Sensory Integration and Speech Therapy

Emalee Kioski, MS, CCC-SLP
Ashley Springer, MS, CCC-SLP
March 17th, 2017 CSHA
Disclosure Statement

- Presenter Emalee Kioski, MS, CCC-SLP has no relevant relationships to the products or services described.

- Co-presenter Ashley Springer, MS, CCC-SLP has the following non-financial relationship with the products or services described, reviewed, evaluated or compared in this presentation.
  - Sensory Integration and the Child by Jean Ayres
    - This book is sold at Pediatric Therapy Network (PTN). Ashley is an employee of PTN and receives no compensation for the sales of products, books, and/or merchandise.
Participant Expectations

As a result of this presentation, the participant will be able to define the areas of the sensory system and how they work together with speech and language development. Participants will be able to identify sensory behaviors that can impact attention, arousal, affect, and emotional stability in a client with sensory needs and be able to perform basic Ayres Sensory Integration (ASI) techniques to help a child successfully engage in the speech-language therapy session.
What is Sensory Integration?

- *Sensory integration* is an unconscious process of the brain that organizes information detected by one’s senses (taste, sight, hearing, touch, smell, movement, gravity, and position).
  - Gives meaning to what is experienced by sifting through all that input and selecting what to focus on (i.e. listening to the teacher instead of the traffic outside).

- Allows us to act/respond to the situation we are experiencing in a purposeful manner (aka *Adaptive Response*).
What is Sensory Integration?

- Dr. A. Jean Ayres defined sensory integration as:
  
  - The neurological process that organizes sensations from one’s body and from the environment and makes it possible to use the body effectively in the environment
  
  - Postulates that adequate processing and integration of sensory information are an important foundation for adaptive responses
Adaptive Response

• A purposeful, goal-directed response to a sensory experience
  • A baby sees a rattle and reaches for it
    • Seeing $\rightarrow$ sensory experience (SE)
    • Reaching $\rightarrow$ adaptive response (AR)

• Learning to ride a bike
  • Child senses when he moves off center/begins to fall $\rightarrow$ SE
  • He shifts his weight to keep balanced on the bike $\rightarrow$ AR

• When the child gets off the bike, his brain knows more about gravity and the space around his body and how his body moves; therefore riding a bike is easier each time

• This is how sensory integration develops.
Ayres Sensory Integration

- Dr. A. Jean Ayers was a researcher and clinician who developed assessments and conducted a series of studies that shaped sensory integration theory and intervention.

- In the 1970’s Dr. Ayres starting researching sensory systems and used rats in two different environments:
  - One: a basic cage with no equipment
  - Second cage: ‘Rat Heaven’ with stairs, slides, swings, wheels

- When looking at their brains, she noticed that the rats in the ‘Rat Heaven’ cage had more synapses and thicker connective tissues.

- Concluded that varied sensory experiences CHANGE THE BRAIN.
Developing Sensory Integration

- Like language development, sensory integration is a developmental process.

- A newborn has most of the neurons he will ever have, with a few more added in the first few years of life.
  - However, there are very few interconnections/synapses.
  - As the baby interacts with the world, the sensory and motor impulses cause the fibers to grow branches reaching out to other neurons.

- Childhood play leads to sensory experiences that organize the sensations of the body.

- It is not an all or nothing matter.
  - Either good, average, or poor.
  - No one has perfect sensory organization.
Surge of SI Research

• The presence of sensory differences is part of the DSM-5 basis for diagnosis of ASD under the restricted, repetitive patterns of behavior, interest, or activities criteria

• Because of the inclusion of sensory differences in DSM-5 ASD criteria, intervention aimed at addressing sensory concerns has gained renewed interest
Early Sensory Integration Problems

- Some children with SI problems do not roll over, creep, sit, or stand at the same age as other children.

- Others may reach developmental milestones on time, but have trouble later with being clumsy and frequently falling/stumbling; Some may have trouble learning to tie shoes or ride a bike

- You may notice the child does not play as skillfully and he/she might miss details or doesn’t understand the way other children do
What SI Disorder Looks Like

- Having poor sensory integration can make basic activities effortful and difficult and therefore less successful and satisfying.

- Many children with poor sensory integration can have average or above average intelligence but struggle with keeping up with peers academically or have behavior problems.

