Observations Based on Sensory Integration Theory in School Based Practice

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Objectives

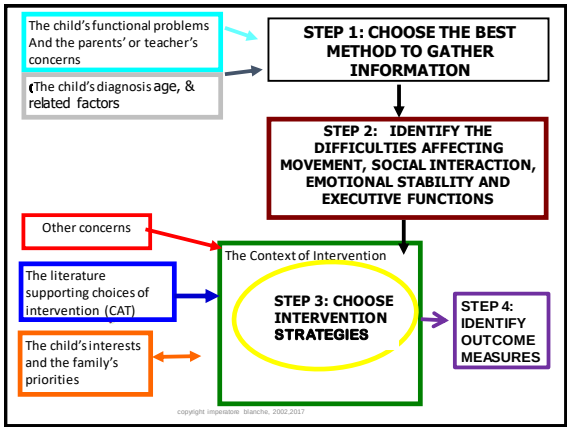
- Identify evidence supporting the use of Sensory Integration Theory to support participation at school.
- Administer and interpret clinical observations of proprioceptive, postural, vestibular functions and praxis.
- Learn to use clinical observations to enhance school-based assessments of sensory integration.
- Interpret clinical observation findings to support intervention plans in school-based practice.

Clinical Reasoning Uses Critical Thinking Skills

- Def: the therapist's thought process used to make decisions about client care (Schell and Schell, 2008)
- "the part of practice that therapists do not notice – their own everyday storytelling" (Mattingly, 1994)
- Influenced by several factors including therapists' talk as a powerful source for learning and sharing (Burke, 1998)
- This model will make the "talk" noticeable

Clinical Reasoning Assessment Model: A 3 STEP PROCESS

- STEP 1: Choose the best method to gather information
- STEP 2: Identify the difficulties affecting functional performance
- STEP 3: Choose evidence based intervention strategies



STEP 1: CHOOSE THE BEST METHOD TO GATHER INFORMATION

WHAT NEEDS TO BE TAKEN INTO CONSIDERATION:

- The child's functional and participation issues
- The parents' and teachers' concerns
- The child's diagnosis
- Other concerns

Gathering Information Methods

- Histories, surveys, interviews
- Skilled observations
  - Unstructured observations
  - Structured observations
- Standardized Clinical Tools

How do we choose the method to gather information?

Unstructured and Structured Observations

- What information is provided by unstructured observations?
  - Sensory needs and preferences
  - Motor difficulties and compensations
  - Behavioral organization
  - Play preferences and avoidances
  - Functional limitations and strategies utilized

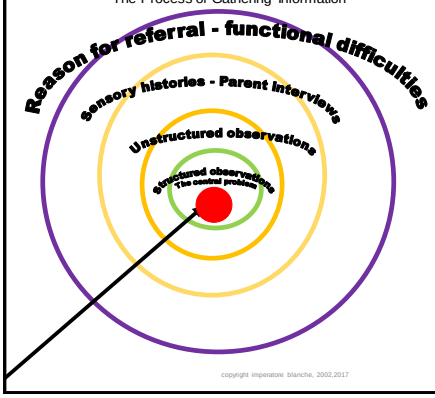
Structured Observations

- More specific strategies
- Controlled by therapist to collect specific information
- Some norms exist

Standardized Clinical Tools

- Developmental Evaluations
- Evaluations of Body Functions: Movement, Motor Coordination, Sensory Processing
- Evaluations of Functional Performance and Participation
- Evaluations of Quality of Life and Sense of Wellbeing

The Process of Gathering Information



STEP 2: IDENTIFY THE DIFFICULTIES AFFECTING MOVEMENT, SOCIAL INTERACTION, EMOTIONAL STABILITY AND EXECUTIVE FUNCTIONS

- Based on clinical reasoning and clinical judgment
- Requires organization of the data to draw a conclusion
- Data Organization

What Information Needs to be Gathered?

Sensory System	Proximal Functions	Distal Functions
Vestibular	Antigravity Extension Maintaining a Stable Visual Field Neck Co contraction Bilateral Motor Coordination Arousal	
Proprioceptive	Joint stability and cocontraction (alignment) Postural Control Motor planning	
Tactile	Tactile comfort Motor planning Fine motor	

Choosing the Best Evaluation Tools

- Most accurate
- Easier to administer
- Less intrusive
- Less expensive
- Less time consuming

Analysis (Imperatore Blanche, 2010, 2012)

1. Are the difficulties primarily related to sensory processing ? (primary or secondary)
2. If related to sensory processing, are the difficulties related to arousal modulation or motor performance?
3. What type of sensory processing difficulties are present?
4. Conclusion based on the number of data points that support the hypothesis
5. Relate difficulties to participation or the "so what?" What other areas need to be addressed?

Are difficulties primarily related to sensory processing?

