



# INTEROCEPTION

How are you feeling?

Barbara Luborsky, OTR/L

# Interoception Overview

- Sense of how we feel in our internal organs and skin
- Allows assessment of our internal state- both body state and emotional state
- Key component of emotional experience-how we view or feel our emotions
- Receptors are deep within body tissues such as skin, muscles, and internal organs
- Locus of interoceptive processing is the Insula



# Self-regulation Sub-types

- Body State Regulation
- Sensory Regulation
- Regulation of Attention
- Energy Regulation
- Regulation of Emotions



# Interoception and Autism

Research shows:

- In a large study of adolescents and adults, there was significantly less connectivity within subdivisions of the insula and communication between the insula and other areas of the brain, in individuals with ASD than in typical controls (Di Martino et al., 2014)
- Across 24 studies of activity within the insula, individuals with Autism consistently had less activity within the insula than individuals without ASD (Di Martino et al., 2009)
- Examination of insular structure showed reduced gray matter volume in the insulas of individuals with Autism as compared to typically developing control subjects (Radeloff et al., 2014)

- Interoceptive Overresponsivity
- Interoceptive Underresponsivity
- Interoceptive Discrimination Difficulty

## 3 Main Patterns of Dysfunction

- “Over-feel” internal sensations
- Feel their internal states more readily
- Feel many different internal signals at once
- Often, can’t discern which are the most salient
- Some individuals describe it feeling “noisy” within their bodies



## Interoceptive Overresponsivity



- Only notice internal signals when they have become intense
- Often do not feel internal states or emotions
- Can be a pattern of not noticing and then exploding

## Interoceptive Underresponsivity

- Tends to have vague sense of discomfort
- May have some idea that something is going on but won't be able to differentiate exactly what the feeling means
- May not recognize exhaustion and just keep going until they “drop”

## Interoceptive Discrimination Difficulty





# Early Challenges of Interoceptive Difficulties

- Self-regulation
- Recognition of body states
- Recognition of emotional states
- Regulation of emotional responses
- Decision making
- Flexibility of thinking

# Long-term Results

- Poor ability to take another person's perspective
- lack of empathy
- Poor overall self-awareness

- Yoga and Movement
- Co-Regulation
- Play and work in nature
- Visual Supports
- Body scan

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## Supports

# Yoga & Other Movement Activities

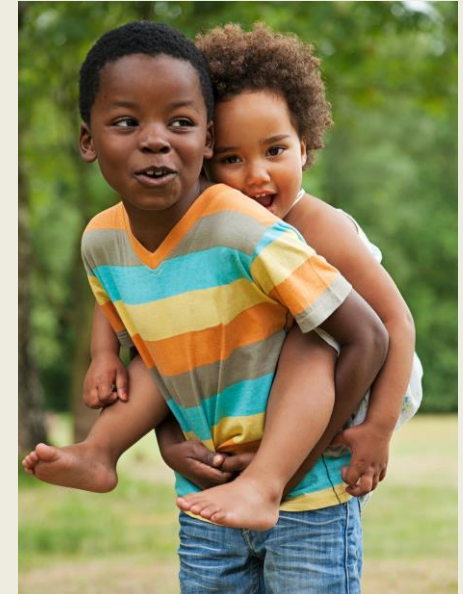
*Increase Your Awareness* - The more you know about this topic, the easier it will be for you to create individualized supports for specific children.

Research has shown that mindfulness activities enhance Interoceptive Awareness. (Daubenmier, 2013) The insula is activated during meditation and engagement in mindfulness activities improve the structure and the function of the insula. (Farb, 2007) This strategy will benefit your entire community, adults included. Exercises and principles of mindfulness are quick and easy to implement.



# Co-Regulation

- Relying on another person to help us regulate,
- As interoceptive awareness develops we need less help from others.
- We develop the ability to notice sensations, connect them to emotions, and adjust our responses.
- Ultimately, we become independent at regulating ourselves and our responses.
- Attaining independence with self-regulation is a result of support from the environment and the people around us through co-regulation.



(Rosanbalm, K. D., 2017)

# Example

Pairing students of different ages/skill levels invites co-regulation.

