

Bringing Cutting Edge Tech to Enteral Feeds: A Success Story!

By Tammi Jantzen

There is no question that technology in support of life saving measures is abundant in the neonatal ICU (NICU). However, technological innovations have not historically extended to addressing feeding and nutrition support for the tiniest patients. Poor growth is strongly associated with adverse neurodevelopmental outcomes.



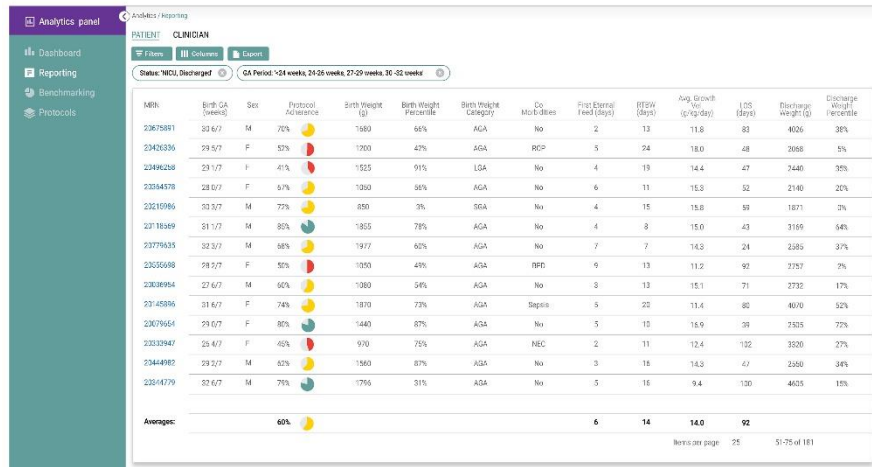
Standardizing the process for preterm infant feeding is one way to ensure the successful progression of enteral and oral feeding, and thus optimal nutrition management. However, clinician variability in individual practice attitudes, experience, and knowledge can influence the successful implementation of a feeding strategy. Preterm infants are commonly subjected to delayed onset of enteral feeds, longer duration of trophic feeds that provide inadequate nutrition, longer time to full enteral feeds, and longer transition times to oral feeding.

As the benefits of standardization have become clear, clinical practice groups have developed consensus-based enteral feeding protocols for nutrition management to provide evidence-based care with less variability. However, to be truly effective, compliance monitoring is necessary. Even among hospitals that have adopted feeding practice guidelines, most do not have an automated system to measure the quality of nutrition delivered, to monitor protocol adherence or lack thereof, or to gather useful insights from feeding data.

Assessing a New Feeding Protocol Using NICUtrition®

NICUtrition® is the first clinical decision support tool to support feeding protocols, feeding practice, and decision-making in the NICU. It interfaces with the hospital's EMR and provides an intuitive presentation of feeding, nutrition, and growth-related data. It automates a hospital's enteral feeding protocol to deliver a clear interpretation of guideline suggestions with a focus on standardizing and optimizing feeding decisions by the NICU care team, thereby reducing practice variability, and

NICUtrition®
by Aduro Medical



MRN	Birth GA (weeks)	Sex	Protocol Adherence	Birth Weight (kg)	Birth Weight percentile	Birth Weight Category	Co-Morbidities	First Enteral Feed (Days)	FFEW (Days)	Avg. Growth % (g/g/day)	LOS (Days)	Discharge Weight (kg)	Discharge Weight % (kg/kg)
23675881	23.6/7	M	70%	1580	65%	AGA	No	2	13	11.8	83	4026	26%
23426336	29.5/7	F	52%	1200	42%	AGA	ROP	5	24	18.0	48	2068	5%
23496226	29.1/7	F	41%	1525	91%	LGA	No	4	19	14.4	47	2440	35%
23214578	28.0/7	F	67%	1280	86%	AGA	No	6	11	15.3	52	2190	20%
23210966	29.3/7	M	72%	850	9%	SGA	No	4	15	15.8	59	1871	2%
22718369	28.1/7	M	80%	1855	79%	AGA	No	4	8	15.0	43	3159	64%
23279635	28.3/7	M	98%	1977	82%	AGA	No	7	7	14.3	24	2385	37%
23250598	28.2/7	F	50%	1090	49%	AGA	ROP	9	13	11.2	92	2257	2%
23208994	27.6/7	M	60%	1380	54%	AGA	No	8	12	15.1	71	2232	17%
23145896	31.6/7	F	74%	1870	72%	AGA	Septic	5	22	11.4	80	4070	52%
23027654	29.0/7	F	90%	1440	87%	AGA	No	5	15	16.9	39	2535	72%
23332947	28.4/7	F	62%	970	25%	AGA	NEC	2	11	12.4	132	3320	27%
23444982	29.2/7	M	52%	1560	87%	AGA	No	3	18	14.3	47	2360	34%
23214779	29.6/7	M	75%	1756	91%	AGA	No	5	16	9.4	130	4035	15%
Averages:			60%					6	14	14.0	92		

increasing confidence in nutrition decision making.

It includes statistics of outcomes and associated protocol compliance to help identify opportunities for practice improvements. NICUtrition® couples historical and current feeding data with analytics to allow for longitudinal analysis of feeding trends and outcomes. It also provides benchmarking to measure the effectiveness of quality improvement programs.

