INTRODUCTION/PROBLEM STATEMENT

Human milk and breastfeeding is the preferred form of nutrition for all infants through the first year and beyond.1-3 Only 22% of all infants are exclusively breastfed for the first six months and only 31% of infants are breastfed for one full year.4

Pediatric nurses play a critical role in helping mothers achieve their personal breastfeeding goals and this clinical practice guideline provides guidance for pediatric nurses in all practice settings.

The nurse is the most critical health professional in the support of a mother’s lactation experience when the mother’s child is hospitalized.5-7 The reason that nurses are critical is that in the United States there are only 3.79 International Board Certified Lactation Consultants (IBCLCs) per 1,000 live births and there are only 4.57 Certified Lactation Counselors (CLCs) per 1,000 live births.8 Based on these number it is unlikely that every breastfeeding mother will be seen by an IBCLC or CLC. Furthermore, research by Hallowell and colleagues on a national sample of Neonatal Intensive Care Units (NICUs) found that less than half (49%) of all NICUs employ lactation consultants in their units. Furthermore, these researchers have identified that only 13% of NICU nurses report providing breastfeeding support to mothers of NICU infants8 and the majority of very low birthweight infants are discharged home on formula.9 Clearly, alternative models of care must be considered for educating nurses and pediatric nurses must be empowered to provide evidence-based lactation support and care. One such example developed at a children’s hospital is the Breastfeeding Resource Nurse (BRN) program.10 Research in a children’s hospital demonstrated that the BRN program led to institutional cultural change to support human milk and breastfeeding11 and that 90% of nurses reported providing direct breastfeeding support and care.12 In addition, BRNs reported that they used the knowledge gained in the course to empower their families with the use of evidence, served as advocates for the families, and that they were “willing to go the extra mile” to provide evidence-based lactation support and care.13

DEFINITION(S)

The World Health Organization (WHO) defines exclusive breastfeeding for the first six months as the provision of 100% human milk (no juice, no water, no infant formula, no complementary foods).3 Exclusive breastfeeding includes direct breastfeeding as well as the provision of human milk through other means (bottle, feeding tube, cup, etc.).

RATIONALE AND SUPPORTING INFORMATION

All available evidence demonstrates that children are more likely to experience increased morbidity and mortality from a lack of exposure to human milk,1 so it is critical for pediatric nurses to be the strongest advocate for their patients and promote and protect breastfeeding.14 The Society of Pediatric Nurses (SPN) position statement on human milk and breastfeeding15 details the myriad of improved outcomes for infants who are fed human milk/breastfed. For sick children, human milk is not just the ideal source of nutrition, it also provides a multitude of immunobiologic advantages which an infant would not receive from infant formula. Furthermore, human milk and breastfeeding are associated with increased brain development...
(more white matter, more grey matter, bigger brains) and improved developmental outcomes and enhanced intelligence quotient. Furthermore, researchers have demonstrated that there is a dose-response relationship, meaning that prolonged and exclusive breastfeeding plays an important role in early neurodevelopment and childhood cognitive outcomes.

It is also important to note that there are few contraindications to breastfeeding (HIV positive, HTLV 1 or 2 positive, a mother undergoing chemotherapy or radiation treatment). The AAP specifically states that “maternal substance abuse is not a categorical contraindication to breastfeeding.” Mothers who are in treatment programs should be encouraged to breastfeed and programs that keep mothers and infants together are associated with better breastfeeding outcomes.

In 2011, the Surgeon General issued the Call to Action to Support Breastfeeding (SGCTASP). This detailed plan outlined 20 key action items that must be addressed to improve the landscape of breastfeeding in the United States. The United States Breastfeeding Committee (USBC) is an organization of national non-profits and federal government partners who provide guidance to oversee progress toward implementation of the 20 recommendations. See www.usbreastfeeding.org for more details.

