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The Road Ahead: An Occupational Therapy Manual to Infant Development for Parents in the NICU

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THE ROAD AHEAD: AN OCCUPATIONAL THERAPY MANUAL TO INFANT DEVELOPMENT FOR PARENTS IN THE NICU

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Abstract

Occupational therapists have been collaborating with the parents of our tiniest patients in the neonatal intensive care unit (NICU) for quite some time. They have a wealth of information and expertise in the area on infant development and parent education. Admitting a baby to the NICU is a shock for most parents and can take a toll on a family. The role of the occupational therapist is to help educate the family and to provide the tools to safely take care of their baby and to smoothen the transition from the hospital to home.

In the NICU, the OT has an important role which is to educate the parents and caregivers. Throughout the baby's hospitalization, the parents are taught a variety of topics from infant development, sensory development, basic baby care (swaddling, bathing Kangaroo Care, etc.), feeding, proper positioning, infant safety, and safe sleep practices. These topics are covered prior to the baby being discharged from the NICU, so that parents and caregivers feel comfortable and prepared to take home their bundle of joy.

A parenting manual for first-time parents in the NICU has never been created and a product of this type does not exist on the market. There are many baby books, but there are no parenting manuals that have a journal-like format where parents can write down their personal thoughts, what happened with their baby, reminders, and notes. The final Doctorate Capstone and parenting manual were created to address this need and to help parents organize the information they received in the NICU. It allows parents to have the information at their fingertips once they return home with their baby.

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Dedication

To my daughters, Zoey and Skyler, you are my reason for everything that I do in life. You can do anything in life that you set your mind to do. The sky is the limit! I love you both to the moon and back to infinity and beyond! Thank you for being my greatest inspiration in life to be the best Mommy for both of you!

To my mother – Thank you for being the greatest super Mom/Grandma anyone could ever ask for! You have always encouraged me and pushed me to be my best! You have always been there for every single school and extracurricular activity and every milestone in my life. I am eternally grateful to have you by my side and I love you very much!

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To Bryce – Thank you for supporting me with my goals and dreams! I appreciate your constant encouragement and patience. I love you and am profoundly grateful for all your support.

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Chapter I: Introduction

The purpose of this capstone project is to create a manual for new parents as an introduction to the neonatal intensive care unit (NICU). The manual entails important topics on what to expect in the NICU, the healthcare workers that would care for their baby, common medical conditions, terminology, abbreviations, basic knowledge about the sensory system of a premature infant, developmental milestones, positioning, feeding, and discharge information on how to properly care for their baby as well as resources. Within the manual, there is a developmental milestone chart, an area where parents can journal their thoughts, questions to ask the doctor and/or their healthcare provider, personal reminders, and their child's future medical appointments. Oftentimes, new parents do not feel prepared to take care of their baby and are unsure of what to expect. It is impossible to be prepared for every situation that could arise with a baby, but parents should be well-prepared through educational resources such as classes, literature, and community outreach programs.

Though some basic baby care is taught in the hospital, parents continue to lack the confidence and awareness to understand and read their baby's cues. Parents should also be prepared to understand developmental milestones and to be aware of red flags in their baby's development, so that they can discuss it with their pediatrician. In a study by Raspa et al. (2015), parents stated that they did not feel prepared to identify signs of developmental delay and did not know where to go for early intervention services if it was warranted. Most hospitals offer parents baby basic classes. Some classes are free, while others require a fee to attend the class. Some OBGYN doctor's offices require parents to attend these classes, while others allow them to be optional. The lack in continuum of care and education is detrimental to the parents and the baby.

There are a variety of baby and parenting books on the market, but none that are organized into a journal format where parents can track their baby's developmental milestones or write down notes or questions to ask their health care provider. In a study by Gottman, J., Shapiro, A., & Parthemer, J. (2005), there was a 6-hour workshop which utilized lectures, demonstrations, role playing, videotapes, and communication exercises to encourage the development and growth of their baby. The parents in the intervention group did not display an increase in hostility towards each other and the quality of the parental relationship was much better than the parents in the control group that did not attend the workshop. Researchers found that there was better conflict-resolution, improved communication, increased awareness, better emotional connection, and appreciation towards each parent which in turn has a positive impact on the infant's overall environmental, neurodevelopmental and emotional growth.

There is a significant need for a parent education manual in the NICU to help parents track their baby's developmental milestones, while also including pertinent topics that every new and experienced parent should know, so that they can have the tools to build confidence and awareness in properly caring for their new baby. With an absence of this format of baby book on the market, it would be a significant addition for parent educational books.

Chapter II: Literature Review and Problem Statement

Problem Statement

First-time parents with an infant in the neonatal intensive care unit (NICU) can easily become overwhelmed by the shock and the anxiety that comes with having their baby in the NICU. New parents often feel unprepared to take care of a baby, much less learn about the NICU environment and its intricacies. Studies show that parents that are informed and educated about their baby prior to delivery exhibited more parental confidence, awareness, cooperative parenting, and created a positive environment for their baby.

PICO Question

Will educating parents on infant development and basic baby care prior to hospital discharge promote infant and parent bonding?

Literature Review

A literature review was performed on evidence-based methods and strategies that are effective with providing parent education to families with an infant in the neonatal intensive care unit (NICU). This literature review orients families to the NICU, provides information about parent education, developmental milestones, basic baby care, feeding (breastfeeding and bottlefeeding) and sleep. Bryanton et al. (2013) discovered that parents who received education displayed parental confidence, increased infant safety, maternal-infant connection, parental competence, infant language development, improved cognitive growth and the ability for parents to read their infants cues.

