

# “Challenges in Sensory Processing and Integration - Identifying presenting problems and Strategies for improvement”

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# Objectives

At the end of this training, the learner will be able to:

- Understand what sensory integration and sensory processing is
- Identify common presenting problems in children with sensory challenges
- Identify strategies to help clients and caregivers

# Occupational Therapy and Physical Therapy



# Fast Facts

## Sensory Challenges and Autism

- DSM-V inclusion criteria: “Hyper- or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement)”.
- Sensory challenges are observable very early on and can be integral in obtaining early identification
- Children with autism present with a wide variety of sensory challenges

# Fast Facts

- Research suggests that 10%–55% of children without a diagnosed disability are affected by challenges with processing and integrating sensations.
- This estimate increases to 40%–88% for children with various diagnoses.
  - (Ben-Sasson et al 2009; Cheung & Siu, 2009; Fernandez-Andres et al. 2015)
- A child can have sensory processing challenges and not be autistic.

# What is sensory processing and integration?

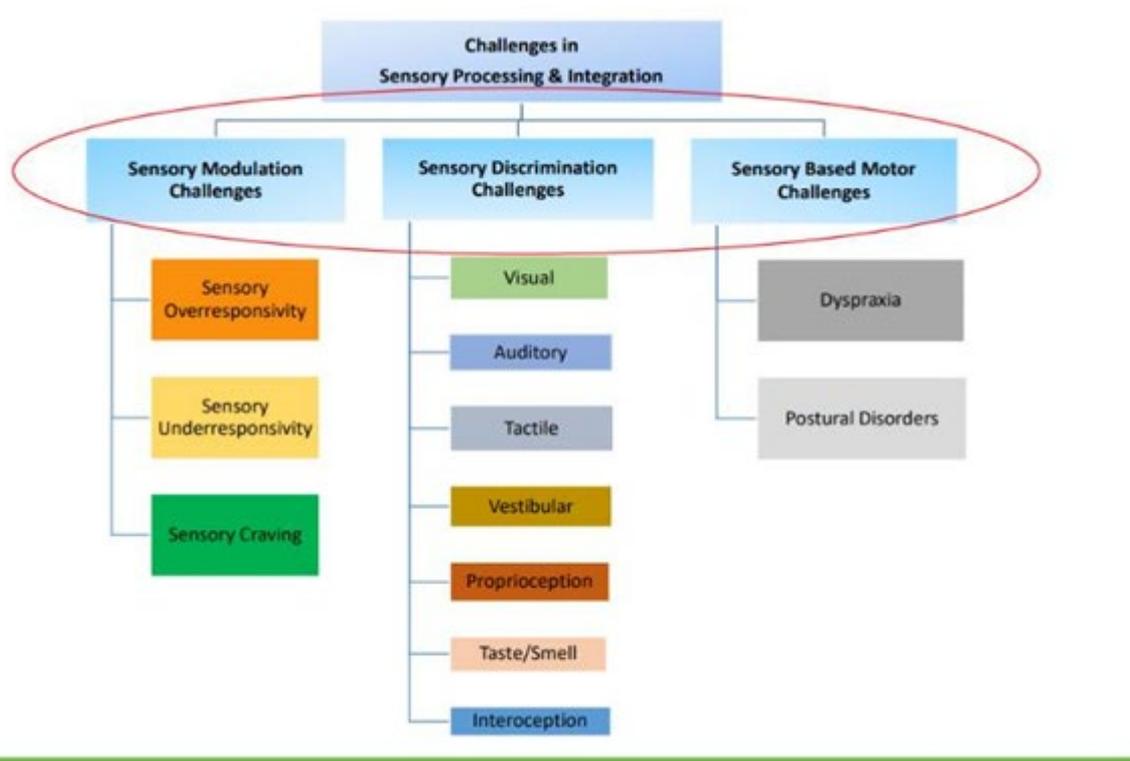
Sensory processing and integration is a child's ability to

- Take in information from the senses
- Combine it with previous experience and
- Produce appropriate responses

