Assessment of risk factors for hospital readmission for patients on home parenteral Nutrition (HPN)

Kimberly Landsittel, PharmD; Johanna Bezjak, PharmD, BCNSP; Tina Borneman, RPh, BCNSP; Rebecca Tokarski, PharmD, BCNSP; Kayla Szabo, PharmD, BCNSP; Jenifer Ashner, BSN, RN; Ranette Ostrowski, BSN, RN

INTRODUCTION

Home parenteral nutrition (HPN) is used in patients who cannot meet their nutritional requirements by oral or enteral intake, and who are candidates to receive therapy outside an acute care setting.

Parenteral nutrition is an effective method of sustaining patients who cannot ingest or absorb adequate nutrition via the GI tract.

Approximately 40,000 people are estimated to be receiving HPN in the United States. As of December 2020, there are approximately 6,800 patients on-service at Chartwell.
125 of these patients received HPN.

Readmission rates for patients discharged on HPN are considerably higher than the all-cause readmission rate
in the United States.

The 30-day readmission rate for HPN patients varies, but is commonly reported as > 30%. For comparison, the 30-day readmission rate for patients with heart failure is approximately 23%.

Risk factors for hospital readmission in HPN patients have been reported in prior studies, but vary. For example, both single-lumen and multi-lumen catheters have been reported to increase the risk for hospital readmission. Other potential risk factors include presence of an ostomy or fistula,
and history of bone marrow transplantation.

OBJECTIVES

The purpose of this pilot study is to examine the rate of hospital readmissions for high acuity patients discharged on HPN, and to then identify the risk factors associated with hospital readmission.

The data points captured in this pilot study will guide the need for further research, and help in the examination of Chartwell processes that could benefit from additional improvement.

By first identifying potential risk factors for readmission, this will allow for a better understanding of how to mitigate risk and therefore prevent controllable readmission(s).

TABLE 1. CRITERIA FOR INCLUSION & EXCLUSION

INCLUSION CRITERIA	EXCLUSION CRITERIA
• Adults (> 18 years old) • Receiving HPN • Utilizing Chartwell as a home infusion provider • Start of care beginning on or after July 1st 2020	• Pediatrics (< 18 years old) • Discharged to a skill nursing facility (SNF) • Taken off service (TOS) before an onboarding assessment could be completed

FIGURE 1. PATIENTS INCLUDED IN STUDY

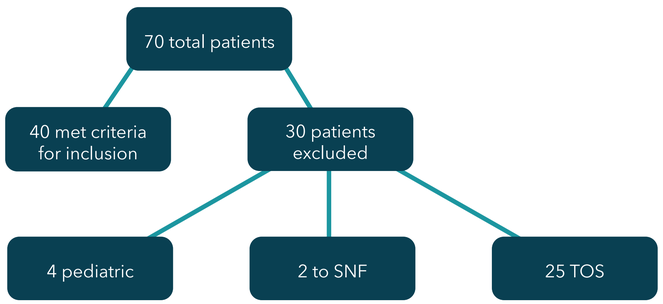

TABLE 2. BASELINE CHARACTERISTICS

DEMOGRAPHIC	N (%)
Age group (in years) • 21-40 • 41-60 • > 61	 • 4 (10%) • 16 (40%) • 20 (50%)
Sex • Male • Female	 • 18 (45%) • 22 (55%)
First time receiving home IV therapy • Yes • No • Unable to assess	 • 24 (60%) • 14 (35%) • 2 (5%)
Drain, ostomy or fistula present • Yes • No • Unable to assess	 • 23 (57.5%) • 15 (37.5%) • 2 (5%)
Access type • PICC • Port • Hickman	 • 33 (82.5%) • 5 (12.5%) • 2 (5%)
Number of lumens • Single • Double • Triple	 • 4 (10%) • 33 (82.5%) • 3 (7.5%)

MATERIALS & METHODS

This study is a single-center analysis comparing HPN patients who were readmitted to the hospital to those HPN patients who had no readmissions from July 2020 to present.

