

Hospital Admissions for Bloodstream Infections Acquired during Outpatient Hemodialysis Through a Central Venous Catheter (HD-CVC): Patient Population and Selected Outcomes

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1. BACKGROUND

- Hemodialysis via central venous catheters (CVC) carries increased risk for bloodstream infections
- This study characterizes the demographics, clinical baseline characteristics, and clinical and economic outcomes associated with the development of bloodstream infections (BSI) requiring hospitalization in patients undergoing outpatient hemodialysis through a CVC (HD-CVC)

2. METHODS

- Retrospective data were collected from the Premier Healthcare Database, containing hospital inpatient records
- For each patient undergoing HD-CVC, the first inpatient admission with a BSI with discharge dates in calendar years 2020-2022 was included
- Bloodstream infections were identified using ICD-10 codes and onset was assessed using procedural blood culture code dates
- Bloodstream infections were defined as present-on-admission (POA-BSI) if the blood culture collection date was before or <3 days after the admission date
- Descriptive analyses included: baseline demographics, clinical characteristics, and outcomes, including hospital costs

3. RESULTS

- Over the 3-year collection period, 166,394 admissions were identified among 91,448 unique patients
- POA-BSI were seen in 22,902 (25%) initial admissions during the study period (Figure 1)
- The demographics of the POA-BSI patients are listed in Table 1
- All-cause mortality rates for first admission with POA-BSI: **17.1%**
 - Died in hospital: **13.1%**
 - Died within 90 days of index discharge: **4.0%**
- Length of stay and ICU utilization for all patients are shown in Table 2
- Admission and ICU costs (and per diems) are shown in Table 3
- Readmission and CVC removal rates are shown in Figures 2 & 3

