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SCIENCE ON YOUR SEAT

Perspectives in **Nutrition**

Supporting the Supplementers: The Clinician's Role In Protecting Breastfeeding Duration in the Setting of Combination Feeding

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Human breast milk is the ideal food for babies. The benefits of breast milk and breastfeeding are well known, and many health agencies, including the World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC), are consistent with their recommendations for breastfeeding and the use of human milk as suggested by the American Academy of Pediatrics (AAP). The AAP policy statement on breastfeeding and human milk supports exclusive breastfeeding for approximately six months after birth and "continued breastfeeding, along with appropriate complementary foods introduced at about six months, as long as mutually desired by mother and child for 2 years or beyond."[1] The majority of families initiate breastfeeding, but despite expert recommendations and the stated health benefits of breastfeeding to infants and their parents, breastfeeding rates decline over the first year of life. The CDC 2022 Breastfeeding Report Card indicates that while 84% of infants start out breastfeeding, 57% remain exclusively breastfeeding at one month and as infants approach the 6-month mark that exclusive breastfeeding number drops to just 25%.[2] Numerous parents choose to feed their baby both breast milk and infant formula at some point in their baby's first few months. Alternative feeding options, including the use of infant formula, are utilized when the parent's own milk is not available. This is referred to as combination feeding, mixed feeding, or supplementation.

As many families do not achieve their own breastfeeding goals and subsequently turn to supplementation, it becomes imperative that parents are provided compassionate support and receive knowledgeable care for mixed feedings before their baby is 6 months old. Parents prefer informed healthcare providers who have up-to-date breastfeeding knowledge and can provide individualized breastfeeding care. In addition, maternity care practices have been shown to have significant and lasting impacts on infant feeding outcomes. Importantly, clinicians play a vital role in triaging breastfeeding issues, identifying who would benefit from supplementation, and navigating formula selection.

Learning Objectives

- Identify indicators for breast milk supplementation of healthy term infants
- Navigate infant formula selection for long- and short-term supplementation
- Describe strategies for protecting breastfeeding duration for families needing supplementation

Who Are the Supplementers?

Indications for supplementation

While exclusive breastfeeding is ideal, any amount of breastfeeding or breast milk is valuable to an infant's health,

development, and immunity. Parents have several reasons why they may choose to supplement their breast milk.

Medical indications for the parent or the infant may lead a family to utilize supplementation. An infant may require supplementation if they are struggling with growth and weight gain, have hypoglycemia, persistent jaundice, or were born prematurely. Alternatively, a mother or parent may want or need to add supplementation into their baby's diet if they have anatomical challenges such as a history of having breast surgery or have a medical condition that inhibits the ability to establish a full milk supply. *(See risk factors for suboptimal lactation.)*

Additionally, a family may select supplementation if they prefer a shared feeding experience and shared parent responsibility. Some mothers or parents utilize supplementation as a way to reduce their perceived stress through times of travel or when they return to work. A recent literature review published in 2022 summarized relevant evidence on the relationship between breastfeeding and maternal mental health.[3] Approximately 20% of women are impacted by perinatal depression during pregnancy and three months postpartum. The conclusion of the review reported that depression may lead to early cessation of breastfeeding.[3]

Difficulties with the mechanics of breastfeeding may cause a parent to turn to supplementation. Common issues include breast pain and discomfort with breastfeeding, inability to latch baby, and low or perceived low milk supply. Women report that low milk supply is the most common reason for early breastfeeding cessation.[4] Parents want to be understood and feel their concerns have been heard when seeking support.[5] Expert nutritional and lactation guidance is essential when triaging common lactation risk factors for suboptimal lactation.

