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What Is the Impact of NICU-Dedicated Lactation Consultants?

An Evidence-Based Practice Brief

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ABSTRACT

Background: Benefits of exclusive human milk diets for preterm and low birth-weight infants are well established. Despite known benefits, supporting mothers in the provision of mother's own milk for high-risk infants is challenging. Lactation support in the neonatal intensive care unit (NICU) is highly variable. Lactations consultants (LCs) are often shared between postpartum units and the NICU, potentially increasing LC workload with less time spent with high-risk mothers. Furthermore, less than half of NICUs in the United States staff an international board-certified lactation consultant. Limited understanding exists regarding impacts of NICU-specific lactation support on breastfeeding outcomes.

Purpose: The purpose of this evidence-based practice brief is to synthesize the literature on the impact of NICU-specific lactation support, LCs who work exclusively in the NICU, and provide guidance about how NICU staffing with LCs solely focused on supporting mothers of high-risk infants impacts breastfeeding outcomes for low birth-weight infants.

Search Strategy: CINAHL PLUS, PubMed, Cochrane Library, and OVID databases were searched using key words and restricted to English language.

Findings: During hospitalization, NICUs staffed with dedicated board-certified LCs have increased potential to yield improved breastfeeding rates through hospital discharge, increased proportion of infants who receive mother's own milk, and increased duration of breastfeeding or human milk expression through hospital discharge.

Implications for Practice: Human milk nutrition is related to improved outcomes for high-risk infants. Neonatal intensive care unit–specific lactation support can potentially optimize maternal breastfeeding practices and improve outcomes for high-risk infants.

Implications for Research: There is a need for further studies pertaining to NICU-specific lactation consultants and influences on breastfeeding outcomes.

Key Words: breastfeeding, lactation consultant, lactation support, low birth weight, neonatal intensive care unit, preterm or premature infants

Human milk is considered the nutritional standard for premature infants due to the immediate, short-, and long-term benefits.[1] The use of human milk offers many advantages for preterm and high-risk infants including decreased infections, decreased necrotizing enterocolitis (NEC), decreased retinopathy of prematurity, improved neurodevelopmental outcomes, and decreased hospital readmissions.[1,2] Components of human milk include immunoglobulins, various carbohydrate polymers, enzymes, lactoferrin, and growth factors that are known to enhance the underdeveloped immune system and improve the integrity of the developing gastrointestinal tract of preterm infants.[3] Receiving mother's own milk (MOM) in the first 48 hours after birth has the potential to decrease lifelong disease and sequelae by seeding the developing gut and microbiome with the best foundation. This is particularly important in high-risk infants who are more vulnerable to developing NEC and other multisystem infections.[4]

Most hospitals with delivery services and neonatal intensive care units (NICUs) employ lactation consultants to support breastfeeding and the delivery of human milk. However, lactation consultants (LCs) are often shared between postpartum units and the NICU, which can increase the workload of the LC beyond reasonable scheduling, potentially resulting in less time spent with mothers of high-risk infants and/or vulnerable premature low

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birth-weight infants. A NICU-specific or NICU-dedicated LC is a credentialed expert of breastfeeding who works exclusively in the NICU to support mothers of high-risk infants with breastfeeding support and the provision of MOM. Availability of the NICU-dedicated LC is throughout the duration of an infant's hospitalization.

Less than half of NICUs in the United States staff an international board-certified lactation consultant dedicated solely to the NICU.[5] A study by Hallowell and colleagues[6] assessed factors associated with infant feeding of MOM at NICU discharge and found that at least 48% of very low birth-weight infants receive MOM at hospital discharge but with great variability of lactation consultant support among the NICUs studied. It is clear that lactation support in the NICU is highly variable. Given this degree of support, it is often the expectation that bedside nurses, physicians, nurse practitioners, or therapists provide breastfeeding counseling to mothers and families, yet patient care tasks and management can often supersede detailed lactation counseling. Human milk expression and breastfeeding support have been cited as one of the areas where missed care often occurs in the NICU environment.[7] MOM is well known to be highly specific to the individual needs of her infant and as such, optimizing support for milk expression and breastfeeding is ideal. Moreover, NICU mothers often require repeated and long-term support to establish and sustain human milk production, given the immaturity of their infants and the sometimes-long hospitalizations. Maternal emotional status and experience are also particularly important to address for optimal breastfeeding and provision of MOM. Mothers of preterm infants are often faced with feelings of guilt, stress, and anxiety, which can impact breastfeeding success. A dedicated LC may be best suited to help mothers cope with the complexities of breastfeeding and premature birth.

