EVIDENCE BASED QUALITY IMPROVEMENT

STRATEGIES WORK TO INCREASE EXCLUSIVE BREAST MILK FEEDING RATES AT HOSPITAL DISCHARGE OF WELL NEWBORNS

By

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Abstract

One maternity center has successfully utilized an evidence based quality improvement microsystem approach to increase exclusive breast milk feeding rates through participation in a state quality collaborative project during 2011. Their unit level cycles of change included refining skin-to-skin birth routines, scripting of breastfeeding concepts, evaluation and application of lactation education and many other strategies that synergistically yielded increased rates of exclusive breast milk feeding of newborns at hospital discharge. Breast milk feeding is held as one of the most consequential choices that parents make for their newborn. Hospitals may voluntarily prove their investment toward maternal success in breastfeeding by perinatal care core measure reporting. The success of this maternity center exemplifies how evidence based practices can be implemented in a clinical setting and gives direction to others working to achieve improved perinatal care core outcome measures.
Quality Improvement and The Joint Commission Perinatal Care Measure PC-05

The Labor Delivery Recovery Postpartum (LDRP) Maternity Unit provides an ideal microsystem for implementing continuous quality improvement activities to impact the Joint Commission’s (TJC) perinatal care (PC) core measure set. The current five measures were adapted from the National Quality Forum’s set and then implemented as of April 2010’s hospital discharges (Milton, 2010). This paper describes the use of a LDRP Maternity Center microsystem team as a quality improvement model to achieve the Perinatal Core measure goal of increased exclusive breastfeeding at hospital discharge of well newborns.

Exclusive Breast milk Feeding (PC-05) at hospital discharge is “critical for the success of exclusive or any breastfeeding” (Centers for Disease Control and Prevention, 2007). “The Healthy People 2020 and the Centers for Disease Control (CDC) have been active in promoting this goal” (Milton, 2010). Exclusive breast milk feeding is defined as “a newborn receiving only breast milk and no other liquids or solids except drops or syrups consisting of vitamins, minerals, or medicines” (United States Breastfeeding Committee, 2011). The exclusive breastfeeding ratio is determined by dividing the number of infants that only receive breast milk (numerator) divided by the total number of term infants discharged (denominator). Exceptions include “Neonatal Intensive Care Unit admissions, documented human immunodeficiency virus, active tuberculosis, active varicella infection, active human t-lymphotrophic virus type I/II, active herpes simplex with lesions, substance abuse by mother, and radiation by mother” (United States Breastfeeding Committee, 2011). A mother’s choice to feed artificial milk substitutes or a medically indicated reason such as infant weight loss are not excluded from this breastfeeding ratio’s denominator. Therefore, the resulting measurement serves as an optimal outcome based on best practices for exclusive breastfeeding and is not impacted by widely assorted medical practice guidelines for
dehydration or weight loss. Because this measure is affected by so many variables within the hospital experience, quality improvement methods are needed to reach increased exclusive breastfeeding at hospital discharge of well newborns.

Defining the Need for Exclusive Breastfeeding

The World Health Organization (WHO) and many major maternal-child health professional organizations “recommend exclusive breastfeeding for the first 6 months” (Cramton, 2009, p. 386). “If 90% of United States (US) families could comply with medical recommendations to breastfeed exclusively for 6 months, the US would save $13 billion per year and prevent an excess of 911 deaths, nearly all of which would be in infants” (Bartick & Reinhold, 2010, p. e1052). “Significant health differences exist between infants who consume only breast milk compared to infants who consume breast milk supplements with artificial milk, and infants who consume only artificial milk” (Thulier, 2010, p. 628). Understanding these differences in outcomes of infant feeding methods have led to the need to identify “any breastfeeding” verses “exclusive breastfeeding”.

Infants fed exclusively breast milk have significant decreases in the following childhood illnesses: “otitis media, gastroenteritis, necrotizing enterocolitis (NEC) and deaths from NEC, hospitalizations and deaths from lower respiratory tract infections, sudden infant death syndrome (SIDS), childhood asthma and deaths from childhood asthma, childhood leukemia and deaths from leukemia, type I diabetes and deaths from type I diabetes, and childhood obesity” (Bartick & Reinhold, 2010, p. 1049). These risk ratio decreases are derived from the 2007 Agency for Healthcare Research and Quality breastfeeding report. Research also associates any artificial milk substitutes given to the infant within the hospital stay as a negative association with exclusive breastfeeding after discharge (Cramton, 2009).
Enormous financial and national resources have been spent by hospitals and public health entities in the past three decades (Tender, et al., 2009) to achieve successful breastfeeding. Yet the 2011 Surgeon General’s call to action reports United States breastfeeding continuation rates drop to as low as 13% by the infant’s 6th month of life (The Office of the Surgeon General, 2011). A review of literature reveals multifactorial determinants (Lu, 2010) impact breastfeeding rates and there is debate in interpreting what are the most influential causes ((Barnes, Cox, Doyle, & Reed, 2010) of this abandonment of breastfeeding by many women. The 2008 United States Breastfeeding Report Card reveals rates of exclusive breastfeeding were a wide range of 8% to 53% in 3-month-old infants (Cramton, 2009) depending on area of the country surveyed. This is a significant healthcare problem aimed at impacting exclusive breastfeeding (Cramton). In response to the economic and health morbidity and mortality impact on infants in the United States from suboptimal breastfeeding, hospital leaders need to take action to improve the rates of exclusive breastfeeding at discharge of well newborns.

