

## **Understanding Sensory Processing Difficulties: Information for Schools and Teachers**

**Please use the advice and strategies contained in this pack before asking the School Nurse to make a referral to the Occupational Therapy Service. If you feel you require further information please feel free to book onto one of our education sessions.**

### **What is Sensory Processing?**

Sensory processing refers to how we as humans interpret and use the information that we receive from all of the sensations from within our body and from our environment.

Sensory information is gathered by the brain from different systems around the body. The most familiar of these systems is sight, smell, taste, touch and hearing. In addition to these are the lesser known 'Proprioceptive' and 'Vestibular' systems, which will be discussed further with the other systems.

All of our sensory information is integrated to give us an understanding of who we are, where we are and what is happening around us. When our senses are integrated correctly we can respond appropriately to the sensation. For example, we will take off an itchy woollen jumper that is annoying us or we may take in a deeper breath to smell some flowers.

### **What happens if Sensory Information is not being integrated properly?**

We, as humans are recognised as "sensory beings". We register, process and use sensory based information all of the time, and have our own sensory preferences and ways of dealing with things. However, some people with sensory processing disorders may have difficulty in understanding what is happening inside and outside of their body and the sensory information their body is registering may not be accurate.

Having a sensory processing difficulty can affect an individual's ability to live, learn and have coordinated, fluid movement. It can significantly impact upon a child's daily activities, such as washing, dressing or brushing their teeth independently and can affect how they manage school-based occupations like writing, scissor skills, focused attention etc.

Imagine how a classroom may feel to a child with sensory processing difficulties: the pictures on the wall may repeatedly grab their attention as their brain does not register that this has been seen before. Their body is incapable of providing adequate information as to where their arms and legs are, so they will move about more in their seats to get extra feedback. The noise of the school bell will sound like someone screaming in their ear. When lining up to move classes they may be on 'high alert' and afraid that someone will brush passed them and hurt them as a result.

Children tend to react with their instincts and may struggle to communicate how they feel. They may appear muddled in a world they cannot quite understand, and this will show in their behaviour and emotional reactions. A child with sensory processing difficulties can often be labelled as wilful or naughty, but the child's reactions to the world need to be understood. They need support from those around them and to have strategies and activities in place to help make life a little easier for them.

This information pack has been designed to help identify and manage possible sensory processing difficulties. Each sensory system is discussed along with problems that can occur and any hints and activities that may help.

Melin, all the text below will be placed in a concertina/drop down bar, with the headings only seen on the outside of each bar. The yellow highlight shows each bar.

### **The Tactile System - Touch**

This system has two functions, protection and touch discrimination.

Protection - Our skin has receptors within it that respond to pain, temperature and touch. This alerts us to potential threats and allows us to react appropriately. The information is interpreted by the brain which then decides how we should act

Discrimination - The skin is our largest most sensitive organ. It has different receptors that allow us to feel in detail and respond to pressure applied to the skin. Through touch we gain information about where and how our body is positioned. We gain information about objects and our environment and are able to develop fine motor skills.

When the tactile system runs correctly a child should be comfortable and willing to interact with objects and people and be in an alert, yet calm state to learn.

### **Sensory processing difficulties that affect the tactile system**

There are two types of difficulties that can occur. The most common is being **over sensitive to touch**, less common is being **under sensitive to touch**.

#### **Over sensitive to touch**

Children who experience this may:

- Avoid being touched unexpectedly e.g. while waiting in line after break
- Get upset when others brush past them
- Push or shove other children as they are fearful of them getting too close
- Avoid messy play and become distressed if pushed to take part
- Get upset when their hands or face are messy
- Be distracted, inattentive and fidgety when quiet concentration is expected, relevant to age/developmental level
- Appear in shock at times, when their protective mechanisms kick in
- Get upset by the weather conditions.

