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Jenny's Bio

- University of Kansas Alum
- 30 years pediatric OT
- School-based OT Supervisor
- Author Learn to Move
- Inventor Letter Treasure Hunt

















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- Free Resources
- Ebook:
 - https://www.jennylclark.com/free-ebook/
- Newsletter:
 - https://www.jennylclark.com/sign-up-for-clarkcomments/
- Blog Articles:
 - https://www.jennylclark.com/category/blog/
- Contact Jenny
 - jenny@jennyLclark.com

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Poll Question What is your occupation?



- OT/COTA
- PT/PTA
- SLP/SLPA
- Early Interventionist
- Parent



Poll Question What area of practice do you primarily work?



- Hospital
- Out-Patient clinic
- Schools
- Homes

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Disclosures



Financial:

- Medbridge royalties for courses
- · AAPC Publishing royalties for books 'Learn to Move'
- Therapro royalties for game 'Letter Treasure Hunt'
- · Abilitations royalties for Learn to Move kit
- · Cross Country Education/Pesi royalties for recorded courses
- · Summit Professional Education

Nonfinancial:

none



Course Objectives



- Understand and identify signs of sensory dysfunction in infants and toddlers.
- 2. Develop a collection of sensory solutions for young children with SPD that you can assimilate into your therapy practice.
- 3. Integrate sensory interventions aiding infants and toddlers with developmental skills such as playing, eating, sleeping, bathing, and dressing.

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What is Sensory Modulation?



- A neurological function essential for homeostasis to attain/maintain optimal level of behavioral arousal and state of alertness
- A. Jean Ayres defines modulation as the "brain's regulation of its own activity" (1979, p. 182)
- In typically developing children, healthy sensory modulation occurs automatically, unconsciously, without effort
- Impacts daily childhood occupations



What Does Sensory Modulation Impact in Young Children?



- Sleep/wake cycle
- Feeding
- Emotional Regulation
- Ability to self-soothe
- Engagement
- Relationships
- Attention

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What is Sensory Modulation Disorder?



- Difficulty responding to sensory input in an adaptive manner relative to the degree of the sensation
- Children with SMD respond to irrelevant sensory input with exaggerated behaviors that are inappropriate to the environmental demands
- 3 subtypes:
 - · Sensory Over responsivity
 - · Sensory Under responsivity
 - Sensory Seeking/craving



Sensory Modulation Disorder Symptoms in Young Children



- SOR: Heightened difficulty falling asleep, distressed by getting dressed & diaper changes, upset from food on face, gags from food textures
- SUR: Doesn't respond to name, high pain tolerance to shots, difficulty waking up, is hard to engage in play
- SS/Craving: May bang head/pinch/hit/bite, needs to be swaddled tightly, seeks out crashing activities, needs excessive movement i.e. rocking

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Research: (Mitchel, et. al. 2015)
Sensory Processing Disorder in Children Ages Birth—3
Years Born Prematurely: A Systematic Review



 Premature infants born before sensory systems mature in utero & exposed to aversive stimuli in NICU at risk for SMD, especially SOR



Neurotypical Sensory Processing in Infants & Toddlers: The 4 A's of Infancy



- Describes the way in which infants/toddlers perceive & modulate sensory information for behavioral organization
- 4 A's have mutual regulatory influence & are interdependent
- Example: Ability to regulate arousal impacts ability to sustain attention

Williamson, G., Anzalone, M.E. Sensory Integration and Self-Regulation in Infants and Toddlers (2001)

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Neurotypical Sensory Processing in Infants & Toddlers: The 4 A's of Infancy



- 1. Arousal
- 2. Attention
- 3. Affect
- 4. Action

Williamson, G., Anzalone, M.E. Sensory Integration and Self-Regulation in Infants and Toddlers (2001)