Barriers to exclusive Breast milk feeding in the LDRP hospital setting

Many circumstances influence a women’s decision to breastfeed such as socioeconomic status, low level of maternal education, father’s occupational status, cesarean birth, and neonatal intensive care practices (Bartick & Reinhold, 2010). Public Health has worked to eliminate these enemies of breastfeeding that correlate with low breastfeeding rates in the United States. This hospital microsystem team identified similar barriers. These barriers included acceptance of formula milk substitutes as being equal to breast-milk feeding, consumer expectations for nursery care at night, and medical procedures that disrupt keeping mothers and babies together.
Others have also identified artificial milk substitutes being routinely used in United States hospitals (Purdy, 2010) such that artificial milk substitutes are considered equal to breast milk. For example, the culture is so accepting of artificial milk that formula gift bags continue to be distributed to new parents during their hospital stay throughout the United States. Less than half of hospitals have discontinued this formula marketing practice. Some of those that have “banned the bags” have continued to allow company formula representatives access to distributing coupons and educational programs to nurses and providers. The end result of this practice is continued formula coupon distribution to mothers without regard to their intention to breast milk feed their newborns. In addition, hospitals are reluctant to renounce the “free formula” which continues to force a dependent relationship with the marketers of artificial milk substitutes. Eliminating formula bag distribution and rejection of free formula are examples of evidence-based steps toward reducing artificial milk feeding of infants (Thulier, 2010). Quality improvement experts assert that banning the hospital formula bags to reduce exposure to formula after discharge without attention to other formula introductory pathways is an example of “system” oriented issues which must be addressed by “local leadership” (Hendrich, Tersigni, Jeffcoat, Barnett, & Brideau, 2007). In this case, previously unquestioned parts of American hospital practices which yielded unparalleled barriers to breast milk feeding of infants, can be abandoned for healthier alternative practices (Abrahams & Labbok, 2009). Decades of artificial milk feeding have presented formula as equally acceptable to breast milk in modern cultures. This has influenced families, and healthcare workers in America in commanding ways. One study that examined detrimental practices that were done on a national basis found that 24% of hospitals routinely supplement full term breastfeeding infants and 77% of facilities issue samples of infant formula to breastfeeding mothers (Thorley, 2009). This cultural provocation is so prevailing that “the longer Hispanic
women live in the United States, the less likely they are to initiate breastfeeding”…and “the shorter the duration of exclusive or any breastfeeding” (Gill, 2009, p. 244). Acculturation can negatively influence breastfeeding in immigrating women within one generation. Other factors within the hospital and health service environment include breastfeeding policies and practices that facilitate or impede, early and unrestricted feeding, provision of information for women during pregnancy and during the postnatal period, rooming in, demand feeding, and “restricted use of dummies and teats” (Bartick, Stuebe, Shealy, Walker, & Grummer-Strawn, 2009, p. e794). A quality improvement microsystem team can manage this issue as they direct actions to remedy the intended and unintended affects of such practices (Shojania & Grimshaw, 2005).

Baby Friendly Hospital Initiative (BFHI)

The Baby Friendly Hospital Initiative (BFHI) has identified an improvement pathway of ten steps to achieve increasing rates of breastfeeding intiation and duration. This international initiative was launched in 1991 by WHO and United Nations Children’s Fund (UNICEF). More than 20,000 hospitals in over 150 countries have participated and fulfilled the ten step guidelines to improved maternity services that are identified as baby-friendly (Abrahams & Labbok, 2009). As of October 5, 2011, there were only 119 baby friendly designated facilities in the United States (US Baby-Friendly Birth Facilities, 2011). Because the ten steps to successful breastfeeding are all necessary for the baby friendly designation and must be surveyed for on site assessment every five years, the goal often requires 3-5 years of improvement work.

Research from 14 hospitals internationally revealed “statistically significant upward trends in EBF (exclusive breastfeeding) under two months and under six months” (Abrahams & Labbok, 2009, p. 1) after baby-friendly status was achieved. In a Czech republic retrospective
study of years 2000-2006, “the average rate of exclusively breastfed infants for the whole study period was 90.32% in BF hospitals and 87.63% in non-BF hospitals (P < .001)” (Mydilova, Vignerova, & Sipek, 2009, p. 73).

Hospitals in the United States who choose to report on the Joint Commission’s (TJC) Perinatal Care Core measure set are invested to make changes that result in clearly defined outcomes (Milton, 2010) such as exclusive breast-milk feeding. Each TJC measure set has parameters that allow public reporting of data (Romano, 2010) that facilitates comparison among hospitals in impartial terms in order to achieve transparency between hospitals for consumers. Other industries have long histories of using rigorous microsystem approaches in maintaining efficiency and competiveness in the business world (Bartick et al., 2009). Replication of these approaches by an LDRP maternity center has great potential for creation of benchmarks and boundaries in quality initiatives while improving measures such as exclusive breastfeeding at hospital discharge.

