

NEW YORK STATE PERINATAL QUALITY COLLABORATIVE ENTERAL NUTRITION IMPROVEMENT PROJECT

The New York State Perinatal Quality Collaborative (NYSPQC) Enteral Nutrition Improvement Project reduced statewide the percentage of newborns of <31 weeks' gestational age who were discharged from the NICU at weights below the tenth percentile for post menstrual age. Using a learning collaborative model aimed at decreasing such postnatal growth restriction, the NYSPQC facilitated improvement in somatic and head growth and increased breast milk use, with no increase in morbidity, in preterm infants cared for at NYS RPC and Level III NICUs.

The incidence of postnatal growth restriction among preterm infants remains high. Studies have shown that somatic and head growth before 40 weeks' gestation is associated with better neurodevelopmental outcomes in preterm infants. In a report from the National Institute of Child Health and Human Development Neonatal Research Network, infants with better growth had lower rates of cerebral palsy and rehospitalization, and higher scores on mental and physical developmental testing.¹ In 2010, the NYSPQC, consisting of the NYS Department of Health, 18 regional perinatal centers, and the National Institute for Child Healthcare Quality, identified that nearly a third of infants born < 31 weeks' gestation were discharged home weighing < 10th percentile for post menstrual age, which could increase the risk of developmental delays in these infants. In response, the NYSPQC initiated the **NYS Enteral Nutrition Improvement Project** to improve nutrition and healthy postnatal growth and improve neurologic outcomes among preterm infants.

Project Methods

NYSPQC pursued a two-phase quality improvement project to improve postnatal growth in preterm infants.

Phase 1 – RPC Enteral Nutrition Project

In 2010, all 18 Regional Perinatal Centers (RPCs) formed a learning collaborative to review literature, share nutritional policies and practices, and develop opportunities for improvement. Interventions included regular coaching calls and face to face learning sessions during which RPC leaders shared nutritional practices, presented outcomes, and discussed ways to break down barriers to improvement. RPC growth, feeding, and morbidity measures were garnered from NYS SPDS NICU model data and additional nutritional policies and practices were obtained by surveying NYS RPC neonatologists.

Phase 2 – Level III NICU and RPC Enteral Nutrition Project

In 2015, drawing upon the collaborative learning methods and the nutritional practices, interventions and impact on outcomes identified as effective in Phase 1, 20 of 33 NYS Level III NICUs joined the 18 NYS RPCs in the collaborative improvement project. During Phase 2, the American Academy of Pediatrics recommended use of and NYS authorized Medicaid reimbursement for Pasteurized Donor Human Milk (PDHM). This resulted in sharp increase in the use of PDHM among NYS NICUs. Thus, Phase 2 coaching calls and learning sessions focused on optimizing growth during PDHM use.

Project Results

Phase 1 – RPC Enteral Nutrition Project (Between 2010 and 2013)

1. Incidence of the primary outcome, Postnatal Growth Restriction (PGR), defined as NICU discharge weight < 10th percentile for Postmenstrual Age (PMA), decreased from 32.6% vs. 26.3%, a significant 19% reduction.
2. Changes in z-scores narrowed between birth and discharge weights and head circumferences.
3. The number of infants discharged between the 10th and 50th percentile increased as the number of infants discharged < 10th percentile decreased (Figure 1).
4. Use of breast milk increased at first feeding, first full feeding, and feeding at NICU discharge (Figure 2).
5. Central line utilization per 100 patient days decreased as did incidence of Central Line Associated Blood Stream Infection (CLABSI) per 1,000 patient days.

