

July/August 2019

Registered Dietitian-Led Infusion Care Helps Prevent Hospital Readmissions, Improves Quality of Life, Saves Costs

By Mary Englert, MS, RD, CSO, LDN, CNSC



The transition from hospital to post-acute care is a vulnerable time for patients requiring infusion. While all therapies provided at home or in Ambulatory Infusion Suites require excellent clinical care to ensure the best outcomes, parenteral nutrition (PN) is especially critical due to the complexity of this therapy and the increased risk of complications and/or hospital readmission.

For patients with short bowel syndrome (SBS), Option Care has found that home nutrition care provided by Registered Dietitian (RD)-led multidisciplinary teams is highly valuable. A national study conducted between June 1, 2017 and June 1, 2018 demonstrated that proactive care by such teams led to clinical interventions that successfully addressed dehydration in patients transitioning to home parenteral nutrition (HPN) without the need for rehospitalization.¹

Preventing readmissions improves patient quality of life and decreases health care spending. We believe that our team approach and protocols reduce both readmissions and their associated costs. Following is a brief presentation of research that supports this thesis, as well as projected potential savings. We also explore the role of the patient and referring physician in HPN therapy and recommend a few best practices.

BACKGROUND

Dehydration is a common, yet often preventable, issue for patients with SBS. This research was prompted by a desire to assess the efficacy of current therapeutic management by a multidisciplinary nutrition support team of this often overlooked problem.

While SBS can be caused by a congenital defect, often it is the result of gastrointestinal surgery in which a portion of the small intestine—and sometimes part or all of the large intestine—is removed. SBS leads to malabsorption of fluid and nutrients.² Many people with SBS require HPN to ensure all of their nutrition and hydration needs are met.

Individuals with SBS who require PN typically are started on treatment in the hospital and then discharged to post-acute care. These are patients with complex conditions requiring complicated therapy. If their therapy is not well-managed, patients face a heightened risk of dehydration, which can lead to seizures, altered mental status, and kidney impairment. Any of these complications can prompt readmission to the hospital to address the problem before they can resume PN therapy at home.³

This study demonstrated the value of close monitoring as well as a rigorous clinical management protocol in preventing dehydration and readmission to the hospital. RD-led nutrition support teams following clinical guidelines based on the latest research regularly assessed each patient (weekly at a minimum). The teams measured lab values and performed a full nutrition assessment including evaluation of gastrointestinal (GI) output, oral intake, and side effects.

DEHYDRATION IN HPN PATIENTS

When patients are discharged, the extent of health information provided by the hospital to the post-acute care provider often is less than ideal. For example, surgical reports and nutrition data may not be provided. This presents an upfront challenge to the home care team to ensure vital health statistics are not overlooked. An essential element in our protocol is to obtain a full and complete patient assessment after discharge to confirm the nutrition support team has all the details of the patient's clinical history and current status.

Additionally, some HPN patients are at increased risk for dehydration because their fluid intake often isn't the same as it was in the hospital, where they could have received up to an extra liter of fluid a day intravenously. The nutrition formulation prescribed

upon discharge often doesn't account for such a significant decrease in daily fluid intake. Our nutrition support team closely monitors patients, especially that first week, to detect early signs of dehydration or identify inadequate fluid intake that could lead to dehydration. We also make recommended corrections to the prescription to prevent dehydration from occurring or correct it from happening when warning signs are present.

Fluid requirements can be based on calculations using total calories required and weight. However, the prescription often needs to be altered based on GI output. Other factors also play a role in the need for close monitoring and subsequent modification in nutrition. For example, the level and type of fluid individuals can consume by mouth varies according to the type of ostomy placed. Some drink too much or consume a less desirable type of fluid, which can increase ostomy output or cause diarrhea and ultimately, dehydration, so GI output and oral intake must be observed closely.

METHODS

SBS patients 18 years of age and older that started on HPN between June 1, 2017 and June 1, 2018 with a nationwide home infusion company were evaluated. A multidisciplinary nutrition support team led by a RD provided ongoing assessment and management of the patient's HPN after hospital discharge. The patient's PN volume at hospital discharge was recorded as well as adjustments made to the volume at weeks 1, 2, 3 and 4 post-discharge. The main reason for the volume adjustments was recorded, as were hospital readmission rates within two weeks of discharge and reason for readmission.