Implementing the Life Course Health Development (LCHD) Model

The fundamental bedrocks of infant feeding methods have been studied in recent years and breastfeeding has overwhelmingly been found to be overwhelmingly more than nutrition alone. As early as 1946, the “British National Birth Cohort Follow-Up Study provided extensive evidence of the effect of early life experience on cognitive functions, physical growth trajectories, blood pressure and respiratory health” (Halfon, Russ, & Regalado, 2005, p. 7). The Life Course Health Development model (LCHD) is useful in analyzing the current evidence that breast milk feeding is superior to artificial milk substitute feeding. The LCHD suggests that a person’s health results from cumulative influences “of multiple risk and protective factors that are programmed into an
individual’s biobehavioral regulatory systems during critical and sensitive time periods in development” (Halfon et al., p. 6, 2005). Much of what is considered critical occurs in the first three years of life. The brain micropathways influence the body’s adaptive responses in multiplied ways that can impact future susceptibility to diseases. Since breast milk feeding appears protective toward reduced severity of so many childhood illnesses, this model is a framework to understand how important this critical action of breast milk feeding is to the future health and wellbeing of infants. As healthcare practitioners learn to prevent disease by promoting healthy birth practices (Crenshaw, 2003) such as increasing exclusive breast milk feeding, they can adopt the LCHD framework in health care delivery practices such as in the maternity setting (Halfon et al., 2005). For example, “initial breastfeeding protects against obesity in later life” (Owen, Martin, Whincup, Smith, & Cook, 2005, p. 1367) and therefore is a worthy goal to prevention of obesity. Early experiences are known to be influential in bonding and attachment of newborns and parents. The breast crawl at birth represents one evidence-based way for initiating breastfeeding as it exhibits the newborn has skills and senses that enable neonatal reflexes to suckle at the breast. “The primal movement of crawling to the breast by the infant stimulates oxytocin releases by the mother as the infant propels himself to the breast” (Henderson, 2011, p. 299). There are profound biological neuroendocrine responses that occur in the first hours past birth that are routinely disrupted in hospital practices. The “maternal habitat” is superior to all newborns as the place that feeding should take place for facilitation of breastfeeding (Henderson, p. 300). Breastfeeding is therefore important as an influence during the critical years of infancy.

The LDRP Maternity Setting as a Microsystem

The LDRP maternity setting is unique in its scope of care in that it allows the patient to view their maternity experience through one room from which the entire obstetrical experience takes
place (Fannin, 2003). The nursing staff and providers in such units provide care from admission through discharge and are less likely to have a silo type observation of the patients experience due to their exposure to the entire hospital stay. An LDRP simplifies convening a team of providers and staff members that are able to view processes of care during the mother’s entire maternity stay. When the nurse workflow is separated between labor and delivery or postpartum nursing teams, other hospitals must enlist nursing leaders in the different units to get appropriate team members that represent and can infuse all processes that affect patients. Though, pioneers such as Celeste Philips championed the LDRP model of care as a part of “family centered care” work in recent decades, there is limited literature on the LDRP model benefits beyond a “homelike” environment for patients (Fannin). Family centered maternity care is a conceptual model of care and is not dependent upon the physical environment (Jimenez, Klein, Hyvon, & Mason, 2010). Those that have championed the LDRP model of care have found it to be helpful in providing such benefits as the evidence based healthy birth practice of keeping mothers and babies together (Crenshaw, 2003). The commonly termed practice of “rooming in” has been researched to increase breastfeeding success measures (Fannin). Long held as an ideal model of maternity care provision (Patient Education Management, 2011), the LDRP allows the connection of stakeholders with direct processes that affect outcomes (Foster, Johnson, Nelson, & Batalden, 2007). Because of its partially closed system, the LDRP provides a natural environment for small continuous trials of change necessary for quality improvement projects. Processes can be modified frequently in this microsystem because it provides direct access to observable effects and data that can be used to further drive improvements. This “frontline activity” done in “the smallest replicable unit” is known as a healthcare clinical microsystem and “is the key to implementing effective strategy” (Foster et al., p. 336).
A clinical microsystem can be used as the staging ground for an immense problem such as not enough exclusive breastfeeding at hospital discharge recognizing that the complexities of influence from culture, communities, families and healthcare individuals converge during the childbirth hospital stay. Indeed, use of the clinical microsystem is one of quality improvement’s essential starting points for this important work (Foster et al., 2007). The Dartmouth Institute has created a model of improvement based on this small unit called a clinical microsystem (Baltalden, et al., 2004). They recommend that a representative group of multidisciplinary members of this small unit be convened for the purpose of improving outcomes (Foster et al.). A clinical microsystem connects the “needs of the customers with the organization’s core competency” and is what Quinn and other industry leaders found “key to implementing effective strategy, information technology and other key aspects of intelligent enterprise” (Foster et al., p. 336). This group should fully represent all who interact with the patient so that improvement processes are not short sighted for all perspectives and to assure that it is representative of all who are influencing the patient care experience. As a result of healthcare professionals adopting the science of improvement, hospitals now must accept the challenge of addressing and planning to produce “a high-quality, high-value maternity care system” (Carter, et al., 2010, p. S7) that can perform work to achieve Improved perinatal core measures.

