Unit 4: SENSORY INTEGRATION DISORDERS AND ITS CONCEPTS

MEMBERS:

- Camus, Sophia Claudette M.
- Castillo, Adrianne P.
- Galo, Meg Maeco
- Pascual, Maria Katrina F.

SENSORY INTEGRATION DISORDERS AND ITS CONCEPTS

DEFINITION

Sensory Integration Disorder (SID), also known as Sensory Processing Disorder (SPD), is a neurological disorder that occurs when the brain encounters difficulties in receiving and responding to information transmitted through the body's sensory systems (*Sensory Integration Disorder,* n.d.). People with this condition exhibit heightened sensitivity to their surroundings (Ash, 2024). SID involves sensory integration which is the processing, integration, and organization of sensory information from the body and the environment. The sources of these sensory information include vision, auditory, tactile, gustatory, olfactory, proprioception, vestibular, and interoception (*What Is Sensory Integration?*, n.d.).

ETIOLOGY

There is no known cause for SID, however, researchers speculate that it might be linked to the processing and organization of information within sensory pathways of the brain, as these are frequently observed in individuals with autism (Holland, 2022). It is also uncertain if sensory issues can occur on their own or if they are caused by another disorder. Some medical professionals view sensory processing issues as a symptom of another issue rather than a diagnosis in itself. According to a 2020 review and a small-scale 2017 study, prenatal or birth complications, including premature birth, low birth weight, parental stress, and substance consumption during pregnancy, may be associated with sensory processing disorder. Overexposure to certain chemicals and a lack of sensory stimulation in childhood are also identified as potential risk factors.

The neurological disorganization resulting in SID occurs in three different ways: the brain does not receive messages due to a disconnection in the neuron cells; sensory messages are received inconsistently; or sensory messages are received consistently, but

do not connect properly with other sensory messages, – leading to the inefficient motor, language or emotional outputs (*Sensory Integration Disorder,* n.d.).

PREVALENCE & INCIDENCE

Number of Cases	*Rate of New Cases*
• In a 2009 study, it has been found that **one in every six children** has sensory processing issues that make it hard to learn and function in school. • The Sensory Processing Disorder Foundation claims that as many as **1 in every 20 people – both children and adults** – in the **United States** is affected by the condition. It often seems to be worse in children, though (Shaw, 2012).	• A 2016 study shows that **66% of children with autism** and **32% of children with special education needs with no autism** show definite differences in sensory behaviors. • More recently, a 2020 study found that sensory processing difficulties predicted executive and cognitive dysfunctions in inhibitory control, auditory sustained attention, and short-term verbal memory in children within the autism spectrum in a school context. • An estimated **40 to 60% of children with ADHD** also have trouble processing stimulation from one or more senses (Rodden, 2022). • Approximately **1–2% of children** have a diagnosis of autism in the UK, of whom **≥ 90%** also experience at least moderate sensory processing difficulty (SPD), which can have an impact on their daily life and well-being (Randell, 2022).

SIGNS, SYMPTOMS, PATHOMECHANICS

Manifestations that the **Physician/Allied Health Professional** Perceive	Pediatricians and developmental specialists are those that can diagnose SPD. A child with sensory processing difficulties can be overresponsive or underresponsive to a particular sensory input. For instance, in children who are **over responsive to loud noise or bright lights**, the noise and light that is tolerable to others is too much for them, and they respond by covering their ears and squinting their eyes. In contrast, those who are **under responsive to sound** may present as children who do not turn to important sounds (for instance, name being called) or have intense rocking and swaying for those who are under responsive to the proprioceptive and vestibular input. There are also **children who do not feel pain or seek out extra tactile input** via touching objects in their environment. They can also have sensory defensiveness manifested as, for instance, intolerance to clothing tags or certain food textures. Children with sensory processing difficulties can also have **frequent meltdowns** (crying, screaming, kicking, collapsing, having self-injurious behavior, or aggression) that can potentially interfere with daily functioning and their ability to learn. Individuals with SPD often have **speech and language impairments**. Speech and language development requires several foundational processes including, but not limited to, the integration of auditory and visual stimuli, motor planning and proprioceptive knowledge of the body in space.
Manifestations that the **Parents/Significant Others** Perceive	Sensory processing issues are often first recognized during the toddler years, when parents notice that a child has an **unusual aversion to noise, light, shoes that are deemed too tight and clothes that are irritating**. Infants and toddlers may show **resistance to cuddling**, to the point of arching away when held which may be attributed to feeling actual pain when being touched. By preschool, an overstimulated child's anxiety may lead to **longer or frequent tantrums**. They may also notice **clumsiness and trouble climbing stairs**, and **difficulty with fine motor skills** like wielding a pencil and fastening buttons. More baffling and alarming to parents are children who exhibit extreme behaviors such as: ● Screaming if their faces get wet ● Throwing tantrums when you try to get them dressed ● Having an unusually high or low pain threshold ● Crashing into walls and even people

