Understanding Sensory Processing

A resource for carergivers

Who is this resource pack useful for?

This pack has been developed for those who support children with sensory processing diffierences. This pack aims to help you understand which senses may be causing your child difficulties, and why certain behaviours are observed.

What is the purpose of the resource pack?

In this booklet, Stockport Occupational Therapy aim to provide information that is easy to understand regarding sensory processing,and tips on how to support your child.

How to use this guide

There are many techniques and activities that you can use to support your child if they have sensory processing differences to improve their everyday life.

Use this guide to consider what is causing the behaviour or difficulty that you are seeing to understand why it might be happening, and try some of the strategies recommended.

This pack will not provide a diagnosis for a child. Instead, it will guide you to support them by developing coping strategies to manage their sensory processing needs better.

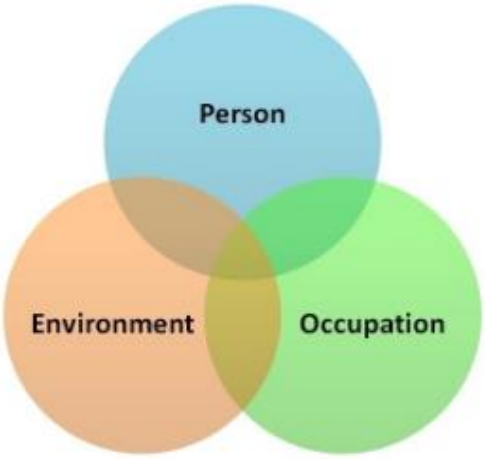
Our Occupational Therapists have found that empowering parents and schools has a considerable benefit, due to a whole shift in understanding and support for the child.

Our goal is to provide resources that can help you to understand the child's sensory processing needs better, both now and in future.

Introduction

Occupational Therapists are interested in supporting children who experience difficulties doing all the things that are important to them. This support may include accessing education, playing (or engaging) with others and being able to do things for themselves independently.

We adopt a 'whole person' approach where we consider the individual child's need, their environment and their engagement in meaningful activities (occupations).



If there are daily challenges for your child, in order to understand why these are happening, we specialise in assessing their fine and gross motor skills and perception and making suggestions to improve these difficulites, or provide equipment.

We are also often asked to explore sensory processing difficulties as we recognise that these can limit a child's ability to interact with others, their environment, and to perform meaningful activities.

Sensory processing overview

Sensory processing is defined as

"The **neurological process** that **organises sensation** from one's own **body** and from the **environment** and makes it possible for us to use the body **effectively within the environment**." -Jean Ayres

Or in other words – how our bodies send messages to our brain to understand our world!

We all use sensory information in our daily lives, such as being able to understand if our cup of tea is the right temperature in the morning, or balancing ourselves on the way up and down stairs.

And like it or not, sensory information is EVERYWHERE.

Some of us **seek** out extra sensory input to keep us calm and alert by fidgeting, biting our pen, going for a walk or drinking a strong coffee.

Others will **withdraw** from sensation and **avoid** it by wanting to be in a dark environment, turning the radio off when parking, avoiding close contact with others and strong flavours in food - These are just naming a few!

Most of us will have sensory preferences and little quirks, and we have likely developed ways of managing these to help us in our daily lives. For a lot of us, our sensory preferences can change on a day to day basis, depending on things like who we are with, what mood we are in and maybe what else is going on at the time. You can help your child to manage their sensory preferences by talking about them with others, and reminding them that it's okay to be different from other people.

Try to avoid letting sensory preferences become 'a big deal' to the child and try to remain neutral and encouraging of whatever they are finding challenging.

Remember, the more we avoid things, they can becomea more significant issue, and the less chance our minds and bodies will have to get used to it. For important activities in your child's everyday life, such as dressing, brushing their hair, and accessing play group; increased exposure will help support their management and tolerance.

Avoiding situations can sometimes make them worse in the long run. But it's essential that when you do these things, you have strategies in place to make them bearable.

Our sensory systems

We will all be aware of our five senses of sight, touch (tactile), taste, smell and sound (auditory). However, there are three more 'hidden' senses that have a lot to do with supporting our balance, co-ordination and ability to remain calm daily. When all of our senses work together this helps us to complete daily activities and stay calm and alert.