The Microsystem Multidisciplinary Team

A first step in microsystem quality improvement work involves establishing a multidisciplinary team (Baltalden, et al., 2004). Two physicians were enlisted in this project to represent well babies from both outpatient and inpatient perspectives. Also enlisted were staff nurses, discharge nurses, lactation consultants, managers, NICU nurses, lactation consultants,
childbirth educators, clinical leaders and a clinical specialist. Using the Dartmouth microsystem as foundation model for team selection, the new team formed to begin improvement work in September 2010. At that time, this suburban hospital in a large Southern city, had 28 LDRP beds, 26 providers, and 100 nursing and support staff that interfaced with approximately 200 families each month. Demographics included all races and socioeconomic backgrounds, and the majorities were nonhispanic white, middle income, with high school or college educations. Approximately 10% of these women seek childbirth education or breastfeeding education each year. Midwifery care and the unit’s reputation in the community support natural childbirth options though greater than 90% of women who give birth there receive medical interventions such as epidurals.

The State Quality Collaborative

“Quality improvement collaboratives are increasingly being used in many countries to achieve rapid improvements in health care” (Overtveit, et al., 2002, p. 345). The project team was invited to participate in a state collaborative that had been successfully leading aggregates of 20-40 hospital groups in perinatal quality improvement activities since 2008. State Quality Collaborative leadership championed use of the microsystem team as essential to change and educated teams on best practices to facilitate the work teams would do to increase exclusive breast milk feeding at discharge of well newborns. They encouraged inclusion of a family member on the team (Institute for Patient- and Family-Centered Care, 2011). The team committed to frequent meetings, education learning day trips to meet with other hospital teams that were participating in the collaborative and to individual assignments. They did not include a family representative member initially. Later, as new strategies were trialed, family members were utilized for feedback on small trials of change.
Having hospital upper level managerial approvals for a front line microsystem team allows the team to overcome workplace bureaucratic barriers by moving improvements to high priority status. Having the highest levels of administrative approval in each hospital setting is supported by the evidence as predictive of greatest success in quality improvement processes (Bartick, et al., 2009). Therefore, the state collaborative insisted that each hospital include an administrator at the director level on their improvement team. In this hospital, the director obtained approval from administration and participated in the trips and meetings as a team member.

Past Improvement Activities

This maternity center had been doing formal quality improvement work to improve breast milk feeding rates since 2009 when they stopped distribution of hospital formula gift bags. That initiative was followed in 2010 by a sophisticated project that formalized skin-to-skin delivery routines for care of infants at birth. Though both of these evidence-based strategies are proven to increase exclusive breast milk feeding rates, both initiatives only resulted in two spikes each year to the 50% rate of mothers exclusively breast milk feeding at hospital discharge. Because computerized charting was available, data on “0” intake of formula could be easily generated to verify average monthly rates of 43% exclusive breast milk feeding at hospital discharge of newborns. Unlike many in the perinatal collaborative aggregate, this hospital team did not have uncertainty on their starting point for the improvement project. A retrospective review of their quality improvement work of 2009-2010 revealed use of a team approach with education being the primary vehicle of change used to influence outcomes. Of note, the improvement team had administrative support and was made up of nursing leaders and staff nurses. No physician team members or family members participated formally in the planning and implementation of these previous initiatives.
The Culture’s influence

Both the 2009 and 2010 formal quality projects encountered cultural barriers to improvement processes related to breast milk feeding of newborns in the hospital setting. Team members stated that “staff resistance” was by far their greatest obstacle. Nursing and support staff lamented that “women should have their own rights to decide about breastfeeding and that no one should be pushing it on them”. Conversations would become emotional as nurses described mothers crying because “breastfeeding is so hard”. Delivery routines for skin-to-skin were not hardwired and appeared to be abandoned for a variety of reasons such as “mother refused” or the “baby was not stable”. Most delivery audits were not completed and after several months, it appeared that the audits were only completed when skin-to-skin care at birth was implemented. This data was not reliable as a true reflection of routine practices on most days due to a 20% sample size. These were some indicators that there were culture specific influences affecting rates of exclusive breast milk feeding for newborns at discharge.

Other obstructions to the improvements of 2009-2010 included routine use of the newborn nursery as the central command area of the unit. Having important information and shift gathering aspects as part of the newborn nursery environment appeared to influence the amount of time newborns spent away from their parents. The literature validates that having a newborn nursery can pose a barrier to successful breastfeeding for mothers in the hospital if the public and staff culture view it as the normal service for providing support for mothers at night (Beake, Rose, Bick, Weavers, & Wray, 2010). Though this was a LDRP setting, newborns were separated from their mothers and spent hours each night in the nursery due to parent requests, nurse routines, and provider morning examinations. This high level of nursery activity served to make discussion of
the importance of rooming in for mothers and babies into an emotional issue for some staff
members. The project team found it difficult to separate staff’s lack of knowledge of best practice
from the many voiced reasons that the babies were “better off in the nursery”.