Figure 1. Distribution of Discharge Weight Percentiles, 2010 vs. 2013

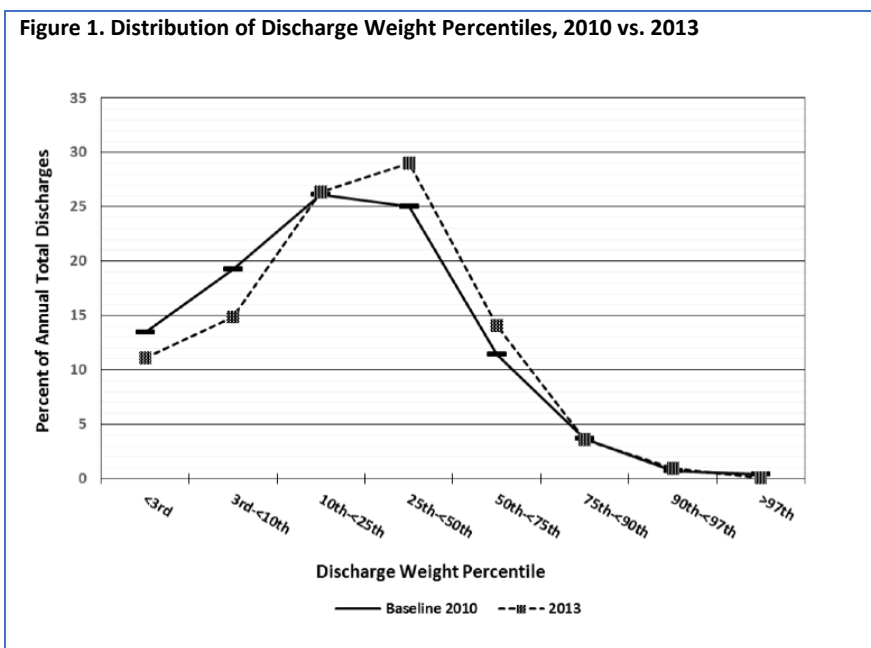
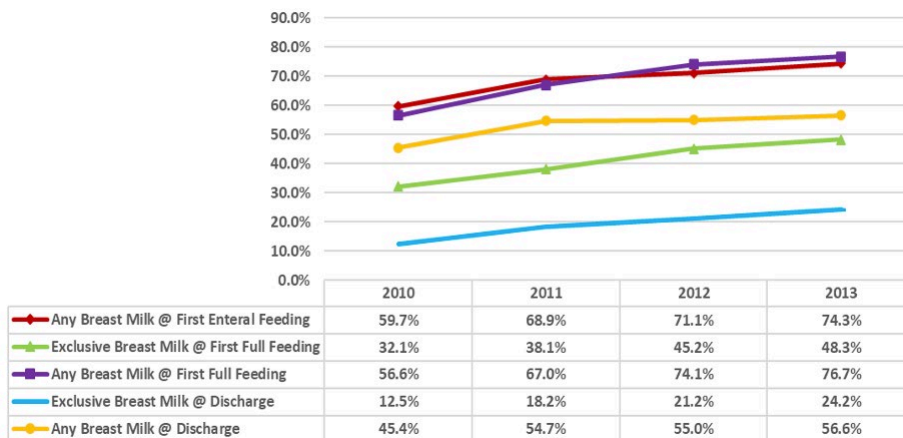


Figure 2. Percentage Receiving Exclusive or Any Breast Milk among RPCs, 2010 - 2013



**Phase 2 – Level III NICU and RPC
Enteral Nutrition Project (Between
2015 and 2018)**

1. Incidence of the primary outcome, Postnatal Growth Restriction (PGR), defined as NICU discharge weight < 10th percentile for Postmenstrual Age (PMA) decreased from 32.5% to 25.2% at RPCs and from 30.7% to 21.8% at Level III NICUs, significant reductions of 21% and 29% respectively [Note: RPC rate increase between 2013 and 2015 is attributed to increased breast milk feeding and changes in the Fenton growth scale] (Figure 3).
2. Changes in z-scores narrowed between 2015 and 2018 for both RPCs and Level III NICUs.
3. At RPCs, median age at first feeding decreased from 3 to 2 days. It was unchanged at Level IIIs.
4. At RPCs, use of any breast milk increased at first feeding and first full feeding, but not at discharge (Figure 4).
5. At Level III NICUs, exclusive use of breast milk increased at first feeding, first full feeding, and feeding at NICU discharge (Figure 5).
6. Use of Pasteurized Donor Human Milk (PDHM) increased.
7. Incidence of nosocomial sepsis decreased, and incidence of NEC trended lower at RPCs, but not Level IIIs.
8. Mean length of hospital stay increased at RPCs and trended longer at Level III NICUs.