Our hidden senses

Vestibular - *This sense relates our response to movement. Information about how our body is moving goes to our brain and tells us if we are moving forward, backwards, side to side etc. A well developed vestibular sstem will help us to carry out planned movements while maintaining balance.*

Proprioception – *This sense relates to body awareness. This system is responsible for telling our brain where our body is in space by sending messages from our muscles, joints and ligaments. Having an awareness of where our bodies are in spaces allows us to plan and coordinate actions without the need to look. For example, being able to put an arm into a coat or foot into a shoe without looking.*

Interoception – *This sense is not as well known; it relates to sensory feedback from inside the body and organs. For example the feedback from the stomach to inform the individual they are full/hungry; or that an individual may feel anxious due to their heart beating faster.*

When processing sensory information becomes challenging

A child with sensory processing difficulties gathers information from their senses (sight, sound, touch, movement) like any other child, however, when this information enters the brain, it is not very well processed or understood. As a result, the brain doesn't quite know how to respond, this helps to explain some of the reactions from these children in response to sensory input that is not 'typical' (e.g becomng very upset in loud, or bright environments), hence, their sensory processing 'differences'.

It is common for a child to change in their responses to sensory input throughout the day and in other situations. For example, it may be identified that a child only presents with difficulties in one environment, e.g. at home but not in school. This might be due to them being able to self-regulate and suppress their need for sensory input during the day at school. However, when they return home and they have 'kept a lid on things' during the day and they experience a less structured and un-timetabled environment, they can become overwhelmed and find it challenging to cope with the sensory input.

Below we describe some common terms used to describe some of the behaviours or actions we see in children who process sensory information differently to others.

Over-Responsive

Children who are over-responsive to sensory stimuli are typically more sensitive to sensory input than others. Their bodies feel sensation too easily or too intensely. They might feel as if they are constantly bombarded with information. As a result, these children often have a "fight or flight" response to sensory input, e.g. being touched unexpectedly or loud noise. They may try to avoid or minimise they contact with these sensations, or environments to lessen the stress they experience.

Under-Responsive

Children who are under-responsive to sensory stimuli are often quiet and passive, disregarding or not responding to stimuli of the usual intensity available in their sensory environment. They may appear withdrawn, difficult to engage and or self-absorbed because they do not notice the sensory input in their environment. They may also seem to have poor body awareness or clumsiness. These children may also not recognise when things are too hot or cold, or they may not notice pain in response to bumps, falls, cuts, or scrapes.

Sensory Seeking

Children who are sensory seeking actively seek or crave sensory stimulation and have a real desire for sensory input, much much more than other children. They tend to be constantly moving, crashing, bumping, and/or jumping. They may "need" to touch everything and be overly affectionate; not understanding what is "their space" vs "other's space."

Now we take a look at our sensory systems in more depth. We explore our different senses describing what difficulties might look like in each sense, depending if they over responsive/ sensitive, under responsive and/or seeking. We then provide you with a list of strategies.

You might only find that you child fits a couple of these areas of difficulty, all of them, or none at all. But take your time to review the information and make a plan of which strategies you'd like to try to support them.

Touch (tactile)

The tactile system covers a range of different types of touch including:

- Temperature - ability to regulate temperature.
- Pain
- Pressure
- Crude touch - sense that something has touched them without being able to locate where they body been touched.
- Discriminative touch - also known as fine touch, ability to sense and locate where they have been touched.
- Protective touch links to; pain, temperature and light touch and alerts to potentially trigger the fight or flight response.

<u>Over-responsive/ sensitive</u>

Avoids touch
Loves or hates hugs
Only likes certain textures of clothes
Dislikes messy play
Can react aggressively to anothers touch
Feels pain easily and is sensitive to temperature

<u>Under-responsive</u>

Requires firm touch to respond to stimulus
Is sometimes heavy handed
Over-grips objects
Is sometimes too close to others
Does not seem to respond to pain or temperatures

<u>Seeking</u>

Touches all items in sight

Seeks out touch from others

Seeks out messy play

Strategies for an over-responsive child

- Play dough activities – deep pressure, kneading and rolling, pressing with biscuit cutters.
- Encouraging messy play activities and praise for engagement (sand, rice) or wet (water).
- Alter the environment; allow the child to go earlier or later at busy times of the day. E.g. changing in lessons, lunch or assembly.
- Thinking of where the child is placed in the class environment to reduce the likelihood of being bumped into or brushed passed.

