



## INTRODUCTION

- Short bowel syndrome (SBS) dependent on parenteral support (PS), also known as SBS with intestinal failure (SBS-IF), is a debilitating malabsorptive condition often caused by massive resection of the intestine, leading to reduction in intestinal function below the minimum necessary for nutrient and fluid absorption to maintain health, growth, and survival<sup>1,2,3</sup>
- Although PS is lifesaving, complications including catheter-related bloodstream infections, sepsis, and catheter-related central venous thrombosis/deep vein thrombosis (DVT) may occur<sup>1,40</sup>
- There is limited real-world data on the impact on HCRU
- Economic burden for SBS dependent on PS is high with major drivers that increase healthcare resource utilization (HCRU), including PS costs and complications, symptom management, and emergency room visits<sup>5,6</sup>

## OBJECTIVES

- The aim of this real-world analysis was to assess HCRU of SBS patients dependent on PS
- To capture symptoms; comorbidities; nutrition/medication utilization; healthcare provider interactions, such as laboratory tests, physician office/outpatient/emergency department visits, and inpatient admissions/stay

## METHODS

- An observational retrospective, real-world analysis of insurance claims between January 2019 and March 2023 was conducted using Komodo Healthcare Map™ data (Table 1)
- Patients were indexed at first observed PS insurance claim and classified with SBS dependent on PS if they had (1) chronic and continuous PS claims for ≥6 months, (2) intestinal resection or congenital abnormality history, and (3) concurrent diagnosis of intestinal malabsorption
- Descriptive statistics were used to capture the HCRU outcomes of the overall cohort and separately for age, nutrition claims, and surgery status sub-cohorts

Table 1 | Cohort Attrition

Step	Description	N
1	Any nutritional support code	20,496,023
2	Chronic nutrition (≥2 nutrition codes [≥1 PN or hydration] >6 months apart)	2,308,576
3	Continuous nutrition (average ≥2 nutrition codes per month for >6 months)	104,911
4	Surgical/congenital origin of SBS	46,175
5	Diagnosed malabsorption	11,592
6-10	Exclude patients with	
	6. <3 years of continuous enrollment before nutrition start	3,550
	7. <1 year of continuous enrollment after nutrition start	1,953
	8. Unknown age or sex	1,944
	9. No prior prescription for teduglutide	1,734
10. Evidence of obstruction AND any specified metastatic codes	<b>1,587</b>	

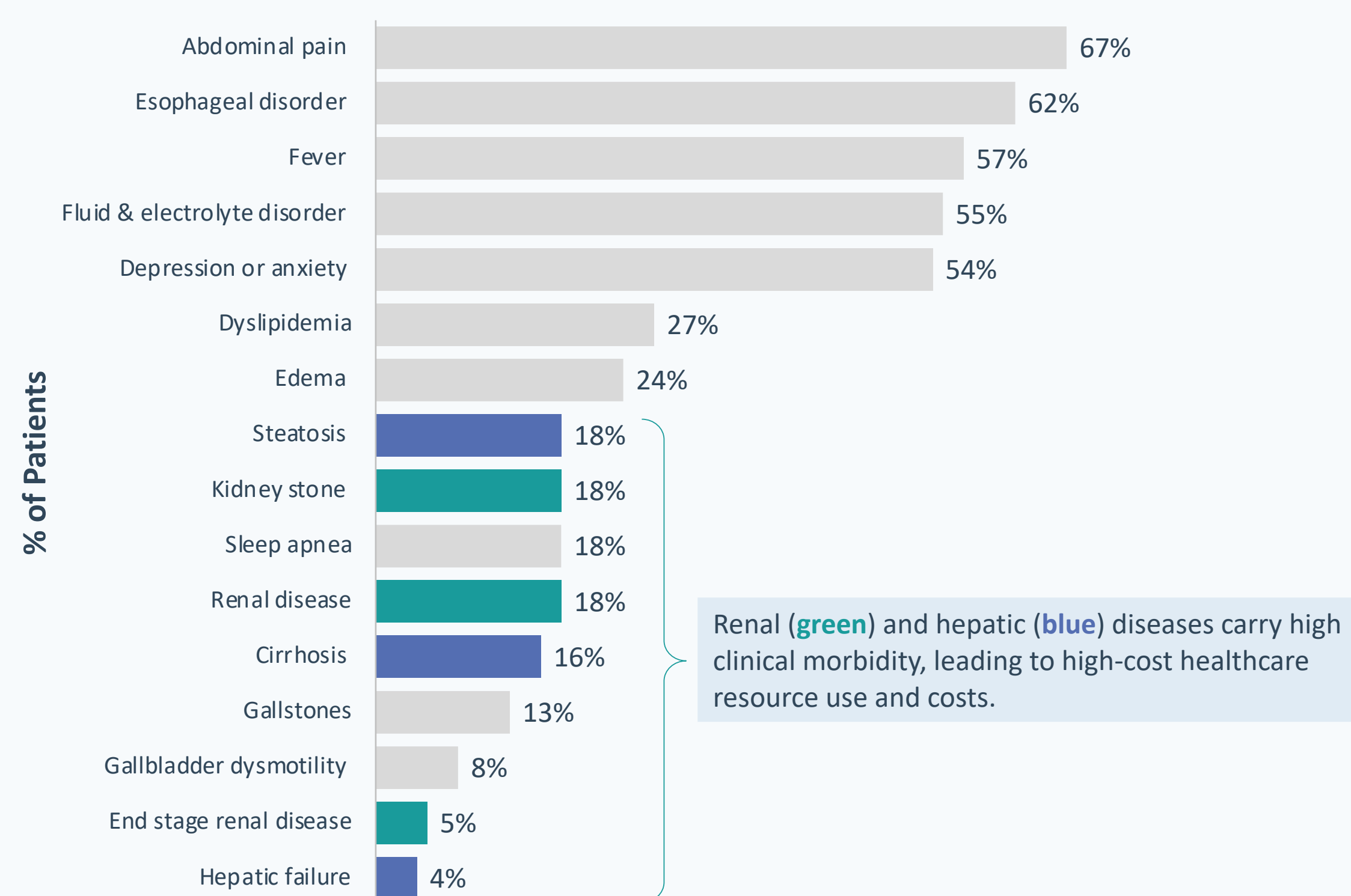
Abbreviations: PN, parenteral nutrition; SBS, short bowel syndrome.