BARRIERS TO BREASTFEEDING AND HUMAN MILK PROVISION FOR HIGH-RISK INFANTS

Challenges and barriers to breastfeeding and human milk provision in the NICU include parents' lack of knowledge of human milk benefits, difficulties with lactation and human milk expression, maternal stress and fatigue, the nature of the neonatal intensive care environment, delayed initiation of expressing, and physical separation of infants from their mothers.[2,8] Surveyed mothers also report not enough time with an LC availability of breast pumps, time limitations, length of hospital stay, separation from infant, returning to work, and their infant being ill as common barriers to breastfeeding.[9] Barriers perceived by surveyed NICU staff include inadequate lactation help, availability of breast pumps, lack of consistent information, lack of education, frequency of mother's visits, time restraints, maternal stress, separation of mothers from their infants, nurse discomfort, maternal discomfort, prescribed feeding volumes, and formula supplementation.[9] Furthermore, Callen and colleagues[10] identified inadequate MOM supply as one of the greatest barriers of sustained breastfeeding in addition to the infants' health status, nipple and breast problems, and maternal emotional status. Maternal health problems following delivery, such as pregnancy-induced hypertension, can also affect lactation ability.[11] It has also been noted that maternal socioeconomic and educational disparities impact breastfeeding outcomes.[11]

In addition, physical and developmental immaturity of preterm infants makes it difficult to directly feed at the breast. Delayed initiation of direct breastfeeding and reliance on breast pumps also serve as a barrier to establish breastfeeding in the NICU.[12] Furthermore, it is not a usual practice for infants less than 32 weeks postmenstrual age to directly breastfeed in the NICU, mostly due to medical stability of the infant and focus on human milk provision over support of direct breastfeeding.[13] Despite evidence that physiologically stable infants less than 32 weeks can safely initiate feeding directly at the breast, delays in direct breastfeeding continue to add to the challenges of supporting mothers to breastfeed in the NICU.[13] The lack of direct breastfeeding can also be attributed to the need for fortification of MOM, as human milk does not fully meet the nutrition needs for optimal growth and development of preterm and very low birth-weight infants.[14,15] Overall, challenges to providing human milk to premature infants are abundant and complex and optimal support is required by both high-risk mothers and NICU staff.

PURPOSE AND CLINICAL QUESTION

The purpose of this evidence-based practice brief is to synthesize the literature pertaining to the potential impact of NICU-dedicated LCs on improved breastfeeding outcomes for low birth-weight infants and to discuss other advantages of a NICU-specific LC. The research question specifically addresses whether LCs should be staffed to work solely in the NICU. We would argue that the needs of this high-risk population are different from the needs of full-term mothers, demanding more resources to support the delivery of human milk and ultimately, breastfeeding for critically ill infants requiring NICU care. Yet, being able to quantify the need for these resources is still an area where there are more questions than answers.

SEARCH STRATEGY

A literature search using CINAHL PLUS, PubMed, Cochrane Library, and OVID databases yielded a

total of 10 studies assessing lactation support on breastfeeding outcomes. Key search words included neonatal intensive care unit, lactation support, breastfeeding, lactation consultant, low birth weight, and preterm or premature infants. Articles were included if they were relevant to the clinical question, published between 2000 and 2018, and English was the primary language.

TYPES OF LACTATION SUPPORT SPECIALISTS

To better understand the degree of support by lactation experts, it is important to provide a general overview of the different types of lactation specialists providing care in the acute care setting. Lactation support specialists can be stratified into 3 categories: professional, certified, and peer (see Table 1). The United States Lactation Consultant Association (USLCA) distinguishes the differences of various breastfeeding support professionals. International board-certified lactation consultant (IBCLC) licensure can be obtained from the international board-certified lactation consultant examiners. The IBCLC must be a recognized health professional or complete 14 college-level health science subjects (if one does not have a college degree as a health professional) in addition to 90 hours of lactation-specific education, 300 to 1000 clinical practice hours, and successfully passing a criterion-referenced examination.[16] A position statement by the International Lactation Consultant Association describes 6 benefits of the IBCLC's impact that include improved breastfeeding outcomes, lower healthcare costs, improved consumer satisfaction, improvement of an institution's image, improved consumer trust, and improved breastfeeding programs and policies.[17]

Certified lactation counselors (CLCs) may consist of lactation specialists, educators, or consultants. Certified lactation counselors lack health science prerequisites but must complete a 45-hour course modeled by the World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) competency areas for breastfeeding and lactation, in addition to passing a certification examination. In contrast to the IBCLC, there are no clinical practice requirements for CLC certification.[16,18] Although there are differing pathways and prerequisites for both the IBCLC and the CLCs, the Centers for Disease Control and Prevention supports utilization of any lactation specialists (they do not specify type), and CLCs can further bridge the gap of potential inadequate breastfeeding support.[19]