Arousal

- Ability to maintain alertness and make transitions between different states of sleep & wakefulness
- Newborn 6 states of arousal; deep sleep, light sleep, drowsy, quiet alert, active alert, crying
- High risk infants difficulty with smooth transition between states of arousal
- Toddler arousal levels; Child accepts 'handling' in drowsy state, 'handling' aversive in stressed state





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Attention

- The desire to focus selectively on a desired stimulus or task
- Child with sensory modulation disorder (SMD) may have difficulty with sustained focus
- Child may only be able to attend to 1
 sensory modality at a time to prevent
 over-stimulation i.e. Light up sound
 toy, light without sound or vice versa









Affect





- The emotional component of behavior
- Interferes with ability to be 'playful' due to poor sensory modulation
 - Anxious & withdrawn from action
 - Avoids sensory input that is integral to a child's play
- Atypical reactions to sensation may impact attachment relationships
 - Tactile defensive infant & primary caregiver interaction
 - Toddlers decreased sensory organization develop behaviors that inhibit ability to form relationships with peers

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Action

- The ability to engage in goal directed behavior
- Action is dependent upon perception, cognition,
 & neuromotor maturation; primitive reflexes,
 muscle tone, strength, skill
- Successful play = form goal from environment cues (child pretends sandbox is beach) & sequence actions to bring results (child uses sand toys to create a castle)







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Identifying Sensory Modulation Processing Patterns in Infants & Toddlers

- Observation Questions
 - Birth-12 months
 - 12-18 months
 - 18-36 months
- Parent Interview
- Sensory Symptoms Checklist



Research: (Flanagan, Schoen & Miller 2017)

Early Identification of Sensory Processing Challenges in Infants at Risk for Sensory Processing Challenges

- Results: This study provides initial data on possible early developmental disruptions in infants at high risk for SPD
- Conclusion: Early identification of SPD leads to earlier intervention to minimize manifestation of symptoms and maximize health, well-being, and participation in early childhood occupations

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Observation: Birth-12 Months



Does Baby:

- Like to be held?
- Attend to more than 1 stimulus at a time?
- Explore toys orally?
- Eat textured foods? When were these introduced?
- Meet developmental motor milestones?
- Have appropriate sleep/wake cycles (after first 6 weeks)?



Observation: 12-18 months



Does Child:

- Enjoy exploring textures from food or toys?
- Follow simple directions?
- Make eye contact when parent is interaction?
- Play progress maturely or get stuck? (i.e. banging toys)
- Adapt to different textured clothing?

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Observation: 18-36 months



Does Child:

- Modulate activity level or need excessive movement?
- · Play on playground equipment with ease?
- Stay focused on activity even with external distractions?
- Engage appropriately in group activities?
- Adapt to changes in routine?



Parent Interview



- What is your child's typical day like?
- What type of sensory activities does your child like/dislike?
- How does your child manage transitions?
- Is there a predictable time of day or type of activity when your child is most or least organized?
- Are your child's self-care tasks limited by sensory or motor problems? (e.g. does not tolerate food textures, fearful during bathing)
- How does your child respond to affection/touch?
- Does your child enjoy playing with other children?

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Infant/Toddler Sensory Symptoms Checklist



- · Is frequently fussy, difficulty calming
- Wakes 3 or more times in the night
- Requires extensive help to fall asleep
- Is distressed by having face/hair washe
- · Resists cuddling
- Is in constant motion
- · Craves upside down or swinging
- · Startles from loud sounds
- Sensitive to bright lights
- Anxious, difficulty separating from adult





Research: (Celik, et. al. 2018)





- Results: positive correlation between sensory processing and motor development in preterm infants
- Conclusion: Evaluation of sensory processing and motor development in preterm infants is necessary for effective implementation of therapy assessment and interventions

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Supporting Parents with Infant/Toddler Sensory Remedies

- Infant Skin to Skin
- Infant Massage
- Swaddling
- Baby Wearing
- Calming a fussy Infant
- Safe to Sleep
- Tummy Time

