Core Muscles Training for Lower Back Pain

Core Muscles Training

This specialized training is designed to retrain and condition the crucial lower back muscles that surround the lower spine. Having originated out of physical therapy in the 1930s, this therapy program has gained wider exposure due to the emerging popularity of Pilates and core training classes. While this program has proved its effectiveness with many individuals, it also requires the acquisition of a new level of muscle control of deep inner muscles that most people have had no familiarity with. Here is a description of the core muscles anatomy, functioning and basic techniques to control these muscles.

The Core Muscles

Four Muscle Groups Forming a Cylinder of Muscles Lining the Inner Surface of the Abdomen

Front of the Abdomen - *Transversus Abdominus*

These abdominal muscles (commonly called the transverse abdominals) lie deepest in the abdomen -- underneath the *rectus abdominus* (commonly called the 6-pack muscles) and the *oblique abdominals* (commonly called the obliques).

The transverse abdominal muscle is considered to be the main support muscle providing stability -- connecting via the *thoracolumbar fascia* to each lumbar vertebrae (lower back) of the spine and wrapping around to the front of the abdomen and connecting to *the abdominal aponeurosis* and *linea alba*.

Back of the Abdomen - Multifidis

A very deep intersegmental back muscle on both sides of the spine, connecting to each lumbar (lower back) vertebrae. The multifidis is involved in bending the back and spine as well providing postural support to keep the spine upright.

Above the Abdomen - Diaphragm

The diaphragm is a domed-shaped muscle of respiration functioning at the top of the core. It provides stability to the spine by contracting and tightening in concert with the transverse abdominals, thus maintaining a firm pressure of stability in the abdomen.

Below the Abdomen - The Pelvic Floor Muscles

Like the diaphragm, the pelvic muscles contract with the transverse abdominals to form the cylinder of muscles surrounding the abdomen, thus providing a connecting loop from front to back (from the tail bone to the front of the pelvis).

Technical Anatomy

Pelvic floor muscles are also called the *pelvic diaphragm*, which consists of a group of small muscles and connective tissue working in unison to support the spine. These muscles are: *levator ani* (made up of *pubococcygeus*, *puborectalis*, and *iliococcygeus*), the *coccygeus*, and the *perineal* membrane and *deep perineal pouch*.

The Objective of Core Training

When the four muscles contract together correctly, support is given to the spine by maintaining a stable position (called the neutral zone). They keep the core of the body rigid during all types of movement. Clinical research has confirmed that low back pain results when core muscles stop contracting prior to limb movement – making the spine susceptible to injury. These muscles operate without one's conscious perception, contracting and stabilizing the spine during any movements – even before any arm or leg movements take place! Thus reprogramming the core muscles to contract at the correct time is the basic process of reestablishing core stability.

Contracting the Core Muscles

By properly contracting the core muscles – and this is a perfected technique beyond simple muscle contraction – the entire group of muscles (the transverse abdominals, multifidis, diaphragm and pelvic floor muscles) operates as a unit to support the lower spine.

Learning to contract the right amount of pressure on the core muscles is best achieved by first fully contracting the muscles, and then releasing the contraction by half, and then half again. You can find these muscles by taking your index fingers and placing them on the bony prominences on the front of your pelvis (*anterior superior iliac spines* - ASIS). Try to contract your TA (transverse abdominal muscle) by drawing your navel towards your spine without changing the position of your lower back. By gaining the sense of how to use these muscles, enables one to acquire the "touch" of a gentle tightening process.

Body Position

Lie on your back, knees bent up, with hips resting against the rug or mat (not the hard floor). Feet are shoulder width apart, and the upper body is completely relaxed.

Do not hold your breath as you perform the exercises – just breathe normally. Don't breathe into your diaphragm (puts too much pressure) rather focus on breathing into the sides of the rib cage.

Visualization Techniques

There are two popular mental processes that aid in learning to contract the core muscles.

- As you exhale, visualize contracting your navel (belly button) down to the floor below you. This technique contracts the transverse abdominals. If this does not work, cough, and you will feel the TA pop into your hands. That is what you are looking to feel without coughing.
- As you exhale, visualize preventing yourself from urinating by pulling up the muscles that control your bladder (we've all done this one before). This technique contracts the *pubococcygeus* (PC) muscles (part of the pelvic floor muscle group). The PC muscles are also called the kegel muscles.

Kegel (pubococcygeus or PC) Muscles

Techniques for contracting the PC muscles (one of the pelvic floor muscles) were first developed by Dr. Arnold Kegel, hence the term PC muscles. (The kegel exercises are also known as pelvic floor muscles training.)

The focus of these exercises is to specifically contract the PC muscles, which are integral for controlling the bladder and are often given to pregnant women to condition these muscles for the birthing process. Technically, the kegel exercises provide muscular conditioning for preventing vaginal prolapse and uterine prolapse as a result of the birthing process.

These exercises are also used for treating urinary incontinence in both men and women. For men, they can also help in treating prostate pain and swelling resulting from *benign prostatic hyperplasia* (BPH) and *prostatitis*.

In addition for women, kegel exercises are used for increasing sexual gratification.

Receiving Instruction

Learning to properly contract the core muscle requires a considerable amount of practice to develop the right technique.

Receiving Instruction - continued

Since the technique is subtle (compared to strength training, etc.) and that doing it improperly often results in over contracting the major muscles that surround the core muscle, it is recommended that in your initial stage of training, you seek out a class with a qualified instructor. It's really important to get it right the first time, so you don't have to go through the difficulty of unlearning the wrong way before perfecting the right way.

Sources: **The Intersegmental and Multisegmental Muscles of the Lumbar Spine: A Biomechanical Model Comparing Lateral Stabilizing Potential** *Spine* 1991; 16(7): 793-799 **Respiratory-related Activation of Human Abdominals Muscles During Exercise** *Journal of Physiology* 2002; 541.2: 653-663 **A Universal Model of the Lumbar Back Muscles in the Upright Position** *Spine* 1992; 17(8): 897-913 **Functional Stability Re-training: Principles and Strategies for Managing Mechanical Dysfunction** *Manual Therapy* 2001; 6(1): 3-14