Peer counselors are individuals with personal breastfeeding experience who have also completed 18 to 50 hours of classroom training. Examples of peer counselors include Le Leche League volunteers or Women, Infant, and Children program counselors. In some states, Women, Infant, and Children counselors may be required to be CLCs but this is not always the case. An examination or certification is not required of peer counselors.[16]

TABLE 1. Comparison of Lactation Support Types

	Prerequisites	Certifying Board	Required Clinical Hours	Examination	Credentials Awarded
Professional	Recognized health professional or complete 14 college-level health science subjects 90 h of lactation-specific education	International Board-Certified Lactation Consultant Examiners	300-1000 clinical practice hours	Criterion-referenced examination	International Board-Certified Lactation Consultant (IBCLC)
Certified	45 h of education that relate directly to the WHO/UNICEF (World Health Organization/United Nations Children's Fund) competency areas for breastfeeding (lactation)	Academy of Lactation Policy and Practice	None	Criterion-referenced examination	Certified Lactation Counselor (CLC) IBCLCs or CLCs can obtain advanced certification as advanced lactation consultant (ALC) or advanced nurse lactation consultant (ANLC)
Peer	18-50 h of classroom training Personal breastfeeding experience	None	None	None	None

In efforts to strengthen the discussion of lactation support, it is important to recognize other successful models in supporting breastfeeding in the NICU such as The Rush Mother's Milk Club and the expansion of Baby-Friendly Hospital programs to include NICU recommendations. Both Rush Mother's Milk Club and Baby-Friendly Hospital initiatives by the WHO and the United Nations Children's Fund are evidence-based breastfeeding programs to promote optimal human milk provision and breastfeeding practices in the NICU.[20,21] Lactation specialists and breastfeeding programs can serve to complement each other and not necessarily replace one another.

SUMMARY OF EVIDENCE

There are countless articles describing breastfeeding support models but few addressing how NICU-specific lactation support can influence breastfeeding outcomes. For the purpose of this integrative review, breastfeeding outcomes are defined as breastfeeding initiation (milk expression), receipt of any MOM during hospitalization, and/or breastfeeding rates during hospitalization and at discharge. Table 2 outlines the existing evidence delineating the impact of lactation support on breastfeeding outcomes in greater detail. There were a total of 10 studies identified in the literature. Eight of these studies were specific to low birth weight, preterm, or the NICU population, and 2 studies were inclusive of both healthy and preterm infants. Six of the studies discussed IBCLC interventions, 1 study discussed any lactation consultant or counselor support interventions, 1 study reviewed the effects of lactation consultant support combined with viewing a video on breastfeeding preterm infants, and 2 studies reviewed the effect of peer counselors (included as a comparison intervention). A study by Hallowell and colleagues[6] was also reviewed, but not included in the summary of evidence as the study did not specifically assess NICU-dedicated lactation consultants, but found that the presence of a lactation consultant in the NICU was associated with an 8% increase in very low birth-weight infants who were discharged home on MOM.

Common themes derived from the identified studies include increase in the number of infants who receive any MOM during hospitalization, increased MOM received at the time of discharge, increased breastfeeding initiation rates, increased number of infants who directly breastfeed as first oral feed, and increased exclusive breastfeeding.[22-29] The included study findings also revealed significantly higher rates of MOM availability during hospitalization with increased exposure to lactation support.[26,28] This may suggest a positive direct correlation between improved breastfeeding outcomes with increased duration of lactation support received. The study by Pinelli et al[30] did not demonstrate positive breastfeeding outcomes with combined breastfeeding education via video, weekly lactation support visits, and frequent postdischarge follow-up. This finding may be attributed to the weekly inpatient visits by the LC, suggesting that frequency of LC support may also be an influential factor in positive breastfeeding outcomes. With the exception of this particular study, all other reviewed studies with interventions by LCs demonstrated a positive correlation in breastfeeding outcomes.

It is difficult to quantify the exact number of hours or interaction between mothers that yields to positive breastfeeding outcomes. Maternal needs are unique and LC interaction should be tailored to each mother. Despite the varied time spent with LCs, findings are supportive of the recommendation for NICUs to provide continued access to LC support.

Among the studies demonstrating positive breastfeeding outcomes with interventions by an LC, there was only 1 systematic review, 1 randomized controlled trial (RCT), and 1 pilot RCT. The lack of RCTs, meta-analyses, systematic reviews, and large-scale, multicenter studies limits the strength of generalizable recommendations, warranting the need for further research in this area. Furthermore, the frequency and duration of support by LCs are yet to be determined.