#### **Helpful hints and activities for those overly sensitive to touch**

For the student who experiences sensitivity to touch (tactile defensiveness):

- Allow them to stand at the end of a line when amongst a group, to prevent them from being knocked or pushed
- Arrange classroom seating in a way that minimises the risk of them being jostled and bumped by classmates (i.e. have the child's desk either near the teacher or at the back of the room)
- When planning an art activity; modifications to the activity may be needed to accommodate the child who is sensitive to touch. Be aware that materials such as glue, finger paints, clay, paper maché, etc, may cause the child to have an aversive response

- Do not force them to complete activities against their will. Instead, suggest using tools (hammer, paint brush, etc) that may help the child participate more fully, and /or work up to the texture by using media they are happy to touch
- Prior to activities which may lead to anxiety for the child such as messy play or assembly time, use some of the heavy work activities suggested for proprioception problems on pages 9-10. Any task that provides active pushing/pulling or deep touch/pressure is calming to the nervous system so they are less likely to react in an inappropriate way
- Avoid light touch, use firm pressure when touching the child and always approach from the front
- Allow them to use 'fidget' toys, permit them one object. Set boundaries for them using it and ensure that this is not negatively impacting on their attention to tasks
- Children who have an oversensitivity to touch will often have poor touch discrimination, so they will need to experiment with lots of different textures and touch experiences at their own pace. To help them cope with touch experiences, or to help them keep calm, try using some proprioceptive/heavy work activities found in this section.

### **Under sensitive to touch**

Some children may be under sensitive to touch or may have reduced touch discrimination. Children who experience these may:

- Want to touch things more often than other children, in order to make sense of the texture/object
- Not notice having messy hands and face
- Not knowing where they are being touched
- Wear clothing twisted on their bodies and not seem to notice
- Have difficulty managing tasks where control and fine motor skills are needed, including use of tools e.g. pencils, scissors etc. For these children, it may be like doing tasks wearing thick rubber gloves
- Have difficulty in cleansing themselves after using the toilet
- Rely on their vision more to supplement poor touch perception
- Have poor body awareness
- Have trouble perceiving physical characteristics of objects.

### **Helpful hints and activities for those under sensitive to touch and/or have poor touch discrimination**

Encourage the child to experience as many tactile experiences as possible. Try integrating the following types of activities into their classroom activities:

- Messy Play - such as sand, water, finger paint, lentils, rice, shaving foam, play dough, powder, jelly, slime. Try pouring seeds or beans over hands
- Feely Box - a box with a sleeve attached to one end over a hole (you can use a pillowcase). The child places their hand through the sleeve to feel for objects inside the box without looking. Start with familiar objects with different shapes/textures, and then try objects with similar shapes/textures
- Hide and Seek - find objects of different shape and size hidden in bowls of
  - rice/lentils/dried beans, dried pasta shapes etc
  - polystyrene packing pieces
  - sand/fish tank or pot plant gravel
- Play dough, incorporating small hidden objects to pick out.

## **Smell and Taste**

Smell travels directly to the centre in our brain that controls our emotion, memory and learning. Smell is closely linked to our sense of taste, think about how bland food tastes when we have a cold for example.

Our brains are wired so that we are able to respond appropriately to taste and smell. For instance a bad smell does not go away, our brain just stops noticing it otherwise we would be totally distracted by it. If we smell burning we know to act on this promptly and appropriately.

### **Sensory processing difficulties that affect taste and smell**

Again, there are two difficulties that may occur, these are an **over sensitivity** and **under sensitivity** to taste and smell. The latter of the two is least common and does not usually impact on class activity. Where there is a sensitivity the child may:

- Avoid food that most other children of their age would enjoy
- Crave or get upset by certain tastes and/or smells and may not appear to get used to the smell
- Become distracted by a smell in the room and have difficulty focusing on the lesson
- Become nauseated or gag at smells that others are only mildly affected by.

### **Helpful hints and activities for oversensitivity to smell**

- Let the child carry out some heavy work activities to distract and calm them from the smell
- Allow them to have their favourite scent or an object that they like the smell of to block out the 'offensive' smell.

## **The Visual System**

There are two components to the visual system, **eye movement** and **visual processing**. Both of these components can be affected by sensory processing difficulties.

### **Sensory processing difficulties that affect vision: Eye movement**

The movement of our eyes is controlled by muscle. The eye muscles allow us to follow a moving object, fix on an object, scan a page of writing, and focus our eyes on one object and move to another refocusing quickly. If a child experiences difficulty with eye movement you may notice the following behaviours in class:

- Eye contact is limited as they struggle to maintain focus
- They use their fingers when reading to keep their place even when not age appropriate
- They repeatedly lose their place when copying from the board
- They may struggle to judge distances and bump into furniture in the classroom.