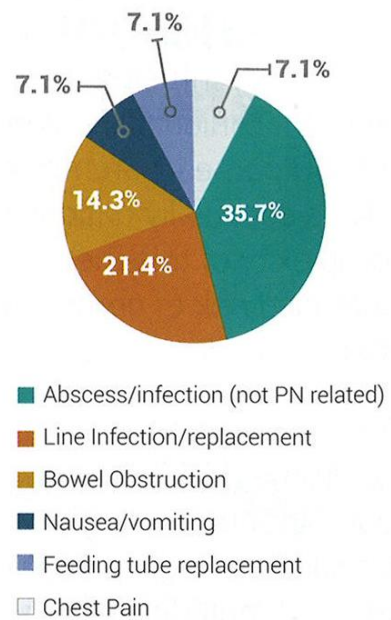
RESULTS

A total of 116 patients with SBS were started on HPN during the review period. Of this total, 14 patients (12%) were readmitted to the hospital within two weeks of discharge. Of these readmissions, none were due to dehydration (see Exhibit 1).

There were 63 total interventions made to the HPN volume during the four-week review period. In week 1, there were 18 interventions with an average increase of 376 mL/day, in week 2 there were 17 interventions with an average increase of 314 mL/day, in week 3 there were 13 interventions with an average increase of 119 mL/day and in week 4 there were 15 interventions with an average increase of 338 mL/day (see Exhibit 2).

The most common reasons for fluid adjustments were not meeting the patient's estimated fluid needs (56%), lab values reflecting dehydration (22%) and increased gastrointestinal output (22%) (see Exhibit 3). On average, patients needed an additional 287 mL of volume in HPN the first month after discharge to prevent dehydration.

EXHIBIT 1
Reasons for Hospital Readmission



DISCUSSION

This study highlights the value of nutrition support RDs and RD-led teams in managing HPN patients for clinical monitoring and improved financial outcomes. A 2017 study of home PN patients found dehydration to be the leading (55.6%) diagnosis for nutrition-related

Exhibit 2
PN Volume Adjustments Post-Discharge

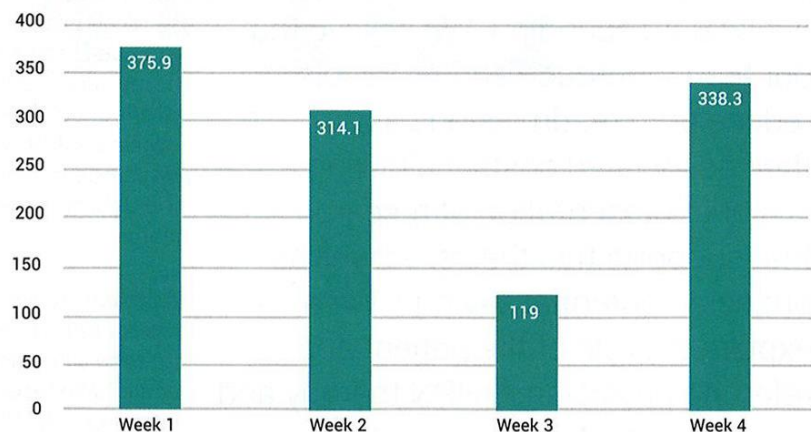
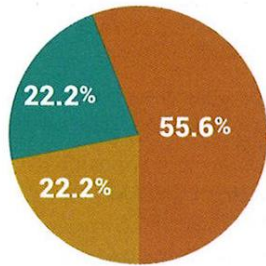


EXHIBIT 3
Reasons for PN Volume Adjustments



- Not meeting estimated needs
- Lab values reflecting dehydration
- Increased GI output

hospital admissions under the metabolic category.⁴ From our results, we can conclude that proactive interventions made to patient’s HPN volume post-discharge resulted in decreased risk for hospital readmission for dehydration. Our study also found the most numerous and significant prescription adjustments were made by the nutrition support team the first week after the patients left the hospital, underscoring just how vulnerable SBS patients are immediately following discharge.

