

Sensory Dysfunction Explained

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Nice to Meet You



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Sensory Systems

VISUAL



AUDITORY



TASTE



SMELL



TOUCH



PROPRIOCEPTION

Body
Awareness



VESTIBULAR

Balance &
movement



Proprioception



How we sense our body's movement, direction, location, and actions.

- Body Awareness
 - How a child perceives their body parts location and where each part is in relation to each other.
 - Stepping down from a curb without looking at their feet
 - Performing simple movements with eyes closed
- Graded Control
 - The amount of force used to complete an action.
 - Pencil pressure
 - Throwing a ball
 - Squeezing a glue bottle

Vestibular System

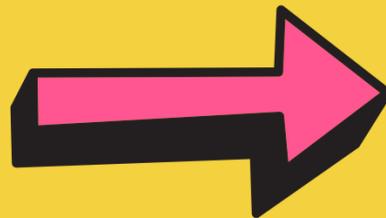
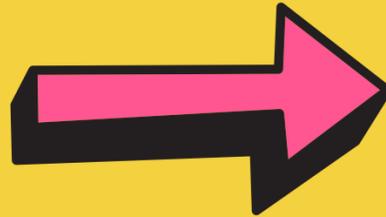


Balance and movement throughout the environment and awareness of our body's position in space.

- The body's relationship with gravity
 - Gravitational security
 - Gravitational insecurity
- Senses when the body is moving
 - Constantly moving or fearful of moving
- Assists in the development of proper coordination, posture, and balance

Talking about Sensory Systems

Intact Sensory Structures



Sensory Processing Dysfunction



Sensory Processing vs Sensory Integration

Processing

How is the information being received?

Structures (skin, eyes, ears) receive information

Information is then sent to the brain where it is interpreted

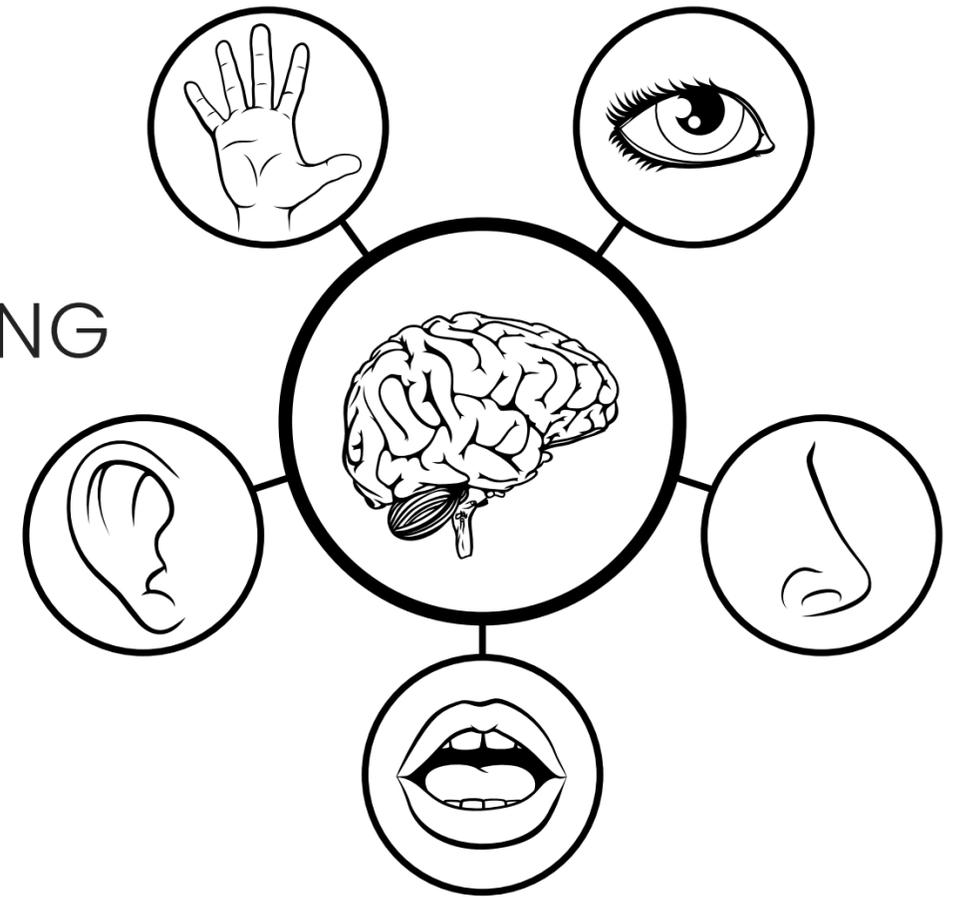
Integration

Brain combines different sensory input - the next step of processing

Theory of Sensory Integration: focus on three systems: vestibular, tactile, proprioceptive

Sensory Processing & Modulation Disorders

How do we manage incoming sensory information?