### **Helpful hints and activities for poor eye movement**

- Chat to the parents/carer of the child. The child may need an assessment by an Orthoptist (eye specialist) at their local general hospital
- Ensure the child sits at the front of the class
- Provide a written sheet on the desk to copy from rather than copying from the board
- Use large print books/work sheets
- Use a finger or ruler to mark where reading
- Use a typoscope when reading (cut out a window in a piece of card and show only what is needed to be read)

- Use an angled writing surface to reduce the distance the eyes have to travel from the board to the paper.

### **Visual processing**

Visual processing is how the brain selects and responds to the input seen. If a child has difficulties with visual processing you may notice that they:

- Struggle to stop noticing the pictures or people in the room, and are visually very distractible
- May dislike or cover their eyes when the fluorescent lights are switched on, as they are over-sensitive to bright light and sunlight
- May complain of a headache, rub their eyes, have watery eyes or squint.

### **Hints and activities to help visual processing**

- Build up the sides of a desk with cardboard to block out distracting stimuli
- Keep visual distractions in classroom to a minimum, especially hanging or moving projects, as movement is more visually distracting than still projects on the wall
- Keep the classroom clutter free as far as practical
- Have the child sit near the classroom teacher to facilitate the child's ability to attend to directions and tasks
- Use different colours for different lines on the whiteboard.

### **The Auditory System - Hearing**

Auditory processing refers to how the brain recognises and makes sense of sound. Sound consists of loudness, pitch, how long it lasts for and where it is coming from. Our body automatically puts all of this information together and responds appropriately to it.

### **Sensory processing difficulties that affect the auditory system**

There are two types of auditory processing difficulties that can occur. The first is an **over sensitivity** to auditory input (sound) and the second is an **under responsiveness** to sound.

#### **Over sensitive to sound**

If there is a difficulty the child may:

- Put their hands over their ears when the noise level rises in the class or the bell rings
- Overreact to sounds that others barely notice
- Continually notice noise such as a fan, or ticking clock and be unable to focus on another task.

#### **Helpful hints and activities for those overly sensitive to sound**

- Show understanding for their sensitivities, as it can be very uncomfortable and sometimes even hurt
- Try to forewarn the child of any loud noise before it occurs (i.e. bell/fire alarm)
- To minimise auditory distraction, a classroom with a rug or carpet would help decrease extraneous noises
- Allow them to wear headphones or ear plugs when there is an expected excess of noise in the room
- Don't sit them near the school bell or school intercom system.

#### **Under sensitivity/difficulty registering auditory input (hearing sound)**

If this is a problem, the child may:

- Speak in a loud voice
- Hum to themselves
- Seem to ignore you when you call their name even though you know they have heard.

\*Please note that these behaviours may also be seen in children who are over sensitive to sounds, as they can struggle to screen out surplus noise in order to attend to your voice or they may hum as a way to block out other unexpected sounds.

### **Hints and activities for those with under sensitivity/difficulty hearing**

- Only speak to the child when they are facing you and looking at you
- Give simple instructions. Use simple, expressive sentences, and do not use too many words
- Speak a little more slowly and clearly
- Start with one instruction and increase as the child is able to retain more information
- Ask the child to repeat the instruction to you to ensure they have heard and retained the information
- Wait for the child to process the information and respond, which may take them longer
- Give written instructions or prompt sheets, as well as verbal ones
- Reduce extraneous noise or wait until it has gone before giving instructions. (Do not expect the child to concentrate when there is a lot of noise going on outside the classroom)
- Reduce background noise – e.g. humming from electrical items, ticking clocks, etc.

### **Proprioception**

Proprioception refers to how the body senses itself. It is a subconscious sense that tells us where our arms and legs are without us having to look at them. This occurs when information is passed on from our muscles and joints, through the spinal cord and to our brain. This process continually works, even when we are still, to maintain resting muscle tone to ensure that we remain upright, stable and in control of our body's position.

Having a sense of proprioception also helps us to understand how much force we need to apply to objects and actions.

