

Neurodevelopmental Care in the NICU

Taryn L. Temples, MSN, RNC-NIC, CNE

Beginning early in fetal life, brain development is designed to occur over the 40-week period of pregnancy in a safe and controlled intrauterine environment.¹ Infants in the NICU are subject to abnormal stressors such as bright lights, loud noises, and painful procedures. These stressors can negatively influence long-term brain development, including intellectual, social, and emotional skills. Neurodevelopmental care strives to ease the stress of the NICU environment by customizing care provided to premature and critically ill infants based on behavioral cues in order to maximize proper brain development and minimize long-term risk factors.²

Understanding Infant Behavior



FIGURE 1 ■ "Stop! I am stressed."

Stress signals include finger splay, tense muscles, arching of the back, gaze aversion, hiccups, spitting up, grimacing, bradycardia, apnea, and oxygen desaturation that indicate a preemie is over-stimulated and too stressed to continue with an interaction. Caregivers should stop what they are doing and allow a brief period of rest before continuing with care. This period could include containment holding, swaddling, or offering the infant a source of non-nutritive sucking comfort, such as a pacifier or the mother's breast (Figure 2).³

Premature infants cannot use words to tell caregivers what they are feeling or thinking, but they do give us many hints in their behavior. It is important to look for behavioral cues to determine whether it is safe to continue with a task, or if the infant needs a "time out" in order to rest and recover from a particular stimulus (Figure 1). Prolonged exposure to stress leads to physiologic decompensation and poor adaptation to the environment, increasing the risk for developing emotional and behavioral disorders.



FIGURE 2 ■ "Console me so I can rest and recover."



FIGURE 3 ■ "I am ready to respond to you and your care."

The period of quiet alertness when an infant makes direct eye contact, brings hands to mouth, roots for a nipple, grasps at a finger, or coos signifies readiness to respond to and interact with the environment. This is the ideal time for caregivers to complete assessments, diaper changes, feedings, diagnostic procedures, or administer medications (Figure 3). Even during painful procedures, preemies are better able to respond to pain management techniques when they are alert versus asleep.

Providing Neurodevelopmental Care

Appropriate neurodevelopmental care practices focus on five identified themes that support interactions between infant, family, caregiver, and environment.^{4,5,6}

Core Measure	Suggestions for Neurodevelopmental Caregiving
Create a Healing Environment	<ul style="list-style-type: none"> • Keep lighting dim whenever possible • Use blankets and covers to shade incubators • Cycle lighting to mimic normal night-day rhythms • Use noise-reducing materials in the floor, walls of NICU design • Speak softer than regular adult conversation levels • Set alarm levels to be heard just outside of the room, but no louder
Protect Sleep	<ul style="list-style-type: none"> • Allow at least 90 minutes of uninterrupted sleep after care times • Use a sleep-wake assessment tool to determine if procedures are necessary • Cluster care during wakeful periods to reduce excessive interruptions in sleep
Minimize Stress and Pain	<ul style="list-style-type: none"> • Regularly assess infant pain using an established pain scale • Offer non-pharmacologic pain management strategies during all invasive procedures • Non-pharmacologic strategies include containment holding, Kangaroo Care/skin-skin holding, oral sucrose solutions, non-nutritive sucking (NNS), therapeutic touch, massage
Support Age-Appropriate Activities of Daily Living	<ul style="list-style-type: none"> • Use positioning pillows and blanket rolls to promote ergonomically appropriate positioning • Change infant position regularly throughout the shift • Offer oral feedings when the infant is awake and interested • Use stress signals and behavior cues to allow for quality oral feeding attempts over quantitative volume goals • Provide daily skin care to clean skin folds and diaper area • Provide swaddled bath once or twice weekly when stable
Promote Family-Centered Care	<ul style="list-style-type: none"> • Allow parents 24/7 access to their infants in the NICU, rooming in when possible • Acknowledge parents as an active part of infant's care team, not a NICU visitor • Teach parents to perform oral and skin care on their infants • Encourage daily skin-skin time when stable • Encourage parents to assist with temperature checks, diaper changes, and feedings • Allow parents to provide non-pharmacologic pain support during all procedures (swaddling, containment holding, NNS) • Allow parents to leave recordings of themselves singing and reading to their infants in the incubator • Initiate daily interdisciplinary care team rounds, including time for parents to ask questions and give input on discharge planning

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References available online
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