Parent Education

Parent education is imperative for new mothers, fathers, and for extended family members that will be taking care of the infant while in the NICU and once the infant is

discharged home. This provides the medical professionals that work with families in the NICU to orient and prepare the family for what to expect, the medical professionals that will be taking care of their baby, how to properly and safely care for their infant while they are in the NICU and upon discharge home.

Ateah (2013) held a prenatal parent education intervention. It was performed in the last class of a series of six prenatal classes that were offered through the public health system in a Midwestern Canadian city. The class covered safe sleep environment for infants, Shaken Baby Syndrome, risks of physical punishment and positive parenting, and infant development and safety concerns. Parents felt that receiving educational information on safe infant care should be delivered in education sessions to expectant parents and that in-person presentations were the most effective way of sharing this information. This study discusses the importance of parent education for first-time parents about infant care and safety, as well as the education methods they preferred the information to be delivered.

Cashin et al. (2021) created an early postnatal psychoeducation intervention program for new parents to help them adjust to parenthood. There were 89 topics of information that were selected by a panel of eight clinicians and research professionals and eight experienced parents that they felt were important to educate parents about. The following themes were endorsed by both panels with a >80% across varies age groups (0-3, 3-6, 6-9 and 9-12 months): Attachment, Co-parenting relationship, Feeding, Parental mental health, Safety, Sleep, Developmental milestones, Social & community support, and Health. The 89 topics were divided into "Essential", "Good to Know" and "Essential/Good to Know Uncategorized."

SmithBattle et al. (2004) examined forty-four low-income parents who were given a baby book journal and were asked to rate the book based on the content, the readability, and the

aesthetic. The format was like a baby book keepsake where parents can record various information about their baby. The researchers noticed that a book of this format did not exist on the market. The parents were required to document in the journal and have a telephone for follow-up calls surveys. The book was written in a way that made it seem that the baby was speaking to the parent and the mothers gravitated toward this. The participants also acknowledged that they liked that they could write their personal thoughts, their frustrations, etc. in this journal, as opposed to it being a fill-in-the-blank type of book.

Developmental Milestones

Developmental milestones are a guide at certain points in an infant's growth where gross motor, fine motor, cognitive, language, and social/emotional milestones are assessed. Schering (2022) from the American Academy of Pediatrics (AAP) News, stated the AAP and the Centers for Disease Control and Prevention (CDC) revised the developmental milestones in the Centers for Disease Control and Prevention's *Learn the Signs. Act Early.* program. This program uses family-friendly language to help parents identify developmental delay and autism in children. Some infants that are admitted into the NICU have a form of developmental delay. Developmental milestones provide pediatricians and health care professionals such as occupational therapists to determine whether an infant or a child has a developmental delay.

The American Occupational Therapy Association (AOTA), 2022) published the *FAQ: CDC Developmental Surveillance Milestone Checklists* on their website. Two occupational therapists are ambassadors for the CDC's *Learn the Signs. Act Early.* program. They provided their input on the developmental surveillance milestone checklists. It discusses the updated changes and provides information for practitioners to consider when assessing developmental milestones.

Ronan et al. (2015) studied parent educational materials for NICU parents as a supplementation to their NICU discharge. The researchers noticed while they performed a literature review that there were no research articles on educational materials for NICU parents. The purpose of this study was to create a trifold brochure (to accompany the DVD) and DVD that discussed developmental activities and positioning using evidence-based practice and professional NICU feedback. The feedback was obtained from NICU professionals then the trifold brochure and DVD were edited to accommodate the feedback. Researchers concluded that educational materials are imperative for parents on being prepared to commence a home program with their premature baby once discharged from the NICU. The combination of the brochure and DVD helped parents to observe each position and experience and its purpose.

Basic Baby Care

Basic baby care is an important part of parenthood. Some hospitals offer classes for free or for a nominal fee. Classes include swaddling, diapering, dressing, bathing, sleep strategies, soothing techniques, crib safety, and household safety. Many parents report feeling ill-prepared to caring for their new baby. Subramanian et al (2020) reviewed survey data and research articles that suggest the importance of incorporating pre-discharge education and post-discharge follow-up have shown to be successful with improving newborn care practices. The information would cover newborn care practices at home. Postnatal education programs for parents have shown to reduce newborn illness and death by improving umbilical hygiene care, breastfeeding, thermal care, clean/dry umbilical cord hygiene, hand hygiene, and skin-to-skin.

Feeding

Feeding is another crucial factor in an infant's growth and development. Gibbs et al. (2018) studied the correlation between infant attachment and breastfeeding. The researchers used

data from the Early Childhood Longitudinal Study of children from 9 months to 2 years old from the National Center for Education Statistics. They also used the Toddler Attachment Sort-45 (TAS-45) which "measures toddler-parent attachment (infant attachment security and temperamental dependency)." Using descriptive statistics, the researchers were able to analyze the data to assess infant attachment behavior, breastfeeding practices, and temperamental dependency using weighted and unweighted sample means. The results showed that breastfeeding is associated with some factors of attachment security. Breastfed children tend to have higher scores for being "warm and cuddly," "cooperative" and displayed lower scores for "demanding and angry" compared to children that were breastfed for less than 3 months. Breastfeeding is also associated with infant attachment security, but not temperamental dependency.

