You Work Where: The Role of Therapy in the NICU

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Objectives

- Overview of the NICU Environment
- Defining the role of the Neonatal Therapist in the NICU
- Understanding of the Premature Infant

- https://www.youtube.com/watch?v=NXcp2-8h6x8

The History of NICUs

- Early 1900s incubators were invented
- First special care unit established in 1923
- 1950-60s Establishing Regional NICUs
- 1970s-80s start of modern NICUs
  - Focus on increasing family involvement
  - Foundation of Developmental Care with use of Newborn Individualized Developmental Care and Assessment Program (NIDCAP)

- 1970-80s-Start of therapy and early intervention with a focus on sensory stimulation
- 1980s- Start of increasing/encouraging rooming in of parents
  - Start of widely available mechanical ventilation
- 1990s- Availability of use of artificial surfactant

Levels of Care

- Level 4: Regional NICUs

  -Highest level of care, specialty surgeries, includes pediatric subspecialist
- Level 3: Advanced Care NICUs
  - Care of critically ill infants of any age/size
- Level 2: Special Care Nursery
  - Infants $\geq$ 32 weeks
  - Admit and stabilize younger and/or critical patients prior to transferring to higher level of care
- Level 1: Well Baby Nursery

NICU Team

- Neonatologist, Specialty Providers
- Neonatal Nurse Practitioner
- Nurses
- Respiratory Therapists
- Pharmacy
- Nutrition
- Lactation Consultants
- Social Work & Case Managers
- Neonatal Therapist (OT, PT, SLP)
- Early Intervention Specialist
- Psychologist, Chaplin, Parent Advocate

“Neonatal Therapy is the art and science of integrating typical development of the infant and family into the environment. It incorporates theories and scopes of practices from the respective disciplines of occupational therapy, physical therapy and speech language pathology. It requires advance knowledge of diagnosis and medical interventions inherent to the NICU setting in order to provide safe and effective assessment, planning and treatment. At this early point in the life span, Neonatal Therapy promotes optimal long-term developmental outcomes and nurtures infant parent relationship by addressing the following synergistic neurodevelopmental systems: neurobehavioral, neuromotor, neuroendocrine, musculoskeletal, sensory and psychosocial. These systems provide the foundation of the development of functional skills”

-NANT Professional Collaborative

“Neonatal Therapists are an essential part of the NICU team. A neonatal therapist is an occupational therapist, physical therapist or speech language pathologist who delivers holistic direct patient care and consultative services to premature and medically complex infants in the Neonatal Intensive Care Unit. Using integrated, neuroprotective, family centered model, Neonatal Therapist provide highly specialized and individualized therapeutic interventions in the NICU. These interventions support optimal long term development, prevent adverse sequelae, and nurture the infant-family dyad. Neonatal Therapist provide education to the family and NICU team”

-NANT Professional Collaborative

Roles of Neonatal Therapist

- Consultative to Multidisciplinary Team
- Direct Intervention
- Supporting Parent Education & Participation
- Staff Education
- Developmentally Supportive Care
- Supporting Transition to Home

