

Examining CLABSI Rates by Central Line Type

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Background

Central line-associated bloodstream infections (CLABSI) are linked to increased morbidity and mortality, longer hospital stays, and significantly higher healthcare costs.

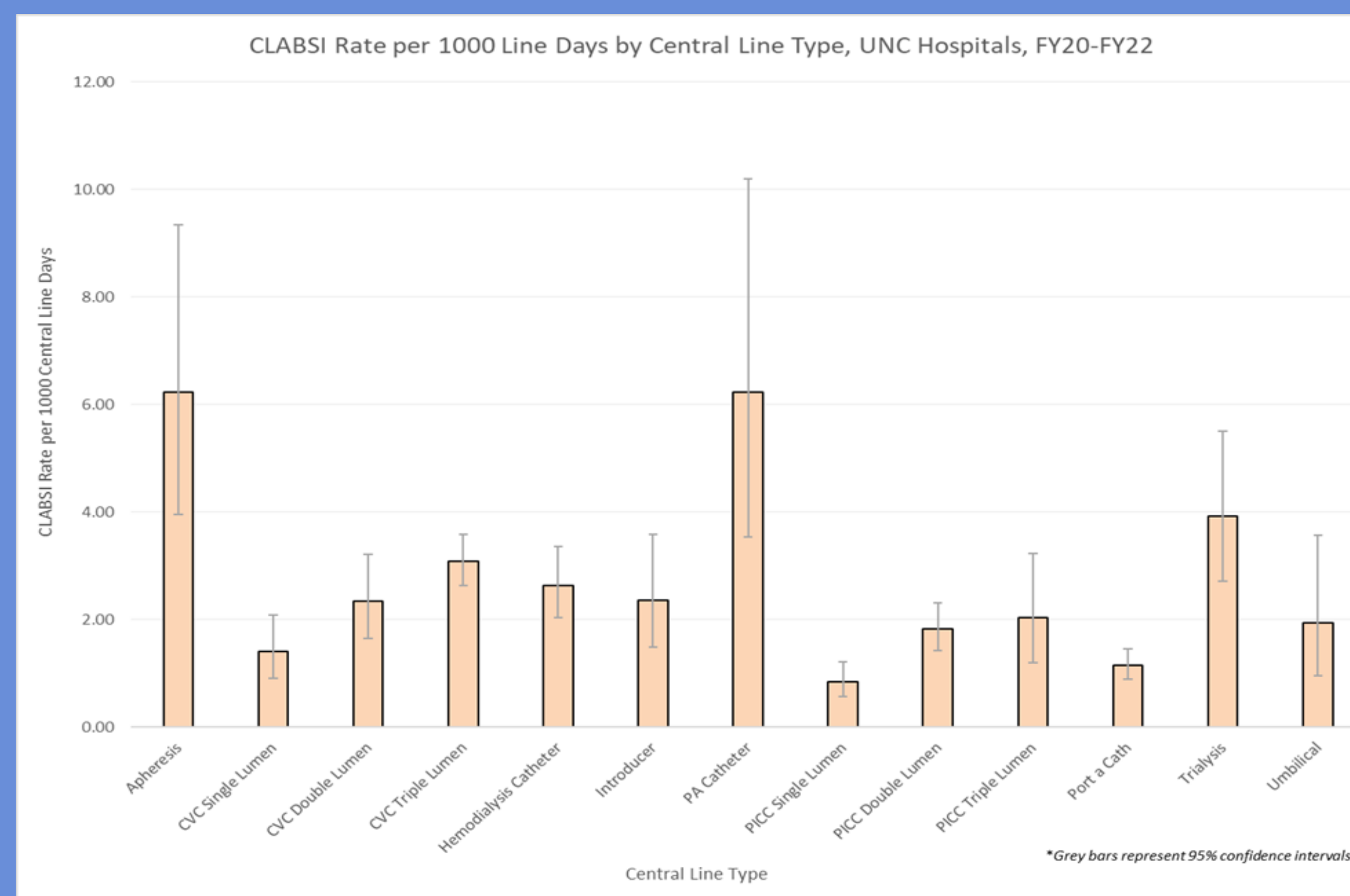
Infection prevention guidelines recommend line placement in specific insertion locations over others because of the relative risk of infection. The relative risk of CLABSI by line type remains poorly defined.

Therefore, the purpose of this study was to assess CLABSI rates by line type to determine if some central lines had a lower risk of infection and should be recommended over others given similar clinical indications.

Methods

At UNC Hospitals, data was obtained on central lines across a 3-year time period (FY20-FY22) from Epic EMR. Central lines were categorized as apheresis catheters, CVC lines (single, double or triple lumen), hemodialysis catheters, introducer lines, 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 time-period were recorded and CLABSI rates by line type per 1000 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. 95% confidence intervals were calculated for each point estimate to assess for statistically significant differences in rates by line type.



Line Type	Number Line Days	Number CLABSI	CLABSI Rate per 1000 Line Days
PA Catheter	2249	14	6.22
Apheresis	3374	21	6.22
Trialysis	7888	31	3.93
CVC Triple Lumen	50948	157	3.08
Hemodialysis Catheter	23511	62	2.64
Introducer	8472	20	2.36
CVC Double Lumen	14973	35	2.34
PICC Triple Lumen	7878	16	2.03
Umbilical	4631	9	1.94
PICC Double Lumen	37119	68	1.83
CVC Single Lumen	16343	23	1.41
Port a Cath	55126	63	1.14
PICC Single Lumen	31913	27	0.85

Results

During FY20-FY22, there were 264,425 central line days and 458 CLABSI for an overall CLABSI rate of 1.73 CLABSI per 1000 central line days. 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 (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), while 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 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.