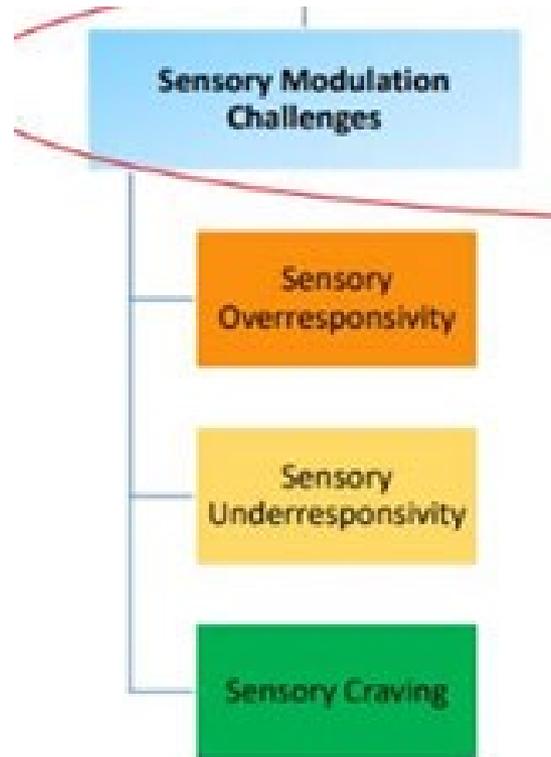
Children with challenges in sensory processing

- Have difficulty with “detecting, regulating, interpreting, and responding to sensory input”
- Resulting in symptoms that affect participation and function across childhood occupations

# Occupational Therapy Nosology



# Sensory Modulation



# Sensory Modulation

- Ability to regulate and organize reactions to sensory input in a graded and adaptive manner (i.e., balancing of excitatory and inhibitory inputs)

Modulation challenges can be:

- Over responsive (OR),
- Under responsive (UR)
- Seeking/craving

# Sensory Over Responsiveness (SOR)

- Extreme sensitivity or avoidance to input
- Child responds “too much” to input-may be too early, too long, or just too intense
- Input is not pleasant to the child and they feel it at a higher intensity, duration than others
- Typical responses of “flight, fight, or freeze”
- May also be referred as Sensory avoidance, sensory over reaction, hypersensitivity



## Sensory Under responsive (SUR)

- Lack of or minimal response to sensory input
- Child is often quiet and passive and may appear withdrawn or difficult to engage
- May notice child not responding to pain
- May also be referred to as hyposensitivity, under reactive

## Sensory Seeking/Craving

- Child actively seeks out more sensory input
  - Running, spinning, crashing
- If the input is **organizing**
  - may be classified as **seeking**
- If the input is **disorganizing**
  - may be classified as **craving**
- Main take away is that when we see a child seeking out sensory input
  - We may need to dig a little deeper as to why

# Sensory Seeking/Craving

## Sensory Seeking:

- If a child is seeking input AND we see that it is organizing (adaptive response)
- We want to provide opportunities for the child to get that input

## Sensory Craving:

- If a child is seeking input AND we see that the more input they get – the more **disorganized** they get (maladaptive)
  - Still provide input but
  - Provide structure –
    - Limit the amount,
    - Have an activity with beginning, middle and end
  - Use cognitive strategies - pair a task with sensory input

# Sensory Modulation



Under responsive



Over responsive



Craving

# Possible signs of sensory modulation challenges-SOR

- Extreme reaction to loud noises
- Easily distracted by sounds
- Fearful of movement
- Poor tolerance to clothing and/or diaper changes
- Easily distracted by visual stimuli
- Extreme resistance to try new foods
- Poor tolerance to getting hands or face messy
- Extreme aversion to wearing certain clothing, bathing, hair cuts, or brushing teeth
- Difficulty calming/“difficult child”
- Emotional or attention challenges
- Inflexible or rigid with routines

