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 Menu Item: CHP Breast Milk Labeling

<b><i>Hospital National Patient Safety Goals</i></b>	<b>Select all that apply</b>
• Improve accuracy of patient identification.	√
• Improve the effectiveness of communication among caregivers.	
• Improve the safety of using medications.	
• Reduce the risk of healthcare associated infections.	√
• Identify safety risks inherent in the patient population.	√
• Prevent wrong site, wrong patient, and wrong person surgery.	

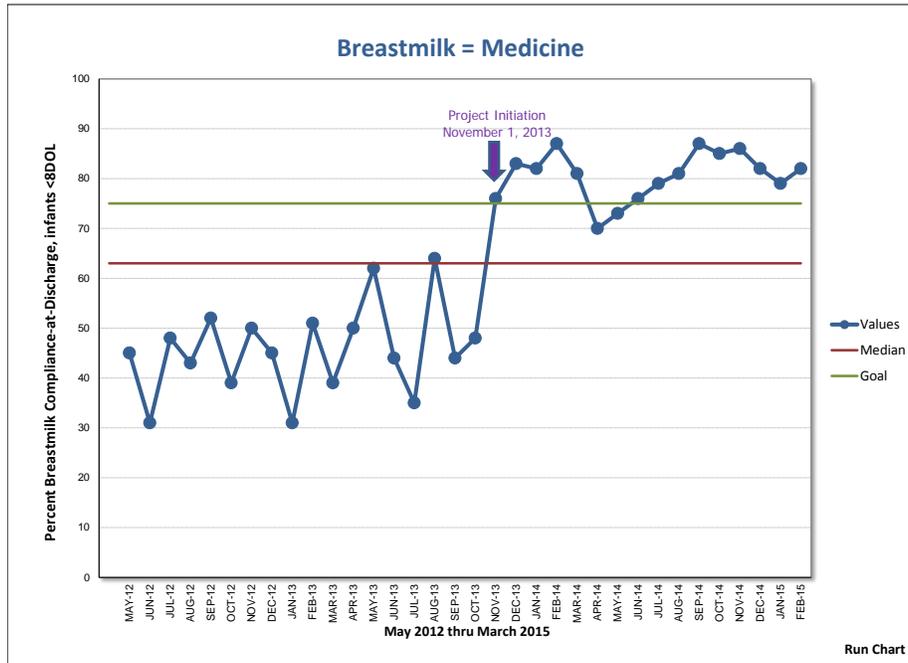
<b><i>National Priorities Partnership Goals</i></b>	<b>Select all that apply</b>
• Engage patients and families in managing health and making decisions about care.	√
• Improve health of the population.	
• Ensure patients receive well-coordinated care across all providers, settings and levels of care.	√
• Safety: improve liability and eliminate errors wherever and whenever possible.	√
• Compassionate palliative and end-of-life care.	
• Remove waste and achieve effective, affordable care.	

## **Executive Summary**

The benefits of breastfeeding are well known, but they hold special significance for premature and medically complex babies. Because breastmilk helps to prevent infection and provides the best nutrition with easily-digestible ingredients, it reduces the length of stay for hospitalized babies.

Because of the babies' critical condition or complex health issues, parents may think that they cannot provide breast milk. At Children's Hospital of Pittsburgh of UPMC (CHP), clinicians support and encourage the mothers' efforts to initiate and continue breastfeeding while the baby is hospitalized. Even if the baby is unable to nurse due to the medical condition, mothers are encouraged to pump so that a milk supply can be maintained until the baby is ready to nurse. Babies are discharged on mother's breastmilk approximately 80% of the time. The following chart shows the increase in breastfed babies upon discharge from CHP over the past 16 months since the inception of the breastfeeding project.

Figure 1



The percentage of breastmilk feeding events nearly doubled in the past 16 months; and therefore, the risks associated with wrong breast milk also increased. When wrong breast milk is administered, it is considered the same as accidental exposure to body fluids. The patients and mothers (whose breastmilk was inadvertently used) are tested for infectious diseases.

Clinical Leadership expressed concerns about administering breastmilk with the existing handwritten process, and they had hopes that the process could be improved by using similar technology as positive patient identification (PPID) for medications.

### Background Knowledge

Renowned for its outstanding clinical services, research programs and medical education, Children’s Hospital of Pittsburgh of UPMC (CHP) has helped establish the standards of excellence in pediatric care. From Primary Care, Emergency Care and Acute Care to Ambulatory, including Transplantation, Cardiac Care and Neonatology, talented and committed pediatric experts care for infants, children and adolescents who make over 1,000,000 visits to CHP each year.

