Deep Water Heel to Buttocks: Notice the ITB tightness of the left lower extremity

The Great Equalizer

Using water as a screening tool for athletic performance

By Rick McAvoy, PT, DPT, CSCS

It seems that each time an article is written about incorporating aquatics into the athletic population, the focus is on using the water's supportive and gentle properties when the athlete cannot tolerate the full gravitational influences of land-based training. Or the article emphasizes use of water for its cardiovascular benefits, such as in deep-water running.

However, I find the water to be a very beneficial tool for other reasons as well. Water is a powerful medium that can be used in any phase of an athlete's training—from rehabilitation to the highest levels of sports performance.

I have been incorporating water into my athletes' training programs for years. Now more than ever, there is research in the strength and conditioning journals validating the benefits of aquatic training for strength, flexibility and power, among other effects.

Using the water as a movement screen is something I have discovered to be very beneficial and incorporated into every athlete's aquatic training session. In the water, you are able to target multiple muscle groups simultaneously and focus on both agonist/antagonist and side-to-side comparison very quickly.

Athletes rely heavily on motor patterning for their specific sport. They also, like most of us, are influenced by gravity and momentum. In the water, both gravity and momentum are diminished and movement tends to slow down.

This commonly brings out dysfunctional patterns more clearly. Because water is a surrounding medium and provides three-dimensional resistance, when an athlete moves in the water, he is subjected to the forces of buoyancy, viscosity and drag. These factors tend to turn most athletes (at least initially) into motor morons.

Even the simplest movement, such as walking forward or backward with proper reciprocal arm swing, has frustrated the most elite athlete in my experience. I encourage them to always remember, "The harder you push, the harder the water pushes you back, so there is no way you can ever overpower the water." On a good note, the water's hydrostatic pressure acts as a second pair of hands and assists with increased proprioceptive feedback so the athlete is able to improve his body awareness and motor patterning relatively quickly.

Mobility or Stability?

Athletes must have an equal amount of mobility and stability for optimum sports performance. One without the other tends to equal joint dysfunction, which leads to injury. In the water, it is easier to screen for issues with mobility or stability by manipulating the athlete using the water's properties and by paying close attention to body position and alignment from all directions as the athlete moves.

Often, the aquatic screening and correction exercises are the same; the only difference is the cueing from you, the therapist/trainer.

During the initial screening exercise, the athlete should only be given simple instruction on how to perform. Again, it is crucial to view the athlete from the front, back and sides during the screening exercise so any issues with mobility and/or stability become more evident.

If you are relatively new to aquatic training, this will take a fair amount of practice. The corrective cueing should then be given to further determine the extent of either mobility or stability issues. Below are a few examples of how to challenge the athlete in the water to bring out dysfunctional movement patterns more clearly.

Multidirectional exercises such as walking/clap-behind exercise in both forward and backward directions are very simple ways to note issues with mobility/stability. The athlete performs this exercise by keeping the upper leg in a vertical position in line with the body, then bringing the heel toward the buttocks while attempting to reach back with both arms to touch the lifting heel, then stepping forward and performing with the opposite leg.

Common compensation is seen with hip flexor tightness in that the upper thigh comes forward. Also, with increased ITB tightness we tend to see the upper leg move into abduction. Limitations in pectoral and biceps length will also become evident. With decreased core stability, there is also increased lumbar spine extension as the heel comes back toward the buttock. When the athlete performs clap-behind exercise and then steps backward, he requires increased pelvic stability to stabilize on the closed-chain leg as the open-chain leg moves into extension. Proper cueing for proper pelvic stabilization during the corrective segment of this exercise is essential.

If you still need confirmation, put the athlete in the deep water in a vertical position holding two flotation barbells (pictured) and then perform the exercise with the lower extremities. This exercise in the deeper water requires increased abdominal and gluteal recruitment to stabilize the body.

Varying the water's depth as just mentioned makes deficits of stability more clear. Since the water becomes deeper, the athlete finds it more difficult to stabilize in a vertical position because more gravity is diminished. Usually in deeper water, while the athlete is suspended in a vertical position, you will see the athlete's legs move forward with increased hip flexion. Cueing for proper gluteal recruitment will increase vertical

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alignment and improve hip extension. Is this Lower Crossed Syndrome? Maybe, but not if proper alignment can be maintained with proper cueing. Perhaps as a friend of mine says, it is "waking up the DNA."

Multiple positions in the water, such as supine, prone and side-lying, make it easier to focus on agonist/antagonist deficits and side-to-side deficits with your athletes. By having the athlete in a supine position with barbells and/or a flotation belt and attempting to maintain a horizontal position in the water, deficits in gluteal recruitment will be brought out. A prone position will bring out deficits more related to abdominal recruitment. Moving into a side-lying position reduces the surface area by about two-thirds, forcing the athlete to incorporate the entire lateral line musculature. Deficits are noted from side to side.

Performing exercises at multiple speeds tends to bring out dysfunctional patterns more clearly. If an athlete tries to fight the water and uses too much momentum, issues with stability usually become much more evident. For example, if an athlete is performing plyometric training in the water incorporating vertical jumps and the speed is increased, you will usually see increased collapsing of the less-stable side.

Different types of aquatic exercise equipment also can be helpful in determining issues with mobility or stability. If you are questioning an issue with lower-extremity mobility, then an assistive device such as a flotation cuff on the leg can help determine if there truly is an issue with lower-extremity mobility. If stability is a question, then a resistive fin with increased speed will tend to bring out stability issues in the trunk or lower extremity. Remember that proper alignment and cueing are the keys to detecting movement pattern dysfunction in the water.

Certain aquatic exercises bring out evident muscle dysfunctions more clearly than others. The type of athletic population you work with will determine if the athlete has more stability or mobility issues. For example, if you work primarily with gymnasts, then stability may be more of an issue. Whereas if your clientele consists of football players, mobility may be your focus. Either way, the water is a very effective medium for treating any type of athlete or dysfunction. If possible, performing land-based training with your athletes on the same day as your pool session will help instill the proper corrected motor patterning with more of a gravitational influence. I refer to this as "amphibious training."

Incorporating components of this aquatic screening into your athlete's initial exposure to the aquatic setting will allow you to target movement pattern dysfunction to a greater extent, thus enabling you to design more effective aquatic training sports performance programs. This will not only help enhance your athletes' performance outside the pool, but also hopefully reduce the frequency of athletic injuries overall. Remember that regardless of your athlete's size or sport, water is the great equalizer. ■

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