Fuhrman et al. (2020) examined sixty-eight families that were seen post hospital discharge for newborn feeding education. Preterm and late-preterm infants are at risk of poor feeding and feeding challenges once discharged from the hospital. Researchers identified strategies that were useful with improving feeding once discharged home. The speech-language pathologist performed 83 consults to 68 families (15 families were repeat consults). The infants that attended this feeding clinic appeared to show improvement. The infants that were seen during this 6-month period were not referred to their pediatrician for a recommendation for a comprehensive feeding evaluation. Mothers of late preterm and newborn infants were more likely to ask more questions and attend group sessions. Mothers of preterm infants were less likely to attend group sessions with reasons unknown to the researchers as their hypothesize that parents may have possibly gotten their questions answered by a medical professional or possibly

hesitant to discuss their infant's concerns about illness and other concerns around other parents. The reason remains unknown.

Sleep

Sleep is such an imperative and integral part of an infant's brain development and growth. An infant's sleep cycle starts around 26 to 28 weeks' gestational age. Sleep cycles are imperative for the development of the sensory system, as well as neurosensory and motor systems. Graven and Browne (2008) performed a research study where they evaluated a neonates' sleep patterns such as rapid eye movement (REM sleep), non-rapid eye movement, and the quiet intervals between sleep and being awake. If there are interferences with a baby's sleep, it could become detrimental to a baby's sensory development. In the NICU, parents are educated on the importance of sleep and brain development.

In a separate study, Averill (2008) performed a literature review of infant sleep and feeding. Researchers discovered that there were few articles that discussed the correlation between infant sleep and feeding. Articles regarding mothers that breastfeed tend to co-sleep with their baby, compared to mother's that formula feed their baby. A separate study found that breastfed babies did not wake up more often than formula-fed babies. The babies were awake with 4 hours of onset of sleep and were much more unhappy. In another study, breastfed babies averaged 45 more minutes of sleep than those who supplemented with formula in the evening and 47 more minutes of rest than those offering formula from midnight to 6am. There was a variety of literature discussed in this article that remained within the topic.

Chapter III: Project Implementation

The process of the capstone project implementation started with meeting with capstone mentor, Dr. Kaitlyn Ploeger on Zoom or by phone call every 2-3 weeks to discuss the NICU parenting manual. The manual was also created to be a journal where parents or caregivers could document the events that occurred with their baby, write down questions for the doctor or healthcare staff, an area for reminds, and doctor's appointments.

The first step was to create an outline for the manual. The process for developing the manual included deep reflection upon what I educate and teach each family while their baby is in the NICU. I wanted to follow a similar organizational flow starting from the basics and working my way to more medical and physiological concepts about their baby. I wanted parents to understand the science and the evidence-based research behind what we do, why we are teaching these topics and concepts, and how this will help upon discharge home. The manual covered topics that parents/caregivers are introduced to the NICU, parents are educated about certain topics that pertain to their baby's stay in the NICU. Dr. Ploeger suggested to combine related topics together to streamline the manual and create more clarity and connection with the parents/caregivers. The culmination of the evidence-based research, my professional experience as a NICU OT/former NICU mother, and parent feedback helped me selected the topics for the manual.

The manual started with an orientation to the NICU, introduction to the NICU, common conditions, equipment utilized in the NICU, basic information about an infant's sensory systems, developmental milestones (cognitive, language, movement/physical development, and social/emotional development), basic baby care such as Kangaroo Care (skin-to-skin), swaddling, diapering, swaddle bathing, infant massage, feeding, the importance of sleep, safe

sleep practices, positioning aids, caregiver role/parent education, and parent resources. The topics that were selected were based upon research studies, parent feedback, and the topics that were taught to patients and their families that have been under my care.

Initially, when discussing what ages should be covered in this manual, my first thought was to create a manual from birth to 2 years old. After consulting with Dr. Ploeger, she suggested shortening it and making it from birth to 1 year old, so that it was not overwhelming to new parents. She suggested that if I wanted to create more manuals in the future that I could, but for the purposes of new parents, birth to 1 year would suffice to help parents get through their first year with their baby.

During my capstone defense presentation, the committee recommended to focus on ages birth to 3 months old because the amount of content might be overwhelming for a new parent. Based upon that decision, I decided to change routes for the final manual and focus on birth to 3 months old. My future plan is to create multiple volumes with different age ranges such as 3-6 months, 6-9 months, 9-12 months, etc. By breaking down the manuals into volumes, it will help to keep the information clear and concise without becoming overwhelming.

Table 1: Capstone Project Timeline

	Time	**Task**
1	Aug-Dec ‘21	Needs assessment and literature review Finalize capstone project and defend capstone project proposal
2	Dec ’21-Jan’22	Create outline with topics for parenting manual
3	Jan‘21-Mar‘22	Met with Dr. Ploeger every 2-3 weeks to discuss outline for manual and selected topics
4	March 2022	Defend capstone project presentation
5	Mar-Apr’22	Complete Capstone Project Paper

Chapter IV: Project Evaluation and Results

The capstone project was implemented with both NICU and experienced parents between the ages of 21-42 years old. Due to the lack of participation, this project included experienced parents that did not have a baby in the NICU. The participants who were included in the project were three former NICU parents and two experienced parents (no NICU experience and did not have a baby in the NICU). There were three NICU parents who provided feedback on how to improve the manual. I provided the parents with the NICU manual via email. I emailed each parent open-ended feedback questions that had the following questions: 1) What did you like best about the parenting manual? 2) What improvements would you make to the parenting manual? 3) What other topics (that were no in the manual) would you like to see included? To keep parents anonymous, I will state "Parent 1," "Parent 2," and "Parent 3" along with their feedback.

