

Background

- The University of Alberta Hospital (UAH) is a 650-bed tertiary teaching hospital that provides specialized hematology services to adults with a variety of hematologic diagnoses on an 18-bed inpatient unit (unit 5F4).
- A review of five years (2018-2022) of bloodstream infection (BSI) data in this hematology inpatient population was completed to evaluate overall trends over time and identify potential modifiable factors to reduce infections.

Methods

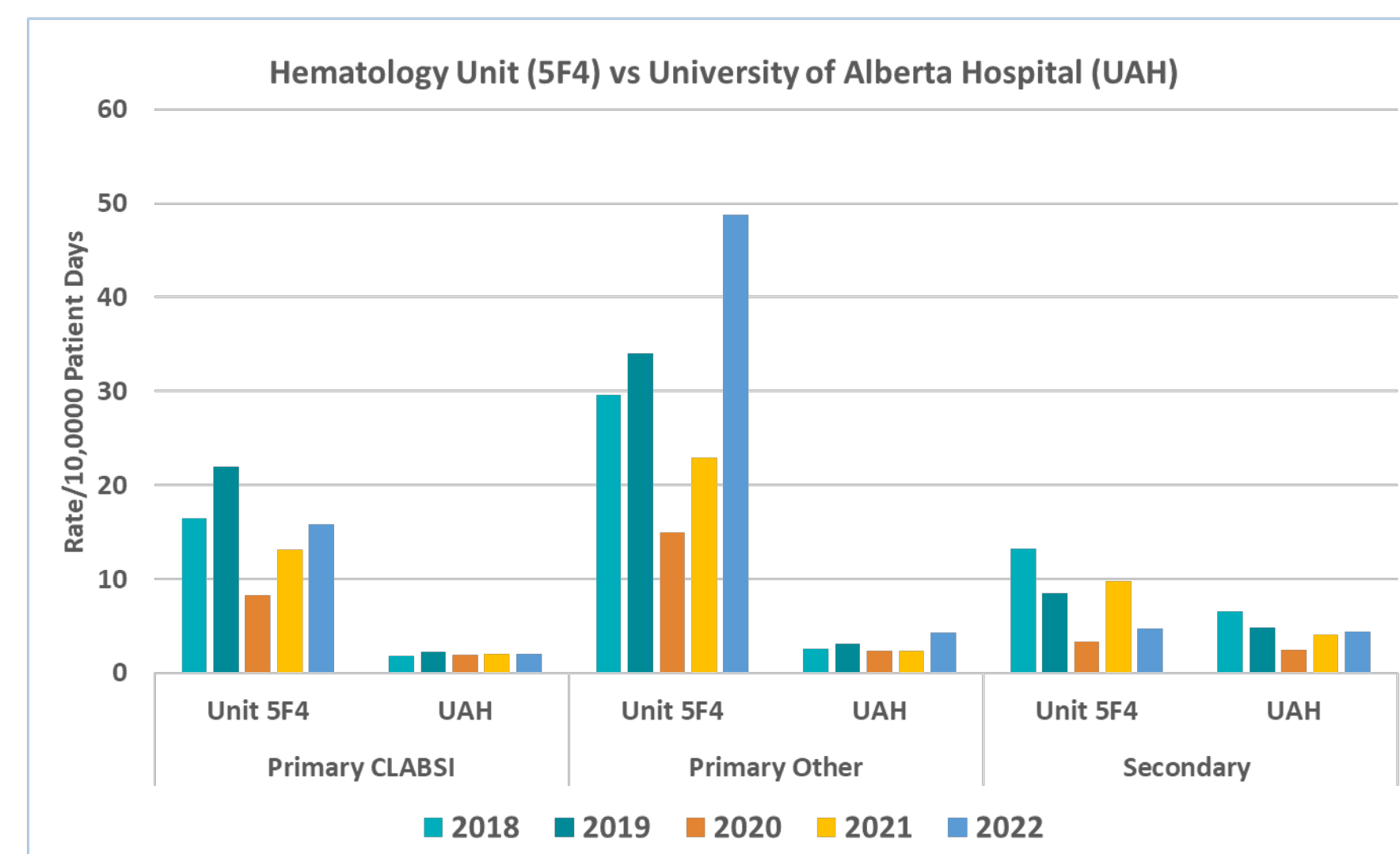
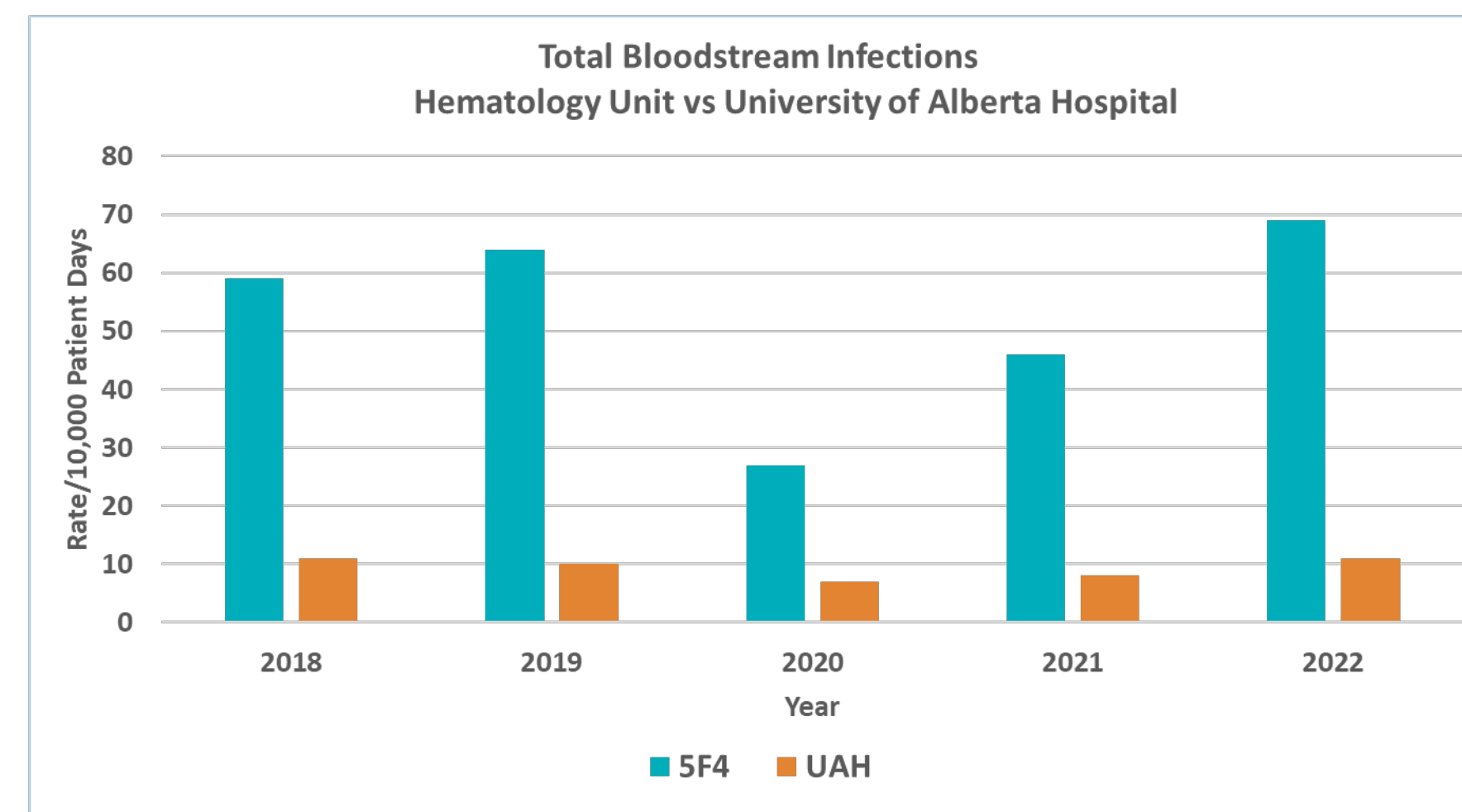
- The UAH Infection Prevention and Control (IPC) staff conduct hospital wide, prospective BSI surveillance to identify hospital acquired (HA) cases based on surveillance protocols and standardized infection definitions from the National Healthcare Safety Network (NHSN).
- A list was extracted from the Alberta Health Services (AHS) provincial data system of all hematology patients admitted to unit 5F4 who had an HA BSI with a culture date between January 1, 2018 and December 31, 2022.
- 162 HA BSIs were identified in 127 hematology patients. These charts were reviewed to determine demographic details and additional information about diagnosis, treatment and outcome.

