Purpose: The purpose of this quality improvement project was to determine if a nutrition protocol for this population would improve the time taken to initiate nutrition in the post-operative period and improve the amount of nutrition received while in the Pediatric Intensive Care Unit (PICU).

Background and Significance: Providing adequate nutrition for this population is a known challenge. In the past, the initiation of feedings in the PICU post-operatively had been based on physician judgment and personal preference. The feeding protocol was intended to decrease variation in practice as well as to provide a framework for the initiation and advancement of feedings.

Question: Will the use of a nutrition protocol in patients with congenital heart disease from ages birth to six months admitted to the PICU post-operatively improve the nutrition provided?

Design: A protocol was created based on recommendations made from the National Pediatric Cardiology Quality Improvement Collaborative (NPC-QIC) feeding work group and implemented in the PICU after education of the staff. A dietician assigned to the PICU evaluated each patient and made recommendations for kilocalorie goal. Patients that were identified as high risk for necrotizing enterocolitis (NEC) were followed using the high risk algorithm and were monitored closely during the initiation and advancement of feeds. Retrospective and concurrent chart reviews were conducted to reflect pre- and post-protocol data and included demographics, NEC risk category, time to initiation of feeds, time to reach calorie goal, and days at full calorie goal.

Findings: Descriptive statistics were computed for all demographic and clinical variables. Findings included an increased calorie intake in the concurrent group as well as earlier initiation of enteral feedings or total parenteral nutrition in the concurrent group.

Clinical Implications: The use of this feeding protocol provided improved calorie intake in this population by emphasizing early initiation of feedings, decreasing provider variability, and by providing a framework to advance and monitor feedings while reducing unnecessary interruptions in feeds.

Jenny Lamon, DNP, APRN, CPNP-AC, CCRN-P, PICU, The Children’s Hospital, Oklahoma City, OK

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A quality improvement project implementing a nutrition protocol for patients from birth to six months in patients who have congenital heart disease (CHD) and were admitted post-operatively was initiated in the Pediatric Intensive Care Unit (PICU) at The Children’s Hospital in Oklahoma City, Oklahoma.

**Background**

- Adequate nutrition following surgery for congenital heart disease is an important component of recovery, but is commonly difficult to achieve due to hemodynamic instability, volume overload, and high risk of complications from feeding such as necrotizing enterocolitis (NEC).
- Feeding protocols maximize nutrition potential for patients who have undergone repair of a congenital heart lesion (Slicker et al., 2013).
- Types of CHD resulting in gut hypoperfusion, such as ductal dependent lesions, may increase the risk for NEC causing difficulty in providing adequate and timely nutrition.

**Purpose**

**Primary Objective:** Evaluate the use of a nutrition protocol for post-operative CHD patients to improve the nutrition they receive by measuring the percent of goal calories provided and the duration of time until goal calories were met.

**Methods**

- A nutrition protocol based on recommendations by the National Pediatric Cardiology Quality Improvement Collaborative (NPC-QIC) feeding work group was created to direct initiation of nutrition in the post-operative period.
- IRB approval for data collection from concurrent and retrospective chart review was obtained through The University of Oklahoma Health Sciences Center.
- The protocol was used in practice to initiate and advance nutrition. Patients who were at high risk for NEC with the introduction of enteral feedings were monitored using a high-risk algorithm.

**Results**

- There were zero patients meeting goal calories prior to the implementation of the feeding protocol compared to twenty-eight percent of patients in the concurrent group meeting goal calories.
- Time to initiate nutrition was shorter in the concurrent study group; however, this was not found to be statistically significant.
- An identified complication in protocol implementation were protocol deviations such as the introduction of trophic feedings prior to advancement of enteral feedings.
- No significant correlations were made between days intubated and number of calories received (p=0.5980).

**Discussion**

- Implementation of a protocol for initiating and advancing nutrition in infants with congenital heart disease in the post-operative period ensures a consistent approach to nutrition in this population.
- The use of a nutrition protocol improved calorie intake by emphasizing nutrition earlier in the post-operative course than previous, reducing practice variability between providers, and provided an organized framework for monitoring feeds which may have reduced unnecessary interruptions in feeds.
- The initiation of trophic feedings has not been well defined as safe or beneficial in the literature for this specific post-operative population, therefore, is not currently recommended by the NPC-QIC. However, trophic feeds have been shown to be safe in pre-operative patients (Toms, Jackson, Dabal, Reebals, & Alten, 2015).

**Conclusions**

The implementation of a protocol for initiation of nutrition for post-operative infants who have CHD creates a standardized method to initiate and advance nutrition and improves the amount of calories that these patients receive.

**Key References**
