

Confidence Gain

Water is a welcome sight for many patients with acquired brain injuries

By Patty Lefrak, PTA, CBIS, ATRIC

Aquatic Therapy

Aquatic therapy has a rich history with roots dating back to the days of the Grecian empire. In fact, the so-called father of medicine, Hippocrates, applied a variety of "water healing" techniques for patients, finding its unique properties ideal for physically constrained patients who had difficulty exercising on land.

He understood that buoyancy makes individuals less weight bearing, reducing the amount of pressure placed on a knee or hip, for example. And he learned that water's resistance qualities helped orthopedic patients improve flexibility, strength and muscle tone.

These same principles apply to other areas of therapeutic rehabilitation, including programs focused specifically on treating patients with acquired brain injuries (ABIs).

Aquatics for Individuals With ABIs

Causes of an acquired brain injury include external forces applied to the head and/or neck (traumatic brain injury), anoxic/hypoxic injury (i.e., cardiac arrest, carbon monoxide poisoning, airway obstruction, hemorrhage, near drowning), intracranial surgery, infectious diseases, seizure disorders, toxic exposure (i.e., substance abuse, ingestion of lead and inhalation of volatile agents), aneurysms and vascular obstruction (stroke).

An acquired brain injury can result in cognitive, physical, emotional or behavioral impairments that lead to permanent or temporary changes in functioning, often dramatically affecting an individual's balance, gait, flexibility and strength and emotional stability. Enter aquatic therapy.

Aquatic therapists have found that water-based activities help patients with acquired brain injuries gain strength and stimulate the confidence that will encourage them to try similar activities on land, assisting in a quicker return to near-normal functionality. The physics behind aquatic therapy is hydrostatic pressure, or the force exerted by a fluid, which increases or decreases in proportion to its depth to create buoyancy. In fact, individuals are up to 90 percent less weight-bearing in neck-deep water than on land, ensuring that weak muscles are well supported.

Many patients with a brain injury will have muscle spasticity on the affected side. Aquatic therapists have found that warm water is conducive for dampening spastic movements and

tremors. When heated to between 85 and 90 degrees, the water helps soothe muscle tone, providing for greater range of motion with less pain.

Water also is a great medium for re-educating muscles-one of the most common physical therapies for individuals with neurological impairments. Its property of viscosity provides natural resistance, meaning that an individual must exert more effort in the water to accomplish the same exercise on land.

Resistance activities in water build muscle tone, improve balance and even increase cardiovascular fitness. Varied levels of resistance-the speed at which an aquatic therapy pool's treadmill moves, for instance-can be used to create progressions for patients recovering from an acquired brain injury.

Take Scott, for example, a marathon runner who suffered a stroke that left him unable to maintain his standing balance without support. As part of his treatment program at Pate Rehabilitation, he runs on a treadmill in an aquatic therapy pool to improve his gait pattern and core stability. On land, this was prohibitively difficult, but in a buoyant environment-controlled by the therapist who can raise or lower the pool's water level-Scott is achieving remarkable success.

Running in the water has helped decrease his base of support during gait, allowing him the freedom of working on unsupported walking while in the water, a goal Scott wants to eventually carry over on land. Overall, aquatic therapy has not only helped Scott regain his strength and improve his gait, but it has also greatly boosted his confidence that perhaps one day he will be able to return to the sport he loves.

New Techniques, New Equipment

The practice of aquatic therapy is becoming more sophisticated, with many emerging techniques that not only employ therapeutic advantages, but are also enjoyable activities. Ai Chi, for instance, mimics the fluid movements of the Tai Chi martial arts, a Chinese technique known for its healthy benefits in dealing with stress and tension.

Ai Chi is performed standing in shoulder-depth water using a combination of deep breathing and slow, broad movements of the arms, legs and torso. It is described by its creator Jun Konno,



This is the end portion of a modified Ai Chi pose. The patient has moved her arms, rotated her trunk and pivoted her feet. At this time, she requires tactile cues from the therapist in order to maintain her balance and align her body. Throughout the activity, therapist Patty Haddock, PTA, CBIS, ATRIC, works on deep breathing with the patient.

an Olympic swimming coach, as a combination relaxation/exercise technique "that increases oxygen and caloric consumption simply with correct form and positioning in the water . and is ideal for creating improved range of motion, balance and mobility."