Observations	Sensory	Neuro-motor	Interactive	
Tremor				
Increased tone				
Echolalia				
Copying				
Postural control				

If the difficulties are related to sensory processing , are difficulties related to arousal modulation or to motor performance? Or what affects specific performance issues?

- Name issues related to arousal
- Name issues related to motor performance

Arousal: How is it evidenced?

- Attention, regulation of emotions, organization of behavior
- Arousal tone: high, low, fluctuating with the situation

Motor Performance: How is it evidenced?

- Postural control, motor planning (feedback related), motor planning (feedforward related), construction, copying/imitation, gross motor, fine motor
- Motor performance related to sensory processing
- Other motor performance issues

What Type of Sensory Processing Difficulties are Present?

- Under responsiveness to vestibular
- Over responsiveness to vestibular and GI
- Tactile discrimination difficulties
- Over responsiveness to touch (tactile defensiveness)
- Under responsiveness to proprioception (or proprioceptive discrimination)
- Proprioceptive seeker

Analysis: Developing a Hypothesis about Sensory Processing

Data
- Hesitant on the swing
- Sits with rounded upper back
- Runs and crashes
- Does not like to play sports
- Difficulty writing name
- Prefers inner tube
- Fine motor tremor
- Low scores in the VMI

Interpretations
- Tactile hypersensitive
- Vestibular hyposensitive
- Neuromotor difficulties
- Gravitational insecure
- Tactile discrimination difficulties

OBSERVATION	VESTIBULAR		BIS	PROPRIO hyporesponse	SOMATO PRAXIS	TACTILE		OTHER
	Hypo responsive	Modulation			Tactile discrimination		Modulation / defensive	
Automatic Postural Control and Antigravity Movements								
AUTOMATIC POSTURAL ADJUSTMENTS Adaptive (on ball, balance board, or single limb balance)	Poor – becomes significantly worse with eyes closed			Poor – becomes significantly worse with eyes closed	Poor – related to poor trunk stability			
Anticipatory (postural background)	Poor			Poor	If tactile discrimination is also poor			
Antigravity Extension (observe with and without vest. input)	Poor				If the child can't assume but can maintain the position			Neuromotor deficits

OBSERVATION	VESTIBULAR		BIS	PROPRIO hyporesponse	SOMATO PRAXIS	TACTILE		OTHER
	Hypo responsive	Modulation			Tactile discrimination		Modulation/ defensive	
Antigravity Flexion	Difficulty with neck stability				Poor	If poor, may relate to somatopraxis		
POSTURAL TONE/MUSCLE TONE	Decreased extensor tone			May be low overall	Decreased flexor tone			Increased – neuromotor deficits
PROTECTIVE REACTIONS	Poor or delayed							
BILATERAL MOTOR COORDINATION			Poor (for age)		If tactile discrimination is also poor.			Motor coordination disorder
CROSSING BODY MIDLINE & HAND PREFERENCE			Mixed hand pref & poor X					

Culminating in a Conclusion

- Counting the data points that support each hypothesis/weighing
- Questioning the data and identifying needed information
- Conclusion

ACTIVITY Functional Observationss.	BODY FUNCTION Interpretations	Sensory Process. Interpretations Conclusion
Falls and trips often	Low registration Decreased vestibular Decreased prop Decreased post. control	Hipo to proprio
Constantly in motion from one activity to the other	Short attention span Poor ideation Decreased motor plan Seeks vestibular	Hipo to vestibular
Likes puzzles/avoids balls	Decreased motor plan Poor ideation	Poor ideation
Objects fall from his hands	Decreased sensation	Decreased feedforward
Leans/	Decreased post. Control Decreased proprioceptive	
Etc.		

Identifying Needed Information

So what? Relating the difficulties to participation

ACTIVITY Functional Observations	Sensory Process. Interpretations & Conclusion	PARTICIPATION
• Falls and trips often	Under responsive to proprio	• Academic performance
• Constantly in motion from one activity to the other	Under responsive to Vestibular	• Playing in team sports
• Likes puzzles/avoids balls	Poor ideation	
• Objects fall from his hands	Decreased feedback	
• Leans/		
Etc.		

The Role of Structured Skilled Observations (Clinical Observations)

SI Evolution

- Emerge from Ayres' original description of sensory processing related soft neurological signs
- Traditionally described as "clinical observations" or a group of structured observations of sensory processing and its effect on movement and behavior originally described by Ayres (1984) to help DIAGNOSE sensory processing difficulties.
- She proposed that they be part of every assessment of sensory integration. Ayres (1984) utilized these observations in a structured or unstructured manner, depending on the context of the assessment.

