

Introduction

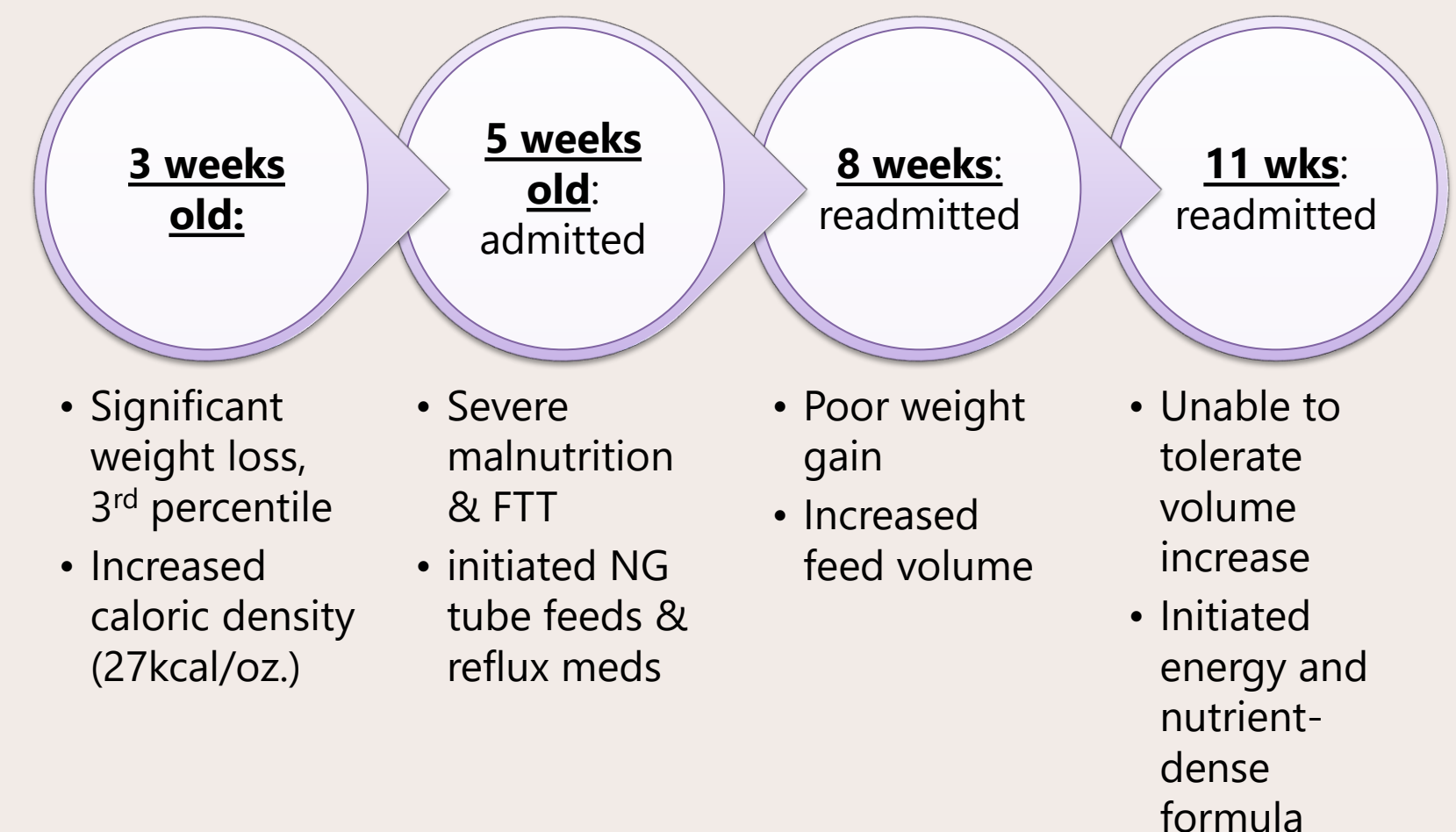
- Nutrition optimization prior to surgery improves outcomes in infants with congenital heart disease (CHD) ³⁻⁵
- Growth promotion can be challenging in unrepaired infants due to:
 - higher energy requirements
 - fluid restrictions
 - feeding intolerance
- Standard powdered formulas require mixing recipes for caregivers to achieve higher caloric density
- Manual mixing leaves room for error & inconsistency
- Powdered formula can be poorly tolerated in infants with CHD at the caloric density required for growth
- Energy and nutrient-dense formula has been used to successfully treat FTT postoperatively⁶⁻⁸
- Evidence is limited in unrepaired infants⁸⁻¹⁰

Case Presentation

4-month-old ex-36 week infant, past medical history: CHD with large anterior ventricular septal defect (VSD), atrial septal defect (ASD), moderate pulmonary stenosis & solitary right kidney.

