

Step 3: Measure For Success – Proficient Carving of Data Using a NutritionIQ Application



Gomez Pomar, E., MD, MsC¹; Byrns, M., RD1; Genetti D.²

¹St Bernards Regional Medical Center, Jonesboro, Arkansas ²Astarte Medical, Yardley, PA USA

Background

Implementation of a standardized feeding strategy in the neonatal ICU (NICU) has been shown to effectively minimize practice variability and accelerate the attainment of key milestones without adverse morbidities. However, tracking feeding and nutrition metrics remains a challenge.

Objective

A new feeding protocol was implemented at a 16 bed, level III NICU, beginning in mid 2020. In order to understand the history and progression of the current standard of care, we reviewed and analyzed 5 years of nutrition practices in the unit. We evaluated the effectiveness of our protocol implementation by utilizing a NutritionIQ software application, NICUtrition®, to track the detailed nuance of NICU feeding and nutrition.

Methods

- Retrospective data for 957 patients were analyzed, including volume of enteral feeds, days to first and full feeds, and growth measurements
- Detailed analysis on 406 qualified patients
- o Admitted to the NICU before their third day of life
- o Stay of at least 5 days
- o Born under 2,500 grams
- o Born earlier than 36 weeks gestation
- High resolution data related to nearly 200,000 feeding events and 50,000 growth measurements were included in the analysis
- First full enteral feeds events were defined as the first day of life on which an enteral feeding rate of a least 120mL/Kg/Day was achieved while also not receiving any volume from parenteral nutrition
- Utilized the NICUtrition® platform to collect, measure and recommend feedings in the context of the new protocol
- o Provided live support for the daily nutritional clinical decision process
- o Tracked adherence to the guidelines
- Data were analyzed comparing the medians and quartiles for key benchmarks including birth to discharge z-scores for weight and head circumference
- P-values calculated for means for each metric based upon a cutoff date of 7/31/2020, which represented the implementation date of the NutritionIQ application and the effective date of the new feeding bundle