CHP is the only hospital in southwestern Pennsylvania dedicated solely to the care of infants, children and adolescents. Care is provided by more than 700 board-certified pediatricians and pediatric specialists. CHP also provides primary care and specialty care at over 30 locations throughout the Pittsburgh region, as well as clinical specialty services throughout western Pennsylvania at regional health care facilities. Children’s is ranked among the U.S. News & World Report’s 2013-2014 Best Children’s Hospitals Honor Roll and is ranked in all ten of the evaluated specialties.

CHP leads the way in advanced technology as the first pediatric hospital in the country to achieve Stage 7 recognition from HIMSS Analytics for its electronic medical record and has been recognized by KLAS, an independent health care research organization, as the number one pediatric hospital in its use of health care information technology.

CHP is a leader in healthcare, and takes pride in proactively identifying and resolving potential patient care issues before they occur. Though a wrong breastmilk error is a relatively low occurrence, the potential was growing because the frequency of storing and feeding with breastmilk was on the rise.

When wrong breast milk is administered, there are potential health risks to the baby and emotional risks for the parents. In addition, the mother whose milk was given in error is asked to undergo screenings for infectious disease.

Wrong breastmilk from a single feeding is a potentially small overall health risk; however, there is a significant negative impact to the patient, family, and community.

### **Local problem being addressed and Intended Improvement**

CHP has a 55-bed NICU that is for complex health issues in newborns and an additional 255 beds for children of all ages, many of whom are breastfed babies. At CHP last year, there were over 34,000 events where expressed breastmilk was administered.

The team evaluated the documented occurrences of wrong breastmilk. In 2011 to 2013, there were four wrong breastmilk errors and one near miss reported. The Department of Health was involved, and CHP was asked to develop a remediation plan to prevent the occurrence of wrong breastmilk.

When a child is fed breastmilk from the wrong mother, the CDC states that the possible exposure to HIV or other infectious disease should be treated as if an accidental exposure to other body fluids had occurred. There are infectious disease risks with wrong breast milk. Baby is at risk for diseases such as HIV, Hepatitis B and C, Cytomegalovirus, Streptococcus and Staphylococcal infections. As a result, it is recommended that the babies undergo blood testing at 3 months, 6 months, and one year. The mothers' (whose breastmilk was given in error) are requested to undergo testing. There is also an emotional impact in that parents who have a critically ill child may be further compromised by an infectious disease. The risk is small, but it is a real concern.

When the nurses investigated the breastmilk process, they found that the process was entirely manual. The labels were stamped with the patient's name and medical record number, and the collection information was handwritten.

The technology and clinical informatics teams reviewed available solutions offered from vendors, and found that the process to administer breastmilk was needlessly complex. The vendor systems required text data or many user steps in the process and it was rather expensive for such a limited functionality. In addition, the systems reviewed would require different mobile devices than those available.

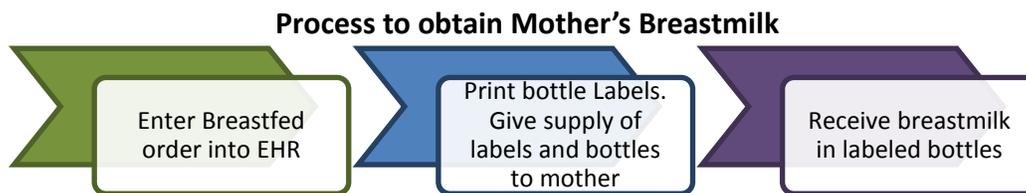
## Design and Implementation

A simple-to-use application that verified the patient and the breastmilk was needed. The goal was right milk to the right baby. The project team recommended a simple solution that works similar to positive patient identification with medication administration and lab sample labelling.

The Motorola MC40-HC Handheld Computer was used as the smart mobile device. This device is already in use for positive patient identification for medication distribution and lab specimen collection since 2007. It is also the same device used for Medication Tracking. The breastmilk application is an Android application on the handheld computer with a SQL database and Windows operating system.