- Modulating: Grading response to sensation
- Filtering: Suppressing irrelevant information

Effect on development: senses need to be mastered in order to support thinking and learning

Evidence behind the Diagnosis

Neurological basis for sensory processing dysfunction

- Malfunction of brain structures and brain chemistry that are responsible for modulating and filtering information may not be working properly
- Studies measure different aspects of sensory processing by looking at brainwaves, brain structures, and neurochemistry
 - Example: Study of brainwaves showed that children with SPD, compared to typically developing children, showed a neurological deficit in filtering sensation
- Studies establishing link between sensory processing disorders and deficits in cognitive and executive functioning (problem solving, planning, higher level thinking)
 - Example: In children with Autism, sensory processing deficits predicted deficits in cognitive and executive function



Sensory Modulation Disorders

(Subtype of Sensory Processing Disorders) How is our body reacting to sensation?

OVER SENSITIVE

- Sensory Overload
- Poor Filtering abilities
- Attention difficulties due to sensory overload and poor filtering
- Difficult engaging in **daily tasks** that have a tactile sensation
- **Inappropriate behavior:** disproportionate response to sensation, acting out, withdrawing
- **Mood:** moody, irritable, poor social interactions
- **Mental Health:** anxiety

UNDER SENSITIVE

- Not responding or noticing sensation
- High threshold for attention
- **Perceived as lazy**, impacts relationships from peers and teachers
- **Attention:** difficulty initiating and maintaining attention to sensation that are a typical intensity, such as a teacher speaking
- **Engagement:** clumsiness can make it difficult for children to engage in activity

SENSORY SEEKING

- Seeking out intense input
- Perceived as "wild" or "hyperactive" causing disciplinary and social problems
- Socialization is impacted because they made be too close or too forceful
- Attention is impaired due to preoccupation with finding sensory input

Sensory Integration

Definition: Sensory integration theory is the idea that our five senses work together and communicate with our brain to produce a motor, behavioral, emotional, or attention response to support our bodies' interaction with the environment (Lane et al., 2019, Roley et al., 2007). This process is seen as active and ongoing as we continually interact with our environment while completing day-to-day tasks.