Risk factors for suboptimal lactation

While intention to breastfeed is at a contemporary all-time high, risk factors for suboptimal lactation like obesity and metabolic disorders are also at all-time highs. Awareness of these risk factors and attenuation strategies are needed in perinatal healthcare. In their landmark policy update on breastfeeding infants greater than 35 weeks gestation, physicians from the Academy of Breastfeeding Medicine (ABM) identify maternal risk factors for the delay in secretory activation of mature breast milk production until day four or later. These maternal risk factors include primiparity, cesarean delivery, polycystic ovary syndrome, advanced maternal age, infertility, lack of perceived increased breast size during pregnancy, and a body mass index (BMI) greater than 27.[6] **The prevalence of delayed secretory activation is 1 in 5 multiparas and 1 in 3 primiparas.** ABM also describes risk factors for a complete lack of secretory activation, such as breast hypoplasia or hormonal disruption, of which at least 1 in 20 mothers experience. Beyond the risk of delayed/lack of milk onset, other prenatal, intrapartum, postpartum, and infant risk factors for suboptimal lactation are described, including gestational age of less than 38 6/7 weeks.[6]

When breastfeeding is not going as planned

Rapidly rising rates of many of the risk factors for suboptimal lactation previously listed have a direct impact on a family's breastfeeding journey. The ABM states in its updated policy algorithm that "risk factors should inform the threshold for supplementation."[6] Therefore, if the colostrum phase of lactogenesis is prolonged and the infant experiences symptoms of insufficient intake, clinicians will need to guide parents through their options for supplemental nutrition.

Human milk as a supplement

In an effort to maintain exclusive breast milk feedings for their infants, parents often inquire about the availability of donor human milk. Some U.S. hospitals are providing banked donor milk (BDM) to healthy term infants for medically indicated supplementation, but in most facilities, BDM is reserved for high-risk infants. When BDM is not an option, parents may turn to informal milk-sharing (IMS). The ABM position statement on IMS for the healthy term infant provides excellent guidance for clinicians charged with assisting families in their quest to maintain their infant's access to the benefits of breast milk while mitigating any health risks associated with community-based IMS. The ABM highlights two important strategies: 1. Medical screening of the donor, and 2. Safe milk handling practices. It provides practical and detailed instructions for ensuring that both strategies are successful. The ABM

> **"Physicians and other healthcare providers can help mothers and families evaluate the risks and benefits of informal milk sharing while making informed infant nutrition decisions."[6]**

strongly discourages internet-based breast milk sharing "since the donors are unknown to the recipient and/or cannot be medically screened and the milk is often not suitable for consumption upon arrival."[6]

While working with families to maximize mother's own breast milk production and, if other safe sources of human milk are unavailable, clinicians will then provide guidance for the family's next best option for supplementation.

What Are the Considerations When Choosing a Formula for Supplementing Families?

Choosing a formula

Infant formula is created to mimic the composition of human milk. Numerous infant formulas are available and there is not any one specific brand or type that is best for all babies. Commercially prepared infant formula is a nutritionally complete alternative to breast milk. Its nutrient profile is regulated by the U.S. Food and Drug Administration (FDA) to ensure it contains vital ingredients that growing babies need to thrive. Parents and families may ask about making their own infant formula; however, homemade infant formula is highly discouraged as it may be unsafe, nutritionally incomplete, and lead to health problems for their infants.[7] Similarly, illegally imported infant formulas from other countries are precarious as they may not have been stored or shipped properly. The notion that formulas from other countries are nutritionally superior for babies than those manufactured in the U.S. is not based on scientific evidence. Formulas that are imported to and legally sold in the U.S. are reviewed by the FDA and must meet U.S. safety and nutritional guidelines.[8] Determining what formula to utilize for supplementation is largely based on the intention for supplementation.

Short term supplementation

During temporary and short-term periods of formula supplementation, consider the use of a protein hydrolysate formula. The ABM protocol on supplementation for the term healthy neonate endorses the utilization of protein hydrolysate formula in situations where supplementation may be temporary.[9] Intact cow's milk protein exposure is avoided when using protein hydrolysate formulas, and research has shown that protein hydrolysate formulas can help reduce bilirubin levels and support the resolution of jaundice.[10] In newer studies, researchers found that infrequent exposure to cow's milk-based formula, specifically shortly after birth, should be avoided to prevent allergic disease as occasional exposure to cow's milk-based formula was a risk factor in developing IgE-mediated allergic disease.[11]

Long term supplementation and combination feeding

Recent evidence suggests that early regular daily consumption of at least 10 mL of cow's milk protein-based formula between 1 and 2 months of age may help prevent cow's milk protein allergy (CMPA) development.[12] Additionally, choosing a formula that contains lactose is important. Lactose is a naturally occurring sugar in human milk that is responsible for optimizing an infant's microbiome with beneficial bacteria, provides a rich energy source, and aids in the absorption of iron and calcium. Families that plan to utilize formula daily during longer-term supplementation, such as combination feeding, should consider the use of standard cow's milk protein and a lactose-containing formula.

