SENSORY PROCESSING GUIDANCE FOR SCHOOLS

Children's Occupational Therapy
Gloucestershire Care Services NHS Trust
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WHAT IS SENSORY PROCESSING?

Sensory processing is the ability of the brain to organise information received from the senses so an appropriate response is made. We all learn about ourselves through our bodily senses. As well as the five senses of touch, taste, smell, sight and sound, the body also senses movement, force of gravity and body position through the muscles and joints. This is referred to as proprioception – the ability to sense one’s position in relation to the space around one.

We are constantly receiving sensory input from many sources including movement and gravity, sounds, vision, touch and smell. Our brains must be able to organise and process this sensory input, and to use that input to respond appropriately to a particular situation.

Many children don't know how to cope with the different sensory input they receive. They have difficulty registering and organising sensory information. This makes it difficult for them to perform the many complex tasks necessary for learning and functioning in the world.

Sensory Processing Dysfunction

For most of us Sensory processing occurs automatically, unconsciously without any effort. Sensory processing Dysfunction is difficulty in processing and organising sensory information. It is a sort of ‘traffic jam’ in the brain. Bits of sensory information get tied up in traffic and certain parts of the brain don’t get the sensory information that they need to do their jobs. (Jean Ayres 1979). As a result, the world is perceived incorrectly. It provides a different learning experience from everyone else’s.

Some of the early signs of Sensory Dysfunction

- Overly sensitive to touch, movement, sights and sounds.
- Under reactive to touch, movement, sights and sounds.
- Easily distracted.
- Social and/or emotional problems.
- Activity level that is unusually high or unusually low.
- Motor coordination difficulties
- Impulsive, lacking in self control.
- Difficulty in making transitions from one situation to another.
- Inability to unwind or calm ones self.
- Poor self concept.
- Delays in speech, language or motor skills.
- Delays in academic achievement.

SENSES

The Tactile System

Tactile system is developed by a baby through touch as a primary method of communication and to establish social bonds. Through tactile responses a child
learns about feeding, dressing, language, movement, perception, basic concepts and handwriting.
Tactile processing is the ability to interpret sensory information from the skin

**Signs of Tactile Dysfunction**

**Hypersensitive (over sensitive) –** This is also known as Tactile Defensiveness is characterised by a child who may overreact to sensations that do not distract his peers,

- May dislike certain foods due to texture.
- May dislike brushing teeth or hair.
- Responds with alarm when face/body is washed.
- Frequently walks on tip toes to limit sensation on the feet
- Does not like the feel of certain clothing.
- Reacts aggressively/emotionally to touch
- Rubs or scratches at a place on the body that has been touched by another
- Dislikes crowds.
- May avoid putting hands in sand, finger paint, glue and other “messy” activities.
- Dislikes being dirty.

**Hyposensitive (under sensitive)** Characterised by a child who does not seem to be aware of tactile sensations.

- Does not react to painful experiences.
- Frequently bumps into and pushes other children
- Seems unaware of cuts, bumps and bruises
- Bites self or picks nails frequently
- Difficulty manipulating tools and toys.
- Craves touch, may touch constantly or indiscriminately.
The Proprioceptive System

Proprioception is the conscious and unconscious awareness of body position and movement. The proprioceptive system is the muscle sense which tells the brain:

- When and how the muscles are contracting or stretching.
- When and how the joints are flexing, extending or being pulled and pushed.
- What the body parts are doing and where they are in space.
- The force muscles are exerting.
- How to modulate the vestibular system.

If the proprioceptive system is not functioning correctly the child may have difficulty with fine motor skills, gross motor skills and self help skills.

Signs of Proprioceptive Dysfunction

- Stiff uncoordinated movements.
- Poor spatial awareness.
- Craves deep pressure sensations on body.
- Unaware of obstacles in their pathway.
- Difficulty in moving and maintaining posture without the use of direct vision.
- Difficulty getting in and out of chair, up and down stairs.
- Too tight or too weak grasp on pencil.