Results

Figure 1: Day of Life At First Full Enteral Feeding

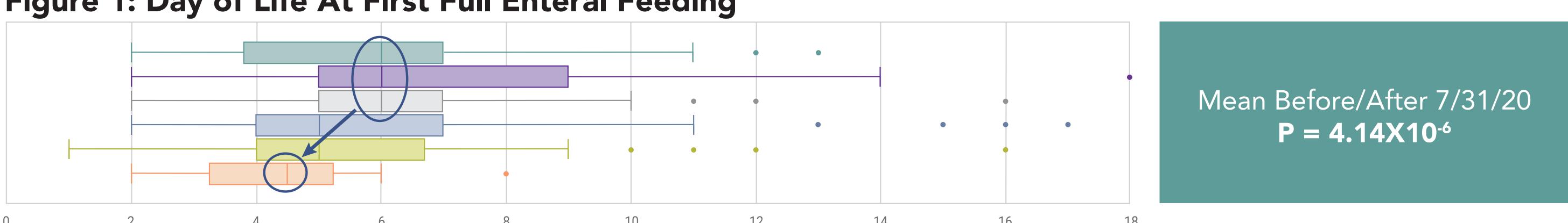


Figure 2: Days to Return to Birthweight

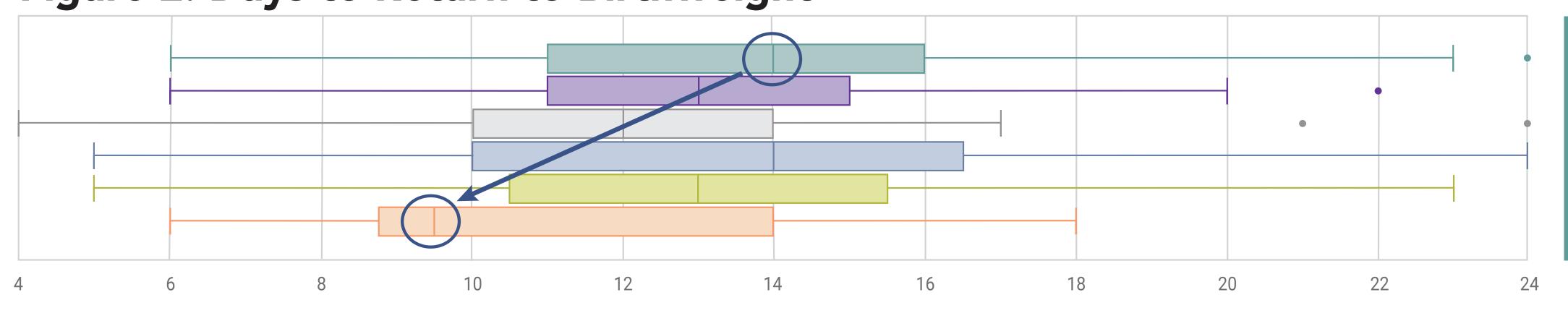
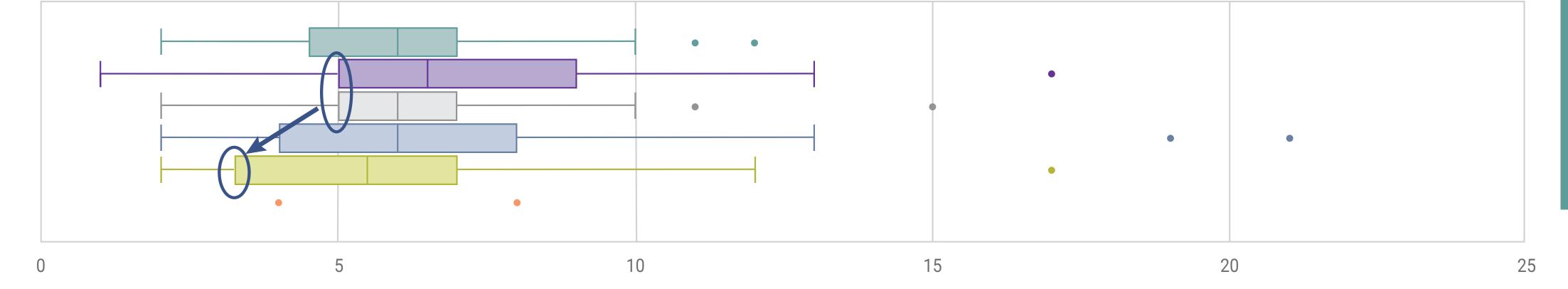


Figure 3: Number of Days Receiving Parenteral Nutrition



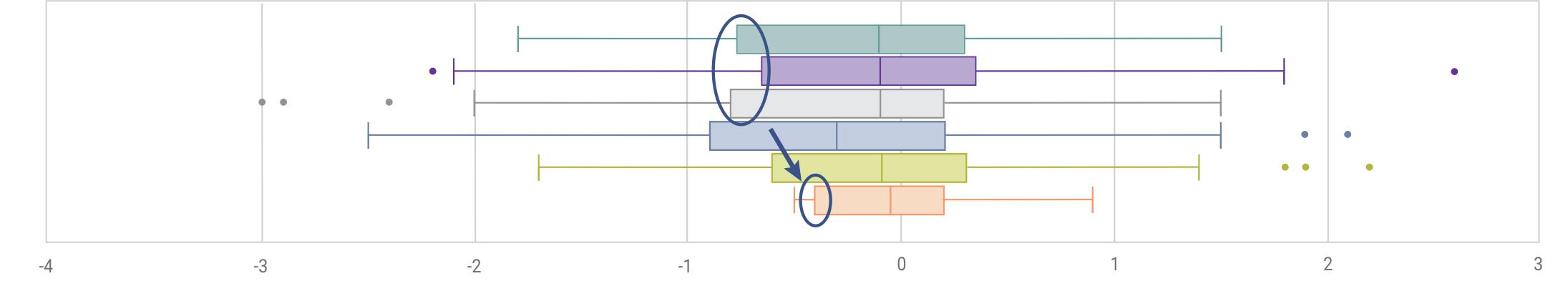
First Quartile Improvement

Median

Trend Is Of Note;

Mean Not Yet Significant

Figure 4: Birth to Discharge Delta Z-Score (Head Circumference)

