Sensory Integration via Water Exercise

Sensory integration (SI) refers to how people use the information provided by all sensations coming from within the body and the external environment. We usually think of senses as separate channels of information, but they actually work together to give us a reliable picture of the world and our place in it. The human brain uses information about sights, sounds, textures, smells, tastes, and movement in an organized way that will create and assign meaning to sensory experiences. Thus, one will know how to respond and behave accordingly.

When we move, some muscles must contract while others relax. This happens automatically. The central and peripheral neurological systems drive movement commands through sensory and reflex behaviors. The sensory system takes information as the body moves through space; changes position, posture, speed; and responds to gravity and different forms of tactile feedback. The motor system creates and controls tension in stabilizing and moving muscles. It responds to sensory feedback with gross or fine motor control. Motor skill training methods normally consist of adaptive physical education, movement education, and gymnastics.

For most of us, sensory integration occurs without conscious thought or effort. For others, sensory integration happens inefficiently. A sensory processing disorder (SPD) is a condition in which the brain has struggled to receive and respond to the information that comes in through the senses. The sensory integrative approach is vital to treat SPD. This approach is guided by one important aspect—one’s motivation in selection of the activities and well-regulated sensory systems can contribute to important developmental outcomes in the social-emotional-physical communication, self-care and cognitive-adaptive skill development.

The neurological disorganization resulting in sensory integration occurs in three different ways:

1. The brain does not receive messages due to a disconnection in the neuron cells;

2. Sensory messages are received inconsistently; or sensory messages are received consistently, but do not connect properly with other sensory messages.

3. When the brain purely processes sensory messages, inefficient motor, language, or emotional output is the result.

According to Sensory Integration International (SII), a non-profit corporation concerned with the impact of sensory processing problems on people’s lives, the following are some signs of SPD:
* Be uncoordinated
* Bump into things
* Be unable to tell where their limbs are in space
* Be hard to engage in conversation or play
* Oversensitivity to touch, movement, sights, or sounds
* Under activity to touch, movement, sights, or sounds
* Tendency to be easily distracted
* Social and/or emotional problems
* Activity level that is unusually high or unusually low
* Physical clumsiness or apparent carelessness
* Impulsive, lacking in self-control
* Difficulty in making transitions from one situation to another
* Inability to unwind or calm self
* Poor self-concept
* Delays in speech, language, or motor skills
* Delays in academic achievement

Factors that contribute to SPD include: premature birth, autism and other developmental disorders; learning disabilities; delinquency and substance abuse due to learning disabilities; stress-related disorders; and brain injury. Two of the biggest contributing conditions are autism and attention-deficit hyperactivity disorder (ADHD).

The presence of SPD is typically detected in young children. While most children develop SI during the course of ordinary childhood activities, which helps establish such things as the ability for motor planning and adapting to incoming sensations, others' SI ability does not develop as efficiently. When their process is disordered, a variety of problems in learning, development, or behavior become obvious.
Balance, muscle control and cognitive decline are some of the most important challenges that naturally accompany aging. One of the main reasons people over the age of 60 visits a doctor is because of a balance related issue.

In my view, as a physical and health educator, Health-Fitness Education is one of the most important educational subjects to influence, maintain and improve people’s (any age) physical, emotional and learning abilities (Experience your body the way it is meant to be).

As a part of my doctoral thesis, I developed an educational method called the SykorovaSynchro Method. The core of this method is to apply the neurological rule: “The less muscular effort, the more enhanced sensory awareness is for learning and for physical performance.”

The purpose of the SykorovaSynchro Method is to structure an exercise program with the use of sensory integration/mental imagery, somatic movement, and awareness exercises to enhance communication between the brain and the rest of the body. It helps to achieve positive changes in one’s life - a new sense of self awareness and control, stress reduction, revitalization of energy flow, postural alignment and flexibility, circulation, sensory-motor learning ability and creativity. The SykorovaSynchro Method has three stages/progressive levels:

1. To balance function of sensory-motor cortex via mental imagery (sometimes called visualization, guided imagery), progressive muscular relaxation and control breathing. Result is relaxed but alert state of awareness.

2. To enhance sensitivity/awareness of somatic movement (movement regulated by feeling, mental imagery, sensation). Result is ability to perform somatic/intuitive movement.

3. Ability to perform conscious exercises – via mental imagery, sensation. Positive result is in neuro muscular conditioning/function - postural improvement, balance, coordination, flexibility and agility.

The water’s natural resistance and buoyancy creates a comfortable environment for functional exercises to improve buoyancy, balance and motor control.
1. Water Exercises to improve and maintain balance

By definition balance is a state of equilibrium or equipoise; equal distribution of weight, amount, etc. Components of water exercise have this therapeutic progression for balance improvement and maintenance:

- Equilibrium: orientation to the vertical position via nerve signals from the inner ear
- Body alignment: a kinesthetic sense of how body segments are linked
- Pelvic stability: a consistent pelvic angle during activity
- Coordination between the upper or lower body: an interval awareness of their relationship
- Muscle tone: the use of muscles to accomplish all of the above components with the least amount of effort

Pelvic stability: a consistent pelvic angle during activity

2. Water Exercises to achieve coordination.

The physiological definition of coordination is the harmonious functioning of muscles or groups of muscles during the execution of movements. Coordination is also the capacity of the human organism for rhythm and interconnection. Lack of coordination creates tension leading to a cycle of activation-relaxation being replaced by high activation-low activation. Uncoordinated people are tense. Water resistance slows down the movement and increases reaction time, which will give time within the exercise to relax specific muscles. Coordination is the practice of effort and relaxation at the same time.
Water resistance slows down the movement and increases reaction time

3. Water Exercises to achieve agility.

A person's flexibility and speed refers to the ability of the joints to move through a full range of motion with quickness. Having muscular flexibility allows for more movement around the joints, which are a great way to increase agility and keep the body protected from injury.

Sensory Integrated Imagery workshop promotes body awareness via somatic exercises, breathing exercises, mental imagery, static, static-passive, dynamic stretches, and freedom of movement exercises. All exercises performed at a low impact.
aerobics pace. A water environment is an ideal medium for strengthening and improving sensory integration and by this brain function at any age.

Resources:


4. Sensory Integration International/ the Ayres Clinic. 1514 Cabrillo Avenue, Torrance, CA 90501-2817.

5. Sensory Integration Dysfunction. 
   (http://home.ptd.net/blnelson/SIDEWEBPAGE2.htm).