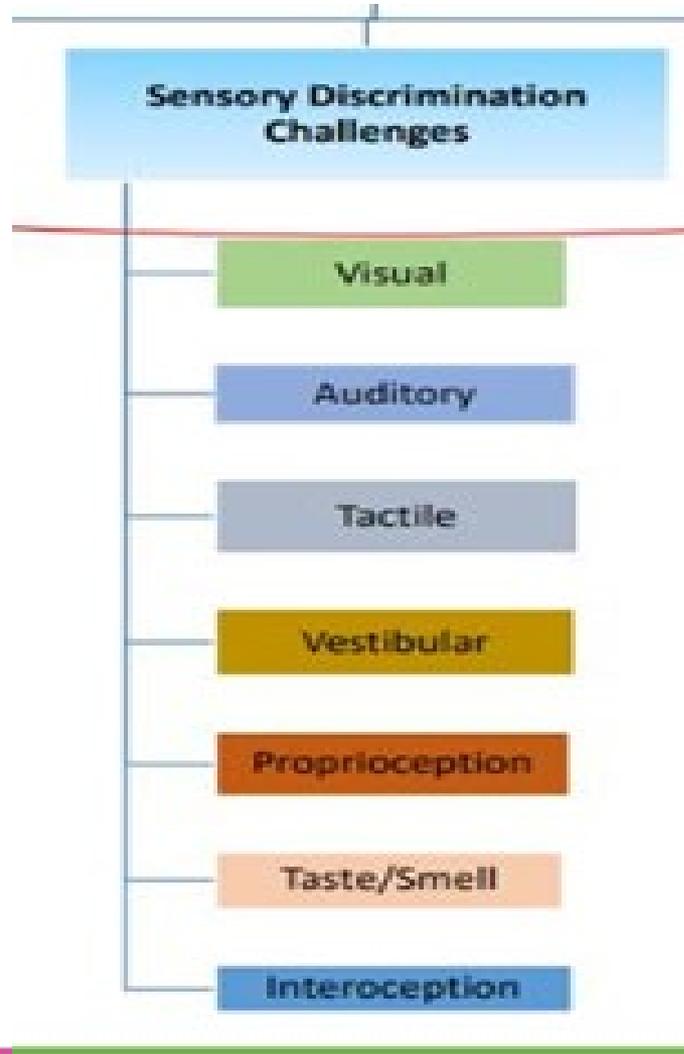
## **Possible signs of sensory modulation challenges-SUR**

- Limited engagement with their surroundings/“super easy child”
- Not responding or delayed response to touch/noise (rule out hearing loss)
- High pain tolerance
- “Bump on a log”

## **Possible signs of sensory modulation challenges-Seeking/Craving**

- Needing to touch everything or everyone
- Making constant noises
- Constantly moving or fidgeting
- Chewing/licking non-food items (when not age appropriate)
- Doing everything with 100% force
- Impulsive
- Decreased safety awareness

# Occupational Therapy and Physical Therapy



## Sensory Discrimination

- The ability to interpret stimuli (intensity, duration, temporal and spatial aspects) in order to make meaning of it and respond appropriately
- It is the child's ability to recognize specific qualities and differences of input and have appropriate responses.

# Interoception

- The 8<sup>th</sup> sense
- Interoception is the ability to feel what is going on inside the body.
- These body signals help us know when we are hungry, thirsty, or when to use the bathroom.
- Being able to sense body signals allows us to recognize our feelings.
- (AOTA Practice Framework 2020)
- For example, when we feel our muscles shake and our heart race, we may realize that we are nervous.

