

Sensory Integration Disorder: A Primer for Providers

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Sensory integration disorder, or dysfunction, is a common but misunderstood problem that impacts behavior, attention, organization, learning, motor and social skills. Before birth, the human brain interprets sensory information, touch, movement, sight and sound. After birth, children receive information from their environment through the sensory systems.

IN ADDITION TO TOUCH, SIGHT, sound, taste and smell, the body has several other important senses. These include movement, interpretation of the force of gravity and awareness of body position. These allow us to experience, interpret, and respond to different stimuli in our environment. These are not only interconnected but are also connected with other systems in the brain. The inter-relationship among these three senses is complex. The integration and interpretation of the sensory information becomes critical to a child's ability to function in any environment, such as home, school and the playground. Sensory integration focuses primarily on three basic senses—tactile (touch), vestibular (motion), and proprioception (position).

The tactile system processes light touch, pain, temperature and deep pressure. Initially, touch is used by the body as a protective mechanism. The tactile system becomes more discriminative as a child matures, but the body continues to use touch for protection (i.e. pulling away from pain).

Tactile defensiveness may occur when the brain is unable to adequately inhibit the touch input, resulting in sensitivity to unexpected or light touch. The child may have difficulty concentrating, demonstrating negative emotional reactions and disorganized behavior.

Dysfunction in the tactile system may provoke a variety of behaviors. These include:

- irritation with certain types or textures of clothing, socks or tags;
- irritation with textures or tastes of food;
- avoidance of getting hands dirty with items such as mud, paint, glue, play doh;
- avoidance of grooming tasks such as tooth brushing, hair cutting/ washing, or nail cutting;
- withdrawing from touch and wanting it only on specific terms.

A child with tactile dysfunction may be in "fight or flight" mode, and attempt to pre-empt *light or unexpected* touch by peers with pushing, hitting or biting. He may preferentially seek out *pressure* touch with hugs, by wearing heavy items, or through crashing activities, head banging, picking, or chewing. A dysfunctional tactile system may lead to a misperception of touch and/or pain (causing hyper- or hyposensitivity), causing distractibility, irritability, hyperactivity, or even isolation from peers.

The vestibular system, located in the inner ear, detects movement of the head in relation to gravity. Children who present with vestibular system dysfunction usually react in one of two ways. They may be very sensitive to movement, showing fear of swings, climbing, being upside down, inclines,

stairs, walking on uneven surfaces and curbs. Alternatively, they may actively seek intense sensory experiences such as excessive body whirling, swinging, jumping, and/or spinning. This type of behavior reflects a hypo-reactive vestibular system: children with this problem are continuously trying to stimulate their vestibular systems.

The vestibular system also impacts the integration of primitive reflexes, the development of muscle tone, balance, stability and body awareness. Vestibular weaknesses may cause a child to avoid creeping, and move quickly into walking. Emotional sensitivity and organizational skills are also related to vestibular processing, impacting a child's ability to focus attention, organize time and space for transitions. Children with vestibular processing problems need predictability, routine and external organization.

The proprioceptive system relies on joints, tendons and muscles to provide individuals with an automatic sense of body awareness. Proprioception is used when across reaching a table for glass of milk without spilling it, jumping over a log and stepping off a curb. It provides the awareness necessary to manipulate tools such as a pencil, scissors, buttons, or a sewing needle. Some common signs of proprioceptive dysfunction are clumsiness, a tendency to fall, a lack of awareness of

body position in space, odd body posturing, minimal crawling when young, difficulty manipulating small objects (such as buttons and snaps), eating in a sloppy manner, and resistance to new motor movement activities.

EFFICIENT INTEGRATION OF THE SENSORY SYSTEMS must occur for the development of attention, behavior, learning, motor skills and organization. A child may demonstrate over- or under responsiveness, resulting in a high activity level, or fatigue. He may seek out excessive movement or touch in contrast to self imposed isolation. A child may demonstrate weakness in motor development through clumsiness, incoordination or speech delays. He may be emotionally reactive, sensitive, irritable, distractible, hyperactive, impulsive, or aggressive and demonstrate difficulty with transitions and organization. This behavior can be easily misunderstood or misdiagnosed as defiance, ADD/ADHD, or an emotional/behavioral condition. Children must also be able to interpret and integrate sensory information efficiently and effectively in order to plan and execute new or skilled motor tasks. This is known as praxis, and becomes especially important in school and other learning situations.

Children demonstrating inadequate integration of sensory input are likely to have difficulty in the classroom. They may display disorganized behavior such as inattention, distractibility, need for movement, (continued on next page)

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For our "back-to-school" issue, we look at a problem that is impacting an increasing number of children (and adults) in our society: sensory integration disorder. Given its impact on a child's development, both social and academic, it is important for pediatric and family medicine providers to be familiar with its symptoms and treatment. We've asked a Maine occupational therapist who has worked extensively with sensory integration disorder to provide us with some enlightenment on the subject.



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A Primer for Providers

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irritability, difficulty with transitions or changes in routine, and avoidance of academic tasks, poor writing, playground problems and motor delays. Accommodation strategies start with understanding the child's processing system and respecting each child as an individual. These may include:

- implementation of appropriate movement in the class,
- reduction of visual and auditory stimulation in the room,
- providing a quiet space to retreat to when over stimulated,
- use of fidget toys and weighted items,
- oral stimulation (chewing and sucking can be an organizing behavior),
- use of appropriate writing utensils and paper,
- emphasis on external organization and routine.

CHILDREN WHO ARE SUSPECTED of having a sensory integration disorder should be evaluated by an occupational or physical therapist certified or experienced with sensory integration disorders. The evaluation may involve the SIPT (Sensory Integration and Praxis Test) or the Sensory Profile. The SIPT uses 17 subtests to assess the integration of sensory input. The Sensory Profile is a questionnaire that assesses sensory modulation and regulation as it impacts behavior, attention, organization, learning and motor skills. Treatment involves providing the child with activities which organize the central nervous system for improved output, developing strategies for improved modulation and regulation of sensory input, and assisting the adults in the child's life to have a better understanding of the child's needs. ■

WEBSITES FOR MORE INFORMATION:

www.comeunity.com/disability/sensory_integration
www.spdnetwork.org

Good Books

Sensory Integration Disorder



The Out-of-Sync Child and The Out-of-Sync Child has Fun
by Carol Stock Kranowitz

Unlocking the Mysteries of Sensory Dysfunction
by Elizabeth Anderson and Pauline Emmons

Tool Chest for Parents, Teachers and Students
by Diana Henry

Take Five, Staying Alert at Home and School
by Mary Sue Williams and Shelly Shellenberger