Nutrition at NICU Discharge for the Preterm Infant

Featuring:

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TRANSCRIPT

Narrator: Case studies are an excellent way to learn concepts to apply in clinical practice. Welcome to Abbott Nutrition Health Institute's Clinical Case Study Series, helping expand the knowledge of nutrition management in clinical practice through case study presentations.

Today's case study will highlight nutrition management strategies for the preterm infant upon discharge from the Neonatal Intensive Care Unit. Our presenter is Stephanie Merlino Barr, a Neonatal Registered Dietitian Nutritionist with MetroHealth Medical Center in Cleveland, Ohio.

Stephanie Merlino Barr: Let's begin with a quick knowledge check. True or false? Does adding powdered preterm infant formula to expressed breast milk provide a feed that is nutritionally equivalent to expressed breast milk with human milk fortifier?

The answer to this question is false. While sprinkling powdered formula into expressed breast milk can achieve similar energy density as fortified breast milk, this method of human milk enrichment does not achieve the same protein and micronutrient concentration as fortified human milk. For infants with a history of extreme prematurity and nutritionally complex hospital stays at NICU discharge, these infants may have nutritional requirements that are similar to the 2022 ESPGHAN Preterm Infant Enteral Nutrition Requirements, which are listed here.

While human milk alone may be used to meet the volume and energy requirements of these infants, it may not be sufficient to meet the protein and micronutrient requirements. You can see that fortifying expressed breast milk using the typical one packet of human milk fortifier to 25 mls breast milk or alternating direct breastfeeding with fully fortified human milk bottle feeds or alternating feeds with expressed breast milk or direct breastfeeding with 24 calorie per ounce preterm infant formula.

All of those plans provide distinctly different protein and micronutrient provisions that may be better suited to a preterm infant, at NICU discharge. In thinking about preterm infant discharge formulas, those are products that are typically 22 calorie per ounce and have higher protein and micronutrient compositions compared to term infant formulas but are less concentrated than preterm infant formulas. The research for prolonged utilization of these preterm discharge formulas is strongest to support the extended use in these products for infants born less than 1250 g.

Both the American Academy of Pediatrics and the European Milk Bank Association state that there may be benefits of human milk fortification following NICU discharge. They also state that fortification post NICU discharge is safe, and that there have been no documented deleterious effects of fortification post NICU discharge in the published literature.

When thinking about preterm discharge formula use, I do as follows. For infants who are born less than 750 g, I tend to use those products until an infant is 12 months corrected age, whereas infants who are born at a larger size, say 1500 to 2000 g, I tend to use those products until a 3 to 6 month corrected age point.

For infants that are taking 100% of their intake of a preterm infant formula or fully fortified breast milk, I'll use that plan until an infant reaches a weight of 3.6 kg. For discharge plans that involve a combination of unfortified breast milk, partially fortified breast milk, and a partial component of preterm infant formula, I may use those tools for slightly longer because they're not providing 100% of the preterm infant nutrition plan.

For our case study, we'll be looking at baby girl Elle B.W. Elle was born at 30 weeks post menstrual age. Her NICU course was significant for bronchopulmonary dysplasia, a septic workup which resulted in multiple disruptions in her enteral nutrition provision, which culminated in metabolic bone disease of prematurity. So, Elle is very nutritionally high risk, but we wanted to make sure that we were continuing to address her high unique nutrition requirements following NICU discharge. What are baby's estimated nutrition requirements? Next, what are family’s feeding goals? And finally, what is available and accessible to family following NICU discharge?

So, let's apply these questions to baby Elle B.W. Given her slow growth and no nutrient deficit, she had an elevated nutrition requirement of over 120 kcal/kg/day, 3.5 g/kg/day protein, and at least 3 mmol/kg/day of calcium, 2.2 mmol/kg/day of phosphorus, and 2 mg/kg/day of zinc. Family had a stated desire to continue a combination of direct breastfeeding and bottle feeding. There was a known issue of insufficient expressed breastmilk supply, with Mom producing approximately 30 to 50% of infant's daily volume requirements, despite frequent lactation follow up and many interventions to try to address Mom’s lower expressed breastmilk supply. Knowing Elle's very high nutrition requirements, we wanted to utilize preterm infant nutrition products.

We knew that this patient was WIC eligible and was going to be followed by an outpatient Registered Dietitian Nutritionist (RDN). We were able to provide this family with this concentrated, preterm infant formula, utilizing an industry sponsored NICU nutrition program, so these supplies were mailed directly to the patient's home. We saw that Elle continued to gain weight really well, meeting our weight gain growth goals of 30 to 35 grams per day. Linear growth we can see here continues to increase steadily but not quite catching up yet. Following NICU discharge, linear growth catch up tends to take a little bit longer than weight gain catch up growth. Looking at Elle's catch-up growth as well as her continued good linear growth, paired with our ability to meet Mom's specific lactation goals for her infant, I view this nutrition discharge plan as an overwhelming success.

Understanding available resources to create a preterm infant discharge nutrition plan is incredibly important. These resources include industry-sponsored NICU discharge nutrition programs, insurance coverage, the Women, Infants and Children Supplemental Nutrition Program, or WIC or SNAP benefits. Additionally, it may be helpful as a clinician to understand different resources available to help you calculate different nutrition plans for home going. Different calculation tools that are available include WebNova, as well as educational resources like the Pocket Guide to Neonatal Nutrition, which gives an outline on how to perform calculations that are useful in creating a discharge nutrition plan.

Let's conclude on some important concepts. A Registered Dietitian Nutritionist (RDN) should be involved not only in the team preparing for an NICU discharge, but also in following up with a patient after NICU discharge. Nutritional requirements of discharging preterm infants need to be individually determined. Nutrition plans at NICU discharge need to account for nutrition requirements, family's feeding and lactation goals, and the feasibility of a nutrition plan.

Narrator: For more information on neonatal nutrition, visit anhi.org/education.