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## **Spinal Stabilization Exercises: The Low Cost Solution to Exercising Your Patients**

By Craig Liebenson, DC and Jerry Hyman, DC

The goals of spinal stabilization exercise are to allow the patient to move pain-free using the least amount of effort possible. To successfully navigate through the activities of daily living the patient learns how to protect potentially vulnerable structures of the spine by recognizing and respecting the functional limitations dictated by their low back condition.

For example, a person caring for an infant must avoid the natural tendency to slump when lifting the baby in their charge. They learn the importance of stabilizing their back by performing a slight anterior pelvic tilt ("tail out") to avoid the "strain" of slumping when kneeling or squatting during a lift. Conversely, while carrying a baby, the tendency of the spine is to kyphose. The stable position is maintained by performing a slight posterior pelvic tilt ("squeeze buttocks"). In other words, the stable position or range of the spine varies depending on the task. It is the practitioner's responsibility to identify the unique needs of each patient and situation and prescribe exercises or postural advice accordingly.

This is a highly individualized approach. Each patient may have sensitivities that vary with gravity/weightbearing, position, or movement.<sup>1</sup> For example, disc patients are usually sensitive to flexion positions or movements, as well as to gravity. Conversely, stenotic patients are sensitive to extension positions. The majority of patients without clinically significant structural pathology will vary in their sensitivities: from those with extension movement sensitivity, if their facets are irritable, to those with weightbearing sensitivity whose posture is disturbed.

These intrinsic sensitivities of the patient function in much the same manner the extrinsic demands of different activities described above (lifting, carrying). They indicate that exercises must be customized to the needs of the patient and/or their activity. The disc patient will require a program of nonweightbearing exercises which avoid the flexion range. The stenotic patient will require posterior pelvic tilt exercises in all

patients, particularly standing so that they can be trained to avoid the stenotic position. And the patient without structural pathology will need a varied program of exercises designed to protect their unique sensitivities and prepare them for the biomechanical demands of their activities.

This stabilization approach is not only a treatment but a strategy that allows a patient to function throughout the day within their prescribed limits. This is a very dynamic approach because these limits are constantly changing as the patient either improves or is faced with new challenges in their ADLs, occupation, or recreational activities. For example, when reaching overhead the patient will learn to produce a posterior pelvic tilt as a check rein to strenuous lumbar hyperextension. Conversely, during sitting and lifting, an anterior pelvic tilt will be taught to maintain the stable lordotic position of the spine during those activities where slumping is the natural tendency.

These particular movements are guidelines only. Movement involves the entire locomotor system not just one spinal segment or region. A chain of events is always involved which may start at the feet or the neck. For instance, hip extension may be restricted during gait and lead to overstress of the lumbar spine as compensatory hypermobility and trigger-points develop. But this problem may have stemmed from adaptations to hyperpronation of the foot. The key link may be a calcaneonavicular joint dysfunction or it may be a tight iliopsoas. The key dysfunctions must be addressed for our spinal adjustments, trigger point-therapy, or stabilization exercises to be truly effective.

The key to initiating stabilization exercises is recognition of the functional range of the patient. Dennis Morgan PT, DC, an originator of this functional approach says: "The functional position is the most stable and asymptomatic position of the spine for the task at hand."<sup>2</sup> This will therefore vary as described above, depending on the patients' activities (sitting, lifting, reaching) or sensitivities (gravity, positional, movement).

Early on in an acute patient or in a "kinesiophobic" chronic patient, the functional range may in fact be very narrow. In such cases isometric exercises, where little or no movement occurs, may be the best starting point. The skilled practitioner's task is to activate the patient as early as possible, and identify the proper functional range for initiating a progressive, therapeutic exercise regime. The initial functional range is their training range, and this is the seedling which if cared for will grow and expand into a wide repertoire of dynamic, stable, and pain-free activities.