How Clinicians Can Provide Timely Support for Supplementers

Antenatal guidance for protecting breastfeeding duration

The evidence regarding antenatal breastfeeding education indicates that interactions, which include developing coping mechanisms for what to do when breastfeeding isn't going as planned, and antenatal education that is paired with in-person postpartum support have the most impact on breastfeeding duration beyond 12 weeks.[13] Armed with information regarding risk factors for suboptimal lactation, clinicians can provide anticipatory guidance for at-risk families. For example, a 39-year-old mother with diagnoses of obesity and polysystic ovary syndrome (PCOS) can be provided education on the powerful impact of postpartum expression of colostrum early and often to both provide additional intake for the baby and to maximize her milk production.[14] She and her family can be informed of the chance that her milk volume may not increase quickly and have a plan of action ready to implement during the critical milk production calibration window. Consulting with a knowledgeable lactation care provider during the wait time for a one-hour glucose challenge test is an ideal opportunity to review risk factors, perform a physical exam to screen for possible anatomical challenges, order appropriate breast pumping supplies, and develop an individualized, risk-appropriate plan of lactation care that includes education on breastfeeding-friendly supplementation types and routes, in the event it becomes necessary.

Teaching parents how to protect their long-term breastfeeding duration goals through their short-term challenges is essential.

Early postpartum care—a call for a paradigm shift

Jane Morton, M.D., and her team from Stanford University proposed a re-framing of lactation support that includes risk stratification for care.[14] For the low-risk dyad, a continued focus on breast attachment, followed by breast milk production and then calories for the newborn are appropriate, but for dyads at risk for delayed milk onset or other challenges, adjusting the priorities to first calories, then milk

production, then breast attachment can be protective to both short-term newborn well-being and long-term breastfeeding duration. Inpatient perinatal programs, in addition to outpatient obstetric and pediatric clinics, can utilize the algorithm provided by the ABM and the protocol developed by Dr. Morton to update policies and procedures.[5] By placing priority on the establishment of robust milk production by 7-10 days post-delivery, clinicians can help the breastfeeding family protect their long-term breastfeeding goals.

If challenges arise that necessitate supplementation, a layered approach to infant feeding is often recommended—to include some breastfeeding, some pumping, and some supplementation—often referred to as "triple feeding." While valuable for protecting both the breast milk production and the breastfeeding relationship, some parents—particularly if they were unprepared for challenges and/or are receiving conflicting messages from health care professionals—become overwhelmed by the surprising difficulty they are experiencing. If both birth and breastfeeding are not going the way they envisioned, psychological pain is added to the physical pain of recovering from delivery. When faced with a multi-step process to feed their babies, parents may become overwhelmed. Clinicians can reassure them by using the catchphrase "milk out, milk in" and communicating that if milk is coming out of the breasts every time milk is going into the baby, we are protecting your long-term breastfeeding options. Because processing new information and learning new behaviors is challenging during this time, the aforementioned simplified framework can be helpful.

For families whose infants are not ready for full breastfeeding or are awaiting increased maternal milk production, a manageable combination feeding plan is needed. For day and night feeding routine options that include practicing breastfeeding, offering supplemental milk, and expressing breast milk to build and sustain milk production until a full transition to the breast is possible, see Figures 1 and 2. Note: If a mother is managing infant feedings without help, the "triple feeding" or daytime option should be limited to 3-5 days, as it is not a sustainable long-term routine for most families.

Transitional care

Introduction of solid foods

Pediatric clinicians often facilitate a breastfeeding family's transition from one developmental stage to another. For example, when introducing solid foods, clinicians can emphasize the importance of nutrient-dense offerings (such as mashed avocado and pureed meats) and remind parents that the solid foods are supplemental to the liquid portion of the infant diet (breast milk or formula), which remains the priority for optimal growth and development during the introductory months.