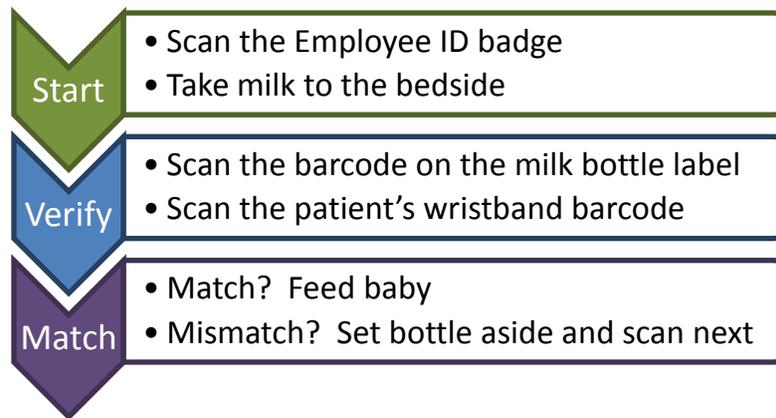
For simplicity, an existing order for mother's nutrition (breastfeeding mothers receive free meal vouchers) was utilized to order the breastmilk diet. The order is interfaced with an HL7 order from the EHR. This sends the patient barcode information to the breastmilk PPID application. Labels are printed from the EHR for the bottles.

All scanning and preparation is completed at the bedside. We scan the baby and all empty labeled bottles immediately before giving them to the families. When the families give the milk to staff for storage in the pantry, we again scan the baby and the milk to verify the milk is labeled correctly prior to storage. When feeding the baby, the milk is transported from the pantry to the baby's bedside where it is again scanned prior to feeding. When the baby is discharged we scan each bottle before it is sent home with the family.



A consideration is when there are twins who are both breastfed and who are patients at the same time. The breastmilk needs to “match” with both of the babies’ identification. In this case, the twins can be “merged” in the breastmilk application so that either patient identifier is valid.

### Process to Match Patient and Breastmilk



With the milk scanning initial go-live, training was multi-dimensional. We used both online education (CHEX) and rounding. CHEX is the system that we use for online training modules (so we can track who has completed training). This was step-by-step instruction, walking the staff through the entire process. At go-live Nursing Informatics and the Nursing Educators rounded and worked with staff. We were available to review the process and review education when needed. Nursing Informatics was also available at all times by pager if help was needed.

For new staff, Nursing and Patient Care Technician's receive education on the milk scanning process when they attend Cerner EHR training. Nursing Educators and Preceptors also work with the new staff as they are orienting on the units.

### Lessons Learned

The application needs to be simple to use without required text data input. More complex designs and existing solutions were evaluated; however, the complexity of required text data input was judged to be too complex for a handheld solution. When it is feeding time for babies, it is important to be quick and accurate.

Since all nurses and patient care technicians can feed the babies, it is important for the application to authenticate the user and add the user credentials to the application for easy identification. CHP uses the barcode on the employee identification badge to authenticate and logs the user identification. The match or un-match status of the event is also logged for up to 5 bottles in one attempt.

The breastmilk needs to be scanned before returning to mother upon discharge. After the breastmilk ID project was launched, there were two incidents when the wrong breastmilk was returned to the mother upon patient discharge. The breastmilk return procedure now includes that breastmilk is scanned with the patient and bottle barcodes before returning to mother for discharge. There have been no further reported errors since this procedure was implemented.

The labels need to withstand freezing, thawing, and refrigeration. Breastmilk is stored in either the refrigerator or the freezer, and the first order of labels was not able to withstand the rigor of moisture and frozen crystals. Test the labels before ordering a mass quantity.

### **How I.T. Was Utilized**

The Electronic Health Record (EHR) is the start of the process. The patient is admitted as an inpatient and then is electronically identified with barcodes on the patient wristbands generated from the Electronic Health Record. The patient's dietary needs are identified through the breastmilk order placed in the EHR, and the mother's breastmilk is labeled with the patient-identifying barcodes. The breastmilk order is interfaced with HL7 interface message to the breastmilk PPID system.

