



PEEK INTO NICU: ART OF FOSTERING NEWBORNS

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The presence of a physical therapist in the Neonatal Intensive Care Unit (NICU) has been found to be influential in reducing physical impairments and limitations in infants, as well as in educating the family on how to provide optimal care for their newborn. Two terms coined in the NICU that should be learned are 'Early intervention' & 'Developmental supportive care'.

EARLY INTERVENTION: It is a prevention-focused program that aims to support the well-being of preterm infants and their families. It involves identifying and providing early support to children who are at risk of poor outcomes and can help prevent problems from occurring or address them before they worsen. Early intervention programs are often implemented soon after birth, when the infant's brain is still developing and interventions are most likely to have the greatest impact.

DEVELOPMENTAL SUPPORTIVE CARE: It is a practice model that aims to reduce stress and pain for babies, parents, and healthcare professionals in a neonatal unit. It also aims to provide babies with developmentally appropriate sensory experiences and maximize their neurological development. This approach can help reduce long-term cognitive and behavioural problems.

As a Physiotherapist in NICU, we can do....

Nesting: In utero, the fetus is confined to an enclosed space with well-defined boundaries to support the development of physiological flexion. The boundaries allow a fetus to extend his arms and legs to meet resistance and subsequently recoil his extremities into a gently flexed position. This physiological flexion is necessary for the development of normal posture movement control. In the Nesting technique, the babies are protected inside a nest made out of rolls of cloth. It improves the comfort of neonates. The rolls can help them to feel boundaries and they can push up against the sides of the rolls comforting them (Fig-1). Nesting can be done while the infant is in the NICU and placed on a monitor that helps to ensure that the baby is physiologically stable. Because of the fragility of preterm infants, most NICUs have adopted a minimal handling and stimulation approach for very immature infants.

Swaddling: Swaddling is the art of snugly wrapping a baby in a blanket for warmth and security. It can keep the baby from being disturbed by her startle reflex, and it can help her stay warm and toasty for the first few days of life until her internal thermostat kicks in. It may even help to calm the baby.

Positioning: Preterm infants characteristically demonstrate low postural tone, with the amount of hypotonia varying with gestational age. Developmentally supportive positioning for infants in NICU may help to reinforce normal skeletal alignment and provide opportunities for normal movement patterns. In addition, positioning can provide skin care and support respiratory function. The combination of these three benefits can allow the infant to improve and longer sleep.

Research indicates that infants with long stays in NICU, who are not appropriately positioned, are at risk for positional plagiocephaly, and torticollis and may demonstrate a decrease in the quality and spontaneity of movement. The goal of neonatal positioning is to Optimize alignment toward a neutral neck-trunk position semiflexed, midline extremity posture, and neutral foot position. Hyperextension of the neck, Frequent head turning to the side, Lower extremity frogging, and use of Bigger diapers should be avoided.



Figure: 1 – NESTING, SWADDLING & POSITIONING

Kangaroo Mother Care: It is a Special way of caring for preterm-low birth weight babies which is practiced in many cultures. It fosters their health and well-being by promoting physiologic stability, breastfeeding, infection prevention, and increased maternal confidence & bonding. Kangaroo care is also known as skin-to-skin contact and the baby is breastfed exclusively to the utmost extent. Direct contact is established by removing all the baby's clothes, except for their diaper, and lying them in a prone position on the mother's chest (the Baby's abdomen should be at the level of the mother's epigastria) (Fig-2). It has been found that kangaroo care can be neuroprotective as it supports brain plasticity. KMC can be started as soon as the baby is stable in the hospital and continued at home. Short KMC sessions can be initiated during recovery with ongoing medical treatment (IV fluids, oxygen therapy). During

KMC, Mother's breathing stimulates the baby's breathing, thus reducing the occurrence of apnea. It also helps decrease maternal stress and depression.



Figure:2 – KANGAROO MOTHER CARE

Therapeutic Massage: Infant massage (i.e. gentle and slow hand contact) is an early intervention approach to help with a newborn's tactile sense. There is some evidence to suggest that massage can help with growth and weight gain for low birth weight and premature babies, reduce the length of stay in the hospital, reduce neonatal stress, and promote sleep.

Massage therapy with moderate pressure may be useful. Research by Lu et al. has found that moderate- pressure massage therapy can cause greater daily weight gain in preterm infants than light- pressure massage therapy(Fig-3).



