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Developmental Care Matters

Yamile Jackson, PhD, PE, PMP

In 2001 I became the mother of a micro-preemie, and I realized that I was the only source of comfort and sense of protection for Zachary for the 155 days he spent in the NICU. Soon after his birth, I moved from being an impotent and hopeless “visitor” to becoming an important member of the team that provided the best possible developmental care for my now healthy son. My maternal instinct made it easy to nurture him and I was ready to provide love, undivided attention, positive stimulation, and energy. My PhD in ergonomics and human factors engineering made me effective in assessing and enhancing his environment to help him grow, develop, and heal. I was the best habitat for my baby in Kangaroo Care for 6 to 7 hours a day, and invented The Zaky, a device that held my scent and simulated the touch, weight and feel of my hands and forearms when I had to be away.

Zachary changed not only my personal and professional life, but he has touched lives around the globe. Applying ergonomics’ best practices and maternal instinct to help nurses provide sound developmental care to newborns has been my passion for over a decade. Zachary and the thousands of babies around the world that I have helped make it very clear that the care that we provide (or fail to provide) to the preemies in the NICU have lifelong repercussions. The development of preemies no longer should be left to the personal preference of the caregiver nor to devices that are available or used for decades, but it should be supported by evidence, now available thanks to many research projects.

To me as a neonatal ergonomist, proper developmental care must be baby-centered with two main goals: Neurological development, by providing any care that promotes homeostasis and that is supported by positive physical, physiological, social and emotional development; and the effective integration of the baby into his/her family and that does not completely separate the baby from the mother.

Babies who are born prematurely are welcomed to a world of life, death and separation, and their parents’ shock to the dream they had in their hearts of providing a healthy start for their baby. NICU nurses are challenged to keep up with the advancing developmental growth of the infants and individualize the care depending on the gestational age, medical condition, family situation, etc, and learn/practice evidence-based developmental care that starts with knowing the vast variety of positioning requirements due to the baby’s lack of muscle tone and skeletal development.

Tone starts developing from the toes and goes up, so it is backwards from the development of any other system. An infant born at 24 weeks basically only has ankle dorsiflexion which, if not protected, plantar flexion might eventually result in the child walking on the toes and require many therapy sessions to resolve. At 27-28 weeks an infant has flexion to the knee but no tone in upper extremities so she or he requires full support to maintain good alignment and musculoskeletal development. Infants begin to show some flexor tone in the upper extremities and increasingly in the lower extremities around 31-36 weeks. Arms and legs are flexed around 36-37 weeks so the infant can finally attempt to pull the body into midline.

Organized behavior also develops on a continuum, like tone. Nurses, therapists and parents have to pay attention to hips, shoulders, necks, airways and molding of the soft heads, not to mention the loud monitors, bright lights, scent of alcohol, and the large number of interventions and devices in a variety of challenging settings including different modes of ventilation, sensors, leads, vascular access devices, catheters, wounds, stomas and drains.

If you were a baby, would you be able to self-regulate and sleep soundly under these conditions or while you are scared or feeling excruciating pain? Not likely; however we are expecting babies to sleep so they can develop their brain—and the mother, the principal source of comfort for the baby, is often denied the opportunity to be the primary developmental caregiver of her own child.

Many things that happen in the NICU are “common” but they are far from “normal,” for example, the baby’s association of touch with pain (which may prevent the baby from enjoying human touch for the rest of his life), of movement with stress (which may prevent proper development of joints and muscles), the detachment or inability to bond with the mother or other family members (we all know the implications of this), some musculoskeletal deformities,
or even apnea/bradycardia of prematurity. I work to significantly decrease, and in some cases even eliminate them by providing an ergonomic environment/habitat to the baby, and without the need of expensive equipment, stimulants, medications, or invasive procedures.

The best developmental care is not possible without maternal intervention. There is significant evidence that Kangaroo Care helps the baby survive and thrive; however, the mother is not always available or the baby is not always stable for skin-to-skin sessions. A recent randomized clinical trial entitled “Effect of a Maternal Simulated Intervention on Physiologic and Developmental Behaviors of 28-34 Week Gestation Infants in a Level III NICU” (Russell, Weaver, Vogel, 2011) suggests that the maternal simulation intervention device used in the study called The Zaky was effective in decreasing apnea and bradycardia and improving self-regulation and organization for babies in the study.

Why is this significant? Maybe apnea and bradycardia of prematurity are not caused by the immaturity of the brain, heart, and respiratory system and we don’t have to use stimulants that don’t help the baby to sleep. It is unlikely a coincidence that the eleven babies in this study that used The Zakys Maternally Scented had zero episodes of apnea and bradycardia.

As I thank you for the job that you do, I challenge you to not only save the lives of babies like Zachary, but to improve the environment/habitat of the baby, which without a doubt will in turn improve the quality of their life for a lifetime. I invite you to encourage parents to hold their babies in Kangaroo Care at least as much as I did 10 years ago (6-7 hours a day) and simulate their presence when they are not there.