Maternal return to work

Another key transitional time in a family's breastfeeding journey is when the nursing mother returns to work outside the home. The latest U.S. Census found that 67% of women return to work during the first 12 months following delivery, and, horrifically, a Department of Labor survey revealed that nearly one in four mothers were back at work within two weeks of delivery.[15] Families often turn to their pediatric clinicians for support during this time, particularly when breast milk production begins to falter under the pressures of separation, elevated stress, and partial pump dependency. An excellent reference for parents and clinicians is Working and Breastfeeding Made Simple by Nancy Mohrbacher.[16]

Ideally, each family would have a return to work consult with a lactation care provider, but all clinicians can provide anticipatory guidance as well as acute care by considering four aspects of breastfeeding maintenance for the working family. *(See Figure 3: Return to Work Considerations.)*

First, consider the logistics: When and where will she pump? Does she need assistance with communicating her needs to her supervisor? A letter of medical necessity from her healthcare provider, along with a copy of state/federal laws regarding milk expression at the workplace, can be a vital tool for a mother returning to

Figure 1: Daytime Feeding Routine – 30 Minutes Total

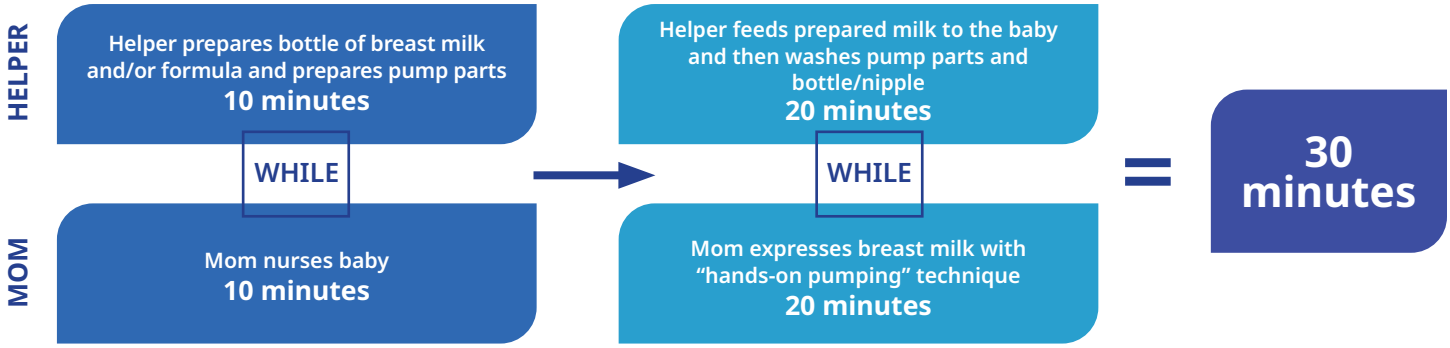

Figure used with permission by Gloria Dudney, 2024.

Figure 2: Nighttime Feeding Routine – 20 Minutes Total

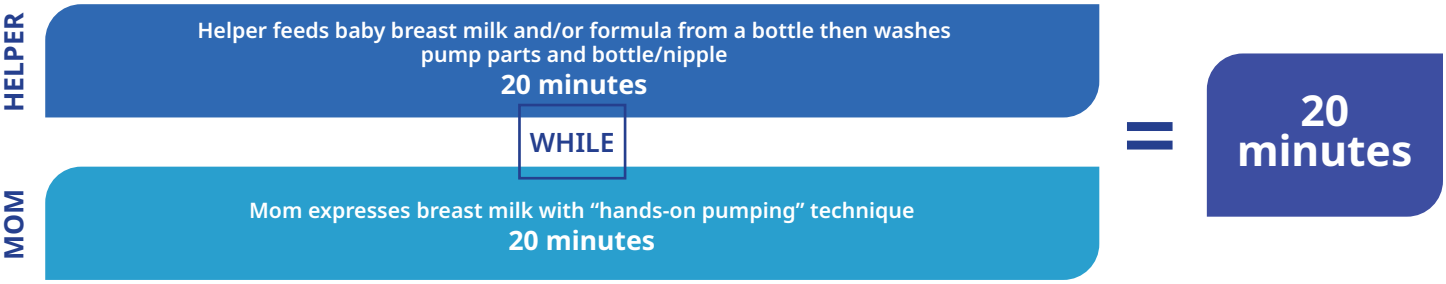

Figure used with permission by Gloria Dudney, 2024.

a work environment where there is no precedent for pumping on breaks.

