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12-2016

Obstacles to Introducing a Post-operative Feeding Protocol in the Single Ventricle Population

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Background

- 1 in 4,000 infants born with HLHS
- Interstage mortality rate 8-24 %
- Feeding intolerance is common post-op (NEC, poor weight gain, GERD, vocal cord paralysis, swallowing dysfunction) and contributes to mortality/morbidity
- Complications may be due to impaired mesenteric blood flow, low cardiac output, or abnormal systemic vasculature
- Feeding guidelines are limited
- Standardization of care may improve outcomes

Objective

To decrease the morbidity associated with feeding complications by implementing a post-operative feeding protocol for infants with single ventricle physiology

Design

Single center cohort study with convenience sampling comparing feeding-associated morbidities in infants before and after initiation of a post-operative feeding protocol

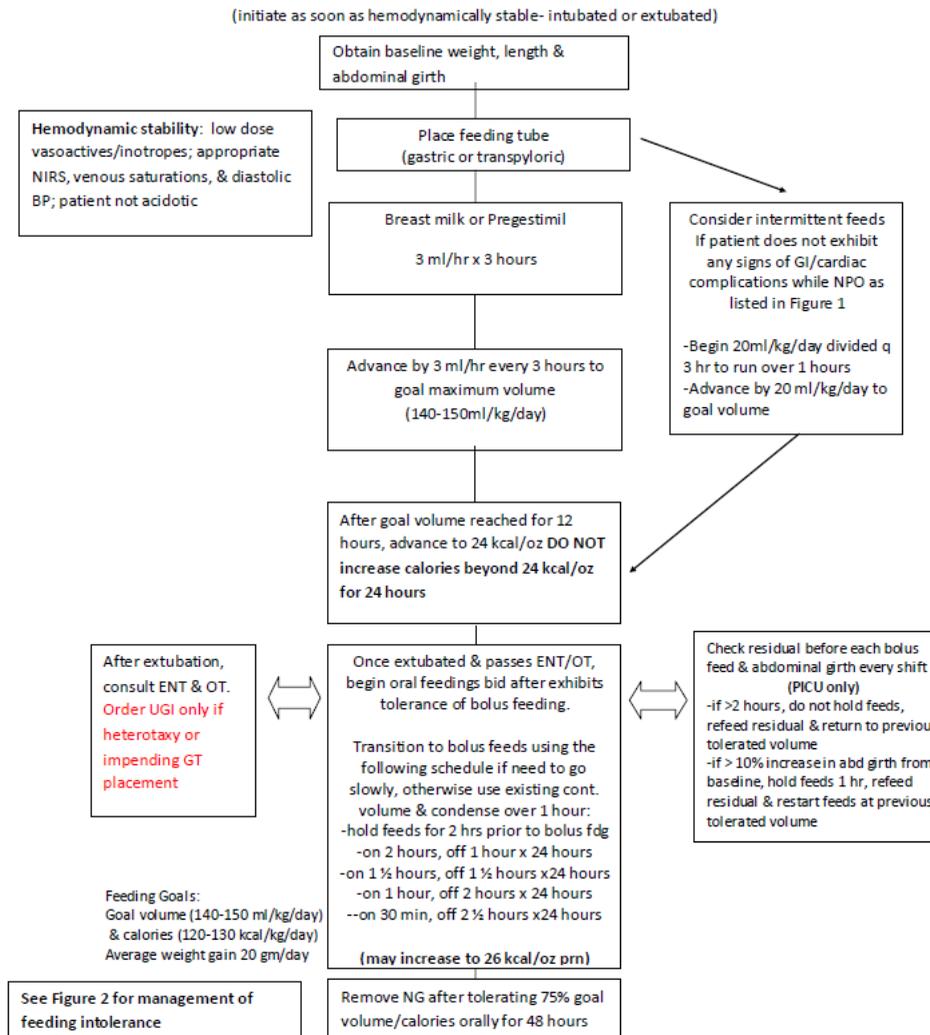
Participants

All infants who underwent first stage palliation for single ventricle physiology from July 2012 through August 2016

Methods

- Retrospective chart review
- Pre-protocol group- July 2012 - June 2014; 40 infants
- Post-protocol group-July 2014 – Aug 2016; 32 infants
- Electronic medical record used for WAZ score and LOS
- Bell's Criteria used to classify stage of NEC

Single Ventricle Feeding Algorithm



Results

- Protocol compliance = 55%
- NEC was detected in 4 (10%) pre-protocol patients and 6 (18.8%) post-protocol patients ($p=0.323$).
- Enteral feeds were initiated sooner in the post-protocol group (3.56 vs. 4.7 days; $p=0.55$), and days to full feeds was sooner in the post-protocol group (11.6 vs. 14; $p=0.613$).
- Hospital length of stay was longer in the post-protocol group by 11 days ($p=0.238$).
- Change in WAZ score from birth to dc was less in the post-protocol group (-0.841 vs. -1.03; $p=0.192$).
- Pre-protocol group had higher number of true univentricular heart defects (87% vs 53%; $p=0.05$)
- Afterload reduction use was higher in pre-protocol pts ($p=0.001$)
- More Heme + stools in post-protocol group (53% vs 30%; $p=0.047$)
- Arch gradient by echo 23% pre-protocol; 48% post-protocol ($p=0.034$)
- Arch gradient by cath 23% pre-protocol; 47% post-protocol; $p=0.035$; depressed ventricular function 13% pre; 31% post; $p=0.058$

Conclusion

- ❖ Expected outcomes not observed
 - ❖ Only 55% compliance in following protocol - weak association between intervention and results
 - ❖ Change in after-load reduction practice
 - ❖ Hospital length of stay longer due to increased incidence of NEC
 - ❖ Increased incidence of NEC & Heme + stools due to hypoperfusion of intestines related to increased incidence of depressed ventricular function and aortic arch gradients
 - ❖ Explanation for increased gradients unknown and requires further investigation, may be attributed to differences in surgical technique, graft materials used, or patient population
- We will use these findings to revise the existing feeding protocol to improve barriers to compliance, and improve weight gain among our SV patients. Additionally, we would like to develop diagnostic and treatment strategies for NEC in this patient population, as it is different from the premature infant population on which the Bell's Criteria was defined.**