



Making Sense of the Senses

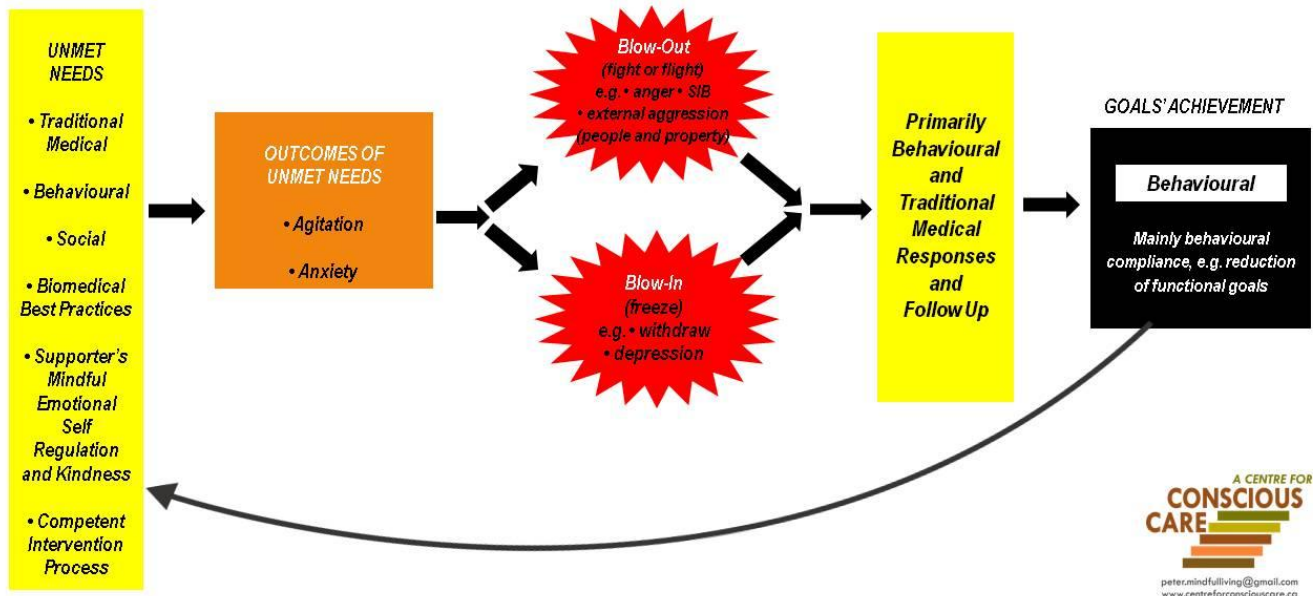
Session IX – Resource 1



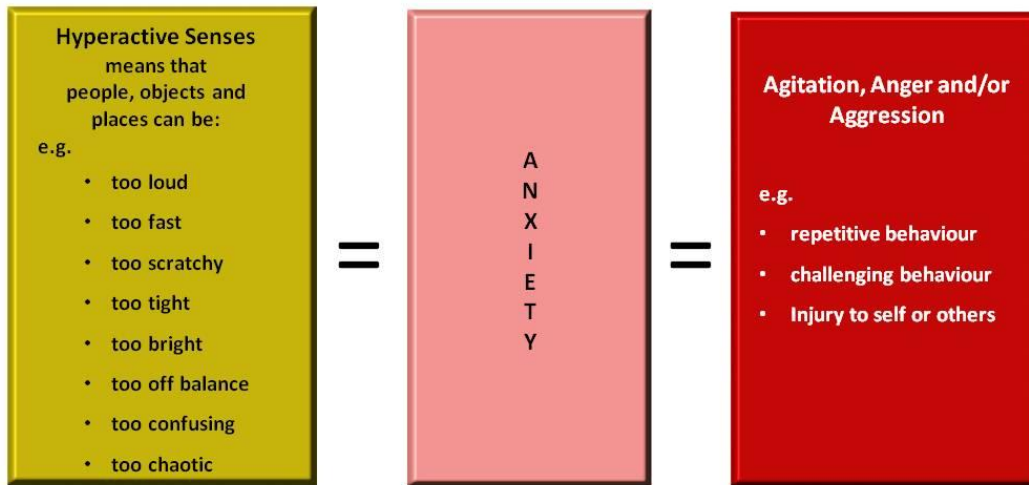
MAKING SENSE OF THE SENSES

- Everyone's 'reality'/life experience comes through 8 senses
- Our sense doors are:
 - Taste
 - Smell
 - Hearing (Auditory)
 - Seeing (Visual)
 - Touching (Tactile)
 - Balancing (Vestibular)
 - Body Awareness (Proprioception)
 - Interoception (sensing pain or too hot/cold)
- If any sense door isn't fully developed and operational, it can be overly sensitive (hyperactive) or under sensitive (hypoactive).

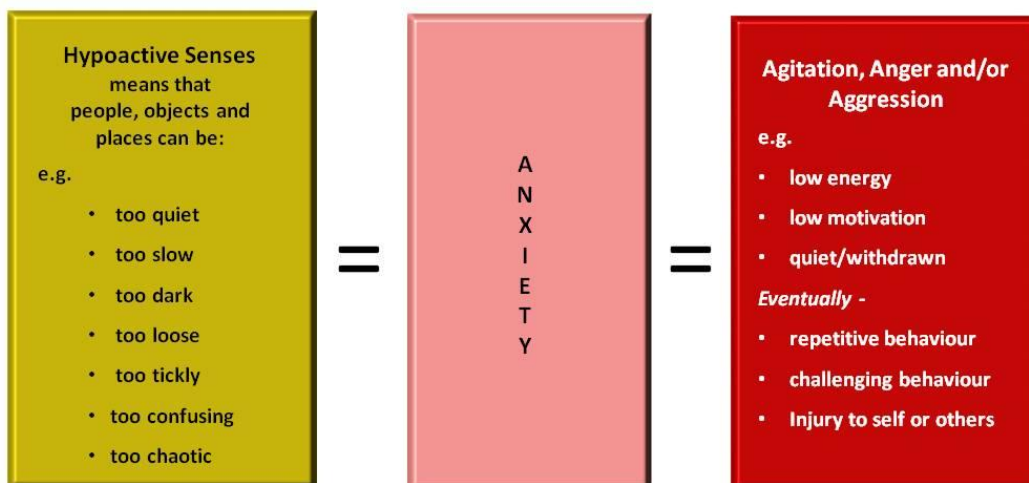
The Recurring Cycles of Behaviour to Calm to Behaviour



Hyperactive Senses Lead to Challenging Behaviours



Hypoactive Senses Lead to Challenging Behaviours



Prevalence of Sensory Problems

- People with autism and other developmental disabilities are at a much higher risk of having sensory integration problems (approximately 80% of this population have sensory integration problems).



Prevalence of Sensory Problems (cont'd)

- **Startle Response**
A majority of people with developmental disabilities **startle much more readily** due in part to hyperactive hearing (the inner ear does not form properly). They also startle for up to 1 hour versus 5-10 seconds for neurotypical individuals.
- **Senses must all be working together** i.e. be integrated. If they are not, several of the person's senses can react to over stimulation e.g. a startle often makes light seem 5 times brighter and noises 5 times louder.



Prevalence of Sensory Problems (cont'd)

- A high percentage of challenging behaviours such as aggression or self harm are caused by sensory problems (reference Aggression to Calming).

A high percentage of these challenging behaviours can be prevented and deescalated with sensory interventions to improve sensory processing (in the moment) and sensory integration.



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Prevalence of Sensory Problems (cont'd)

- A person's preferred stimulating activities are often clues leading to what need they are trying to meet and how best to meet that need. Encourage safe self stimulation and add a well balanced, prescribed (by Occupational Therapist if possible) daily sensory diet (reference below).
- Occupational Therapists who are trained and certified in Sensory Integration methods are the best qualified to assess and plan interventions and daily sensory diets.
- The following are examples of typical sensory processes that are more often problematic for people with developmental disabilities.



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Balanced Gastrointestinal (GI) is required for....

Balanced Neurotransmitters which are required for....