Proprioception is the key skill required to plan movements. It becomes automatic with repetition.

Activities performed against resistance facilitate good proprioception.

Vestibular System

The vestibular system is the balance sense. It is the ability to interpret information relating to movement and balance.

It tells us:

- Where one is in relation to gravity, i.e. when you are spinning, jumping and swinging.
- Whether one is moving or standing still.
- How fast one is going and in what direction.
- Where one’s body is in space.

Its function is to:

- Maintain muscle tone and posture in order to move efficiently.
- Maintain a stable visual field by adjusting eye and neck muscles to compensate for movement of head/body.
- Enable you to use both sides of body together.
- Provide foundation for higher level learning.
**Signs of vestibular Dysfunction**

If a child’s vestibular system is **over sensitive** the following may be observed:

- Car sickness.
- Child who over reacts to mild or vigorous movement that most children would enjoy
- Dislike of carnival rides.
- Seeks sedentary options
- Fearful of jump up and down stairs, rolling in a barrel, climbing, leaning backwards, somersaults and swinging.
- They may try to control and manipulate events to avoid stressful sensations which may appear to others as obstinate and unco-operative behaviour.
- They often seek physical support from an adult.

If a child’s vestibular system is under **sensitive** the following may be observed:

- Child who needs lots of vigorous activity in order to "get going"
- Often stumbles and falls.
- Rocks in chair at desk
- Twirls/spins thought the day
- Seeks movement constantly- fidgets, rocks cannot sit still
- Takes excessive risks
- Difficulty co-ordinating both sides of the body, lacks hand dominance, does not cross midline.
- Confusion of right and left.
- Reversal of letters
- Has difficulty motor planning and performing motor sequences
- Delay in speech, reading, writing and visual perception.
- Love of fast and moving equipment – without becoming dizzy.
- Inability to follow a moving object, draw a line, read a line of print of copy from blackboard.
- Trouble holding head up while sitting.

**Visual Processing**

Visual perception is the ability to understand and interpret visual stimulus in order to understand the world. A child who has a deficit in visual processing has normal or corrected vision.

Visual perception skills develop when well organised vestibular, proprioceptive and tactile systems at brain stem level support interaction with the higher level function of the cerebellum.

**Signs of Visual processing dysfunction**

If a child’s visual system is **over sensitive** a child may be seen to over react to visual information in the environment that other children are not distracted by the following may be observed:
• Avoid bright lights
• Become frustrated when trying to find objects in competing backgrounds ie find pencil in drawer
• Is distracted by activity within the classroom
• Has difficulty completing puzzles as compared to peers
• Gets lost in familiar places
• Struggles to copy information form text book or board.
• Avoids eye contact

If a child’s visual system is **under sensitive** a child may appear unaware of visual information that they should notice the following may be observed:

• Looks carefully or intently at objects and/or people
• Hesitates going up/down stairs
• Has difficulty staying between the lines when colouring and writing
• Handwriting is illegible
• Difficulty copying form board- unable to hold image long enough to transfer it to the page
• Leaves sections on work sheets blank

If there is poor visual perception the following signs may be observed:

• Inability to avoid objects.
• Lacks personal space and boundaries.
• Disorganised possessions.
• Difficulty holding eye contact.
• Difficulty with depth perception.
• Poor attention to visual detail.
• Poor handwriting.
• May avoid reading, writing and drawing.
• Has difficulty with building and doing puzzles.
• Gets lost easily.
• Difficulty recognising and drawing letters, numbers and shapes.

**Auditory Processing**

Auditory processing is the ability to interpret information that is heard. It involves:

• Receiving information.
• Perceiving and discriminating between sounds.
• Sound association and decoding.
• Remembering what is heard.
• Attending to sound.
• Integration of what has been heard and expressing a response.
• Localising sound.
**Signs of Poor Auditory Processing**

If a child’s auditory system is **over sensitive** a child may be seen to over react to noises that other children are not bothered by.