- A lot of these children “float under the radar”:
  - Struggle to keep up, but are not far enough behind in school to become eligible for services; or there is not an appropriate eligibility category.
Signs and Symptoms of SI Disorder

- **Hyperactivity**
  - May be the first thing a parent notices and often a major complaint
  - Child may be moving all the time
  - Might run instead of walk
  - Much of his activity may not seem purposeful

- **Distractibility**
  - Especially noticed at school because the child cannot “shut out” the noises, lights, and/or confusion of many people doing different things
  - Labeled as “all over the place”
Signs and Symptoms of SI Disorder

* Behavior Problems
  * Appear “fussy” and unable to enjoy being with his family or playing games with other children
  * Basic activities are effortful and difficult and therefore less successful and satisfying leading to an incomplete/negative self-concept
    * Losing a game can be very threatening to this incomplete self-concept and he might ruin the game
    * If he is always trying to make himself feel successful and important, he cannot think about the needs of other people so sharing or picking up on social cues might be especially difficult
  * Might play with younger children who cannot challenge him, or with adults who understand and accept him
Signs and Symptoms of SI Disorder

- **Muscle tone problems**
  - May have to use a lot of effort just to hold his head and body up against the pull of gravity
    - This causes quick fatigue
  - Inadequate muscle tone in the neck causes a child to rest his head on his hand or arm while sitting at a desk
    - He may lean against a pole because standing alone is too much work

- **Coordination Problems**
  - May lose balance and stumble easily
  - Drop his pencil more than other kids
  - Even fall out of their chairs
Signs and Symptoms of SI Disorder

- Academic difficulties
  - A child with SI disorder has trouble dealing with the space around him. He may bump into things or people because his ability to judge where things are in space and where his own body is in space is disordered.
  - This can translate to difficulties copying from the board. First the child has trouble with the space between himself and board, and then he has trouble spacing letters as he writes them.
  - Reading, writing, and math all require a great deal of sensory integration and make complex demands on the brain. An SI disorder may interfere directly with the learning process or it may cause poor behavior (e.g. skipping class because it’s too hard or dropping out altogether) that interferes with school work.
Signs and Symptoms of SI Disorder

• Speech and Language
  • Speech & Language development require the integration of auditory and visual stimuli, motor planning, knowledge of the body in space, and tactile input of the articulators
  • All sensory systems interact with each other to provide information that contributes to increasingly complex skills
  • If a child has difficulties integrating sensory experiences into meaningful outcomes, speech and language will be impacted
Signs and Symptoms of SI Disorder

● Speech and Language
  ● From *Sensory Integration and the Child*:
    ● “A delay in language development is a common problem and an early clue that all is not well in the brain. Some children do not listen well, although they do not have a hearing problem; it is as though the words entered their ears but got lost on their way through the brain. Other children know what they want to say but cannot direct their mouths to form the words.”
  ● Speech and language are an end product of adequate sensory integration, but are often one of the first noticed difficulties. Presentation may include:
    ● Inconsistent response when spoken to
    ● Imitation difficulties
    ● Difficulty with appropriate social referencing
    ● Difficulty learning in groups or contributing to group discussions
    ● Difficulty with speech motor planning
The Sensory Systems

- We all know the 5 senses
  - Auditory
  - Visual
  - Tactile
  - Gustatory (taste)
  - Olfactory (smell)

- But we actually have 7 senses!
  - Proprioception
  - Vestibular

- Neither have anything to do with seeing dead people…
The Sensory Systems

- The **proprioceptive** system provides the body with information regarding joint and body movements and position in space.

- This is the sense that tells you which joints are bent or extended, which muscles are contracting and which are relaxing.

- Helps regulate muscle tone

- **Proprioception is crucial to fine motor coordination.**
The Sensory Systems

- The **vestibular** system controls what we often think of as our sense of balance.

- Messages from the semicircular canals in the inner ear relay information to the brain. Difficulties with vestibular processing often co-occur with hearing and auditory processing deficits.

- When you hear a noise and turn toward it, that's the vestibular and auditory systems working together.

- When the makers of IMAX films use camerawork and surround sound to make you feel like you're in motion even when you are sitting still in a theater, they are manipulating the visual and auditory systems to "trick" the vestibular system.
The Sensory Systems

- Speech is a fine motor activity
  - Proprioception is crucial for fine motor coordination
  - The vestibular system works together with visual, auditory, and tactile systems to make interactions with our environment meaningful

- Therefore, if the sensory systems are impacted, how can we expect a child to make meaningful gains in a speech therapy session if he/she cannot regulate sensory input?
Tactile System

- The tactile system provides the body with information regarding light touch, pain, temperature, and pressure.

