Case Study: 13 Month Old Premature Infant

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History

- 24 week preemie, corrected age 13 months
- Respiratory distress, CLD, reactive airway disease and laryngomalacia
- GERD - G tube and Nissen
- Not crawling
- Followed in SICC - referral made to OT&PT
  - No services received
ICF Framework

Health Condition - Premature Birth-at-risk

- Body function & structure
  - Skeletal alignment
  - ROM
  - Postural Control
  - Muscle Performance
  - Ventilation/Respiration
  - Sensory Organization

- Activities
  - Routine Care
  - Feeding
  - Sleeping
  - Mobility
  - Play

- Participation
  - Attention and Interaction with parents, siblings, and caregivers

Environmental
- Home, daycare
- Multimodal input

Personal
- ANS
- Motor, State and Self Regulation

Activities
- Mobility:
  - static supine, sit and standing, no independent transitional movements
- Play:
  - Decreased visually directed bimanual play
  - Dependent on caregivers for toy choice & placement

Participation:
- All interactions dependent on caregivers due to immobility

Environment:
- Home and daycare positioning exersaucer

The Guide to Physical Therapy Practice

- Examination
  - History
  - Systems Review
  - Tests and Measures
- Evaluation
- Diagnosis
- Prognosis
- Intervention
Systems Review

- Cardiovascular and Respiration
  - Stable
- GI Function
  - Minimal oral feeds
  - No mouthing toys or hands to mouth
- Neuromuscular
  - No transitional movements, static supine sit and standing at support surface
- Communication
  - No babbling

The Guide to Physical Therapy Practice

- Examination
  - History
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    - Tests and Measures
      - Functional skill measurement
- Evaluation
- Diagnosis
- Prognosis
- Intervention

Functional Skills Measurement

- video
Developmental Assessment: AIMS Scores
- Supine: 4
- Prone: 5
- Sit: 9
- Stand: 2
- Total Score: 20
- Corrected age: 13m
- Percentile Rank: <5

Dominant Scapular Retraction/ Thoracic Extension
- Limits
  - Midline play
  - Eye hand coordination/ downward gaze
  - Oral exploration
  - Rotation and arm weight bearing for transitions

Wide BOS, Shortened Hip Flexors, Weak Hip Extensors
- Limits weightshift in prone or sit for transitional movements
- Poor foundation for development of fine motor, oral motor and visual skills
Evaluation

- **Posture:**
  - Dominant Scapular Retraction & thoracic extension
  - Unopposed activity of trapezius and rhomboid musculature
- **ROM**
  - Shortened hip flexors, spinal extensors and lateral thigh musculature
- **Postural control**
  - Patterns of movement favor use of spinal extension > abdominal activation
- **Strength**
  - Weak abdominals & hip extensors

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**Intervention Goals**

*(developmentally age appropriate and functional)*

- Improve bimanual, visually directed play in sitting
- Active weight shift out side of the base of support to reach for toys
Strategies

- Elongate
  - Muscles limiting patterns of movement or postural alignment
- NDT based trunk coactivation and strengthening
  - Improved balance between trunk flexors and extensors
  - Increase variety of movement patterns available
  - Focus on transitional movements (trunk rotation) & balance
- Focus on function
  - Opportunities for practice and repetition
- Awareness of behavioral state regulatory issues
  - Facilitate reorganization as necessary

Intervention: Effects of NDT Treatment Based Trunk Protocol For Infants with Posture and Movement Dysfunction (Amdt S et al 2008)

- Repeated measures block design
- Infants with posture movement dysfunction stratified by severity and randomized to Treatment Group or Parent Infant Play Group
- Infants had to score below the 5%tile AIMS& meet qualifiers MAI
- 10 one hour treatments over 15 days
- Assessment on GMFM initially, after treatment and 3 weeks later

The examination followed published NDT guidelines:
- (1) history and parental concerns/needs
- (2) examination of functional skills in the context of life roles
- (3) examination of posture and movement components, eg. alignment, weight shift, base of support, movement strategies, postural control, as they relate to functional activity skills and limitations
- (4) systems review to determine the impact of system and subsystems as they relate to functional activities and limitations, eg. respiratory, visual, cardiovascular, neuromuscular, musculoskeletal systems.
Intervention

- Emphasized transitional movements
- Sequence of engage, align, activate repetition, home repetition
- Facilitation of dynamic co-activation of trunk flexors and extensors in the sagittal plane adequate to meet the demands of the functional activity
- Facilitation of active weight shift in the frontal plane to get elongation on the weightbearing side while maintaining coactivation
- Facilitation of active functional trunk rotation in the transverse plane while maintaining coactivation

Results

- NDT Treatment Group - within group GMFM scores were significant over time
- Pretest to 3 week follow-up also significant
- Play group, GMFM demonstrated positive trends but no significance

Intervention

- video
Intervention

- video

Goals
- Purposeful, meaningful to/ for child/family
- Home programming
  - Simple suggestions that can be incorporated into everyday care/play
**Functional Home Programming Suggestions**

- Diaper changes supine to SL to sit
- Discourage use of walker and excessive standing
- Encourage floor play
- Position toys outside base of support
- Reinforce carrying handling with hands to midline and trunk rotation
- Reinforce appropriate height of visual stimulation

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**Sitting Pre and Post**

- [Pre-treatment photo]
- [Post-treatment photo]
One Month Later

- video