A Midwest acute care hospital with a 19-bed level III NICU recently implemented NICUtrition® to evaluate the effectiveness of a newly developed enteral feeding protocol and to track the detailed nuance of NICU feeding and nutrition on a prospective basis. The NICUtrition® implementation process began with a 5-year retrospective data extract of growth, feeding, and care data for preterm infants admitted to the NICU between 24-34 weeks gestational age at birth. This data, extracted from their EMR, was analyzed to



establish a baseline of feeding and nutrition metrics for the NICU care team. Although there was no feeding protocol in place for this 5-year historical period, they were able to use the data to analyze past trends in feeding volumes, feeding advancements, and nutrition components as well as the corresponding growth and outcomes.

The next step in the implementation process was prospective data collection and the rollout of a newly developed preterm infant feeding protocol. The protocol was digitized and integrated into NICUtrition®, enabling the analysis of all prospective data for protocol adherence. Metrics related to modifications to protocol guidelines and associated outcomes are available natively within NICUtrition®. Going forward, comparisons between benchmarked historical data and prospective data captured during the use of the feeding protocol and NICUtrition® was finally possible.

The Impact of Standardizing Care

NICUtrition® provided the NICU care team with longitudinal, granular-level data on feeding and nutrition metrics and milestones, including birth weight, days to first enteral feed, days to first fortification, days to full feed, and central line days among many other key metrics. It evaluated adherence to nutrition guidelines by automating the hospital's new feeding protocol. In examining the two primary metrics, initiation of enteral feeding and achievement of full enteral feeding, a measurable and significant improvement was observed by reviewing the recent practice in the context of the previous 5 years, organized by calendar year. (See Figure 1 and Figure 2)

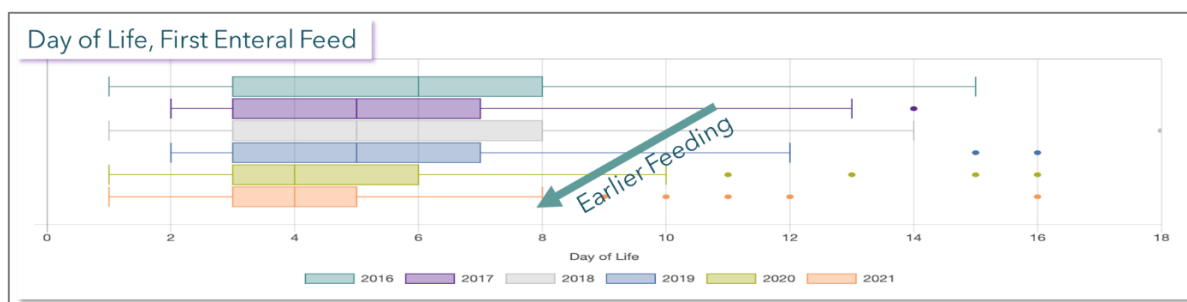


Figure 1: Day of life for first enteral feed, results show earlier first feeds per new protocol.

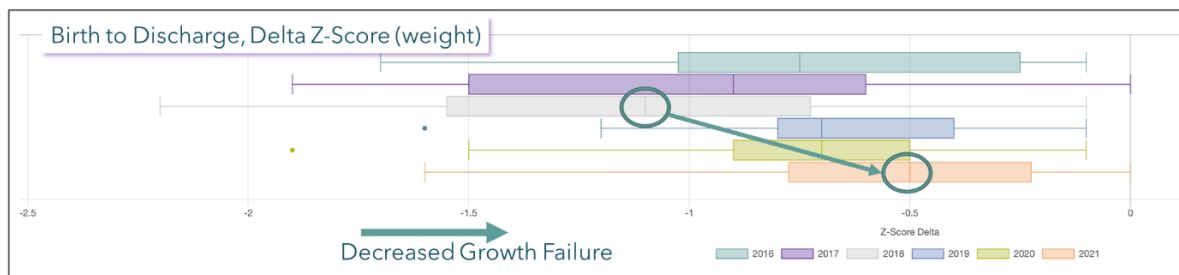


Figure 2: Corresponding birth to discharge delta z-score for weight improved over same period.

Lack of Data is Not the Problem

The issue isn't lack of available data, but rather the ability to liberate and transform this data into actionable insights for clinicians in real time. The ability to measure discrete, but nuanced care milestones is currently resource intensive, and cost and time prohibitive. For this hospital, understanding care milestones for this patient population required access to and analysis of large amounts of care data across over a thousand patients and five years. NICUtrition® was able to harness the data entered into the EMR so that it could inform the assessment of feeding practices while also evaluating the effectiveness of nutrition-related quality improvement programs. This has led to better patient care among preterm infants and optimized resource utilization in the NICU.

Look Who's Taking Notice

We are pleased to announce that our co-authored abstract **“Step 3: Measure For Success - Proficient Carving of Data Using a NutritionIQ Application”** was accepted for the Pediatric Academic Societies 2022 Meeting. If you attending, please visit our poster session on Friday, April 22 from 6:15-8:45pm.



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Interested in learning more about **NICUtrition®**? Visit our website at <https://nicutrition.com/> or contact sales@astartemedical.com.