- Holds hands over ears to protect for sound
- Complains about noise levels within the classroom
- Is distracted by noises within the classroom
- Easily frustrated during listening activities
- Needs instructions to be repeated and may confuse instructions
- Gives the impression that they are not paying attention

If a child’s auditory system is **under sensitive** a child may appear unaware of sounds/noises and do not seem to hear as much as others do.

- Difficulty discriminating/locating sound
- Make noise for noises sake
- Difficulty relaying simple message
- Gives inappropriate response to routine questions
- Difficulty following simple instruction
- May take longer to respond to instructions or to answer a question
- Frequently misuse grammar
- Problems with spelling
- Speech can be hard to understand due to inaccurate word substitution.

**Olfactory System**

Sensory organ for smell is the nose.

Taste and smell are more than mere sensory decoration. They serve as valuable early warning systems in situations where there are no auditory or visual clues.

These senses can contribute to memorable experiences on a personal level and memory associations may occur.

**Oral Processing**

This is the least versatile of the senses. It is triggered by the chemical content of substances in the environment. The chemical particles are picked up by receptor sites on the tongue.

There are four tastes perceived:

- Sweet
- Sour
- Bitter
- Salt

Children have more taste buds than adults; therefore they have a more highly developed sense of taste. A child may have difficulties perceiving taste or be over sensitive to strong tastes, which can lead to issues at meal times.
Touch and pressure receptors in the mouth perceive information about texture and sensation of food. Taste also works very closely with smell. It is rare to taste something without smell. It elaborates on the information received about food.'

**INDICATORS OF SENSORY PROCESSING DIFFICULTIES**

General indicators of sensory processing difficulties may include:-

- Overly or underly sensitive to touch, movement, sights or sounds
- Motor coordination difficulties
- Activity level unusually high or low
- Poor organisation of behaviour
- Delays in speech and language development
- Poor self concept
- Difficulties in activities of daily living
- Difficulties in learning
- Challenging behaviours

Other indicators of sensory difficulties are the social, emotional and behavioural responses to sensory stimuli, which may include:-

- Temper tantrums
- No sense of humour
- Cries easily
- Can’t express emotions
- Uncooperative
- Anxious
- Poor self confidence and self esteem
- Immaturity
- Avoids eye contact
- Overly affectionate
- Can’t read body language
- Frustration
- Difficulty coping with changes in routine

When looking at the specific sensory systems the following difficulties may be observed using a checklist.
SENSORY PROCESSING – REFERRAL ROUTE

A child may experience a number of difficulties in the above areas.

Concerns expressed by teacher, SENCO, parent/carers that reflect items from the Sensory Integration Checklist.

School complete Indicator Checklist through classroom observations, then discuss with parent/carer.

Refer to ‘Guidance Pack’ for strategies to be used in school.

Identify appropriate strategies, implement and review.

Monitor progress at school and home.

If concerns continue or progress is slow, consider with parent/carer referral to the Occupational Therapy Service via a health professional
STRATEGIES FOR SCHOOL

There are children in all schools who show signs of Sensory Processing Difficulties, in various degrees.

Some children have difficulty focusing and school making it much harder for them to learn. This can be seen in different ways such as talking, lots of movements and fidgeting or sluggishness and slumping in their chair.

Children may become more attentive and focused when there are changes in their environment and certain resistive type of activities are adopted.

WHOLE SCHOOL APPROACH

Advocate flexible teaching and learning i.e. taking account of auditory, kinaesthetic (inc. tactile) and visual learning styles.

Provide safe (quiet, comfortable) spaces in school for calming at all times. Difficulties can occur especially during playtimes, change, times of less routine (i.e. Christmas).