### **Sensory processing difficulties that affect proprioception**

The common difficulty in processing proprioceptive information appears to be a lack of sufficient information, so the child is likely to act in a way to acquire more input, and may be seen to:

- Fidget in their seat in an attempt to gain more information from the muscles and joints as to the position of their body parts
- Use too much or not enough force for the task in hand e.g. be heavy handed or struggle to grade the force they should place through a pencil, or play with toys, struggle with PE, using particular apparatus or playing ball games
- Have weak arms and legs in regard to sustaining a position for a period of time
- Keep looking at their hands when writing or using a mouse on a computer
- Keep looking at their feet when trying to ride a bike or climb apparatus
- Chew hard on their pen or sleeve
- Push or bang into other children, but is not an aggressively natured child
- Be clumsy and uncoordinated
- Seek crashing and banging activities.

### **Hints and activities for those with proprioceptive processing difficulties**

Children who experience difficulty in processing proprioceptive information often need input in the form of pressure or heavy resistance in order to receive, process and use information adequately. Tasks that require heavy resistance help innervate the muscles and joints, and in turn the brain. This helps the body to assimilate and process movement and helps to grade that movement effectively too.

Proprioceptive activity/heavy work has also been found to be helpful in calming individuals if they become over stimulated.

### **Proprioceptive/Heavy work activities that may be helpful:**

#### **Carrying objects:**

- Helping with the shopping, to pack, carry and empty heavy groceries
- Allowing the child to wear a back pack with some heavier items in (not too heavy), such as a few books. This may be helpful during times of transition or when sitting to help them keep calm
- Stacking/moving chairs
- Gardening, using a watering can, carrying objects or sacks of soil etc
- Carrying sand in buckets
- Any kind of activity that involves some weight to it, but make sure the weight and size used is appropriate for the child (not too heavy).

#### **Pulling/pushing objects:**

- Shopping trolley
- Laundry basket
- Raking leaves
- Riding a bike
- Swimming
- Resistance activities at the gym.

#### **Jumping/bouncing:**

- Trampoline
- Onto bean bags
- Sitting on a large ball while undertaking other activities
- Space hopper
- Exercises on/with a large gym ball
- Sack race
- Wheelbarrow walking on hands
- Simple jumping, bouncing, twisting and turning exercises.

#### **Proprioceptive activities for hands and arms:**

- Pushing hands together
- Prior to handwriting have the child do some warm up exercises such as pressing palms together, pulling each finger-tip, press the palms on to the desk, chair push ups with hands flat on the seat pushing their body up

- Pushing hands onto a wall - with straight arms lean into the wall and push
- Tug of war - sit on the floor opposite another child, feet touching and holding hands, pull and push each other
- Push ups – complete half-push ups on the knees if push ups are too difficult
- Making and kneading bread
- Rolling out pastry
- See above 'Carrying objects'
- See 'Pushing/pulling objects'
- Lay on floor to watch TV and hold head in hands
- When playing a game, sit on the floor on your side and prop your weight onto the arm of the same side
- Pop bubble wrap using each hand, and take it in turns to pop a bubble with each finger to thumb separately.

### **Other proprioceptive activities:**

- Get the child to help in activities in and around the school and playground
- Re-organize furniture in the class, put out gym equipment, etc.
- School garden - digging a patch, using a wheelbarrow, carrying bags of soil, manure etc.
- Collecting pebbles from the beach
- Walking on sand and sand dunes
- Cleaning windows, polishing furniture
- Help with school books, tidying things away for the teacher
- Give the child a lap weight (such as a wheat pack)
- Use a 'Move N sit' cushion to sit on to give them additional feedback, available from [www.specialdirect.com](http://www.specialdirect.com) or [www.sissel.com](http://www.sissel.com), [www.sensorydirect.com](http://www.sensorydirect.com)
- Go underneath heavy quilts, blankets, cushions, to induce a feeling of being squished
- Slow rocking, backwards and forwards.

We carry out many daily activities that can provide plenty of input for children with sensory processing difficulties. We just need to be more aware of these opportunities and be prepared to adapt things slightly as and when required.

### **The Vestibular System**

The vestibular system is involved in the management of movement and the effects of gravity on the body. It ensures that the body remains upright against gravity and allows the body to automatically adjust to movement and positional change.

