Leicestershire Partnership NHS Trust

Working with a child who has sensory processing differences

The Sensory Systems
and how we can make sense of them.

Children's Community Occupational Therapy Service

Contents

- What is sensory processing
- What are all of our senses and their roles
- What difficulties can occur
- What we might see- the behaviours
- Oral Strategies
- Resources

Sensory Processing

- We all take in sensory information constantly. This is from within our body and from outside our body.
- Sensory processing is the central nervous system's (spinal cord and brain) acknowledgement of and the organisation of all of this sensory information for our everyday use and for our ability to function.
- When our senses are integrated correctly we are able to respond appropriately to the sensation. For example we move away from the hot radiator or breath in deeply to smell fresh flowers/baking.

Our Senses

- 5 senses you will be familiar with:
  - Visual= seeing what is ahead and to the side in our immediate environment (also has a role in balance and movement)
  - Auditory= hearing and locating noise/sound (also supports communication)
  - Tactile= sense of touch, discriminating the physical qualities of external objects, the amount of pressure being used/given, the temperature and also pain (very strong emotional and social role) -Total body, but split for information from the body from that of the head and face
  - Olfactory and gustatory= smelling and tasting (protective and communicative)

Our Senses continued

- 2 additional, less familiar senses:
  - Proprioception= our sense that tells us where our body parts are, including their position and what work they are doing- this is our body awareness- Total body
  - Vestibular= our sense of movement, rotation in any direction, our posture and organisation of our movements and through detecting gravity tells us which way is up – in our head

These two additional senses in partnership with our tactile sense give us all the information about what our body is doing *all* of the time. They work together so we know where we are and where we start AND end.

The Tactile sense

- What we feel.
  - This system is:-
    - Protective
    - Discriminative
    - Senses light touch
    - Senses deep touch
    - Feels temperature

Proprioceptive sense

- Our internal body awareness
  - Helps us sense our body position
  - Judges and grades the force we need to complete activities i.e. reach for, and then pick up an object
  - Senses deep pressure (alongside the tactile deep touch) and allows us our ‘heavy work’ movements
  - Dampens down/calms our involuntary nervous system

Vestibular sense

- Our internal spirit level
  - Tells us where our heads are in space- which way is up
  - Judges the speed and direction of our movement (with help from our eyes)
  - Helps us relate to the force of gravity so we can be ‘grounded’ in time and space

How we cope with all this information

- We are receiving sensory information all the time from all our senses.
- This information tells us all about our world and how to respond to it.

- We only use about 5% of the sensory information we receive and ignore or filter out the other 95%.

Too much or too little…

Difficulties can arise when;

- We filter out more than 95% of that information or;
- We let in more than 5% of the information.

This affects our overall arousal level- our whole bodies level of alertness.

Even small disruptions to sensory processing have an impact on our function, participation and self-esteem.

What can go wrong

- Sensory modulation difficulties
  - Over sensitive
  - Under sensitive
- Body awareness difficulties
  - Poor registration and/or
  - discrimination
- Motor planning difficulties
- Poor motor skills

Sensory Modulation Dysfunction

And it's impact on living and learning:

Sensory Modulation

=

-Feeling Just Right- ☺

Sensory Modulation

- Sensory Modulation facilitates
  - a ‘calm and alert state’,
  - a physiological window in which our ability to function and learn/develop is maximised.

This is seen as our fright, flight or fight system- an ‘overactive autonomic nervous system’