Table 2 | Patient Characteristics

Characteristic	N=1,587
Mean age, years	34.6
3-17, n (%)	456 (29)
18-44, n (%)	548 (35)
45-64, n (%)	493 (31)
≥65, n (%)	90 (6)
Male/female, %	34/66
Race, n (%)	
White	826 (52)
Hispanic or Latino	183 (12)
Black	187 (12)
Asian or Pacific Islander	36 (2)
Other/unknown	63 (4)/292 (18)
Payer type, n (%)	
Medicaid/Medicare	668 (42)/266 (17)
Commercial	535 (34)
Unknown	118 (7)

- All data presented reflect the index date through the end of the study period (mean, 2.75 years)
- Overall, 1,587 patients were included in the analysis; among them, 66% of patients were female and 52% were white (Table 2)

Figure 1 | Diagnosed Comorbidities and Symptoms (N=1,587)<sup>a</sup>

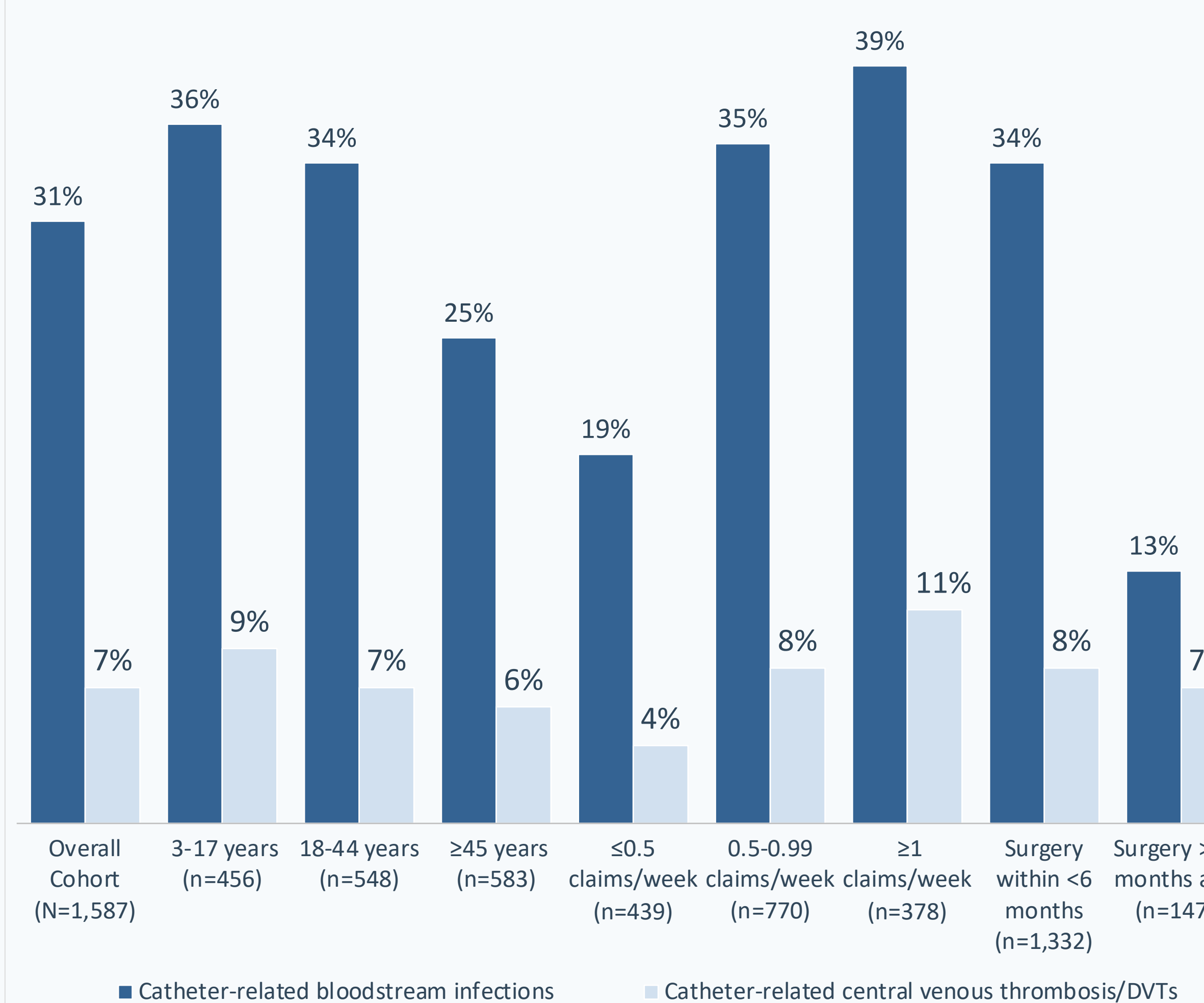


<sup>a</sup>Data presented reflect the index date through the end of the study period. Abbreviations: HCRU, healthcare resource utilization.

- The most prevalent comorbidities and symptoms were abdominal pain (67%), esophageal disorder (62%), fever (57%), fluid and electrolyte disorder (55%), and depression or anxiety (54%) (Figure 1)

## RESULTS

Figure 2 | Catheter-Related Bloodstream Infections and Thrombosis Events Across Sub Cohorts (% of Patients)



DVT, deep vein thrombosis.

- Overall, 31% of patients had claims for catheter-related bloodstream infections and 7% of patients had claims for catheter-related central venous thrombosis/DVTs (Figure 2)
- Patients with ≥1 nutrition claim/week had approximately twice the frequency of catheter-related bloodstream infections than patients with ≤0.5 claims/week (39% versus 19%)

Table 3 | Impact of Bloodstream Infections (N=1,587)

	n (%)
Patients with a bloodstream infection	745 (47%)
Inpatient admission OR emergency department visit within 5 days of a catheter-related bloodstream infection or sepsis diagnosis	572 (77%)
Patients with emergency department visit	189 (25%)
Patients with inpatient admission	518 (70%)
Median inpatient length of stay for patients with a bloodstream infection	14 days

- Of the 1,587 patients, 745 (47%) of patients had claims for bloodstream infections
- The median inpatient length of stay for patients with a bloodstream infection was 14 days (Table 3), whereas the median length of inpatient stay for patients in the overall cohort was 8.1 days