As with most problems, it is the unknown factors that serve to sabotage outcomes (Lu,
2010). Obstructions that the team identified included many from a comprehensive literature
review such as high numbers of staff members that offer advice on breastfeeding, inconsistencies
among lactation experts in daily practice, hospital birth procedures such as epidurals (Widland,
Normal, Uvnas-Moberg, Ransjo-Arvidson, & Andolf, 2009), IV fluids and surgical births
(McGrath & Phillips, 2008), and acceptance of current outcomes as optimal. The maternity
center’s data revealed low exclusive breast milk feeding rates for mothers with primary cesarean
births. McGrath lists three main reasons that are associated with this trend for post surgical
mothers to choose bottle-feeding. “Delay in putting the baby to breast for the first time, the baby
was in a stressed state when put to the breast for the first time and the baby received formula
during the separated time” (McGrath & Phillips, p. e35). Data trends in this center revealed that
the majority of our repeat cesarean mothers declare intent to formula feed upon their admission to
the hospital. Evidence supports continuous quality improvement as an appropriate method to
mediate these combined barriers (Baltalden, et al., 2004). Continuous quality improvement offers
multiple options to problem solve and approach multifaceted systems for best outcomes (Shojania
& Grimshaw, 2005). The state quality collaborative named the project “Exclusive Human Milk for
Babies” (EHM4B).
Assessment methods

Though some hospital statistics report averaging a rate of 50% exclusive breast milk feeding at discharge (Bartick et al., 2009), this LDRP maternity center was averaging 43% on this core measure. The state quality collaborative offered opportunity and support for the maternity center to work with nineteen other hospitals to increase their exclusive breast milk feeding rates. The team was granted permission to join the collaborative in September 2010 in preparation for application of evidence-based principles of quality improvement that would begin in January 2011.

The state collaborative was led by experts convened to guide hospital teams in using evidence-based practices to improve their exclusive breast milk feeding rates. These project leaders designed a comprehensive data collection audit tool to assess each hospital’s breastfeeding practices. This preliminary data was entered into a database that offered the ability to provide transparency and benchmarks between hospital collaborative teams.

The audit tool was a collection of evaluation questions that were derived from an extensive literature review. Audits tracked whether the baby was placed skin-to-skin at birth, the number of minutes of skin-to-skin time each hospital shift, pacifier usage, newborn separation time from mothers, formula supplementation reasons, weights, phototherapy and lactation support measures.

The need to record up to six 12 hour shift summaries for each baby proved quite labor intensive for the staff. Incomplete audits of entire shifts of data reduced sample sizes each month. In this center, the nurses were accustomed to the 2010 birth audits of skin-to-skin delivery routines, so there was extraordinary compliance for the portion of the audit focused on the initial hour past
birth. The project team gained detailed skin-to-skin data on 80-90% of deliveries with the initiation of this audit tool. These collaborative audits were later refined and could be submitted to the database when at least 3 shifts per newborn were completed. The maternity center gained many new data details from these audits about their culture and practices and the results were then used to guide small trials of change. This was very helpful in interpreting whether the trials had any affect on the breast milk feeding rates of mothers in this LDRP setting.

Baseline data

Initial baseline data collected in December 2010 confirmed an average of approximately 43% exclusive breastfeeding at discharge. The project team was disappointed to find that mothers and newborns were separated greater than one hour per shift almost 89% of the time. Data also revealed routine use of pacifiers described as being “nurse initiated” about half the time. Several nurses objected to these pacifier questions being a part of the audit. One nurse stated the wording of the questions were “offensive to nurses” and there was conversation with collaborative leadership about rewording or removing the questions from the data collection tool. The state leaders addressed the pacifier questions with discussion of evidence (Almquist-Tanger, Bergmen, Dahlgren, Roswell, & Alm, 2011) that supports baby friendly’s rationale for postponing pacifiers until after breastfeeding is well established. “The proposed mechanism for the relationship between reduced breastfeeding and pacifier use is that when infants use pacifiers they tend to suck on the breast less, and as a result the milk supply is reduced, and subsequently fails” (Jaafar, Jahanfar, Angolkar, & Ho, 2011). This hypothesis is not supported by recent evidence compiled by Cochrane Library reviewers in 2011 and nurses were knowledgeable that pacifiers are supported as helpful in prevention of Sudden Infant Death Syndrome (Jenik, Vain, Gorestein, &
Microsystem team members conversed with nurses about importance of influence (Weddig, Baker, & Auld, 2011) and recognition that all actions can lead to outcomes became a common theme to all involved in responding to the data in their daily practices. Nurses were empowered to discuss the pros and cons of pacifier usage and promote delaying routine use until after breast-milk feeding is established.

Another audit finding was a lack of documentation of lactation supportive activities and lactation services. The nurses stated on the audits that they informed patients of lactation services and offered lactation support measures 100% of the time, yet they did not document it because “it was the lactation consultant’s area in the medical record”. This is an example of systems producing results by default, as it appeared that nurses compartmentalized lactation notes to only be done by lactation consultants. This had resulted in no indication of lactation support provided by nurses inside the electronic medical record. Rather than address the obvious need to document, the team specifically addressed how and where in the electronic medical record the nurses were to record lactation supportive activities. Subsequently the audits revealed compliance to documentation of lactation supportive activities by nurses.

Initial audits revealed the principle reason that formula was given to newborns in this maternity center was because the mother requested it. The project team identified that education of nurses would be necessary so they could in turn educate new mothers that supplementation is “not indicated for sleepy infants with less than 7% weight loss and no signs of illness, healthy term infants with normal bilirubin levels, fussy or constantly feeding infants with less than 7% weight loss nor the infants of tired or sleeping mothers” (The Academy of Breastfeeding Medicine Protocol Committee, 2009). However since the audits listed other evidence-based reasons that formula might be given, nurses began to mark other reasons with detailed notations as to what they
tried prior to formula administration. These notes were not an audit measure but they revealed focused nursing attention on justifying or preventing infants from receiving formula when a mother’s intention was to breastfeed.