	● Putting inedible things, including rocks and paint, into their mouths The following behaviors are also manifested: ● Easily distracted ● Physical clumsiness or apparent carelessness ● Impulsive ● Difficulty making transitions from one situation to another ● Poor self concept ● Lacking self control ● Social and/or emotional problems ● Inability to unwind or calm self ● Delays in speech, language motor skills or academic achievement
Manifestations that the **Patient** Experiences	**A. Tactile** ● Sensitive to clothing textures and clothes labels ● Dislikes hair brushed or washed ● Reacts badly to being touched unexpectedly ● Unusually sensitive to being too hot or cold **B. Visual** ● Overwhelmed in a visually 'busy' environment ● Focuses on little details in a picture and misses the whole ● Loses his/her place frequently when copying from the blackboard **C. Auditory** ● Low tolerance of noise generally, says that noise 'hurts ears' or gives him/her a headache. ● Seems not to register sound. ● Fails to respond to hearing name called **D. Oral** ● Fussy or picky eater with determined food preferences and limited range

	● May lick, taste or chew on inedible objects ● Dislikes toothpaste and brushing teeth **E. Olfactory** ● Disturbed by cooking, bathroom or perfume smells ● May not notice unpleasant, noxious odors or be able to distinguish smells/fragrance **F. Vestibular** ● Avoids playground apparatus and equipment ● Fearful of heights ● Crave movement experience, especially fast or spinning ● Thrill seeker **G. Proprioception** ● Difficulty understanding where their body is in relation to other objects ● May appear clumsy and bump into things ● Misjudges the weight of an object **H. Interoception** ● Unawareness of hunger or thirst.
Structural & Anatomical Changes	**Proprioceptive receptors** are located in the joints and ligaments, allowing for control and posture. The proprioceptive system tells the brain where the body is in relation to other objects and how to move. Children who are hyposensitive crave input; they love jumping, bumping and crashing activities, as well as deep pressure such as that provided by tight bear hugs. If they're hypersensitive, they have difficulty understanding where their body is in relation to other objects and may bump into things and appear clumsy; because they have trouble sensing the amount of force they're applying, they may rip the paper when erasing, pinch too hard or slam objects down. The **vestibular receptors**, located in the inner ear, tell the brain where the body is in space by providing the information related to movement and head position. These are key elements of