SEE

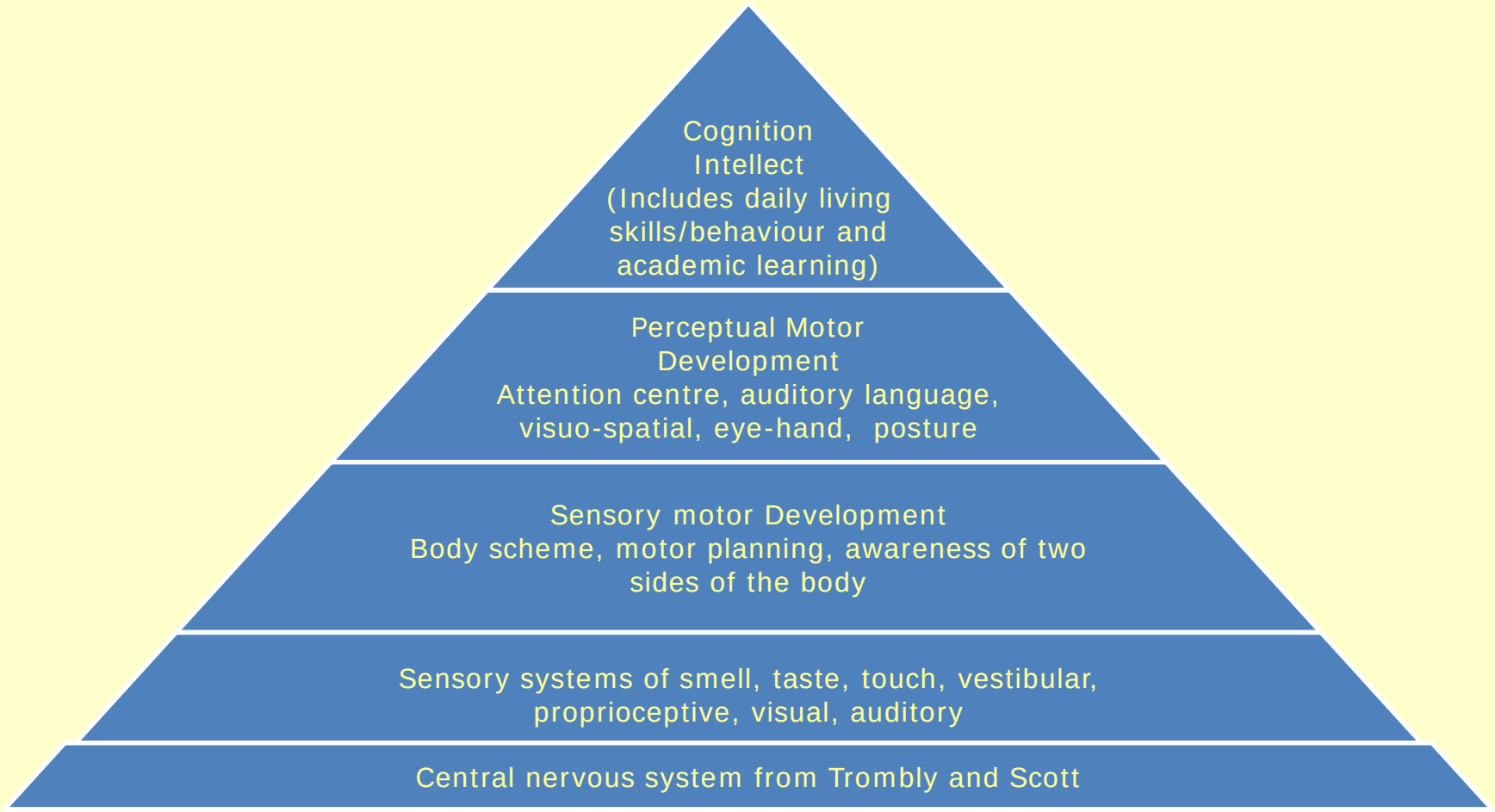
BEHAVIOUR

AND

THINK

SENSORY

SPD hierarchy for function



Different Thresholds for response

- High Threshold Response
  - Needs more stimulation (duration, frequency, intensity) for the sensation to register
  - Under-responds to stimulation
    - "Hyporesponsive"
    - "Low registration"
  - May crave and seek more sensory stimulation to try to meet the neurological threshold where it registers
    - "sensory seeking"

Different Thresholds for response

- Low Threshold for response
  - Sensation may be registered with even a small amount of stimulation and any prolonged stimulation is uncomfortable
  - Over-responds to stimulation- adrenal response to something that is non-noxious to others
  - May avoid sensory stimulation
    - “sensory sensitive”
    - “sensory defensiveness”
    - “hyperresponsive”

How we work out what to do

- Be a detective!
- Analyse the activities/environments that interferes with function
- Make environmental modifications
  - Take something out
  - Put something in
- Teach strategies for mutual regulation ie for the child to indicate help is needed and support self regulation wherever possible- sensory diet/ sensory lifestyle/ sensory snack

Visual Information

- Under responsive
  - Difficulty finding something in a busy background
  - Struggles to locate friends in a crowd
  - Struggles to find their place on a page
- Over responsive
  - Doesn’t like bright lights
  - Prefers darker rooms
  - Covers or shades eyes
  - Excessive blinking or eye watering when background light changes
  - Wants to wear peaked caps, keeps hood up or long hair over their face
- Seeker
  - Looking at shiny objects
  - Flicking fingers
  - Enjoys flashing lights and colours