A monthly census report of patients new to home infusion service was cross-referenced with a system-wide readmissions report.

The inpatient medical chart is utilized to collect date and facility of readmission, as well as reason for readmission.

Risk factors are assessed by using outpatient data. Patients are contacted by a pharmacist via telephone to complete an onboarding assessment, which inquires specific questions to assess risk factors for readmission.

Readmissions are classified as related or unrelated to HPN. Readmissions related to HPN are further classified by cause: infectious, mechanical or metabolic.

*Statistical significance was calculated using Fisher's exact test through Stata statistical software, version 16.1. P-values < 0.05 were considered statistically significant.

RESULTS

Out of the total 40 included patients, 27 patients (67.5%) were readmitted to the hospital and 13 patients were not readmitted.

The total amount of hospital readmissions among patients were 57. The maximum amount of readmissions per patient was 6 readmissions.

15 of the 27 readmitted patients (55.5%) were readmitted to the hospital within 30 days of their start of care date.

13 readmissions (22.8% of readmissions) were considered related to HPN therapy. Of the readmissions related to HPN therapy, 1 was considered metabolic, 6 were considered infectious and 6 were considered mechanical.

TABLE 3.1 COMPARISON OF RISK FACTORS BETWEEN READMISSION GROUPS

FACTOR	LEVEL	TOTAL	READMISSION(S)		NO READMISSION(S)		P-VALUE
			N	%	N	%	
Age Group (in years)	21-40 41-60 61+	4 16 20	4 11 12	100% 68.75% 60%	0 5 8	0% 31.25% 40%	0.381
First time receiving home IV therapy	Yes No Unable to assess	24 14 2	16 10 1	66.7% 71.4% 50%	8 4 1	33.3% 28.6% 50%	> 0.99
Drain, ostomy, or fistula present	Yes No Unable to assess	23 15 2	18 8 1	78.3% 53.3% 50%	5 7 1	21.7% 46.7% 50%	0.157
Access type	PICC Port Hickman	33 5 2	21 4 2	63.6% 80% 100%	12 1 0	36.4% 20% 0%	0.524
Number of lumens	Single Double Triple	4 33 3	2 9 2	50% 27.3% 66.7%	2 24 1	50% 72.7% 33.3%	0.273
Use of Chartwell HPN placemat*	Yes No Unable to assess	22 16 2	15 11 1	68.2% 68.75% 50%	7 5 1	31.8% 31.25% 50%	> 0.99
Issues with HPN preparation technique**	Yes No Unable to assess	7 25 8	5 18 5	71.4% 72% 62.5%	2 7 3	28.6% 28% 37.5%	> 0.99
Agency	UPMC Non-UPMC No agency	28 11 1	23 4 0	82.1% 36.4% 0%	5 7 1	17.9% 63.6% 100%	> 0.99
Number of adults in the home	1 2 3+ Unable to assess	8 21 9 2	5 15 6 1	62.5% 71.4% 66.7% 50%	3 6 3 1	37.5% 28.6% 33.3% 50%	0.899
Number of children in the home	0 1 2+ Unable to assess	29 4 5 2	21 2 3 1	72.4% 50% 60% 50%	8 2 2 1	27.6% 50% 40% 50%	0.593
Number of pets in the home	0 1 2+ Unable to assess	18 9 11 2	12 4 10 1	66.7% 44.4% 90.9% 50%	6 5 1 1	33.3% 55.6% 9.1% 50%	0.598
Involvement in care score***	1 2 3 Unable to assess	5 22 11 2	3 17 6 1	60% 77.3% 54.5% 50%	2 5 5 1	40% 22.7% 45.5% 50%	0.379
Readmission Risk Score****	Higher or highest Medium, lower or lowest N/A	25 4 11	16 3 8	64% 75% 72.7%	9 1 3	36% 25% 27.3%	> 0.99

*The Chartwell placemat is provided to HPN patients along with their first delivery. It provides information about HPN preparation and allows a suitable, easily sanitized surface for patients to prepare their HPN.

