

# Physician Fact Sheet

## Sensory Integration Disorders

### Signs and Symptoms

## What are Sensory Integration Disorders?

**Sensory Integration Disorders (DSI)**, first identified in the 1960's by Dr. A. Jean Ayres, is a developmental disorder that is characterized by deficits in:

- √ processing and organizing sensory information
- √ assigning meaning to sensory events
- √ acting or responding to situations in a graded, adaptable manner

also known as **Sensory Processing Disorders (SPD)**

Children who have **Sensory Integration Disorders** may not be able to perform everyday tasks of self care or play easily. They also tend to have increased frequency of falls and spills more so than other typically



developing children.

#### Estimated Prevalence

- 73% are male
- 5-13% for children entering school.
- 40-88% for children with autism

#### Associated Disorders

**DSI** is commonly associated with:

- Learning disabilities
- Developmental Coordination Disorder
- Attention Deficit Disorder with and without hyperactivity
- Pervasive Developmental Delay/ Autism Spectrum Disorder
- Language Delay
- Auditory processing disorders
- Institutionalized children
- Dyslexia

#### Functional Problems Associated with DSI

- Decreased social skills resulting from behavioral/attentive/affective disorders
- Delayed fine/gross/oral motor skill development
- Delayed/atypical emergence of daily living skills
- Impairments in sleep/eating/elimination patterns

(Interdisciplinary Council on Developmental & Learning Disorders, 2005)

## Features of Sensory Integration Disorders

**Major Subtypes:** **DSI** 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 input
- Impairment not due to general medical condition
- Impairment interferes with functional skills, social-emotional health, & behavioral regulation.

- Usually identified in early childhood or adolescence
- Variable presentation as compensatory behaviors may have developed. However, underlying deficits persist.
- Empirical evidence of physiologic measures show:
  - \* Atypical sympathetic nervous system activity in abnormal electrodermal (EDA) response to sensory stimulation. (McIntosh, Miller, Shyu, & Hagerman, (1999)
- Prevalence of vestibular and /or cerebellar symptoms

#### 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

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.doverehab.com](http://www.doverehab.com)  
 (516) 935-3683

## Subtypes of Sensory Integration Disorders

### Sensory Modulation Disorder

**Definition:** Problems in self regulating the intensity and nature of responses to sensory input.

**Diagnostic Features:**

- Strong negative responses to sensory stimuli that is not usually aversive to others
- Responses may be emotional or behavioral
- May involve over responsiveness to all senses, but most commonly tactile and visual stimuli
- Problems exacerbated by stress, may fluctuate over time, and may be dependent upon situation

### Somatosensory Processing Disorder

**Definition:** Problems interpreting sensations arising from muscles, skin, and joints (leading to poor body awareness).

**Diagnostic Features:**

- Poor recognition and interpretation of essential characteristics of tactile stimuli
- Poor detection of differences or similarities in qualities of stimuli e.g. squeezes too tight, breaks toys, grip too light
- Often occurs concurrently with dyspraxia and poor fine motor skill development

### Postural-Ocular Disorder

**Definition:** Problems with quality of control or stabilization of the body during anti-gravity activities.

**Diagnostic Features:**

- Hyper or hypotonic muscle tension/tone or joint instability
- Poor muscle co-contraction for movement against gravity or postural control
- Difficulties in oculo-motor control or functional use of vision
- Often occurs in combination with vestibular, auditory and/or visual motor problems

### Dyspraxia

**Definition:** Deficit in the ability to plan, sequence & execute novel or unfamiliar actions.

**Diagnostic Features:**

- Awkward, poorly coordinated motor skills which occur in combination with a deficit of sensory processing
- Often occurs in combination with perceptual, visual-motor, or language problems
- Poor ability to generalize learned skills to other similar motor tasks
- Poor timing or rhythm of motor actions