Case Characteristics

Characteristics of Cases	Percentage of Cases
Male	63
Less than 60 years old	53
Length of Stay Prior to BSI- Greater than ten days	72
Neutropenia at time of BSI	82*
Diagnosis-Acute myeloid leukemia (AML)	57*
Curative Chemo Given	82
30 Day Outcome-deceased	23*

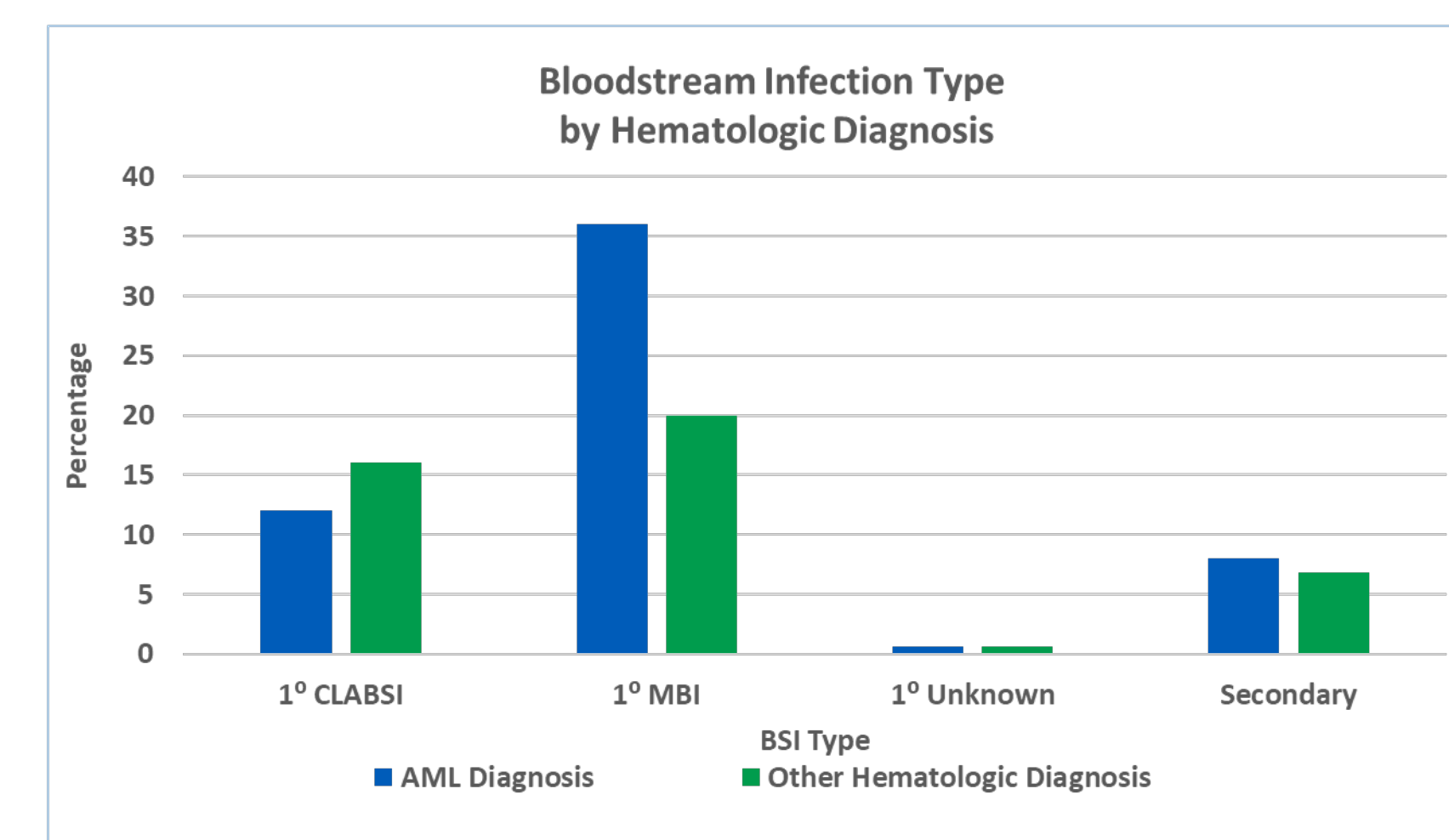
Over the review period, the case demographics were relatively stable. There was a trend toward increasing length of stay. There was a statistically significant increase in neutropenia and AML diagnosis. Mortality decreased over the study period.