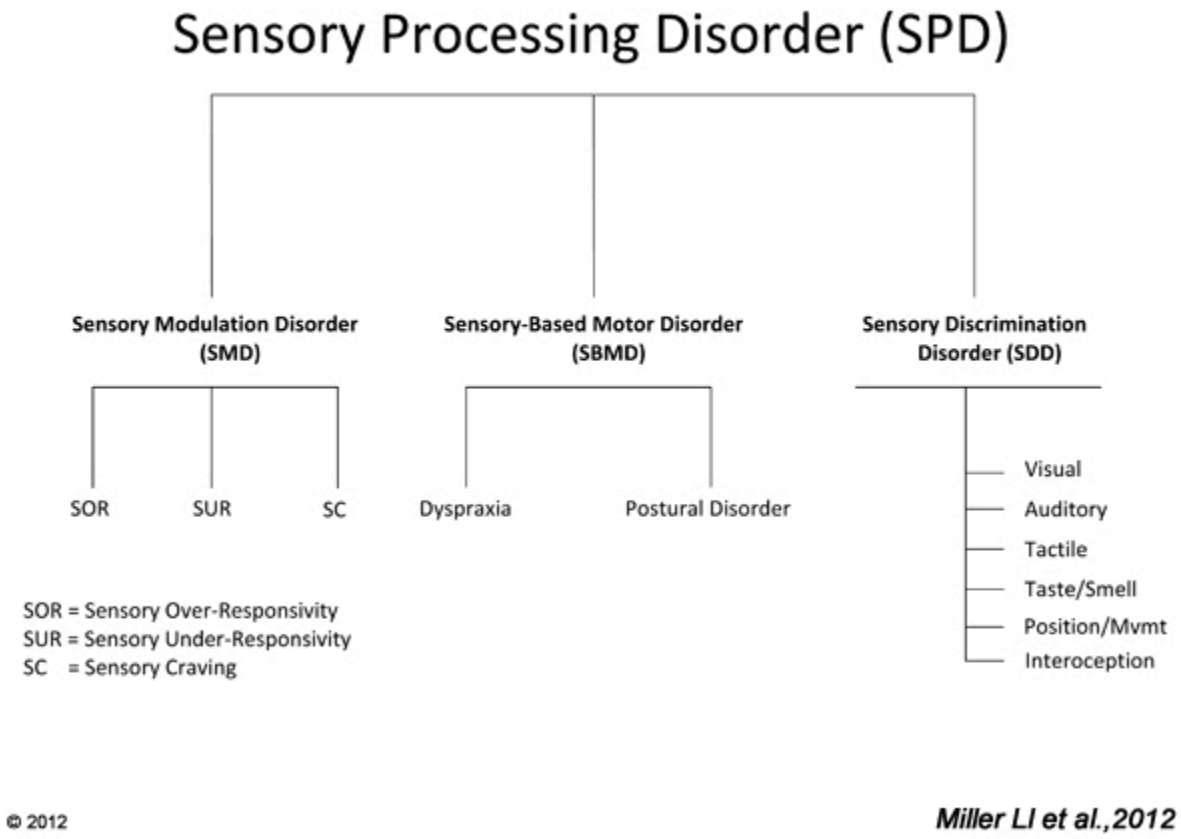
	balance and coordination, among other things. Those with hyposensitivity are in constant motion; crave fast, spinning and/or intense movement, and love being tossed in the air and jumping on furniture and trampolines. Those who are hypersensitive may be fearful of activities that require good balance, including climbing on playground equipment, riding a bike, or balancing on one foot, especially with eyes closed. They, too, may appear clumsy.

POSSIBLE SPEECH-LANGUAGE PROBLEMS ASSOCIATED WITH THE CONDITION

Possible SLP Areas (e.g., Language, Cognition, etc.) Affected	**A. Speech** ● Many children with SPD are also diagnosed with a speech delay or aphasia, which is a difficulty communicating spoken language. This might happen when a child is sensitive to sound and has difficulty processing the auditory information surrounding him or her. If children are averse to sensory input to the mouth, it can impair their capacity to generate various speech sounds, which need rapid and exact alternating motions of the articulators. **B. Swallowing** ● Another aspect to consider is the difficulties in oral stimulation. When a kid has difficulty digesting anything other than pureed foods, or when she is unable to suck or swallow effectively, her mouth muscles may not be growing sufficiently to allow her to talk. **C. Cognition** ● Sensory processing is the way we receive information through our senses, and people with SPD might struggle to handle certain sensations correctly. **D. Receptive and Expressive Language** ● Children with SPD may struggle to express themselves verbally. This can show as a limited vocabulary, trouble constructing phrases, or difficulties arranging ideas for effective communication.

