

WHAT IS SENSORY INTEGRATION?

Sensory integration is the brain's innate ability to take in (register and perceive) information from the environment through the various senses, process and organize the information and then use it effectively.

WHAT IS SENSORY INTEGRATION DYSFUNCTION?

Sensory integration dysfunction is when the brain is unable to process the information received from the senses. When this occurs, the brain cannot analyze, organize or integrate this information to produce a functional outcome.

POSSIBLE SYMPTOMS OF SENSORY INTEGRATION DYSFUNCTION

- ✓ Hyper or hypo sensitive to touch, movement, sight, sounds or smells.
- ✓ Activity level which is too high or too low.
- ✓ Coordination problems.
- ✓ Delays in speech, language, motor skills and academic achievement.
- ✓ Poor organization of behavior
- ✓ Poor self-concept (body awareness)

THE VESTIBULAR SYSTEM

Vestibular processing refers to the information that is provided by the receptors within the inner ear. These receptors are stimulated by movement of the head and input from other senses. This input tells where we are in relation to gravity, whether we are still or moving, how fast we are going, and in which direction. It also influences the development of balance, equilibrium, postural control and muscle tone. Vestibular input also plays an important role in helping to maintain a calm, alert state and keeping the level of arousal in the central nervous system balanced. An under-reactive vestibular system can contribute to distractibility and hyperactivity due to the lack of its modulating influence. Depending upon the situation, vestibular stimulation can either calm or stimulate and facilitate a more organized activity level. Children can be hyper and/or hypo-responsive to this type of input.

VESTIBULAR INPUT IS VERY POWERFUL AND ACTIVITIES SHOULD BE COMPLETED AFTER CONSULTATION WITH YOUR OCCUPATIONAL THERAPIST.

Some characteristics that indicate possible VESTIBULAR (movement) issues:

Over-responsiveness to vestibular input:

- ◆ Avoids movement in general, has a fear of falling, has fear of heights
- ◆ Dislikes upside down play or playing on playground equipment
- ◆ Very cautious, moves slowly, prefers sedentary work
- ◆ Fearful/hesitant to go up/down stairs
- ◆ May experience motion sickness on school bus

Under-responsive to vestibular input:

- ◆ Craves intense movement input and will create self movement i.e. rocking, moving or re-positioning in chair, spinning self or objects
- ◆ Daredevil behaviors, thrill seeker
- ◆ Putting head in upside down position or rapid head turning/shaking
- ◆ Poor or decreased balance skills
- ◆ Up and down out of seat frequently or falling off of chair
- ◆ In constant motion
- ◆ Running or moving about quickly
- ◆ Toe walking
- ◆ Becomes over-excited watching other children moving
- ◆ Decreased attention to task
- ◆ Erratic arousal level

THE PROPRIOCEPTIVE SYSTEM

This system is made up of receptors in the muscles and joints in the body. It provides information to the brain about body position and movement without using the vision system. This information is created by the contracting and stretching of muscles as well as the pulling and compression of joints between bones. Proprioceptive input, a name for heavy work or deep pressure to the muscles and joints can be both calming and alerting to the nervous system. Unlike other sensory input, it is rarely overloading. It also improves body image, muscle tone and strength.

Some characteristics that indicate possible PROPRIOCEPTIVE issues:

- ◆ Decreased body awareness/clumsy/accident prone
- ◆ Body tensing or jaw/teeth clenching
- ◆ Banging hands on table
- ◆ Getting self into small spaces- i.e. under desks
- ◆ Stomping, marching or heavy steps
- ◆ Hugging, banging into or pressing against people or objects
- ◆ Touching wall while walking down hall
- ◆ Plays rough
- ◆ Over-exaggerated movements- i.e. shoving chair under desk
- ◆ Exerts too much or not enough pressure-i.e. breaking writing utensils, pressing too hard or too light when writing
- ◆ Erratic arousal level
- ◆ Decreased attention to task
- ◆ Self-injurious

THE TACTILE SYSTEM

This refers to our sense of touch. These receptors are located throughout the skin and provide information about the environment. It includes our ability to protect (alerts to danger) and discriminate (provides information about the qualities of something). Some children are hyper-responsive to touch stimulation while others may be hypo-responsive or some children can be a little bit of both. Difficulty in this system may also impact upon feeding skills.