This study also attempted to calculate the potential health care savings associated with avoiding hospital readmission in this patient population. Typical hospitalization for HPN patients experiencing dehydration

include an average length of stay (LOS) of three days at an average cost of \$2,000/day.⁵⁻⁷ We therefore determined the 63 proactive clinical interventions over one month correlated to 189 saved hospital days with an annual projection of 2,268 saved days. Based on a daily average hospitalization cost of \$2,000, monthly health care dollars saved equated to \$378,000 with the potential to save over \$4.5 million annually (see Exhibit 4).⁵⁻⁷

THE FULL TEAM

The study results suggest best practices to identify and troubleshoot issues, including being proactive and getting patients involved in their own care. Nutrition support teams work closely with patients and their referring providers to develop a personalized treatment plan and offer extensive education. They help patients understand the importance of meeting oral fluid needs (and being honest about their intake), closely monitoring GI output and reporting side effects.

The research also illustrates the value of excellent communication not only between the RD, nurse and pharmacist but with the prescriber and patient as well. Here’s what that looks like. The nurse and dietitian collect vital information and the dietitian makes the recommended changes to the prescription with the pharmacist, reviewing the changes with the provider.

The most numerous and significant prescription adjustments were made by the nutrition support team the first week after the patients left the hospital

The entire team, including the patient, is alerted to the prescription change and the need for it. The nurse works closely with the dietitian to address non-compliance or other issues. Multidisciplinary team members perform rounds and provide detailed progress notes, which are shared with the prescriber. This fully integrates the patient into the process, which increases the likelihood of compliance. By thoroughly getting to know patients, we help them understand they are a vital part of their own care, and that they can reach out directly with questions or concerns at any time (see related story on p. 33).

Nutrition teams strive to develop excellent relationships with prescribers, who often rely on the team’s clinical expertise in recommending changes to the nutritional formulation. The protocol at this organization is to ask if the prescriber: would like to review the labs and make their own adjustments;

Exhibit 4
PN Clinical Interventions and Estimated Cost Savings

	Total Interventions Made to Volume	Hospital Days Saved (Mean 3-day LOS)	Health Care Dollars Saved (\$2,000/day) ⁶
Prevented dehydration first month	63	189	\$378,000
Projected annual hospital days/dollars saved		2,268	\$4,536,000

wants to work collaboratively with us based on our clinical assessment to make modifications; or prefers that we revise the prescription based on our recommendations. Most providers choose the latter, as indicated in their signed orders.

In fact, another Option Care study evaluating RD-led nutrition support in 505 patients with a variety of conditions (including those with SBS) found providers increasingly are turning to RDs for nutrition prescription management.⁸ The percentage of patients' HPN managed by an RD increased by 18% over a five-year period, reaching 91%. The research also demonstrated care led by RDs was more likely to follow ASPEN guidelines. For example, the average number of days patients received HPN decreased by 33% during the analysis, indicating that they were transitioned off HPN as soon as medically appropriate, as suggested by ASPEN guidelines.⁹

High-quality clinical management of HPN and other infusion patients is key to ensuring quality of life, cost savings and positive outcomes. Many individuals with SBS require HPN long term or even lifelong and need regular adjustments to their therapy to ensure they are achieving their nutrition goals and staying healthy.

In fact, another Option Care study evaluating RD-led nutrition support in 505 patients with a variety of conditions (including those with SBS) found providers increasingly are turning to RDs for nutrition prescription management.⁸ The percentage of patients' HPN managed by an RD increased by 18% over a five-year period, reaching 91%. The research also demonstrated care led by RDs was more likely to follow ASPEN guidelines.⁸ For example, the average number of days patients received HPN decreased by 33% during the analysis, indicating that they were transitioned off HPN as soon as medically appropriate, as suggested by ASPEN guidelines.⁹

High-quality clinical management of HPN and other infusion patients is key to ensuring quality of life, cost savings and positive outcomes. Many individuals with SBS require HPN long term or even lifelong and need regular adjustments to their therapy to ensure they are achieving their nutrition goals and staying healthy.

