

This article provides a summary of an integrative review on the efficacy of enteral nutrition (EN) and parenteral nutrition (PN) for meeting the nutrition and energy needs of pediatric patients following hematopoietic stem cell transplantation (HSCT). In addition, recommendations for clinical practice and research on nutrition supplementation for pediatric patients post-HSCT are included.

#### AT A GLANCE

- Nurses can educate healthcare providers on the benefits of EN for pediatric patients, as well as recommend the appropriate use of PN when EN is an insufficient or unfeasible option.
- Oral intake should be considered first-line therapy for treating nutritional deficiencies in pediatric patients.
- Additional research is needed to support the development of clinical practice guidelines for the use of EN or PN following HSCT in the pediatric patient population.

#### KEYWORDS

enteral nutrition; parenteral nutrition; pediatrics; stem cell transplantation

#### DIGITAL OBJECT IDENTIFIER

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# Enteral and Parenteral Nutrition

An integrative literature review on nutrition in pediatric recipients of hematopoietic stem cell transplantation

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The children's hospital of a major medical center in the midwestern United States was treating a four-year-old patient named J.H. who was diagnosed with acute lymphoblastic leukemia. The patient received high-dose chemotherapy for bone marrow ablation followed by a hematopoietic stem cell transplantation (HSCT). During the 14-day course of the inpatient care, J.H. developed grade 4 (severe) mucositis and was unable to swallow any liquids or solid foods. To determine the best practice standard of care, the HSCT care team conducted a literature review of the available evidence to evaluate which intervention, enteral nutrition (EN) or parenteral nutrition (PN), would have more positive outcomes.

## Background

HSCT is the primary treatment for hematologic and lymphoid cancers, such as acute lymphoblastic leukemia and Burkitt's lymphoma, as well as other non-malignant disorders (Cheng et al., 2011). The highly catabolic treatment means that patients can suffer from gastrointestinal (GI) tract complications, including graft-versus-host disease (GVHD), mucositis, hepatic veno-occlusive disease (i.e., sinusoidal obstruction syndrome), diarrhea, nausea and vomiting, and alterations in taste and smell (Sanner & Wallace, 2012).

In addition, a study by Cheng et al. (2011) reported that pediatric patients have a higher incidence of mucositis than adults and that mucositis more greatly affects the quality of life of pediatric patients. Over time, continued GVHD of the GI tract or acute moderate to severe mucositis can lead to insufficient oral intake, malabsorption, and impaired nutritional status.

In the pediatric population, adequate nutrition promotes growth and physical development. Although pediatric patients have been shown to better tolerate aggressive chemotherapy treatments compared to adult patients (Sanner & Wallace, 2012), more aggressive therapies can lead to significant negative effects on organs and further increase the risk for malnutrition. To ensure that pediatric patients and their parents adhere to treatment plans and that patients respond well to interventions, it is recommended that healthcare providers focus additional attention on nutritional assessments following treatment administration (Qutob, Gue, Revesz, Logan, & Keefe, 2013).

EN and PN are accepted methods of supplementary nutrition. EN, which delivers nutrients through a tube or stoma using the GI tract, is a less costly intervention; however, patients may be hesitant to consent to the EN tube insertion procedure. PN, which delivers nutrients via IV directly into the bloodstream, can increase the risk of infection (Guièze et al., 2014).