Auditory Information

- Under responsive
  - Not responding to instructions or name
  - Slow response to novel environmental sounds
  - Poor auditory discrimination even in low levels of background noise
- Over responsive
  - Difficulty filtering out background noise
  - Sensitive to lawnmowers, hairdryers and vacuum cleaners
  - Difficulty coping in assembly, PE, lunch halls, swimming
  - Covers ears
  - Creates own noise to block external noise
  - Challenging behaviour in order to leave a situation
- Seeker
  - Shouting
  - Banging objects to make a noise
  - Putting music up very loud

Tactile Information

- Under responsive
  - Drops items often
  - Clumsy pencil grasp
  - Messy dresser/eater
  - Unsure where their bruises came from
  - High pain threshold
- Over responsive
  - Overreacts to unexpected touch
  - Doesn't like grooming
  - Difficulty standing in line
  - Dislikes clothing/labels
  - Difficulty sitting in groups
  - Picky eater- strong texture and temperature preferences
- Seeker
  - Fidgetting
  - Stroking
  - Exploring items with hands
  - Loves messy play

Oral information (oral-tactile, olfactory, gustatory

- Under responsive
  - May have unclear speech (language skills unaffected)
  - Eating difficulties
  - Messy eater, slow eater
  - Dribbling, chapped lower lip
- Over responsive
  - Doesn't like having teeth brushed
  - Picky eater-specific flavour preferences, restricted diet
  - Preference for bland foods or uses ketchup as a flavour masker
  - Gagging at strong smells
- Seeker
  - Mouthing and biting
  - Puts unusual things in mouth
  - Likes strong flavours and smells
  - Makes peculiar mouth movements

Proprioceptive information

- Under responsive
  - Clumsy
  - Bumping into things
  - “all thumbs”, “two left feet”
- Over responsive
  - No neurological process or observable behaviours to support this category exists
- Seeker
  - Banging hands/pencils on table
  - Rough with peers
  - Bumping and crashing deliberately into things
  - Loves rough and tumble play
  - Bites on stuff
  - Purposefully falls off things

Vestibular information

- Under responsive
  - Poor balance
  - Reduced protective reactions to movement
  - Clumsy
  - Sedentary- prefers table top activities to sports and active play
- Over responsive
  - Over-reacts when feet are lifted off the ground
  - Avoids swings
  - Avoids having feet elevated
  - Fear of steps or stairs
  - Motion sickness
- Seeker
  - Bounces up and down
  - Constantly moving
  - Can’t sit still at a table or on the carpet
  - Spins around
  - rocking

Who needs what?

Under responders need MORE

- INTENSITY
- DURATION
- FREQUENCY
- NOVELTY

Over responders need LESS

Who needs what?

- SEEKERS are usually under responders- so treat them as such
  - Occasionally the seeker is trying to use one of their systems to block out or dampen down another system- increase proprioceptive input to calm down that system and remove that need.

Some strategies to start with

- Tactile Support Strategies
  - Under responsive
    - Varied touch activities
    - Contrasting tactile experiences within learning- ie sandpaper letters/drawing in shaving foam
    - Fidget toys
    - A good rub with a bath towel (and a hug)
    - A shower rather than a bath
  - Over responsive
    - Do not approach from behind
    - Use firm pressure not light touch
    - Let then control the touch
    - Forewarn before any activity
    - Avoid sitting/standing in the middle of large groups
    - Position away from main thoroughfares

Some strategies to start with

- Auditory Support strategies
  - Under responsive
    - Give strong auditory cue (clap/bell ring)
    - Gain eye contact before giving instructions
    - Individual should be close to the sound source
    - Use other sensory systems to support (visual)
    - Short and clear directions- chunk information, frequent pauses for processing time
    - Allow individual to make noise
  - Over responsive
    - Reduce auditory stimuli (room acoustics, echoes, background noise)
    - Do not talk over background noise
    - Make noise/speak in the visual line of the individual
    - Give visual instructions
    - Have a quiet corner or retreat
    - Wear ear plugs/headphones
    - Avoid going to noisy environments
    - Forewarn individual of loud sound