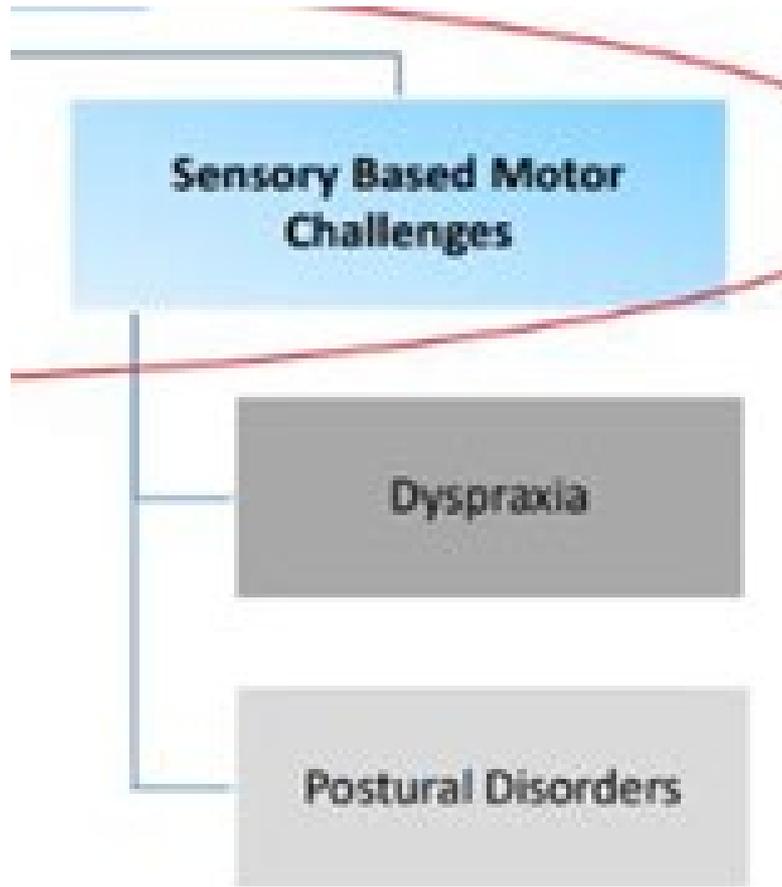
# Possible signs of sensory discrimination challenges

- Child cannot tell when their mouth is full and overstuffs their mouth
- Child gets touched but does not know where they were touched or what type of touch it was (ie: gentle or painful)
- Child hears a noise, but cannot tell where it came from and what type of noise it is
- Difficulty with body awareness – not able to grade force or difficulty with timing a response

## Possible signs of sensory discrimination challenges

- Not sense the need to use the bathroom until the feeling is extreme
- Not notice cues of frustration until exploding
- Say “I don’t feel good” or “I hurt” but not be able to identify where they hurt or what’s wrong
- Avoidance or fearful with movement

# Occupational Therapy and Physical Therapy



## Sensory Based Motor Challenges

- The ability to process sensory stimuli to maximize motor output specific to postural, ocular, and bilateral functions
- Made up of dyspraxia (motor planning) and postural disorders.
- Postural disorders involve impaired perception of position of body position and/or poorly developed movement patterns that depend on core stability.

## Possible signs of SBMD

- Child that wants to play the same toys over and over again.
- Child needs someone to show them how to play with new toys, mount new equipment at the park.
- Difficulty attaining gross motor milestones or looking very uncoordinated/clumsy when doing these tasks
- Child appears weak and/or has poor endurance

# Intervention Strategies

## **Multifaceted approach for Children with Challenges in Sensory Integration and Processing**

- A recent article written by leading sensory researchers and published in the *American Journal of Occupational Therapy* suggests 3 broad categories of interventions to use with individuals with sensory challenges
- This framework provides a way to use a variety of intervention approaches that can support the functional goals of children with sensory challenges by focusing intervention on:
  1. The child
  2. The caregiver
  3. The task or modifying the environment

(Reynolds et al., 2017)

## Child Focused interventions

- Interventions to enhance sensory processing & integration
    - Ayres Sensory Integration (ASI)
    - Sensory-based approaches
  - Behavioral approaches
  - Practice and developmental skill building
  - Cognitive approaches (CO-OP)
  - Biomechanical approaches
- (Reynolds et al., 2017)

## General key concepts

- **Never** force sensory input on the child
  - If they are refusing to do an activity, think about ways to either modify the activity or change the activity all together
- Honor the child's response
  - If the child displays fear or another response, stop and either change the activity or, if possible, ask the child how they are doing
- Prepare the child for new sensory experiences
  - Talk to them about what is going to happen

# Ayres Sensory Integration

- Ayres Sensory Integration (ASI)= individually tailored sensory motor activities co-created by therapist and child, contextualized in play, and continually adjusted and adapted by therapist to provide a level of challenge that matches and gradually increases the child's performance complexity
  - Evidenced based theory and intervention guided by the research of Dr. Jean Ayres.
  - Identified to help with research, efficacy and treatment
  - This approach requires training and adherence to fidelity measure
  - Goal is to improve nervous system's ability to register and respond to sensory input

