

AQUATIC ATHLETIC REHAB AND CONDITIONING FOR RUNNERS

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“Very often the difference between the perennial champion and the perennial bridesmaid is just that edge; an ability to avoid and/or recover quickly from physical trauma.”
(Liquori & Parker, 1980)

Injury Rehabilitation Plus Athletic Conditioning

Despite the fact that sport has become increasingly sophisticated in terms of physical training, the number of running-related injuries is rising, especially among young athletes. Fortunately, water is an ideal environment for injured athletes to heal as well as maintain and even increase their fitness and their performance. In fact, the biggest misconception about aquatic athletic training is that it's only useful when injuries prevent land training, On the contrary, it can be a valuable cross-training tool for any sport, though for the purposes of this article we will focus on running. In addition to offering a healing environment and an opportunity to increase fitness, aquatic athletic conditioning also provides a means for injury prevention. In fact, depending on the intensity at which you apply them, many aquatic techniques can be concurrently therapeutic and challenging. Altering intensity with ROM and speed of movement and using progressively challenging equipment allows the aquatic therapist to increase the workload incrementally, keeping clients challenged throughout the process.

The key is to demonstrate to your athletic clients (whether they are competitive or recreational runners) that the pool is both a post-rehab safety net and a challenging, effective fitness-training tool. Also important is to

help clients see that this aquatic continuum between rehab and fitness is fluid – that as they heal, aquatic sessions become progressively more fitness-oriented, but also may regress to being more therapeutic when necessary.

Two Main Goals: Healing and Conditioning

Your two main goals in working with injured athletes should be:

1. Facilitating healing of the injury

and, equally if not more importantly

2. Concurrently maintaining and even increasing the athlete's overall conditioning as they heal; preparing them to return to land-based training; and, hopefully, convincing them to continue aquatic cross training to both enhance performance and prevent future injuries.

Deep Water Running for Rehab and Conditioning

Deep water running (DWR) can be a great adjunct to the pounding of long distance running or sprinting on land. Most of the research examining the merits of DWR have demonstrated its ability to maintain aerobic fitness in injured runners during a layoff. Only a few studies have looked at the performance-enhancement potential of DWR regardless of injury. In one study conducted at Brigham Young University researchers divided 32 equally fit runners into 3 groups and had one train exclusively by DWR, one group continued their normal running training and a third group trained only on stationary cycles for 6 weeks, after which maximal aerobic capacity (VO₂max) was measured while all three groups ran on treadmills. Not only did no significant differences occur between the three groups, but all of the

athletes improved their two-mile race time by an average of one percent even though the aquarunners and cyclists hadn't run one step on land in six weeks. So not only can DWR be important in maintaining runners' fitness during injury layoffs, it can also potentially boost performance as much as land-based training but without the impact and potential for injury.

I realize many of you reading this article don't have access to deep water, but for the most part with aquatic running, the water doesn't have to be that deep; four-to-five feet will often suffice.

Proper Deep Water Running Form

The key to proper DWR form is to maximize resistance by maintaining a vertical alignment with only a very slight forward lean. The most common mistake athletes make in aquatic running is leaning too far forward. I often use former sprinting great Michael Johnson, the former 200m/400m Olympic champion, as an example when trying to get athletes to run more erect in water. What made him unusual was his upright posture when he sprinted versus the classic form used by most sprinters. One of the advantages of DWR versus land running is the ability to engage more muscle groups, especially of the upper body and core. When done correctly, DWR is truly a full-body workout. Encourage your clients to pump their arms, cup their hands, activate their gluteals and engage their abdominals.

Four Styles of Deep Water Running

I teach my runner clients four different styles of running (all of which emphasize different muscles) as well as other deep water exercises such as cross-country skiing to keep things interesting and challenging.

1. I call this first style of running “shuffle running” - which is short for “Marathon Shuffle Running” because it mimics a marathoner’s efficient, shuffle gait with minimal hip and knee flexion and with a plantar flexed foot. Many distance runners are heel strikers so this plantar flexed position of the feet in shuffle running counter-balances and also strengthens the anterior tibialis muscles of the shins. “Dolphin running” is a more advanced version of shuffle running. It is simply an elevated version of shuffle running which increases intensity and prepares a client for eventually going without a flotation belt by requiring that they lift their body vertical out of the water.

2. The second style of running, “high knee running” is more of a sprinting style –with a dorsiflexed foot and 70-80 degrees of hip flexion. The focus here is quick cadence or turnover.