Some characteristics that indicate possible TACTILE issues:

Indicators of tactile hyper-sensitivity:

- ◆ Withdrawal from tactile stimuli (i.e.-won't play with paint, glue, etc.)
- ◆ Behavioral over-reactions prior to or after tactile experience (i.e.-aggressive after being bumped into in circle time or gym)
- ◆ Gagging/vomiting with tactile play
- ◆ Dislike hair-washing/cutting and bathing
- ◆ Difficulty playing/working in close proximity of others or being in a crowd
- ◆ Difficulty tolerating hugs, kisses
- ◆ Prefers certain clothing textures and styles (i.e. long versus short sleeves, no tags)
- ◆ Prefers certain food textures and temperatures
- ◆ Can be self-injurious

Indicators of tactile hypo-sensitivity:

- ◆ Frequently touching things/putting non-food objects into mouth
- ◆ Difficulty transitioning away from tactile activities
- ◆ Seeks out deep pressure and bumps into others
- ◆ Can be self-injurious

VISION

This is the ability to take in information through the eyes and produce an image. Vision is the ability to get meaning from eyesight.

OCULAR MOTOR SKILLS

Ocular control is the smooth and coordinated movement of the eyes to attend to and follow objects and people in the environment. Controlled eye movements are needed for finding and tracking a moving object, scanning the environment, sustaining eye contact on a fixed object or person, shifting your gaze from one thing to another and eye hand/eye foot coordination skills.

VISUAL STIMULATION

Although many children may not have any vision or ocular motor limitations, they may get visually over-stimulated by everyday environmental stimuli. They may be easily distracted by bright lights or a busy environment (i.e. wall decorations) and not be able to offer eye contact or visually attend.

Some characteristics that may indicate VISION issues:

- ◆ Limited eye contact
- ◆ Frequent blinking/squeezing both or one eye together
- ◆ Squinting eyes
- ◆ Covering eyes
- ◆ Visually distracted by environmental stimuli
- ◆ Excessive interest in visually stimulating objects, creates visual stimulation i.e. spinning objects
- ◆ Looks intensely at objects, can't focus on objects or stares into space
- ◆ Difficulty accommodating to bright lights, sun or colors

- ◆ Afraid to be in a dark room or turns lights off
- ◆ Loses place when reading
- ◆ Skipping lines/words when reading
- ◆ May pay attention to detail and miss the whole picture
- ◆ Difficulty finding objects in a cluttered area
- ◆ Difficulty with figure ground skills (can't find a sticker on a colorform board)
- ◆ Hesitation going up or down steps

AUDITORY

This is our sense of hearing. The auditory system sits together with the vestibular system inside the ear. Sound enters from the outer ear (pinna) and passes through the ear canal and into the middle and inner ear where high and low frequency sounds are perceived. An example of a higher toned sound is a person's voice. These sounds tend to carry a lot of information. A lower toned sound tends to be deeper and not carry as much information. Rhythm, however, is picked up through lower frequency sounds and is important for developing fine and gross motor skills.

Auditory processing is the perception of and ability to understand what is heard in the environment. You need to be able to discriminate between sounds, associate and decode sounds and remember what is heard. When these things do not occur, a child may appear inattentive or unable to "listen". There is a difference between listening and hearing. Listening is active and one must want to do it. Hearing is the passive reception of sound.

Some characteristics that indicate AUDITORY issues:

- ◆ Adverse reactions to everyday environmental sounds
- ◆ Speaking too softly or loudly
- ◆ Poor "listening" skills or appears not to hear
- ◆ Easily distracted by extraneous background sounds/noises
- ◆ Difficulty discriminating between sounds
- ◆ Focus on background/less important information
- ◆ Hums or sings to self
- ◆ Covers ears
- ◆ Becomes over-stimulated in loud, crowded places