

Aquatic Physical Therapy
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Water has been used for thousands of years to facilitate the healing process in many ways. All the way back to the time of the ancient Romans, soldiers used hot baths after recognizing the therapeutic effects of water.¹ Today, many spas and health clubs have become popular due to the beneficial effects of water. The word “spa” originates from salus per aqua, which means health through water, representing the powers that water is thought to have.² The use of water for therapeutic effects has evolved and is used in many ways to facilitate the healing process today. Aquatic physical therapy is an emerging treatment technique that is becoming more popular with therapists and patients because of the positive results of the treatment.

Aquatic physical therapy really began to grow after World War I when aquatic therapy programs were formally developed to serve injured American soldiers.¹ Now, there are aquatic physical therapy programs all over the United States that work with a wide variety of patients. Aquatic physical therapy is an evidence based and skilled practice of physical therapy in an aquatic environment by a physical therapist.³ It is purposeful, therapeutic exercise in the water that is designed and directed by a qualified physical therapist performed to address individual physical impairments or disabilities to reach treatment goals.⁴ This therapy can include, but is not limited to, treatment, rehabilitation, prevention, health, wellness and fitness of patient populations in an aquatic environment.³ Many hospitals and clinics now have their own private pools for therapy, while many others use local pools such as the YMCA or gyms for rehab.

The properties of water such as buoyancy, relative density, hydrostatic pressure, surface tension, turbulence and streamlining enhance treatments for patients.^{1,3} Buoyancy reduces the load and stress on joints that are affected by pain and allows for exercise techniques that may be too difficult or painful on land.⁵ A decrease in weight bearing due to buoyancy is one of the most significant advantages of aquatic physical therapy. For example, patients waist deep in water feel only about 50% of their body weight on the joints. Neck deep water takes away 90% of a person's body weight, greatly reducing the load on patient's joints.⁴ Buoyancy can be used to assist, support or resist motions depending on positioning of the patient in the water by the therapist.

Relative density is the ratio of body mass to a volume of water. For example, a person with greater lean muscle mass is more likely to sink into the water than someone with a higher percentage of body fat. Due to the effects of relative density, someone with increased anxiety or spasticity will tend to sink more into the water than someone who is relaxed.⁴ This is important to understand as a patient or therapist, because certain patients may need more support or guidance than others depending on their body composition or their comfort level in the water.

The warmth of water and hydrostatic pressure can help reduce pain and swelling and ease movement.⁴ Hydrostatic pressure is the pressure of a fluid exerted on the surface of a submerged object, such as the pressure one may feel when in the water. This pressure will increase the deeper a patient is submerged in the water. The pressure of the water helps to increase blood flow to the heart and lower the heart rate, thus reducing the stress on the body during exercise.⁴

Resistance can be added to therapeutic exercise by increasing the speed of movement and the depth of water a patient is in. The surface tension of the water can also create a more challenging environment for exercise. Movements that break the water's surface tension, such as splashing, add resistance and can be used for effective therapeutic activities. Performing exercises and movements under the surface of the water will be easier for patients, especially for those with extremely weak muscles.⁴

The last of the properties of water that can be used to facilitate aquatic therapy include streamlining and turbulence. When a patient moves with and in the direction of flowing water, this streamlining affect facilitates their movement making it easier to move.⁹ When a patient moves against and into the current turbulence, it is more challenging and increases the amount of work required to move through the water. This is another way to challenge patients as they progress in therapy. Physical therapists use the many properties of water to facilitate and enhance a patient's experience in the water to help improve function and meet goals.

There are many advantages to using aquatic physical therapy. As mentioned earlier, the different properties of water can assist and challenge aquatic exercises. Some advantages to having patients participate in aquatic physical therapy include: pain relief; increased strength, endurance and flexibility as well as increased relaxation; an increase in heart and lung function; and a decrease in body temperature. The patients will experience overall less stress on muscles and joints.^{3,4} It has also been found that the feedback and support of the patient in the water can increase balance reactions and decrease the risk and fear of falling for patients, resulting in a safe work environment. There are also many psychological benefits to aquatic physical therapy including;

decreased perception of pain, anxiety and depression, improved self-confidence and mood; increased motivation; and a positive social environment.^{1,2}

There are various patient populations that have shown great improvements from participating in aquatic therapy. Patients with any of the following impairments may improve from aquatic therapy. These impairments may consist of: decreased strength and range of motion, tolerance to weight-bearing activity, decreased motor planning, abnormal muscle tone, impaired trunk and head control, and respiratory problems.

Orthopedic patients can range from patients with joint replacement or injury, chronic pain and osteoporosis.⁵ Patients with neurologic diagnoses such as stroke, spinal cord injury, multiple sclerosis and many pediatric patients with cerebral palsy, spina bifida, juvenile arthritis or other pathologies have shown to make significant gains from participating in aquatic physical therapy also.⁶ Other patients which may benefit from aquatic physical therapy may include: geriatrics, soldiers, athletes, obese patients, pre- and post-natal women, patients with fibromyalgia, arthritis or others with diabetes.^{1,4,6,7}

There are some disadvantages of aquatic physical therapy. For example, pool for therapy is very expensive, as there are many costs to running, maintaining, and staffing. Some facilities use local pools, gyms or YMCA's. While more cost effective, the disadvantage of using other facilities is the additional time spent traveling to and from these locations and block scheduling patients on specific days and times because of facility availability.^{4,8}

Aquatic therapy can be difficult for patients who need extra stabilization or special equipment. Patients who have open wounds, infections, decreased vital capacity, incontinence, uncontrolled seizures or other allergies to pool chemicals should not

participate in aquatic therapy, as well as those patients who may have excessive fear of the water.^{4,6,8} Other contraindications that should be considered are; having an acute joint injury, postural hypotension, IV sites, peripheral vascular disease, sensory loss and impulsivity.

Aquatic physical therapy should be used only when the fluid dynamics of water offer benefits that cannot be provided on land. There should be a specific reason for putting someone into an aquatic environment along with measurable and land-based goals.^{4,6} Physical therapists and medical doctors can determine what type of treatment is best for each patient; aquatic therapy is not for everyone. Aquatic physical therapy interventions are designed to improve or maintain: function, aerobic capacity, endurance, balance, coordination, postural control, flexibility, strength, power and relaxation. It is also a great tool to transition into a wellness program after a patient has completed therapy.⁴

To find out more about aquatic physical therapy, refer to the American Physical Therapy Association's aquatics section webpage (<http://www.aquaticpt.org/>). Talk to your local physical therapist and rehabilitation providers to find out more information on aquatic physical therapy and what it can do for you.

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