Unstructured Observations (Blanche and Reinoso. 2008)

Linked to vestibular functions

A. Vestibulo-spinal functions:

•-Extensor tone

•-Neck stability

B. Vestibulo-ocular:

•Stabilization of the visual field

Unstructured Observations (Blanche and Reinoso, 2008)

Linked to Proprioceptive Functions

- Muscle tone is decreased (not hypotonia)
- Joint Hypermobility
- Inadequate joint alignment and co-contraction
- Inefficient ankle strategies on uneven surfaces
- Decreased, slow, or absent weightbearing and weight shifting strategies
- Inappropriate grading of force
- Tiptoeing
- Tendency to push, pull, or hang
- Tendency to lean on others
- Need of visual input when copying simple body movements

Unstructured Observations (Blanche and Reinoso, 2008)

Linked to Vestibular / Proprioceptive Functions

- Falling and tripping
- Catching/throwing balls
- Activity level (both overly active and overly passive)
- Tendency to crash, run, fall, jump, bump into others and objects
- Avoidance of movement experiences, fear, anxiety.

Structured Observations (Blanche and Reinoso, 2008)

Linked to vestibular functions

- Vestibulo-spinal:
- Prone Extension
- Supine Flexion (neck stability)
- Postural measures with eyes closed on soft surface

- Vestibulo-Ocular:
- Eye tracking
- Side to side movements of the head while maintaining a stable visual field

Structured Observations (Blanche and Reinoso, 2008)

Linked to Proprioceptive Functions

- Schilder's arm extension test
- Slow ramp movements
- Finger to nose
- Sequential finger touching
- Alternating movements

Structured Observations (Blanche and Reinoso, 2008)

Linked to Vestibulo / Proprioceptive Functions

•Jumping Jacks, Symmetrical Stride Jumps & Reciprocal Stride Jumps

•Postural measures with eyes closed

The importance of observations in the evaluation process:

- They allow the therapist to utilize clinical judgment skills and analyze strengths and weaknesses in the context that they occur;
- They allow adaptation of the demands of the task to fit the child's abilities;
- They can be performed in a structured manner as well as can be observed during functional tasks in a variety of environments; and
- They enable the therapist to plan treatment based on the child's difficulties

Essential

- As accompanying data to standardized testing
- Pivotal when other forms of gathering information cannot be utilized.
- Need to be carefully analyzed
- HELP DIAGNOSE SI DIFFICULTIES so the intervention **targets specific** problem areas

Modified Clinical Test of Sensory Interaction for Balance

- Standing with Feet Together (Romberg)
- Standing on One Foot
- Heel To Toe

	Feet Together	One Foot L	One Foot R	Heel to Toe
Open, Firm				
Closed, Firm				
Open, Soft				
Closed, Soft				

STANDING WITH FEET TOGETHER (ROMBERG)

What do we need to observe?

What does it mean?

Preliminary Data

STANDING ON ONE FOOT

What do we need to observe?

What does it mean?

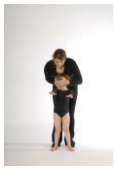
Heel to Toe

What do we need to observe?

What does it mean?

Modified Postural Schilder's Arm Extension test

What do we need to observe?



What does it mean?

Skipping

- **What do we need to observe?**
- **What does it mean?**

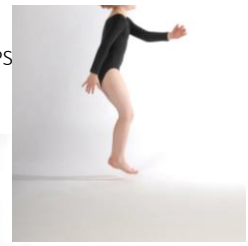
Series of Jumps – Jumping Jacks

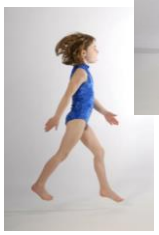
What do we need to observe?

What does it mean?

Series of Jumps – Symmetrical Stride Jumps

What do we need to observe?





What does it mean?

Series of Jumps – Reciprocal Stride Jumps

What do we need to observe?

What does it mean?

High Kneeling

What do we need to observe?

What does it mean?

Antigravity Extension

What do we need to observe?

What does it mean?

Antigravity Flexion

What do we need to observe?

• **What does it mean?**

Ocular Movements

What do we need to observe?

What does it mean?

Slow Ramp

What do we need to observe?

What does it mean?

Sequential Finger Touching

What do we need to observe?

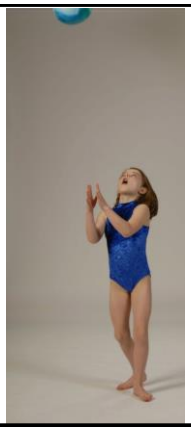
• **What does it mean?**

Diadokokinesis

What do we need to observe?

What does it mean?

Projecting Actions in Time & Space



What do we need to observe?

What does it mean?

Comfort with Gravity

What do we need to observe?

What does it mean?

OTHER OBSERVATIONS

- Comfort with tactile input
- Comfort with vestibular input
- Constructional abilities
- Ideation and executive functions

- Proprioceptive skills (COP)