- Modifying arts and craft activities to allow alternatives; using tools such as glue paddle, paint brush. This may encourage a child to participate more within these tasks allowing to build up participation.
- The use of heavy work (proprioception) or calming strategies before activites that are generally stressfull for them.
- Avoid light touch, use firm pressure when touching the individual.
- Avoid approaching from behind as the child may be startled if touched without warning.
- Allow them to use 'fidget' toys, permit them using one object. Set boundaries for them using it and ensure that this is not negatively impacting on their attention to task.

Strategies for a child who is seeking

- Sensory Bins
- Finger painting
- Slimes and putties
- Playdough and clay
- Paper Mache crafts
- Crunchie and chewy snacks
- Cooking
- Baking
- Gardening
- Tactile figets
- Compression/tight clothing

Strategies for a child who is under-responsive

- Using light touch soft objects such as feathers.
- Making foods with mixed textures.
- Use play dough with a range of textures, hide objects in the play dough.
- Using sticky/slimey textures such as foam, wet sand etc. Games such as hiding objects for the child to find.
- Encourage working with a range of material and textures; sand paper, tissue paper, wool, cotton wool, pasta and other dried foods.
- Use of a feel box – place objects inside of box with a whole for the child to place their hand to feel the objects and guess what it is without visibly seeing.

Proprioception (Body awareness)

The proprioception system is how a child perceives their own body image and their ability to locate their body in space. The body image is developed through feedback provided by the child's muscles and joints. Having this body awareness allows an individual to plan, sequence and complete movements correctly. It also helps to help a child feel in control of their body and remain calm.

Over-responsive/ Sensitive	Under-responsive	Seeking
It is very uncommon that an individual will present with being over-responsive	Clumsy Avoid sports Too much/ too little force in activities	Seeks rough and tumble play Chews items frequently Described as 'heavy handed' Struggles to sit still

Strategies to provide input for the proprioceptive system

- Resistance activities – pulling, pushing, carrying objects.
- Lifting items with some weight, heavier shopping bag, backpack with books in (within reason for the size of the individual). Any additional weight should be more than 10% of child's body weight.
- Weight bearing activities – wall push ups, press ups, four point kneeling, animal walks.
- Oral chews / crunchy or chewy foods types / drinking through a straw / blowing through a straw or blowing bubbles.
- Use of therapy/ gym ball; bouncing on, rolling over and for applying light pressure.
- Wearing a backpack with some weight in, e.g. books, useful to use at transition times. (no more than 10% of child body weight)
- Physical sports activities – running, swimming, climbing, circuits or obstacle courses.
- Upper limb resistance activities, pressing palms together, press open palms onto desk in standing, play dough warm up tasks (pressing, squeezing and rolling). Useful to use prior to handwriting or focused work.
- Theraband around front two chair legs, to be off the floor to allow child to rest feet on and push through allowing some resistance.
- Prior to handwriting have the child do some warm ups including….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.
- The child uses a lap weight (such as a wheat pack)
- Use a 'move n' sit cushion to sit on to give them additional feedback.
- Yoga is a great activity that both stretches and compresses muscles and joints for good feedback for this sensory system.

Vestibular (movement/ balance)

The vestibular system supports individuals:

- Balance and Posture – supports in staying upright against gravity and is engaged when there is movement involving the head position, may prevent from falling over if bending down and supporting an upright posture when seated.
- Impacts upon the sleep/wake cycle and impacts arousal and attention levels.
- Controlling eye movements - supports in stabilising visual fields to participate in an action while in motion.
- Detecting head movements.

Over-responsive/ Sensitive	Under-responsive	Seeking
Hates spinning, jumping Becomes dizzy easily Hates busy place full of movement (shops, playground) Avoids feet off the ground activities (swings) Seeks physical assistance from adults	Poor balance Low muscle tone Poor hand-eye co-ordination	Is always on the go Has difficulty sitting still Is constantly fidgeting and tapping Does not appear to become dizzy Like watching objects spin

There is some overlap with how an individual may present with some similarities across the areas. The easiest way to distinguish between over or under-responsiveness is that an individual who is over-responsive will avoid and resist vestibular input or movement. However, an individual who is under-responsive will seek out and will enjoy always moving or spinning.

Strategies for a child who is over-responsive / sensitive

When working with this child, it is essential that they are 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 (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 movement activities.

- Use a firm, supportive seat that will not tip, to help the child feel stable and secure whilst at their desk. Make sure their feet can stay flat on the ground.
- Use your hands to help the child develop his awareness of his body position. Always use firm ‘grounding’ touch and concentrate on the joints of the 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, onto 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.