Foundational Knowledge for Neonatal Therapist

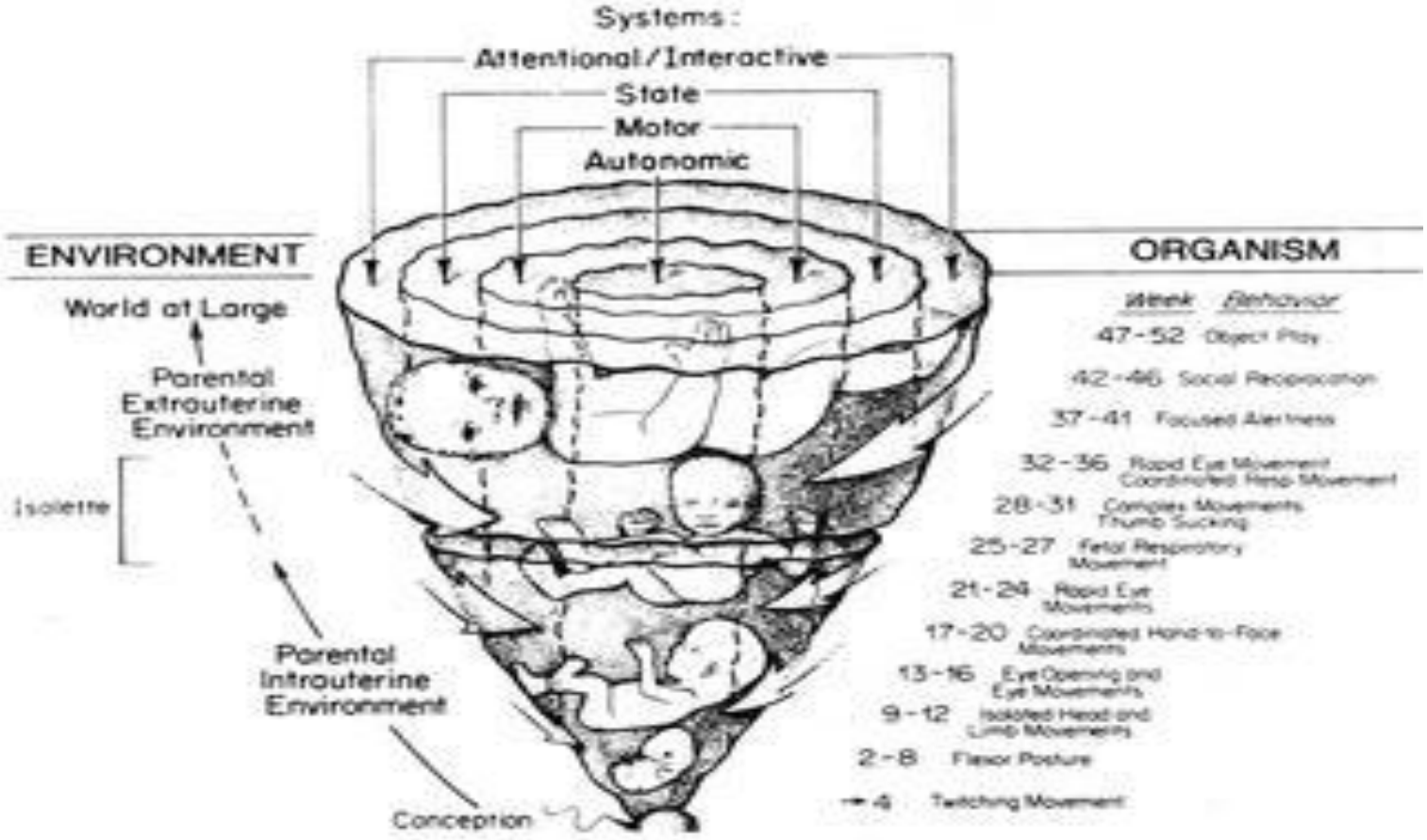
- Fetal Development
- Common Medical Conditions of Preterm & Term Infants in the NICU
- Preterm & Term Development and Behaviors
  - Sensory
  - Neuromotor
  - Neurobehavioral
- Family Centered Developmental & Neuroprotective Care

Common Therapy Interventions

- Developmentally Supportive Care/Neuroprotection
  - Positioning & Handling
  - Sensory and Environmental Modifications
  - Facilitating Parent Bonding/Participation
  - Parent Education with Infant's Unique Cues

- Addressing specific impairments (Brachial plexus, club foot, torticollis, asymmetrical head shape, etc)
- Supporting pre-feeding and oral motor skills
- Patient specific feeding interventions

MODEL OF THE SYNACTIVE ORGANIZATION OF BEHAVIORAL DEVELOPMENT



Synactive Theory

- Created to have framework to understand preterm behaviors
- Dynamic system between the infant, caregiver and environment
- Physiological->Motor->State->Attention-> Regulatory

Physiological

- Signs of Instability or Immaturity :
  - Bradycardia, Tachycardia, Desaturations
  - Apnea or Tachypnea
  - Skin Color Changes (pale, dusky, cyanotic, mottled)
  - Visceral Response (gagging, emesis, hiccups)
  - Tremors or Startles

Physiological

- Signs of Stability and or/Maturity:
  - Stable vital signs: HR, RR
  - Pink and stable coloring
  - Stable digestion

Motor

- Signs of Instability or Immaturity
  - Changes in Tone (hypotonic/flaccid, hypertonic)
  - Frantic Movements
  - Finger Splay or Stop Sign
  - Grimace
  - Diffuse Activity
  - Sitting on Air
  - Protective Positioning (hand on face, arm extension, etc.)