Balanced Sensory Integration & Processing

Audio Sensory Processing Problems



Inner Ear Problems

PwDD often can not tune into human speech because they cannot use their Middle Ear Muscles to dampen the lower sound frequencies as all neurotypical people can do.

- Because lower frequencies are at full volume, they mask higher frequencies
- Lower frequencies trigger Fight/Flight brain responses
- Autopsies often find cerebellum inflammation which has close links to the vestibular inner ear system (ref. John Hopkins 2005)
- Sound Therapy is often an effective treatment



Complete the Sensory Screening Tool

Session IX – Resource 2



What to do?

- Occupational Therapists who are trained and certified in Sensory Integration methods are the best qualified to assess and plan interventions and daily sensory diets.
- The following are examples of typical sensory processes that are more often problematic for people with developmental disabilities.



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Proprioception – Sense of Movement of Body

What Is It?

- This sense system receives sensory stimulus from the muscles and joints which affect fine and gross motor development skills and body awareness.
- Brain should develop awareness and a subconscious 'body map' about our body parts position, orientation and location at all times.
- An improved 'map' leads to better orientation, coordination of movements and the maintaining of position and balance.
- Often the real reason that s/he keeps crashing, jumping, tripping, falling, enjoys tight clothing, avoids playing sports, writing too dark, breaking things, and bangs their head is that they are trying to reorganize/make stronger the messages from joints to the brain to improve motor skills i.e. improve the map.



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Proprioception Regulating Exercises – Daily Sensory Diet

- Vibration is highly stimulating to our proprioception sense e.g. massage chair.
- Weighted/compression clothing and blankets are self calming to this sense.
- Practice measured strengthening exercises to learn to use right level of force.
- Squeeze machine.
- Regular doses of touch from massage, brushing, handholding is excellent.
- Caving/Rock climbing.
- Pushing and pulling.
- Carrying heavy objects.
- Weight resistance and pressure work-outs.
- Jumping on the trampoline
- Throwing or catching a heavy ball or beanbag
- Rolling up tightly in a blanket
- Two people laying on backs playing bicycle together
- Digging in heavy sand
- Sucking on a water bottle
- Chewing heavy crunchy food

Tactile – Sense of Touch

What Is It?

- The sense of touch is critical to lay the foundation for a more balanced, organized central nervous system.
- The Tactile system may need to be Stimulated if it is hyposensitive
 - therefore they may get too close to people and/or touch others too much
 - it may take a lot for them to feel pain
 - when they get agitated they need to hold or play with an object
- The Tactile system may need to be inhibited if it is hypersensitive
 - therefore it may be hard for people with developmental disabilities to have people touch them
 - they take off their clothes when they are anxious
 - they may feel pain very easily
 - they may avoid certain textures like sand, grass or slimy foods

Tactile Regulating Exercises – Daily Sensory Diet

To Stimulate:

- Chewing appliances
- Walking on a variety of textures in bare feet
- Gripping appliances to stimulate 'feel'
- Colourful clothing, pictures etc.
- Hand stimulation with many different textures -
 - e.g. - from sand to water,
 - to rough to smooth,
 - to hot to cold

To Calm:

- Avoid people who get too close
- User friendly clothing – not too tight or too scratchy
- 'Snoozelin type' environments, slow moving soft light, soft textures and colours, soft music/'bubble tubes'
- Ear plugs/head phones
- Soft food textures e.g. minced or puréed or smoothies
- Sunglasses

Vestibular – Sense of Balance – What to Do

What Is It?

- The Vestibular system receptors are in the inner ear.
- The system responds both to movement and gravity.
- The system affects balance, eye movements, posture, muscle tone and attention.
- Is often related to hearing regulation problems.

Vestibular Regulating Exercises - Daily Sensory Diet

- Through planned and controlled sensory stimuli with adaptive responses, levels of organization in the brain are enhanced. New neuron cells are grown.
- Jumping, hopping, bouncing (on a mini trampoline or stabilization ball), catching, throwing, skipping and pogo stick.
- Swinging, rotating and hammocking in all directions also improves inner ear functioning.
- Balance beam (1" x 6" x 8' boards in pattern). Walk toe to heel.
- Balance on boat bumpers.
- Boat in the ocean exercise.
- Vaulting – sudden jolts are very helpful.
- Standing and balancing on elliptical cushion while catching balls.
- Wii and Xbox balancing exercises.
- Sit on air cushion.
Weight shifting stimulates balance and improves inner ear and motor behaviour functioning. This reduces movement fear and anxiety that often leads to agitation, anger or aggression.
- To be most effective, activities must be done frequently and consistently.