A chiropractor's entire armamentarium of techniques and approaches will be challenged to unload and unstress the spine to "carve out" a training range. Neck or foot adjustments, postural muscle stretches, reflex therapies, etc., may all be incorporated as means to this end. The stabilization program starts by utilizing the position of least stress. For instance, exercises often will begin in a nonweightbearing supine position. Supportive devices (cushions, exercise balls) to help pre-position a patient in a pain-free posture will be utilized. Anything that can be done to help catalyze and initiate patient reactivation will be incorporated into this program.

Progression of exercises proceeds from simple to functional, nonweightbearing to weightbearing, stable to labile, etc. Attention is focused on the quality not the quantity of the movement. It is not the number of sets, repetitions, or weight that is performed, but the coordination and stability that is maintained during a course of repetitive and sustained exercises that is the goal. For example, strength gains at the sacrifice of proper pelvic positioning or lumbopelvic control will undo all the therapeutic good of our adjustments or other interventions. Sit-ups performed without lumbopelvic stability will overstrain the lumbar facets. Similarly, hip extension exercises on a standing hip machine or during bridges, if performed without enough posterior pelvic tilt, will overstress the lumbar spine causing irritation to facets and leading to myofascial trigger point formation in the lumbar extensor muscles.

Therapeutic exercise concepts/principles allow us to identify improper movement patterns during the performance of activities of daily living, circuit training, etc. While our patients must exercise to fatigue to appreciate strength gains, fatiguing the desired parts is more important than sets and repetitions. This is one of the main contributions of the neuromuscular perspective. Gyms are full of individuals supposedly promoting their fitness through various exercises. However, poor quality or "trick" movements are epidemic in such settings and undermine the purpose of such a pursuit.<sup>3</sup> For example, poor lumbopelvic control is commonly seen on stairmasters, treadmills, abdominal machines, lunge and squat exercises, and step aerobic classes. Cervicocranial hyperextension and a head forward position are seen during sit-ups, lat pull downs, squats/lunges, and rowing exercises. These are but a few examples to illustrate that quality of movement is usually ignored in health club settings. Chiropractors getting involved in rehabilitation will want to incorporate good biomechanical advice into their programs such as is emphasized in the stabilization program.

A recent study documented the effectiveness of stabilization exercises when combined with a McKenzie approach in failed lumbar laminectomy patients.<sup>4</sup> Timm, in a randomized, controlled trial looking at

exercise and passive care, concluded that low-tech exercises gave a greater benefit than high-tech exercises (Cybex), physical modalities, or joint mobilization.<sup>3</sup> Previous work by Saal and Saal involved stabilization exercises for a presurgical group of patients with back and leg pain who were referred for surgery. They withheld the surgical intervention and concluded: "All patients had undergone an aggressive physical rehabilitation program consisting of back school and stabilization exercise training," and a "92 percent return to work rate."<sup>5</sup>

The stabilization exercise program consists of floor, exercise ball, proprioceptive, and strength training exercises. So long as the functional range is respected, very challenging exercises can be created which isolate the key spinal stabilizers; abdominals, gluteals and quadriceps muscles. The cardinal sign of successful stabilization exercise therapy is postexercise soreness in the targeted muscles without an increase in the patient's back or leg pain.

The most exciting tool is the exercise ball, which by virtue of its dynamic shape allows for precise isolation of the key trunk stabilizers while challenging one's balance. By working the muscles, while increasing the balance demand, a tremendous "burn" can be accomplished very quickly.

Stabilization exercises take very little office space, don't require any expensive equipment, and can be helpful to patients weather five or 50 minutes is spent with them. Chiropractors can learn to incorporate this skill into their practices within a short time. They have been proven to be effective for failed surgery and disc patients. While manipulation is now the "gold standard" for nonradicular patients in the acute and subacute stages, an approach such as this is the perfect complement to any chiropractor's practice style.

### *References*

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This column will cover the integration of rehabilitation concepts in the chiropractic practice. Upcoming columns will include: "Rehabilitation: The Missing Link in Managing Headaches"; "Valid and Reliable Low-Tech Functional Capacity Tests"; "Duration and Frequency of Passive and Active Care for Complicated Patients." How to measure outcomes, find the correlation between muscle and joint dysfunction, and view regional complaints from a broad perspective of locomotor system dysfunction will be detailed in "DC".

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