

# Inpatient Rehabilitation for Infants with Brain Injury: An Interdisciplinary Approach

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# **Continuing Medical Education Commercial Disclosure Requirement**

We, (Heather Witt, Jennifer Noffsinger, and Cassie Ginn), have no commercial relationships to disclose.

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Equipment will be discussed during this presentation, however no specific brand recommended. We have no financial affiliation with any vendors or manufacturers.

# Objectives

Upon completion of this course:

- You will be able to list common causes of acquired and traumatic brain injury in infants
- Describe the elements of an interdisciplinary approach to rehabilitation for an infant with acquired or traumatic brain injury
- Be able to discuss complicating factors to recovery for these patients.

Almost half a million emergency department visits for TBI for those aged 0-14 each year<sup>1</sup>

Traumatic brain injury (TBI) is the leading cause of disability and death in children and adolescents in the U.S. According to the Centers for Disease Control and Prevention, the two age groups at greatest risk for TBI are age 0-4 and 15-19.

Among those ages 0 to 19, each year an average of:

- 62,000 children sustain brain injuries requiring hospitalization as a result of motor vehicle crashes, falls, sports injuries, physical abuse and other causes
- 564,000 children are seen in hospital emergency departments for TBI and released.
- Among children ages 0 to 14 years, TBI results in an estimated in:
  - 2,685 deaths
  - 37,000 hospitalizations
  - 435,000 emergency department visits

In its 2004 Report to Congress, *Traumatic Brain Injury in the United States: Emergency Department Visits, Hospitalizations, and Deaths*, the Centers for Disease Control and Prevention notes falls are the leading cause of TBI for children age 0-4.

**Approximately 1,300 U.S. children experience severe or fatal brain trauma from child abuse every year.** <sup>2,3</sup>

# Common Causes of Brain injury in the infant

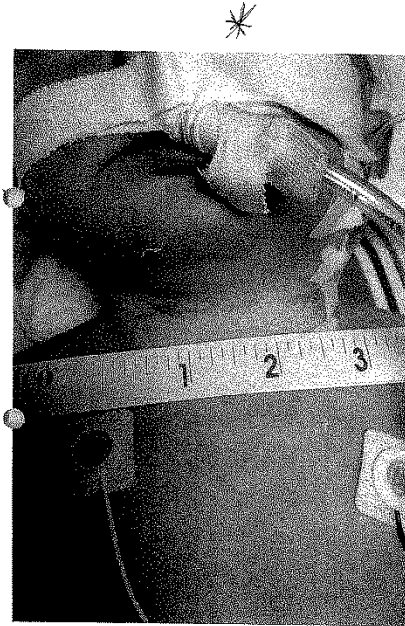
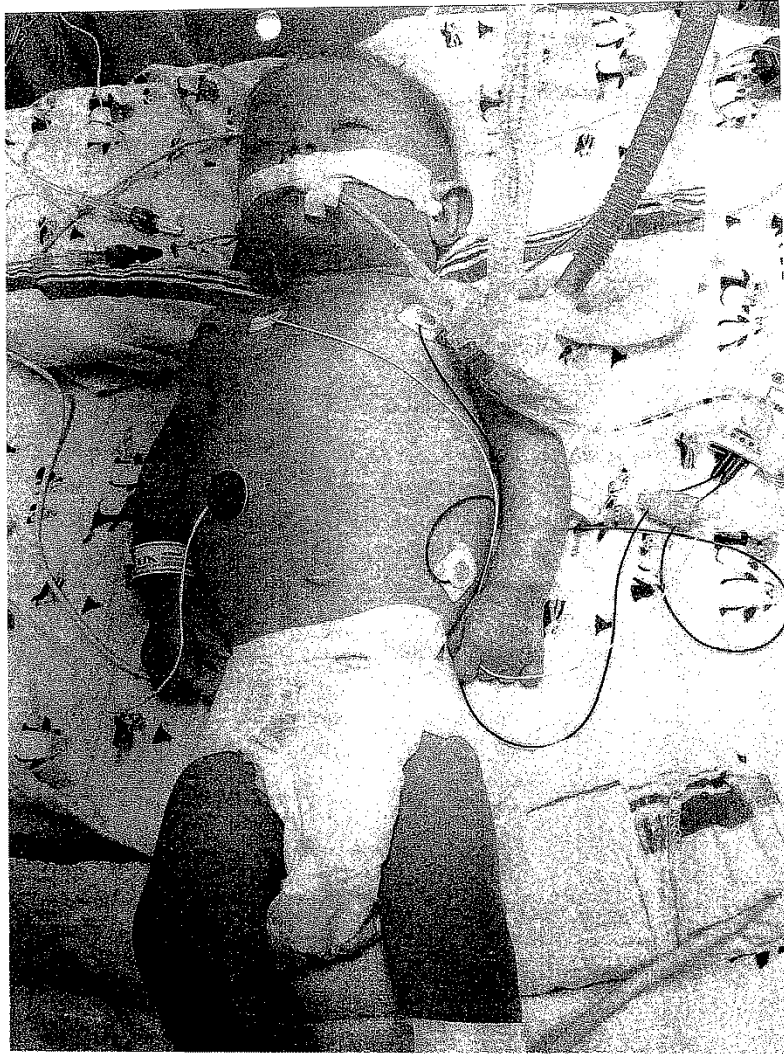
- Birth asphyxia/physical trauma during birth
- Falls
- Meningitis
- Abusive Head Trauma
- Motor Vehicle Accidents