Of the 2 studies that discussed interventions by peer support, 1 did not reveal positive correlations with improved breastfeeding outcomes and the other study revealed increase in odds of postpartum woman providing any amount of human milk with peer counselor support.[24,31] It is difficult to draw meaningful conclusions on the effects of peer counselors to the limited number of studies identified. Although both studies were RCT designs, the relatively small population sizes decrease the strength of the evidence. The quality of interaction between peer counselor support and mother may also influence breastfeeding outcomes. Technologic literacy, access to technology, or personal preferences may be influential factors to why the study by Niela-Vile and colleagues[31] and Internet-based support did not show any positive effects for breastfeeding outcomes.

Staffing Considerations

Calculation of needed full-time equivalents (FTEs) in the inpatient setting is complex and inclusive of recommendations set forth by established literature and organizations such as the American Academy of Pediatrics and the WHO.[32] The goal is to achieve availability of LCs in the inpatient setting at all times to provide education and manage breastfeeding issues.[32] Staffing recommendations are stratified by the type of inpatient setting to appropriately account for the specialized needs of neonatal intensive care and special care units.

TABLE 2. Summary of Evidence for Neonatal Intensive Care Unit Lactation Support

Author(s) Country (Year)	Title	Study Design Sample Size	Results	Implication
Castrucci et al (2006)[22]	A Comparison of Breastfeeding Rates in an Urban Birth Cohort Among Women Delivering Infants at Hospitals That Employ and Do Not Employ Lactation Consults	Cross-sectional, retrospective study assessing discharge breastfeeding rates in hospitals with and without IBCLC support n = 11,525	2.28 increase in odds of breastfeeding at discharge (95% CI, 1.98-2.62)	Positive relationship found between breastfeeding rates at discharge in hospitals that employed IBCLCs
Castrucci et al (2007)[23]	Availability of Lactation Counseling Services Influence Breastfeeding Among Infants Admitted to the Neonatal Intensive Care Units	Cross-sectional, retrospective study comparing breastfeeding rates at discharge from NICU in hospitals with and without IBCLC support n = 2132	1.34 increase in odds of breastfeeding initiation prior to hospital discharge for women delivering at hospital with IBCLC (95% CI, 1.03-1.76)	Positive correlation with breastfeeding initiation prior to discharge and IBCLC availability
Dweck et al (2008)[26]	NICU Lactation Consultant Increases Percentage of Outborn Versus Inborn Babies Receiving Human Milk	Retrospective chart review of 3 time periods. Time periods: T1 = Before LC hire T2 = After LC arrival T3 = 3 mo following LC arrival n = 406	Percentage of infants receiving any MOM during hospitalization increased over time periods T1 = 55%, T2 = 62%, T3 = 69%, (P = .049) Percentage of infants who received MOM at the time of discharge. T1 = 47%, T2 = 45%, T3 = 59% (P = .028)	Significant increase in the number of infants who receive any MOM during hospitalization and increase in the number of infants who receive MOM at discharge with NICU lactation consultant support
Gharib et al (2018)[28]	Effects of Dedicated Lactation Support Services on Breastfeeding Outcomes in Extremely-Low-Birth-Weight Neonates	Longitudinal retrospective study of 3 epochs with varying hours of lactation support. Epochs: 1 = 0 h 2 = 40 h 3 = 56 h n = 422	Infants who fed at the breast as first oral feed increased from 0% in epoch 1 to 4% in epoch 2 and 26% in epoch 3. (P =.0001) Infants who received any human milk in the NICU increased from 69% in epoch 1 to 87% in epochs 2 and 3 (P = .0807)	Increased number of infants who received MOM via direct breastfeeding as first oral feed Odds of infants receiving any human milk compared with exclusive formula feedings
Gonzalez et al (2003)[29]	Evaluation of a Lactation Support Service in a Children's Hospital Neonatal Intensive Care Unit	Preintervention versus postintervention comparing 2 study periods in the NICU of no IBCLC support and with IBCLC support n=350	Proportion of NICU infants ever fed MOM increased from 31% to 47% (P = .002) Proportion of NICU infants to receive MOM at discharge increased from 23% to 37% (P = .004)	Positive correlation of increased MOM received during hospitalization with dedicated lactation support in the NICU and at the time of discharge

(*continues*)

TABLE 2. Summary of Evidence for Neonatal Intensive Care Unit Lactation Support (*Continued*)