Bloodstream Infection Rates

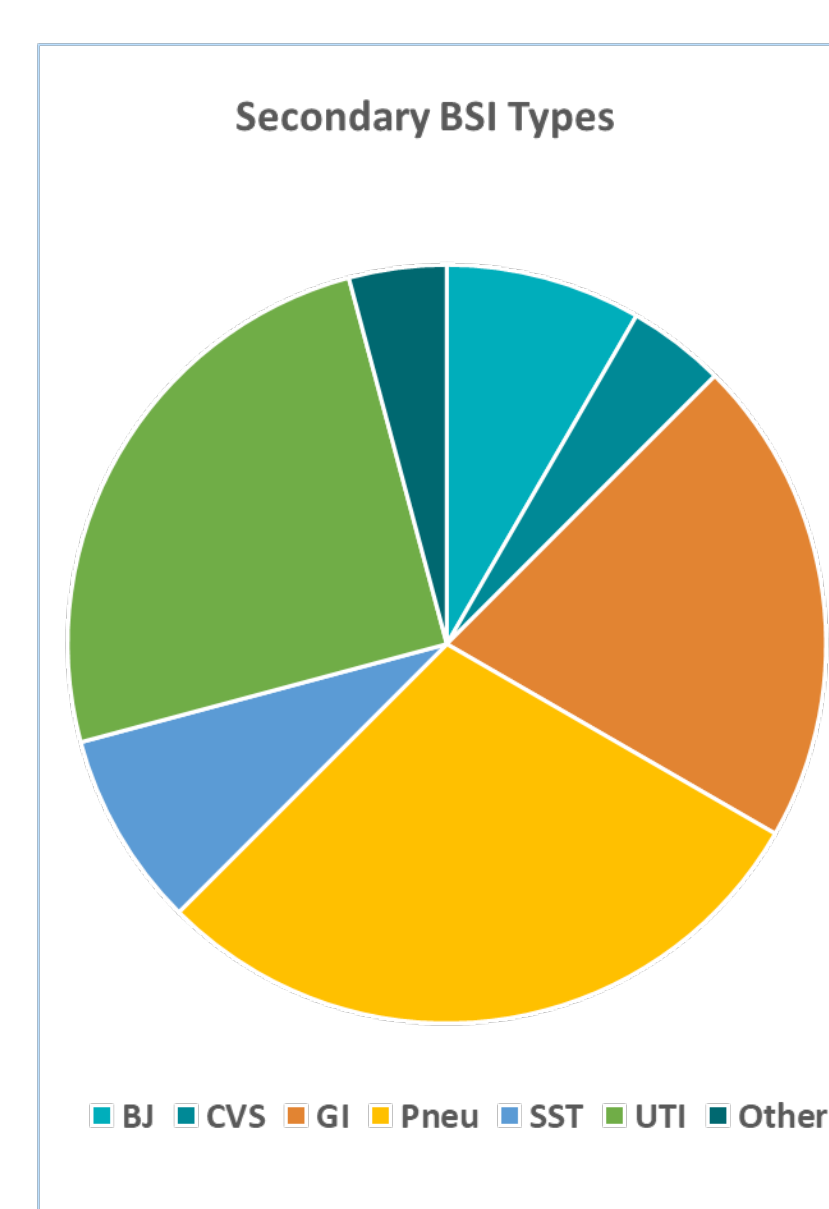
