

Risk of Postnatal Growth Restriction Varies 5-fold Among Infants < 31 weeks Gestation Cared for in New York State (NYS) Designated Regional Perinatal Centers (RPCs)

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Background

In 2010, the New York State Perinatal Quality Collaborative Neonatal Improvement Project began a quality improvement (QI) initiative to decrease the proportion of infants < 31 weeks gestation who are discharged from the Neonatal Intensive Care (NICU) with a discharge weight less than the 10th percentile for postmenstrual age.

This report describes statewide baseline variation in growth outcomes among preterm infants cared for in NYS RPCs.

Methods

From the NICU Module of the New York State Perinatal Data System (SPDS), a database of neonatal outcome and clinical care practices to which all NYS RPCs are mandated to report, the study population of all infants < 31 weeks gestation who were born or admitted within 48 hours and survived to discharge from a NYS RPC during 2010 was identified.

Using the database, gestational age, birth and discharge weight, and length of stay data were collected. Post-menstrual ages at NICU discharge and z-scores for birth weight (BWT) and discharge weight (DWT) from the NICU were calculated using the methods of Fenton (2007). For each of the 18 RPCs in NYS, the incidence of postnatal growth restriction (defined as discharge weight < 10th percentile for post-menstrual age), relative risk (RR) and 95% CI of DWT < 10th percentile compared with the NYS and the median difference between birth and discharge weight z-scores, mean were calculated and presented to each RPC to guide their nutrition program and/or practice bundle. Statewide summary data were also calculated to identify centers with the lowest risk of postnatal growth restriction and to assess the success of the program over time.

All 18 NYS RPCs are participating in the project.

Data were available on 1,387 infants < 31 weeks gestation. Among these:

- The median BWT was at the 47th percentile for GA;
- The median DWT was at the 19th percentile for PMA; and
- Overall 32.6% of infants < 31 weeks GA cared for at NYS RPCs were discharged < 10th percentile.

Relative Risk of Discharge Weight < 10th Percentile Among NYS RPCs

Figure 1.

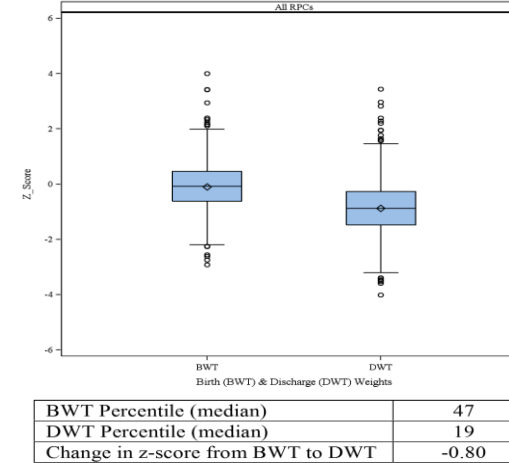
NYS RPC	N	GA (wks, mean)	Discharge Weight <10th percentile (%)	RR	95% CI
A	76	27.9	11.8	0.36	0.18 - 0.73
B	91	26.7	14.3	0.44	0.24 - 0.79
C	81	27.4	19.8	0.61	NS
D	119	27.6	20.2	0.62	0.39 - 0.97
E	84	27.5	22.6	0.69	NS
F	100	28.2	24	0.74	NS
G	44	28.4	25	0.77	NS
H	58	28.2	31	0.95	NS
I	75	27.6	36	1.1	NS
J	66	28.0	36.4	1.12	NS
K	43	27.2	37.2	1.14	NS
L	126	27.8	37.3	1.14	NS
M	67	28.0	41.8	1.28	NS
N	117	27.5	41.9	1.29	NS
O	65	28.0	43.1	1.32	NS
P	23	27.9	47.8	1.47	NS
Q	29	28.3	48.3	1.48	NS
R	123	27.5	60.2	1.85	1.36 - 2.51

One RPC (R) was significantly more likely to discharge infants at <10th percentile of weight.