Play based therapy where therapist creates a multi sensory environment that the child is actively engaged in and work towards adaptive responses

(Parham, et al. 2011)

# ASI

- Play based with active engagement
- Individualized intervention accounting for child's preferences and intrinsic motivation
- Multi-sensory activities
- Specifically designed equipment for activities that challenge
  - Sensory processing and motor planning skills
  - Organization, sequencing, timing and problem solving

# Child Focused Interventions: ASI Fidelity Measure

1. Ensuring physical safety
2. Presenting a range of sensory opportunities (specifically, tactile, vestibular, and proprioceptive – but including additional sensory systems as needed per child )
3. Using activity and arranging the environment to help the child maintain self regulation and alertness
4. Challenging postural, ocular, oral, or bilateral motor control
5. Challenging praxis and organization of behavior

(Parham, et al. 2011)

# Child Focused Interventions: ASI Fidelity Measure

6. Collaborating with the child on activity choices
7. Tailoring activities to present the “just right challenge”
8. Ensuring that activities are successful
9. Supporting the child’s intrinsic motivation to play
10. Establishing a therapeutic alliance with the child

(Parham, et al. 2011)

# Intervention Examples

## Sensory Over-Responsivity (SOR)

- Use motivating play to encourage child to play with different textures
- Start with deep pressure if able
- Ensure whole body input as tolerated
- Offer tools to child so they do not need to touch input with their body (paint brush, shovel, pushing another toy through media, etc). This will allow them to learn about the texture in a safe way so that they will then be willing and able to touch later

# Sensory Over-Responsivity (SOR)

- Be aware of aversive reactions (even subtle ones) and do not force sensory input on the child
- Grade the input to the child's tolerance
- Provide opportunities to engage in sensory experiences in pleasant, fun way
- Environment – dim lights, slow rhythmical music, calm voice, slow movements
- If you notice the child is attending to sounds outside the room – identify the sound, or have the classroom try to guess what the sound is
- Be aware of when you touch a child – let them know in advance

## Intervention Examples

### Vestibular Under – Responsive (UR)

- Fast blast input via high intensity-such as high quick release on a swing
- Irregular intense vestibular input
- Rotary
- Quick changes in head position (on lap or therapy ball)
- Therapeutic use of self
- Energetic, loud voice
- Animated facial expressions
- Variety of positions (head in relationship to gravity)

# Intervention examples

## Vestibular Over-responsivity or vestibular discrimination difficulties

- Use slow (predictable) linear movements as opposed to fast movement or rotation
- Provide breaks so the child has time to process the input
- Provide opportunities for changes in position (i.e. out of upright)
- Adding proprioceptive input may help with modulating or being able to accept the movement
- Model or have another child engaged, taking a turn

# Intervention Examples

## Proprioception seeking/craving

- Help the child get the input in a safe way
- Set up the environment – use the movement/play room
- Provide heavy work as part of play process
  - Carry weighted bean bag
  - Push weighted wheeled toy
  - Be the “delivery” person for the classroom
  - Crawl through tunnel, under pillows/pads
  - Be a different animal as moving through the classroom
- Offer structure to input when treating craving
  - If child is doing climbing task have him or her complete a puzzle so there is a closed ended task signifying the end of the activity
  - Introduce breaks
  - Set limits/Offer choices, use First/then language
  - Getting in line – verbal cue – “Hands down”

# Intervention Examples

## Sensory discrimination challenges

- Identify qualities of sensory input
  - Movement: Fast or slow, in a circle or a line
  - Touch: smooth, bumpy, rough, scratchy
  - Use body language: use your eyes, use your arms and tummy muscles to hold on
  - Use a flashlight to help direct visual gaze
  - Play identify a sound game

# Child Focused Interventions

Sensory based, protocol or curriculum

- The Alert Program
- Zones of Regulation
- Superflex (social skills program)