Author(s) Country (Year)	Title	Study Design Sample Size	Results	Implication
Héon et al (2016)[27]	An Intervention to Promote Breast Milk Production in Mothers of Preterm Infants	Pilot randomized controlled trial n = 40	Higher duration (minutes per day) of human milk expression in intervention group ($P = .43$) No statistical significance in the frequency of MOM expression, volume of MOM, and MOM lipid concentration	Positive correlation between the duration of MOM expression and lactation consultant support
Merewood et al (2006)[24]	The Effect of Peer Counselors on Breastfeeding Rates in the Neonatal Intensive Care Unit	Randomized controlled trial comparing a hospital's usual NICU breastfeeding practice versus 6 wk of peer counselor support n = 108	181% increase in odds of postpartum woman providing any amount of breast milk with peer counselor support (odds ratio, 2.81 [CI, 1.11-7.14, $P = .01$)	Increase of mothers who provided MOM to their infants in the NICU with peer counselor support
Niela-Vilen et al (2016)[31]	Breastfeeding Preterm Infants—A Randomized Controlled Trial of the Effectiveness of an Internet-Based Peer Support Group	Randomized controlled trial comparing routine NICU lactation support with peer lactation counseling via social media n = 124	No correlation in breastfeeding outcomes in control versus intervention group Authors listed high number of study dropouts and mothers who chose not to participate in peer support group as limitations	No effect of intervention on duration of breastfeeding or breast milk expression for preterm infants
Patel and Patel (2016)[25]	The Effectiveness of Lactation Consultants and Lactation Counselors on Breastfeeding Outcomes	Systematic review of RCTs evaluating the effects of lactation consultants on breastfeeding outcomes n = 5048	1.35 increased odds of breastfeeding initiation with LC support (95% CI, 1.10-1.67) 1.49 increased odds of any breastfeeding rates (95% CI, 1.09-2.04) 1.71 increased odds of exclusive breastfeeding up to 1 mo (95% CI, 1.2-2.44)	Increased odds of Initiation of breastfeeding, breastfeeding rates, and of exclusive breastfeeding when lactation consultant/counselor support available for postpartum mothers
Pinelli et al (2001)[30]	Randomized Trial of Breastfeeding Support in Very Low-Birth-Weight Infants	Randomized controlled trial comparing usual NICU breastfeeding support with supplementary structured breastfeeding (mothers viewed a video on breastfeeding preterm infants, received individual counseling from LC, weekly inhospital contact, frequent contact postdischarge) n = 128	No statistically significant impact on mean duration of breastfeeding in control group versus intervention group	No positive effect on the duration of breastfeeding with combination of video, weekly LC inhospital visits, and postdischarge interaction

Abbreviations: CI, confidence interval; IBCLC, international board-certified lactation consultant; LC, lactations consult; MOM, mother's own milk; NICU, neonatal intensive care unit; RCTs, randomized controlled trials.

The USLCA recommends 1.9 FTEs per 1000 births in hospitals with NICUs (level III hospital) and 1.6 FTEs per 1000 births in newborn special care units (level II hospitals).[32] One FTE is equivalent to 1 full-time LC working a total of 40 hours per week. Based on the USLCA recommendation, it would mean that a NICU that averaged 500 births per year would need 1 full-time staffed LC. Staffing needs calculated by a large tertiary care teaching hospital with 4200 births per year developed ratios for IBCLC staffing and found 1 FTE per 235 NICU admissions to be optimal for an effective lactation program.[33] This ratio requires 2.4 more FTEs than recommended by USLCA; however, the authors disclosed that the breastfeeding goals established by individual lactation programs must be considered when determining staffing needs. According to the Centers for Disease Control and Prevention breastfeeding report card, there were 3.5 IBCLCs per 1000 live births in 2013; however, the Centers for Disease Control and Prevention did not specify IBCLC practice location in its report (ie, well newborn versus NICU or inpatient versus outpatient).[19] Optimal staffing of IBCLCs should meet or exceed established guidelines; however, the unique needs of a particular unit should be considered, particularly in units with higher NEC or infection rates. It is also important to note that IBCLCs are not abundant in numbers, with there being only 16,616 IBCLCs in the United States.[34] With increased attention to the need for IBCLCs, organizations may need to consider the financial risks and benefits of funding the certification of IBCLCs.