- Think about what position the child likes to be in during different activities in the classroom. Let the child maintain the position they are happy and secure in (e.g. cross-legged on the floor).
- Slow predictable linear rocking – rocking horse, chair.
- Trampoline – rhythmic slow up and down.
- Prone (on stomach) rolling backwards and forwards over a therapy/gym ball.
- When travelling in a car or other transport to position so can see out of the front of the vehicle, e.g. front or middle seat of the car.
- Allow individual time when completing stairs, allowing them to go first or last in a line of others. To use quieter stair cases is possible.
- To have a hand rail for individuals to use when ascending or descending stairs.

Strategies for a child who is under responsive and seeking:

- Promoting gymnastics, yoga, pilates – forward rolls, positions that promote regular changes in position and challenge centre of gravity through moving head out of midline.
- Use of wobble cushion (move n sit cushion)
- Movement breaks – allowing to stand up and alter position or to move around the room by collecting an item to give them a purpose.
- Jumping on a trampoline, faster movements.
- Running, jumping, skipping, hopping, climbing etc.
- Supervised use of park or school apparatus – swings, slides, climbing frames.
- Rolling over or bouncing in a seated position on a therapy/gym ball.
- Wheelbarrow walks, walking on all fours.
- Use a ‘defined’ spot for them e.g. carpet square, sequencing spot during carpet time or assembly.
- A regular change of position can help them to maintain their attention e.g. Lying on tummy, sitting on the floor, sitting on a chair during circle time, kneeling.
- Work with in success; if they can stay in circle well for 20 seconds, use this as your baselines and increase your time from this point.
- 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.
- Providing a fidget toy to keep their hands busy. To use at their desk so as not to distract other children.

Taste and smell

Our taste and smell sensory systems are very closely linked. They help protect us from harm by recognising when something might be harmful to consume. These systems are also closely related to our emotional memories which is why often we enjoy the smells of freshly cut grass, or sun cream lotion.

Over-responsive/ Sensitive	Under-responsive	Seeking
Avoiding of typical children's foods Strong dislike to toothpastes or strong smelling body sprays Can become very distracted by certain smells	Will not notice smells or tastes in the environment or their foods	Seek out strong tasting foods Constantly seek out smells of food and non-food items May eat very quickly and overfill their mouth

Strategies for children who are over-responsive and sensitive

- Use familiar smells and tastes
- Offer preferred smells in stressful situations
- Use proprioceptive activities prior to stressful events/ situations
- Allow the child to choose smells that are comforting to them

Strategies for children who seek out smells/ tastes who might be under-responsive

- Using strong smells within their day such as mint and citrus
- Offer strong smelling hand soap/sanitiser
- Offer strong tasting foods/ make their own ice lolly/ ice cube tray
- Use smelly pens

***Note: It is okay to have food preferences. Sometimes an individual won't like food, and that's acceptable and should not be forced, that does not always mean they have sensory difficulties.*

Visual

There are different aspects of our visual systems the first is our **eye movements** and the second **visual processing**. The movements of our eyes are controlled by muscles, these allow us to follow a moving object with our eyes, fix on an object, scan a page of writing and focus our eyes on one object and then move to another and re focus quickly. Visual processing is the brain selecting and responding appropriately to visual input.

Over-responsive/ Sensitive	Under-responsive	Seeking
Prefers to be in the dark or with minimal visual input Express discomfort to bright lights, struggles with changes in lights between environments, dislike flashing lights etc Takes longer to adjust to lights and changes in lights	Likes to watch things that are moving/ spinning Stares intensively at people or objects Brings things close to their eyes to see Becomes frustrated when trying to find objects in messy environments	Likes to watch things that are moving/ spinning Stares intensively at people or objects Seeks out strong, bold and bright colours

Strategies for the child who is over-responsive/ sensitive:

- Store clutter and objects away in labelled boxes.
- Keep colours of rooms calm and uncluttered.
- Wear sunglasses and sun caps to reduce visual stimulation and sun exposure.
- Where possible, reduce visual distractions or have a set area with reduced visual stimulus for a work station. Use desk screens or position near or facing a wall in class to reduce visual stimulation at focused times.
- Position child near the front of the classroom, avoid facing windows if busy environment outdoors, or doorway that leads to busy corridors.