	Individuals with SPD may experience difficulty understanding and processing spoken language. They may struggle to understand complicated or rapid speech, resulting in deficits in receptive language abilities.
Characteristics of these Affected SLP Areas	**A. Speech** ● Inconsistent speech sound production, trouble coordinating motions for exact articulation, and challenges with motor planning required for clear speaking. **B. Swallowing** ● It is difficult to coordinate the muscles involved in swallowing. Increased sensitivity to food and beverage textures, tastes, temperatures, and scents. Sensory issues arise when eating and drinking. **C. Cognition** ● Sensory processing issues can impair attention, focus, and overall cognitive function. Difficulty removing extraneous sensory information. Issues with task organization, planning, and execution. **D. Receptive and Expressive Language** ● Limited vocabulary, trouble constructing grammatically sound words, and arranging thoughts for efficient communication. Understanding and digesting spoken language can be difficult, particularly in complicated or fast-paced contexts.

TYPES, COURSE, & PROGNOSIS



Types	
Sensory Modulation Dysfunction	● Definition: Difficulty regulating responses to sensory stimuli ● Course: Challenges in maintaining appropriate level of alertness and responsiveness to environmental stimuli

	● Prognosis: Difficulties in self-regulation, emotional dysregulation, challenges in adapting to different sensory environments A. Sensory Over-Responsivity ● Definition: Predisposition to respond too much, too soon, or for too long to sensory stimuli most people find quite tolerable ● Course: Sensitive to certain stimuli over time, leading to heightened reactions or avoidance behaviors ● Prognosis: Heightened stress, anxiety, avoidance behaviors, impact on social interactions and daily activities B. Sensory Under-Responsivity ● Definition: Predisposition to be unaware of sensory stimuli, to have a delay before responding, responses are muted or responds with less intensity compared to the average person ● Course: Diminished responsiveness to sensory input ● Prognosis: Reduced engagement with the environment, difficulties in focusing, potential impact on learning and social interactions C. Sensory Craving ● Definition: Driven to obtain sensory stimulation, but getting the stimulation results in disorganization and does not satisfy the drive for more ● Course: Seek out sensory input excessively ● Prognosis: Overdependence on certain sensations, potential for risky behaviors or seeking out extreme stimuli
Sensory-Based Motor Disorder	● Definition: Difficulty with balance, motor coordination, and the performance of skilled, non-habitual and/or habitual motor tasks ● Course: May persist or worsen over time, affecting activities that involve movement and coordination ● Prognosis: Difficulties in coordination, motor planning difficulties, impact on activities requiring physical skills A. Postural Disorder ● Definition: Impaired perception of position of body position; poorly developed movement patterns that depend on core stability. Thus, appears weak and/or has poor endurance

	● Course: Difficulties in maintaining a stable and coordinated posture may continue, potentially impacting daily activities and physical comfort ● Prognosis: Difficulties in maintaining stable posture, potential impact on physical comfort and activities B. Dyspraxia ● Definition: Difficulty thinking of, planning and/or executing skilled movements especially novel movement patterns ● Course: Motor planning and execution difficulties, characteristic of dyspraxia, may persist and affect activities that require coordinated movements ● Prognosis: Difficulties in motor planning and execution, impact on daily tasks and coordination
Sensory Discrimination Disorder	● Definition: Difficulty interpreting subtle qualities of objects, places, people or other environments ● Course: Challenges in accurately interpreting and distinguishing between different sensory stimuli may persist, impacting the ability to make sense of the environment ● Prognosis: Difficulties in accurately interpreting sensory information, potential impact on learning and social interactions A. Auditory DD ● Definition: Difficulty interpreting characteristics of sensory stimuli that is heard ● Course: Difficulties in processing and interpreting auditory information may persist ● Prognosis: Difficulties in processing and understanding auditory information, potential impact on communication and learning B. Visual DD ● Definition: Difficulty determining/interpreting characteristics of sensory stimuli that is seen ● Course: Difficulties in processing and interpreting visual information may persist ● Prognosis: Difficulties in processing visual information, potential impact on tasks requiring visual perception C. Tactile DD ● Definition: Difficulty determining/interpreting characteristics of sensory stimuli that is felt on the skin or interpreting higher level visual/spatial characteristics of touch (includes stereognosis and graphesthesia disorders) ● Course: Difficulties in accurately processing tactile information may affect the ability to