Impact on Healthcare Costs

Lactation consultants have the potential to indirectly impact healthcare costs. As previously discussed, human milk diets are associated with decreased NEC, decreased infections rates, and decreased hospital readmissions,[1,2] and improved breastfeeding outcomes may reduce the overall morbidities and thereby indirectly reduce associated costs.[35] Compliance of exclusive breastfeeding for the first 6 months of life by 90% of US families is estimated to lead to a $13 billion per year cost savings and prevention of 911 excess infant deaths.[36] Necrotizing enterocolitis associated costs account for about 20% of spending within NICUs in the United States.[4,36] A strategy to decrease NEC in high-risk infants is the use of donor human milk.[37,38] However, purchasing of donor human milk is a costly alternative to MOM and can serve as a financial burden to an organization and is often difficult to pass on in billing. Caroll and Herrmann[38] examined the average cost of donor human milk to achieve exclusive human milk diets and found that the mean cost per infant can range from $27.04 to $590.90 per infant stay on the basis of the average price of donor milk at $4.00 per ounce. Increasing availability of MOM by means of optimizing LC support may decrease cost for organizations that purchase donor milk.

Ganapathy and colleagues[39] completed a cost analysis of discharged infants less than 28 weeks of gestation with the diagnosis of NEC. The cost of NEC was approximately $74,000 (95% confidence interval [CI], $47,051 to $100,957) per infant and increased to about $198,000 (95% CI, $159,261 to $236,819) per infant where surgical intervention was warranted.[39] A more recent study by Colaizy and associates[40] found that extremely low birth-weight infants who received exclusive formula diets have a 12.05% increased risk for developing NEC (95% CI, 1.54-94.17) and extremely low birth-weight infants who received a mixture of formula and MOM have a 8.68% increased risk (95% CI, 1.15-65.24), resulting in the total direct medical costs of NEC in extremely low birth-weight to be $27.1 million (CI, $24 to $30.4 million) and indirect medical costs of $563,655 (CI, $476,191 to $599,059).[40] Decreases in NEC rates could offer a significant economic value and cost reduction to healthcare spending. Salary data for LCs from salary.com report a median salary of $79,909; however, factors such as type of LC and educational background were not reported in detail.[41] The cost of a single event of medical NEC based on the study by Ganapathy and colleagues[39] is close to the equivalent of the yearly salary of an LC. One case reduction of medical NEC can offset the cost of staffing 1 full-time LC. Furthermore, the examination fee for IBCLC certification is $660 and 90 hours of training may cost up to $1000.[42] The cost of training and certifying an IBCLC may yield significant return on investment when compared with the cost of disease burden related to suboptimal human milk provision. Each organization has unique financial and budgetary considerations; however, training of IBCLC should be considered.

Improving breastfeeding rates and MOM availability by utilizing LC support may also decrease cost burden of infection. Patel and associates[43] demonstrated a dose-response relationship between increasing human milk volumes by 10 mL/kg/d in the first 28 days of life with decreased odds of sepsis by 19% (odds ratio: 0.981, 95% CI: 0.967-0.995, $P = .008$) with subsequent hospital costs savings related to the decrease in sepsis. Hospital costs were found to be reduced with increased doses of MOM. The adjusted cost saving for infants who received more than 25 mL/kg/d of human milk was $20,384 and infants who received more than 50 mL/kg/d of human milk was $31,514.[43] Furthermore, human milk diets are associated with decreased hospital readmissions.[1,2] Hospital readmissions are high-priced, with the average daily cost of $1163 and average hospital stay of 3.2 days.[44] This number is likely even higher with the cost of inflation over the years. Overall, human milk feedings received

during NICU hospitalization can decrease the economic burden of preterm births, which was estimated to be at least $26.2 dollars in 2005.[45]

Payment and Reimbursement

A significant challenge to routinely staffing IBCLCs is inconsistent reimbursement. Inpatient services rendered by the IBCLC is commonly bundled into the total cost of care without separate billable services that leads to an inadvertent increase in the overall hospital operating expense.[46] The lack of licensure for IBCLCs is a contributing factor to reimbursement as federal requirements for Medicaid reimbursement require licensure of providers, found in section 1905 of the Social Security Act.[46] The Centers for Medicare & Medicaid Services updated this provision in 2013 to include reimbursement of IBCLC services, under preventative care fee-for-service plans, if that service was recommended by a licensed practitioner.[46,47] Unfortunately, there are no clear guidelines to help translate these changes to the clinical arena and reimbursement by public or private third party payers remains inconsistent.[46,47] It is important to note that although inpatient reimbursement for IBCLC is lacking, there still remains a significant return on investment as the cost of disease far outweighs preventative measures as discussed in the previous section.