Note: Pay attention as to how the individual responds to activity. If they appear over or under-stimulated, adjust 'speed' accordingly.



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Sensory Processing and Integration Summary

1. Any sense can be over or under stimulated. Observations should also be made concerning:
 - visual (sight) – too bright or too dull
 - auditory (hearing) – too loud or too quiet
 - gustatory (taste) – too sour or sweet, bitter or salty or spicy
 - olfactory (smell) – too musty, putrid, pungent or not enough
2. Observe the people with developmental disabilities who you support to see what repetitive activities they prefer, and what their symptoms of sensory dysfunction might be. Keep accurate records and share observations with an Occupational Therapist or Medical Doctor in order for them to plan a work-out sensory diet regime.
3. People with developmental disabilities need patterns/order, organization and consistency/predictability to keep senses working properly. Due to neurophysical irregularities (e.g. sensory dysfunction) always, always ask "Is their maladaptive behaviour to this experience, organizing their senses right now?"
4. To ensure optimal sensory integration, absolutely no synthetic materials e.g. plastics, polyesters in shoes, clothes, carpets etc. Use totally natural fibers to minimize risks of energy build up causing behavioural explosions.
5. Environmental toxins e.g. cell phone radiation, must be minimized.
6. Whole Foods Nutrition is critical.
7. Consult a qualified Occupational Therapist for assessments and treatments.



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Essential Proprioception and Vestibular Sensory Integration & Processing Equipment & Exercises

1. Mini-trampoline Workout.
2. Trampoline and Medicine Ball Rebounding.
3. Bosu Ball Exercise – ball catch, step-ups, and squats.
4. Weight Lifts (in gym).
5. Balance Beam – figure 8, toe to heel course.
6. Vibrating Massage.
7. Compression Vest.
8. Weighted Blanket.
9. Wii and Xbox Balancing Exercises.



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Essential Proprioception and Vestibular Sensory Integration & Processing Equipment & Exercises (continued)

10. Sensory Regulator Proprioception Exercises.
11. Stabilization Ball Exercises.
12. Elliptical Cushion.
13. Treadmill (cardio).
14. Stair Stepper (cardio).
15. Elliptical (cardio).



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Useful Equipment

Examples of Equipment for Sensory Integration and Brain Coherence Exercise

<i>Purpose</i>	<i>Equipment</i>	<i>Approximate Cost Per Unit</i>
Coherence	AAR Trampoline	\$ 250.
Coherence	Recumbent Bike	500.
Coherence	Tread Mill	2,500.
Tactile	Quarry Sand Bin Set	700.
Tactile	Feelie Dice	150.
Tactile	Tactile Walkway	500.
Tactile	Tactile Disks Set B	130.
Tactile	6 x 5 x 10 Gym Mat	500.
Proprioception	Full Body Massage Mattress	225.
Proprioception	Squeeze Vest	700.
Proprioception	Weighted Blanket	325.
Proprioception	Squeeze Machine	425.

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Useful Equipment

Examples of Equipment for Sensory Integration and Brain Coherence Exercise

<i>Purpose</i>	<i>Equipment</i>	<i>Approximate Cost Per Unit</i>
Vestibular	Stabilization Ball	\$ 100.
Vestibular	Balance Swing & Sway Kit	2,500.
Vestibular	Auto Magic Swing	1,000.
Vestibular	Indoor Swing Frame	220.
Vestibular	Extra Wide Swing Seat	90.
Vestibular	Wheelchair Swing	1,150.
Vestibular	Wheelchair Suspension System	100.
Vestibular	Adult Full Support Swing Set	250.
Vestibular	Wheelchair Rocker	1,000.
Vestibular	Teen Spinner	900.
Vestibular	Balance Beam	300.
Vestibular	Vaulting Horse	500.
Audio & Visual	Snozelen Room	3,000.

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