Focus on the neonatal intensive care (NICU) environment

Remarkable scientific and technological advances in obstetrics, perinatology and neonatology have improved outcomes for infants born at the edge of viability. Technological innovations, surfactant therapy, thermal management, advances in ventilation technology, and intravascular cannulation have all contributed to improved survival of the premature. Though the neonatal intensive care unit (NICU) provides the highly specialised care capable of increasing the chances of survival, it does not necessarily offer the ideal environment for the development of the infant. Much has been learned about the harmful effects of noise and light exposure in the NICU environment on the neurodevelopment of the premature. The aim of neonatal intensive care is essentially to preserve life by extending the appropriate medical care in an environment that mimics the womb and provides as near positive an experience as has been prematurely interrupted. More recent care procedures seek to reduce the discrepancy between womb and NICU environment. Reducing noise and light exposure, restraining unnecessary handling and adopting more restful positioning constitute a series of initiatives aimed at reducing stress for the neonate and improving neurodevelopmental outcome.

The two most important points in the care of premature infants are the maintenance of the animal heat and the provision of a suitable food. It is unquestionably of advantage to protect them from noises, bright lights and handling, because in this way the normal intrauterine conditions are more nearly approached,” declared Dr John Lovett Morse, instructor in paediatrics at Harvard Medical School, during his address before the Washington Gynaecological Society. 

Evaluating the NICU environment and principles of Feng Shui, the ancient Chinese ethnoscience that promotes the flow of healing energy, combine to provide a less stressful environment.

Light

Constant light may disturb the body rhythm, and bright light may not permit premature babies to open their eyes and look around. [5] Constant bright light has shown to cause irregular heart rates and decreased sleep in preterm infants. In some NICUs, the premature babies are placed in a microenvironment that simulates the rhythm and ambiance of life in the womb. However, a study carried out by researchers from the Duke University Medical Centre demonstrated that exposing premature infants of less than 31 weeks gestation to cycled light that mimics the normal circadian rhythm helps them grow faster. [6] Cycled light in the NICU provides the night/day environment on which adults rely for health, growth and development. Additional research will be needed to study the long-term impact of a cycled-light environment on these infants.

Modern incubators provide a microenvironment with better control of ambient light. Additionally, in some NICUs, a blanket is draped on top of the incubator to stop excessive room light from reaching the infant. Today’s cot designs as well as the use of subtle colours, soft lighting and principles of Feng Shui, the ancient Chinese ethnoscience that promotes the flow of healing energy, combine to provide a less stressful environment.

Positioning, handling and touch

Most of the handling and touch that premature infants experience in their early life is related to medical procedures. Professor Lynda Law Harrison, RN, Ph.D., FAAN, co-director of the World Health Organisation Collaborating Centre for International Nursing at the University of Alabama, has extensively studied the physiological and behavioural effect of gentle touch on the preterm infant. [7] Findings from several studies suggest that premature infants in the NICU continue to be handled frequently throughout the day, mainly for procedural interventions. Only minimal amounts of so-called “non-procedural touch” take place. Findings from studies indicate that interventions consisting of still, gentle touch have an immediate comforting and positive effect on the premature infant. However, longer-term outcomes of gentle touch (e.g. weight gain, reduced hospital stay) were not documented in these studies. [7] Developmental support can be provided through positioning, such as placing and holding a premature baby in a flexed position reminiscent of the curled position that would naturally assume in the womb. [8] Other comforting measures, such as swaddling and providing soft boundaries when the baby sleeps, reduce stress and support physical development.

Kangaroo Care (KC) positioning for premature babies is a method of skin-to-skin contact to promote parent/infant bonding and reduce some of the stress associated with the NICU. KC consists in placing stable, premature infants, dressed only in a nappy and hat, in skin-to-skin contact with their parent’s chest for up to two or three hours a day. The KC technique was developed in Columbia to deal with overcrowded neonatal units. In impoverished settings, KC reduces morbidity, improves breastfeeding rates, improves bonding between mother and infant and increases satisfaction in parents and care providers. [9]

NICCAP Federation International

The Newborn Individualised Developmental Care and Assessment Program (NICDAP) was developed in 1985 with the aim to make the NICU more nurturing in every possible way. The NICDAP approach, originated by Dr Heidellise Als, focuses on changing the medical systems that are responsible for the physical welfare of the newborn. NICDAP training aims to change the usual task-oriented care system to a relationship-based approach. Research has demonstrated the NICDAP approach to be effective in reducing the negative impact of premature birth and improving the developmental, behavioural and medical outcomes for premature infants in the intensive care unit (www.nidcap.com). NICDAP Federation International (NFI) is a private, non-profit organisation formed in 2001 to promote certification and dissemination of the NICDAP approach. The NFI is committed to maximising the developmental outcome of the premature babies by providing high-quality education and training to make the NICU more nurturing. To date, NICDAP training centres have been established throughout the USA, in Sweden, France and The Netherlands.

Conclusion

If the Morse viewpoint accounts for the potential negative effects of excessive noise, bright lights and unnecessary handling on the premature infant it is still widely shared a century later, continuous medical and technological advances aim to provide a safer and less disruptive supportive care to the neonate. Other techniques and approaches, such as nurses Kangaroo Care and NICDAP, aim to provide a nurturing, infant-centred NICU environment maximising the developmental outcome for the newborn while engaging the infant’s family.

[9] Ruiz-Pelaye NG, Charpak N, Cuervo UG. Kangaroo Mother Care, an example to follow from developing countries. BMJ 2004; 329:1179-1181.