The vestibular senses are located in the inner ear and are stimulated when we move or change our head position, enabling us to remain orientated when we bend over to pick things up, ride in a car, walk or run around, participate in PE and so on.

The vestibular system reduces confusion about conflicting visual information. For instance, if a child hangs upside down the vestibular sense will confirm to the child that their world has not just turned upside down. This sense also enables us to stabilise our visual field, so if we play basketball we can run whilst also looking at the net to score.

Information from the vestibular senses passes through an area of the brain that impacts on our attention and arousal levels (sleep/wake cycles). An example of this could be how we handle a baby; to wake them or get them excited we may bounce them on our knee, to get them to sleep we may rock them back and forth slowly and smoothly.

### **Sensory processing difficulties that affect the vestibular system**

When vestibular information reaches the brain, the brain decides what to do with it. The body's first reaction is to protect us, so information is assessed for any threat or danger and then the body acts accordingly. However, a child with a poor functioning vestibular system may not act in accordance with what the activity would expect.

A child may have an overly sensitive vestibular system, which can lead to them having exaggerated emotional responses to movements against gravity that is way out of proportion with the actual potential threat. Conversely, some children may experience an under responsiveness to movement and seek out as much movement as they can.

### **Over sensitive vestibular system**

Children who experience this may:

- Avoid apparatus or fast-moving playground equipment
- Hesitate or avoid walking downstairs
- Get dizzy very easily
- Get car sick on trips
- Be fearful of heights even on slightly raised surfaces
- Avoid tilting the head from midline e.g. dislikes doing forward rolls
- Appear cautious, move slowly, and unlikely to take risks.

### **Under sensitive vestibular system**

Children who experience this may:

- Need to keep moving as much as possible in order to function
- Have difficulty staying or sitting still in their seat or at mat time
- Repeatedly jump up and down, rock back and forth, shake their heads
- Crave intense movement experiences, going upside down jumping off furniture etc.

### **Reduced muscle tone and poor balance**

Some children experiencing this may:

- Move about or get out of their seats in an awkward manner
- Have a poor sitting posture, where they often slump over their desk or have to prop themselves up for support
- Have difficulty participating in PE, and find the activities very challenging with poor balance skills
- Appear fidgety and clumsy
- Appear to have loose floppy joints and body
- Have difficulty using tools such as a pencil, paint brush, scissors, etc.
- Have difficulty maintaining or regaining balance, and therefore may have more playground accidents than other children.

### **General hints and activities for the vestibular system**

Children need to be doing daily activities that encourage movement, balance, rhythm and co-ordination. A good variety of movements should be incorporated into the day, every day as a matter of course. There are some ideas listed below. Be aware, if the child feels very dizzy, sick or becomes over-stimulated - stop!! If they become over-stimulated use some proprioceptive activities to calm them.

- Use balance beams or walk along a line heel to toe, in a slow controlled manner
- Jumping, bouncing, twisting, turning
- Swinging backwards forwards, rotating, spinning
- Rolling down slopes or rolling in a carpet/rug
- Activities that require change in head position as well as movement
- Somersaults, hand-stands, cart wheels etc
- Play parks - see saws, slides, roundabouts, swings etc.

Most vestibular input is gained from actually starting and stopping a movement, so frequent stopping and re-starting is advised.

### **Hints and activities for those with an overly sensitive vestibular system**

When working with a child who has gravitational insecurities, it is essential that they feel in control of the amount of challenging movement experiences they will engage in. The child should never be pushed past his or her limit.

Finally, be aware of sensory strategies you can use to make the child feel calm, safe and secure (Proprioceptive activities/Heavy work). These are useful to prepare the child for challenging work against gravity and to comfort and calm them if they feel unsure or unhappy with certain activities.

