

## **Sensory Processing and Motor Planning**

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Sensory Integration is the way that sensations are organized for use. The brain locates, sorts and orders sensations and uses them to form perceptions, behaviors, and learning. If the brain does a poor job integrating sensations, this will interfere with many areas of life, resulting in more effort and difficulty, with less success and satisfaction. It has been reported that about 5% to 15% of the children in the United States experience trouble with sensory integration, causing them to be slow learners or to have behavior problems (Ayres, 2005).

Sensory Integration Disorder can affect many areas of a child's functional abilities including body awareness, motor planning, coordination, auditory processing, visual processing, fine motor skills, behavioral challenges and social skills. As a result, these children experience difficulties with academic / learning skills, focusing and attending, participation in community sports, activities of daily living and other areas. Motor planning is one of the most significantly affected areas with sensory processing disorder. Motor planning is the ability to carry out a skilled, non-habitual motor act in the correct sequence from beginning to end. Incoming sensory stimuli must be correctly integrated in order to form the basis for appropriate, coordinated motor responses. Poor sensory processing hinders the development of motor planning from many angles: a child may not have a reliable internal map of his body to use in motor planning, he/she may not be able to attach a meaning to an object presented visually, he/she may have trouble abstracting the potential use of an object, a child may be reluctant to engage in purposeful activity and he/she may resist doing anything new or different (Ayres, 2005).

The most common and effective treatment for sensory processing disorder is therapy, including Occupational Therapy, Speech Therapy and Physical Therapy. They have been shown to make great improvements in the lives of children with Sensory Integration Disorders. The main idea of sensory integration therapy is to provide and control sensory input, especially the input from movement (vestibular system), muscles and joints, and skin in such a way that the child spontaneously forms the adaptive responses that integrate these sensations.

In addition to traditional therapy, it has been found that aquatic therapy is an excellent supplement to land-based pediatric therapy. The water provides 30 times more proprioceptive input than land, along with an even pressure to the entire body. Conditions of the pool's environment including constant temperature, buoyancy, viscosity and resistance of the water all provide relatively constant somatosensory input and significantly increases sensory integration and processing. These qualities can help a child with sensory processing deficits to modulate sensory input increasing participation and attention to activity and improving the likelihood of carryover into land therapy and daily living skills. Knowing appropriate techniques in the water to help children improve body awareness and motor planning can carry over into mastering areas of difficulty on land.

Many skills relating to sensory integration and motor planning can be addressed in the water. The use of resistance and movement in the water can calm and organize the sensory system and ultimately improve body awareness. With improved body awareness, the child will be able to participate in exercises and activities improving strength and overall coordination. When a child is most organized, it becomes possible to address more complicated skills including visual motor, visual perception, bilateral skills, crossing midline, auditory processing, breath support, oral motor skills, and other functional skills. Using the water to address these skills also increases participation, attention, and motivation, which ultimately helps with follow through and reaching personal and therapeutic goals.

Children with Sensory Processing Disorder are frequently overlooked in the school and doctors offices as a "behavior problem" or something "they will just grow out of". For these children, tasks are very challenging for them and they do not understand why and become easily frustrated. Using techniques in the water will help a therapist be able to engage better with the child, along with providing them the organized sensory input they need in a functional matter. This results in the child feeling successful and able to take on more challenging tasks. In addition, the child will gain the skills necessary to carry over into activities of daily living and/or land therapy. As therapists, we are providing children with the foundation that shapes the rest of their lives, and there is nothing more rewarding than seeing a child succeed and ultimately grow into the best person that they can be.

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