---

---

## Common Signs and Symptoms

- Withdraws from light and unexpected touch such as social touch, clothing tags
- Dislike of activities involving unexpected touch such as hair washing, tooth brushing, hair/nail cutting
- Gagging, refusal to eat certain foods resulting in limited diet
- Avoidance of messy or textured materials such as lotion, glue, foods with sauce
- Strong preferences for clothing texture and fit
- Over sensitive to sounds or sights
- Difficulties manipulating clothing fasteners
- Difficulties manipulating small objects
- Deficits in ability to discriminate among similar sounds, pictures, textures, touch
- Difficulty adjusting for direction of movement, force. Holds pencil too tight, too loose, pushes too hard, tears paper when erasing, etc
- Poor balance reactions
- Poor sense of speed of movement
- Poor postural control over strength, e.g. poor sitting tolerance
- Poor dynamic body righting or equilibrium
- Avoids weight bearing on upper extremities
- Difficulty isolating head from eye movements or poor ocular control in tracking or visual shifting e.g. when reading, copying from black board
- Avoids climbing, fear of heights, swaying playground equipment
- Fatigues quickly
- Poorly established hand dominance
- Inefficient, sloppy self-care skills
- Poor use of tools e.g. utensils, pencil, scissors
- Problems playing sports
- Resists trying new activities
- Difficulty transitioning from one task to another
- Resists change in routines
- Poor play skills, often prefers to play with younger children
- Poor articulation
- Poor awareness of body in space
- Difficulty playing ball games

---

---

### Resources

**Books:**

- Ayres, A. J (2005) Sensory Integration and the Child  
Los Angeles: WPS
- Beil, L and Peske, N (2005) Raising a Sensory Smart Child
- Aquilla, P, Sutton, S, and Yack, E (2003) Building Bridges through Sensory Integration
- Koomar, J, Kranowitz, C, Sklut, S (2001) Answers to Questions Teachers ask about Sensory Integration

**Websites:**

- [www.comeunity.com](http://www.comeunity.com)
- [www.ldonline](http://www.ldonline)

# Impact of Sensory Integration Sub-types at School and at Home

## Impact at School

### Sensory Modulation Disorder

- Difficulty adjusting to change in classroom routines (substitute teachers, “specials”, etc.)
- Organizational deficits impact ability to function independently
- Self-management deficits compromise ability to adapt to non-structured activities (lunch, recess, etc.)
- Compromised social skills, difficulty with friendships
- Fluctuating arousal levels begin to distance peers

### Somatosensory Processing Disorder

- Needs more assistance with grooming than peers
- Difficulties with hygiene and grooming begin to be noticed by peers
- May be unaware of messiness after eating, toileting, etc.
- Sloppy appearance, clothing worn with twists, poorly adjusted
- More bumps and bruises than peers
- Difficulty manipulating classroom tools due to poor appreciation of touch and movement

### Postural-Ocular Disorder

- Difficulty maintaining centered position for fine motor activities
- Poor endurance with sitting posture as needed for efficiency with fine motor activities
- Poor ability to control muscles of the eyeballs leads to difficulty with reading comprehension
- Poor ability to direct movement of classroom tools
- “Slushy” speech and poor listening skills

### Dyspraxia

- Poor spatial awareness impacts math and spelling skills
- Motor sequencing deficits impact handwriting
- Motor planning and sequencing deficits impact ability to follow multi-step instructions. Classroom tasks need to be broken down
- May have difficulty with sound sequencing as needed for phonics

## Impact at Home

- Difficulties with self-regulation, temperament, and arousal challenge parenting skills. Parents are in need of support.
- Sensory hypersensitivities impact child’s preferences in terms of nutrition, clothing, routines
- Constricted exploratory play behavior limits ability to learn from experience
- Issues with arousal (under or over aroused) impact others in the household
- Issues with temperament impact others in the household

- Poor safety awareness results in frequent accidents and visits to the hospital emergency room
- Lack of precision in motor skills impacts efficiency and task organization
- Poor fit in clothing choices, hair styles impact appearance
- By third grade issues with self esteem tend to impact social relations

- Lack of fine motor skills leads to delayed acquisition of self care skills
- Learned helplessness impacts social maturity
- Low endurance leads to preferences for sedentary play which further impacts development of motor skills
- Often “left out” of team sports, activity groups, etc.
- May have issues with weight management

- Uses social personality to make up for coordination deficits
- Significant issues with balance impact play (bike riding, skating, etc.)
- Difficulty learning new motor skills involving sequencing (ie tying shoe laces, jump rope/ hand clapping games)
- Presents with difficulty organizing “personal space” or too rigidly organized; either trait antagonizes family members

### Resources

#### Books:

#### Websites:

[www.comeunity.com](http://www.comeunity.com)  
[www.ldonline](http://www.ldonline)