- Tactile information provides us with our very first method of learning, and is how an infant receives emotional and sensorimotor interactions from the environment.

- Many reflexes are based in the tactile system

- Orphans deprived of touch from mother had significant delays and presented with autism-like behaviors (Casler, 1965), monkeys without a soft “mother” figure cannot tolerate being in an unfamiliar environment and would not let others play with them (Harlow 1958, 1959)

- NICU research shows tactile stimulation positively impacts state regulation. (Field, et al., 1986)
Tactile System

- The tactile system is composed of both exteroception (sensation from outside the body) and enteroception (visceral sensations).

- Motor learning depends on adequate tactile (and proprioceptive) processing.
Tactile System Connections

Spinal Cord

- Tactile information travels through three different tracts:
  - DCML: touch, pressure, integration with proprioceptive information
  - Spinothalamic (sometimes referred to as anterolateral): Pain, temperature, pressure
  - Trigeminothalamic: Tactile sensation from face (feeling food and/or saliva on the face).
Tactile System Connections

- Reticular System: Arousal
- Limbic System: Emotional tone
- Hypothalamus: Visceral control
- Thalamus: Subconscious recognition of input
What Poor Tactile Perception Looks Like

- Hyperresponsive/Overresponsive/ Tactile Defensiveness:
  - Avoid being touched on his/her face
  - Avoid touching certain textures
  - Have difficulties with baths, teeth brushing, or cutting fingernails
  - Have difficulties with certain food textures
  - Dislike being barefoot on the beach or in the yard
  - Can use proprioceptive input as a regulator
    - Crash, jump, run, stomp when walking

- Hyporesponsive/Underresponsive
  - Slow in development of fine motor skills
  - Mouth objects inappropriately
  - Appear clumsy
  - Oral-motor difficulties
Proprioceptive System

- Proprioception is the sense of the body’s position in relation to itself, and to the movement of the body’s parts.

- The proprioceptive system provides the body with information regarding joint and body movements and position in space.
Proprioceptive System
Connections

Spinal Cord

- Proprioceptive information travels from receptors in muscles and joints through the spinal cord.

- This provides information regarding muscle tone, joint stability, spinal reflexes, and sends continuous information to the brain regarding muscle length and tension.
What Poor Proprioceptive Perception Looks Like

• Hyporesponsive/Underresponsive
  • Appear clumsy
  • Low tone
  • Poor oral-motor skills
  • Awkward body movements/inefficient positioning (e.g. sitting on the edge of the chair, standing too close to peers, using too much force when petting an animal or writing)

• Excessive use of proprioception to modulate (regulate)
  • Excessive climbing, jumping, banging, crashing, biting, etc.
  • Self-stimulatory actions (banging head, self-injurious, etc.)
Vestibular System

- The vestibular system gives us our sense of balance and spatial orientation in order to help us coordinate movement with balance.
Vestibular System

- The peripheral vestibular system consists of the utricle, saccule, and semicircular canals

- Utricule/Saccule
  - These receptors respond to linear movement and head tilt

- Semicircular canals
  - These receptors respond to changes in direction and rate of angular acceleration or deceleration of the head
Vestibular System

- Since these structures are mirrored in the two ears, we can detect direction of movement by comparing the difference in frequency of input between the left and right organisms.

- The signal leaves the inner ear through the vestibular nerve and communicates with nervous system structures via the vestibular nuclei. These connections make vestibular function critical for sensory integration.

- Cranial Nerve VIII is the vestibulocochlear nerve so vestibular information travels alongside auditory information. Difficulties with vestibular processing often co-occur with hearing and auditory processing deficits.
Vestibular Connections

Cerebellum

- The vestibular nerve and nuclei send signals to the cerebellum, and the cerebellum also provides feedback to the vestibular system

- Why do we care?
  - These connections are important for ongoing control of eye movement and posture
  - General difficulties at this level will cause difficulty following an object in front of the eyes, difficulty engaging in play involving movement, etc.
Vestibular Connections

Cranial Nerves

• The vestibular system interacts with Cranial Nerves III, IV, VI

• These connections help fix the eyes as we move, giving us an ongoing stable visual field even when the rest of our body, or the world around us, is moving.