Whole school ethos promoting such activities as:
- Brain gym
- Yoga
- Motor control exercises
- Multi-skills
- Wake and Shake
- Take five
- Encourage movement breaks / heavy work activities before and between desk activities

Encourage extended out of hours Activities (not always competitive) i.e.
- Sport
- Tai Kwando
- Multi-skills
- Dance
- Music

Consider the environment
- Lighting - is there enough natural lighting?
- Displays – bright/reflective colours can be attention grabbing or distracting.
- Clutter – is the table /workspace as clear as possible?
- Room temp - too hot/cold?
- White boards - kept clean reduces visual distractions.
- Noise - keep background noise to a minimum; consider use of earplugs/defenders if necessary.
- Borders – helpful? Green go red stop.
- Prompts verbal and visual encourage child to make eye contact.
CLASSROOM STRATEGIES

The following strategies are suitable for all children and particularly those children with sensory difficulties. These ideas will also complement any advice given to the school by Occupational Therapy.

1. Consider the sensory demands of the class environment.

2. Have an area (if possible) where there is less sensory stimulus so that they can work at times without distraction and they don’t distract others.

3. Have an area where they can go and calm down (in class if possible). These areas need to be separate from facilities for isolation and exclusion since they are there to prevent escalation and they should be seen as places of safety.

4. Consider visual stimulation
   - Clearly displayed.
   - Timetables (visual and interactive if possible), capable of being changed on a day to day basis.
   - Keywords/Topic vocabulary.
   - Clearly labelled areas and resources.
   - Clearly labelled expectations/rules and objectives.
   - Place coloured card/paper under the child’s workbook. This will highlight the book/worksheet against the background.
   - Coloured borders at the start and end of lines for writing e.g. green for go and red for stop.

5. Consider auditory stimulation
   - Wait longer than you think is necessary to process instructions and put into action.
   - Establish and prompt eye contact with the child before speaking to them.
   - Teach children to ask for help and make yourself available to them if they are having difficulty.
   - Break directions down into steps and allow extra time for children to process them if needed.
   - Use prompts to help children increase alertness and return their attention to task in hand.
   - Monitor and limit the time that focused auditory attention is required.
   - Consider classroom noise level.

4. Consider splitting the lessons that involve a lot of sitting, for refocusing and calming through:
   - Brain gym
   - Yoga
   - Multi-skills
   - Drinking water
   - Drama
   - Rhythm and movement
5. Ensure consistent routines, rules and boundaries from all adults including supply teachers.

6. Plan transition times ie

   ✓ Around class activities.
   ✓ Lesson to lesson (especially important in Secondary schools).
   ✓ Playtime to classroom.

7. Check understanding (success of processing) of information by:

   ✓ Saying/displaying what you are going to teach.
   ✓ Say/display what you have taught.
   ✓ Practise what has been taught.

8. Have a range of resources at your disposal ie

   ✓ Different size/colour/shapes of writing implements.
   ✓ Different methods of recording.
   ✓ Fiddling aids (blue tac, bands, squidgy balls).
   ✓ Different resources for calming, extension, withdrawing.

9. Don’t assume what makes us feel safe/happy is the same for all ie

   ✓ Some children may find messy play really challenging (tactile defensiveness).
   ✓ Eating can be difficult for some children with tactile or odour defensiveness.
   ✓ Crowded situations including lining up can be very difficult for children with sensory integration difficulties.
   ✓ Playtimes are difficult for many children across a whole range of sensory issues.
   ✓ PE, whilst very good for many children with sensory issues is also very difficult for them and may lead to them attempting to withdraw.
   ✓ Art is a lovely activity, but can be very stressful for children who have motor control issues or who are visually or tactile defensive.
## SPECIFIC STRATEGIES