Strengths

Parent 1 stated:

- "The topics are informative and having knowledge on what to do."
- "Provided a good overview of what to expect as a NICU parent."
- "I would have felt more prepared if I received this manual/journal."
- "I like the area to journal my thoughts."
- "Liked what to expect after being discharged."

Parent 2 stated:

- "Easy-to-read guide."
- "Variety of topics that I want to know as a new, NICU parent."

- “I feel more informed as a parent on how to take care of my baby and what to expect in the NICU.”
- “It does not make me feel as nervous or scared when I read about the equipment used in NICU and its purpose.”
- “Liked how everything broke down into sections.”

Parent 3 stated:

- “I loved the organization of the manual. I felt that I could clearly put my thoughts into what I was writing.”
- “I liked the appointment page. Being a busy parent, it is nice to have all my appointments in a convenient location.”
- “I appreciated the explanations of medical staff, especially with being a new parent. This manual helped me connect with my baby’s medical team in a more intimate way where I felt more included and well-informed.”
- “I liked the number of pages in the manual. I felt encouraged me to write in it without it feeling like a chore having to complete it.”

Areas for Improvement

Parent 1 stated:

- “I would like to see more pictures and charts.”
- “I like the topics about the NICU, feeding, baby care, etc. but I feel overwhelmed by the amount of information. If there is a way to simplify each topic area, I would like that.”
- “Including more common problems like breathing problems, GERD, jaundice problems and what to do.”
- “Feeding cues to lookout for (i.e. rooting, sucking on hand, etc.).”

- “How much weight is appropriate to gain?”
- “Include more safe sleeping practices, Shaken Baby Syndrome, Purple Crying.”

Parent 2 stated:

- “I would like more hospital, local or parent resources especially with public programs. My daughter was referred to The Regional Center for services but we never heard from them, so I had to reach out to you to find out what to do next. After speaking with you, I called the case worker and someone finally came to the house to do the evaluation. If you could list the procedure of how things work and what to expect in that sense, it would be very helpful. A lot of parents don’t know what to expect and what the process is, how long it should take, and so forth.”
- “Tummy Time: When to start tummy time, how often to do it, what it does like prevents flat head, strengthens core and neck, instructions or ideas on how to do it.”
- “Want a manual that is about 20 pages long (not too long but not too short).”

Parent 3 stated:

- “I would have like more pictures and diagrams.”
- “I would have loved an information page to find more resources.”
- “I would appreciate more step-by-step style instructions in certain categories such as swaddling, feeding, diapering, and other various techniques.”

When I received the results from the other parents, I recorded their feedback to improve the parenting manual. The parent feedback was helpful and provided great insight into what first-time parents want in a parenting manual, what they find most useful, and where there is room for improvements and important changes.

Finally, I received feedback from the capstone committee which is comprised of the occupational therapy program director, the capstone project professor, and the capstone project mentor. After my final capstone defense presentation, the committee provided feedback and ways to improve the manual. They started by agreeing to streamline the material and keep it pertinent to what parents need to know. Another committee member stated that the age range for the manual was very large and that birth to 1 year old is too much information for new parents. Another person suggested making this manual from birth to 3 months old. It would be enough information to help new parents once they are discharged home and in the first 3 months of their baby's life.

After receiving this feedback from the parent participants and the capstone committee, I went forth and took the recommendations for improvements and applied that to my manual.

Chapter V: Discussion and Impact

The culmination of the classes we took throughout these past 2 years have led to the result of creating the NICU parenting manual. While I was working, I met many families who I educated on how to care for their baby while in the NICU. Many times, I wondered to myself how I could make this more understandable, meaningful, and relatable to the families. I had a random thought that it would be interesting to put everything we taught the parents into a book, but that was a fleeting thought. To turn this fleeting thought into a reality is unbelievable!

I am a former NICU mother of a 34-week-old, late term, premature daughter. I wanted to take my experiences as a mother and an occupational therapist to create a journal-like manual that would help parents make the information that we were teaching easy to understand. There are so many medical terms that are discussed during medical rounds and in private conversations with the medical team that it can become overwhelming for parents and caregivers, especially when they're trying to understand their reality that their baby is in the NICU. Simple concepts become complex because we cannot fathom the gravity of our child being in the NICU. The thought that this was not part of our birth plan crowds our thoughts and our mind as we find ways to cope. I recall many times when I felt alone and isolated. My family and friends did not understand what I was going through and did not know what to say or do. Only those closest to me were there through thick and thin. This was difficult and heartbreaking.

By making this manual, I wanted to also create a place where parents could journal their feelings and thoughts. I want it to be a place of catharsis, information, support, and resources. Writing can be a source of stress relief for some such as myself, but it can also be a place to document your baby's journey.

When you're in the NICU, it feels like you're going to be there forever, but once you're discharged home, it's another world. There's happiness, excitement, fear, anxiety, and stress because you do not know what's going to happen once you get home with your baby. I kept finding myself running to my baby books to read on what to do when certain things happened. I read it religiously and went back anytime there was a problem with the baby. This is also where I thought about the idea of the manual. As a parent, if I was always running to read my parenting books then I want to create a parenting manual to help parents get through the first 3 months at home with baby.