Fig: 3 – THERAPEUTIC MASSAGE

Therapeutic Handling: The primary aims of handling include assisting the newborn to achieve maximal interaction with parents & caregivers, and facilitating postural & movement patterns appropriate to the infant's adjusted gestational age. It includes care of a neonate around sleep/wake cycles time, no routine procedure, Providing 2-3 hrs of uninterrupted sleep, following "Minimal Handling" or "Quiet hour" Protocol, reducing noise, Reduce lights, and Clustering the caregiving procedure. Don't disturb the baby all the time.

Physical Activity: It has been proposed that a lack of physical stimulation might contribute to metabolic bone disease in preterm infants, leading to decreased bone mineralization and growth. Therefore, physical activity has been explored as an intervention to help promote bone mineralization and growth. Physical activity for neonates includes facilitating extension and flexion of the extremities, performing a range of motion exercises, and holding patients into flexion to help facilitate pushing against resistance. These exercises are usually completed for several minutes, several times a week for at least two weeks. Doğan et al. note that passive range of motion exercises may be beneficial for bone development, especially when applied to an infant's proximal joints.

Multimodal stimulation: The use of tactile, vestibular, proprioceptive, visual & auditory stimuli to facilitate infant development has been reported. For auditory stimuli, Soft & soothing music is used. For the tactile stimulus Gentle

touch, massage & swaddling, For Visual stimulus pictures/human faces, and bright toys are used. For the Vestibular stimulus gentle rocking movements, and swinging are beneficial.

Non-Nutritive Sucking: High-priority functional activities in the NICU are sucking and swallowing. These actions should be supported by the physiotherapist and other caregivers. Non-nutritive sucking provides tactile stimulation to the intraoral structures and facial muscles through a pacifier or a glove-wearing finger (Fig-4). Research shows that non-nutritive sucking can help reduce the length of hospital stay and improve feeding behaviours. It can be done using pacifiers.



Fig:4 - NON-NUTRITIVE SUCKING

Family Education: Family education is a substantial component of interventional care in the NICU. Understanding how to care for the preterm infant is important for posture and movement development, parent-infant attachment, and maintaining the baby's physiological stability. Coaching the family on how to best support the baby's motor development should include topics such as feeding, dressing, sleep positioning, playing and communicating, therapeutic holding, and carrying the newborn after discharge.

OUR LIFE IN NICU: STORY OF A NICU GRADUATE

Hello, I am a 'NICU graduate child' means after birth I lived in the NICU for some days. My mother said that I was born 8 weeks earlier than the expected date of delivery, so everyone used to call me 'preemie'. In NICU I made many friends. I heard that some of my friends were like me born premature and others had weak lungs (Respiratory distress syndrome), heart infections (Necrotizing endocarditis), brain tissue infections (Meningitis/Encephalitis), bleeding in the brain (Intraventricular hemorrhage), etc. But all were very strong fighters just like me. The room of the NICU was so strenuous and loaded heavily with noxious stimuli that we couldn't handle it. The loud noise of machines, the flashing lights, frequent running of doctors and nurses used to frighten me. I was put on oxygen therapy by 'O2 hood', and the Nasogastric tube was inserted inside my nose for feeding, and for regulation of my body temperature I used to sleep under a Radiant heat warmer. Besides all these displeasures, I was under constant observation and great care by my neonatologist, physiotherapist, nursing staff, and many more people who always work with enthusiasm. For my weaker lungs, Dr. Neonatologist gave me SURFACTANT THERAPY that made my lungs stronger and helped me breathe efficiently. My Physiotherapist used to SWADDLE me to calm me down and help me regulate my body, giving me different POSITIONING and NESTING, she used to do MASSAGE THERAPY to strengthen my muscles and CHEST PHYSIOTHERAPY to clear secretions from my lungs. She also taught me NON-NUTRITIVE SUCKING so that later on I can do breastfeeding nicely. My therapist also taught my mother to give KANGAROO MOTHER CARE (skin-to-skin contact) which had increased 'Mother- Infant bonding' between us. Gradually I started improving and gaining weight so they sent me home with my family!!

After living so long in my mother's womb which is the calmest and safest place, suddenly coming to NICU was quite scary for me so used to cry, cry, and cry....But after realizing that how much care and help they are giving me I wanted to THANK them but I have no words to describe so again I started **crying, crying, and crying.....!!!**