Second, mechanics: Which pump and flange will she use? Although technology is improving, many of the wearable pump types—particularly the ones covered by insurance—are ineffective at milk removal, placing long-term milk production at risk. In addition, the breast shields, or flanges, provided by pump manufacturers are often too large, placing her at risk for nipple pain and trauma in addition to ineffective milk removal. Precise measurements of the nipple diameter, taken before any stimulation from nursing or pumping, are essential to ensuring a good fit.

Third, hormones: Are there exogenous or endogenous hormonal barriers? The endocrine system of postpartum bodies can present complex challenges, and the interplay of appropriate hormones is vital to continued lactation. If a mother is experiencing milk production challenges following her return to work, clinicians can investigate pumping frequency to support prolactin levels, screen for abnormalities in thyroid hormone levels, obtain a history of any hormonal contraception, and educate her regarding strategies to increase oxytocin response during pumping.[17]

Finally, emotions: How is she feeling about this transition? Acknowledgement by the clinician of the difficulty of separation and increased pressures of modern family life on the physiology and psyche of a nursing mother is itself valuable. But further support via referral to a perinatal mental health counselor may be indicated, particularly if either parent has an elevated postpartum depression score or verbalizes that they are not coping well. For acute needs, families can call the National Maternal Mental Health Hotline at 1-833-TLC-MAMA.

It's not all or nothing

To eventually reap the profound long-term maternal, infant, and societal benefits of breast milk-feeding, a robust production of breast milk must first be established and protected in the short term. Clinicians play a vital role in providing the right information at the right time. But sometimes, even when the ideal education is provided at the ideal time, and families are fully compliant with plans of care, exclusive breastfeeding is not attainable for a variety of physiological or logistical

Figure 3: Returning to Work Considerations

Image used with permission. Tismaja. Mother Worker Pumping. Shutterstock. Accessed September 9, 2024. https://www.shutterstock.com/

reasons. This challenging scenario is presented daily to perinatal clinicians. How then can we as clinicians best facilitate a mother and family's optimal physical and mental health? In a qualitative study exploring mothers' responses to the master narrative of "breast is best," mothers provided wisdom and guidance for clinicians.[18] The authors report that "many women extensively prepared for exclusive breastfeeding, only to face immense difficulty" and "the initial response to considering formula was a sense of shame." Mothers sought "safe havens" online where they could "ask for formula feeding advice and avoid being chastised or shamed for not trying harder to breastfeed." The study participants "proposed a more inclusive vision of breastfeeding where more options are supported, such as combination feeding, and where support is individualized to consider the mother and baby as well as the entire family unit."[18] The clinical tools explored in this article provide the type of support desired by the mothers in the study and can be added to the toolbox as clinicians endeavor to meet the needs of today's perinatal families.

Continuing Education

As part of this continuing education activity, read the following supportive open-access article:
Kam RL, Bennetts SK, Cullinane M, Amir LH. "I didn't want to let go of the dream": Exploring women's personal stories of how their low milk supply was discovered. *Sex Reprod Healthc.* 2024;40:100953. doi:10.1016/j.srhc.2024.100953

This self-study activity has been approved for 1.0 contact hour by Kendra Schreiner, 18160 Cottonwood Rd., PMB 352, Sunriver, OR, an independent provider approved by the California Board of Registered Nursing, Provider #15828. Application to the CDR has been made for 0.5 CPEU credit for Registered Dietitians.

To receive credit, go to https://www.surveymonkey.com/r/G25YTPS or scan QR code to complete the post-test, evaluation, and receive a certificate of completion. Print and maintain a copy of the certificate for your records.

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