Figure 3 | Healthcare Provider Interactions (N=1,587)

% of Patients	Annualized visit rate/year		
	Mean	Median	
Lab procedures	100%	35	29.3
Office visits	100%	54.3	42.1
Homecare	100%	53.4	28.7
Outpatient	99%	19.3	11.3
Emergency department visits	85%	4.5	2.1
Inpatient admission	75%	2.6	1.7

- Among healthcare provider interactions, 85% of patients visited the emergency department (mean, 4.5 visits/year) and 75% were admitted as inpatients (mean, 2.6 visits/year) (Figure 3)
- Among all patients (n=1,587), the most common diagnoses leading to an emergency department visit was abdominal pain (22%) and fever (15%) and to inpatient care was catheter-related bloodstream infections (36%) and sepsis (19%)

## DISCUSSION & CONCLUSIONS

### Discussion

- Comorbidities and symptoms with clinical and economic burden were frequent, which can potentially impact long-term HCRU costs
- Across sub-cohorts, catheter-related bloodstream infections were higher in patients receiving more nutrition claims and lower in patients who received surgery >12 months ago compared to those who had received surgery within <6 months
  - Catheter-related central venous thrombosis/DVTs were generally consistent
- Patients with SBS dependent on PS demonstrated high rates of emergency department and inpatient encounters, often from PS-related complications
- Study limitations include those inherent to analyses based on claims data

### Conclusions

- Future treatments should aim to minimize the frequency of PS administration, which is associated with elevated risk of catheter-related bloodstream infections and greater HCRU

## REFERENCES

- Jeppesen PB. J Parenter Enteral Nutr. 2014;38(1 Suppl):8S-13S.
- Siddiqui MT, Al-Yaman W, Singh A, et al. J Parenter Enteral Nutr. 2021;45(7):1441-1455.
- O'Keefe SJD, Buchman AL, Fishbein TM, et al. Clin Gastroenterol Hepatol. 2006;4(1):6-10.
- Winkler MF and Smith CE. J Parenter Enteral Nutr. 2014;38(1 Suppl):32S-37S.
- Schalamon J, Mayr JM, and Höllwarth ME. Best Pract Res Clin Gastroenterol. 2003;17(6):931-942.
- Winkler M and Tappenden K. Nutr Clin Pract. 2023;38 Suppl 1:S17-S26.

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