



Inter-professional Spine Assessment and Education Clinics (ISAEC)

The Posterior Chain and the Low Back Pain (LBP) Patient



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Questions?
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The posterior chain is the series of muscles that run up and down the dorsum of the body and include the paraspinals, the glutes, the hamstrings, the calves and even the plantar fascia. A strong posterior chain contributes to a strong core and facilitates coordination, power, and strength during functional limb movements. As such, the posterior chain makes up a large portion of the core musculature. This “backside” of the core is important to address when managing patients with LBP.

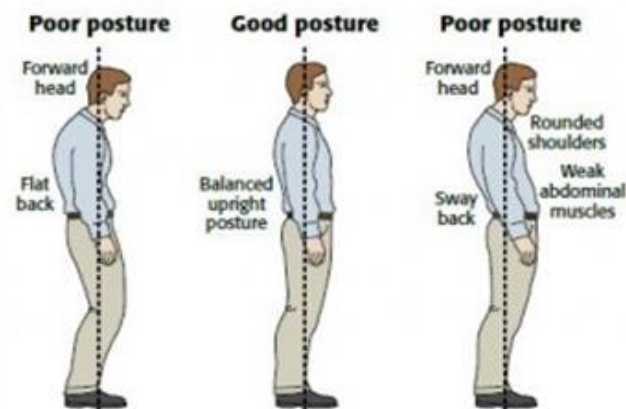
The posterior chain is often neglected for two reasons: The first being our ‘sitting lifestyle.’ In a seated position, the hamstring muscles become hypertonic while the quads/psoas muscles become adaptively short and stiff, inhibiting the function of the glutes as primary hip stabilizers and hip extensors. Evidence of dysfunction can be identified when patients are asked to hip hinge but end up flexing from the lumbar spine instead of tilting from the hips. When people cannot rotate the pelvis properly it is partly due to poor kinesthetic awareness, but also due to weak/inhibited glutes, short/stiff quadriceps/psoas muscles, and hypertonic hamstrings. In turn, this results in increased stress on the lumbar spine which is most efficient and protected in a neutral position, or lumbar lordosis. Anatomically, the back side of the pelvis should lie slightly higher than the front. With hypertonic hamstrings, and stiff/short hip flexors from sitting, the pelvis has a propensity to assume a posterior tilt, resulting in a flattening or loss of the ideal lumbar lordosis. The resulting posterior pelvic tilt increases the load on the intervertebral discs of the spine. Over time, the risk of injury to the lower back increases due to the diminished disc capacity to manage unexpected or excessive loading from prolonged relative lumbar flexion. These findings can often be seen in a patient’s posture, as depicted in the diagram below.

The second reason the posterior chain muscles are often neglected is that these muscles are not visible in the mirror. This is often referred to as ‘mirror syndrome’ and is a tendency for people to train only the body parts they actually see, such as the abs, quads and biceps. As such, even if people do work out, the chances are their posterior chain is underdeveloped.

Another important consideration is muscle length and stiffness. In some individuals, genetics may play a role in their lack of flexibility. However, more often, stiff/short musculature of the posterior chain, is the result of compensation for a weak ‘core’, and the propensity for our society to sit. This ‘sitting lifestyle’ results in deconditioning, as well as stiffness and shortening of muscle groups. Additionally, but less often, individuals can experience stiff and short ‘core’ musculature as a result of previous injury and/or overtraining.

To prevent this, a multi-pronged approach to training of the posterior chain musculature is required. Many workout programs will over stretch the posterior chain, and over work the anterior chain, exacerbating the problem. Proper isolation when stretching quads/psoas/hamstrings, as well as myofascial release, gluteal activation work, and working to improve functional range of motion training are all important. Key exercises include but not limited to: proper hip hinging, squats, glute bridge, clamshells, glute bridge with a march, lateral mini-band walk, quadruped hip extensions, and walking lunges.

In summary, encourage your patients to train their posterior chain. A simple discussion about the importance of the above can contribute to improved adherence to the ISAEC recommendations and ultimately improved management of LBP patients.



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