- This happens in many cases without any adult prompting.
- Develop some activities and lessons expressly for improving regulation.
- Provide activities that require both muscle work and rhythm simultaneously, like wall pushups with a partner.
- First present a lesson to the class: explain how to do wall pushups with a consistent rhythm. Show the class where they can do this in the classroom and tell them to try doing it with a partner. This type of working together, focused on the rhythmic execution, is co-regulation at work.



An indoor spot for wall pushups- on the side of the bookshelf





# Be in Nature



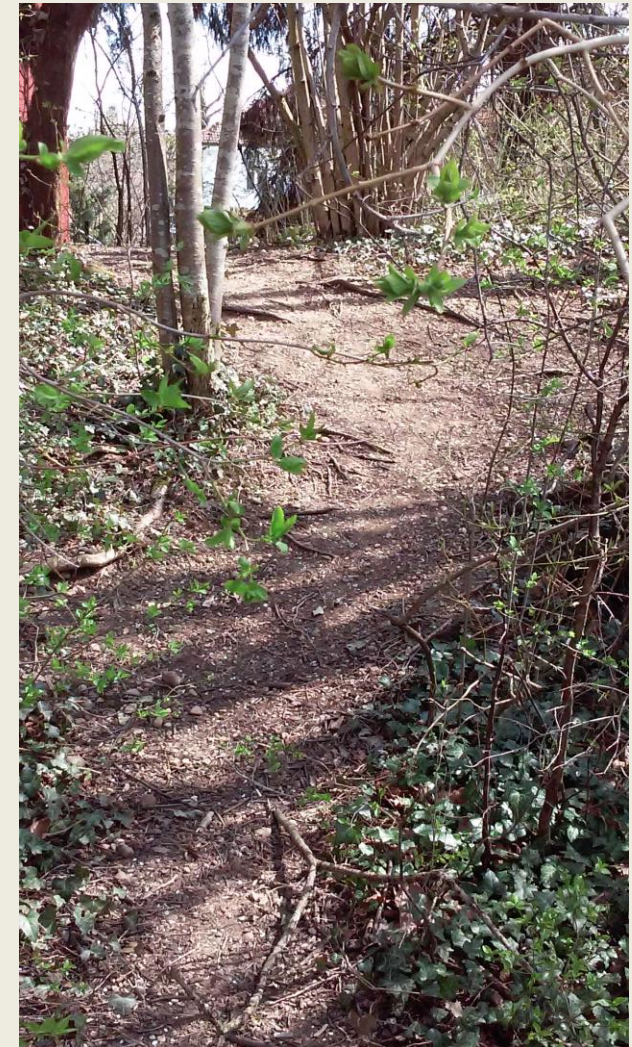
- Water the garden, take a walk, have a picnic, read a book, play a game outside.
- Point out smells, sights and sounds.
- Share how they make you feel.
- Ask your students what they are feeling too.



# Playing and working in nature

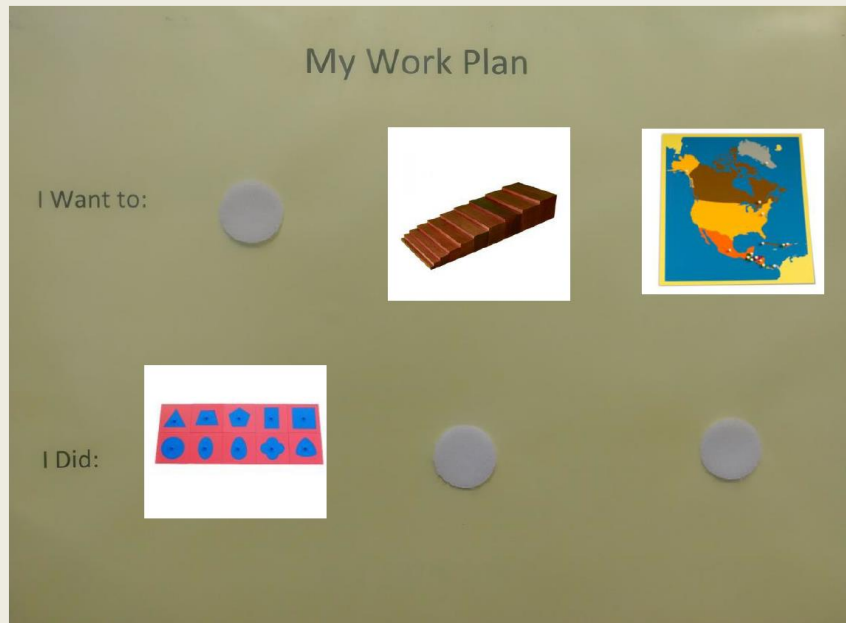


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# Visual Schedule Choice Menus