# Sensory Based Interventions (SBI)

- Input to single sensory system, can be directed by adults and provided, as needed, in response to child's self-regulation; examples include brushing, weighted lap pad or vest, fidget, wiggle seat, chewy
- Typically occur in the child's natural environment
- Adult-directed sensory modalities applied to the child
- Addresses single sensory systems
- Modalities provided in a systematic manner throughout the child's day or as needed in response to child's self-regulation
- Often combined into a sensory diet/sensory lifestyle

(Watling, Koenig, Davies, & Schaaf, 2011)

## SBI (Cont.)

- Goal is a short-term effect on self-regulation, attention, or behavioral organization
- Evidence is limited on the efficacy of sensory-based approaches
- Common modalities:
  - Therapeutic brushing
  - Bouncing on a ball
  - Adapted seating devices

(Watling, Koenig, Davies, & Schaaf, 2011)

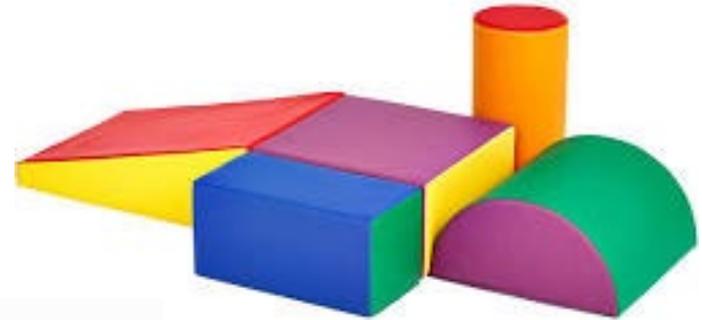
# SBI's for tactile input



# SBI's for vestibular input



# SBI's for proprioceptive input



# Caregiver Focused Interventions

## Intervention Approach

- Parent- and teacher-mediated interventions
- Family and teacher education
- Coaching

(Reynolds et al., 2017)

## Caregiver Focused Interventions

- Supports goal acquisition by:
  - Building on family/teacher strengths
  - Use of sensory activities occurring in natural contexts
  - Embedding education/coaching in daily occupations

## Caregiver focused interventions

- Outcomes -recent studies suggest positive impact on:
  - Play, social skills, social-emotional development, joint attention, and social communication for children
  - Reduced parental stress, maternal competency, improved family relationships, and parenting efficacy for caregivers

## Coaching for caregiver/teacher

- Use self therapeutically
  - ✓ Calm voice, slow movements for OR child
  - ✓ High energy, fast/irregular movements for UR child
- Use self therapeutically
  - ✓ Offer choices appropriately
  - ✓ Clear limit setting
  - ✓ 3 P's – praise (specific), paraphrase (repeat back), point out (point out behavior)

# Environmental Supports and Adaptations

- Supports provided within the environment to enhance success
- Changes made to the physical, social, temporal, and/or virtual environment

(Reynolds et al., 2017)

# Environmental Supports & Adaptations

- ***Supports and Adaptations*** should be related to a child's ability to learn and participate
- To promote regulation, attention, and improved behavior:
  1. provide appropriate supports to enhance success
  2. remove environmental barriers hindering function

# Environmental Supports & Adaptations

- Examples:
  - Changing the lighting, removing sounds, providing alternative seating, etc.
  - Visual schedule for predictability
  - Provide a quiet space – “time in” (rather than “time out)

## Environmental Supports & Adaptations

- As with any intervention, carefully consider evidence for each adaptation recommended.
- Ensure adaptations match the child's strengths and will address the challenges the child is having with participation

# Additional considerations

Relationship and engagement

Consider that you are part of the child's environment

What best helps the child attend, relate, engage?

- Waiting
- Use of humor
- Slowing down speech
- Certain activities, games
- Limiting words in directions
- Use of visual cues (1, 2, 3)
- Use of First/Then
- Picture schedules

## Sharing

- What are some things you have found helpful in setting up your classroom?
- What are strategies that have been helpful? with a particular child, or in your classroom
- What are strategies you've found helpful for your children who are seekers?
- What about for children who are over-responsive?

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