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# ACTIVITIES TO PROVIDE SENSORY INPUT

A practical guide for parents and service providers of children with sensory processing disorders

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# **Sensory Processing**

A Brief Introduction

#### What is sensory processing?

Sensory processing involves the ability to make sense of sensations, thereby enabling us to generate adaptive responses. Disorders of sensory processing can have extreme adverse effects on development. The influence of a disordered system can be so pervasive that the individual demonstrates difficulties in all aspects of their life. This might include problems with social skills, behavior, daily self-care tasks, academics, and behavior.

#### What are the symptoms of sensory processing disorders?

Symptoms of sensory processing disorders can manifest themselves in the form of attention problems, self-injurious behavior, self-stimulation, frequent tantrums or aggression, unpredictable explosions of emotion, impaired learning, poor social skills, poor balance, over or under response to various sensations, and difficulty maintaining an alert but relaxed state. Sensory processing problems can be found in individuals who have no medical diagnosis. These individuals might typically demonstrate one or more of the above characteristics.

#### Who commonly demonstrates sensory processing disorders?

Sensory processing problems are linked with impaired neurological functioning and are also commonly seen in individuals who have the following diagnoses:

- Autism and Autism Spectrum Disorders (including Asperger's Syndrome, Pervasive Developmental Disorders, and PDD-NOS)
- Sensory Integration Dysfunction/Sensory Processing Disorder
- Non-Verbal Learning Disability
- Mental Retardation
- Cerebral Palsy
- Attention Deficit (Hyperactivity) Disorder
- Down Syndrome and other chromosomal disorders
- Other learning disabilities

#### Are there different types of sensory processing deficits?

Sensory processing deficits can be divided into four categories:

- 1. Sensory defensiveness is the inability to correctly interpret and respond to incoming information. An individual with sensory defensiveness responds to benign sensory input as if it was threatening and demonstrates unusual responses or behaviors that are difficult to manage. These reactions can be a negative response to sound, sight, smell, touch, taste, or movement; but the majority of negative reactions (80%) are related to touch. For example, a child in line at school may be lightly bumped by another child. The child who was bumped may overact defensively to this and perceive the bump as being hit, and then may cry or hit back.
- 2. Sensory Modulation is the ability to achieve an appropriate level of alertness and attention to the task at hand. An alert but relaxed state is required to enable an individual to transition between activities and function optimally. For example, the excitement demonstrated during play activities would be inappropriate in the classroom or mealtime settings. In order to self regulate, children often engage in self-stimulation (hand flapping, spinning, etc), fidgeting. Children with sensory modulation difficulties also tend to have difficulties with transitions, which can result in negative behaviors. These children are often described as "hyper" or "lethargic" depending on their ability to modulate incoming stimuli.
- 3. **Sensory Registration** is the ability to adequately recognize sensations. Dysfunction in this area can be seen through heightened or diminished detection of specific sensations. An example of this would be individuals who cannot transport themselves without touching or bumping into walls and furniture. They are not aware/registering the sensations from their joints/muscles as well as their visual perceptual system to tell them where they are in space. They may have low tone, delayed response, problems with muscle grading, excessive hanging on objects, rocking, climbing, or may be rough with other children.
- 4. **Sensory Integration** is the ability of our brain to take in and interpret multisensory information in order to produce the appropriate adaptive response. For example tossing/catching a ball requires the visual, proprioceptive, vestibular, and tactile senses to all work together on a coordinated manner. These children often have poor motor control, poor bilateral coordination, and poor ability to play on playground equipment.

\*\* Problems with sensory defensiveness and sensory modulation are a result of dysfunction in pathways in the brain, while problems with sensory registration and sensory integration are the result of a dysfunction in the pathways in the peripheral nervous system.

# How do you meet the needs of individuals who have sensory processing difficulties?

The first step is a proper evaluation. Individuals with sensory processing disorders are often misunderstood and misdiagnosed, resulting in unsuccessful treatment often using a behavioral approach. Addressing sensory processing problems from a behavioral approach *alone* imposes even more stress on the struggling nervous system. With the proper evaluation and treatment, maladaptive behaviors resulting from disordered sensory processing often quickly decrease as the brain is receiving the sensations it has been craving. Behavior modification techniques can be extremely helpful, but only when used to create structure and only when used in conjunction with a comprehensive sensory integration program.