 Parents benefit from education, techniques & approaches to incorporate at home (Mitchel, et al 2015)



Helping an infant with Sensory Regulation Infant Skin-to-Skin Care



- Baby is naked and placed on mother's bare chest between breasts with blanket placed over both
- Right after birth and beyond
- Benefits for system regulation/modulation
 - 1. Maternal child bonding
 - 2. Reduces crying & colic
 - 3. Better eating & weight gain
 - 4. Improved quality of sleep
 - 5. Stabilizes body temperature
 - 6. Relief from pain
 - 7. Enhanced brain development

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Infant Massage



- Boosts the immune system
- Helps baby with self-regulation/calming
- Builds strong emotional attachment
- Assists in alleviating pain
- Promotes deep sleep
- Stimulates muscular development and growth
- Decreases stress for baby and mom
- How to massage a baby; "I love You" technique
 - Place oil on flat part of fingers, draw letters I,L,U upside down
 - https://www.youtube.com/watch?v=nUNzi9PYBwc





Infant Massage Lab

Demonstration with doll

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Swaddling



- What is it? Snugly wrapping a baby in a blanket for warmth and security
- Soothes nervous system
- Improves neuromotor functioning
- Reduces crying
- Promotes longer stretches of sleep
- Decreases procedural pain



Swaddling Precautions

American Academy of Pediatrics



- "Hip Healthy Swaddling" allows baby's legs to bend up & out
 - Don't swaddle infant too tightly, keep hips loose
 - Tightly wrapping infant's legs can lead to hip dysplasia
 - https://hipdysplasia.org/developmental-dysplasia-of-the-hip/hip-healthy-swaddling/
- Stop swaddling by age 2 months before infant intentionally starts to roll
- Swaddling decreases infants arousal for calming, but may make it more difficult to wake up for infants with decreased arousal levels – risk of SIDS
- Watch for infant getting overheated
 - Symptoms: sweating, damp hair, flushed cheeks, heat rash, rapid breathing

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Types of Swaddling



- Diamond
- Square
- SwaddleSack
- Commercially purchased swaddle sacks
- https://www.babylist.com/hello-baby/best-swaddles
- How to Hip Healthy Swaddle video:
- https://www.youtube.com/watch?v=LLqfRQdUP7k



How to Swaddle Correctly (Diamond

- To swaddle, spread the blanket out flat, with one corner folded down
- 2. Lay the baby face-up on the blanket, with her head above the folded
- 3. Straighten her left arm, and wrap the left corner of the blanket over her body and tuck it between her right arm and the right side of her body.
- 4. Then tuck the right arm down, and fold the right corner of the blanket over her body and under her left side.
- 5. Fold or twist the bottom of the blanket loosely and tuck it under one side of the baby.
- 6. Make sure her hips can move and that the blanket is not too tight.
 - 2-3 fingers between babies chest and swaddle

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Infant Swaddling Lab

Demonstration with doll



"Babywearing"



- What is it? The use of a fabric sling to carry a baby
- Benefits
- Helps with sensory modulation
- Creates bond between baby & caregiver
- Decreases infant crying
- Helps with brain development
- Gives parents chance to engage in daily tasks
- Options:
 - Kangaroo shirt: A shirt with a pouch sewn onto front (newborn)
 - Wrap: A long piece fabric that is wrapped around adult and baby to create a pouch for baby (Baby)
 - Ring sling: A piece of cloth with rings sewn into one end (Baby/Toddler)
 - Pouch sling: A wide piece of cloth sewn into a tube shape (Baby/Toddler)

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How to Calm a Fussy Infant

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- Facilitate the 'Calming Reflex'
- Discovered in 1990's by Dr. Harvey Karp -Pediatrician
- What is it? During the last 2 months of pregnancy, baby experiences constant rhythmic soothing sounds & womb motion
- Karp's Infant Calming Technique simulates this



Karp's Infant Calming Technique The 5 S's to illicit the 'Calming Reflex'