Strengths

The parenting manual helps bring clarity to the world of NICU. It provides awareness to challenges that NICU parents encounter as a first-time parent. It encourages more intimate parental involvement in their child's overall development. It also helps to bridge the gap between the NICU and discharge home with baby. The manual helps to deepen the bond and connection between the parent/caregiver and the baby. Another strength of the manual is that it is versatile, and the information is relevant to both NICU and non-NICU parents. It is my hope and future goal to help many families with this parenting manual.

Challenges/Limitations

Prior to making this manual, I did not have any previous experience in creating a manual. I had an idea, but never had to make one. I have created educational handouts, power points, and gave many presentations, but nothing to this degree of information. I felt that this was my biggest limitation. I had never had a class on it and basically had to research how to create a manual. Looking in retrospect, I wish there was someone who created a manual and could teach me how to properly create one with all the correct elements in there.

Another challenge that I encountered while researching this project was attempting to find information on every topic that I was planned to include in the manual. Though there is information on each topic, there might not necessarily be a credible research study attached to it, so that was a major challenge. With everything we do in occupational therapy, it is important to have evidence-based research to support our findings and the reasoning behind why it is important to have a manual of this caliber on the market.

Another limitation that I encountered was the lack of participation feedback that I received from both NICU and experienced (non-NICU) parents after reading the manual. As mentioned earlier, I emailed six parents open-ended survey questions on how I could improve the parenting manual, but only heard back from two parents via email. Though I received very little participation, the feedback I received was helpful and provided good insight into how I could improve the manual. I also received excellent feedback from the capstone committee (comprised of the Occupational Therapy program director, professor, and capstone mentor). After stating that one of the parents felt overwhelmed by the amount of information that I provided in the manual, a member of the committee suggested that instead of making a NICU parenting manual from birth to the first year of life, I should create a manual that just focuses on birth to three months old because parents want to know exactly what to do in the first few months of life. I could not agree more. It was apparent that I needed to reduce the amount of information that I was writing and make it even simpler, more streamlined, and relatable.

Creating this manual has been challenge in terms of time management. Since I did not have previous experience in putting together a manual, it took an extended time to organize the information into manageable parts and determine the layout.

With the doctoral capstone project, I was able to utilize and practice different writing styles with the paper and the manual. The paper required technical writing skills with proper formatting and verbiage. In the manual, I created a product that required basic language without the use of technical and confusing medical jargon. The manual is appropriate for the general public and anyone with an eight-grade reading level.

Chapter VI: Conclusion

The culmination of the evidence-based research, parent feedback, and professional experience helped with bringing this capstone project together to create a parenting manual for NICU parents. I have never created a manual before, but I was determined to develop one that would help first-time NICU parents. I feel that this manual could also help both NICU and non-NICU parents. The goal of this project was to create a journal-like manual where parents could journal their thoughts as a stress relief outlet, but also keep track of important reminders, questions, and doctor appointment dates. I wanted this manual to be a place that parents could refer to as a resource to help them care for their baby once their home from the NICU and an all-in-one book where they could find the answers they needed to ease their mind.

Appendix A: Parenting Manual

The Road Ahead: An Occupational Therapy Manual to Infant Development for Parents in the NICU

By: Nicole Suzuki-Uyeno, OTR/L

INTRODUCTION

The purpose of this parenting manual and journal is to provide information regarding the neonatal intensive care unit (NICU), infant development education, basic baby care, family resources, and special considerations following discharge from the NICU.

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CHAPTER 1
Orientation to the NICU

INTRODUCTION

Welcome to the neonatal intensive care unit (NICU)! This parenting manual will serve as a guide to orient you to the NICU throughout your baby's hospital stay.

What to expect?
Once you are admitted to the hospital by your obstetric gynecologist (OB-GYN) to prepare for delivery, the neonatologist will visit you and your partner for a consultation to assess the possibility your baby will be admitted into the NICU. The neonatologist and OB-GYN collaboratively determine based upon your medical condition and if your baby may require further treatment in the NICU.

ROLE OF THE NICU TEAM

Before delivery
Prior to delivery, the NICU team will be in the delivery room or the operating room (O.R.), if having a cesarean section (c-section). The NICU team will be on stand-by for the delivery of your baby. The team consists of a NICU registered nurse and a respiratory therapist (RT or RCP).

After delivery
Once your baby is delivered by the OB-GYN, the baby will be carefully handed to the NICU team where they will perform their assessments. The NICU nurse performs the Dubowitz/Ballard Examination for Gestational Age and Apgar Scoring. Each baby is carefully assessed for signs of problems or complications after delivery. The NICU nurse will perform an overall physical evaluation of the baby to assess the gestational age and maturity. The baby's weight, length, head circumference, abdominal circumference, temperature, pulse, breathing rate, general appearance, skin, head and neck – fontanels ("the soft spot" on a baby's head), face, mouth. Lungs, heart sounds, genitalia, arms and legs are assessed and documented.

The NICU nurse checks the baby's Apgar score upon delivery. The Apgar score is given at one minute and five minutes after birth for heart rate, respiratory rate, muscle tone, reflexes, and color. Each of these areas can have a score

between zero, one, or two. The maximum number of points that can be accumulated is ten. Most babies score between an eight and ten. One or two points can be deducted for blue hands or feet due to poor circulation or if the baby is taking a long time to breathe.

If the baby Apgar score is low, scores are recorded at five-minute intervals until 20 minutes.

Once the NICU team has performed their physical assessment and Apgar scoring, if the baby is stable, they will immediately place the baby in an incubator and transport the baby to the neonatal intensive care unit (NICU) for further testing.