The Baby Friendly Hospital Initiative (BFHI) was developed to protect and support breastfeeding during the birth hospital stay. The 10 steps focus on improving breastfeeding practices for newborns immediately following birth. However, a 2018 publication from the WHO demonstrated that in 168 countries, only 10% of hospitals achieved this designation. Despite a 25-year history, the BFHI has not been consistently able to improve breastfeeding outcomes globally. Additionally, the BFHI does not specifically address the needs of critically-ill or hospitalized infants (preterm, low birthweight, surgical). However, the WHO recommends that vulnerable infants should be fed mother’s own milk.

**CLINICAL PRACTICE RECOMMENDATIONS**

If an infant requires hospitalization, the pediatric nurse must assess the mother’s lactation status by inquiring if the mother is currently pumping or breastfeeding her child and by reinforcing the importance of human milk and breastfeeding. The Spatz 10 steps for the protection and promotion of human milk and breastfeeding in vulnerable infants can guide the pediatric inpatient nurse. The 10 steps are as follows:

- Step 1 – Informed decision
- Step 2 – Establishment and maintenance of milk supply
- Step 3 – Human milk management
- Step 4 – Oral care and feeding of human milk
- Step 5 – Skin-to-skin contact
- Step 6 – Non-nutritive sucking at the breast
- Step 7 – Transition to direct breastfeeding
- Step 8 – Measurement of milk transfer
- Step 9 – Preparation for discharge
- Step 10 – Appropriate follow-up

**Step 1-Informed Decision:** The pediatric nurse should utilize the American Academy of Pediatrics (AAP) position statement to teach the family about the dose response of human milk and breastfeeding as well as the SPN Position Statement which details out specific ways in which human milk protects infants from morbidity and mortality. (A)

**Step 2: Establishment and maintenance of milk supply:** If the infant is unable to directly breastfeed (i.e. feed from the breast), the pediatric nurse must educate the mother about principles of milk expression
including but not limited to:

1. Mothers should pump with a hospital-grade electric breast pump at least every two to three hours for a goal of at least 8 pumping sessions per 24 hours to establish milk supply. If the mother is pumping for an older hospitalized child, she should pump at least as many times per day as the child was breastfeeding prior to hospitalization to ensure that milk supply is not compromised.\(^{21,22}\) (C)

2. Continuing to pump for at least 2 minutes after no milk flow is observed.\(^{21}\) Mothers have an average of 5.0 \(\pm\) 2.0 milk ejections during pumping sessions and 62% of available milk is expressed during the first two milk ejections.\(^{23}\) It is critical that mothers are completely emptying their breasts at each pumping session in order to ensure complete milk supply. (C)

3. Mothers should pump both breasts simultaneously to decrease time spent pumping and increase pumping efficiency and quality of milk expressed (higher fat content).\(^{23}\) Normal milk production is 440-1220 mL per 24-hour period with average of 700-800 per day. (C)

4. Pediatric nurses should be encourage mothers to drink to thirst and that the best sign that they are well hydrated is if their urine is pale and clear. A systematic review in the Cochrane database supports there is no evidence that increased maternal fluid intake increases milk supply.\(^{25}\) (A)

**Step 3-Human Milk Management:** The hospital should provide food grade hard containers (i.e. plastic or glass) rather than storage bags as milk retains more of its nutritional and immunologic properties.\(^{26}\) Hospitals must prioritize adequate space for the storage of both refrigerated and frozen human milk as well as systems in place to ensure that the right infant receives the right milk. (C)

Pediatric nurses should prioritize the use of fresh milk over frozen thawed milk due to the unique bioactive components of human milk. When milk is frozen or heat-treated (to make Pasteurized Donor Human Milk), the bioactive components of human milk are decreased.\(^{27}\) (B)

One 2010 research study, on 36 samples of human milk, reported that mother’s milk, stored in the NICU refrigerator at 4°C for up to 96 hours, maintained its overall integrity.\(^{28}\) (C) While more research is needed to confirm this finding within hospital settings, the Centers for Disease Control (CDC)\(^{29}\) provide guidance for human milk storage at home for healthy full-term infants on their website (https://www.cdc.gov/breastfeeding/recommendations/handling_breastmilk.htm). Frozen milk can be safely stored for 3-6 months in a home freezer or 6 months to 1 year in a deep freezer.\(^{29}\) (D)