	interpret and respond to touch stimuli may persist ● Prognosis: Difficulties in processing tactile information, potential impact on comfort and daily activities D. Vestibular DD ● Definition: Difficulty interpreting characteristics of sensory stimuli, experienced through movement of the body through space or against gravity ● Course: Difficulties in processing vestibular input, related to balance and spatial orientation, may continue to impact activities involving movement ● Prognosis: Difficulties in processing vestibular input, potential impact on balance and spatial orientation E. Proprioceptive DD ● Definition: Difficulty determining/interpreting characteristics of sensory stimuli experienced through use of the muscles and joints ● Course: Difficulties in accurately perceiving and interpreting proprioceptive input, related to body position and movement, may persist ● Prognosis: Difficulties in perceiving body position and movement, potential impact on coordination F. Gustatory DD ● Definition: Difficulty determining/interpreting characteristics of sensory stimuli that is tasted ● Course: Difficulties in accurately perceiving and distinguishing tastes may continue to affect dietary choices and preferences ● Prognosis: Difficulties in perceiving and distinguishing tastes, potential impact on dietary choices G. Olfactory DD ● Definition: Difficulty determining/interpreting characteristics of sensory stimuli that is smelled ● Course: Difficulties in accurately perceiving and interpreting smells may impact responses to the environment ● Prognosis: Difficulties in perceiving and interpreting smells, potential impact on environmental awareness H. Interoception ● Definition: Difficulty interpreting stimulation from internal organs (may not feel need to use the toilet or may have frequent somatic complaints such as stomach aches)

	• Course: Difficulties in recognizing and interpreting internal bodily sensations may persist, influencing self-awareness and emotional regulation • Prognosis: Difficulties in recognizing and interpreting internal bodily sensations, potential impact on emotional regulation

MANAGEMENT

Occupational Therapy (OT)	Occupational therapists specialize in helping individuals develop the skills needed for daily living and work. For individuals with SPD, occupational therapy is often a key component of intervention. OT may focus on sensory integration therapy, fine and gross motor skills, self-regulation strategies, and activities of daily living.
Sensory Integration Therapy (SIT)	This specialized form of occupational therapy aims to improve the brain's ability to process and organize sensory information. It involves engaging individuals in purposeful activities designed to challenge and gradually integrate their sensory responses
Speech and Language Therapy	Some individuals with SPD may have challenges related to language and communication. Speech therapists can work on improving communication skills, language development, and addressing any issues with auditory discrimination.
Physical Therapy (PT)	For individuals with SPD who experience challenges with motor coordination, balance, or posture, physical therapy can be beneficial. Physical therapists can provide exercises and activities to enhance motor skills and overall physical development.
Behavioral Therapy	Cognitive-behavioral therapy or behavioral interventions may be helpful for individuals with SPD, especially if they are experiencing behavioral challenges related to sensory sensitivities. This can involve teaching coping strategies and addressing any associated anxiety or behavioral issues.

SLP THERAPY: AREAS TO BE EVALUATED, MATERIALS, AND POSSIBLE STRATEGIES/APPROACHES

Oral Motor Skills	● Evaluation Areas: ○ Lip strength and coordination, tongue movements, jaw stability, oral reflexes. ● Evaluation Materials: ○ Tongue depressors, mirrors, oral-motor exercises, and tools for measuring range of motion. ● Strategies/Approaches: ○ Strengthening Exercises: Incorporate exercises targeting specific oral muscles. ○ Oral-Motor Stimulation: Use sensory-friendly tools to stimulate and desensitize oral structures. ○ Feeding Therapy: Address difficulties related to chewing, swallowing, and overall oral coordination.
Articulation and Phonology	● Evaluation Areas: ○ Sound production, sound discrimination, phonological processes. ● Evaluation Materials: ○ Standardized articulation assessments, speech sound discrimination tasks, speech samples. ● Strategies/Approaches: ○ Auditory Discrimination Activities: Incorporate activities to improve sound perception. ○ Multisensory Approach: Utilize visual and tactile cues to enhance speech sound production. ○ Phonological Awareness Activities: Focus on sound awareness and manipulation..
Expressive Language Skills	● Evaluation Areas: ○ Vocabulary, grammar, sentence structure, narrative skills. ● Evaluation Materials:

	○ Standardized language assessments, language samples during structured and unstructured tasks. ● Strategies/Approaches: ○ Visual Supports: Use visual aids to enhance language expression and comprehension. ○ Sensory-Based Language Activities: Integrate sensory components into language tasks. ○ Structured Play: Use play-based activities to encourage expressive language skills.
Receptive Language Skills	● Evaluation Areas: ○ Comprehension, auditory processing, following directions. ● Evaluation Materials: ○ Standardized language assessments, auditory processing tests. ● Strategies/Approaches: ○ Visual Supports: Provide visual cues to enhance comprehension. ○ Sensory Integration Techniques: Use sensory strategies to improve attention and processing. ○ Interactive Listening Activities: Engage in activities that promote active listening and understanding.
Pragmatic/Social Communication Skills	● Evaluation Areas: ○ Turn-taking, non-verbal communication, social interactions. ● Evaluation Materials: ○ Social communication assessments, structured social interaction tasks. ● Strategies/Approaches: ○ Social Stories and Scripts: Develop stories to teach social expectations. ○ Role-Playing: Engage in role-playing activities to practice social scenarios. ○ Visual Supports: Use visual aids to aid social understanding.

Fluency/Stuttering	● Evaluation Areas: ○ Speech fluency, disfluency patterns. ● Evaluation Materials: ○ Standardized fluency assessments, speech samples during conversation. ● Strategies/Approaches: ○ Relaxation Techniques: Integrate relaxation exercises to reduce anxiety. ○ Pacing Activities: Encourage a slower rate of speech and practice pacing. ○ Sensory-Based Techniques: Use sensory strategies to manage stress and tension.
Feeding and Swallowing Skills	● Evaluation Areas: ○ Oral sensory processing, chewing, swallowing. ● Evaluation Materials: ○ Clinical observation, feeding assessments, texture trials. ● Strategies/Approaches: ○ Sensory-Based Feeding Therapy: Address aversions and sensitivities. ○ Oral-Motor Exercises: Include exercises to improve oral muscle coordination. ○ Texture Desensitization: Gradual introduction of varied food textures.

CRITICAL MEMBERS OF THE MANAGEMENT TEAM

Pediatrician/Developmental Pediatrician	Provides overall medical care, assesses developmental milestones, and may help rule out other medical conditions that could contribute to sensory issues.
Occupational Therapist (OT)	Focuses on enhancing sensory integration, fine and gross motor skills, and activities of daily living. Provides sensory-based interventions and strategies to improve functioning.
Speech-Language	Assesses and addresses speech, language, communication, and oral-motor skills. Works on

Pathologist (SLP)	improving articulation, language expression, and social communication.
Physical Therapist (PT)	Addresses gross motor skills, coordination, balance, and posture. Helps with the development of motor planning and movement.
Psychologist or Counselor	Offers support for emotional and behavioral aspects related to sensory challenges. Provides coping strategies, social skills training, and addresses any associated anxiety or stress.

PRECAUTIONS TO PROTECT ONESELF AND THE CLIENT FROM HARM/DANGER DURING THERAPY SESSIONS PARTICULAR TO SID

Establish Clear Communication	a. Build Trust and Rapport - develop a trusting relationship with the client to establish open communication. Ensure the client feels comfortable expressing their needs and concerns during the session. b. Use Visual and Verbal Cues - incorporate visual and verbal cues to signal transitions or changes in the session. This helps the client anticipate and prepare for modifications in activities.
Monitor and Respond to Sensory Overload	a. Observe Signs of Discomfort - continuously monitor the client for signs of sensory overload, such as increased agitation, withdrawal, or heightened sensitivity. Be attentive to non-verbal cues. b. Provide Sensory Breaks - Incorporate sensory breaks into the session when needed. Allow the client to engage in calming activities or take a brief break to self-regulate.
Utilize Sensory-Friendly Materials	a. Select Appropriate Tools - choose sensory-friendly materials and tools based on the client's preferences. Avoid items that may be overly stimulating or triggering for the client. b. Gradual Introduction- introduce new sensory materials gradually, allowing the client to

	become accustomed to them and minimizing the risk of sensory overload.

