Sensory Integration

“treatment begins with understanding”
WHAT IS SENSORY INTEGRATION?

• How does it function in our lives today?
• Our brains must organize and process information from each of our senses and then use the input to respond to different situations.
• Over 80% of the nervous system is involved in organizing sensory input.
• We receive sensory information, interpret, respond, and learn from our experiences through the life span. This is an automatic process.
Sensory Integration and Our Connection to the World

- Self Regulation.
- Comfort, self esteem.
- Motor Planning, sequencing.
- Motor skills development.
- Attention, impulse control.
- Readiness to learn.
- Application of learned material.
The Seven Senses

- **Touch**: Well established by 2-4 months
- **Hearing**: Well established by 24 weeks
- **Vision**: Continues to develop after birth
- **Smell**: Well established by 28 weeks
- **Taste**: Refined in 3rd Trimester
- **Vestibular**: Begins developing at 8 weeks, fully developed by 6 mo
- **Proprioception**: Continues to develop after birth
The Tactile System

- Protection
- Discrimination
- Stereognosis
- Body Awareness
- Eyes Occluded
- Survival
- Nourishment
- Learning
How Well Do You Know the Back of Your Hand?

• 9 feet of blood vessels
• 30 hairs
• 300 sweat glands
• 4 oil glands
• 13 yards of nerves
• 9000 nerve endings
• 6 cold sensors
• 600 pain sensors
Signs of Dysfunction

- Avoids getting messy in glue, sand, finger paint, tape
- Picky with clothing, sheets, towels, foods, textures
- Avoids going barefoot, especially in grass or sand
- Has decreased or heightened awareness of pain or temperature
- Poor fine motor skills.
- Difficulty with activities of daily living skills
- Articulation
The Auditory Environment

- Look for cues in the hyper-sensitive student.
- History cues, ear infections, tube placement.
- Limit extraneous noise.
- Provide “white noise”
- Seating
- Limit yelling
- Detective work, Low and High Pitched noise.
Auditory Regulation

- Responds negatively to unexpected or loud noises
- Holds hands over ears
- Cannot learn with background noise
- Seems oblivious within an active environment
The Visual Environment

- Provide different sources of lighting.
- Visually consistent spaces
- Artwork
- Letter guides
- Visual countdown timer/standard clock
- Limit clutter
- Consistent typeface or font
- Visual detective
- Desk partitions
- Reading window
- Visual examples
- Alternatives for worksheets
Signs of Vision Dysfunction

- Prefers to be in the dark
- Hesitates going up and down steps
- Avoids bright lights
- Stares intensely at people or objects
- Avoids eye contact
- Poor eye-hand coordination
The Oral-Motor and Olfactory Environment

- Experiment with smells that are more universally calming, vanilla.
- Oral motor activities-sweet, sucking, chewy food or crunchy, cold, bitter and sour tastes.
- Chewy tube, aquarium tubing, small hard candy.
- Gum chewing with strict guidelines.
Signs of Oral/Olfactory Sensory Dysfunction

- Does not seem to smell strong odors
- Routinely smells nonfood objects
- Seeks out certain tastes or smells
- Avoids certain tastes/smells that are typically part of children's diets
Vestibular System
Vestibular Function

- Sense of movement and gravity.
- Changes in motion of the head.
- Reinforce and maintain muscle tone.
- Relationship to the earth.
- Input from the vestibular system paces the functioning of the entire central nervous system and prepares it for other sensory input.
- Movement, rate, force, direction.
- Handwriting
- Bilateral coordination
- Need movement to listen and learn.
- Vestibular process-subcortical, supports cortical processes.
- Non verbal communication.
- Planning and grading movement.
- Stabilization of the eyes while the body is moving.
Signs of Vestibular Dysfunction

- Appear uncoordinated.
- Don’t perceive visual information correctly.
- Slow to learn.
- Poor development of speech, articulation, language.
- Motion sickness.
- Emotional reactions.
- Becomes anxious or distressed when feet leave the ground.
- Avoids playground equipment—insecurity.
- Takes excessive risks while playing, has no safety awareness.
- Hand dominance.
- “Hunger” in vestibular dysfunction.
- Safety
- Use of vision to monitor everything.
PROPRIOCEPTION

Unconscious awareness of position in space.

Receptors in muscles, tendons, ligaments, joints, and connective tissue.

Kinesthesia-joint position sense.
Signs of Proprioceptive Dysfunction

- Continually seeks out all kinds of movement activities
- Hangs on other people, furniture, objects, even in familiar situations
- Seems to have weak muscles, tires easily, has poor endurance
- Will forget what was learned last week. Walks on toes
How We Learn To Function In The Sensory World

1. Sensory Registration
2. Orientation
3. Interpreting
4. Organizing a Response
5. Executing a Response

The process is cyclical, with each step leading to the next, and the cycle repeating.
Level One - Primary sensory systems, by 2 months
Tactile sense, vestibular sense, proprioceptive sense, visual and auditory senses

Level Two - Perceptual motor foundations, by 1 year
Body Awareness, bilateral coordination, lateralization, motor planning

Level Three - Perceptual motor skills, by 3 years
Auditory perception, visual perception, eye-hand coordination, visual-motor integration, purposeful activity

Level Four - Academic Readiness, by 6 years
Academic skills, complex motor skills, regulation of attention, organized behavior, visualization, self esteem, and self control.

“The Out of Sync Child” by Carol Kranowitz
<table>
<thead>
<tr>
<th>Hyper-Sensitive</th>
<th>Hypo-Sensitive</th>
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<tbody>
<tr>
<td>Low pain tolerance.</td>
<td>High pain tolerance.</td>
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<td>Avoids playground equipment.</td>
<td>Poor safety awareness.</td>
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<td>Paper cut is highly distracting.</td>
<td>Sensory seeking.</td>
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<tr>
<td>Does not tolerate being touched by others-circle time and in line.</td>
<td>More rough with others.</td>
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<td>Risk for fight or flight responses.</td>
<td>Risk for injury.</td>
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Optimal Level of Arousal

Low Arousal

Sensory Overload
A Sensory Friendly Environment

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<tr>
<th>Activity Demands &amp; Grading</th>
<th>Occupation based activity.</th>
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<td>Just Right Challenge</td>
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<td></td>
<td>Purposeful</td>
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Overcoming Sensitivities

- Sensory play-rice, beans, shaving cream
- Handle real coins
- Mystery Bag
- Tactile mediums
  - Ziploc with hair gel
  - Writing on paper overlaid on coarse grit sandpaper.
  - Sidewalk chalk
  - Write letters in shaving cream, pudding, rice, sand.
  - Paint with water on newsprint
  - Finger paint, make homemade play dough.
- Water play
- Calming sensory experiences.
- Feet touch the floor
- Bungee cord, therapy band on desk legs.
- Non-intrusive fidgets
- Sensory Stations
Providing Opportunities For Proprioceptive and Vestibular Needs

- Alternatives to prolonged seating.
- Floor time, bean bag chairs, “reading tent.”
- Movement breaks, clapping games, follow the leader, animal games, Simon says, songs
- Provide a rocking chair.
- Heavy work activities.
- Deep pressure activities.
- Alternatives to omitting recess breaks.
- Add rhythm to your activities.
- Swinging on the playground.
- Alternatives to chairs.
- Alternatives to sitting cross-legged.
THANK YOU