

Hydrotherapy: A Sensory Integration Treatment Modality

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In Arizona the swimming pool has become an important environment for integrating a normal play activity with sensory integration (SI). Because the swimming pool is frequently more common than the swing set in the back yards of Arizona's children, a complete SI treatment program has been implemented in and around the pool.

Many persons with disabilities could probably be helped through hydrotherapy, including, among others, amputees and people with cerebral palsy and spina bifida. The program I will describe is intended for children with SI disorders that are functionally milder than those mentioned. Often these children do not qualify for occupational therapy services in the schools because they are succeeding academically, but when they are assessed with the Sensory Integration and Praxis Tests (SIPT) (Ayres, 1989), sensory processing problems and dyspraxia are evident. Clumsiness, poor posture, laziness, fatigue, and attention-arousal imbalances are some of the behaviors noted. Self-confidence and self-esteem area also usually lower in these children. They often know what they want to do and what they are supposed to do, but they do not have the automatic control to follow through as easily as their peers.

Sensory integrative problems influence behavior from early in life. Low exterior muscle tone of the neck and back often prevent these babies from lifting their heads up against gravity. They are not comfortable prone and frequently do not rock on their stomachs as other infants aged 6 to 9 months old. Without adequate muscle tone to hold the shoulder blades down, winged scapulas and poor shoulder stability interfere with the infant's ability to creep correctly in the quadruped position. This position may also be avoided because it requires holding the head up against gravity.

When these children enter the preschool and school years, parents report, "My child loves the pool. He or she looks like a fish underwater." The key word is *under*. Again, low neck and back extensor muscle tone prevents these children from swimming comfortably with the head above the water for extended periods of time, so they swim under water, bringing the head out of the water only to breathe.

Poor extensor tone is just one example of the many areas of difficulty that can be addressed through hydrotherapy. Other therapy goals could include improvement in postural movement patterns, bilateral motor coordination and praxis, gravitational security, attention-arousal functions, and the somatomotor adaptive response.

Family Participation

Increased endurance and self-confidence lead to more successful play interactions with family and peers in the pool. When appropriate, parents and siblings are encouraged to participate in some of the treatment sessions, because the child often spends several hours a day with family members in the pool. The activities are fun and the child can measure his or her own progress. As the child masters different activities, various pool toys and equipment are used to challenge him or her further.

Explaining Pool Treatment to Parents and Clients

As all-over extensor tone develops, the child is able to better maintain his or her head and neck above water and kick, using mostly hip flexion rather than knee flexion. As the asymmetrical tonic neck reflex becomes integrated and bilateral motor coordination develops, rhythm and the sequencing of arm strokes with the head for breathing improve. The child no longer has to fight gravity to stay above water. Endurance improves and learning to swim becomes less fatiguing as motor planning becomes more automatic and less cortical.

Precautions

1. As in all sensory integration treatment, safety must be stressed and precautions taken. A lifesaving certificate should be acquired by the occupational therapist and updated regularly.
2. Children with vestibular and proprioceptive systems that do not process sensory input correctly or adequately may be "lost in space." This can become a life-and-death situation in the water. It is important to maintain close proximity and monitor affective changes in the vital signs. Teach children to "watch the bubbles" for clues to spatial orientation. Bubbles always go up.
3. Children with myringotomy tubes will need to have their participation approved by their physicians. Earplugs and a swimming cap are usually required.

How to Sequence a Treatment Session

Preparation: Wake up. Provide tactile and proprioceptive input to enhance body awareness and to prepare the body for gross motor praxis. Rubbing, brushing, and vibration can be used, preferably actively by the child.

Activities: Gross motor play. Encourage antigravity postures by placing the child prone on a small inner tube, gradually reducing the amount of chest support over time. Develop antigravity flexion by challenging the child to hold a beach ball with arms and legs while supine as the therapist attempts to pull the ball away. Work on inhibiting the asymmetrical tonic neck reflex, crossing the body midline, and achieving upper extremity cocontraction by placing the child on hands and knees on top of a large inner tube. With the child in this position, encourage him or her to hit a beach ball thrown from one side with the contralateral hand. Equilibrium responses and trunk rotation can result when the child and therapist straddle a large inner tube facing each other while rotating to

opposite sides. Active vestibular input can be achieved in several planes by positioning a child, flexed, on top of a beach ball and having him or her attempt to roll into the water. Repeated jumping on a diving board can provide vestibular stimulation and heavy joint proprioceptive input. The stimulation can be graded with wrist, waist, and ankle weights, worn intermittently. Close supervision throughout all of these activities is critical and cannot be overemphasized.

Ending the session: Quiet time and clean-up. The pool session always ends out of the water, where two large beach towels are made available. The evaluation before treatment will have determined the child's attention-arousal functions and needs, with regard to inhibitory versus facilitatory input. If the child requires facilitation, a fast body rubdown is provided. If the child requires inhibition, slow firm pressure is provided head to toe, in the direction of the hair follicles. The second towel is then laid out so that the child can be wrapped like a hot dog in a bun. Neutral warmth from the child's body heat and firm maintained pressure can result in total body relaxation. After at least 5 minutes, the child is slowly rolled out of the towel and instructed to "get up slowly keeping the quietness inside." As in all SI treatment; it is important for the child to participate in putting toys away. This process provides closure to the treatment session and promotes organizational skills. Many children with attention deficits have difficulty terminating activities, so the therapist may need to provide additional transition time for some children between activities.



Adolescents and Adults

Although adolescents and adults are most often treated in the traditional clinical setting, treatment in the pool is at times more acceptable to this population than treatment by traditional suspended equipment and scooter boards. Older clients sometimes express feelings of embarrassment when asked to swing. The easy accessibility to pools in Arizona provides these clients with the ability to reinforce treatment independently. Some adults have reported better auditory perception after swimming regularly.

Summary

When sensory integration treatment is recommended (preferably following an SIPT evaluation), hydrotherapy is an excellent medium. Some of the elements found in traditional SI treatment are also important in hydrotherapy, including family participation and the building of a sensorimotor base for future skill development.

Special considerations, including precautions in the water and the safe use of pool equipment, require some supervision and guidance by a therapist with prior experience in providing SI treatment in a traditional setting. For further details on a complete hydrotherapy program, please contact author.