- After birth, numerous formula changes due to significant weight loss (figure 1)
- Attempts to increase caloric density with hydrolyzed powdered formula resulted in persistent vomiting, constipation and skin sensitivities.
- Partially hydrolyzed low lactose formula (27kcal/oz) improved symptoms but unable to gain weight
- Multiple readmissions for severe malnutrition & FTT in the setting of feeding intolerance, despite numerous formula & medication changes.
- Initiation of energy and nutrient-dense formula yielded rapid improvement in weight gain leading to surgery.
- The patient saw improvement in constipation but retching and some emesis continued.

Patient Readmission Timeline



Discussion & Conclusions

- Patients with left to right shunts are at higher risk of FTT & feeding intolerance⁵
- This patient demonstrated an inability to tolerate increased caloric density with standard hydrolyzed formulas.
- Converting to a low osmolality nutrient-dense formula yielded improved feeding tolerance and weight gain, a pattern aligned with prior studies⁶⁻¹⁰
 - Prior to converting: gaining avg 0.53 grams/day
 - After converting: averaged 22.6 grams/day
- In the setting of reduced gut perfusion, low osmolality formula may facilitate improved absorption resulting in weight gain.
- A severely malnourished patient displayed significant growth improvement on an energy and nutrient-dense formula.
- In patients with unrepaired CHD & growth challenges, a low-osmolality nutrient dense formula may be a viable option & should be explored in a larger sample size.

	Energy and nutrient-dense formula	Other leading cow milk-based formulas*
Protein, gm	2.6 per 100 calories	2.06 per 100 calories
mOsm/kg H₂O	360 per 100 calories	307 per 67.4 calories
MCT:LCT ratio	24:76	minimal
Sterile option	Yes	2 out of 4
Risk of incorrect mixing	No	Yes, 4 out of 4

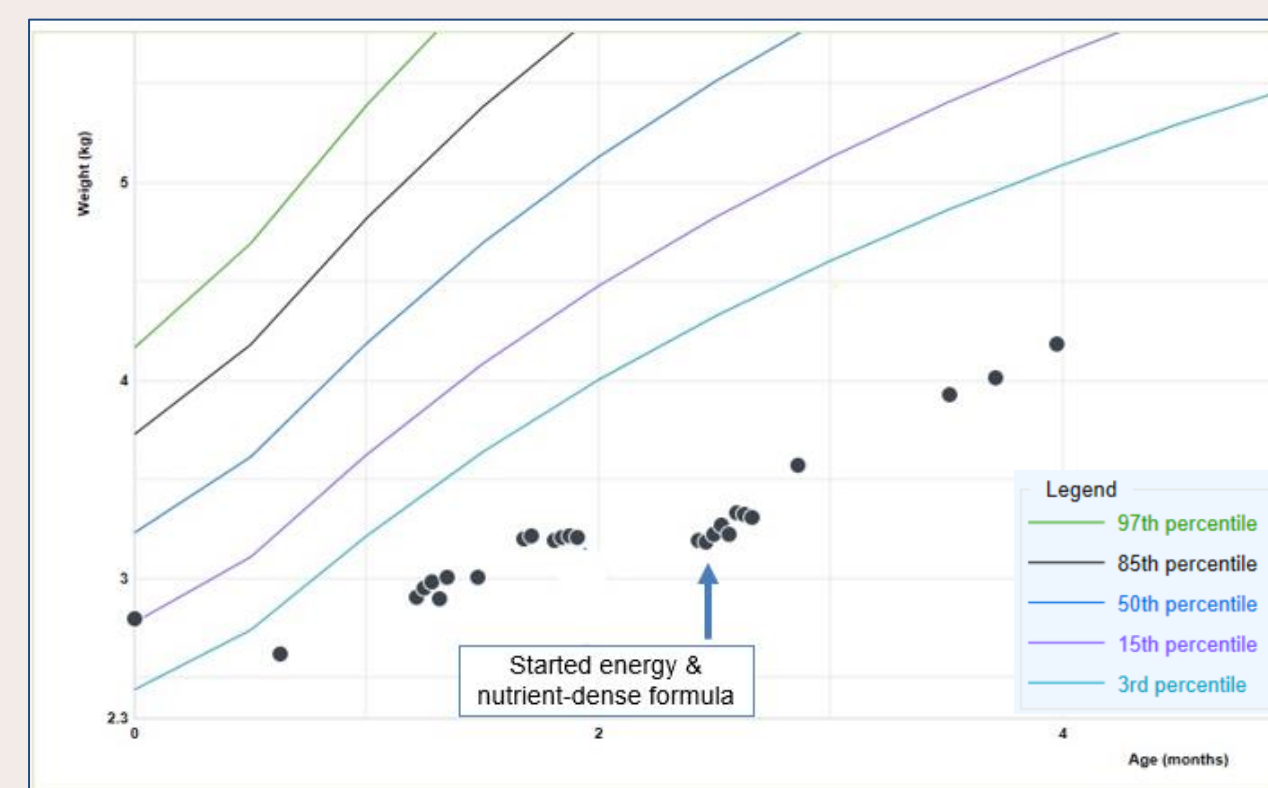


Figure 1- Patient growth chart