Research on pasteurized donor human milk (PDHM) from Human Milk Banking Association of North America demonstrates that PDHM maintains microbiological purity for 4 days at 4°Celcius.\(^{30}\) (B)

The AAP Policy statement on the use of PDHM states that donor milk should be utilized if mother’s own milk is not available or its use is contraindicated with an emphasis on the need for donor milk for preterm and other vulnerable infants (such as surgical infants).\(^{31}\) (A)

The American Society of Anesthesiologists states that infants can receive human milk for up to 4 hours before elective procedures requiring general or regional anesthesia or procedural sedation and analgesia.\(^{32}\) (D)

**Step 4-Oral Care and Feeding of Human Milk:** While infants are unable to receive enteral feeds or prior to oral feeding, infants should receive human milk oral care. Participation in human milk oral care
engages the family in the care of their infant, allows them to feel like they are contributing to their child’s care and motivates the mothers to keep pumping and build their milk supply.\(^3^3\) (C)

For infants, unable to directly breastfeed, human milk can be fed by gavage or feeding tube. For tube feeds, fresh milk should always be prioritized. Nurses should also be aware that gavage tubes are associated with bacterial contamination and that human milk can help protect the infant from morbidities related to contaminated feeding tubes, such as feeding intolerance and necrotizing enterocolitis (NEC).\(^3^4\) Though based on a small number of neonates (n=7), this study found a relationship between enteral tube bacterial contamination, formula feeding, and development of necrotizing enterocolitis (NEC).\(^3^4\) (C)

**Step 5--Skin to Skin Contact:** If the infant is unable to directly breastfeed (i.e. feed at the breast), the pediatric nurse should encourage the mother to hold her infant in skin-to-skin contact for as many hours per day as feasible. There is a Cochrane systematic review on both term and preterm infants demonstrating the benefits and safety of skin-to-skin contact.\(^3^5, 3^6\) Additionally, skin-to-skin contact may be beneficial to reduce the pain response and recovery from frequent procedures.\(^3^7\) (A)

**Step 6 – Non-nutritive sucking at the breast:** In a critical review of interventions supporting transition from gavage to direct breastfeeding in preterm infants, non-nutritive sucking was found to be an important intervention.\(^3^8\) (C)

**Step 7 – Transition to direct breastfeeding:** Infant-driven/cue-based feeding was associated with improved outcomes and shorter length of stay.\(^3^8\) (C) Mothers should be encouraged to spend as many hours a day as feasible to directly breastfeed their infants prior to discharge. A clinical pathway developed at a children’s hospital to facilitate transition to direct breastfeeding resulted in 100% of eligible infants being able to directly breastfeed prior to discharge.\(^3^9\) (C)

**Step 8 – Measurement of milk transfer:** Assessing an infant’s ability to effectively suckle and transfer milk at the breast is essential. Until the infant is able to demonstrate that he/she is effective at transferring full feeds from the breast, pre-and post-breastfeeding weights are the only way to determine actual milk transfer and ensure that the infant is not underfed or overfed. The weights should be obtained with a precise electronic scale (accurate to at least \(\pm 2\) grams).\(^2^2\) (C)

**Step 9 – Preparation for discharge:** Infant-driven/cue-based feeding is associated with improved outcomes and shorter length of stay.\(^3^8, 4^0\) (C)

**Step 10 – Appropriate follow-up:** When the infant is being discharged to home from the pediatric facility, the nurse should provide the mother with referrals for continued lactation and breastfeeding support. These referrals include but are not limited to: local breastfeeding support groups and organizations, IBCLCs in the community where she is located, and appropriate evidence-based websites.\(^2^2\) (C)
REFERENCES


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