SPINAL TAP

MAY '06 ISSUE 3

Our focus for this newsletter is trunk stabilization exercises. Recently, emphasis has been put on co-contraction of the deep trunk muscles, the transverses abdominis and lumbar multifidus. Here we present two different opinions and approaches to teaching trunk stabilization exercises. An excellent overview is available in an article by CA Richardson and GA Jull in Manual Therapy 1995;1:2-10.

Robert Watkins, Jr., M.D.
Los Angeles Spine Surgery Institute
St. Vincent's Hospital
Los Angeles, California

New Approach to Trunk Stabilization

The CORE: The Inner Unit (Local) vs. the Outer Unit (Global) of the Lumbar Spine

There is a new breakthrough study in treatment of the lumbar spine by physical therapy. It was done by Hodges, Richardson, and Jull (Australians) and resulted in publication of a book entitled Therapeutic Exercise for Spinal Segmental Stabilisation in Low Back Pain, November, 1998.

This study had 2 groups of patients with recurrent low back pain. The groups both received PT and were given the same exercises from the same therapists with the exception of one exercise. Selective recruitment of the transverse abdominis and deep multifidi as well as the pelvic floor were given to only one half of the group. These patients stayed significantly better (much fewer relapses) than the group who were not trained in the selective recruitment of these deep stabilizers.

The main problem that occurs in low back pain patients is that frequently the transverse abdominus and deep multifidi turn down or even turn off after as few as one or two episodes of low back pain. As a result, these patients use their superficial global muscles such as the obliques, rectus abdominis, erector spinae and superficial multifidi but have little or no inner stability.

The global muscles are designed for movement but not for stability. Patients must be cued to bring their navel to their spines and to pull up on their pelvic floors. There are several other verbal as well as tactile cues to help them learn to recruit the local or inner unit muscles in a neutral spine position. If told to tighten their abdominals without first recruiting their inner unit (local muscles), they will automatically compensate with their global or outer unit muscles which are not designed for stability. Allowing our patients to use their superficial muscles without their stabilizers will ensure that they continue to have episodes of low back pain, using compensatory superficial muscles with no inner stability. Our patients may feel better after PT, but they won't stay better. We have a 3 year study which validates this.

The Watkins Trunk Stabilization was the best exercise protocol we had prior to this study. It now needs modification to teach control of the deep stabilizers in neutral spine position prior to beginning the sequence.

Judy Leese PT, MEd
Progressive PT, Inc
Tarzana, CA 91356

continued on page 2

Point/Counterpoint:Trunk Stabilization 101

As physical therapists, the majority of our patients are referred to us with low back pain. We are sent a patient to evaluate and treat, we come up with a list of signs and symptoms and then determine how best to proceed. We may manually address some findings, but know our work is not done. We determine there is some weakness and know that by increasing the patient's strength and endurance, we will see a decrease in pain. We have decided to start a beginning trunk stabilization program but have been hearing all this whispering about global versus local stabilizers. So, what to do…..

What is all the buzz about? Well, let's begin with teaching the patient the fundamentals. We first need to cue the patient on how to brace. Since the onset of trunk stabilization in the 80s, therapists have instructed their patients on this important component. However, the spectrum of what I have heard from patients is staggering. I have heard, "but my prior therapist told me to push my back down onto the table and suck in my stomach muscles." Or, "pull my belly button under my ribs and push my back down." Or, "I was never told to do anything with my stomach muscles." Or best of all, "I have been with a therapist for six months and I cannot contract my local stabilizers; therefore, I cannot do any exercises." "What?" I say.

I hope I don't offend anyone but that is a bunch of hogwash. After 20 years of trunk stabilization, patients are being told completely differing techniques on bracing, resulting in different back positions. Also, why are we so preoccupied with global versus local muscles? First, let's address the lumbar position. What our patients need to learn is their neutral, pain free, functional range. Generally, that would be "normal" lordosis and that normal lordosis needs to be controlled independent of the developmental posture the patient is in (motor control). This concept becomes most obvious when a patient has a HNP. Obviously, a patient with a herniation isn't going to be comfortable in a posterior pelvic tilt (back against the table) any more than a person with stenosis would be comfortable in an anterior pelvic tilt. To restate, the stabilized lumbar position should be one that is pain free and functional. Yes, functional. How functional is it to teach a patient to hold a posterior pelvic tilt if we are trying to return them to everyday activities whether that is throwing a football or loading luggage onto an airplane. Has anyone tried to walk holding a posterior pelvic tilt?

Okay, now that we have the lumbar position addressed, let's look at my favorite—global muscles versus local. When we hear "local stabilizers", we are talking about deep multifidi, transversus abdominis and some parts of others. Basically, those muscles that attach directly onto the spine and, due to their nature, do not appear to cause movement when contracted. So, they stabilize. When we hear "global", we are thinking all other muscles that cause movement of the trunk. Is there really this huge paradigm shift that the Australians allude to? From the onset of trunk stabilization, the verbal cue has been something like, "cough or laugh, and hold". Try it. We have those intrinsic muscles contracting as well as the global. Not only that but we have diaphragm action. Can you breathe well? Is talking easy? Sure, after some training. The Australians demonstrated that the multifidus muscle is weaker after injury and that weakness appears to last over time. They also found a delay in the contraction time of the transverse abdominis muscle. This is good and important research. But, as clinicians we need to remember everything we know about the lumbar spine and include it all in our treatment.

Now, if therapists were exclusively using sit-ups and back extension exercises and calling it trunk stabilization, then we would have a problem. But I don't think that is happening. Therapists are generally using an array of exercises; both very traditional, isolated lumbar training exercises and classic abdominal and back extension exercises. One more thought about the exercises. Would a therapist not strengthen all the muscles that cross the knee joint simply because the patient is having a timing problem with the VMO? Therefore, back exercises should not be stopped simply because a patient cannot contract their transversus abdominis. With training, all muscles of the trunk will see an improvement in endurance, strength and timing.

So we now have a patient in a good position, isometrically contracting the important muscles so as little movement as possible occurs. Now what? Well, we have them do whatever we can to challenge their ability to hold this neutral or pain free position. Why? Because that is how we get a back patient returned to their daily activities. By challenging their ability to hold neutral, the outcome is a stronger, more functional person who is able to call on all that they have learned and use that in their everyday life. They can catch a ball in center field and automatically stabilize their trunk muscles to protect their back. It has become as automatic as a sneeze.

To conclude, in the 80s, a group of Bay Area therapists took a European theory on trunk stabilization and put it into practice. The results were remarkable and publicized when in 1987 Joe Montana herniated a disc during a game, had surgery, and trained using exercises that stabilize and strengthen the trunk. Joe returned to play after just five weeks. His therapist incorporated all that she knew into his rehab. The therapist did not concentrate on just the local stabilizers and neither should we.

Gale Hazeltine MSPT, OCS

Worth mentioning:
There are excellent research articles written by a man named Stuart McGill that I highly recommend reading for anyone interested in this topic.