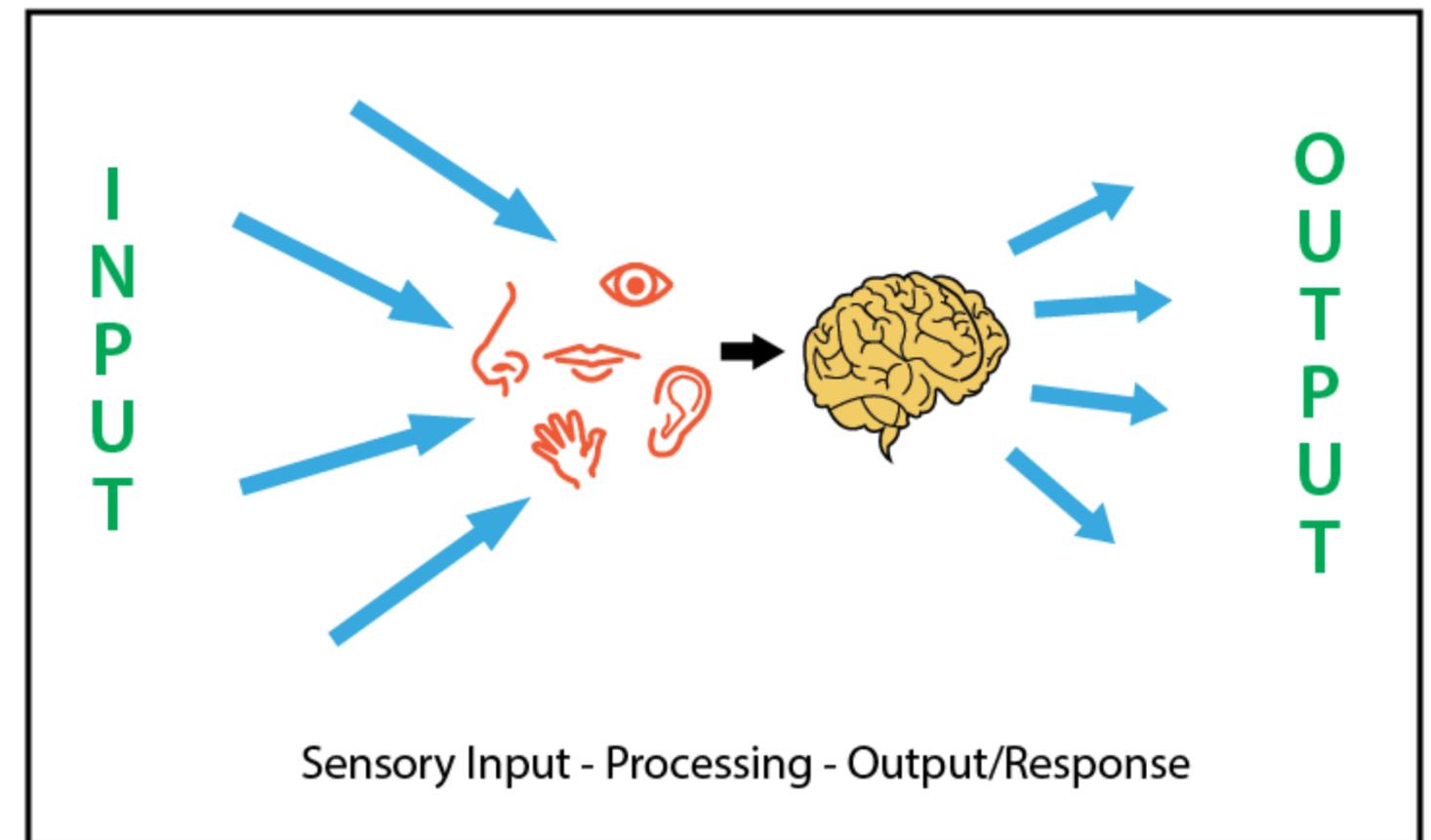


Image: Child Success Center, 2015

Patterns of Sensory Integration Disorders



Proprioceptive System dysfunction:

Symptoms:

- Craves heavy work tasks.
- Seeks joint compression/traction.
- Low awareness of body positioning in environment.

Vestibular System dysfunction:

Symptoms:

- Craves movement/lacks signs of dizziness.
- Struggles with using both sides of the body together.

Tactile System dysfunction:

Symptoms:

- Seeks extra touch input, no touch input, or both.
- Uses vision more than usual to guide day-to-day tasks.

Impact of Sensory Integration Disorders

Limitations in adaptive behavior: difficulty with adapting behavior to changing environment or context.



Limitations in executive functioning: (I.E. planning, self-monitoring, organization, working memory).



Decrease in occupational performance: school, play, activities of daily living (ADLs).



Therapies

Brain Training



Photo courtesy of The Center for Connection, n.d.

Occupational Therapy's Role



- Evaluate need for sensory intervention.
- Collaborate with family, teachers, and other health professionals.
- Identify sensory stimuli affecting daily performance.
- Provide sensory strategies and interventions to support sensory needs to accomplish daily activities.

Sensory Based Therapy

Activities that provide multiple forms of sensory input to organize sensory systems.



Ayres Sensory Integration Therapy

Who is Anna Jean Ayres?