Legislative Considerations

The Affordable Care Act is a healthcare reform law first legislated in March 2010. Under this law, section 2713 was enacted requiring private insurers to provide no-cost coverage for certain healthcare preventative services that include comprehensive prenatal and postnatal lactation support. These services include lactation counseling and coverage of breastfeeding equipment and supplies for rental or purchase.[48,49] While this coverage may be perceived as promising, it does not come without limitations. The provisions of 2713 are vague, which leads to variations in coverage by insurance policies including determination of frequency, method, or treatments of provisions under this section.[48] Lack of knowledge surrounding Affordable Care Act terms and sections may inhibit intrapartum and postpartum mothers from fully utilizing all the benefits under this act. Furthermore, changes in government policy may lead to future reform of healthcare. For these reasons, it is important for healthcare providers to be aware of current legislative policies that may impact patient care and to educate and advocate for patients and families. Section 2713 is particularly significant for the purposes of this article, as advocacy for breastfeeding support includes helping mothers receive access to lactation support and breast pump equipment and supplies.

All states that participate in Medicaid provide pregnancy-related services, defined as services necessary for the health of pregnant woman and fetus. These services include prenatal care, delivery, postpartum care, and family planning services. Pregnancy-related services encompass lactation services under the broad definition; however, lactation services are not specifically mentioned in the Medicaid statue.[50] Because of this limitation, there is a wide variation in reimbursement for the amount and scope of lactation services provided. Since Medicaid is a federally and state-funded health insurance program for low-income individuals, the inconsistency in provision of lactation services widens the gap of healthcare inequalities for vulnerable and low socioeconomic families. The NICU families are especially affected, as low socioeconomic status and certain racial groups are known risk factors for the delivery of low birth-weight infants. It is encouraged that Medicaid programs among individual states eliminate variations in lactation services to provide optimal and consistent coverage for mothers who are in most need of lactation support.

DISCUSSION

The argument for regularly staffing of IBCLCs in the NICU may be difficult to present to organizations because of the lack of immediate financial benefit, variability in reimbursement, upfront certification costs, and limited number of current IBCLCs available. However, based on the appraisal of evidence, NICU-specific LCs can yield increased breastfeeding rates through discharge, increase the proportion of infants who receive MOM, and increase the duration of breastfeeding or human milk expression. Furthermore, the impact of IBCLCs can improve parent satisfaction and trust and improve consistent implementation of the institution's breastfeeding guidelines and policies.[17] LCs can offer a significant return on investment by decreasing overall health costs, improving health outcomes, and improving maternal emotional health and satisfaction.

Studies involving peer lactation support were inconsistent in demonstrating positive effects on breastfeeding outcomes. Recommendations for clinical practice include staffing of an LC exclusively assigned to the NICU, with staffing ratios of at least 1.9 FTE per 1000 births. Furthermore, maintaining current understanding of legislative policies that impact patient care is important. Justification for budgeting a full-time LC may be offset by the decreased need for donor human milk, decreased NEC events, and decreased overall infection-related costs; together, the decrease in these areas has the potential to lead to an even bigger cost savings with a likely decrease in length of hospitalization.[37,39,40]

The most apparent problem is that there is a wealth of growing evidence surrounding the benefits of human milk nutrition; however, the strategies to

promote and manage breastfeeding outcomes remain unchanged. Changes in structure from organizational and government levels are warranted to strategize efficient and cost-effective methods to better support breastfeeding not only in the NICU but also for the health of all mothers and their newborns.

LIMITATIONS

Because of the low number of studies found, further research exploring the effects of lactation support for low birth-weight infants is needed. None of the studies reviewed were national studies, with the majority being single-institution studies or limited to a single city, which limits the generalizability of the findings. Larger multisite studies are warranted to strengthen findings and conclusions and to offer more sound generalizability. Six of the 10 studies found were published between 2001 and 2007, suggesting the need for more recent studies. This could be particularly true since the science around human milk and the microbiome is changing rapidly, and the use of MOM in the NICU has changed significantly, greatly increasing the need for lactation support particularly in this high-risk population. Furthermore, there were only 3 RCTs, 1 pilot RCT, 1 systematic review, and no meta-analyses found in the literature review, warranting the need for strengthened evidence in this research area. The RCTs identified also did not speak specifically about LCs exclusively working to support mothers in the NICU but did study the effects of peer counselors or structured breastfeeding counseling. Furthermore, areas specifically in need of further research include ideal amount of time spent or number of interactions between NICU-dedicated LCs and mothers to establish optimal breastfeeding outcomes; this information could better support staffing ratios such as number of LCs needed to support an NICU with more than 100 beds for example. As the emphasis on breastfeeding practices in the NICU becomes increasingly essential, given the growing science in this area, the need for increased evidence and research is needed to determine best practice guidelines for supporting the nutritional needs of preterm, low birth-weight, and vulnerable infants.