When the team arrives to the NICU, they will bring baby to their spot in the NICU which may be in a "bay" configuration (where there are other babies in the same area) or a private room depending on your hospital. The nurse will perform a Complete Blood Count (CBC). This is a blood test to detect possible medical conditions or disorders.

Depending on the prematurity of the infant, there is a possibility for intravenous (I.V.), peripheral artery, or umbilicus line that may be placed to provide nutrients and medication.

COMMON CONDITIONS IN THE NICU

- Anemia: Lack of red blood cells. Premature babies are anemic because they are born too early and do not have enough time to store iron in their body. There is a possibility that the baby might require a blood transfusion.

- Apnea: This occurs when there is a pause in the baby's breathing. Premature babies do not breathe regularly. If a baby stops breathing for more than 15 seconds, it is considered apnea.

- Bronchopulmonary dysplasia (BPD): Chronic lung disease that affects newborns when they are born prematurely and require oxygen. This causes a problem with how a baby's lung tissue develops.

- Respiratory distress syndrome (RDS): This occurs when an infant's lungs have not fully developed. There is not enough surfactant in the lungs. Surfactant is a substance that prevents the alveoli (the little tiny air sacs)

from collapsing when breathing.

- Heart defects and conditions
    - Bradycardia: Heart rate drops <80 BPM (beats per minute)
    - Tachycardia: Heart rate increases to >160 BPM
    - Patent ductus arteriosus (PDA): There is an opening between the major blood vessels of the heart
- Hypoglycemia: The glucose level in the blood is lower than normal
- Intrauterine Growth Restriction (IUGR): When the womb and the baby do not grow as big as they should
- Intraventricular Hemorrhage (IVH): When there is a bleed in the ventricles of the brain
- Jaundice: Yellow discoloration of baby's eyes and skin due to an increase in bilirubin levels
- Necrotizing Enterocolitis (NEC): Affects the intestines of premature infants. Bacteria enters the wall of the intestine and becomes inflamed

EQUIPMENT USED IN THE NICU

- Monitor: Displays the baby's heart rate, respiratory rate, and the oxygen saturation level
- Leads: 3 wires that are attached to the baby to measure the heart rate, respiratory rate, and oxygen saturation
- Pulse oximeter: Attached to the baby's foot or wrist to measure their level of oxygen

ROLE OF HEALTHCARE PROFESSIONALS

The NICU Staff are a group of individuals who work together to take care of your baby in the neonatal intensive care unit.

- **Charge Nurse:** The lead nurse that manages the unit and handles staff and patient concerns

- **Clinical nurse specialist (CNS):** A nurse with special training to educate families about their baby's medical condition

- **Lactation Consultant:** A person who is trained to help a mother with breastfeeding

- **Neonatologist:** A doctor that provides specialized care to babies that are ill, premature or require surgery

- **Nurse Practitioner:** A nurse with specialized training to care for sick or premature babies. They may also assist the neonatologist with procedures

- **Occupational Therapist:** A health care provider who evaluates and performs oral feeding, upper/lower extremity treatment, and addresses developmental concerns

- **Ophthalmologist:** An eye doctor who has specialized training with an infant's eyes and vision

- **Pediatrician:** A doctor who takes care of infants and children

- **Pharmacist:** A person who specializes in medicine, how they work, and provides medication for patients with different conditions

- **Physical Therapist:** A health care provider who evaluates and addresses movement, muscle strength, and coordination

- **Registered Dietician:** A health care provider who is a trained expert in nutrition

- **Registered Nurse:** A nurse who has specialized training in taking care of premature and sick infants

- **Respiratory Therapist:** A health care provider who cares for infants with breathing problems

- **Social Worker:** A health care provider who helps families cope while their baby is in the NICU. They also provide emotional support and help families with resources, and services

- **Speech and Language Therapist:** A health care provider that specializes in speech and language problems in children. They also help evaluate feeding and swallowing problems in the NICU

CHAPTER 2
Sensory Systems

A baby's sensory system slowly develops over the course of the pregnancy.

The following senses are developed in this order:

- **Touch:** Physical sensation that can be felt through the skin. Premature infants can feel temperature and pain.
- **Taste:** A baby can distinguish between sweet, salty, bitter, and sour.
- **Smell:** The sense of smell from a newborn is so strong that it can tell the difference between their mother's breastmilk and that of another mother. Of course, they will always choose their Mama!
- **Hearing:** Infant's ears are well-developed during birth. It could take up to six months for an infant to fully develop their hearing.
- **Sight:** Babies can visually track an object in the first few weeks of life. Babies respond to high pitched voices vs low pitch noises.

CHAPTER 3
Developmental Milestones

0-3 Month Milestone Checklist

COGNITION	✓
▪ Makes eye contact	
▪ Looks at toy for several seconds	
LANGUAGE	
▪ Cries to express different needs (e.g. hungry or tired)	
▪ Turns head towards noise or loud sounds	
▪ Coos and smiles	
MOVEMENT (Gross & Fine Motor Skills)	
▪ Able to bring hands to mouth (midline)	
▪ Pushes up on arms when laying on tummy	
▪ Lifts and holds head up when laying on tummy	
▪ Moves both hands and legs	
▪ Able to open hands then close hands to make a fist	
SOCIAL/EMOTIONAL	
▪ Looks at your face	
▪ Smiles when you talk to or smile at baby	
▪ Calms down when picked up or spoken to	
▪ Smiles or quiets at the sound of your voice	

**Developmental Milestone checklist created based upon the updated February 2022 guidelines provided by the American Academy of Pediatrics (AAP) and the Centers for Disease Control (CDC).*

DISCLAIMER: This is a checklist for parents and caregivers, but it is **does not** replace a formal developmental screening and evaluation performed by an occupational therapist and other skilled health professionals. It is advisable to seek the advice of a licensed healthcare professional.

