

# Physician Fact Sheet

## Sensory Processing Disorder

### Signs and Symptoms



### What is Sensory Processing Disorder?

**Sensory Processing Disorder (SPD)**, first identified in the 1960's by Dr. A. Jean Ayres, is a developmental disorder in:

- processing and organizing sensory information
- assigning meaning to what is experienced
- acting or responding to situations in an adaptive, purposeful manner
- also known as Sensory Integrative Dysfunction (DSI) (Ayres, 1982)



**Children with SPD may not enjoy common childhood experiences and may be at increased risk for injury.**

#### Estimated Prevalence

- 73% are male
- 5-13% for children entering school. (Ahn, et al, 2004)
- 40-88% for children with autism (Talay-Ongan & Wood, 2000)

#### Associated Disorders

*SPD* is commonly associated with:

- Learning disabilities
- Pervasive developmental disorder/ autism spectrum
- Attention deficit disorder
- Language disorders
- Developmental coordination disorder
- Anxiety disorder/ depression
- Post-institutionalized children
- Post-traumatic stress disorder
- Some behavioral disorders

#### Functional Problems Associated with SPD

- Behavioral/ attentional/ affective organization, e.g. decreased social skills
- Delayed fine/gross/oral motor skill development
- Delayed daily life skills including participation in play
- Impaired self esteem
- Impairments in sleep/ eating/ elimination patterns

(Interdisciplinary Council on Developmental & Learning Disorders, 2005)

### Features of Sensory Processing Disorder

**Essential Features**  
*SPD* has distinct behavioral patterns characteristic of one or more **subtypes**:

- + Sensory modulation disorder
- + Sensory discrimination disorder
- + Postural-ocular disorders
- + Dyspraxia

Essential features are:

- Marked impairment in processing & integration of sensory inputs
- Impairment not due to general medical condition or overt damage to receptors, neural pathways or cortical areas
- Impairment interferes with functional skills, social-emotional health, & behavioral regulation.

- Usually identified in early childhood or adolescence
- Variable course as compensatory behaviors may be developed, however, underlying deficits persist.
- Empirical evidence of physiologic measures shows:

- \* Atypical sympathetic nervous system activity in abnormal electrodermal (EDA) response to sensory stimulation. (McIntosh, Miller, Shyu, & Hagerman, (1999)
- \* Lowered vagal tone and parasympathetic activity associated with stress, developmental/ cognitive delays, emotional/ behavioral over-reactivity. (Schaaf, Miller, Sewell, O'Keefe, 2003)

#### Associated Features

A study of 1000 children with *SPD* conservatively estimated prenatal and birth problems:

- 42% complications during labor or delivery
- 32% delivered by assisted delivery methods
- 25% mothers had infections or illnesses during pregnancy
- 13% were pre-term,  $\leq 37$  weeks
- 5% had cord wrap/ prolapse at birth

Estimated early childhood health problems:

- 62% chronic ear infections
- 40% allergies or asthma
- 27% experienced serious injuries or illnesses
- 25% jaundice at birth
- 20% colic as infants

#### Developmental Features

This study also estimated:

- 47% did not go through the "terrible two's" or did so late
- 37% reported by parents to have a brief / absent crawling phase
- 33% had strong positioning preferences as infants
- 32% had sleeping problems
- 31% had feeding problems
- 28% were hesitant/ delayed learning to go down stairs
- 24% reported by parents to be early walkers

(May-Benson, Koomar, & Teasdale, 2006)