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### **Strategies for the classroom:**

- To help the child feel safe and secure at their desk use a firm, supportive seat that will not tip and make sure their feet are flat on the ground
- Use your hands to help the child develop awareness of their body position. Always use firm 'grounding' touch and concentrate on the joints of their body. This will also help to focus the child's attention on an activity
- The child may become distressed or anxious with changing positions in the classroom e.g. getting down onto the floor, into a chair etc. Use visual markers so the child has a clear aim of where to go e.g. put their favourite cushion on the floor so they can aim to be sitting on top of it
- Break down activities into their most basic parts. For example, it might be more successful to practise sitting on a chair than getting right down to the ground at first. If the child is able to model your behaviour, show them what to do
- Think about what position the child likes to be in during different activities in the classroom. Let them maintain the position they are happy and secure in (e.g. cross-legged on the floor). As their confidence develops, support the child in different, more challenging positions (e.g. flat on their tummy, on a therapy ball) and work towards them maintaining these positions independently

- Use every opportunity to reinforce the child's proprioception/body awareness. This doesn't always have to be done by another person. Trial using a backpack weighted with books or simple pushing/pulling games which facilitate traction and increase sensory feedback.

### **PE strategies:**

- Limit the number of children and reduce the amount of space, to increase a sense of security. Allow the child to increase their ability to work on moveable or suspended equipment at their own pace. The idea is to grade your approach very gently and allow the child to lead on the exploration of activities
- Consider starting off by using mats, soft play wedges and textured materials (bubble wrap, fur, car mats etc) to create uneven surfaces for the child to negotiate around
- When the child is ready, move onto equipment such as small therapy balls, rolls, large wedges etc
- Eventually the child may be able to access more challenging equipment such as climbing frames, swings, benches etc.

### **Hints and activities for those with an under sensitive vestibular system (reduced sensitivity to movement and gravity)**

- Use a 'defined' spot for them e.g. a specific carpet square during carpet time or assembly
- A regular change of position can help them to maintain their attention e.g. lying on their tummy, sitting on the floor, sitting on a chair during circle time, kneeling
- Build and work on success e.g. if the child can remain seated in a static position for 20 seconds, use this as a baseline to improve on next time. Let them go for a walk around and then try sitting again
- Have a box of fine motor activities that they are allowed to go to during transitions between lessons or classroom activities e.g. puzzles, threading, peg boards, pencil tasks
- Give regular short breaks to walk around the classroom, or carry out a chore
- Assign active tasks to the child who seeks movement such as handing out books, moving chairs, giving out art supplies
- Provide as many opportunities as possible for active work during the day e.g. instead of sitting to do maths have them do a problem on the board
- Provide a solid seat with armrests of the correct height
- Provide a tilted desk top (angle board) to help them to maintain an upright posture
- Provide 'heavy work' activities during the day especially prior to handwriting tasks or those which require long periods of sitting. Examples - cleaning the board, handing out books, pushing tasks, moving furniture etc
- Provide a fidget toy to keep their hands busy. Preferably something they can use at their desk so as not to distract other children
- Provide a 'move and sit' cushion which allows them to have the sensation of movement in a more appropriate and less distracting way for the classroom environment, available from [www.specialdirect.com](http://www.specialdirect.com) or [www.sissel.com](http://www.sissel.com), [www.sensorydirect.com](http://www.sensorydirect.com)

### **Movement breaks:**

- Have movement breaks scheduled into the child's timetable at times when they usually need to be on the move, rather than waiting for them to begin moving. You are trying to pre-empt it so that their body is getting the movement it needs in a more functional and structured way. Hopefully they will not need to fidget as much if these activities are done regularly during the

day. Try a combination of movements for 5- 10 minutes directly before you want them to focus their attention well

- Activities that require forward and backward movements are more calming than those in circles. If there are any swings available these can be very calming; space hoppers and bikes are often useful too.

The following activities can be used in movement breaks, but may also be useful in PE and proprioceptive moves:

- Wheelbarrow racing
- Lamé dog exercise (See Smart Moves PE Pack) - Begin with the child on all fours. Get them to wave each 'paw' and then two 'paws' if they can manage it. When they feel confident get them to try lifting the right arm and leg together, then the left arm and leg together
- Bottom walk across the floor, comparing the child to a train and encouraging them to go fast or slow
- Half Knee Push – in a high kneeling position the child should walk on their knees whilst pushing a ball (with resistance)
- Knee Dual – in pairs facing each other in a kneeling up position, get the pair to push palms trying to upset the other's balance. Also try this move on one knee and then switch knees.

#### **Acknowledgement:**

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