CHAPTER 4
Basic Baby Care

Kangaroo Care/Skin-to-Skin

- The baby is held against their mother or father's chest on their bare skin.

- **INTERESTING FACTS:**
    - A baby is able to regulate their heart rate and respiratory rate with their mother
    - Performing skin-to-skin between a father and baby promotes bonding and attachment

Swaddling

- Using a baby blanket (not bulky), a baby can be swaddled from birth up to 3 months old before they try to break out of a swaddle
- Swaddling promotes comfort, calming, and safe sleep practices

Diapering

- Putting a diaper on a baby and cleaning them up can be a little tricky because baby's love to wiggle and move around
- First, set-up your diaper station with a clean diaper, wipes, and a soft pad for baby to lay on
- Next, unfold the clean diaper and place it under your baby
- Clean your baby's discreet areas with a baby wipe or warm washcloth
- For girls: Make sure to wipe from front to back to prevent possible urinary tract infections (UTIs)
- Once you're done, dispose of the diaper and wipes in the garbage. You're good to go!

Swaddle Bathing

- In the NICU, we teach the parents how to perform a swaddle bathing using a large thin blanket
- Next, you're going to swaddle your baby and place them in the infant bathtub

- Each limb is individually washed while the other limbs remain submerged in the water until you move to the other side
- Swaddle bathing provides a safe environment for baby and helps him feel more secure

Infant Massage

- Infant massage is a great way to bond with your baby! By providing gentle massage, you can help to calm your baby when he is fussy, relieve stress, it can help to ease discomfort or pain, and will help soothe your baby to a more comfortable night's rest.

CHAPTER 5
Feeding & Nutrition

Infant-Directed Feeding/Infant-Driven Feeding (IDF)

The baby expresses when they are hungry and ready to eat through their feeding cues.

Feeding Cues:

- Rooting: Baby will turn their head towards the breast to find their mother's milk
- Baby bringing their hand(s) to mouth
- Sucking on a pacifier, hand or thumb
- Crying when hungry

Guidelines for the amount of milk that a NICU baby should be provided per feeding:

- In the first 2 weeks: 1 to 2 ounces (30-60mL) per feeding per day
    - Your baby should have 8 to 12 feedings per 24 hours

- By 1 month: 2 to 4 ounces (60-120mL) per feeding per day
    - Your baby should have 6 to 8 feedings per 24 hours

- By 2 months: 4 to 6 ounces (120mL-180mL) per feeding per day
    - Your baby should have 5 to 6 feedings per 24 hours

- By 3 months: 6 to 7 ounces (180-210mL) per feeding per day
    - Your baby should have 5 to 6 feedings per day

The feeding recommendations are a general guideline. Please follow your pediatrician's instructions and speak with a licensed healthcare professional for further guidance with feeding questions or concerns.

Breastfeeding

Breastfeeding is when a mother places the baby at her breast to provide nutrients to the baby with her milk

- Frequency and duration of feedings for a breastfeeding infant is provided on-demand every 2-4 hours when your baby is awake

Breastfeeding Positions:

- Cradle
- Cross Cradle
- Football hold
- Laid back
- Sidelying

Bottlefeeding

Bottlefeeding is when a parent/caregiver feed the baby milk with a bottle and nipple.

- Frequency and duration of feedings for a bottlefed infant is every 3 hours

- Types of nipples
  - Slow flow
  - Medium flow
  - Fast flow

- Types of Bottle Systems used in the NICU – Enfamil, Similac, Dr. Brown
  - Dr. Brown Ultra Preemie nipple
  - Dr. Brown Preemie nipple
  - Transitional nipple (previously known as Newborn nipple)
  - Level 1
  - Level 2
  - Level 3
  - Level 4
  - Y-cut nipple (for thickened feedings)

- **Specialty Bottles**
  - PIGEON Nipple Bottle System or Dr. Brown Specialty Feeding System:
    - One-way valve bottle for cleft lip and palate, babies with low muscle tone in neck/face

CHAPTER 6
Caregiver Role & Parent Education

Caregiver Role

- Supporting spouse/partner/family member with baby
    - e.g. bottlefeeding baby while mother is pumping breastmilk, wash bottle parts while mother is performing Kangaroo Care
- Reading to infant to promote language and brain development
- Journaling while visiting baby in NICU or at home to express emotions and promote stress relief

Parent Education

- **Safe Sleep Practices:**
    - **Sudden Infant Death Syndrome (SIDS)** is a large reason for infant-related deaths.
    - Back-to-Sleep: Babies should be placed on their back to sleep.

    - **DO:**
        - Babies should be placed in a crib, bassinet, or portable play yard with a firm and flat mattress.

        - Ensure that the crib sheet is tight.

        - Infant sleepsacks are a great way to provide containment while keeping baby safe. You can find these at your local store or online.

        - Dress your baby in an appropriate amount of layers based upon the temperature of your house. If your baby is dressed in too many layers of clothing and/or blankets, your baby may overheat and could possibly lead to death.

        - The crib should only have a mattress sheet, mesh (breathable) crib bumper (optional).