<table>
<thead>
<tr>
<th>SENSE</th>
<th>Over sensitivity</th>
<th>Under sensitivity</th>
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</thead>
<tbody>
<tr>
<td><strong>Touch / Tactile</strong></td>
<td><strong>Goal:</strong> To limit unfamiliar and unpredictable touch sensations</td>
<td><strong>Goal:</strong> To provide a variety of tactile sensations in the classroom</td>
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<tr>
<td></td>
<td>Avoid approaching from behind.</td>
<td>Encourage the child to explore through touch</td>
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<td></td>
<td>Allow the child to direct tactile contact.</td>
<td>Provide a tactile rich classroom environment</td>
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<td>Consider position in class – ideally away from main thorough fare/Allow child to choose where they sit</td>
<td>Increase contrast between items, objects, tasks</td>
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<td></td>
<td>Allow child to stand at beginning/end of line</td>
<td>Give the child appropriate items to touch and “fiddle with” i.e. fiddle toy</td>
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<td>Provide a quiet corner.</td>
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<td>Help the child learn to communicate their need for personal space</td>
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<td></td>
<td>Identify trigger objects/fabrics etc.</td>
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<td></td>
<td>Introduce tactile sensations gradually</td>
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<tr>
<td><strong>Vestibular/ Movement</strong></td>
<td><strong>Goal:</strong> To limit movement experiences that over stimulate the child</td>
<td><strong>Goal:</strong> To provide a variety of movement sensations in the classroom</td>
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<td></td>
<td>Avoid/limit fast movements</td>
<td>Encourage the child to participate in sensory motor and perceptual programmes.</td>
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<td></td>
<td>Limit</td>
<td>Incorporate movement breaks in to the child’s school day</td>
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<td></td>
<td>Give the child an appropriate object to squeeze to calm down i.e. stress ball</td>
<td>Consider a move’n’sit cushion</td>
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<td></td>
<td>Consider the length of time a child is expected to sit in one position</td>
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<tr>
<td><strong>Auditory</strong></td>
<td><strong>Goal:</strong> To decrease distracting noises whenever the child is listening to instructions or is task focused</td>
<td><strong>Goal:</strong> To increase the amount of auditory stimulation in the environment</td>
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<tr>
<td></td>
<td>Consider noise levels – allow child to use headphones/earplugs to</td>
<td>Give a clue to gain the child’s attention</td>
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<td></td>
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<td>Place child near source of</td>
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<td>Eliminate excess noise</td>
<td>Use visual cues to support auditory instructions</td>
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<tr>
<td>Quiet calm and well-paced voices</td>
<td>Allow the child to receive auditory input that does not distract other children.</td>
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<tr>
<td>Keep instructions consistent and concise.</td>
<td>Have child act as classroom messenger</td>
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<tr>
<td>Give a visual clue to gain a child’s attention</td>
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<tr>
<td>Allow child to sit near source of information</td>
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<tr>
<td>Limit auditory distractions</td>
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### Visual

**Goal:** To decrease visually distracting elements in the classroom environment.

- Reduce visual distractions
- Create designated area for frequently occurring information
- Consider child’s position in class/consider a corral
- Use auditory cues to support instructions

**Goal:** To increase visually stimulating and visual cues in the classroom environment.

- Consider lighting
- Provide distinguishing/contrasting visual cues within the classroom
- Use enhanced task features and contextual cues.

### Proprioception

Heavy work activities are used for children with sensory processing difficulties to help increase attention, decrease defensiveness, and modulate arousal.

“Heavy Work” meaning input to muscles, tendons and joints

- Whole body actions involving pushing, pulling, lifting, playing, and moving
- Oral actions such as chewing, sucking, and blowing

Proprioceptive based activities are rarely arousing

- This resistive input obtained through heavy work activities is generally organizing and can improve attention, arousal level, body awareness and muscle tone as well as decreasing defensiveness.

| Place chairs under desks at end of day |  |
| Erase chalk/whiteboard |  |
| Help rearrange desks |  |
| Help move gym mats etc |  |
| Take chewy food at break such as fruit bars or crunchy food such as veg, cereal |  |
| Sharpen pencils |  |
| Hand out books |  |
| Take up register, carry paper |  |
| Climb on playground equipment |  |
| P.e +++ |  |
| Colour rainbow over large sheet of paper whilst kneeling. |  |
| Stack chairs after assembly |  |
| Movement breaks, ie take 5, wake and shake etc |  |
Sensory Processing and the Environment