The second step is addressing the individual's needs:

- 1. Eliminate the source of the problem by decreasing the demands on a disordered nervous system. To accomplish this, make environmental modifications that consider time, physical space, activities, and interactions.
- Provide an enriched environment through the availability of specific sensory activities. This "sensory diet" is specifically tailored for the individual's sensory needs. A prescribed sensory diet facilitates the individual's ability to engage in functional activities and daily routines through provision of needed sensory sensations.

#### How do you determine if sensory processing is an issue?

There are several screening devices available to aid in determining and identifying sensory processing disorders. If such a tool indicates the probability of sensory processing dysfunction, further investigation is warranted. Your occupational therapist or other individual trained in evaluating and treating sensory processing should be consulted to determine the area of dysfunction and appropriate treatment.

#### The following are several resources to help you gather more information on sensory processing:

The Out-of Sync Child by Carol Stock Kranowitz, M.A

The Out-of Sync Child has Fun by Carol Stock Kranowitz, M.A.

The Explosive Child by Ross W. Green, Ph.D.

The Asperger's Answer Book by Susan Ashley, Ph.D.

My Kitty Catsberger by John M. Ortiz, Ph.D.

# **PROPRIOCEPTIVE INPUT**

This system provides an individual with information regarding the position of the body in space. This includes position of body parts, rate and timing of movements, how much force muscles are exerting, and how much and how fast the muscle is being stretched. The brain receives proprioceptive signals from one's muscles and tendons. It is critical to reflexes, automatic responses, motor planning, balance, and muscle tone throughout the body.

If applying proprioception, be cautious with individuals who have low tone or "slack" joints, poorly articulated joints, joint deformities, fragile bones, weak grip, or diminished sensation. Be sure to pay attention to proper joint alignment. Stimulation should be pleasurable and should be discontinued if the individual does not tolerate it well.

#### Suggested Activities to Provide Proprioceptive Input:

- 1. Compression and traction to the joints experienced while jumping, especially on a mini trampoline, old mattress, or tires. Jumping also stimulates the vestibular system.
- 2. Jumping games to music
- 3. Jumping rope
- 4. Pushing a wheelbarrow gives resistance to the upper extremities
- 5. Weight bearing exercises such as sit-ups, pushups, airplane, chair pushups, most yoga poses, lifting weights, etc.
- 6. Tug of War
- 7. Laying on stomach while propped up on elbows
- 8. Clay/play-doh activities
- 9. Various animal "walking" crawling, crab walk, bear crawl, dinosaur stomping, marching, snake slithering, etc.
- 10. Crumple newspaper to make "snowballs". Have snowball fights, crawl through snowballs, etc.
- 11. Carry heavy objects such as books in backpack, carry in groceries, etc.
- 12. Vibrators with a cycle of less than 100 Hz will stimulate the proprioceptive system (rather than the tactile system).
- 13. Squishing child between large pillows, bean bags, etc.
- 14. Pillow fights
- 15. Wheelbarrow walk
- 16. Housework/yard work that provides resistance such as mopping floors, vacuuming, wiping counter tops, sweeping, raking leaves, etc.
- 17. Swimming
- 18. Toss/catch weighted balls or bean bags

Stimulation from this system tends to be organizing and calming for most people.

# **VESTIBULAR INPUT**

Any movement of the head in space stimulates the vestibular system. Input from this system gives information about the direction of motion about where the individual is in space, thus assisting the brain to better organize information from the environment. Among other things, this system helps to establish better communication between the two sides of the brain, influences muscle tone and equilibrium, enables the body to have smooth movements (rather than being stiff and rigid), enables the eyes to work together while promoting improved eye function, and influences the motor aspects of speech. When this system is not functioning optimally, every aspect of an individual's life can be affected. Vestibular stimulation can have an excitatory or inhibitory affect on an individual.

- Inhibitory slow, rhythmical, passive motion with the child in a situation not demanding a motor response, i.e. sitting and rocking himself in a child's rocking chair
- Excitatory rapid motion with expectation of an adaptive motor response, i.e. riding a sled down a hill

\*\* Always watch and respect an individual's natural response to vestibular stimulation. Allowing the individual to control how much stimulation is received will help to avoid over-stimulation. NEVER IMPOSE VESTIBULAR STIMULATION! Too much vestibular stimulation can be dangerous. If flushing, blanching, dizziness, fearful expression, hyper-excitement or withdrawal, unusual perspiring, nausea, or yawning is noted, stop the activity. In the event that the child demonstrates any of these adverse reactions, it may be more helpful for the child to receive immediate self imposed proprioceptive input rather than lying down as the child may be tempted to do.

