

The Power of Immersion is in The Activity That Occurs Once Immersed

The Summer of 04' is here and many of you are thinking about the pool season. At Kassimir Physical Therapy, we have been using the pool year round for the last five years. Aquatic physical therapy involves the application of the physical properties of water to bring about physiological changes in and on the body.

Applying the physical properties of water to the body involves a trip back to undergraduate physics class. Specific gravity (S.G.) relates the density of a



body to that of water (1.0). A body with a S.G. less than that of water will float and greater than 1.0 will sink. A lean muscular body may have an S.G. of 1.10 and an obese body may be .93 The S.G. relates

to Archimedes principle of buoyancy, which states that a body in fluid will experience an upward thrust equal to the weight of the fluid it displaces. Since buoyancy and gravity are opposing forces, less weight is borne on the lower extremities the deeper the body is submerged. Approximate values of weight bearing in water are 50% weight bearing submerged to the ASIS, 25% at the xiphisternum, and 10% submerged to C7. The previously mentioned values vary based on body composition, sex, and speed of walking.

Drag is the resistance to move a body through a fluid medium due to its size and shape. Broad objects have more drag than streamline objects. Object with more drag cause more turbulence. Turbulence causes more back- pressure and resistance to flow. Walking in water provides 5-6 times the resistance of air, however turning and walking back into the moving water creates 40 times the resistance of air.

Application of these two physical principles can direct all of your applications of aquatic physical therapy. By varying the depth of immersion, the

practitioner can change the amount of weight bearing and also the drag incurred due to the surface area of the immersed body. The addition of buoyant objects can decrease weight bearing or increase the resistance to motions which would normally be gravity assisted. Objects with increased surface area can be used to increase resistance during walking or isolated movements for strengthening specific muscles.

For the most deconditioned patients, immersion has many physiological effects: centralization of peripheral blood flow, increased heart volume, increased intrapulmonary blood volume, increased right atrial pressure, increased stroke volume without change in heart rate, increased metabolism, and decreased effects of gravity and weight bearing on musculoskeletal system

CASE STUDY: 55 y/o Female 6 wks. S/P THR

The program began with gait training for proper heel-toe gait in a gravity-reduced environment. She progressed to walking while holding a kickboard flat against her body to increase drag and resistance. Gait training included forward, backward and sidestepping. Her aquatic and stretching program adhered to the standard hip precautions and were carefully monitored for safety. Stretches included: hamstring stretch with a noodle at the achilles tendon, quad and hip flexor stretch with the noodle under the anterior ankle. And the standard "runners" calf stretch. For strengthening, active-resisted hip ab/adduction, flex/ext, knee flex/ext. To add resistance flippers, fins and quicker movements train the muscles well. Stairs training was accomplished with the addition of a Speedo step. Training in water deeper than the patient's height allowed her to move with ease and no weight bearing in her lower extremities for cardiovascular training. She also



About the Author: Stephen C. Freeman MPT, ATC

Steve has been our aquatic instructor for several years. He has been with KPT for 5 _ years and is recently married to his wife Melissa. Steve will be moving to his new house in Hampstead this Summer, but not before spending time on the water as he enjoys boating and water sports.



strengthened her abdominal muscles using lumbar stabilization techniques. After three weeks, she was transitioned back into the clinic for further strengthening.



Gary's dog Lucy

At KASSIMIR PHYSICAL THERAPY, our patients enjoy the environment of the aquatic setting. We have found that aquatic therapy is indicated for patients with ankle, knee, hip, and lumbar spine trauma and arthritis, joint replacements, and shoulder pain and

weakness. The patients enjoy the Meadowbrook pool in Mount Washington and find the facilities to be very accessible.

For those patients with access to a pool, we often train patients in a home pool exercise program for use at their home or gym pool.

New FDA approved treatment! Light Therapy

KPT has added light therapy/infrared therapy to its modality list. This new FDA approved treatment has been showing impressive quick results that improve cellular activity and ATP synthesis to promote healing and tissue repair, reduce inflammation, relieve pain and increase range of motion. Please call a therapist at KPT if you would like further information on this treatment.



What's in the water at KPT:

Congratulations to Jana Hudson (office supervisor) and Jennifer Bozek MPT (staff PT) on their recent weddings. And Steve on his one year wedding anniversary.

Happy Anniversary KPT

Thank you to all of our friends, family, and referring practitioners for 7 great years in private practice. We keep on top of and invest in the most state of the art equipment to serve our patients. Nevertheless, it is the manual skills and expertise of our well trained professional staff to achieve optimal results.

www.kptrehab.com

Don't forget to check us out on the web and tell your patients about it when making a referral.

Quotes:

"I found the website extremely informative and it helped me manage my acute ankle sprain."

"An excellent website! The videos of my exercises were very helpful and allowed me to verify my techniques."

"Wow! What a great website."



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