Baseline data also revealed that greater than 60% of infants were placed skin-to-skin within the first minutes of birth. This was informative that the center’s previous work to hardwire new birth routines that included immediate skin-to-skin placement at birth had become standard practice. The team could now focus on new education on “the breast crawl”, “birth skin-to-skin contact” and “very early skin-to-skin contact” which represented new areas of emphasis needed for continuation of work with skin-to-skin routines (Henderson, 2011, p. 297).

Problems Identified

After the baseline data was analyzed and this microsystem team had attended education from the state, they began small trials of change as directed by the collaborative leadership. Their first small trial was the placement of a roster in the nursery to document reasons newborns were fed formula while there. One week later the completed audit confirmed that nurses were feeding infants formula at mothers request and in amounts between 15-45 ccs. The nursing staff had been educated on the stomach capacity of newborns and many of the nursing staff utilized beads that had been distributed to provide visual imagery for parents. The audits initiated conversation about supplementation and some objections to having to document reasons for formula. The team found that even negative conversation kept priorities of exclusive breastfeeding as a focus. Nurses verbally reacted at being questioned about giving a mother what she requested. Education was done one to one by those on the team and attention was placed on professional ethics to teach parents best practices regardless of their lack of knowledge (Bai, Middlestadt, Peng, & Fly, 2009).
revealed by requesting to formula feed their infant. This need to educate for belief of the evidence continues in this maternity center and was a common problem for most teams participating in the collaborative project. Over time, the team was able to report staff members becoming more invested in the goals of the project. This was the beginning of a culture change that was baby-friendly.

Simultaneously as audits were summarized, nursing staff members were provided feedback through data boards, staff meetings, email reports and one-to-one conversations on total time of skin-to-skin at birth they recorded as individual nurses as well as their compliance as a group in completion of the new audit tools. Since the audits revealed that skin-to-skin as a birth routine had become more standard, the team began to measure length of time on the skin in the first hours past birth. By the second month of data collection, this maternity center was recording 80% of newborns were placed skin-to-skin within the first hour of birth, and 90% of those newborns were skin-to-skin within 5 minutes of recorded birth time. The data revealed a decrease in mothers that refused skin-to-skin from the previous year’s documented 5% refusal rate. Nurses were acknowledged individually for their focus on placing infants skin-to-skin at birth and champions were identified as those who recorded the greatest amount of hours of birth skin-to-skin time.

Small Trials of Change

This LDRP maternity center has seasoned lactation leadership seven days per week by Internationally Board Certified Lactation Consultants (IBCLCs). One lactation consultant in this microsystem team planned a trial of change with new focus toward increased exclusive breastfeeding at discharge. Over several months, she refined a strategy that was eventually named ‘the 24 hour plan”. She had formal trials involving patients and their nurses in February and
March 2011. Her approach included a minimalized information presentation that directed parents’ attention to basics of how to survive the next 24 hours from their infant’s recorded birth time. She followed each family daily with education on the infant’s behaviors, what should be done for successful breastfeeding in that 24 hour period, preparation of support people to stay the night to help care for the baby, and education on hand expression for initiating and building milk supply. She benchmarked against her own initial success rate for exclusive breast milk feeding at discharge. Her results produced higher rates of exclusivity for those newborns she trialed. She also followed the trialed parents after discharge to determine whether they continued with exclusive breast milk feeding in the first weeks at home. She not only validated increased rates in the hospital stay but also documented successful exclusive breast milk feeding in the first weeks at home for those patients in her trial. March 2011’s exclusive breast milk feeding at discharge abruptly rose to 61% in this maternity center.

Realizing quality improvement results can become synergistic as many small trials are multiplied as team members work together in new approaches (Edwards & Philips, 2010), the microsystem team hypothesized that multiple positive changes had assisted the sudden improvement evidenced by the March rate. Their opening of a new maternity center expansion in mid March may have affected their project rate. With their new expansion, the newborn nursery had been renamed the “Newborn Observation Unit” and the expansions larger geography may have limited former night shift routines that increased nursery location time for newborns. Simultaneous to the increasing EHM4B project, the maternity center also had convened a microsystem team for the Supporting Intended Vaginal Births (SIVB) project also being conducted as a state collaborative project. Ultimately this cannot be ignored since decreasing primary cesarean births could impact exclusive breast milk feeding rates. Therefore, the team credited their
lower TJC perinatal core measure for primiparous cesarean rate as possibly synergistic for their increased EHM4B’s rates.

A quote, “It was great advice to stay together” by one father led to another small trial of change at this maternity center. They named the poster “Staying Together/24/7” and provided simple messaging to educate the importance of mothers and family staying to help at night with their newborn. The microsystem team trialed different versions of this poster in various places in patient rooms until the team was satisfied from parent and nursing feedback that the posters were useful in promoting no separation of mothers and babies.