        - Breastfeed if possible.

- **DO NOT DO THE FOLLOWING:**
    - Babies should not co-sleep in the same bed with you or any other family members as this can lead to suffocation or death.

    - Do NOT put stuffed animals, pillows, blankets, and crib bumpers in your baby's crib. Your baby could get caught in these items and suffocate which can lead to death.

    - Avoid placing your baby on a soft surface like a couch.

    - For families with twins, triplets, or multiples, please do not co-sleep your babies in the same crib.

    - Avoid smoking.

Discharge Resources

- **Life after the NICU and other special considerations**
    - Outpatient services
        - **Infant Stimulation Teacher**: Local public health child development centers

        - **Occupational Therapy (OT), Physical Therapy (PT) and Speech-Language Therapy (ST)**: These therapies help patients with developmental, oral-motor, feeding, and speech services

        - **Autism, High-Risk Infant Clinic, and Developmental Clinics**: These are different types of follow-up clinics that your neonatologist or pediatrician may recommend in assessing your baby as they grow-up. These clinics evaluate the need for early intervention services or rehabilitative therapy services

National Resources

American Academy of Pediatrics (AAP): https://www.aap.org/

Centers for Disease Control (CDC): https://www.cdc.gov/

March of Dimes: https://www.marchofdimes.org/

National Parent Helpline: https://www.nationalparenthelpline.org/find-support/state-resources

JOURNAL

Concerns for my baby:

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What makes my baby happy:

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How is my baby's personality forming:

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What makes my baby upset:

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The best part of today:

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APPOINTMENTS

Date	Time	Doctor/Medical Procedure	Details

Questions for the doctor and/or my healthcare team:

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Reminders:

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JOURNAL

Thoughts:

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Curriculum Vitae

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EDUCATION

University of Nevada, Las Vegas, 2022 (In Progress)
Post-Professional Doctorate of Occupational Therapy

Touro University Nevada, 2009
Master of Science, Occupational Therapy

University of Nevada, Las Vegas, 2005
Bachelor of Science, Kinesiological Sciences

AWARDS

- **PIH Health Employee Service Award**, December 2019
- **Touro University Nevada Community Impact Award**, October 2018

TEACHING EXPERIENCE

- NICU to Entry-Level OTD students mental health class (November 2020)
- Mindfulness Meditation to Entry-Level OTD students (October 2020)

CLINICAL EXPERIENCE

- **PIH Health Hospital – Whittier**, Whittier, CA, 2014-2021
- **Kaiser Permanente**, Los Angeles, Downey, Baldwin Park, CA, 2016-2018
- **City of Hope**, Duarte, CA, 2014
- **Citrus Valley Health Partners: Queen of the Valley Medical Center**, West Covina, CA, 2013-2014
- **Western Medical Center**, Santa Ana, CA, 2013
- **Riverside Community Hospital**, Riverside, CA, 2012-2013
- **Hallmark Rehabilitation: The Heights at Summerlin**, Las Vegas, NV, 2012

- **Let's Talk Rehabilitation**, Las Vegas, NV, 2012
- **Functional Pathways: Nevada State Veterans Home**, Boulder City, NV 2012
- **Supplemental Health Care**, Las Vegas, NV, 2011-2012
- **Advanced Healthcare of Las Vegas**, Las Vegas, NV, 2011-2012
- **Progressus Therapy: Clark County School District**, Las Vegas, NV, 2011
- **Covenant Care: Silver Hills Health Care Center**, Las Vegas, NV, 2009-2012

PROFESSIONAL PRESENTATIONS

- **Infant-Directed Feeding,** August 2014
- **Small Baby Neuro-Protective Bundle (Taught lecture and skills lab to PIH NICU Staff regarding developmental care to the VLBW Premature Babies),** November 2015
- **Neonatal Infant Massage,** November 2016
- **Positioning of the NICU Infant,** August 2018
- **Neonatal Abstinence Syndrome Non-Pharmacological Bundle,** January 2019

PROFESSIONAL TRAINING

- **NBCOT Certification,** March 2025
- **American Heart Association, CPR & AED,** July 2022
- **Neonatal Touch & Massage Therapist Certification (NTMTC),** October 2015
- **Lactation Educator Certification (CLE),** August 2015
- **California Children's Services Paneled Certification (CCS),** May 2015

PROFESSIONAL LEADERSHIP COMMITTEES

- **NICU Partnership Council (PC):** Monthly meeting to discuss updates hospital-wide and NICU, assist with evidence-based PC Projects, 2018 – Present
- **Children's Hospital of Orange County (CHOC) Morbidity & Mortality Conference:** Quarterly meeting through collaboration with the PIH/CHOC neonatologists, nurse educators, NICU nurses and occupational therapists, 2014 – Present
- **NICU Developmental Care Committee:** Quarterly meeting to discuss current evidence-based research, update protocol and educate staff on developmental care in the NICU, 2014 – Present

- **NICU Feeding Committee:** Quarterly meeting to discuss current evidence-based research, update protocol and educate staff on feeding research in the NICU, 2014 – Present

PUBLICATION/WORKS IN PROGRESS

The Road Ahead: An Occupational Therapy Manual to Infant Development for Parents in the NICU, University of Nevada, Las Vegas, In Progress, May 2022

PROFESSIONAL AFFILIATIONS

American Occupational Therapy Association (AOTA)
National Association of Neonatal Therapists (NANT)
Occupational Therapy Association of California (OTAC)