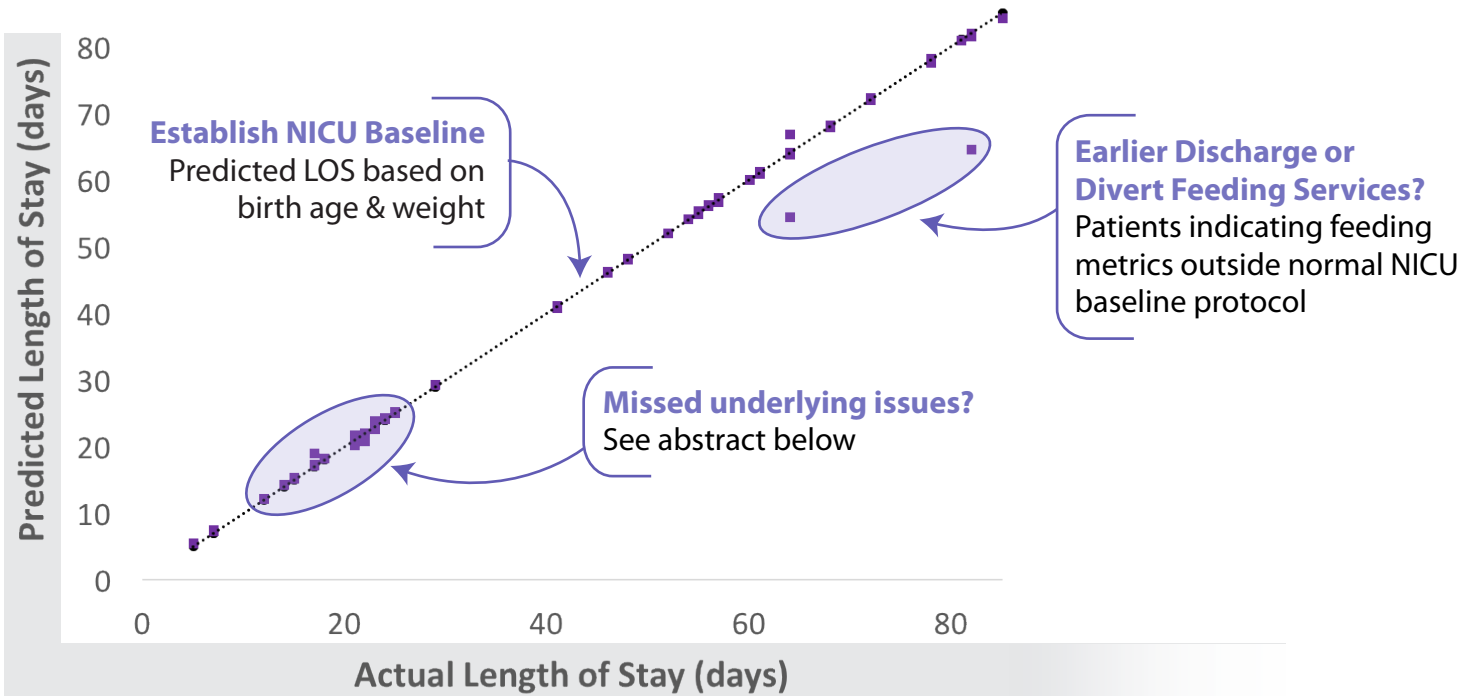


## Machine Learning Models and Predictive Analyses Applied to Metrics

Examples of three possibilities for use of nfant Metrics



## Machine Learning Techniques Indicate Relative Risk For Underlying Post Discharge Feeding Issues

T. Cunningham, G. Capilouto - University of Kentucky & NFANT Labs  
Accepted by HotTopics in Neonatology - 2017

**Introduction:** Neonatal feeding is the most complex behavior of the newborn and a criterion for hospital discharge for preterm infants. Standardized protocols for evaluating feeding skill do not exist so babies may be discharged too soon and rehospitalized for failure to thrive. Our goal was to investigate whether Machine Learning data analysis techniques applied to objective feeding metrics might better inform relative risk.

**Methods:** Healthy preterm neonates were recruited from a 70-bed level IV NICU. Babies were categorized as "high risk" (HR; n = 31) or "low risk" (LR; n = 12) for poor outcomes based on criteria commonly used to identify infants needing longitudinal post discharge follow-up. Sucking metrics were captured via nfant Feeding Solution (NFANT Labs, Atlanta GA) at three time points during hospitalization. Custom algorithms derived spatial and temporal suck and burst metrics from each feeding. At follow-up, HR subjects were divided into those with (HRw; n=19) or without (HRw/o; n=12) ongoing feeding issues. Machine learning algorithms were trained to distinguish between the two using calculated signal metrics. Trained algorithms were then applied to the last feeding of the LR group prior to discharge.

**Results:** Despite being older and heavier at the time of discharge, all of the infants in the LR group, except one, had sucking performance metrics placing them in the HRw group.

**Conclusion:** Advances in Machine Learning coupled with objective feeding performance data at discharge may be more accurate identifying relative risk compared to traditional indices of morbidity such as age and weight.