Enhance your standard of care by providing only evidence-based practices that are now available for developmental care. I request that you always question the need of each intervention before touching or waking up a baby that is in quiet sleep developing the brain. Your decision might help that baby decrease future neurological deficiencies such as learning disabilities and ADHD.

Yamile C. Jackson (PhD in ergonomics and human factors engineering, a licensed Professional Engineer, and a certified Kangaroo Care Professional) gave birth prematurely to Zachary, who weighed less than 2 pounds and was hospitalized for 155 nights in 2001. Three weeks after his birth he survived the deluge of Tropical Storm Allison that flooded his hospital in Houston and shut down all power to his life-support machines. Yamile held Zachary on kangaroo care and her husband Larry and the NICU staff “bagged” him for 9 hours until he was evacuated. Yamile promised Zachary that his pain and struggle to survive were not going to be in vain, so she founded Nurtured by Design, Inc, a leader in neonatal ergonomics, developmental care, and Kangaroo Care.

More than products, Zachary inspired Yamile to design ergonomic devices that effectively facilitate evidence-based developmental care around the clock while engaging the parents’ natural instincts to nurture and heal. The Zaky and the Kangaroo Zak. She is also one of the facilitators of the Kangaroo Care Certification Course offered by the United States Institute for Kangaroo Care (USIKC) since 2010.

For her work and inventions, Yamile has won over 16 awards including “Groundbreaking Latina Entrepreneur of the Year” by Catalina Magazine, “Outstanding Woman-Owned Small Business of the Year” by the SCORE Foundation, “Ultimate Latina Award - Health Category” by the US Hispanic Chamber of Commerce, and was a finalist for the Institute of Industrial Engineers’ “Creativeness in Ergonomics Practitioner of the Year Award.” Zachary’s story of survival and/or the products have been featured in national and international media and even served as inspiration for the made-for-TV movie called “14:Hours” aired on TNT in 2005.

Join the conversation at http://bit.ly/KdU8p or visit www.nurturedbydesign.com for more information. Yamile’s email is yamile@nurturedbydesign.com.
hydrocarbons (PAHs), which are byproducts of burning fossil fuels such as oil and coal. Researchers collected placas from 80 newborn or stillborn fetuses who suffered from spina bifida or anencephaly. The placenta of a healthy newborn with no congenital malformations born in the same hospital was selected as a control. The researchers screened the placenas for persistent organic pollutants, including agricultural pesticides, industrial solvents, and fuel burning byproducts.

**LISTEN UP**

Premies exposed to their parents voices in the NICU tend to have better vocalizations at 32 and 36 weeks gestational age, according to researchers in the Department of Pediatrics, Women and Infants Hospital, Providence, RI. The scientists wanted to find out if infants exposed to more adult language would make more vocalizations, and also studied the sound environment in the NICU. Their study included 36 infants weighing 1,250 grams or less. The researchers made numerous sound recordings, gathering data on how many words were spoken by adults, and total infant vocalizations. Infant vocalizations were detected at as early as 32 weeks, with a significant increase between 32 and 36 weeks. The number of conversational turns in the vocalizations were higher when a parent was present. Premies started making vocalizations eight weeks earlier than the usual start date for newborns, and these increased considerably. Reported in Medical News Today, by Christian Nordqvist, copyright Medical News Today.

**HYPERTENSION**

A study by the Kaiser Foundation for research suggests that hypertension during early pregnancy increases the risk of giving birth to babies with birth defects, and that the risk is from the hypertension, not the drugs used to treat it. Drugs for hypertension contain ACE inhibitors which are known to have a toxic effect on fetuses during the second or third trimesters of pregnancy, but little is known about their effects on a fetus during the first trimester of pregnancy. Researchers evaluated data on 465,754 mothers and their infants. The findings revealed that women using ACE inhibitors during their first pregnancy trimester had a potentially higher risk of having a baby with some form of birth defect compared with women without hypertension or those who were not taking any form of antihypertensive medication. They also discovered a comparable higher risk among women using other hypertensive drugs and those who suffered from hypertension but who did not take any antihypertensive drugs. As such, the findings leaned toward the conclusion that the underlying hypertension in the first trimester is what caused the increases in birth defects. Information is from Medical News Today, from an article written by Petra Rattie, copyright Medical News Today.

**MIND THE GFAP**

Johns Hopkins researchers have discovered that increased blood levels of glial fibrillary acidic protein are vital to the brain's structure and can help physicians identify newborns with brain injuries due to lack of oxygen. Measurement of GFAP can also track how well whole-body-cooling therapy designed to prevent permanent brain damage is working. The study looked at levels of GFAP in 23 newborns born between 38 and 41 weeks' gestation who were diagnosed with HIE and compared them with those in babies born at the same point in the pregnancy. Researchers obtained the GFAP protein from cord blood at the time of birth, from neonatal blood drawn upon admission to the NICU and from daily blood specimens over a seven day period. GFAP levels were significantly higher in babies with brain injury due to a lack of oxygen during the first week of life. Infants who had abnormal brain MRI scans and were treated with whole-body cooling had the highest levels of GFAP. Half of the babies with brain injury in this study had increased levels of GFAP after completion of the 72 hour cooling period.