# Age

- There is a poor prognosis for acquiring new skills following a brain injury<sup>4</sup>
- Some deficits are not seen until later in life<sup>5</sup>
  - Many skills are not expected of an infant that may be affected by their brain injury
  - Some children may be misdiagnosed with other types of learning, behavior, or emotional problems
- Physical characteristics that make infants more susceptible to severe traumatic brain injuries include:
  - Underdeveloped brain
  - Large head
  - Weak neck muscles



# Introduction





Did you feel that inpatient therapy helped you with your overall transition to home rather than going home from the acute care hospital



What were the challenges being in the inpatient rehabilitation setting with an infant?



Did you feel included as  
part of the team





What is your advice for families who may be going through being in inpatient rehabilitation with an infant?



# Speech-pathology evaluation

- Full developmental history
- Overall cognition: reactions to sensory input
- Language/Speech development compared to pre-injury status
- Swallowing
  - Suck/swallow/breathe coordination
  - Nutritive versus non-nutritive suck
- May do Rosetti Infant-Toddler Language Scale

# Speech-Pathology Treatment

- Swallowing/feeding: safe and efficient
  - Work closely with OT/PT for positioning and nursing/dietary for tube feeding schedules
  - Strengthening suck, oral acceptance, reducing or preventing oral aversions
- Speech/language
  - Play based
  - Music
  - Modeling and visual/tactile cues

# PT evaluation

- Full developmental history
- Previously typically developing?
- Birth history
- Comparing pre-injury status to current status
  - Developmental milestones and reflexes
- PT - Looking at patient in four positions
  - Supine
  - Prone
  - Sitting
  - Standing
  - May perform AIMS
- Pull to sit to assess head control
- Assessing spasticity/tone
- WeeFIM – appropriate ages 6 months to 7 years

# PT treatment

- Vestibular involvement
- Head and trunk control
- Aquatic therapy
- Sensory seeking/avoiding
- May demonstrate hemiplegia
- Splinting
- Pet therapy
- Music

# OT Evaluation

- **Clinical Observations**
- Caretaker-infant Interaction
- Therapist-infant interaction
- Play
- Overall responsiveness (sensory seeking/avoiding, listless, readily engaged?)
- Level of irritability
- Midline play
- Posturing and movement patterns
- Activity level
- **Developmental Assessments**
- Obtain history of child's development/play
- Carolina Curriculum for Infants and Toddlers
- Vulpe Assessment Battery

# OT Treatment

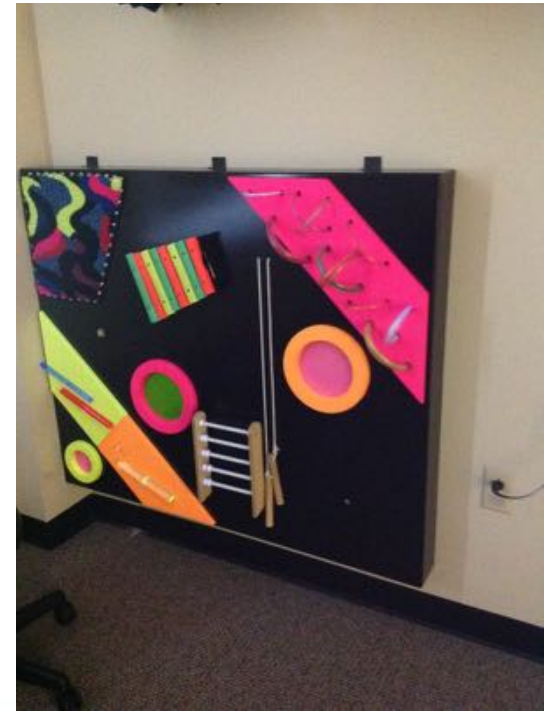
- Play!
- Sensory reduction or increased sensory input
- Caregiver interaction/training
- Splinting
- Bilateral Integration
- CIMT or mCIMT if appropriate
- Midline play
- Functional positioning- reducing compensatory strategies