Motor

- Stability and/or Maturity
  - Stable Tone (flexion/extension balance)
  - Hand to Face
  - Hand Grasp
  - Foot Brace
  - Suckling

State

- Instability or Immaturity
  - Abrupt State Transitions
  - Gaze Aversion
  - Hyper Alert
  - Periods of Crying/Irritability
  - Diffuse State
  - Uncoordinated Eye Movements

State

- Stable and/or Maturity:
  - Smooth State Transitions
  - Well Defined Awake & Sleep States
  - Self-consoling/Soothing
  - Focused “Bright-Eyed” Alertness

Attention/Interaction

- Attention/Interaction
  - Capacity to interact with stable autonomic, motor and state

- Self-Regulation:
  - Well organized & homeostasis

We Learn By Doing

Brains are wired
through hands-on
interaction with
the physical world

Neonatal Integrative Developmental Care Model Principles

- Parent/Infant Dyad at Center of Focus
- Healing Environment
- Partnering with Families
- Positioning and Handling
- Safe Guarding Sleep
- Minimizing Stress and Pain
- Protecting Skin
- Optimizing Nutrition

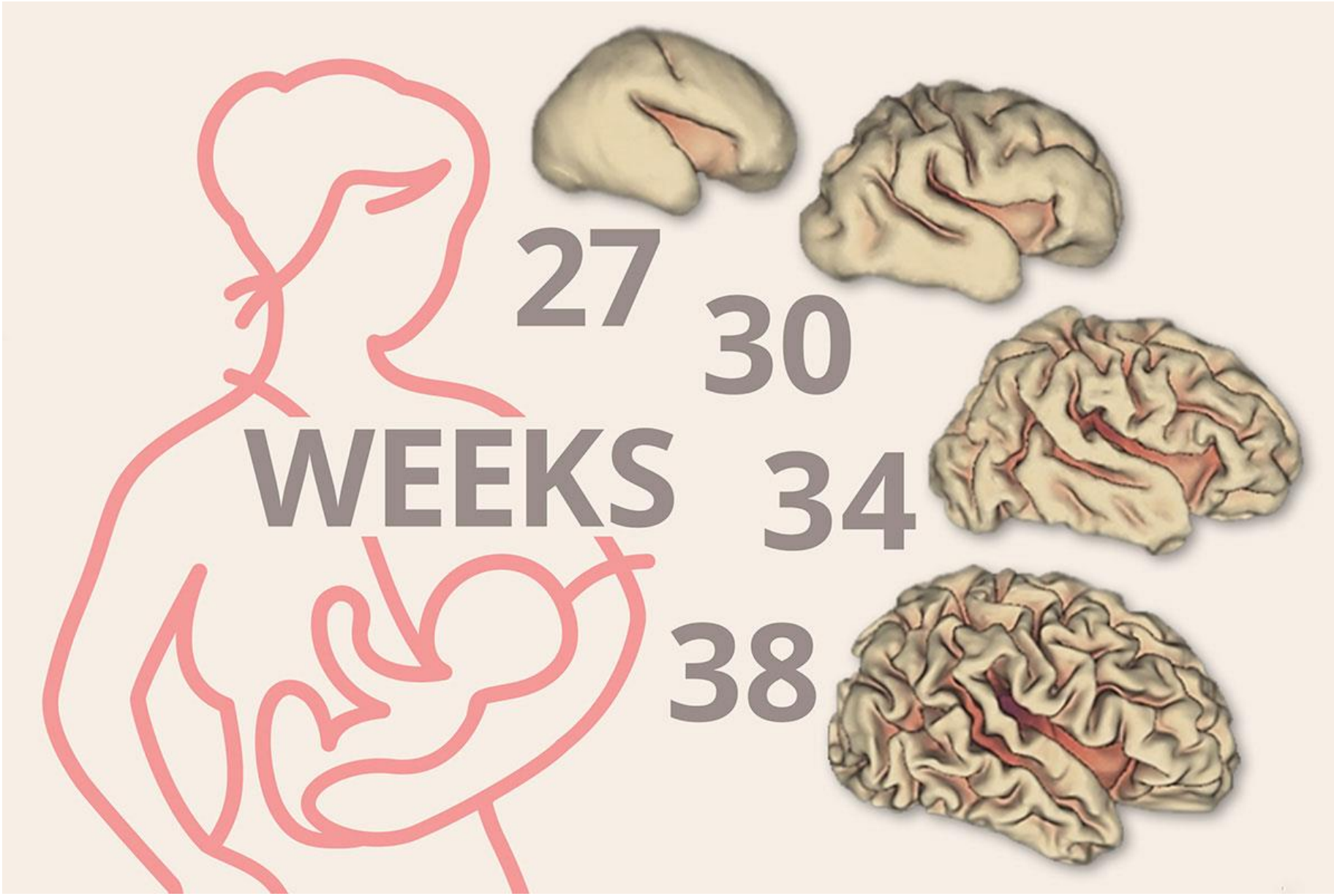
Common Diagnosis in NICU

- Prematurity
- Respiratory Distress Syndrome
- Neurological Issues
- Cardiac Diagnoses
- Congenital Anomalies/Syndromes
- Neonatal Abstinence Syndrome
- Feeding Difficulties
- Birth Asphyxia

Prematurity

- Infants born prior to 37 weeks
  - Extremely preterm (22-28 weeks)
  - Very preterm (28-32 weeks)
  - Moderate preterm (32-34 weeks)
  - Late preterm (34-37 weeks)- 70% of preterm births
- Currently about 1 in 10 preterm births
- Racial/ethnic and geographical disparities persist

Fetal Brain Development


27
30
WEEKS
34
38

Extremely Preterm Infant (22-28 weeks)

- Challenges
  - Very immature and underdeveloped skin
  - Eyelids may be fused at birth
  - Will require prolonged respiratory support
  - Increased risk for infection
  - Increased risk for co-morbidities of
    - Necrotizing Enterocolitis (NEC)
    - Severe Bronchopulmonary Dysplasia (BPD)
    - Severe IVH- majority occur within the first 72 hours
    - Retinopathy of Prematurity (ROP)
    - Periventricular Leukomalacia (PVL)
    - Feeding Difficulties

Considerations for Therapy

- Medical Stability
- Skin Integrity/Positioning
  - Observational assessment vs. hands on assessment
  - Unique positioning needs due to skin protection