• Without these connections, our world would be blurring around us as our head shifted
Vestibular Connections

Spinal Cord

- Vestibular nuclei project to the lateral and medial vestibulo-spinal pathways

- Why do we care?
  - Responsible for influences on muscle tone and ongoing postural adjustments
    - For example, when you walk along rocks your vestibular system communicates with your proprioceptive system to make the muscle adjustments to keep you balanced
  - In the classroom, when a child tries to turn to see something from his/her chair, the rest of their body may not adjust appropriately and they may fall out of their chair
  - These connections responsible for protective extension.
Vestibular Connections

Brainstem

- Reticular core: Responsible for *arousal*

- This is why some types of vestibular input are calming (e.g., rocking chair) and some are alerting (e.g., roller coaster)

- We can use these types of input during therapy to help a child achieve the optimum state of arousal for learning
What Poor Vestibular Perception Looks Like

- Hyporesponsive/Underresponsive
  - Poor postural control
  - Seek movement experiences (e.g., shaking head while sitting in chair, frequent running, swinging)
  - Doesn’t seem to get dizzy
  - Can use proprioceptive input as a regulator (aka sensory seeking)
    - Crash, jump, run, stomp when walking
  - Show low exploratory interest

- Hyperresponsive/Overresponsive
  - Scared or resistant to movement experiences
  - May get car sick
  - Hate being leaned back for diaper changes
Sensory Integration Recap
Integration of Sensory Systems

- When a child has difficulties with one or more of these systems, it can affect a client’s ability to adequately maintain attention, arousal, affect, and/or emotional stability during treatment sessions.

- As speech therapists, we can identify and give appropriate input to help regulate our clients during sessions to help them engage.

- When children are regulated and engaged, it is called being in the “Optimal Band of Engagement”
Optimal Band

Optimal Stimulation Band

Inattentive, avoidance, sensory rejection
Aversion
Threshold
Approach behaviors
Attention
Sensory Processing
Orientation
Threshold
No response, poor attention and processing
Positive Affect

Remated from Baranck (1998)
SLP’s role in ASI Therapy

- What does this mean for speech-language pathologists?
  - First stop: look at child’s occupational therapy report, or ask parents if there has been an occupational therapy evaluation.
  - Look for a section detailing the child’s sensory processing.
    - This may or may not be in line with Ayres Sensory Integration, but something is better than nothing!
    - Take notes on the child’s response to tactile, proprioceptive, and vestibular processing.
      - Are they over or under-responsive to tactile or vestibular?
      - Do they frequently use proprioceptive input for regulation (e.g., crashing, jumping, climbing?). If so, what are they using proprioception to help regulate?
SLP’s role in ASI Therapy

- Try to contact the Occupational Therapist. They tend to be excited about using sensory integration in speech sessions and therefore open to collaboration.

- Questions to ask:
  - What sensory experiences help the child reach the optimal band of arousal?
  - What sensory experiences throw a child out of the optimal band of arousal?
  - Do you notice increased social engagement/functional communication with any particular sensory experiences/activities?
SLP’s role in ASI Therapy

- School OT report*
  - *School OT reports may only discuss “Tactile Defensiveness” as other sensory needs are not considered barriers to “accessing the curriculum” and will not be addressed in an IEP…for now

- The main goal for the speech therapist using ASI in a session is to get the child to engage. When a child is engaged, he/she learns.

- An OT will use ASI in a manner to “change the brain”
SLP’s role in ASI Therapy

- When a child with SI difficulties walks into your room, the first observation to make is whether he/she is high arousal, low arousal, or already in the optimal band.

- High arousal may look like
  - Running/walking with heavy steps in the room
  - Attempted large movements in the chair
    - Spinning side to side
    - Kicking/moving legs
    - Suddenly standing up and jumping

- Low arousal may look like
  - Trouble sitting up (laying head on the desk)
  - Spinning/shaking head
  - Stomps when walking, pushes against objects/people
  - May seek out deep touch pressure
  - Attempts to spin, run, swing, or jump
SLP’s role in ASI Therapy

High Arousal

- What is causing their arousal level to be (or appear to be) above the optimal band?
  - Hyporesponsive to vestibular
  - Behaviors include two opposites: sensation seeking (high arousal) vs low exploratory (low arousal)

<table>
<thead>
<tr>
<th>Therapeutic Interventions</th>
<th>Therapeutic Interventions ctd.</th>
<th>Home Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Provide increased opportunities for movement</td>
<td>- Use swings (within clinic or on playground), pausing movement to facilitate adaptive response</td>
<td>- Take to the park to swing before long periods of structured activities</td>
</tr>
<tr>
<td>- Decrease amount of time child is expected to sit still</td>
<td>- No swings? Try rotating desk chair on wheels, moving child on exercise ball, nystagmus board, sit &amp; spin, etc.</td>
<td>- Sit &amp; spin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Desk chairs that spin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Be sure to spin both ways in an equal and opposite manner</td>
</tr>
</tbody>
</table>
SLP’s role in ASI Therapy

