

# Newsletter

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## Improving Core Stability

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Back pain is a common link among all human beings. Regardless of race, color or creed, back pain is a theme our early ancestors never had. Ten thousand years ago humans lived just into their thirties, forced to exercise daily, to constantly hunt and gather food. Furniture was unheard of. Humans simply squatted to harvest and eat and laid down to rest - both better for the spine than sitting in chairs. Today, more people work seated than standing and frequently live past seventy years of age, leaving plenty of time to suffer from the ill effects of a chair. Although people think they are resting backs when sitting, they are actually exposing their lower spine discs to 40% more pressure than when standing. Also sitting in a chair immobilizes the spine which, when coupled with the additional disc pressures, leaches the fluid out of the discs and encourages degenerative changes.

The Swiss Ball is an option that allows for a healthier spine in the seated environment. Used in years for rehabilitation from neurological and orthopedic injury, these large balls are only now making it into the general exercise and work place areas. For years I have successfully alleviated and often eliminated my patients' back pains by having them use the Swiss Ball as a chair at work, or at home, as well as performing specially designed exercise programs with it. Because the ball is round and has no back or legs it is unstable, unlike a chair. To sit upright on the ball requires activation of postural muscles - there is no chair back to lean on. The body must also activate its smaller joint stabilizer muscles to counteract the instability of the ball. It is the postural muscles that help us fight the effects of gravity and the stabilizer muscles that maintain the alignment of joints, essential to their health and longevity. The postural muscles must come into play to hold the body upright against gravity, unlike chairs and couches which often have soft backs and soft seats that perpetuate a slouch posture. Many simple movement exercises can be performed while seated on a Swiss Ball. These exercises help in pumping fluids through the spinal discs to nourish the disc tissue.

To better understand this process, think of your spinal discs like a sponge. When you apply pressure to a sponge the fluid contained is forced out. When (and only when) that pressure is released, the sponge (disc) will absorb fresh fluid. This process cannot be performed on a chair, which is a great reason for you to get on a ball for better posture improved balance, a healthier spine and reduced back pain!

### **What is core movement?**

The visible motion we see is the result of voluntary movement of superficial muscles. The beauty of that movement relies on complex patterns deep within the CNS (central nervous system). Just as the seed, the source of life of the apple, resides at the very core, so the seed of our movement lies deep within our intrinsic muscles. The intrinsic muscles (core stabilizing muscles) are responsible for joint stability, mobility and posture.

### **Which muscles react?**

Translated to the back, the erector spinae and the rectus abdominus muscles produce voluntary movement while the multifidus and transverse abdominus muscles provide stability. The multifidus cross one, two and three intervertebral spaces, allowing fast reaction time and minute control over each disc. The specificity of the fibers allows the muscle to stabilize the spine and prevent excessive deflections. The deep intrinsic muscles react first, with superficial movement secondary.

When we move from our 'core', our CNS immediately recruits both the deep erectors and the transverse abdominus, and then the ancillary muscles.

Sometimes, with repetitive strain or movement (as in sports related injuries) sustained end range loading to trauma, the body learns compensatory movement patterns to protect injured muscles. If compensatory patterns are repeated often enough and long enough, they become habitual. In this case, the CNS may bypass the deep stabilizing muscles and may send movement messages directly to the superficial muscles. The movement pattern may look much the same, but it is missing the element of core stability. Lack of core stability leads to more muscle imbalance, which in turn can be a precursor to more injury. For example, an ankle strain can lead to knee dysfunction and end up as low back pain.

To reactivate core, stability you need to reprogram the CNS. But the programming is locked away in the unconscious mind. The key to unlocking the system is bypassing the automatic switches and getting the message down to the lowest level of neuromuscular system. You do this by becoming aware of movement (gaining conscious control) and thinking through the movement, thereby activating the movement learning centers of the brain. Moshe Feldenkrais<sup>1</sup>, Vladimir Janda<sup>2</sup>, and other movement specialists advocate 'conscious' movement as a valid tool for movement retraining. This movement does not require great effort: it is small, slow and precise. In fact large, forceful movement restricts the brain's ability to make sensory distinctions while small movement with little effort prompts the CNS to reprogram.

Foam Rollers provide excellent 'prompts' and are especially helpful in core stability retraining. Because foam rollers are cylindrical and inherently unstable, they challenge conscious awareness, provide sensory motor challenges on two planes and enhance balance reactions, body awareness, muscle reeducation, motor planning and neural flexibility<sup>3</sup>. Because the roll is unstable, the mind is actively engaged in trying to stay on the Roller! From this very conscious balancing act, it is an easy step to becoming mindful of each movement.

<sup>1</sup>Feldenkrais, Moshe, Awareness Through Movement, 1977

<sup>2</sup>Janda, Vladimir, Motor Learning Impairment and Back Pain, Journal of Manual Medicine, Springer-Verlag, 1984:22

<sup>3</sup> Creager, Caroline. Therapeutic Exercises Using Foam Rollers, 1996

#### *Other Helpful Texts:*

- Liebenson, C., Rehabilitation of the Spine, 1996
- Lewit, K. Manipulative Therapy in Rehabilitation of the Locomotor System, 1999
- Richardson, C., Therapeutic Exercise for Spinal Segmental Stabilization in Low Back Pain, 1999