- 1. Swaddling: snug womb-like
 - · Decreases startling, increases sleep
- 2. Side or stomach position
 - Hold baby on side or stomach over shoulder
- 3. Shushing
 - Replicate the sound of blood flow in the womb
- 4. Swaying
 - Support infant's head & neck, move no more than 1" back/forth in fast tiny motions
- 5. Sucking
 - Offer pacifier

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Safe to Sleep®

https://safetosleep.nichd.nih.gov/



- Back to Sleep, Tummy to Play
- AAP updated recommendations 2016
- Decreased tummy time increase in motor delays
- Extended use of "containers" (car seats, infant carriers, infant swings) can contribute to positional plagiocephaly
- Infants with plagiocephaly at risk for motor and cognitive developmental delays
- The presence of torticollis affects gross motor development in infants with plagiocephaly (Cabrera-Martos et al., 2015)



Safe to Sleep®

- https://www.healthychildren.org/English/agesstages/baby/sleep/Pages/A-Parents-Guide-to-Safe-Sleep.aspx
- Babies should sleep on their backs until 1 yr old
 - · Skin to skin right after birth for at least 1 hour
 - If baby rolls to tummy while sleeping, no need to move
 - No blankets, pillows, stuffed animals, bumper pad in crib
 - If baby falls asleep in a container, place them in bed on back
- Swaddle baby always place baby on back
- Offer pacifier no strings attached
- Don't let baby get too hot during sleep

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Safe to Sleep®

- Use firm surface, never soft surface like a couch
- Keep baby's bed in parent bedroom first 6 months
- Keep soft objects that could increase the risk of entrapment, suffocation, or strangulation out of the baby's sleep area
- No bed sharing with baby if:
 - Younger than 4 months
 - Born premature
 - Parent is a smoker
 - Parent drank alcohol
 - Bed is soft like waterbed



Tummy Time

- Tummy time develops baby's strength and body awareness
- Promotes motor skill development
 rolling, crawling, grasping
- Integrates vestibular, proprioception & visual systems
- Infants with dyspraxia may avoid this position
- Infants with postural disorder struggle to hold head up
- Infants with SMD may have SOR to movement of head in space www.JennylClark.com





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Tummy Time Techniques



- Supervised tummy time
- Start slowly 1-2 minutes
- · Begin tummy time on caregiver's chest
- If extra support is needed, roll up a towel under armpits
- Encourage infant to push up on arms
- Use variety of surface textures for tactile input
- Place a toy near for baby's eyes to target and to play with for fine motor skills



Tummy Time AOTA Tips Sheet



 https://www.aota.org/~/media/Corporate/Files/About OT/consumers/Youth/Tummy-Time-tip-sheet.pdf



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Therapist Role in Early Intervention AOTA Fact Sheet



- Identify/conduct age-appropriate assessment
- Plan/implement developmentally appropriate intervention strategies
- Reduce environmental barriers that limit participation
- Prepare children and families for transition to preschool
- Work with team members to target outcomes



Coaching Model of Service Delivery in Early Intervention



- Support parents/caregivers by i.d. what they can do to help their child throughout the day
 - · Reinforce a skill
 - Sensory accommodations
 - · Enable new learning
- Engage parents in 'Co-Occupation' with their child
 - Characterized by shared physicality, emotionality, and intentionality in an occupation with another person(s).
 - Develops a bonding relationship
- Encourage play-based activities to promote fine & gross motor skills

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Coaching Model of Service Delivery in Early Intervention



- Focus on childhood occupations & development
 - Eating
 - Sleeping
 - Playtime
 - · Motor milestones
- Home program: Child will practice new skill with activities therapists suggest to caregivers
- Address parent concerns with sensory-related behaviors
 - How to calm a fussy baby
 - Teaching strategies for self-regulation in toddlers



Evidence to Support Coaching as an Effective Intervention



- AOTA (CAT) What is the efficacy of occupational therapy interventions that use education and coaching with parents or teachers to support participation for children and youths who have challenges in processing and integrating sensory information that are interfering with everyday life participation?
- "There are preliminary indications that carefully structured parental coaching and education, followed by parent-implemented strategies provided on a limited basis, can result in positive outcomes."