The environment is the key to how effectively or otherwise a child will learn. This is particularly true of school as it is a learning environment. Children with Sensory processing difficulties will require an environment that is sensitive to their needs. These needs will vary according to the child. What may suit one will not necessarily be ideal for another. Children and adults have senses that respond with random and variable effectiveness and this in turn has a significant impact on how they respond to different and varying stimuli in a learning environment. The ability to undertake a task will depend on the ability to screen out, or inhibit, nonessential sensory information such as background noises and visual information. An individual with sensory processing difficulties may respond to sensory input without this ability to screen out non-essential information which may produce distractibility, hyperactive, or uninhibited behaviours. They may be unable to calm or console themselves and may overreact or be unresponsive to different stimuli. Attention and regulatory problems occur in balancing and regulating the sensory processes.

Children may respond very differently to their peer group in the school environment and will provide different challenges for the teacher.

The Environment

When looking at the environment the following need to be considered:-

- Lighting
- Acoustics
- Furnishings
- Odours
- Demarcation lines between environments, e.g. clear boundaries
- Child’s seating position within the classroom
- Temperature
- Chill out area
<table>
<thead>
<tr>
<th>Lighting - Visual environment</th>
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<tr>
<td>Modify the environment to suit the child’s needs. Is the environment:-</td>
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<tr>
<td>Too dark?</td>
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<tr>
<td>Too light?</td>
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<td>Is there too much artificial light?</td>
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<tr>
<td>The wrong type of artificial light?</td>
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<tr>
<td>Too much daylight?</td>
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<tr>
<td>Light that causes shadows that may panic a child?</td>
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<tr>
<td>Observe how the child responds in different environments within the school and or within different spaces within the classroom. Once you have completed your observations, what changes are possible to implement? For example is it possible to use a different coloured light bulb in a particular corner of the room. This may allow the child a corner in which to relax.</td>
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<tr>
<th>Acoustics</th>
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<tr>
<td>Written instructions will be very useful to ensure that the child is able to process teaching instructions if they experience difficulty processing verbal instructions. Allow the child to work in a quiet room during paired or group activities if the volume of the other children rises too high for their level of noise tolerance.</td>
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<tr>
<th>Furnishings</th>
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<td>Seating</td>
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<td>Desk</td>
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<td>Seating position</td>
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<td>Odours</td>
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<td>Extra supervision</td>
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Further Information

Books

Website

Glossary
## USEFUL BOOKS

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Publisher</th>
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<tbody>
<tr>
<td>ANDERSON, EJ &amp; EMMONS, P</td>
<td>Unlocking the Mysteries of Sensory Dysfunction</td>
<td>Future Horizons</td>
</tr>
<tr>
<td>AYRES, Jean</td>
<td>Sensory Integration and the Child (1979)</td>
<td>Western Psychological Services</td>
</tr>
<tr>
<td>DeGONGI, GA</td>
<td>Paediatric Disorders of Regulation in Affect and Behaviour (2000)</td>
<td>The Psychological Corporation</td>
</tr>
<tr>
<td>KOOMAN, J &amp; KRANOWITZ, Carol &amp; SZKLUT, Stacy</td>
<td>Answers to Questions Teachers Ask about Sensory Integration: Forms, Checklists, and Practical Tools for Teachers and Parents</td>
<td>Future Horizons INC ISBN 1932565469</td>
</tr>
<tr>
<td>KRANOWITZ, Carol Stock</td>
<td>The Out of Sync Child</td>
<td>The Benchley Publishing Group</td>
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<tr>
<td>KRANOWITZ, Carol Stock</td>
<td>The Out of Sync Child has fun</td>
<td>The Benchley Publishing Group</td>
</tr>
<tr>
<td>KRANOWITZ, Carol Stock</td>
<td>101 Activities for Kids in Tight Spaces</td>
<td>The Benchley Publishing Group</td>
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USEFUL WEBSITES

www.sensory-processing-disorders.com

www.sensoryresources.com

http://www.out-of-sync-child.com

www.alertprogram.com

www.sensorytools.net