

# Nutritional Support: Enteral Nutrition Pathway for Children Undergoing Hematopoietic Stem Cell Transplantation

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**BACKGROUND:** Children undergoing a hematopoietic stem cell transplantation (HSCT) are at a higher risk for malnutrition, which could be reduced by enteral nutrition (EN) support.

**OBJECTIVES:** This study evaluated the safety and feasibility of implementing an EN pathway for children undergoing HSCT.

**METHODS:** An evidence-based, standardized EN pathway was implemented for children undergoing HSCT. Parenteral nutrition and EN rates were compared among patients pre- and postimplementation, and t tests and chi-square tests were performed.

**FINDINGS:** A larger proportion of patients received EN and had an increased number of EN days (8.3 versus 5.3 days) postimplementation, which was clinically significant but not statistically significant. Postimplementation, 15 patients required EN and parenteral nutrition. The EN pathway was safe, but had limited feasibility because of the difficulty of placing and maintaining the nasojejun tube.

## KEYWORDS

enteral nutrition; malnutrition; hematopoietic stem cell transplantation

## DIGITAL OBJECT IDENTIFIER

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**BECAUSE OF DEBILITATING UNDERLYING DISEASE** and myeloablative chemotherapy regimens, many children undergoing a hematopoietic stem cell transplantation (HSCT) experience nausea, vomiting, decreased appetite, diarrhea, mucositis, pain, food aversions, altered taste perceptions, and fatigue, which can lead to malnutrition (Baumgartner et al., 2018; Fuji et al., 2015; Hastings et al., 2006). Malnutrition in patients undergoing HSCT is associated with increased infection rate and higher risk for complications (Baumgartner et al., 2018; Chow et al., 2020). Complications include longer hospital lengths of stay, higher associated hospital costs, increased risk for readmission, and increased mortality (Boullata et al., 2017; Torres et al., 2021).

Proactive nutritional support during chemotherapy regimens can improve overall patient nutrition status by the end of therapy (Sacks et al., 2014). To meet caloric requirements, patients often require enteral nutrition (EN), intermittently delivered via nasogastric tube or nasojejun tube (NJT), or parenteral nutrition (PN) throughout their HSCT admission. PN is associated with increased risk for bloodstream infections, higher hospital costs, delayed platelet engraftment, and higher incidents of acute graft-versus-host disease. In contrast, using EN solely or in conjunction with PN can preserve the gut microbiota and mucosal integrity (Baumgartner et al., 2018; Evans, Hirani, & Needle, 2019; McMillen et al., 2020; Soussi et al., 2019; Zama et al., 2020).

The American Society for Parenteral and Enteral Nutrition (ASPEN) recommends a systematic approach to EN, including open communication between providers and patients and families, standardization, and incorporation of best practices into the process (Boullata et al., 2017). Despite the benefits of EN administration, its use is inconsistent. Barriers to EN administration include a lack of institutional and provider support, lack of partnership with nutritionists and dietitians, and hesitation from the patient and caregiver (McMillen et al., 2020). Introducing the expectation that nutritional support is the standard of care for children undergoing myeloablative therapy and initiating EN early in the process through a standardized clinical pathway may minimize patient and caregiver reluctance (Andersen et al., 2015; Ladas et al., 2005; Steele et al., 2016).

Enteral feeds have been shown to be feasible and safe in the pediatric HSCT population (Evans, Hirani, & Needle, 2019; Garófolo, 2012). EN is