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Evidence to Support Coaching as an Effective Intervention



- Children who received a parent coaching program scored better on the Test of Infant Motor Performance in comparison with children who received standard care
- (Dusing et al., 2015).



Sensory Strategies for Childhood Occupations in Early Intervention



- Playtime
- Mealtime
- Bedtime
- Bath time
- Dressing

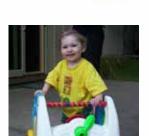


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Playtime

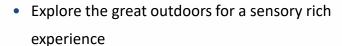
- Playtime is important for early childhood development: motor skills, memory, problem solving, social skills, self-confidence
- "Heavy Work" activities: pulling wagon with blocks, pushing laundry basket filled with clothes, climbing onto furniture
- Textured play area (foam egg crate, yoga mat, outside in grass)





Playtime

- Jumping on a bed
- · Parent piggyback rides
- Rough & tumble play
- Sandbox play
- Roll toy cars on bubble wrap
- Make a glitter bottle



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Playtime

- Play with textured toys
- Scented toys
- Light up toys
- Musical toys
- Play dress-up: develops pretend play & ADL's
- Edible playdough/finger paint with pudding







Learning Through Play AOTA Tips Sheet



 https://www.aota.org/~/media/Corporate/Files/Pr actice/Children/Browse/Play/Learning%20Through %20Play%20tip%20sheet.pdf



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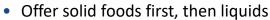
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Mealtime Behavior Modeling: "Food Rules" for Parents



Pediatric Disorders of Regulation in Affect and Behavior (2000) Georgia DeGangi

- Always eat something with your child for socializing/family time
- All meals in highchair/at table, no eating while child roams house
- Separate mealtime from playtime
- Let child self-feed whenever possible, begin with food child can eat on their own (small pieces of banana, bread)







Mealtime

- Position child in supportive chair for postural stability
- Use adaptive spoon shape, size, texture
- If spoon is aversive from hx of reflux, use Nuk toothbrush or bread stick to dip in soft pureed foods
- Use nonskid placement to keep plate from slipping





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Mealtime

- Offer plate with lip guard
- Consider food smell/texture
- Oral motor exercises between mealtimes
- Vibrating teether or electric toothbrush





Intervention for Sensory-Related Feeding Disorder



- Consult MD r/o medical issues (reflux, teething)
- Feeding environment adult relaxed, child alert, environment calm
- Position infant close to caregiver's body
- Position toddler in supportive stable chair for postural stability
- Create a distraction-free feeding environment





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Intervention for Sensory-Related Feeding Disorder



- Stroke infant's cheek with nipple for tactile cue to feed
- · Make mealtime fun
- · Predictable routine for mealtime
- Introduce changes in food textures slowly
- Use calming (SOR) or alerting (SUR) techniques prior to feeding





Intervention for Sensory-Related Feeding Disorder



- Infants: Choose slow-flow nipple
- Toddlers: Try finger foods first
- Crunchy foods that do not require a lot of chewing: Cheerios
- Allow child to close mouth on spoon & remove food rather than scraping food off w/ upper lip/teeth



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Intervention for Sensory-Related Feeding Disorder



- Minimize non-essential touch to the mouth
- Use taste & smell to influence reactivity
- Avoid frequent wiping of the mouth
- Parent involvement essential: work toward collaborative goals





Mealtime Routines for Children AOTA Tips Sheet

 https://www.aota.org/~/media/Corporate/Files/Ab outOT/consumers/Youth/Establishing-Mealtime-Routines-for-Children-Tip-Sheet.pdf