The Bad Ragaz Ring Method, named after the mountain town of Bad Ragaz, Switzerland, which gained notoriety in the 1930s as a hub for aquatic therapy, is based on specific movement patterns and is enhancing the rehabilitation treatment of patients with acquired brain injuries. These patterns are performed while the patient is supported horizontally in the water by floats or rings and consist of passive, active, active assistive and resistive movements, allowing the therapist to help facilitate or inhibit a response from the patient.

Should the patient have a cognitive deficit that prevents him or her from performing the movement patterns, the therapist would use the passive approach, in which the therapist moves the patient's arm or leg. The Bad Ragaz Ring Method is also very beneficial to those who have lost function in a limb by assisting in the neuromuscular re-education of that hemiparetic limb.

Today's aquatic therapy pools are designed to help facilitate more effective treatments that fit a particular patient's individual diagnosis, needs and goals. Underwater treadmills are effectively used for gait training, whether at a walking or running pace.

In addition to controlling buoyancy levels by adjusting water levels, therapists can increase or decrease resistance by activating a series of jets. To supplement a therapist's instruction, many facilities are even using underwater cameras that connect with recording equipment and nearby monitors to provide instant visual feedback for patients.

Some individuals are even using the aquatic therapy techniques to return to swimming. For example, Kate suffered a stroke and was diagnosed with a seizure disorder. During her rehabilitation, Kate used the pool to return to swimming.

Her aquatic therapy sessions help strengthen her core muscles by using those muscles to stabilize her body in the water and against the jets. The movements used help strengthen Kate's arms and legs while rotation of her trunk and reciprocal arm movement aid in improving her gait pattern.

Ultimately, these movements will translate into improved walking and balance on land. Besides gaining strength, these activities have also boosted her confidence and given her a sense of normalcy and enthusiasm-part of the less documented, but no less important, psychological benefits of aquatic therapy.

In addition to the physical attributes, water is also a healing medium for reducing stress and improving concentration-two significant areas of focus in acquired brain injury rehab. Many individuals who are overly focused on a particular exercise on land have a tendency to hold their breath.

Therapists have found that the less stressful aquatic environment provides a great opportunity to work on consistent breathing patterns. They also note that one-on-one instruction in a private and safe pool helps ease a patient's anxiety, producing quicker results among individuals who have not responded as well in group settings.

A Small Part of a Larger Effort

One concern that treatment centers may express when launching an aquatic therapy program is how they will be reimbursed for these services. That issue was largely laid to rest in 1995 with the addition of an aquatic therapy current procedural terminology (CPT) code. Up to that point, providers were simply billing aquatic therapy as "therapeutic exercise." Yet some insurers remain suspect of aquatic therapy charges-concerned that it could amount to not much more than a long soak in a hot tub, perhaps-and continue to deny aquatic-related claims.

The lack of understanding of the importance of aquatic therapy and the reimbursement hesitations indicate the need for aquatic therapists to present a united front to espouse the benefits of aquatic therapy for many injuries, including acquired brain injuries.

Organizations such as the Aquatic Therapy and Rehab Institute provide education and certifications for health care professionals working in the aquatic environment. Its programs are designed to promote therapeutic standards and best practices that can be applied to patients with virtually any physical ailment.

Aquatic therapies designed for patients with acquired brain injuries are effectively helping individuals with acquired brain injury to not only regain balance, strengthen muscles and walk or run at a consistent gait, but to also regain the confidence and emotional strength they had before their injury.

The most successful aquatic therapy regimens complement an overall treatment plan with activities that mimic land-based movements.

Aquatic therapy is just one aspect of a complete rehabilitation program that includes physical, occupational, speech/language and behavioral therapies and repeated cognitive testing. Nonetheless, a water-based program designed around a patient's overall needs and goals can hasten a patient's reintegration into the society they are most familiar with.

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