Ongoing small trials of change multiplied as staff and providers became more invested in trying one new thing (Baltalden, et al., 2004). Many of the small trials were ideas that became too cumbersome to implement or did not produce any observable effect. For example, the team trialed drying the baby at birth directly to a prepared scale so that the weight could be quickly recorded. They had hoped this would avoid the weight being a reason to disrupt skin-to-skin time that is so important to the normal baby adaptations that take place in the first 90 minutes (Henderson, 2011). A few nurses reported that it worked well, but overall the practice was not deemed useful. Because evidence supports minimizing variances of care (Foster et al., 2007), the team promoted waiting on obtaining the baby weight until after the first hour of skin-to-skin time is past.

Small trials of change offer the opportunity to be innovative in problem solving. The maternity center’s lactation staff trialed camisoles designed for mothers in the hospital to hold their babies safely skin-to-skin (Houston, 2004). Some new mothers that tried them also allowed photography. In the next days and weeks, nurses took initiative in getting skin-to-skin pictures of many parents holding their infants skin-to-skin which increased the promotion of exclusive breast
milk feeding. Lactation consultants’ trialed giving free camisoles during 2011’s World Breastfeeding week, which resulted in an observable increase in the center’s exclusive breast milk feeding rates that week. The team did not continue this trial due to financial considerations but the team noted that once again there appeared to be gains associated with the focus of attention that accompanied temporary changes. Since it is difficult to know which interventions increased rates overall, the maternity center credits all of their successful small trials as part of the solution to previously lower rates.

The microsystem physician team members advocated instituting a formal physician order for supplementation of breast milk feeding infants. They presented their case for this change of practice to the June 2011 Pediatric Operations Committee. In preparation for institution of this plan in September 2011, the team worked to provide education to nursing staff on assessment and how to troubleshoot infant needs for supplementation. Initial response from nursing staff was reservation that maternal requests for formula supplementation would inevitably come on night shift making their job difficult. An algorithm was provided to the nurses and educational activities will continue to support this new practice as new processes are designed. September and October exclusive breast milk-feeding rates have increased to 59% and 62.5% respectively with this recent trial of change.

Results

Consistent evidence-based strategies are predictable toward improvements though data fluctuates each month. Overall, this maternity center averaged 54% increased exclusive breast milk feeding at discharge of well newborns over ten months in 2011. This statistic represents more than 200 babies. Accordingly, by viewing these results within the LCHD framework, there is
association of an important short-term outcome with intermediate goals of duration of breast milk feeding and overall long-term healthcare goals. Long-term outcomes such as reduced obesity, less childhood illnesses and improvements in emotional and intellectual health of individuals are possible to correlate with early interventions during critical timeframes such as birth and can be a helpful justification for work to achieve short-term outcomes.

An important milestone in this improvement journey was based on lessons learned from this center’s work with skin-to-skin birth practices. The microsystem team discovered that time spent skin-to-skin at birth was directly correlated to successful latching to the breast by 80% of babies within the first hour, and 90% of babies within the second hour. This improvement data gives validity to the research based benefits of skin-to-skin at birth (Henderson, 2011). Evidence-based medicine became part of a new learning culture that was created as staff proved these benefits for themselves each day. Nurses commented “I don’t have to help them as much” and “I can’t remember when I had to work on latch.” Likewise, when latch has become problematic for an infant, delivery routines are often implicated due to interrupted first hour skin-to-skin practices.

One lesson learned about skin-to-skin practices at birth was related to the short sightedness of the center’s first year’s emphasis on the immediate hour past birth. The improvement team had measurable differences in outcomes from continuing skin-to-skin time daily as a healthy birth practice of “not separating mothers and babies” (Crenshaw, 2003). The state collaborative experts assisted teams to further normalize time spent in the first hours past birth and the days afterward by supplying daily audit questions to record each baby’s daily skin-to-skin time. The refined focus on skin-to-skin time after birth also directed attention to posttraumatic deliveries and post Cesarean skin-to-skin processes. After they began increasing promotion of skin-to-skin time in the days
after birth, the center’s rates of exclusive breastfeeding at discharge for Cesarean mothers increased. It is noteworthy that even the complexity of Cesarean births responded to cumulative trials of change.

Another noteworthy result of this maternity center’s microsystem team work was the development of a new education tool for parents that lends consistent messaging when used by nursing and lactation staff during the hospital stay. The “24 hour plan” is now in the process of being spread as the admission and birth educational intervention for use with parents at this maternity center. Months of small trials resulted in concise messages that appeal to new families. The team added handouts for each 24-hour period into the instruction book they give to families. Nursing staff will utilize the 24 hour sheets each day as they assist mothers to record breastfeeding minutes, skin-to-skin time, and arrangements for support persons to help care for the baby in the mothers’ room at night. The “24 hour plan” has been shared with the state perinatal quality collaborative aggregate and this center awaits formal feedback as to whether other facilities have noted success with this educational tool. This team has also shared their lessons learned from this approach at a regional breastfeeding conference. Currently, the “24 hour plan” is part of their maternity unit’s orientation for new employees. Adding this lactation education strategy, as an hour instruction for all new staff in their orientation is an additional step leadership has taken toward the baby-friendly initiative requirements for staff breastfeeding education (Abrahams & Labbok, 2009).

