

Chronic Low Back Pain: A Total Treatment Approach

Stabilization and Sensorimotor Training

By Jasper Sidhu, BSc, DC

Nothing is more frustrating for a clinician than a patient who presents with chronic low back pain. The patient brings with them multiple factors that could be contributing to their pain. Most have had prior testing that either shows a structural pathology - with high amounts of false positive rates - or shows nothing, which leads to labelling them as having "psychosocial" issues. (Although this article deals with a total physical treatment approach, addressing a patient's beliefs about their pain and providing constant reassurance is also essential for a high degree of success.)

What makes treating the chronic back pain sufferer truly frustrating is the lack of correlation between impairment, disability and perception of pain.¹ One study found that only 51.4 percent of an individual's disability could be explained by performance, psychological and pain factors.² Other researchers point out that spinal range of motion and muscle strength, which are the primary aspects of some rehabilitation programs, have not been shown to be effective. In fact, they have been shown to actually produce negative outcomes in a significant number of people.³

Therefore, there needs to be a shift toward providing a treatment approach that addresses stabilization. Initial stabilization should focus on the local level, involving segmental muscles. The patient can then be progressed to global stabilization, training and conditioning muscles on multiple segmental levels. The total treatment approach should involve an effective assessment, identifying the areas that need to be addressed, and providing the right rehabilitation program and tools to increase function and decrease disability.

Assessment

Apart from evaluating joint dysfunction, an important part of your assessment process is the identification of tight and inhibited muscles. Research has shown that certain muscles have a tendency to become tight and

overactive, while others become inhibited.⁴⁻⁵ With respect to chronic low back pain, the muscles that tend to become tight or overactive include the hamstrings, hip flexors, piriformis, lateral quadratus lumborum, rectus abdominus, external obliques, and lateral and thoracolumbar erector spinae. Through muscle length testing, the tight muscles need to be stretched prior to initiating any form of rehabilitation program. The muscles that tend to become inhibited or weak include the gluteals, vastus medialis, transverse abdominus, internal oblique, multifidus, and medial and lower erector spinae. Screening tests for these muscles can be found in Liebenson's *Rehabilitation of the Spine*, an excellent reference tool with hands-on practical sections that allow you to immediately put these principles to use.

Another assessment approach is to identify the underlying adhesions and scar tissue that may be preventing full range of motion of the tight muscles. All too often, we have stretched patients only to realise that adhesions are preventing the muscle from maintaining the length and initiating contractions that prevent muscular imbalances. Graston Technique is not only effective at treating scar tissue and/or adhesions, but also can be used as a screening tool. Another effective technique is ART (active release technique), which also helps reduce scar tissue to normalize muscle and tendon function. Utilizing these techniques in the assessment phase ensures that the underlying factors which can inhibit the success of a proper stabilization program are addressed and resolved.

Stabilization Training

In order to understand how to effectively prescribe spinal stabilization exercises, we need to first understand their definition. According to McGill, *spinal stabilization exercise* is one that is repeated in a way that grooves motor patterns and ensures a stable spine.⁶ In fact, he outlines five training stages. However, the first three stages are most applicable toward the average patient, while the last two are designed for the athlete.

Stage 1 involves addressing basic movement patterns and basic balance challenges through to complex activity specific patterns. In this stage, adopting a neutral spine is essential before progressing to other exercises. Facilitating inhibited muscles, such as the glutes, is recommended. Teaching a patient abdominal bracing is also initiated, ensuring that you distinguish this from abdominal hollowing. Abdominal bracing is much more effective than abdominal hollowing at enhancing spinal stability.⁷ Once this is accomplished, initiating squat exercises by progressing through basic squat patterns will lead to healthy gluteal patterns, which are needed to spare the back.

In *stage 2*, stabilization exercises are introduced. The exercises that are the cornerstone of spinal stabilization are the plank, side plank, cat/camel, and bird dog position. Which exercises you use will depend on patient tolerance. Plank exercises can even be performed against a wall, rather than on the floor, if patient tolerance is low.

In *stage 3*, the goal is to develop endurance. Endurance, not strength, appears to be the factor that provides the most protection for the back.⁸ Hold each position no longer than seven or eight seconds. That duration is based on evidence from near infrared spectroscopy, indicating rapid loss of available oxygen in torso muscles contracting at these levels.⁹ The goal of treatment is to increase the number of repetitions, rather than increase the duration of each hold.

Sensorimotor Training

In addition to spinal stabilization training, improving balance, position sense, and delayed reaction times should be a part of every program. This can be accomplished by beginning with balancing exercises on the floor and progressing to unstable surfaces such as a rocker and wobble board. A new technology that enhances balance training is a vibration platform. Because patients who exercise on these are subjected to a large amount of involuntary muscle contractions, vibration training provides a low-impact way to enhance position sense, balance and reaction times. Some studies have shown favourable responses in chronic low back pain.¹⁰ In addition to proprioception and balance benefits,¹¹⁻¹² increased strength gains can be achieved in a fraction of the time compared to conventional training, with no additional loads.¹³

Training on any of these balance training tools does not require a significant amount of time. Training can take anywhere from two minutes on a vibration platform or using balance shoes to 20 minutes with the other tools.

As the back pain epidemic continues to persist, there is a realisation that no amount of diagnostic testing or large-scale rehabilitation program is going to provide the optimal solution. Evolving research in back pain suggests it is imperative for the clinician to provide a rational, stepwise approach to their chronic pain patients. Addressing adhesions and faulty movement patterns is essential prior to progressing to an exercise program. Focusing on back stability, balance and endurance, rather than low back strength or range of motion, will lead to better outcomes. Ultimately, the clinician needs to progress the patient to real-world tasks, at the same time ensuring stability of the low back, and all the while providing constant reassurance and support.

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