Core Training with Drag Resistance

By Rick McAvoy, PT, DPT

Core training is a term that has been widely used in the rehabilitation and sports performance world for a number of years, and has been growing in popularity in the fitness arena. Many aquatic fitness professionals develop exercise programs that emphasize the core muscles. Before beginning to incorporate resistive equipment into aquatic core workouts it is very important to have a proper understanding of what the core is, and how it functions. This will assist in executing safe and proper exercise programming.

What is the core?

The core is a multilayered muscular box comprised of 29 muscles of the lumbo-pelvic-hip complex. There are multiple interactive elements involved in order to create proper core stability:

- Central Nervous System
- Passive Structures: Vertebrae, Capsules, Ligaments
- Active Structures: Muscular System

Muscular Anatomy

Slow Twitch Muscles (deep core). These muscles function for compression of the spine, pelvis and hip joint and prevent excessive translation of joint segments. They also provide sensory feedback for posture and movement. Muscles include: Transverse abdominis, multifidi, diaphragm, psoas major, and pelvic floor. (Note: the diaphragm serves as the roof of the muscular core box, so teaching your clients proper diaphragmatic breathing will assist in proper core training.)

Fast Twitch Muscles (superficial core). These muscles are responsible for producing large amounts of torque and gross movements. Muscles include: Erector spinae, external oblique, rectus abdominis, quadrates lumborum, gluteus medius/maximus and adductors.

Developing an Aquatic Core Program

Exercising the core without proper coordination and motor control can cause compensation and muscle imbalances, often leading to inefficient movement patterns and possible injury. Make sure you screen your clients before initiating a core program with resistive equipment.

Muscle imbalances are something I wrote about in the June/July 2014 issue of *AKWA*, and especially apply to core training. For example, if the hip flexor group (iliopsoas) is tight and overactive, it will cause reciprocal inhibition of the gluteus maximus and create issues with the lumbar spine.

Core Exercises

The transverse abdominis (TA) muscle is the deepest muscle in your core. Its fibers primarily run horizontally around the abdomen like a belt. It is one of the primary stabilizing muscles and should be initially developed in a core-strengthening program.

Teaching your clients how to activate their abdominal wall musculature by proper abdominal bracing is the first step in an aquatic core program. More research is being published lately on the abdominal bracing technique versus abdominal hollowing technique for proper TA and oblique activation. It seems as though the abdominal bracing technique is more effective.

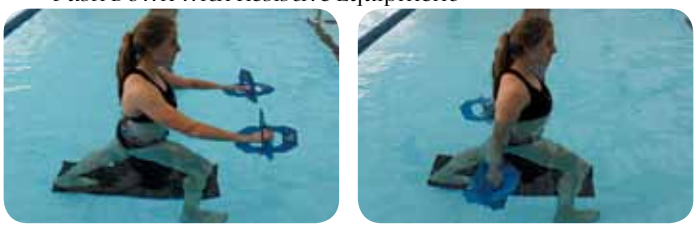
Kickboard Push Down: I typically incorporate this exercise to begin to improve initial abdominal bracing technique. Proper cueing for technique should be incorporated for any aquatic exercise, but especially for this one. Cue to maintain proper upright posture with chest lifted, elbows straight and core tight. Push board under the water, pause briefly, and then return to start position with control.

Push Down with Kickboard

Once the individual can properly engage the transverse abdominis, then a functional advancement using resistive equipment and movement variation may begin.

Push Down: Taking the same exercise, progress by use of drag equipment to increase resistance. From there I integrate an alternating pattern.

Push Down with Resistive Equipment



Alternating Push Downs with Resistive Device

Chest Fly: Submerged horizontal abduction with a resistive device has shown the highest activation of the erector spinae lumborum musculature, even when compared to land-based exercise. (Colado et al.) I also find that alternating this movement really challenges a client's ability to stabilize and maintain alignment.

Flies with Resistive Equipment


Alternating Flies with Resistive Equipment


Rotations: Core rotations emphasizing the transverse plane really are very challenging, and the client needs to be able to maintain proper alignment throughout the entire exercise.

Core Rotations with Resistive Device

When developing a core-training program in the water with drag resistive equipment, emphasis should be placed on the following progressions.

- Simple and slower to faster and more complex movement patterns.
- Lower forces to higher forces/speeds.
- Stable to unstable surfaces and stances.

By having a greater understanding of what comprises the core system, the aquatic fitness professional can better design a more comprehensive, safe and effective workout for students and clients. ●

Reference

Colado, Juan C; Tella, Victor; Triplett, N Travis. (2008) A Method for Monitoring Intensity During Aquatic Resistance Exercises. Journal of Strength & Conditioning Research: November 2008 - Volume 22 - Issue 6 - pp. 2045-2049.

Author

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