Results

Difference Between Birth and Discharge Weight z-Scores for NYS RPCs

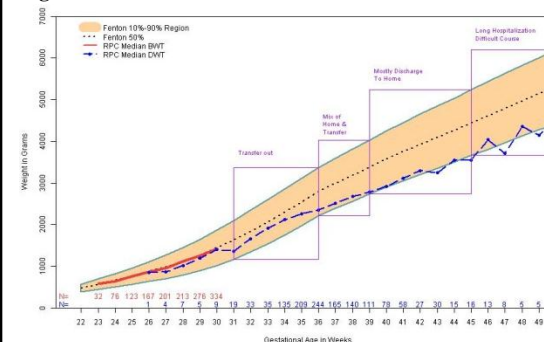
Figure 2.



Discharge weight percentiles are less than birth weight percentiles at all NYS RPCs.

Median Birth and Discharge Weights at NYS RPCs by Gestational Age

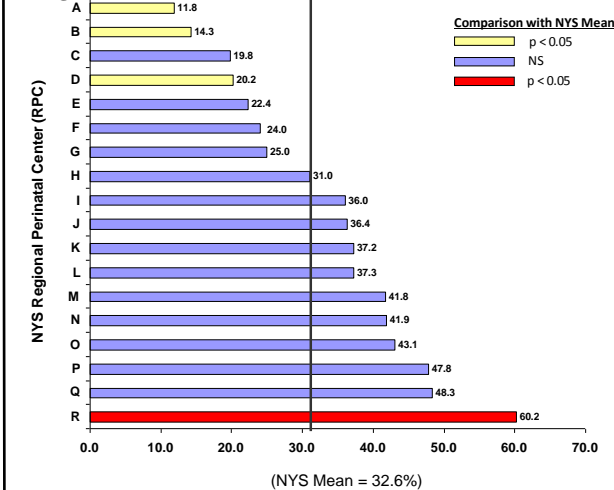
Figure 3.



Infants discharged beyond 40 weeks likely represent a population with complicated course and chronic disease.

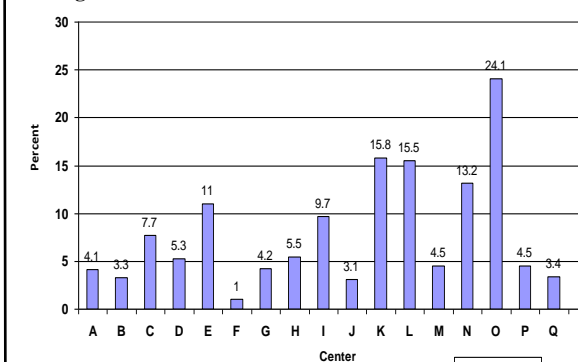
Incidence of Discharge Weight < 10th Percentile Among NYS RPCs

Figure 4.



Incidence of Necrotizing Enterocolitis

Figure 5.



Feeding practices are not associated with NEC which varies by NYS RPC.

Summary

Among infants < 31 weeks gestation born at or transferred to a NYS RPC within 48 hours of birth during 2010, postnatal growth restriction (discharge weight < 10th percentile for post menstrual age) was common and its incidence varied widely among centers.

- There was a five-fold variation in the relative risk of discharge < 10th percentile among RPCs (Fig. 1).
- The mean difference between the BWT and DWT median z-score at each RPC was -0.80 (Fig. 2).
- The risk of discharge weight < 10th percentile increased with increasing post menstrual age (Fig. 3).
- The proportion of infants discharged < 10th percentile ranged from 11.8% to 60.2% with a statewide mean of 32.6% (Fig. 4).
- The self-reported incidence of NEC among NYS RPCs also varied widely ranging from 0% to 24.1% (Fig. 5).

Conclusions

Postnatal growth restriction (discharge weight < 10th percentile) is common, and its incidence varies five-fold among NYS RPCs.

Further study is underway to identify clinical practices that may limit postnatal growth restriction and decrease variation in its incidence among NYS RPCs.

*Participating RPCs: Albany Medical Center Hospital, Women and Children's Hospital of Buffalo, Stony Brook University Hospital, Strong Memorial Hospital, Winthrop University Hospital, North Shore University Hospital, Crouse Hospital, Westchester Medical Center, Jacobi Medical Center, Maimonides Medical Center, University Hospital-Brooklyn, New York University Hospital, Bellevue Hospital, Mount Sinai Hospital, NYP Columbia University Medical Center, NYP Weill Cornell Medical Center, LJI Medical Center-Cohen's Children's Hospital, Montefiore Medical Center, and The National Initiative for Children's Healthcare Quality