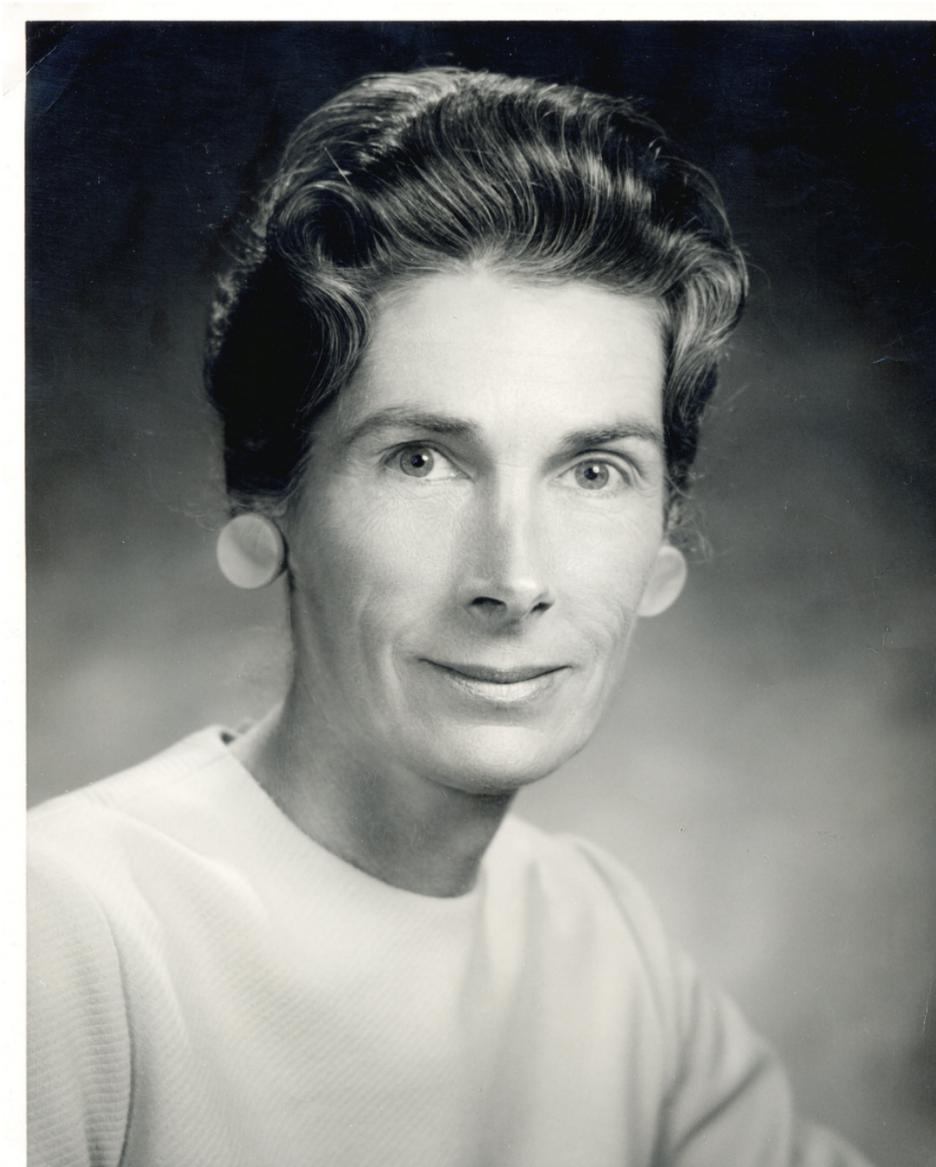


Image: Wikimedia, 2022

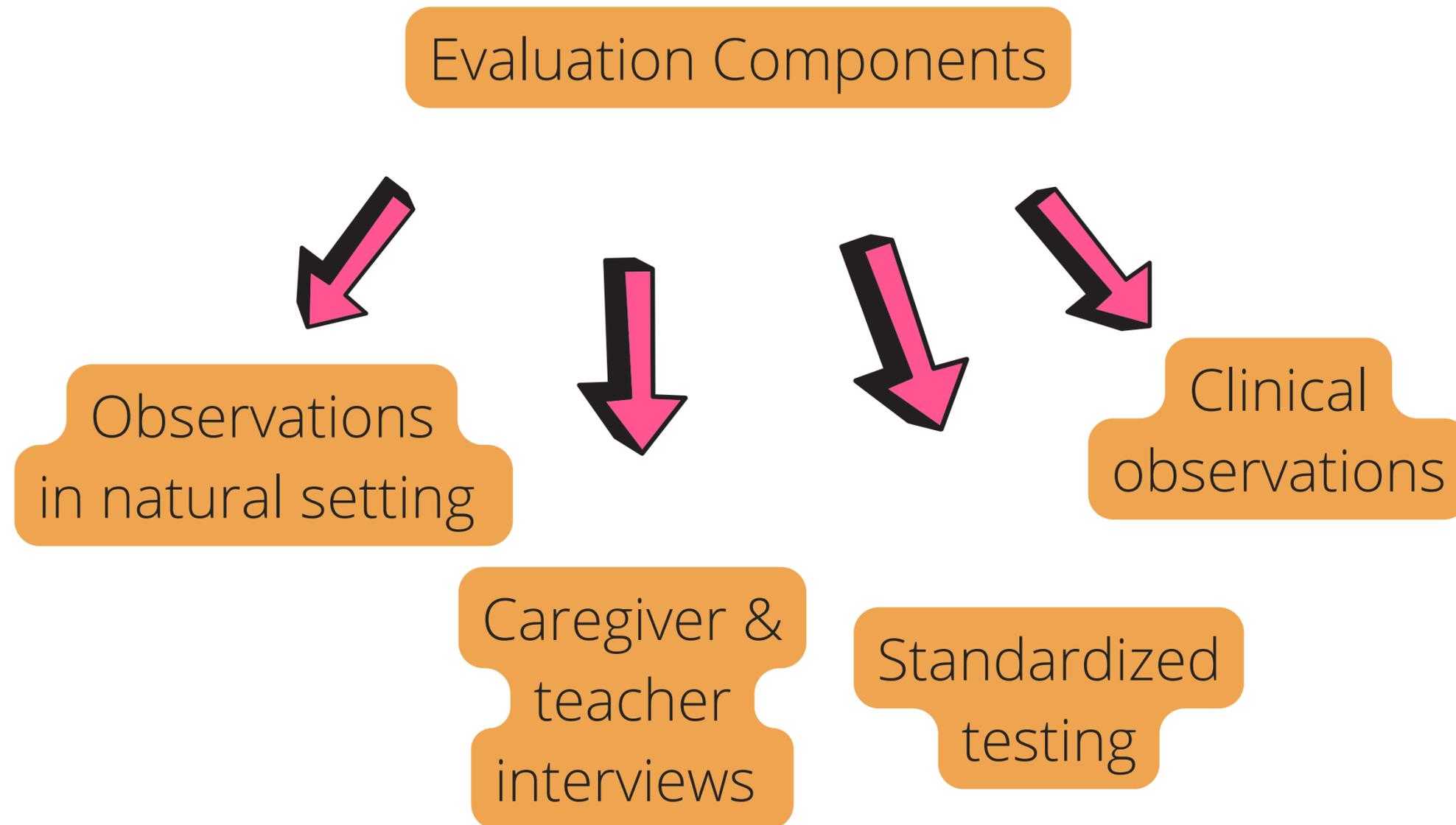
Ayres Sensory Integration Therapy

Main Principles

- There are some main principles that make Ayres Sensory Integration Therapy unique.
- These principles are guidelines for the therapist and must be incorporated to be considered a true Ayres Sensory Integration intervention.

Ayres Sensory Integration Therapy

When is Ayres Sensory Integration
Used?



Ayres Sensory Integration Therapy

Goals of Ayres Sensory Integration

Ordered Sensory
Processing

Adaptive
Responses

Functional Skills
Development

Ayres Sensory Integration Therapy

Ayres Sensory Integration



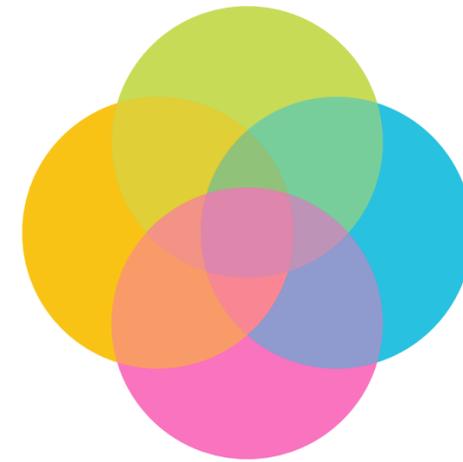
Sensory Based Interventions