Figure 3. Percentages Below Fenton 10th Percentile for Weight at Birth and Discharge Among RPCs and Level IIIs, 2015 -2018

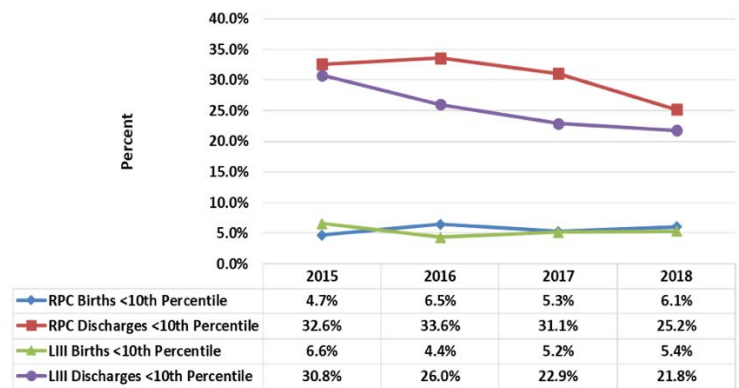


Figure 5. Percentage Receiving Exclusive or Any Breast Milk among RPCs, 2015 - 2018

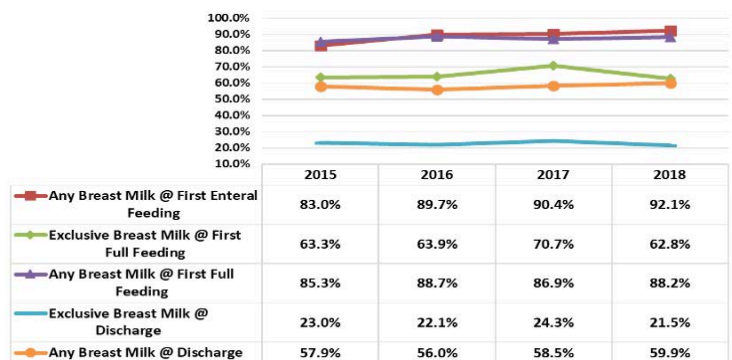
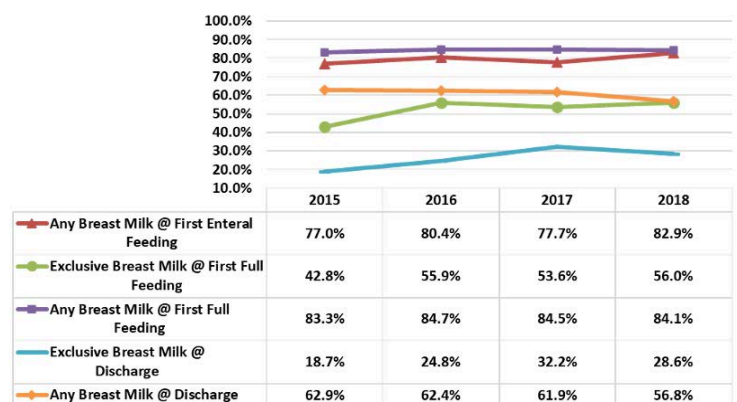


Figure 4. Percentage Receiving Exclusive or Any Breast Milk among Level IIIs, 2015 -2018



¹ Ehrenkranz RA, Dusick AM, Vohr BR, Wright LL, Wrage LA, Poole WK. Growth in the neonatal intensive care unit influences neurodevelopmental and growth outcomes of extremely low birth weight infants. Pediatrics 2006;117(4):1253–1261