



similar clinical indications. **Methods:** At UNC Hospitals, data were obtained on central lines across a 3-year period (FY20–FY22) from the EMR (Epic Systems). Central lines were categorized as apheresis catheters, CVC lines (single, double, or triple lumen), hemodialysis catheters, introducer lines, pulmonary artery (PA) catheters, PICC lines (single, double, or triple lumen), port-a-catheters, trialysis catheters, or umbilical lines. The line type(s) associated with each CLABSI during the same period were recorded, and CLABSI rates by line type per 1,000 central-line days were calculated using SAS software. If an infection had >1 central-line device type associated, the infection was counted twice when calculating the CLABSI rate by line type. We calculated 95% CIs for each point estimate to assess for statistically significant differences in rates by line type. **Results:** During FY20–FY22, there were 264,425 central-line days and 458 CLABSIs, for an overall CLABSI rate of 1.73 CLABSIs per 1,000 central-line days. Also, 16% of patients with a CLABSI had >1 type of central line in place. Stratified data on CLABSI rates by each central-line type is presented in the Figure. CLABSI rates were highest in patients with apheresis lines (6.22; 95% CI, 3.96–9.35) and PA catheters (6.22; 95% CI, 3.54–10.20), and the lowest CLABSI rates occurred in patients with PICC lines (1.44; 95% CI, 1.19–1.73) and port-a-catheters (1.14; 95% CI, 0.89, 1.45). For both CVC and PICC lines, as the number of lumens increased from single to triple, CLABSI rates increased, from 0.91 to 2.63 and from 0.57 to 1.20, respectively. **Conclusions:** At our hospital, different types of central lines were associated with statistically higher CLABSI rates. Additionally, a higher number of lumens (triple vs single) in CVC and PICC lines were also associated with statistically higher CLABSI rates. These findings reinforce the importance of considering central-line type and number of lumens to minimize risk of CLABSI while ensuring that patients have the best line type based on their clinical needs.

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**Bloodstream infection burden among cancer clinic patients with PICC Lines: A prospective, observational study**

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**Background:** Oncology patients are at high risk for bloodstream infection (BSI) due to immunosuppression and frequent use of central venous catheters. Surveillance in this population is largely relegated to inpatient

**Table 1. Oncology Clinic Patient Characteristics, Bloodstream Infections, Emergency Department Visits, and Unplanned Hospitalizations**

	Total N (%) <sup>1</sup>	Hematologic Malignancy N (%)	Solid Tumor Malignancy N (%)	p-value <sup>2</sup>
<b>Cohort Characteristics</b>				
Oncology Clinic Patients	478	271 (57)	207 (43)	--
PICC Lines Among Clinic Patients <sup>3</sup>	645	413 (64)	232 (36)	--
Mean Age (SD)	55.6 (16.9)	52.8 (18.0)	59.2 (14.5)	<0.0001
Female Gender	194 (41)	109 (40)	85 (41)	0.853
History of Prior PICC Line	114 (24)	91 (34)	23 (11)	<0.001
Mean Line Duration (SD), Days	99 (115)	96 (110)	106 (122)	0.310
Oncology Clinic Visits, Mean (SD)	8.6 (11.7)	10.4 (13.3)	5.4 (7.1)	<0.001
<b>Outcomes</b>				
Bloodstream Infection Events <sup>4</sup>	75 (11.6)	43 (10.4)	32 (13.8)	0.199
Gram Positive Pathogen	28 (4.3)	10 (2.4)	18 (7.8)	0.003
Gram Negative Pathogen	40 (6.2)	30 (7.3)	10 (4.3)	<0.001
Fungal Pathogen	3 (0.5)	1 (0.2)	2 (0.9)	0.391
Polymicrobial Pathogen	4 (0.6)	2 (0.5)	2 (0.9)	0.760
ED Visits ≥1	139 (29)	81 (30)	58 (28)	0.656
Unplanned Hospitalization ≥1	224 (47)	141 (52)	83 (40)	0.010

<sup>1</sup>Percentages calculated among all patients. <sup>2</sup>Chi-squared analyses compared frequency of outcomes observed in hematologic malignancy versus solid tumor patients. Differences in mean number of outpatient clinic visits, ED visits, and unplanned hospitalizations assessed using unpaired t-tests. <sup>3</sup>PICC = peripherally inserted central catheters. <sup>4</sup>Bloodstream infection (BSI) events due to any cause; nine patients had more than 1 BSI during the study period.

settings and limited data are available describing community burden. We evaluated rates of BSI, clinic or emergency department (ED) visits, and hospitalizations in a large cohort of oncology outpatients with peripherally inserted central catheters (PICCs). **Methods:** In this prospective, observational study, we followed a convenience sample of adults (age>18) with PICCs at a large academic outpatient oncology clinic for 35 months between July 2015 and November 2018. We assessed demographics, malignancy type, PICC insertion and removal dates, history of prior PICC, and line duration. Outcomes included BSI events (defined as >1 positive blood cultures or >2 positive blood cultures if coagulase-negative *Staphylococcus*), ED visits (without hospitalization), and unplanned hospitalizations (excluding scheduled chemotherapy hospitalizations). We used  $\chi^2$  analyses to compare the frequency of categorical outcomes, and we used unpaired *t* tests to assess differences in means of continuous variable in hematologic versus solid-tumor malignancy patients. We used generalized linear mixed-effects models to assess differences in BSI (clustered by patient) separately for gram-positive and gram-negative BSI outcomes. **Results:** Among 478 patients with 658 unique PICC lines and 64,190 line days, 271 patients (413 lines) had hematologic malignancy and 207 patients (232 lines) had solid-tumor malignancy. Cohort characteristics and outcomes stratified by malignancy type are shown in Table 1. Compared to those with hematologic malignancy, solid-tumor patients were older, had 47% fewer clinic visits, and had 32% lower frequency of prior PICC lines. Overall, there were 75 BSI events (12%; 1.2 per 1,000 catheter days). We detected no significant difference in BSI rates when comparing solid-tumor versus hematologic malignancies ( $P=0.20$ ); BSIs with gram-positive pathogen were 69% higher in patients with solid tumors. Gram-negative BSIs were 41% higher in patients with hematologic malignancy. Solid-tumor malignancy was associated with 4.5-fold higher odds of developing BSI with gram-positive pathogen (OR, 4.48; 95% CI, 1.60–12.60;  $P=.005$ ) compared to those with hematologic malignancy, after adjusting for age, sex, history of prior PICC, and line duration. Differences in gram-negative BSI were not significant on multivariate analysis. **Conclusions:** The burden of all-cause BSIs in cancer clinic adults with PICC lines was 12% or 1.2 per 1,000 catheter days, as high as nationally reported inpatient BSI rates. Higher risk of gram-positive BSIs in solid-tumor patients suggests the need for targeted infection prevention activities in this population, such as improvements in central-line monitoring, outpatient care, and maintenance of lines and/or dressings, as well as chlorhexidine bathing to reduce skin bioburden.

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