The results this maternity center has obtained are due to a persistent use of a microsystem multidisciplinary team at the front line applying evidence-based strategies and adjusting the system of care to achieve better outcomes. Though the team had incorporated quality improvement
strategies in 2009 and 2010, there were some differences in 2011 that seemed to have increased primary outcome rates. The state quality collaborative provided the foundation for microsystem education with its direction and insistence on having physician champions and administrative involvement. These state leaders also provided educational and motivational reinforcement to the team in application of quality improvement small cycles of change and evidence based practices known to facilitate increased breast milk feeding at hospital discharge of newborns. Additionally, the EHM4B collaborative project fostered team building by offering education learning days and the opportunity to share across hospital systems throughout the state. There was friendly competition that promoted teams toward excellence in pushing their limits.

For this center, the use of small trials of change was a new experience and extremely successful. There was reluctance at first to try “something new by Tuesday” although one of the state leaders would encourage this approach in each learning session’s call to action. After committing to one small change at a time, this center learned the secret of the microsystem team’s ability to affect true change and improvement goals. This LDRP model of care is being utilized for its fullest potential and the model of care facilitated much of what the team found helpful. For example, a movement from a birth room to a postpartum room does not interrupt birth practices for skin-to-skin time. Likewise, this model allows the baby to room-in with parents rather than be housed in a newborn nursery. These benefits of the LDRP setting are realized when trying to improve outcomes such as exclusive breast milk feeding and should be considered by facilities that want to improve their family centered practices.
Discussion

Quality improvement can yield impressive improvement results to implement what researchers have determined to be best practices. While these improvements can and should be measured, the results are constantly changing as a reflection of multiple variables in any system. The front lines can and will always affect outcomes associated with the processes they create. This maternity center team’s work suggests that it was the synergistic effect of multiple trials of change and multiplied strategies that have impacted rates of exclusive breast milk feeding at discharge. The center is not far enough into their journey to have all the answers for best practices that increase exclusive human milk at discharge. In fact, the state collaborative is extending this important project into 2012 because data reflects that there is so much more to do. Participating hospitals are better positioned to take next steps after this year of groundwork.

Program development

The strength of the front line microsystem team in quality improvement efforts has been in its use of small trials of change. These continuous changes have been a validating force and have served to direct the improvement processes that are ongoing in this LDRP maternity center. Throughout the year, team members have had the opportunity to meet with the state collaborative and learn what other small trials that have been found successful for other collaborative teams. The small trials have kept the project in high alert state, which is vital to achievement of the primary outcome. Project reports and graphs assisted the team to analyze and plan new activities toward goals of increasing exclusive human milk for well babies at hospital discharge. For the accomplishment of increasing overall rates by 10%, the team is regrouping to study lessons learned, evaluate limitations and failed trials and energize another improvement plan. The team
has been recognized by their hospital and system for their successful project, presented their work at conferences and now they encourage other maternity centers to apply these evidence-based strategies to meet their perinatal care core measure improvement goals.

This maternity center team recognizes that another important step toward more evidence based practices for increasing exclusive human milk at discharge of well newborns requires fulfillment of the WHO and UNICEF’s ten “Baby-Friendly” criteria (Milton, 2010). “Implementation of the International Baby-Friendly Hospital Initiative (BFHI) has been associated with statistically significant annual increases in rates of exclusive breastfeeding among infants 0-2 months of age and among infants 0 to 6 months of age in 14 countries studied” by Sheryl Abrahams and Miriam Labbok (2009). The BFHI has resulted in an 8% increase in exclusive breastfeeding and is estimated to have reduced infant mortality by more than 1 million and saved countries billions of dollars (O'Brien, 2005). Some promising analyses have revealed that one of the ten steps to being baby friendly is not as cost prohibitive to hospitals as was once assumed. In fact, the “1.6- 5 %” costs increases for purchasing infant formula were not statistically significant across the 61 US sites that could be examined in public data files in 2009 (DeliFraine, Langabeer, Williams, Gong, Deigado, & Gill, 2011, p.989). After a maternity center demonstrates they have achieved baby-friendly status, they must use quality improvement projects to hold their gains so they can be renewed every five years (AHC Media LLC, 2011). This maternity center has planned a trip in late 2011 to learn how to incorporate additional criteria necessary for continued improvement work.
In conclusion, this maternity center’s ten months of data and microsystem teamwork in 2011 reveals 10% overall improvement of their EHM4B rates compared with 2010. This represents at least 220 additional babies in ten months who left the hospital exclusively breast milk feeding. This milestone is foundational toward intermediate impacts such as decreased otitis and decreased gastrointestinal illnesses in infants. Long-term impacts that are far reaching for these infants such as decreased obesity and less chronic diseases are worthy outcomes that may affect their individual healthcare futures. The potential reduced healthcare costs and sociological gains from nurture and wellness associated with exclusive breast milk feeding validates the resources that this microsystem LDRP maternity team invested. The LCHD theory reminds healthcare teams that birth is a critical life event for families. It is therefore best practice of evidence-based care to improve rates of exclusive breast milk feeding of newborns at hospital discharge.
Glossary of Acronyms

BFHI: Baby Friendly Hospital Initiative

BF: Baby Friendly

CQI: Continuing Quality Improvement

EHM4B: Exclusive Human Milk for babies

LCHD: Life Course Health Development Model

LDRP: Labor, Delivery, Recovery, and Postpartum

Microsystem: the smallest replicable unit in an organization

NICU: Neonatal Intensive Care Unit

NQF: National Quality Forum

SIVB: Supporting Intended Vaginal Birth

TJC: The Joint Commission


WHO: World Health Organization
References