Figure 1. Identification of Index Inpatient Admissions

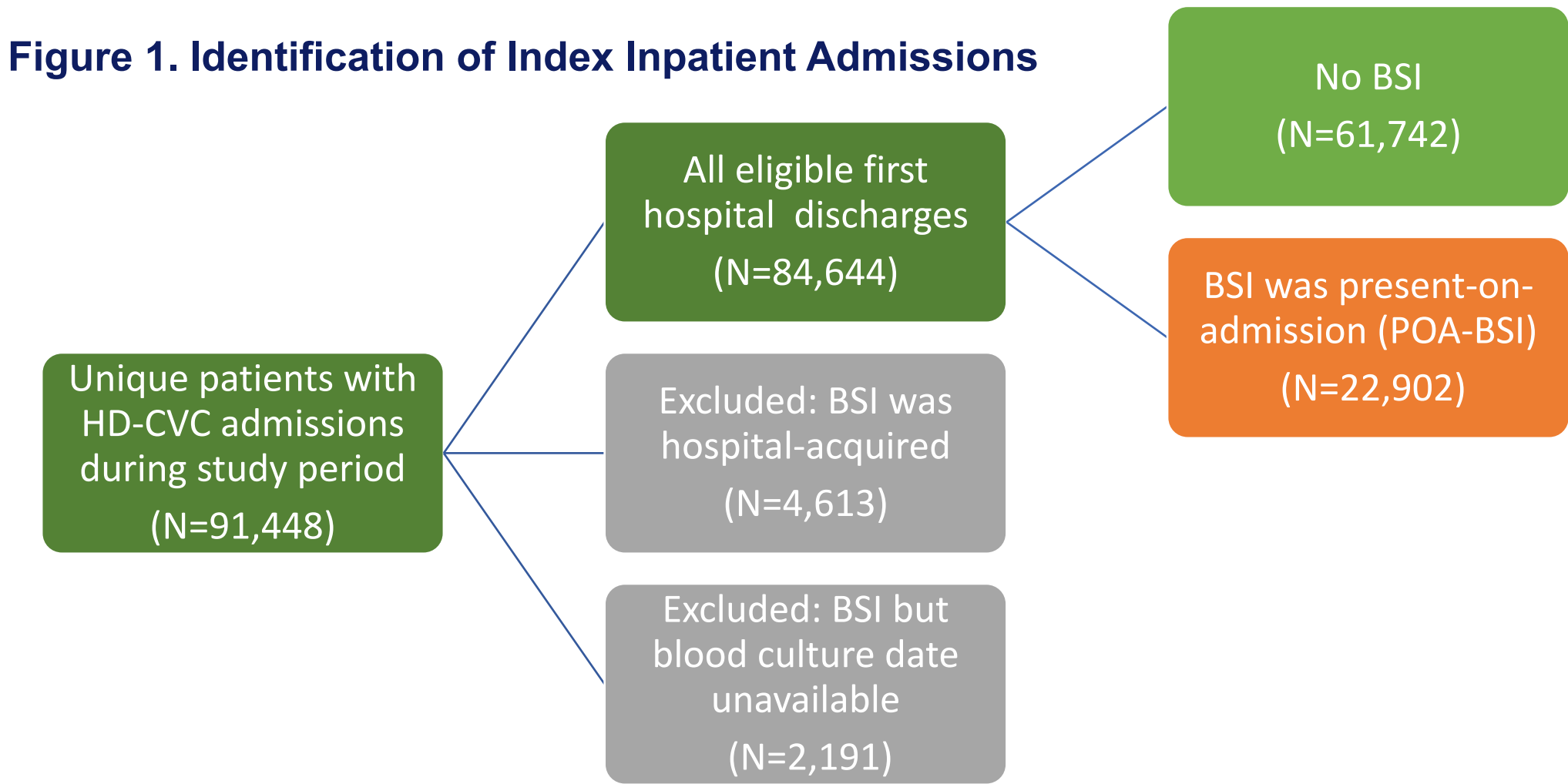


Table 1. Baseline Demographics for HD-CVC Patients that Developed POA-BSI

Characteristic, Evaluated as of Date of First Admission During Study Period		
Age in years, median (range)	63	(18, 89*)
Age category, years, number (%)		
<60	9,318	(40.7%)
≥60 to <75	9,146	(39.9%)
≥75	4,438	(19.4%)
Male, number (%)	12,971	(56.6%)
Race, number (%)		
White	13,330	(58.2%)
Black	6,214	(27.1%)
Asian	769	(3.4%)
Other	1,956	(8.5%)
Unknown	633	(2.8%)
Hispanic or Latino Ethnicity, number (%)	3,734	(16.3%)
Social Vulnerability Index ranking, number (%)		
Top half (most vulnerable) of census tracts	18,021	(78.7%)
Top quartile (most vulnerable) of census tracts	10,768	(47.0%)
Charlson Comorbidity Index (CCI), median (range)	5.0	(0, 21)
Count of CCI Conditions, number (%)		
≥ 3	20,076	(87.7%)
≥ 6	9,734	(42.5%)

HD-CVC: Hemodialysis via central venous catheter; POA-BSI: Present-on-admission bloodstream infection; *Age top-coded.

Table 2. Impacts of Hospital-acquired Bloodstream Infections on Length of Stay and Hospital Utilization in HD-CVC Patients, First Admission During Study Period

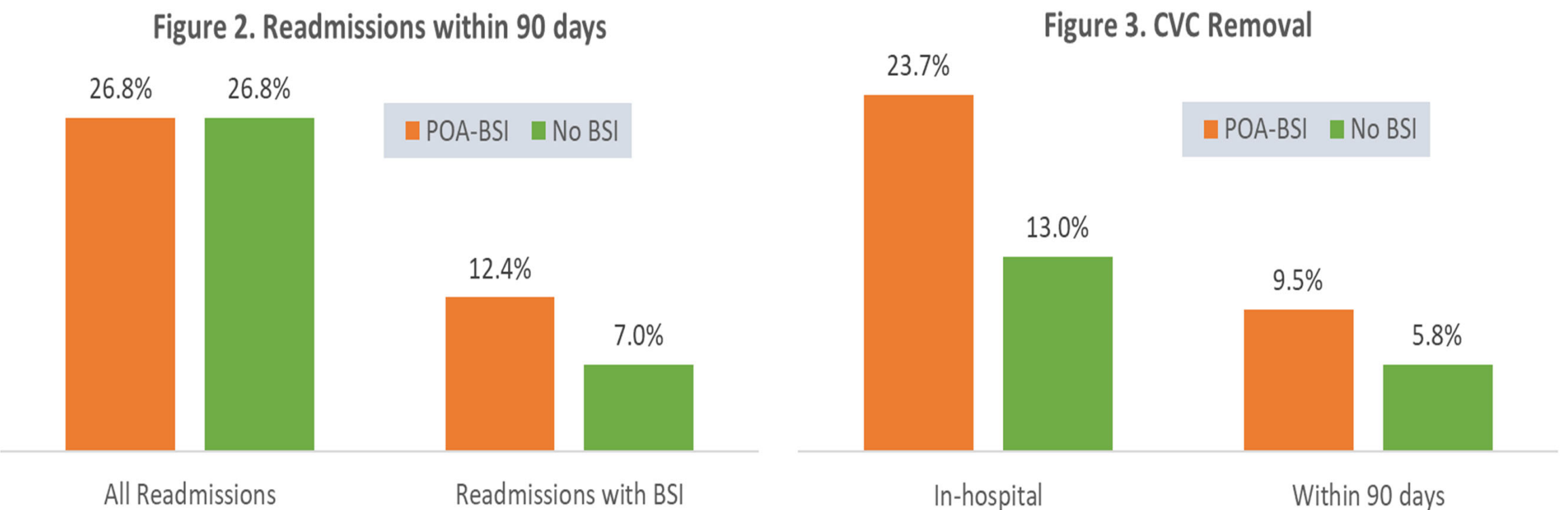
Patients	Median (range) Length of Stay	Admissions with ICU Stays	Median (range) Non-Zero ICU LOS
HD-CVC, no BSI	8 (1, 417)	23.3%	3 (1, 138)
HD-CVC, POA-BSI	16 (1, 738)	54.7%	6 (1, 313)

HD-CVC: Hemodialysis via central venous catheter; BSI: Bloodstream infection; POA: Present-on-admission; ICU: Intensive care unit; LOS: Length of stay in days

Table 3. Impacts of Hospital-acquired Bloodstream Infections on Per Diem and Total Costs in HD-CVC Patients, First Admission During Study Period (USD \$2022)

Patients	Median Total (Per Diem) Admission Cost	Median Total (Per Diem) ICU Cost
HD-CVC, no BSI	\$64,585 (\$8,619)	\$24,425 (\$6,401)
HD-CVC, POA-BSI	\$157,368 (\$10,354)	\$64,889 (\$7,867)

HD-CVC: Hemodialysis via central venous catheter; BSI: Bloodstream infection; POA: Present-on-admission; ICU: Intensive care unit; USD: United States dollars



4. SUMMARY

- Patients undergoing dialysis through a central line are at high risk of hospitalization for bloodstream infections
- These infections are associated with relatively high rates of all-cause in-hospital mortality, CVC removal, and readmission with BSI
- Substantial healthcare utilization and costs were observed among HD-CVC patients admitted with BSI
- Future studies could consider prevention strategies for this high-risk population