**For More Information**  
www.thespiralfoundation.org  
617-923-4410

## Subtypes of Sensory Processing Disorder (Interdisciplinary Council on Developmental & Learning Disorders , 2005)

Sensory Modulation Disorder	Sensory Discrimination Disorder	Postural-Ocular Disorder	Dyspraxia
Problems in regulating the intensity & nature of responses to sensory input.	Problems discerning & assigning meaning to qualities of specific sensory stimuli.	Problems with quality of control or stabilization of the body during movement or at rest.	Deficit in the ability to plan, sequence & execute novel or unfamiliar actions.
<p><b>Common Signs &amp; Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Withdraw from light &amp; unexpected touch such as stroking</li> <li>• Gagging, refusal to eat some textured foods leading to limited diet</li> <li>• Dislike of activities such as teeth brushing, hair washing, or hair/ nail cutting</li> <li>• Avoidance of messy or textured materials such as sand, grass or lotion</li> <li>• Strong preferences for clothing types, textures and fits</li> <li>• Oversensitivity to sounds or visual inputs</li> </ul>	<p><b>Common Signs &amp; Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Difficulty manipulating or finding objects in a pocket or when out of sight</li> <li>• Difficulty distinguishing between similar sounds</li> <li>• Problems finding pictures in a cluttered background</li> <li>• Difficulty with directions</li> <li>• Problems with using too much or too little force, e.g. holds a pencil too tight or pushes too hard</li> <li>• Demonstrates poor balance</li> <li>• Poor sense of speed of movements</li> </ul>	<p><b>Common Signs &amp; Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Poor postural control or strength, e.g. sitting tolerance</li> <li>• Poor righting or equilibrium</li> <li>• Avoids upper extremity weight bearing</li> <li>• Difficulty isolating head/eye movements or poor ocular control in tracking or visual shifting, e.g. when reading</li> <li>• Discomfort climbing/ fear of heights</li> <li>• Poor crossing midline or establishment of hand dominance</li> <li>• Fatigues quickly</li> </ul>	<p><b>Common Signs &amp; Symptoms:</b></p> <ul style="list-style-type: none"> <li>• Poor daily life tasks like dressing or using utensils</li> <li>• Problems playing sports</li> <li>• Tends to be accident-prone and clumsy</li> <li>• Resists trying new activities</li> <li>• Poor play skills, often prefers younger peers</li> <li>• Poor handwriting or pencil use</li> <li>• Poor articulation</li> <li>• Poor body schema or awareness of body in space</li> <li>• Poor automatic adaptation when performing actions</li> <li>• Poor ball skills</li> </ul>
<p><b>Diagnostic Features:</b></p> <ul style="list-style-type: none"> <li>• Strong negative responses to sensory stimuli that is not usually aversive to others</li> <li>• Responses may be emotional or behavioral</li> <li>• May involve over-responsivity to all senses but most commonly tactile and auditory stimuli.</li> <li>• Problems exacerbated by stress, may fluctuate over time and may be situationally dependent.</li> </ul>	<p><b>Diagnostic Features:</b></p> <ul style="list-style-type: none"> <li>• Poor recognition &amp; interpretation of essential characteristics of sensory stimuli</li> <li>• Poor detection of differences or similarities in qualities of stimuli, e.g. temporal / spatial qualities</li> <li>• May involve all senses but most commonly tactile, vestibular, or proprioceptive</li> <li>• Often co-occurs with dyspraxia &amp; poor skill performance</li> </ul>	<p><b>Diagnostic Features:</b></p> <ul style="list-style-type: none"> <li>• Hypo- or hypertonic muscle tension/ tone or joint instability</li> <li>• Poor muscle co-contraction for resistance or movement against gravity or postural control</li> <li>• Difficulties in oculo-motor control or functional use of vision</li> <li>• Often co-occurs with vestibular, proprioceptive, and/ or visual-motor problems.</li> </ul>	<p><b>Diagnostic Features:</b></p> <ul style="list-style-type: none"> <li>• Awkward, poorly coordinated motor skills which must co-occur with a deficit of sensory processing</li> <li>• Often co-occurs with perceptual, visual-motor, or language problems</li> <li>• Poor ability to generalize learned skills to other similar motor tasks</li> <li>• Poor sequencing, timing, or rhythm of motor action</li> </ul>

## References and Resources

- References:**
- Ahn, R., Miller, L., Milberger, S., & McIntosh, D. (2004). Prevalence of parents' perceptions of sensory processing disorders among kindergarten children. *Am J Occup Ther*, 58(3), 287-302.
- Chang, M., & Boggett-Charlson, J. (May, 2005). Consider Sensory Processing Disorder in the Explosive Child: Case Report and Review. *Can Child and Adol Psy Rev*, (14)2.
- Dunn, W. (1994). Performance of typical children on the sensory profile: an item analysis. *Am J Occup Ther*, 48, 967-974.
- May-Benson, T., Koomar, J., Teasdale, A. (2006). Prevalence of Pre- / Post-Natal and Developmental Factors in 1000 Children with SPD. The Spiral Foundation. 124 Watertown St., Watertown, MA 02472.
- McIntosh, D., Miller, L., Shyu, V., & Hagerman, R. (1999). Sensory-modulation disruption, electrodermal responses, and functional behaviors. *Dev Med Child Neur*, 41,608-615.
- Interdisciplinary Council on Developmental & Learning Disorders (ICDL). (2005). *Regulatory-Sensory Processing Disorders. In Diagnostic Manual for Infancy and Early Childhood*. Bethesda, MD: ICDL.
- Schaaf, R., Miller, L., Sewell, & O'Keefe. (2003). Children with disturbances in sensory processing: A pilot study examining the role of the parasympathetic nervous system. *Am J Occup Ther*, 57(4), 442-449.
- Talay-Ongan, A. & Wood, K. (2000). Unusual sensory sensitivities in autism: A possible crossroads. *Inter J Dis, Dev and Educ*, 47(2), 201-212.

### Websites:

www.thespiralfoundation.org  
 www.kidfoundation.org  
 www.spdnetwork.org

### Books:

Ayres, A. (2005). *Sensory Integration and the Child: Understanding Hidden Sensory Challenges*. Los Angeles: WPS.