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Bedtime

- Establish bedtime routine
- Avoid screen time prior to bed
- Massage child proprioception
- Rocking baby vestibular
- Night light/Rock salt lamp visual
- Lullaby music auditory
- T-shirt sheets -tactile







Bedtime



- White noise –keep volume low, place away from crib, limit use
 - Long exposure to infant sleeping machines (ISM) on a nightly basis can contribute to hearing loss and speech/language delays (Hugh et al., 2014)
- If toddler is afraid of heights, place mattress on floor
- Scented room mist diffuser or scented plush animal
- Read favorite bedtime story
- Make a bed tent
- Offer pacifier or non-toxic mouth toy

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Bedtime



- Avoid over arousal activities 1 hour before bedtime
- Snug pajamas
- Warm bath prior to bedtime
- Tight tuck in for deep pressure touch
- Consider room temperature between 68-72 degrees





Research: (Vasak, et. al. 2015)





- Results:
- This study links sensory processing patterns to sleep problems
- Significant correlations between:
 - increased seeking & shorter daytime sleep duration
 - increased sensitivity & longer time to settle to sleep

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Intervention for Sensory Related Sleeping Problems



- R/O medical issues (sleep apnea, psychological, reflux)
- Gather assessment data (sleep schedule, environmental stressors)
- Increase sleep/wake pattern promoting more nighttime sleep
- Too much stimulation during the day may cause child to 'shut down' resulting in daytime sleep
- Determine how specific sensory input affects child's sleep patterns (rocking, quiet music, etc.)



Intervention for Sensory Related Sleeping Problems



- Decrease arousal activities prior to bedtime (roughhousing)
- Calming input in evening (massage, rocking)
- White noise to drown out background sounds



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Intervention for Sensory Related Sleeping Problems



- Give child security object at bedtime
- Help child learn to self-soothe to fall asleep (put in bed when drowsy but still awake, provide pacifier, tuck in blankets for neutral warmth, plush animals to cuddle with)
- Sensory quality of pajama fabric for child's preferences



Bedtime Routines for Children AOTA Tips Sheet



 https://www.aota.org/~/media/Corporate/Files/Ab outOT/consumers/Youth/BedroomRoutineTipSheet .pdf



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Bath Time



- Scented bath soaps/shampoos
- · Variety of textured wash cloths
- Bath water temperature 'just right'
- Warm towel from dryer
- · Water toys to facilitate motor skills





Bath Time



- Wash in sink for child with SOR
- Baby bath seat for support
- Fun foam soaps for tactile input
- Sing bath time songs
- Use swim ear plugs to prevent water in ears
- Allow SS to splash in tub

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Bath Time



- Use firm pressure with washcloth
- Offer shower vs bath for SS child
- Dim lights in bathroom
- Make sure bathroom is odor free
- Prepare SOR child by telling them where you are going to wash them
- Make sure bathtub is clean
- Fill bathtub with water before child enters room



Bath Time Routines for Children AOTA Tips Sheet

 https://www.aota.org/~/media/Corporate/Files/Ab outOT/consumers/Youth/BathTimeTipSheet.PDF



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Dressing



- Secure a wiggly infant on changing table for safety or dress on floor
- Massage child before dressing for ↑ proprioception
- Allow SMD child to go barefoot
- Talk to infant and make eye contact while dressing
- Turn socks inside out so seam is not touching skin
- Prewash clothing for softer textures



Dressing



- · Rub lotion on before dressing
- Wear snug fitting clothing
- Select clothing colors/patterns based on need (SOR vs SUR)
- Use unscented laundry detergent
- Tag free clothing
- Wash clothing before wearing, softens fabric
- Seem-free socks www.smartknitkids.com

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Conclusion



- Purposeful occupation is meaningful activity in which an individual actively participates
- The primary occupations of infants and toddlers involve play & playfulness
- Therapists working in early intervention empower parents to facilitate successful milestones through purposeful play
- This presentation provides therapists sensory tools to add to their therapy bag in helping young children with sensory processing disorder

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