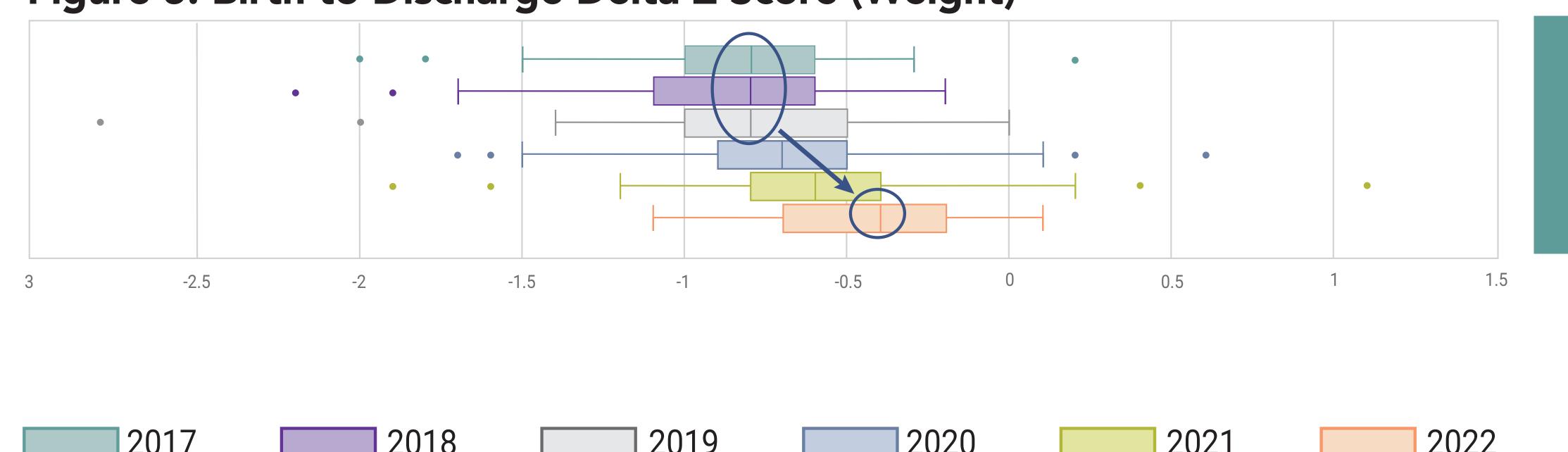


Mean Before/After 7/31/20 P = 0.04182

Mean Before/After 7/31/20

 $P = 3.9X10^{-5}$

Figure 5: Birth to Discharge Delta Z-Score (Weight)



Qualified Data

	# ELBW	# VLBW	# LBW	Total
Before 7/31/20	8 (2.8%)	57 (20.1%)	219 (77.1%)	284
After 7/31/20	2 (1.6%)	19 (15.6%)	101 (82.8%)	122

Conclusion

- The implementation of a feeding protocol results in improved growth outcomes in preterm infants born less than 2,500 grams (see Figures 4 and 5)
- Early feeding with rapid advancement and early fortification proves safe in our implementation (see Figure 1)
- Accurate and timely mining of nuanced data allows for effective evaluation of feeding protocol adherence and tracking of key metrics (see Figures 2 and 3)
- Notably, we see a **statistically significant improvement** in **birth to discharge delta z-scores** for weight when comparing the period prior to implementation to the period following implementation (see Figures 4 and 5)
- Comorbidities or adverse events (NEC, BPD, IVH, ROP, CLABSI, Sepsis) did not increase with the new bundle. We observed a decreased incidence with the new bundle, however, the change did not show statistical significance

About

St. Bernards Medical Center is a 440-bed acute care hospital in Jonesboro, AR and serves as a regional referral center for 23 counties in northeast Arkansas and southeast Missouri. The hospital provides the only NICU in the eastern half of Arkansas.

Astarte Medical is focused on delivering clinical intelligence solutions leveraging analytics and digital tools to improve health outcomes.

Contacts

Enrique Gomez, MD, MsC St. Bernard's Healthcare 225 E Washington Ave Jonesboro, AR 72401 egomez@sbrmc.org David Genetti, CTO
Astarte Medical
10 N Main St.
Yardley, PA 19067
dave@astartemedical.com