PREVENTIVE MEASURES: BEFORE, DURING, AND/OR AFTER SLP THERAPY SESSIONS

BEFORE	DURING	AFTER
Conduct a Comprehensive Assessment: ● Gather detailed information about the client's sensory profile, preferences, and sensitivities. This information can guide the development of a personalized and effective therapy plan.	**Establish Trust and Communication:** ● Build a trusting relationship with the client to foster open communication. Ensure the client feels comfortable expressing their needs and concerns during the session.	**Client Debriefing:** ● Debrief with the client after the session to discuss their experiences, challenges, and successes. Use this feedback to inform future therapy plans.
Environmental Assessment: ● Evaluate the therapy space for potential sensory triggers and hazards. Create a well-organized, clutter-free, and sensory-friendly environment that accommodates the client's needs.	**Use Sensory-Friendly Materials:** ● Select appropriate tools and materials based on the client's sensory preferences. Introduce sensory stimuli gradually and observe the client's reactions to prevent sensory overload.	**Documentation:** ● Record observations related to the client's behavior, responses, and progress during the session. Document any adjustments made to the therapy plan based on the client's needs.

<table>
<tr>
<td rowspan="3">Collaborate with Other Professionals:
Communicate with other members of the healthcare team, including occupational therapists, to gather insights into the client's sensory processing challenges. Collaborate on strategies and interventions that complement each other.</td>
<td>Provide Clear Instructions:
Offer clear and concise instructions to the client. Use visual supports and cues to enhance understanding, especially if the client benefits from visual or tactile input.</td>
<td>Communication with Caregivers:
Share relevant information with the client's caregivers, including progress, challenges, and recommended strategies for continued support at home.</td>
</tr>
<tr>
<td>Monitor Sensory Responses:
Continuously monitor the client's sensory responses and adjust the therapy activities accordingly. Be observant of signs of sensory overload or discomfort.</td>
<td rowspan="2">Evaluate and Adjust:
Regularly assess the effectiveness of therapy interventions. Be flexible in adjusting strategies based on the client's evolving needs and progress.</td>
</tr>
<tr>
<td>Incorporate Sensory Breaks:
Integrate sensory breaks into the session plan. Allow the client opportunities to self-regulate, engage in calming activities, or take short breaks when needed.</td>
</tr>
</table>

SUPPORT SYSTEMS FOR PEOPLE WITH SENSORY INTEGRATION DISORDER

Support Systems	*Organizations*

● Therafree by. Magis Therapies ● TRAVIS by. Trails Center for Children ● Speech Therapy App By. PASP ● Star Institute ● How to support a loved one with SPD by. Children's Therapy Center Co.	A. Magis Therapies and Mindworks Neurofeedback Center ● Offers free speech therapy B. Operation Smile Philippines ● Teletherapy C. Trails Center for Children ● Provides individualized, dyadic and small-group sessions D. Smile Train Philippines ● Offers free speech services

REFERENCES

Arky, B. (2023, October 30). *Sensory processing issues explained*. Child Mind Institute. https://childmind.org/article/sensory-processing-issues-explained/

Ash. (2024, January 22). *What is Sensory Integration Disorder*. Autism 360™. https://www.autism360.com/what-is-sensory-integration-disorder/#:~:text=What%20is%20Sensory%20Integration%20Disorder%3F,often%20oversensitive%20to%20their%20environment