REFERENCES

1. Englert M, Stodola K. Proactive Interventions by Nutrition Support Clinicians in Patients with Short Bowel Syndrome (SBS) on Home Parenteral Nutrition (HPN) Results in Decreased Hospitalizations and Improved Financial Outcomes. Abstract presented at the American Society for Parenteral and Enteral Nutrition (ASPEN) 2019 Nutrition Science & Practice Conference; March 23-26, 2019, Phoenix.
2. National Institute of Diabetes and Digestive and Kidney Diseases. Short bowel syndrome. <https://www.niddk.nih.gov/health-information/digestive-diseases/short-bowel-syndrome>
3. Mayo Clinic. Dehydration. <https://www.mayoclinic.org/diseases-conditions/dehydration/symptoms-causes/syc-20354086>
4. Vallabh H, Konrad D, DeChicco R, et al. Thirty-day readmission rate is high for hospitalized patients discharged with home parenteral nutrition intravenous Fluids. JPEN; 41(8):1278-1285.
5. Sundaram A, Koutkia P, Apoviam CM. Nutritional management of short bowel syndrome in adults. *J Clin Gastroenterol.* 2002;34(3):207-20.
6. Agency for Healthcare Research and Quality. <http://hcupnet.ahrq.gov/>
7. Shelley S. [Home Infusion Providers Struggle with Unfriendly Reimbursement Policies.](#) *Pharmaceutical Commerce.* Oct. 10, 2009.
8. Kinnare K, Englert M, Paul M, et al. The Profile of Adult Patients Receiving Home Parenteral Nutrition (HPN) and Evaluation of HPN Use in Relationship to Current Nutrition Support Guidelines. Abstract presented at the American Society for Parenteral and Enteral Nutrition (ASPEN) Clinical Nutrition Week meeting; Jan. 16-19, 2016, Austin, Texas.
9. American Society for Parenteral and Enteral Nutrition. Guidelines for the use of enteral and parenteral nutrition in adult and pediatric patients. JPEN 2002;26(suppl 1):15A-138SA



Mary Englert, MS, RD, CSO, LDN, CNSC is Area Nutrition Manager for Option Care for the Great Lakes. She presented on this topic at the American Society of Parenteral and Enteral Nutrition (ASPEN) 2019 Nutrition Science & Practice Conference and was selected as an

Abstract of Distinction winner. She can be reached at mary.englert@optioncare.com

PATIENTS PLAY AN ACTIVE ROLE IN MANAGING LONG-TERM PARENTERAL THERAPIES

While this study demonstrates the important role clinical teams can have in the weeks immediately following hospital discharge, in the longer-term, a team approach to care is still highly effective. Once PN patients become stable on therapy, they play a more critical role on the care team.

Monitoring and communication are keystones of the team approach, according to Lydia Zwilling, a cancer survivor and patient with SBS in St. Cloud, Minnesota. "My care team regularly touches base with me to see how my therapy is going; how I'm feeling; check on my weight and so on. I am always informed as to the 'what, where, and why' of any treatment before it's implemented," she explains. "But most importantly, I'm always included in making decisions."

After nearly 20 years of being on PN, Zwilling's therapy doesn't require many adjustments, but her condition wasn't always this stable. Complications from ovarian cancer and radiation therapy led to her need for bowel resection. "My initial recovery and adjustment to SBS was not the norm. I was in the hospital several times each year, usually with kidney problems, infections and chronic diarrhea," recalls Zwilling. "Over the past two to three years, we were able to better manage the diarrhea, which was intensified by taking antibiotics, and adjust my PN formulation so I am thriving. Last year was the first year I was not hospitalized."

Now, her clinical team only adjusts Zwilling's PN when they aren't seeing the desired results. "If there's a change in my weight or nutritional status, they will make modifications to try to head things off before they become serious situations," she says, noting that the team uses data from monthly labs and her reports to the pharmacist, dietitian, and others.

The team also coordinates with her on regular rounds of prophylactic antibiotic flushes to keep central line and urinary tract infections in check. "I'm immune-compromised and highly susceptible, so I take small flush doses for my port and my nephrostomy tube," she explains. This protocol

greatly reduces the need for IV antibiotics, which can wreak havoc with Zwilling's gut.

As retired nurses, Zwilling and her husband are able to monitor for signs of infection or medication side effects that might cause problems. "That self-care has saved us many trips to a clinic or emergency department," she explains.

It's reassuring to go through all the twists and turns of this life-saving therapy with a consistent, capable team, she adds. "Many of the same people have been with me for years—I've been with the same pharmacist for 18 years—and we have a wonderful working relationship," she says. "Everyone is caring, friendly and easy to work with. Best of all, I have complete confidence in their ability to handle anything."