Some strategies to start with

- Vestibular support strategies
  - Under responsive
    - Structure movement activities into routine before seated task
    - Lean against objects when required to balance/sit down
    - Supportive seating
    - Move and sit cushion for work and mealtimes
    - Structure movement in lessons
    - Provide activities requiring different body positions (obstacle courses are good)
  - Over responsive
    - Allow individual to control the movement
    - Do not force the person into movement situations
    - Use playground equipment that allows their feet to remain on or close to the ground
    - Slow and rhythmical/predictable movement first
    - Avoid fast movements before settled activity
    - Individual may work better in different body orientation ie lying down

Some strategies to start with

- Visual support strategies
  - Under responsive
    - Highlight area for attention
    - Remove visual clutter
    - Bright colours
    - Clear borders
    - Visually moving activities
    - computers
  - Over responsive
  - Avoid fluorescent or bright lights
  - Allow wearing of peaked cap
  - Reduce visual distractions
  - Allow time to retreat from bright environments
  - Avoid flickering and flashing lights
  - Forewarn about bright environments

Some strategies to start with

- Oral Support strategies
  - Under responsive
    - Strong flavoured foods
    - Vibration (electric toothbrush, z-vibe etc)
    - Sucking, blowing, making noises, whistles, blowing raspberries
    - Crunchy snacks
    - Sour and fizzy foods
    - Aromatherapy oils in play dough
    - Use small as part of their communication system
  - Over responsive
    - Deep pressure to lips and palate (don't force- don't do palate until happy with lips)
    - Chewing- a tube, gum
    - Forewarn of need to touch
    - Build choice into activities
    - Use bland tasting foods
    - Reduce the pressure on the child to eat foods they are unsure of
    - Avoid strong perfumes, scented cosmetics, fabric conditioners or air fresheners
    - Work away from areas with food smells

Some strategies to start with

- Proprioceptive support strategies
  - Under responsive
    - Pushing, pulling, moving heavy objects
    - Door frame pushes, chair push ups
    - Push-ups/handstands
    - Yoga positions and stretches
    - Sitting cross legged
    - Chairs with backs and sides
    - Dance sacks (lycra tubes of material)
    - Digging in the garden or sandpit
    - Dragging wet washing out of the machine
    - sweeping

Oral Sensory Strategies

- **Craves Spicey; Salty or Sour foods**

These can assist with self regulation – increasing arousal for maintaining a Calm-Alert state.

May also be due to under –responsive to taste so seek stronger sensations.

Ideas:-

- **Let them eat these foods as they are gaining either one of the above.**
- **Offer these foods during snack times and chllenging times for example when sitting in church.**

- **Incorproate them into meals.**

Oral Sensory Strategies

- **Does Not Seem To Get Hungry or Eats Too Much or Too Quickly**

The sense of hunger is reliant on the sensory feedback from the stomach to the brain (Interoceptors). If this sense is under-registering then the child will not know when they are hungry or full.

Filling the cheeks with food also provides proprioceptive feedback for a calming effect.

Ideas:-

- **Respect that there may be a sensory explanation.**
- **Encourage them to pace themselves.**
- **Give small portions and bite size pieces but allow second serving if needed.**
- **To encourage hunger try heavy work or movement activity prior to meal times.**
- **Improve sensory registration by giving regular proprioception and vestibular input.**
- **Try Bubble Mountain prior to eating.**
- **Try an Oral sensory tool to reduce overfilling the mouth.**

Oral Sensory Strategies

- **Chews on Non Food Items – Sleeves, Hair, Fingers, Toys (after developmental age of 18 months)**

This provides proprioception to the jaw and additional oral sensory input.

It can assist in self regulation, promotes attention and is calming in stressful situations.

Ideas:-

- **Provide an oral sensory tool as an alternative.**
- **Provide a water bottle to suck or chew on in class.**
- **Try chewing gum.**
- **Try chewy foods – french bread or toffee.**
- **Use bubble mountains.**
- **Incorporate deep pressure proprioception and movement activities into the day as often as possible.**

Oral Sensory Strategies

- **Gags On Textured Foods, Picky Eater, Extreme Food Preferences.**

As the mouth is part of the Tactile System this can be due to tactile defensive behaviour/Avoidance due to over-responsivity to touch.

This could also be an over-responsive olfactory or visual sensory system.

