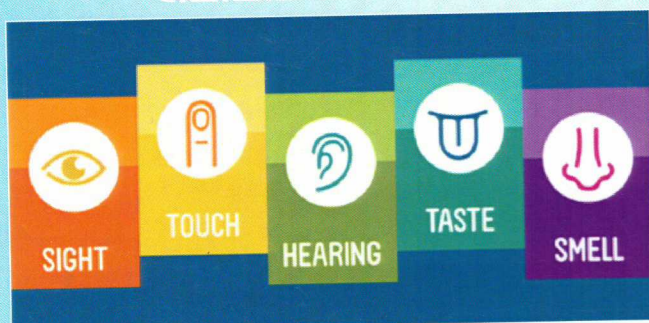


Sensory modalities in the treatment of children with autism



- Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) Autism spectrum disorder (ASD) :
 - Deficits of social interaction and communication
 - Repetitive interests and activities
 - DSM-5 (2013) also includes sensory aspects of the disease as “hyper- or hypo-reactivity to sensory input” as well as “unusual interests in sensory aspects of environment” within the main ASD criterion concerning restricted interests and repetitive behaviors
- Sensory abnormalities are very frequent feature that often go unnoticed due to the communication difficulties of these patients.
- ICD-11 (Jun 2018, WHO) is in sync with DSM -5 diagnostic criteria of ASD barring minor changes.
- The following are some of the examples cited by the DSM-5
 - Visual fascination with lights or spinning objects
 - Adverse response to specific sounds or textures
 - Excessive smelling
 - Excessive touching of objects
 - Apparent indifference to pain, heat, or cold



Sensory Modalities	Examples Of Behaviors Related To Sensory Abnormalities
Visual	Attraction of light sources Starting at spinning objects such as washing machine centrifuge, wheels, and propeller fans Impaired recognition of face expressions Gaze avoidance Refusal of foods because of their color
Auditory	Apparent deafness: the child does not turn to the verbal call Intolerance to some sounds, different from case to case Emission of repetitive sounds
Somatosensory	High pain tolerance Apparent insensitivity to heat or cold Self-aggressiveness Dislike of physical contact, including certain clothing items Attraction for rough surfaces
Olfactory	Smelling non-edible things Refusal of certain foods due to their odor
Taste, oral sensitivity	Oral exploration of objects Food selectivity due to refusal of certain textures
Proprioceptive / kinesthetic	Iterative rocking Inadequate balance

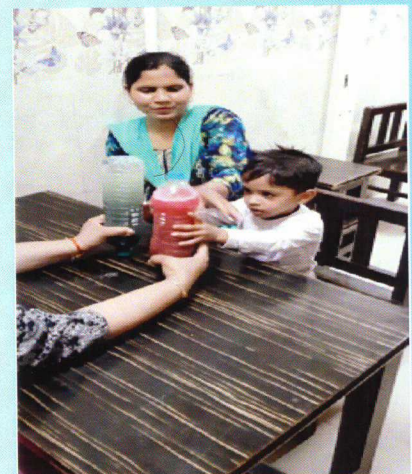
► Sensory features include

- Hyper responsiveness (an over-reaction to sensory stimuli)
- Hypo responsiveness (a decreased response to sensory stimuli)
- Sensory seeking (behaviors aimed at pursuing intense or unusual sensory stimulation)
- Enhanced perception (acute awareness of sensory stimuli)

► These behaviors are not mutually exclusive

► Almost any sensory channel may be involved

► Sensory dysfunction : impaired modulation occurring in the central nervous system, which regulates neural messages concerning sensory stimuli



► Sensory abnormalities negatively impact ASD individuals and their families:

- Impairment of social communication and activities;
- Adaptive behavior (e.g., "problem behaviors": range of interests (restricted, repetitive);
- Everyday routines (e.g., avoiding behaviors due to sensorial distress);
- Cognition,
- Eating behavior leading to a food selectivity that can in turn cause inadequate nutrition
- Sleep: Quality & Quantity

► Several types of sensory abnormalities may coexist in the same person over the course of life, or even at the same time

- ▶ Sensory abnormalities in ASD children (enhanced perceptual functioning) :due to the increased functioning of the brain regions involved in primary perceptual functions
- ▶ Brain pathology is increased reactivity and plasticity of local neuronal circuits, leading to increased perception attention, and memory, making the world aversively intense for the child with ASD
- ▶ An impairment not only of unisensory modalities (e.g., auditory alone) but also of multisensory integration probably related to a brain connectivity impairment, consisting in particular of poor long range connectivity
- ▶ Reduced ability to integrate sensory information across different modalities (auditory, visual, etc.),contribute to core autism symptoms, such as social communication impairments
- ▶ Environmental factors may also influence these symptoms
 - Hyper-responsive behaviors associated with daily living activities and stimuli initiated by the family
 - Sensory seeking behaviors are associated with free play activities and stimuli initiated by the child

Sensory interventions

▶Clinic-based sensory interventions

- Using play activities :gross motor activities activating the vestibular and somatosensory systems
- Aim to enhance the capacity to integrate sensory information,
- Child to adopt more organized and adaptive behaviors, including improved joint attention, social skills, motor planning, and perceptual skills.
- Therapist chooses a “just-right challenge” (*i.e.*, an activity that is just a little above what the child is now able to do without difficulty) from the child's emerging skills and supports his/her adaptive responses to the challenge.

▶Classroom-based sensory-based interventions

- Use single-sensory strategies (for example therapy balls or weighted vests)
- These influence the state of arousal, reduce a high arousal state that can be clinically manifested as restlessness, hyperactivity, and self-stimulating behaviors..



Teaching Methodology

- ▶ Structured teaching
- ▶ Use token reward system and behaviour charts
- ▶ Use social stories and pictorial clues
- ▶ Using picture books ,dough, clay and shapes of alphabets numbers and colors
- ▶ Coping strategy for school, family, environmental and parent counselling
- ▶ Regular follow up to judge impact of intervention

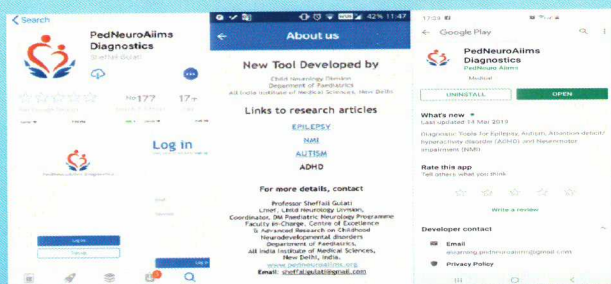
In Conclusion

- ▶ A formal evaluation of sensory function should be always performed and repeated periodically during the follow-up, in order to meet the needs of ASD children which will prevent appearance of problem behaviors, and ultimately alleviate the difficulties of their families and society at large.
- ▶ Adaptation to social ,cultural and home based therapies with a structured teaching paves the way to successful management of Sensory abnormalities in ASD children.
- ▶ Positive encouraging environment and focused therapy with firm and assertive discipline helps in tackling and alleviating sensory processing disorders.

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▶ PedNeuroAims Diagnostics: An app based Diagnostic tool for Epilepsy, Autism, Attention Deficit/Hyperactivity Disorder(ADHD) and Neuro muscular Impairments(Available for Android & Apple devices)

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