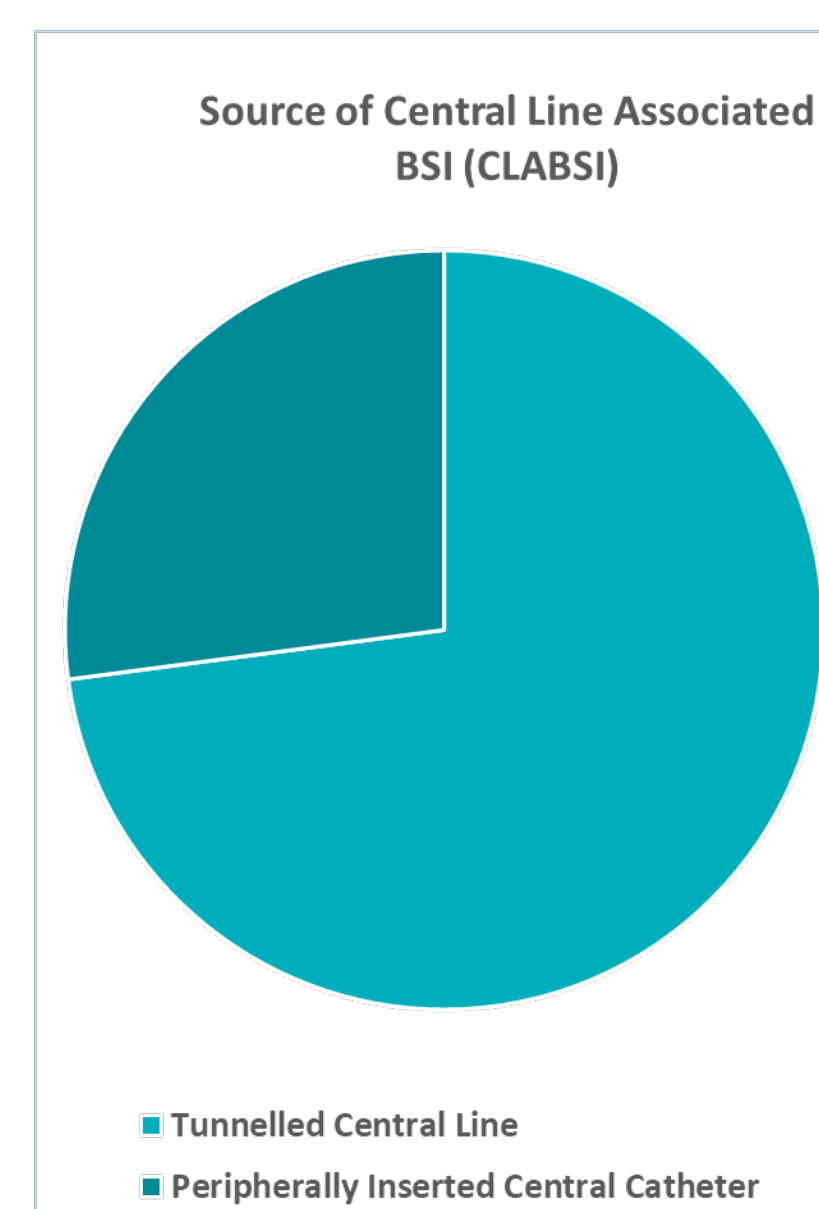