RECOMMENDATIONS FOR PRACTICE

Nursing professionals can advocate for staffing of a dedicated LC within local organizations. This can be accomplished by reviewing existing internal data on breastfeeding rates and MOM use, evaluation of current breastfeeding support measures within our own NICUs, and disseminating current evidence to organizational stakeholders. In addition to advocating for NICU-dedicated lactation support, consistent implementation of guidelines for breastfeeding support needs to be established and integrated as daily routine in parent education and guidance. Furthermore, education of NICU staff is warranted to maintain current evidence-based practice and for consistency between staff communication and NICU families. Other interventions to optimize availability of MOM include providing postpartum mothers access to breast pumps soon after delivery, encouraging mothers to initiate MOM expression within the first hour following delivery, and encouraging frequent kangaroo or skin-to-skin care. The evidence has shown that skin-to-skin care is associated with increased volumes of expressed MOM and increased rates of exclusive breastfeeding.[51-54] Establishment and consistent use of a kangaroo care clinical practice guideline can facilitate frequent skin-to-skin contact between mothers and infants. Initiation of MOM expression within the first 60 minutes following delivery may increase MOM volume and decrease time to lactogenesis stage II (transition from colostrum to the letdown of MOM), thus placing importance on the provision of breast pumps to mothers soon after delivery.[55] A primary goal in the NICU must be to provide optimal human milk nutrition to preterm and low birth-weight infants. Supporting breastfeeding mothers in the NICU must be emphasized and integrated into standard of care. Education of benefits and strategies to promote breastfeeding are imperative for all members of the multidisciplinary team for the most cohesive and consistent support for breastfeeding mothers. Furthermore, advocacy and changes in health policy for improved strategies of breastfeeding promotion are warranted.

CONCLUSIONS

This review aimed to answer the question of whether NICU-specific lactation consultants should be staffed to work solely in the NICU. The lack of recent literature in this area warrants newer and more current evidence. However, the available evidence thus far has been supportive of the inclusion of lactation consultants, particularly IBCLCs in positively impacting breastfeeding outcomes in the NICU. Recent strides toward increased breastfeeding rates by health promotion initiatives and organizations such as Healthy People 2020, the WHO, and The Joint Commission may impact parental attitudes and intentions increasing the overall needs for lactation support; however, these strides are aimed toward infants of the full-term cohort. Premature infants are vulnerable and have unique nutritional needs, which should be differentiated from full-term infants. Breastfeeding practices may be influenced by recent trends and healthcare endeavors to meet current health promotion goals; thus, further research is necessary to establish current evidence-based practices regarding the approach to better support lactation for mothers and their preterm or low birth-weight infants.

Summary of Recommendations for Practice and Research

What we know:	• Less than 50% of NICUs in the Unites States staff a dedicated IBCLC. • Human milk is the recommended nutritional standard for preterm and low birth-weight infants. • Exclusive human milk diets are associated with decreased rates of necrotizing enterocolitis, infection, and retinopathy of prematurity and with improved neurodevelopmental outcomes. • The US Department of Health & Human Services, the World Health Organization, and The Joint Commission promote health initiatives to increase breastfeeding rates. • Neonatal intensive care unit–specific lactation consultants positively correlate with increased breastfeeding rates through discharge, increase the proportion of infants who receive MOM, and increase the duration of breastfeeding or human milk expression. • Studies involving peer lactation support were inconsistent in showing positive effects on breastfeeding outcomes.
What needs to be studied:	• Further studies pertaining to NICU-specific lactation support. • Increase in number of randomized controlled trial or meta-analyses pertaining to NICU-dedicated lactation support and breastfeeding outcomes. • Optimal number of interactions or time spent between lactation consultants and NICU mothers. • Standardized practice guidelines for breastfeeding support in the NICU.
What we can do today:	• Assess own organizational breastfeeding practices. • Advocate for staffing of a dedicated lactation consultant. • Encourage consistent kangaroo/skin-to-skin care. • Encourage MOM expression within the first 60 minutes following delivery. • Educate all members of the multidisciplinary team on strategies to promote breastfeeding in the NICU.

Funding will be essential for better understanding these trends and their impact on high-risk populations. It is clear and well established that human milk is the superior form of nutrition for both term and preterm infants. Preterm infants pose unique needs and challenges and require highly specialized and tailored strategies for providing optimal nutrition. Provision of exclusive human milk nutrition is a primary goal for the overall health of preterm infants; however, strides toward realization of this goal remain less understood and understudied. Investment in training and educating dedicated NICU lactation consultants may serve as a platform to improve health outcomes, offer a starting advantage, and optimize breastfeeding outcomes for mothers and their preterm infants.

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