**Common issues with HPN preparation included improper technique for bringing the HPN to room temperature (ex: bathing in warm water) and insufficient sanitizing of additives, HPN port and/or catheter lumens.

***The involvement in care score is a score assigned by the pharmacist that completed the patient's onboarding assessment. A score of 1, 2 or 3 is assigned to each patient. Higher scores indicate greater involvement of the patient in their own care. A score of 1 suggests the presence of significant psychosocial factors that may impact care.

****Readmission risk scores are assigned to each patient while admitted to a UPMC facility. Scores range from lowest to highest. Patients are assigned N/A if they did not discharge from a UPMC facility. Factors that influence this score include age, chief complaint, medication list, past medical history and abnormal laboratory values.

CONCLUSIONS

RISK FACTORS FOR READMISSION	CHALLENGES	LIMITATIONS
Age (p = 0.381) Drain, ostomy or fistula present (p = 0.157) Access type (p = 0.524) Number of lumens (p = 0.273) Number of children in the home (p = 0.593) Number of pets in the home (p = 0.598) Involvement in care score (p = 0.379)	Patient unwilling to complete onboarding assessment Inability to reach patients and/or caregivers by telephone Inability to contact patients who were frequently readmitted to the hospital Difficulty accessing inpatient data for patients admitted to a non-UPMC facility	Small sample size Unequal amount of observation time among patients (tracking of readmission begins as each patient comes onto service)

FUTURE DIRECTIONS

RESEARCH

Continue to complete the onboarding assessment and track hospital readmission for HPN patients who are new to service, to allow for a larger sample size.

Explore options that would allow for earlier contact of these patients, as opposed to waiting for an end of month report to be released

CHARTWELL PROCESSES TO EXAMINE

Pre-discharge education, to minimize the amount of patients readmitted within 30 days of discharge.

Assessment of patient-specific factors (such as home environment) to ensure they are a proper candidate for HPN prior to hospital discharge.

Reinforce use of Chartwell HPN placemat, especially for patients new to home IV therapy.

Assessment of patient/caregiver understanding after first HPN teach, to decide if repeat teach(es) are necessary.

CAREPATHrx™
Specialty Pharmacy & Infusion Solutions

Home Infusion & Specialty Pharmacy
CHARTWELL
PENNSYLVANIA, LP

References

Staun M, Pironi L, Bozzetti F, Baxter J, Forbes A, Joly F, Jeppesen P, Moreno J, Hébuterne X, Pertkiewicz M, Mühlebach S, Shenkin A, Van Gossum A; ESPEN. ESPEN Guidelines on Parenteral Nutrition: home parenteral nutrition (HPN) in adult patients. Clin Nutr. 2009 Aug;28(4):467-79. doi: 10.1016/j.clnu.2009.04.001. Epub 2009 May 22. PMID: 19464089.

Vallabh, H., Konrad, D., DeChicco, R., Cresci, G., Lopez, R., Steiger, E. and Kirby, D.F. (2016) Thirty-Day Readmission Rate Is High for Hospitalized Patients Discharged With Home Parenteral Nutrition or Intravenous Fluids. Journal of Parenteral & Enteral Nutrition. August 18th.

de Burgoa LJ, Seidner D, Hamilton C, Stafford J, Steiger E. Examination of factors that lead to complications for new home parenteral nutrition patients. J Infus Nurs. 2006 Mar-Apr;29(2):74-80. doi: 10.1097/00129804-200603000-00004. PMID: 16569996.

Ireton-Jones C, DeLegge MH, Epperson LA, Alexander J. Management of the home parenteral nutrition patient. Nutr Clin Pract. 2003 Aug;18(4):310-7. doi: 10.1177/0115426503018004310. PMID: 16215057.