High Arousal

- What is causing their arousal level to be (or appear to be) above the optimal band?
- Hyperresponsive to tactile

<table>
<thead>
<tr>
<th>Therapeutic Interventions</th>
<th>Therapeutic Interventions Ctd.</th>
<th>Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Do not use light touch</td>
<td>- Deep touch pressure (squishing in pillows, squeezes)</td>
<td>- If having a meltdown, try deep pressure under pillows</td>
</tr>
<tr>
<td>- Incorporate deep pressure and proprioceptive input into activities</td>
<td>- Heavy work w/ prop resistance (carrying heavy books, setting up equipment for obstacle course, pushing desks around)</td>
<td>- Lots of heavy work: lifting things, pushing things, etc.</td>
</tr>
<tr>
<td>- Reduce sensory overload in the environment</td>
<td>- Sucking/chewing</td>
<td>- Sucking/chewing: pudding through a straw, chewy tube, gum</td>
</tr>
<tr>
<td>- Dim lights</td>
<td></td>
<td>- Environmental modifications: dim lights, quiet time</td>
</tr>
<tr>
<td>- Soothing sounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Slow rocking</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SLP’s role in ASI Therapy

High Arousal

- What is causing their arousal level to be (or appear to be) above the optimal band?
- Using proprioception to modulate

<table>
<thead>
<tr>
<th>Therapeutic Intervention</th>
<th>Therapeutic Intervention Ctd.</th>
<th>Home Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Give them more prop, combined with eliciting adaptive responses (e.g. functional communication)</td>
<td>- Make “sensory seeking” into appropriate behaviors (jumping to different colors, words, target phonemes/phrases) - Encourage climbing/jumping/crashin in an organized way (e.g., a sequential obstacle course or as part of a game)</td>
<td>* Let child play outside before expected to participate in structured activities - Jumping on trampoline/bed - Heavy work: unloading groceries, carrying items up stairs, etc.</td>
</tr>
</tbody>
</table>
SLP’s role in ASI Therapy

Low Arousal

- What is causing their arousal level to be (or appear to be) below the optimal band?
- Hyporesponsive to tactile/proprioception (poor praxis)

<table>
<thead>
<tr>
<th>Therapeutic Intervention</th>
<th>Therapeutic Intervention Ctd.</th>
<th>Home Strategies</th>
</tr>
</thead>
</table>
| • Encourage exploration of a variety of textures to improve discrimination, while providing input via vestibular/proprrioceptive systems to increase arousal | - Light moving tactile input  
- Strong tastes or smells  
- Irregular/intense vestibular but be careful not to push the child out of optimal band  
- Use a variety of textured materials (wet/dry, smooth/rough, shaving cream, play dough, theraputty, etc.)  
- Vibration  
- Lots of prop: tug of war, heavy work  
- Bouncing on exercise ball | • Encourage messy play!  
• Use electric toothbrush to provide more input in the oral area  
• Jumping on trampoline/bed |
SLP’s role in ASI Therapy

Low Arousal

• What is causing their arousal level to be (or appear to be) below the optimal band?

• Hyporesponsive to vestibular

<table>
<thead>
<tr>
<th>Therapeutic Interventions</th>
<th>Therapeutic Interventions Ctd.</th>
<th>Home Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Need lots of movement, but may not be motivated to move</td>
<td>- Give rotary/orbital vestibular input and check for adaptive response</td>
<td>• Use swing set or park often</td>
</tr>
<tr>
<td></td>
<td>- Irregular/intense vestibular</td>
<td>• Sit &amp; spin</td>
</tr>
<tr>
<td></td>
<td>- Couple vestibular with proprioception (e.g., pumping swing)</td>
<td></td>
</tr>
</tbody>
</table>
ASI in Speech Therapy

- In a school?
  - Have an aide take the student to the playground before your session
  - Schedule sensory kids right after recess, have aide provide some specific input for the last 5 minutes

- In a clinic?
  - Have parents take them to a park before the session
  - Have the parents lead them through a “heavy work” session before coming to speech
  - Have the OT session right before speech
Ayres Sensory Integration Assessment

- What if there is no Occupational Therapy report OR there is no mention of sensory systems within the report?