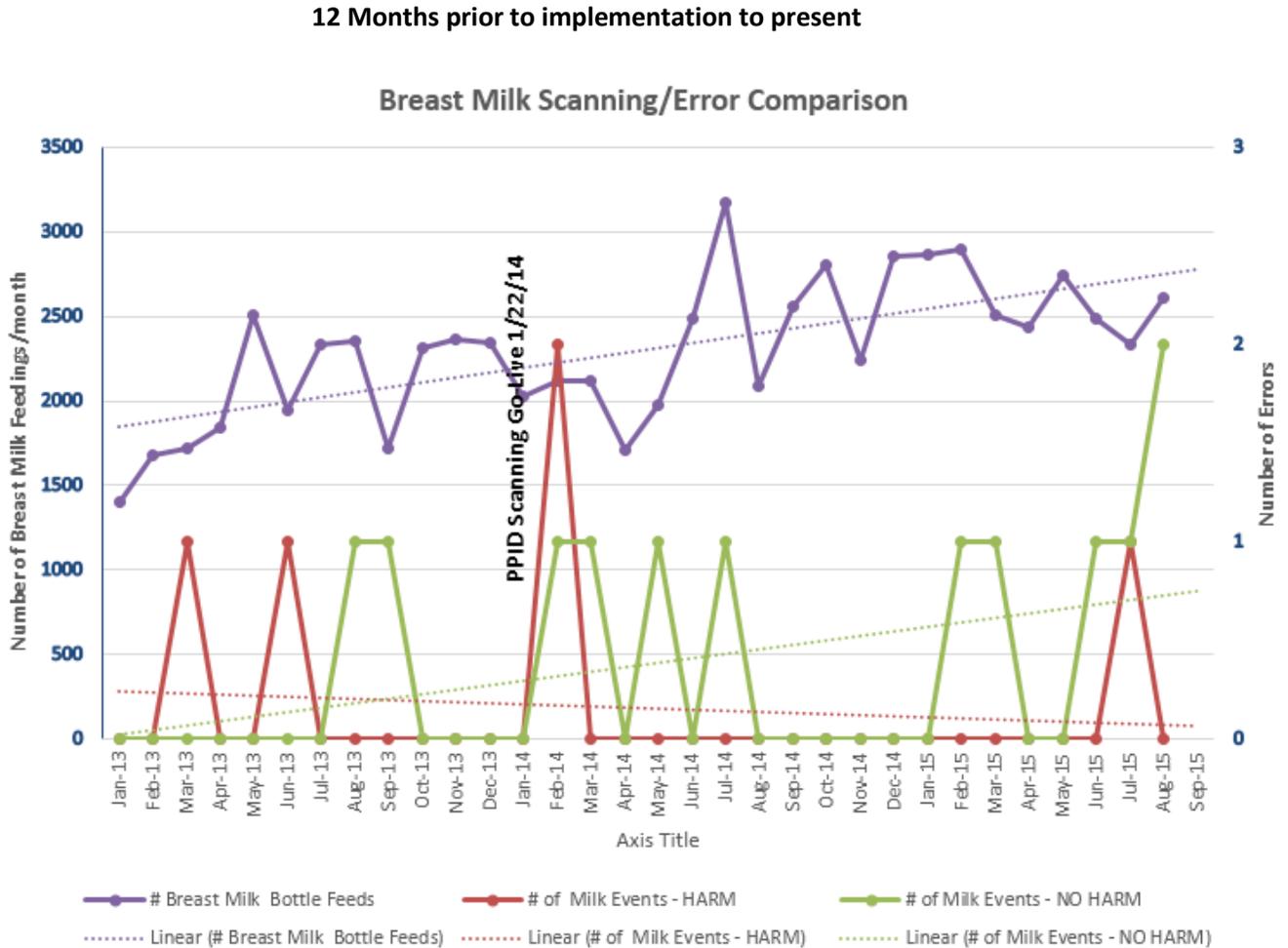
The order for breastfeeding mom in the electronic health record has two functions. It allows the mother to receive meal tickets. This encourages the mother to continue supplying breastmilk and helps with the financial challenges that an inpatient stay can incur. The order also sends the baby's identifying information to the PPID Breastmilk application, so that the breast milk can be scanned when the baby is ready to be fed by mouth.

### **Value Derived Outcomes**

The accuracy of the breastfeeding process to provide the right mother's breastmilk to the right baby is successful. There are no incidents of wrong breastmilk to wrong baby while feeding during the inpatient stay.

There were two errors of breastmilk sent home at discharge. Once the PPID scanning process was implemented to scan the breastmilk at discharge, there have been no errors. In Figure 2 below, is a chart that identifies the rise in breastmilk feedings and the reduction in harmful errors.

Figure 2



### Financial Considerations

The hard return on investment was that this system cost \$27,000 to develop over four months. There is nominal cost savings for lost revenue for follow up blood testing.

The soft return on investment is saving the patient’s family emotional stress over potentially deadly exposure to infectious disease. The risk of an infectious disease procured through breastmilk is very low; however, there are significant potential costs related to the treatment of a patient who contracted a disease through hospital error.

The potential community ill-will as a result of an error and resultant negative publicity is difficult to quantify but is a real risk. The loss of the community’s faith that CHP is the premier hospital with the most effective treatment for childhood conditions and illnesses would be irretrievable.