3. The third style is “tire running – knees in and knees out”, which is basically high knee running with internal and external rotation. This style of running simulates running through 2 rows of tires the way that football and soccer players do in practice. I also have them use a one-armed breaststroke arm (with the back of the hand) opposite the leg to challenge core stability and I cue clients to avoid any lateral movement of their core.

4. The fourth style of running, “overstriding” is an exaggerated, full ROM running style with a lot of hip and knee flexion and extension, similar to what runners do to practice their stride on a track or on a field to simulate the end of a race when they “kick it in”. Here the focus is on ROM rather than leg turnover.

Equipment:

When working in “deep” water I start athletes with a flotation belt to establish their form. Also most athletes have low body fat and a high lean mass and are therefore sinkers, which makes training without a buoyancy device too difficult initially. Aquajogger (www.aquajogger.com) makes an extra-buoyant belt called the PRO Shape, which works well with lean, muscular athletes. Later, to increase resistance for lower body muscles and further challenge the core, I’ll replace the belt with Aquajogger’s “Aquarunner” buoyant footwear. I’ll also have them run and perform other deep water exercise wearing Zoomer fins, which can help strengthen anterior tibialis muscles and increase ankle flexibility. To increase their upper body workload, I often have the athlete wear webbed gloves. I also typically tether a flotation-belted athlete to a ladder or diving board to work on their form. Tethering an athlete also gives the therapist more control over the therapy session and it can increase resistance and therefore the workload for the athlete when they travel forward. If you’re working with more than one athlete, try tethering them side-by-side or even back-to-back to add further challenge to the workout. I also use what I refer to as a “supertether” with more advanced clients. It’s made by Swim Ex or NZ Manufacturing (www.nzcordz.com) and is designed for swimmers with a waist belt so it doesn’t necessitate the client wear a flotation belt. As a result it offers a very intense workout. The client can also turn the waist belt around so they can perform backwards and sideways movements all while working against the significant resistance of this bungee-cord type of tether. Sometimes, however, no equipment is the most challenging of all. I’ll have an advanced athlete do interval training without any flotation support provided they’re

able to maintain proper vertical alignment. I'll also have them run up a pool wall, using the high knee running technique. "Running the wall" simulates running up a steep hill and it also requires the runner to stay upright and engage their core muscles.

Monitoring Intensity

To monitor cardiovascular intensity with an athlete, you may want to use a heart rate monitor, particularly if they are accustomed to training with one. Be sure, to explain to your athlete that their training zone will be approximately 10-to-15 percent lower for the same effort on land. More than heart rate, I typically use perceived exertion to monitor work effort. In the pool, I recommend using a modified perceived exertion scale developed by David Brennan. Instead of the traditional six to 20 range of the Borg scale, Brennan's is a one to five-point scale, where one is "very light", three is "somewhat hard" and five is "very hard." You may also want to use a metronome (or metronome app on your phone) to establish cadence cycles in the water.

Injury Prevention with Aquatic Sport-Specific Training

Many running-related injuries result from imbalances in the strength and flexibility of opposing muscle groups. For example, runners typically have stronger and tighter hamstring muscles compared with their quads, which can lead to hamstring strains as well as knee problems. Exercising in the water necessitates that you work both halves of each muscle pair. This works to balance the strength and flexibility of opposing muscle groups which helps prevent future injuries.

Water is also a great transition environment. You can use the different depths of the pool to gradually transition an athlete back to land exercise. Runners, for example, can transition back to land-based running by gradually training in water of decreasing depth.

How the Aquatic-Rehab-to-Fitness Continuum Changed My Life

I became an aquatic therapy specialist largely because of the personal success I experienced with the aquatic rehab-to-fitness continuum as a competitive runner. Growing up I was not a “water person”. In fact, I was the only kid on my block not on the swim team. I nearly drowned twice before the age of two so if you were to tell me back then that I’d eventually earn my living working in water I would’ve laughed. What led to that change? I discovered that the pool was the best place for me not only to rehab for my sport but also condition for it with great results. Despite musculoskeletal challenges stemming from a congenital scoliosis and a subsequent leg length discrepancy and a history of frequent injuries, thanks to my aquatic training I became a faster, more resilient runner, eventually qualifying for and competing in the 2000 Olympic Marathon Trials. I truly believe my aquatic training gave me an edge over my frequently injured competitors by not only improving my fitness but also helping me prevent injury. Over the past 21 years I’ve not only seen this aquatic continuum work for myself, but for many, many clients of all ages. Today at 50, while I no longer compete, I’m still running pain-free thanks to the work I do as an aquatic therapy specialist/exercise physiologist. My own aquatic workouts have not only enabled me to continue running, but also enjoy a very physically active life in general.

