Developmental Care of the Neonate

Tanya Hatfield, MSN, RNC-NIC
Neonatal Outreach Educator
UCSF Benioff Children’s Hospital
Neurobehavioral Development

- Individualized developmental supportive care
- Preterm and high-risk term infants are neurodevelopmentally disadvantaged
- Developmental support during care is a strategy to reduce the influence of negative experiences to the NICU patient
Premature Infants- Developmental Consequences

Evolution of developmental delay is evident by term equivalent

• Compared to full term infants:
  • Poor orientation (p<.001)
  • Poor tolerance of handling (p<.001)
  • Poor self regulation (p<.001)
  • More sub-optimal reflexes (p<.001)
  • More stress (p<.001)
  • More hypertonicity (p<.001)
  • More hypotonia (p<.001)
  • More excitability (p=.007)
“Everything Matters”
Dr. Heidelise Als
Obtaining a balance among the subsystems of the synactive theory of development, described by Heidelise Als and colleagues, is known as:

1. Behavioral organization
2. State organization
3. Developmental organization
4. Self-regulatory organization

Obtaining a balance among the subsystems of the synactive theory of development, described by Heidelise Als and colleagues, is known as:

1. Behavioral organization
2. State organization
3. Developmental organization
4. Self-regulatory organization
Five Subsystems of Behavioral Organization

1. Autonomic or Physiologic
2. Motor
3. State
   a. Attention or Interactional
   b. Self-regulation
Neurobehavioral Organization and Facilitation - Autonomic

*Signs of stress*- tachypnea, irregular breathing, gasping, pallor, cyanosis, sneezing, yawns, hiccups, straining with defecation, tremors, twitches of extremities

*Signs of stability*- smooth, regular breathing, stable pink color, no twitching or tremors

*Interventions*- Reduce light, noise and activity, hand containment, slowly awaken, pace feeds, minimize sleep disruptions, position appropriately, manage pain

(Verklen and Walden, 2015)
Neurobehavioral Organization and Facilitation - Autonomic

*Signs of stress*- hyper or hypotonia, unable to maintain flexed, aligned posture, stiff extension of extremities, frequent squirming or flailing movement to little to no movement

*Signs of stability*- consistent reliable tone for PMA, improving or well-maintained posture, less self-stimulating motor arousals, hands to mouth, activity consistent with environment

*Interventions*- support rest/sleep, minimize stress, provide boundaries/positioning aids/containment, encourage skin-to-skin

(Verklan and Walden, 2015)
Neurobehavioral Organization and Facilitation—Sleep State

*Signs of stress*—Restlessness, movement, responsive to environment

*Signs of stability*—quiet restful sleep, less movement, less responsive to environment

*Interventions*—
- Age appropriate positioning that promotes comfort
- Quiet dim environment without interruption
- Position with hands to face/mouth

(Verklan and Walden, 2015)
Neurobehavioral Organization and Facilitation - Awake State (attention/interaction)

*Signs of stress*- low level arousal, hyperalert, prolonged awake periods, difficult to console

*Signs of stability*- alert, eyes that can focus on object/person. Robust crying, but able to be consoled with intervention

*Interventions*-  
- Encourage parent holding, STS  
- May be ready for eye contact at 30-32 weeks  
- Support awake moments with age appropriate activity
Neurobehavioral Organization and Facilitation - Self-Regulation

*Without self-regulation*- Little attempt to flex or tuck body, few attempts to push against boundaries, sucking a pacifier may be stressful

*Strategies for self-regulation*- foot boundaries, hands grasped together, hand to mouth/face, grasping blanket, position changes

*Interventions*-
- Swaddle exams, have another person for support
- Swaddle & provide boundaries, hands to mouth
- Provide pacifier when awake and at times other than exams/procedures

(Verklan and Walden, 2015)
Neurobehavioral Organization and Facilitation-
State Transitions

*Signs of stress*- Rapid state transitions, unable to move to
drowsy when stressed

*Signs of stability*- Transitions smoothly from high arousal to
quiet alert or sleep, focused attention, maintains quiet alert
without stress

*Interventions*-  
- Encourage parenting to support skill, cue recognition  
- Avoid rapid disruption of state behavior  
- Assist return to sleep  
- Provide auditory and visual stimulation*

(Verklan and Walden, 2015)
In what state is it most appropriate to interact with an infant?

1. Active alert
2. Quiet Alert
3. Drowsy transitional
4. Light sleep
Developmental Assessment & Response

Cues
Physical & behavioral stability vs stress

Clues
Reasons for response? Stress cues?

Consider Response
Nursing Intervention or facilitation

Connect Patterns of Behavior
Cues that happen every exam & weight

Communicate Developmental Plan
1. Containment during exams and weights
Core Measures of Developmental Care

- Protected Sleep
- Assessment and Management of Stress and Pain
- Developmentally Supportive Daily Living Activities
- Family-Centered Care
- Healing Environment

(Verklan and Walden, 2015)
Impact of NICU Environment - Physical

- Healthy environments for NICU design
  - Single-patient rooms
  - Social Impact
- Skin and development
  - First sense to develop
  - Interface for development

(Verklan and Walden, 2015)
Impact of NICU Environment - Sound

- Sound vs NOISE
- AAP recommends ambient noise to be less than 45-dB
- Ototoxic meds and noisy environment may both contribute to hearing loss
- Potential for atypical development of auditory pathways

(Verklan and Walden, 2015)
Disrupted circadian rhythms, altered sleep cycles, decreased socialization, and decreased oxygenation are side effects primarily associated with what environmental stimulus?

1. Tactile
2. Smell
3. Light
4. Temperature

Impact of NICU Environment - Light

- Vision is the last sense to develop
- Early light leads to
  - Interference with auditory discrimination pathways
  - Problems with peripheral vision, motor coordination, disconjugate gaze & visual processing disorders
- Mismatch in sensory input may alter neuronal connections and organization
- Negatively influence later development
Developmental Care Practices

- Care necessitates a collaborative team with family participation
- Positioning interventions depend on infant’s needs
  - Flexion, containment midline alignment regardless of position
  - Use of aids to support
- Utilize slow transfer with flexion and containment
- Utilize infant feeding cues to determine feeding readiness
Minimize pain, stress & noxious stimuli

Important aspect of care for the neonate

Pain, stress & noxious stimuli can all lead to physiologic instability

ALL handling and care of the infant and their experiences affect BRAIN DEVELOPMENT

“What fires together, wires together”
References


The Critical Role of Sleep in Fetal and Early Neonatal Brain Development. Newborn and Infant Nursing Reviews, December 2008