

“Prehab” for Preemies: Thoughts on Human Milk for the NICU Patient

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The National Perinatal Association (NPA) is an interdisciplinary organization that strives to be a leading voice for perinatal care in the United States. Our diverse membership is comprised of healthcare providers, parents & caregivers, educators, and service providers, all driven by their desire to give voice to and support babies and families at risk across the country.

Members of the NPA write a regular peer-reviewed column in Neonatology Today.



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This August, the theme for National Breastfeeding Month is **Together We Can Do Great Things**. The focus is to celebrate the power and impact of our collective

efforts to ensure that all newborns, especially preterm and critically ill infants, have access to their mother’s milk and optimally to an exclusive human milk diet (EHMD).

For millennia women have labored, delivered, and breastfed their term babies. Over the past sixty years, we have seen the emergence of the disciplines of reproductive technology, high-risk perinatology, and neonatal intensive care. These clinical specialties provide the science, technology, and professional personnel to support the survival of the most extremely low birth weight (ELBW) premature infants and term infants with life-threatening morbidities.

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Such births can result in interruptions and difficulties in establishing and maintaining the mother’s lactation efforts to provide her milk for her infant. It is the role of the entire health care team to support the mother’s efforts to provide her milk for her infant. The American Academy of Pediatrics (2022) advocates exclusive breastfeeding for the first six months of life. For very low birth weight infants (≤ 1500 grams), the **mother’s expressed milk should be considered medical therapy, with higher doses associated with maximal health benefits**. The American Academy of Pediatrics (AAP) further recommends pasteurized donor human milk when a mother’s milk is unavailable or is contraindicated. Fortification of mother’s or donor milk with bovine or human milk-derived hu-

man milk fortifiers should be considered to optimize appropriate growth and development in infants with very low birth weight (VLBW). (1)

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Human milk is so much more than just food, and it does so much more than just provide for growth. Human milk is a biological substance that is part of an evolutionary process that begins early in gestation. During the first six weeks of fetal development, a substance called womb milk provides some limited protein and immune system effects. It will be followed by the development of the placenta and amniotic fluid. After birth, the infant is exposed to colostrum and finally to the mother’s own milk. (2)

Premature birth interrupts this critical process of gut development and maturation. Maternal and infant factors associated with preterm delivery further drives “dysbiosis,” an associated inflammatory process in the infant’s gut. (3) Literature supports that exposure to more than 100,000 components present in human milk, many of which are immune factors and anti-inflammatory, “affords survival benefit” for term and preterm infants (4). This co-adaptation of maternal physiology, breastmilk composition, and infant physiology merge to form what has been referenced as a “global immunologic organ” for the newborn infant. (5)

Neonatologist and clinical researcher Dr. Mark Underwood has stated that “The growth and neuro-developmental needs of the evolutionarily new population of very premature infants are best met by the appropriate fortification of human milk.” (6) Emerging evidence in the field of human milk science is compelling about the benefits of human milk in down-regulating inflammation and limiting the development of neonatal comorbidities. Three recent papers have identified aspects of the benefits of human milk feeding. This includes the “Mother-Breastmilk-Infant Triad” (7), “Human Milk as a “Biological System” (4), and the “Gut-Breast Axis” (8). These systems play a role in the development of the infant’s microbiome, maturation of their immune system, limiting inflammation, and reducing the incidence of neonatal comorbidities. The comorbidities of prematurity include necrotizing enterocolitis, bronchopulmonary dysplasia, retinopathy of prematurity, and late-onset sepsis. They have been described in the literature as the “burdens of prematurity” (9) for the infant, family, medical, educational, and societal services.

“Emerging evidence in the field of human milk science is compelling about the benefits of human milk in down-regulating inflammation and limiting the development of neonatal comorbidities. Three recent papers have identified aspects of the benefits of human milk feeding. This includes the “Mother-Breastmilk-Infant Triad” (7), “Human Milk as a “Biological System” (4), and the “Gut-Breast Axis” (8).”

Another way to look at the role benefits of human milk diets for all infants, especially premature infants, relates to the term “prehab.” Most of us employed in health care are familiar with the term “rehabilitation.” It is defined as “the action of restoring something that has been damaged to its former condition.” Initially, I read about the term in an interview with Tom Brady, currently quarterback of the Tampa Bay Buccaneers. Many sports fans know some basic things about his football career, but few know the breadth of his career accomplishments:

- He is 45 years old
- Has the highest winning percentage among quarterbacks
- Started 316 of 318 games
- Most regular season wins
- Seven times Super Bowl Champion
- Five times Super Bowl MVP
- Most wins in regular season play
- Lifetime leader in passing yards

He credits much of his football success to his commitment to “prehab.” Not rehab. Prehab can be defined as a preventive mechanism to decrease the risk of injury and/or optimize your functional ability and quality of life. Prehab focuses on efforts to” decrease

the burden on individuals and the healthcare system.

So I invite you this month to focus on breastfeeding and the use of breastmilk for our vulnerable Populations to remember the many benefits of human milk diets as a form of “prehab” in term infants. The American Academy of Pediatrics demonstrated reductions in Sudden Infant Death Syndrome (SIDS), otitis media, asthma, childhood obesity, Type 1 and Type 2 diabetes, leukemia, and other diseases. Similar reductions were noted in diabetes, gestational diabetes, hypertension, and breast and cervical cancer in the mothers who breastfed their infants. Premature infants who received an exclusive human milk diet demonstrated reductions in necrotizing enterocolitis, bronchopulmonary dysplasia, necrotizing enterocolitis, and late-onset sepsis.

“So let us move forward promoting and supporting breastfeeding for all infants. Let us work toward the goal of “pre-habing” our infants - term and preterm -from lifelong comorbidities that both restrict and potentially shorten their lives and limit their possibilities.”

So let us move forward promoting and supporting breastfeeding for all infants. Let us work toward the goal of “pre-habing” our infants - term and preterm -from lifelong comorbidities that both restrict and potentially shorten their lives and limit their possibilities. The U.S. Breastfeeding Committee has a vision of healthy, thriving families and communities. However, the committee also reminds us that reaching that goal cannot be achieved by anyone or just by one organization. It happens with a daily effort by us all and by working together to make a change.(12) We at the National Perinatal Association look forward to celebrating all efforts in service to babies, families, and human milk feeding during August.

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Disclosure: The National Perinatal Association www.nationalperinatal.org is a 501c3 organization that provides education and advocacy around issues affecting the health of mothers, babies, and families.

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