Strategies for the child who seeks visual input:

- Use highlighters to outline important information
- May benefit from using IT such as tablet, laptop.
- Completing mazes, dot to dots, words searches, interactive books, colour/painting by numbers.
- Display important information and highlight in the same area on the board, e.g. date and objectives in the same place on the board.

***A child will benefit from regular visual checks to ensure no other visual issues are impacting upon their performance. Individuals with suspected difficulties with eye movement, please make a referral to opthalmology.*

Auditory

The auditory system refers to the brains ability to organise and process auditory information; recognising the frequency, tone, intensity and pitch.
More refined functions of the auditory system are to:

- Interpret sounds against background noises
- Sound localization - the ability to work out the direction of the sounds in relation to its loudness.
- Timing of auditory information (ability to fill in gaps if not heard).

Over-responsive/ Sensitive	Under-responsive	Seeking
Responds negatively to loud or unexpected noises Dislikes loud noise Is easily startled May hum constantly to increase noise or drown out other noises Puts hands over ears when the noise level gets too loud	Appears not to hear although hearing abilities outlines no formal issues Seems to ignore when being spoken to, does not always respond to name being called Difficulty remembering and sequencing multi-step verbal instructions	Enjoys loud noise May hum constantly

Strategies for the child who is over-responsive/ sensitive:

- Low voices with predictable tones
- Listen to natural sounds or rhythmic songs *(60 BPM as similar to heartbeat sound which calms the nervous system).*
- Respect that sensitivities can be portrayed as hurting the individual and that they may present as fearful and required reassurance.
- Warning the child of potential noises, if aware of fire alarm, school bell at the end of lesson 5 minute warning.
- Minimise auditory distractions, quiet clocks, using rugs on loud flooring to reduce excessive noise.
- Consider use of ear defenders, ear plugs or sound cancelling headphones if overwhelmed regularly on an on-going basis. Only use at noisy transition times, so do not become dependent on using all of the time.
- Individuals encouraged to work in quieter areas when required to focus for longer lengths of times.
- Providing the child with the choice to eat at quieter times or in a quieter room for lunch or snack times.
- Allow the child to sit at the end of a row in assembly to minimise noise.
- Allow the child to leave the classroom a couple of minutes earlier to transition and avoid noisy times.
- Use of visual cues to support auditory instructions and minimise the number of verbal instructions given.

Strategies to support the under-responsive child:

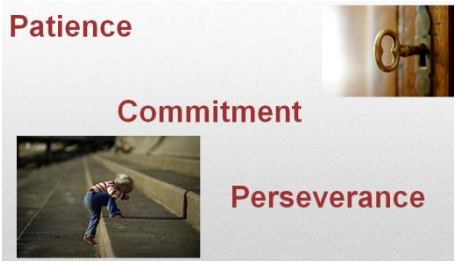
- Call the child's name before speaking
- Play listening games – guess the sound
- Make sure the child is facing the front of the room or directly in front of the teacher when giving instructions.
- Give simple instructions, don't use too many words and support with visual cues.
- Speak loudly and clearly.
- Support by asking the class to be quiet when giving instructions.
- Ask the individual to repeat instructions back to ensure you have been heard and understood.
- Wait for the individual to process and respond to the auditory information, acknowledging that it may take longer than peers.

Our final bit of advice from our Therapists to you..

Our senses underpin our neurological make up, they help us to experience the world around us and make us who we are! For these reasons it is really important to emphasise that sensory processing difficulties are not a ‘quick fix’ and there is no magic wand unfortunately.

As we are working with their neurological processing, the interventions and support strategies listed within this docuemnt will take time. You might not even notice a difference in your child until a few months pass and you realise that they will now wear the winter coat that they had refused due to how it felt last year, or a trip to the hairdressers is slightly less traumatic this time rather than the last.

The best advice we can give you, and the key three things to remember when you are starting out on your journey to understand your child’s needs and get support systems and strategies in place is PCP;



Patience - these strategies need time, the child needs time to adjust, you as a family or school unit need time to understand out how to embed these new activities into your day; give yourself time and be patient.

Commitment – you have to be committed, you have to support the child to be committed, and the nursery or school needs to be committed. Try to have a clear vision and plan with your child and their nursery or school to support you to all work together and stick with it.

Perseverance – there will be tough days, there will be fabulous days. There will be days when you feel that nothing is working, but this is when you need to dig deep and trust that sensory strategies take time, and you will get there.

Writen by Occupational Therapist, Emily Kellett.