#### Suggested Activities to Provide Vestibular Input:

- 1. Playing on most playground equipment including swings, merry go round, climbing bars, and monkey bars
- 2. Swinging
- 3. Riding a scooter board in various positions
- 4. Any rocking or spinning toys or activities
- 5. Any skating (ice or roller) activities
- 6. Running
- 7. Any dance or movement-type activities
- 8. Rolling up in a blanket like a burrito and then being unrolled out of it
- 9. Rolling in a barrel
- 10. Jumping on a mini trampoline (mini trampolines are safer than full-sized trampolines)
- 11. Riding tricycle, bicycle, or big wheel bike
- 12. Using a Sit n Spin
- 13. Playing "Ring Around the Rosie"
- 14. Roller Coasters

# TACTILE STIMULATION

**Tactile input** pertains to the sense of touch on the skin. **Tactile defensiveness** refers to a type of sensory integration dysfunction in which tactile sensations cause excessive emotional reactions, hypersensitivity, or other behavior problems. It is easy to think that a child is just being manipulative or has a "behavior problem" when they are saying something "hurts". However, there is a good chance that their body is having a negative reaction to a certain tactile input that truly gives them the perception of pain. For example, many children with tactile defensiveness are terrified of having their haircut or nails cut. This is not simply a behavior issue. These children genuinely feel that they are going to be injured by the light touch sensation caused by these grooming activities. Daily activities which cause many children to become defensive including brushing teeth, washing body, combing hair, getting dressing, and having their nails cut. With getting dressed, children especially have difficulties with certain textures of fabrics, tags in clothing, fasteners, and socks.

#### Suggested Activities for Tactile Defensiveness:

- Use the palm of your hand and a firm pat to touch a child rather than finger tips. Finger tips tend to provide a more light touch which can be ticklish and alarming. For example, a firm pat on the back is much more rewarding (and less defensive) than the "tickling" sensation of ruffling their hair.
- 2. Have the child stand at the front or the back of the line at school. This helps to prevent negative outbursts due to the light touch sensation of other children brushing up against them.
- 3. Firm and consistent pressure (proprioceptive input) tends to "override" irritating touch sensations. (This is part of the reason why we naturally rub something when it hurts). Try firm massage or gently "sandwiching" the child between cushions/pillows to provide proprioceptive input.
- 4. Try to gently and gradually incorporate a variety of tactile experiences into play.
- Various fabrics for playing dress-up
- Sand boxes, dried beans and rice pools, dried noodle pools
- Finger paints
- Bubbles
- Using your finger to write in shaving cream
- Various squishy, slimy, and prickly toys
- Apply lotion to hands/feet/body/face
- Use cookie dough or play-doh
- Splashing or other water activities, either outside or in the bath tub
- Play with puppets of various textures
- Make "mud pies" in the back yard
- Carve a pumpkin and use your hands to scoop out the inside

### IDEAS FOR INCORPORATING SENSORY STRATEGIES INTO A PLAYROOM/BEDROOM

#### Room Features

- Quiet, calming colors for walls blue, green, and beige are best with minimal artwork
- Incorporate textures into the décor including a variety of rug textures, throw rugs, egg crate mattresses, blankets (for wrapping oneself up) etc.

#### Furniture

- Bean bag chair provides proprioceptive input and support consider throwing a blanket over it or getting cloth covers vs. vinyl
- Small table and chair such that the child's feet can be placed on the floor with hips, knees, and ankles at 90 degrees.
- Hammock
- Pillows both large pillows for "sandwiching", smaller pillows for "pillow fights" and both sizes for "burying under".
- Barrels
- Mirror for body scheme development may want to cover it with a curtain at times to decrease visual distraction.

#### **Toys/Equipment**

- Sound system with child accessible music including nature sounds, classical music, child oriented calming songs, stories (with or without book), movement/dancing songs.
- Toys with a variety of textures in a "Sensory Toy Box"
- Mouth/blowing toys such as bubbles, horns, kazoos, and various music makers
- Calming light machines
- Play-doh, clay, and chalk/chalkboard provide finger/hand resistance for proprioceptive input as well as finger strengthening.
- Buckets of dried beans/rice, sand, fabric pieces, cotton balls, etc, for tactile input.
- Mini trampoline for proprioceptive and vestibular input
- Sit n Spin and/or scooter board for vestibular input
- Doorway swing (if child is less than 100 pounds)
- Large exercise balls for both proprioceptive and vestibular activities