, 2007.

JULY 2011