Ben‐Sasson, A., Carter, A. S., & Briggs‐Gowan, M. J. (2009). Sensory Over-Responsivity in Elementary School: Prevalence and Social-Emotional correlates. *Journal of Abnormal Child Psychology*, *37*(5), 705–716. https://doi.org/10.1007/s10802-008-9295-8

Cerezuela, G. P., Andrés, M. I. F., Sanz‐Cervera, P., & Suelves, D. M. (2020). The impact of sensory processing on executive and cognitive functions in children with autism spectrum disorder in the school context. *Research in Developmental Disabilities*, *96*, 103540. https://doi.org/10.1016/j.ridd.2019.103540

Chicago Speech Therapy: The Effects of Sensory Processing Disorder. (n.d.). Chicago Speech Therapy. Retrieved February 2, 2024, from https://chicagospeechtherapy.com/chicago-speech-therapy-the-effects-of-sensory-processing-disorder/

Green, D., Chandler, S., Charman, T., Simonoff, E., & Baird, G. (2016). Brief Report: DSM-5 Sensory Behaviours in children with and without an Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, *46*(11), 3597–3606. https://doi.org/10.1007/s10803-016-2881-7

Holland, K. (2022, March 1). *Sensory Processing Disorder: Understanding sensory issues in children*. Healthline. https://www.healthline.com/health/childrens-health/sensory-issues-in-children#causes

Larrazabal, M., & Wilson, J. L. (2023, October 16). What is Sensory Processing Disorder & How to Treat SPD? Better Speech. Retrieved February 2, 2024, from https://www.betterspeech.com/post/speech-therapy-for-sensory-processing-disorder

Osp. (2020, October 10). Uncategorized. https://operationsmile.org.ph/category/uncategorized/

Otsimo Editorial. (2023, July 26). Sensory Processing Disorder - Types and Definition. Otsimo. https://otsimo.com/en/sensory-processing-disorder-definition-types/?fbclid=IwAR0xVPitefzt6TVA0fAeqWQVIrv2_tIamQO6I2B8Df3JKa7QFzCsTCg8m8U

Philippine Association of Speech Language Pathologists - A Look into the First Filipino Speech Therapy App. (n.d.). https://pasp.org.ph/Articles/12173164

Randell, E. (2022, June 1). Scientific summary. Sensory Integration Therapy for Children With Autism and Sensory Processing Difficulties: The SenITA RCT - NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK581601/

Resources for parents and professionals. (n.d.). STAR Institute. https://sensoryhealth.org/basic/resources-for-parents-and-professionals

Rodden, J. (2022, March 31). Sensory Processing Disorder: Overview and facts. ADDitude. https://www.additudemag.com/sensory-processing-disorder-overview-and-facts/

Sensory Integration Disorder - LaNC UK. (n.d.). Lanc UK. https://www.lanc.org.uk/related-conditions/sensory-integration-disorder-adhd-asd/

Sensory Integration therapy. (n.d.). HealthyChildren.org. https://www.healthychildren.org/English/health-issues/conditions/developmental-disabilities/Pages/Sensory-Integration-Therapy.aspx

Sensory Processing - STAR Institute. (n.d.). https://sensoryhealth.org/

Shaw, G. (2012, June 20). The Truth about Sensory Processing Disorder. WebMD. https://www.webmd.com/children/features/the-truth-about-sensory-processing-disorder

Speech Services | Smile Train. (n.d.). https://www.smiletrain.ph/patients-families/speech-services

Speech Therapy | MAGIS Therapies and Mindworks Neurofeedback Center. (n.d.). Magis & Mindworks. https://www.magismindworks.com/speech-therapy

Subtypes of SPD. (n.d.). STAR Institute. https://sensoryhealth.org/basic/subtypes-of-spd#summary

Weinerth, B. (2023, June 13). How to Support a Loved one with SPD - Children's Therapy Center - San Jose & Carmel. Children's Therapy Center, Co. https://childrenstherapycenter.com/how-to-support-a-loved-one-with-spd/

What is Sensory Integration? (n.d.). Sensory Integration Education. https://www.sensoryintegrationeducation.com/pages/what-is-si