

# Developmental Care for Premature Infants: A State of Mind

Delivering developmental care to premature infants requires a particular state of mind on the part of the entire health care team. When Heidelise Als originally developed the Neonatal Individualized Developmental Care and Assessment Program, (NIDCAP) her goal was to create a NICU environment in which nurses and other caregivers observed the behavior of premature infants to determine how to make their environment less stressful.<sup>1</sup> She described how careful observation of an infant throughout the day can enable the caretaker to characterize the likes and dislikes of an individual infant in order to develop an appropriate developmental care plan. The importance was evident for decreasing external noxious stimuli, containing the infant in a snug and secure position, performing care activities according to a schedule and allowing the infant time for uninterrupted rest and sleep.<sup>2</sup> Montirosso et al<sup>3</sup> has created a scoring system to measure the quality of developmental care delivered to premature infants in several Italian NICUs, defined in terms of parental presence, infant interventions, and pain management, to assess how that care affects their neurobehavioral outcome at discharge. They found that a higher score for infant-centered care, consisting of measures of parent involvement—including ability to room in, frequency and duration of kangaroo care (ie, maternal skin-to-skin contact), and nursing interventions aimed at decreasing infant energy expenditure and promoting autonomic stability (eg, infant containment, reducing tactile stimulation)—led to better neurobehavioral outcomes at discharge in infants born <29 weeks' gestation. Likewise, a higher score for infant pain management (ie, measures to decrease painful experiences including pharmacologic and nursing care practices) had an additive beneficial effect. The findings underscore the conclusion of Als: environment matters. If validated in independent cohorts, this developmental care scoring system should prove useful as a NICU quality improvement tool in any nursery.

Think about it. Premature infants born between 23 and 32 weeks' gestation spend 2 to 4 months growing and developing outside of their mothers' wombs. They leave the quiet, dark, painless intrauterine environment much too early and enter a world filled with bright lights, noise, painful stimuli, and separation from their parents. Their immature organs are required to function long before they are ready. In addition, various organs, especially the brain, are exposed to toxic effects of medications and therapies that can interfere with normal development and function. It is no wonder that many of the tiniest premature infants, exposed to repeated aversive sensory input during the early months of brain development, are plagued with sensory integration difficulties in later life. NIDCAP and other types of developmental care have been extensively studied as a means of individualizing care and improving outcomes with variable results; most positive, some neutral but none negative.<sup>4-6</sup> Multiple

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studies show that kangaroo care is beneficial to premature infants, decreases their physiologic response to painful procedures, and increases milk production in their mothers.<sup>7–11</sup> It has clearly been shown that repeated painful experiences are associated with adverse cardiovascular responses and can be detrimental to the developing brain.<sup>12</sup> Therefore, it makes sense that premature infants cared for in nurseries which take measures to decrease pain have improved neurobehavioral outcomes.<sup>3</sup> Granted, the long-term benefits have not been definitively determined, but how many studies are necessary before all neonatal health care professionals acknowledge that premature infants have unique personalities and responses, and that understanding their differences, altering their environment

to suit their needs, allowing them unlimited time with devoted parents, and protecting them from pain and other noxious stimulation will lead to both better autonomic stability at discharge and better long-term neurodevelopmental outcomes? How many studies will it take to convince all neonatologists responsible for saving these tiny, medically fragile, neurologically immature patients that it is critical to consider more than genetic variation, new medical treatments and technology, and improved nutrition to optimize their outcomes? Let us go forth with the mindset that all infants, particularly those born premature, benefit from the presence and closeness of their mothers and fathers, do feel and react to pain, and are stressed by loud noises, bright lights, and being woken out of a peaceful sleep.

Although the single-family room NICU design, which enables the presence of parents without limitation, is becoming more common, many of us still work in nurseries with large rooms or several bedded pods. Yet even in these sub-optimal surroundings, it remains possible to alter the environment of any NICU to be more developmentally appropriate and family centered. NICU staff need to keep their voices down, dim the lights when possible, allow infants uninterrupted periods of sleep, and minimize painful procedures when feasible. Parents need to be allowed to act like parents, helping to protect their child and fostering their growth and developmental well-being. In a large, busy NICU, these goals can be challenging and require a health care team with a dedicated and determined state of mind.

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