# Equipment Frequently Used

- Snoezelen Room
- Sensory gym and pediatric gym
- Hi-lo chair
- Crib
- Wedge (for 30 degrees and for prone)
- Large ball
- Swing
- Pet therapy

# Snoezelen Room



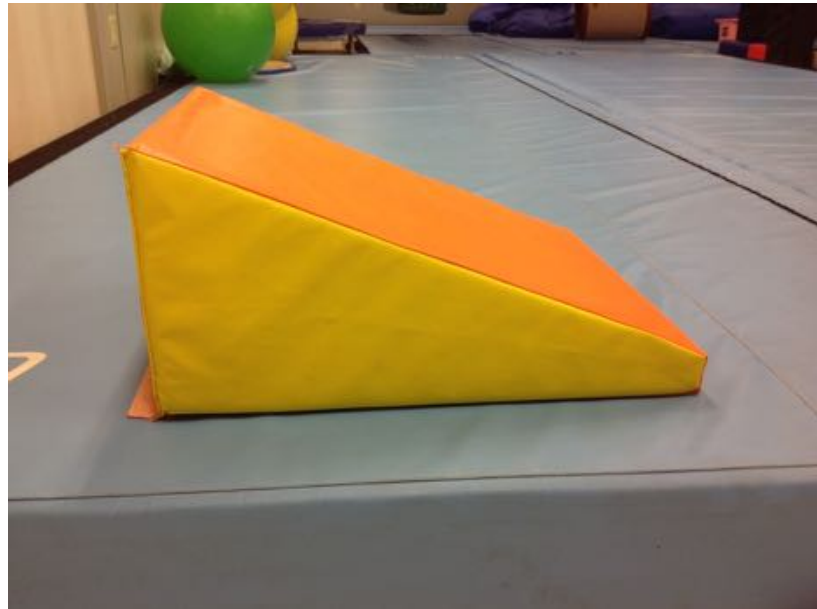
# Seating Options



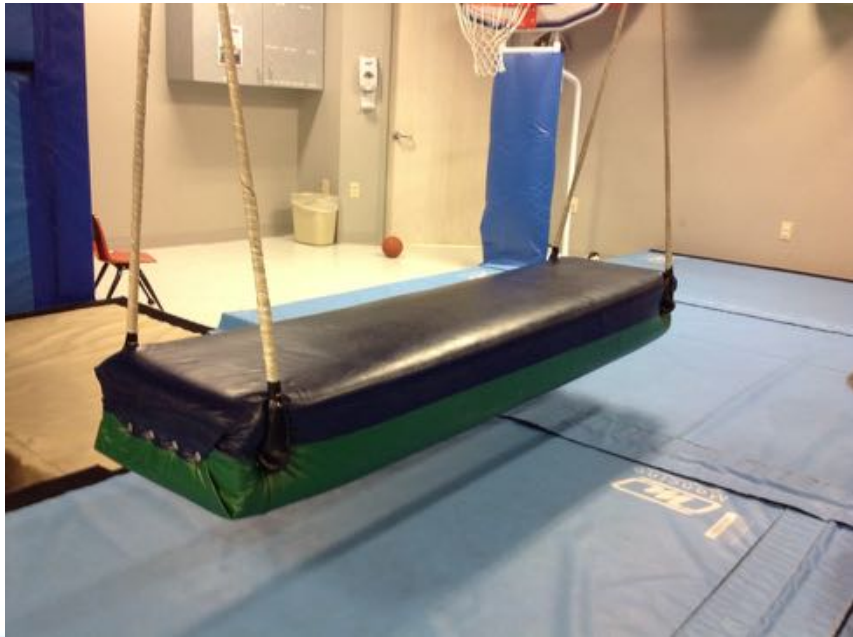
# Standing frame



# Wedges



# Swings



# Therapy Ball



# Continuity of care

- Case management
  - Find local resources
  - Insurance difficulties
  - Potential child protective services referral
- Send discharge summary to outpatient services
- Give contact number for any questions
- Consistent physicians
- Equipment for home



# Challenges/complications

- Medical
  - G-tube
  - Vision
  - Hearing
  - Poly-trauma
  - Trach
  - Seizures

- Social
  - Family must be present 24/7
  - Caregiver issues
  - Education
- Coordination of nursing, therapy, pharmacy, management team
  - Pediatric huddles
  - Interdisciplinary conference meetings
- Reimbursement
  - Utilization Review personnel educates insurance after initial precertification

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# Questions?