  - Generalized hypotonia
- Neuroprotection
- Sensory Modifications
- Family Bonding and Participation

Very Pre-Term Infant (28-32 weeks)

- Improved skin integrity
- Will require respiratory support
- Will need support for thermoregulation
- At risk for infection
- At risk for co-morbid conditions
  - NEC
  - BPD
  - IVH
  - ROP
  - PVL
  - Feeding difficulties

Considerations for Therapy

- Medical Stability
- Family Bonding and Participation
- Positioning
- Neuroprotection
- Focus on pre-feeding experiences as appropriate

Moderate Pre-Term Infant (32-34 weeks)

- May need respiratory support
- May need support for thermoregulation
- May start PO attempt per cues
- May still have challenges with physiological stability
- At risk for
  - Feeding Difficulties

Late Pre-Term Infant (34-37 weeks)

- May need NICU care or may only require Well Baby Nursery
- At risk for breathing difficulties
- May have challenges maintaining temperatures
- At risk for feeding difficulties
- Higher risk for infections and jaundice than term infants

Neuromotor Development of Preterm Infant

- Generalized hypotonia prior to 30 weeks
- Caudal-cephalic
- Distal to Proximal

Neuromotor Development in Term Infant

- Strong Physiological Flexion
- Cephalo-Caudal
- Proximal to Distal

Family Centered Practice

Family Centered Practice

- Assisting parents in learning infants unique cues
- Supporting skin to skin/kangaroo care
- Promoting parent participation and independence in daily activities
- Promoting bonding and strategies to decrease infant stress and discomfort

Benefits of Skin to Skin

- Optimal/natural environment especially for pre-term infants
  - Decreases stress in both infant in parent
  - Increases attachment of parent/infant
  - Improved sleep
  - Promotes optimal brain development
  - Increases milk production & supports breastfeeding
  - Positive sensory experience for infant
  - Promotes flexed and contained positioning

Considerations for Transition to Home

- Caregiver education to support skills and progression of development at home
- Referral to High Risk Developmental Clinic
- Early Intervention Services
- Outpatient therapy services for specific needs (feeding, torticollis, etc.)

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