Work Plan Board



Sensory Choices Board

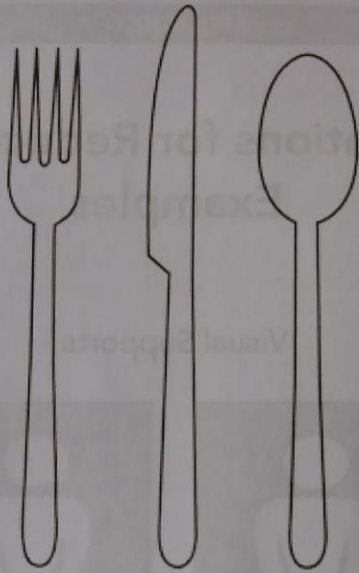
Support the child who can't decide what he needs or wants, by making visual schedules and choice boards. You may find that you need to choose for the child at first, but eventually, they will begin recognizing what they like and what makes them feel good.

# Creating and Using Individualized Supports

- Create a support and then create a lesson to introduce it to the child.
- Use Visual Aids and Social Stories
- Keep it simple - target one issue at a time.
- Use photos of the child and his or her personal belongings in real settings.
- Choose strategies that match the age and learning style of the individual.







**Remember to Eat at the Following Times:**

- 7:30 - Breakfast
- 9:45 - Snack
- 12:00 - Lunch
- 3:30 - Snack
- 6:00 - Dinner
- 8:00 - Snack

From Interoception: The Eighth Sensory System by K. Mahler. Copyright 2016. Shawnee Mission, KS: AAPC Publishing. Used with permission.

## Adaptations for Reduced IA – Examples

### Visual Supports



### Go to the Bathroom At:

- 9:00
- 12:00
- 3:00

Before I go to the playground, I put on the following items. These will help me feel warm when I am playing and having fun:

My Hat

My Vest



# Body Scan: Sample Activity

Body Part	Suggested terms, if needed
Brain	Focused, cloudy, fuzzy, busy, calm
Eyes	Heavy, blurry, teary, tired, itchy, squinty
Nose	Stuffy, runny, itchy, tickly
Cheeks	Hot, cold, ok, tight, loose
Mouth	Dry, wet, happy, tight jaw
Voice	Loud, yelling, content, shut off, fast, slow
Ears	Sensitive, hot, itchy, shut off, sore
Skin	Hot, cold, itchy, bumpy, sweaty, dry
Breathing	Fast, slow, normal, tight, short, panting
Heart	Good, pounding, fast, slow, aching
Stomach	Happy, grumbly, hungry, hurt
Muscles	Tight, loose, tired, weak, shaky, sore, hot
Hands/fingers	Wiggling, tapping, clapping, punching
Feet/toes	Tapping, fidgeting, still, stomping, hot, cold

To help children gain insight into how they are feeling in their bodies, have everyone trace their bodies on big paper or use a small body outline on paper that you hand out. Have the children think about each body part and how it is feeling. Then have them color with strokes and colors that illustrate their feelings. This can be adapted for different age groups by breaking it down into a multi-day project for younger children and requesting more written descriptions in addition to the coloring, on their work, for a more sophisticated assessment of feelings.

# Timers

Timers can help remind children to end a task, start a task or do something that has to be done at regular intervals.







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# How Are You Feeling?

Please feel free to share this with anyone who might be interested or might benefit from the information it imparts.

I hope it will increase adults' capacity to listen to children and help them understand themselves so they can work together to become more self regulated. The more we help our children understand their feelings the better they will be at understanding others.

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