CLABSI=Central Line Associated BSI Primary Other=Mucosal Barrier Injury (MBI) and Unknown

5F4 Bloodstream Infection Types



Patients with AML have twice the odds of developing an MBI compared to those without AML. (OR =2.03 95% CI: 1.0759-3.8140).

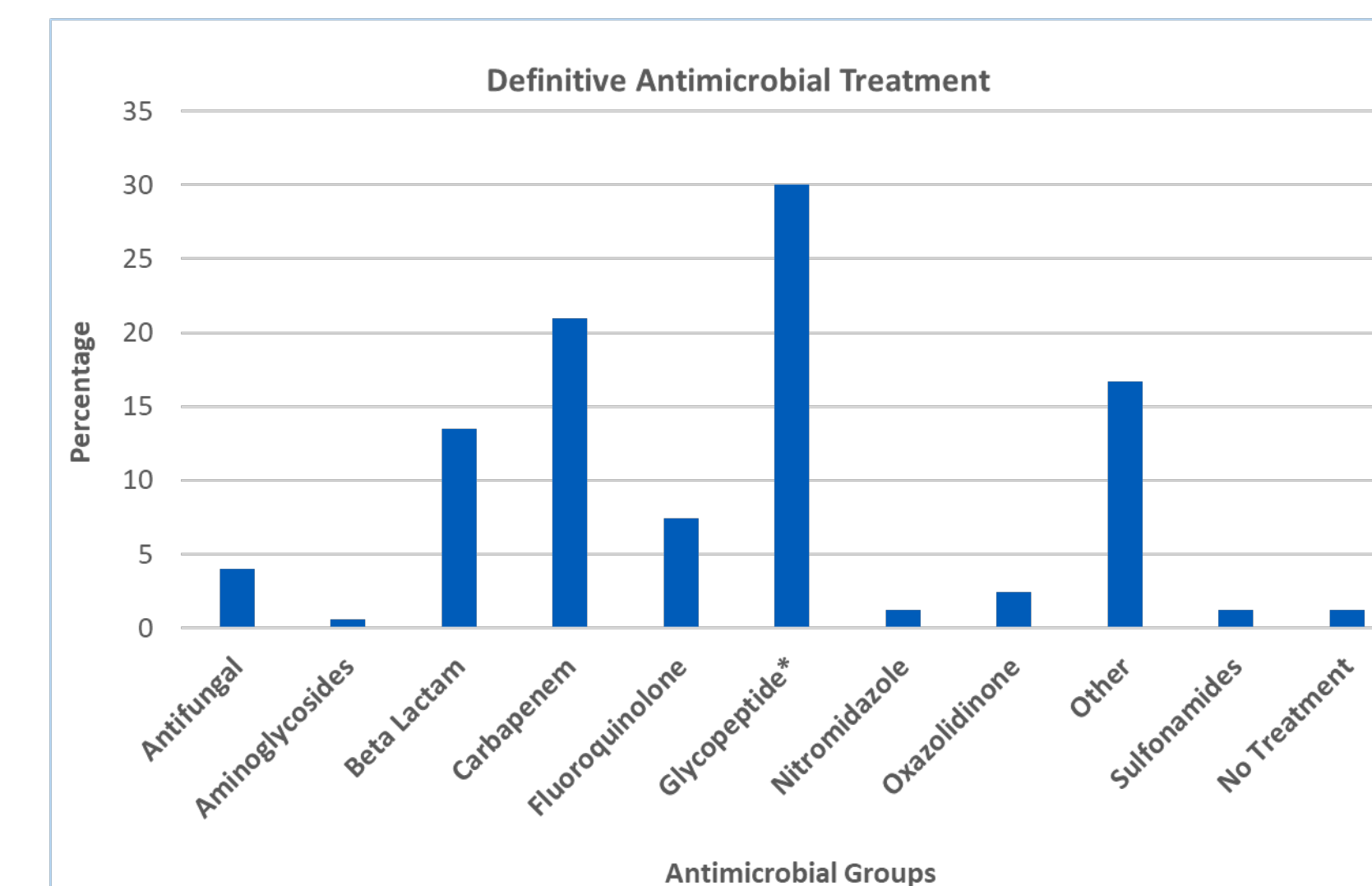


Bloodstream Infection Pathogens

BSI Pathogens	Five Year Total n= 184
Anaerobic Bacteria	8
Gram-Negative Bacilli	82
Enterobacteriaceae	66
Non-Enterobacteriaceae	14
Other	2
Gram-Positive Bacteria	88
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus epidermidis</i>	25
<i>Streptococcus spp</i>	16
<i>Enterococcus spp</i>	32
Other	5
Yeast-Candida species	7