Ideas:-

- **Explore different textures to hands and feetregularly to increase tactile tolerance.**
- **Don't force the issue or foods. Encourage child to explore at own pace with hands or utensils. Let the child lead.**
- **Respect the need for a specific temperature.**
- **Try chewing gum or an oral sensory tool prior to eating to prepare the mouth.**
- **Encourage bouncing, jumping, trampoline, therapy ball for 5-10 minute prior to eating.**
- **Encourage cooking together and playing with food.**
- **Use a vibrating oral sensory tool or toothbrush on a regular basis.**
- **Provide a rescue bowl or towel to clean and spit out food if needed.**

Oral Sensory Strategies

- **Did Not Mouth Objects as a Baby.**

This child is likely to be showing signs of oral tactile sensitivity – tactile defensiveness. They may experience this stage later in life as they are more able to tolerate the sensation.

Ideas:-

- **Provide different textures oral sensory tools.**
- **Encourage texture based play for the hands and feet.**
- **Encourage bubble mountains, musical instruments and other blowing and sucking games.**
- **Encourage a range of proprioceptive and vestibular activities.**

Oral Sensory Strategies

- **Being Messy at Meal Times Causes Distress.**

This is likely to be due to tactile defensiveness when unexpected light touch and bumps are interpreted as a threat to the nervous system triggering fight or flight response.

This can occur when the child is already in sensory overload/protective mode and any sensory input can be uncomfortable.

Ideas:-

- **Offer messy play regularly and offer tools like shovels if needed.**
- **Provide deep touch to the hands prior to messy play.**
- **Involve the child in food preparation to explore textures.**
- **Provide a wet rescue towel to clean difficult textures off the skin.**
- **Engage in 15 minutes of deep pressure or movement activity prior to meals.**
- **Try bubble mountain or deep breathing activities for calming.**

Oral Sensory Strategies

- **Seeks Vibration to Mouth.**

This is activating the tactile receptors and provides proprioception input to the jaw. This is for self regulation and additional oral sensory input which is calming and organising for the brain.

Ideas:-

- **Allow to use an electric toothbrush throughout the day.**
- **Resistive blowing activities – bubble mountain.**
- **Provide chewy and crunchy snacks.**
- **Encourage sucking thick liquids or yoghurt/pudding through a straw.**
- **Provide and oral sensory tool.**

Oral Sensory Strategies

- **Drools Excessively.**

This can be lack of muscle tone and /or proprioceptive awareness of the mouth/jaw structures or muscles.

Ideas:-

- **Provide an oral sensory tool.**
- **Allow an electric toothbrush.**
- **Encourage resistive blowing activities – bubble mountain.**
- **Provide chewy or crunchy snacks.**
- **Encourage sucking thick liquids through a straw.**
- **Offer smoothies and milkshakes.**

Resources available for you

- Angie Voss OTR Books : Understanding Your Child's Sensory Signals and Your Essential Guide to Understanding Sensory Processing Disorder

- Courses available through Sensory Integration Network UK & Ireland, Open to parents, educators, therapists, support workers www.sensoryintegration.org.uk
- Introduction to Sensory Integration (1 day)
- Understanding Sensory Processing (3 day)
- The Alert Program, A guide to self regulation (2 day)
- Books
- Carolyn Murray-Slutsky and Betty Paris (2004) • Is it Sensory - Is it Behaviour? (Also a course)
- Carol Kranowitz (2007) Out of synch Child recognising and coping with Sensory processing Disorder
- Carol Kranowitz (2006) The out of synch child has fun: Activities for kids with sensory processing difficulties
- Ellen Yack, Paula Aquilla, Shirley Sutton (2003) Building bridges through sensory integration therapy for children with autism and other pervasive developmental disorders
- Isbell C & Isbell R (2007) Sensory Integration: A Guide for Preschool Teachers
- Dr Lucy Miller: Sensational Kids
- Websites
- Leicestershire Partnership Trust does not accept any responsibility for the information on these websites.
- www.spdfoundation.com
- www.canchild.ca
- www.thespiralfoundation.org

- **Acknowledgements**
- The following resources have been used in the development of this resource pack.
- Sensory integration network booklet from Introduction to sensory processing- a big thanks
- Cribbin V Lynch H Bagshaw B Shadwick K (2003) Sensory integration information booklet for parents and therapists. SI Network UK and Ireland.
- Bundy AC, Lane SJ, Murray EA (1991) 2nd Ed. Sensory Integration Theory and Practice.
- The Alert Programme, Shellenberger and Williams