Home Strategies

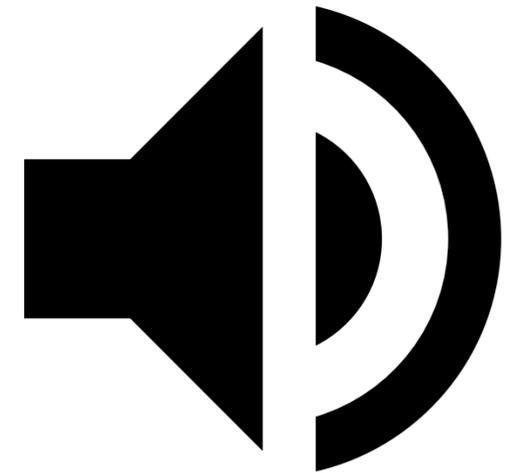
Home Modifications



Lighting



Color



Sound

Fun Table Top Activities



Daily Routines: Teeth & Hair Brushing

What is the underlying issue that makes these activities a challenge?
Child may experience tactile over-sensitivity (also called tactile defensiveness)

What solutions address oversensitivity to touch?

Provide sensory input before brushing

- Deep Pressure to joints: calming effect
- Desensitize the skin: massage face and scalp
- Systematic exposure to sensation: start with damp cloth

Adapt the Activity or Environment

- Use props/modeling
- Visual Aids/Charts
- Timers, songs, games
- Vibrating brush



Questions?

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