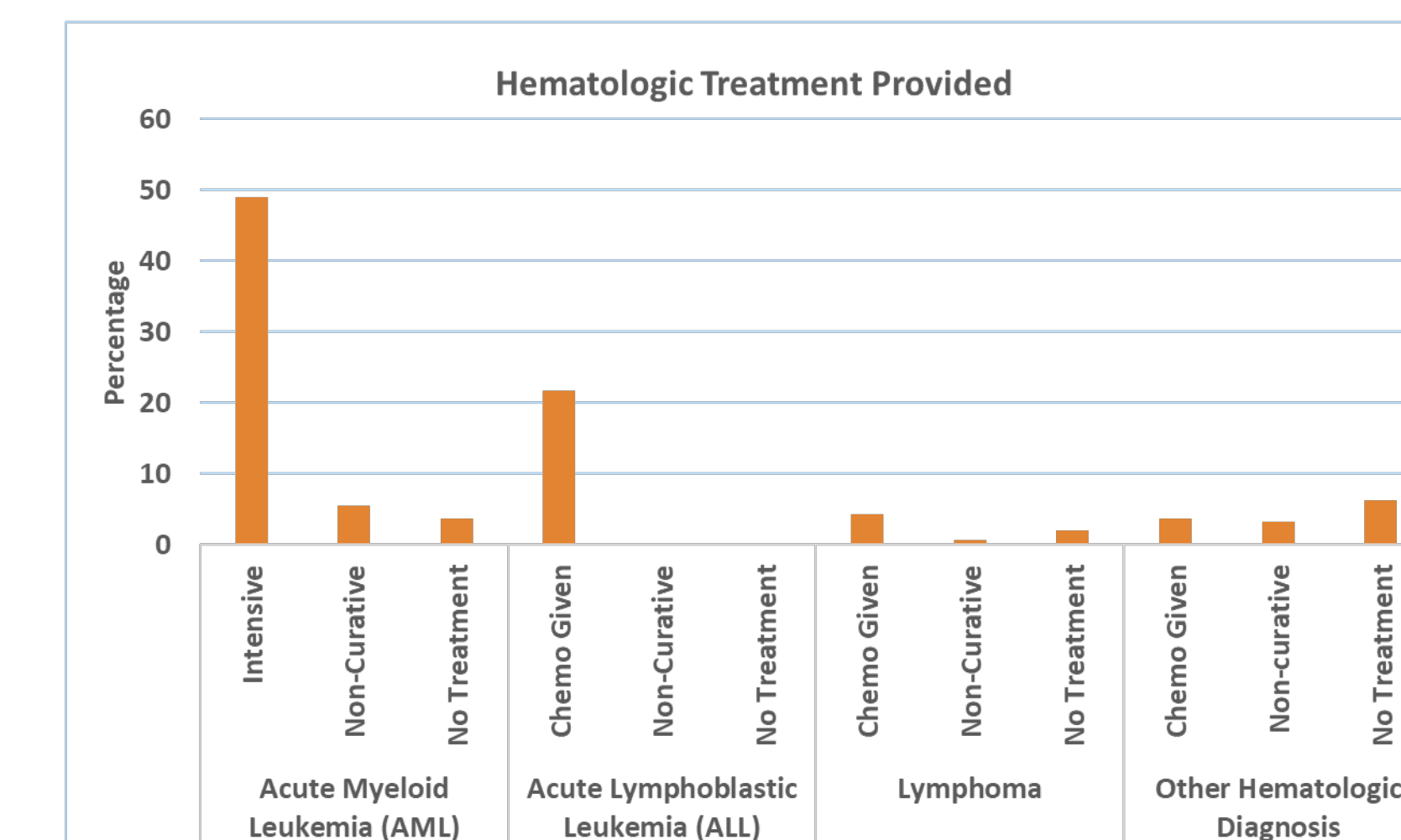
- ARO BSI incidence was low (4 ESBL, 10 VRE and 1 MRSA) with no significant increase over the five years.
- 14% of the infections were polymicrobial.