- Refer to a therapist trained in Sensory Integration for screening

- Or, we must do our own assessment. Your options:
  - Get trained in the SIPT and do your own full sensory assessment
  - Use the SPM (filled out by you, parents, or teachers) to obtain norm-referenced information on child’s sensory system
  - Use case history and clinical observations to delineate the nature of the problem
Ayres Sensory Integration Assessment

- What information do we need to gather?
  - Reason for referral (functional limitations)
  - History of services (pay attention to any previous OT, PT, ABA, or psych services)
  - Caregiver/teacher concerns
  - What is the evidence that the difficulties have a sensory basis?
    - Make sure the basis of the problem is not medical, neuromotor, etc.
Ayres Sensory Integration Assessment

- Clinical Observations
- Formal observation tool available
Sensory Integration Assessment

• Clinical observations
  • Informal:
    • Provide a variety of sensory experiences and take note of the child’s response
    • Natural preferences: set out a variety of sensorimotor equipment/activities and observe what the child gravitates toward and their arousal level while engaged with these activities
    • Elicited responses: provide a direct demand and observe the child’s response
Sensory Integration Assessment

- Sensory experiences to try for analysis
  - Tactile
    - Wet: shaving cream, soap foam, water, bubbles, paint
    - Dry: dry rice/beans/pasta, different fabric textures, balls with different textures
  - Vestibular
    - Linear: back and forth or side to side on a swing (ideally with two hook-up points), up and down on ball
    - Rotary: Ideally need single-point swing hook up to try spinning, nystagmus board, sit & spin
  - Proprioceptive
    - Provide safe equipment for child to climb/crash on, opportunities for heavy work (e.g., pushing heavy objects), trampoline (both vestibular and proprioceptive). Observe if child seeks this input before, during, or after tactile/vestibular experiences
Sensory Integration Assessment

- If it is difficult to tell if a sensory stimulus is truly regulating or just preferred, check to see if you can elicit an *adaptive response*
  - Is there more eye contact or vocalizations while spinning?
  - After proprioceptive input, is the child better able to participate in structured activities?
  - Does the child demonstrate improved affect or emotional stability during or after tactile play?
Ayres SI as Evidence-Based Practice

- Following Jean Ayres’ death, ASI was trademarked to differentiate therapy based on her research and findings from other sensory strategies.

- In 2011, a fidelity measure was published to define what Ayres Sensory Integration therapy was (Parham, et al., 2011).

- When reading research on sensory-based therapies, we need to differentiate studies done using other sensory strategies (e.g., the weighted vest study) from true Ayres Sensory Integration (based on the fidelity measure).
Ayres SI as Evidence-Based Practice

- Meta-analyses of Sensory Integration include ASI studies with studies of other sensory approaches, muddying the data and not providing a true picture of efficacy.

- Based on requirements for an intervention to be considered Evidence-Based from the Council for Exceptional Children, the National Professional Development Center on Autism Spectrum Disorders, and the U.S. Preventative Services Task Force, Ayres Sensory Integration meets the criteria for Evidence-Based Practice (Schaaf, "Evidence for Ayres Sensory Integration", 2015).
Ayres SI as Evidence-Based Practice

Studies contributing to ASI as EBP:


# How ASI is Different

<table>
<thead>
<tr>
<th>Behavioral Approaches</th>
<th>Ayres Sensory Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on encouraging positive behaviors and discouraging negative ones through reinforcement.</td>
<td>Targets sensory-motor factors that affect participation in daily life activities (e.g. bathing, mealtime, dressing, sleeping), routines, social and community activities, and learning.</td>
</tr>
<tr>
<td>Target behaviors directly and focus on shaping/training behaviors by using multiple trials with positive rewards</td>
<td>Focus on the individually tailored sensory-motor activities that affect participation in activities due to sensory system deficits</td>
</tr>
</tbody>
</table>
Video
Resources

- Sensory Integration and the Child: Understanding Hidden Sensory Challenges by A. Jean Ayres, Ph.D.
- Clinician’s Guide for Implementing Ayres Sensory Integration: Promoting Participation for Children with Autism by Roseann Schaaf and Zoe Mailloux
- Sensory Integration: Theory and Practice by Anita Bundy, ScD and Shelly Lane, Ph.D.
- Facebook groups: SIGN Sensory Integration Global Network, International Council for Education in Ayres Sensory Integration
References


References