Antimicrobial Treatment



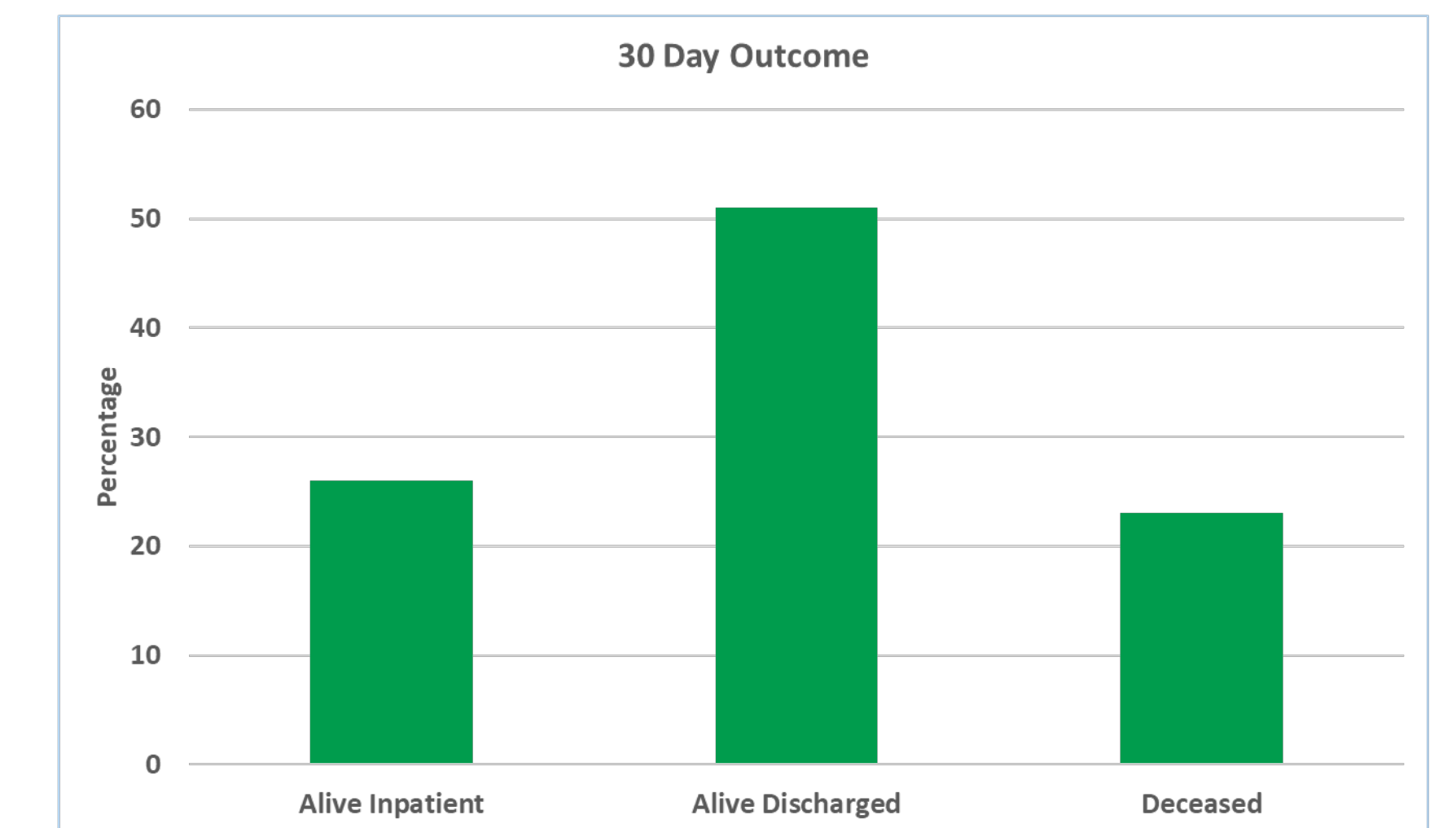
* Glycopeptides were used statistically significantly less over the five-year review period (p=0.0004).

Hematologic Disease Treatment



- 86% (139/162) of the BSI cases had a diagnosis of leukemia.
- 66% (92/139) of BSI cases with leukemia had AML.
- 87% (80/92) with AML received intensive treatment.

Outcomes



Mortality rate significantly decreased (p-value= .03) over the five-year review period.

Conclusions

- One limitation of this review is that complete denominator data for all hematology patients admitted to the unit is unavailable for comparison to the BSI group.
- Severe immunosuppression increased the risk of BSI, especially mucosal barrier injury infections resulting from translocation of gastrointestinal pathogens.
- Pathogen distribution did not change over time.
- Overall, rates of BSI caused by yeast and antibiotic resistant organisms (ARO) were low.
- There was an increased number of patients with AML who had prolonged neutropenia which resulted in higher risk of MBI.
- Diligence with following recommended central line insertion and maintenance bundles is important in this high-risk population.

Acknowledgements

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