Background. The International Nosocomial Infection Control Consortium surveillance reported Central line-associated bloodstream infection (CLABSI) rate of 4.1 per 1000 central-line days in 703 ICUs in 50 countries.

Methods. At the Singapore General Hospital (SGH) a 1,700-bed tertiary care hospital, we conducted a retrospective matched case control study over a 3-year period from 2018 to 2020, to identify risk-factors associated with the development of healthcare-associated CLABSI in adult inpatients. Cases and controls were ≥18 years of age with central lines in situ for at least 48hrs from date of admission. Case definition was based on National Healthcare Safety Network (NHSN) framework to diagnose Bloodstream Infection (BSI) and CLABSI events. Controls had to be admitted within 30 days of the date of admission of the case patients and should not have developed CLABSI. Cases were matched to controls on a 1:2 ratio.

Results. 127 cases and 252 controls were included in the analysis. Cases and controls did not differ in age, gender, BMI, presence of diabetes mellitus or presently enforced infection prevention measures (e.g. Central line bundle care). More cases were receiving chemotherapy (10.2% versus 8.8%, p<0.001), were on TPN (17.3% versus 8.3%, p=0.015) and had been admitted to critical care (73.2% versus 60.7%, p=0.017). Cases were also more likely to have peripherally inserted central venous catheters (37% versus 25%, p=0.017) and have the insertion done in the radiology department under radiological guidance (69.3% versus 55.2%, p=0.011). The median length of stay (LOS) was 44 days (IQR: 0 – 86.8) for cases and 19 days (IQR: 0 – 66.6) for controls (p<0.001). Inpatient mortality was 25.2% (n=32) for cases 13.9% (n=35) for controls (p-value <0.010). In multivariate analysis, receiving chemotherapy (OR 2.0, 95%CI: 1.1 – 3.8, p=0.019), having a Peripherally Inserted Central Catheter (OR 3.9, 95% CI 1.0-3.4, p=0.045), and being colonized with MRSA (OR 1.9, 95% CI 1.2 – 2.3, p=0.013) were associated with healthcare-associated CLABSI.

Conclusion. Novel approaches are required to reduce risk of healthcare associated CLABSI, focusing on interventions for chemotherapy administration, care within ICUs and PICC lines.

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776. Reducing Central Line Associated Bloodstream Infections (CLABSI) in a High-Risk Cohort of Patients by Standardizing Skin Preparation Prior to Pulmonary Artery Catheter Insertion

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Session: P-37: HAI: Device-Associated (CLABSI, CAUTI, VAP)

Background. Central line associated bloodstream infections (CLABSI) are a recognized complication of all central venous access devices including pulmonary artery catheters (PAC). At our institution, PACs are utilized frequently, often for prolonged durations, for patients with advanced heart failure in the cardiac care unit (CCU) who are awaiting heart transplant. In early summer 2018, our hospital infection prevention (IP) department detected an uptick in CLABSI attributable to the CCU. Over these 9 months of zero CLABSI, two CLABSI attributable to the CCU were identified during a 3 month period from November 2017-January 2018. Four additional CLABSI were identified between May-July 2018 prompting an investigation by IP. Review of the 9 CLABSI events attributed to the CCU from May 2018 – June 2019 led IP to prioritize improving PAC insertion practices in our cardiac catheterization lab as a mean to reducing CLABSI (see Table 1).

Results. The implementation of AIC reduced CLABSI standardized infection ratio (SIR) in patients requiring central venous access for less than 8 weeks. We also monitored for complications (malfunction, line exchange, fungal infection).

Discussion. A stepped wedge observational design was used to implement Minocycline + Rifampin impregnated catheters in a rolling fashion across the institution. Children > 3kg were eligible if admitted to a participating unit and required central venous access through a peripherally inserted central catheter (PICC), non-tunneled catheter, or tunneled non-cuffed femoral catheter for < 8 weeks. Units, prioritized based on CLABSI SIR, were added to the intervention monthly until AIC were used throughout the institution. A multidisciplinary team (infectious diseases and infection control experts, CLABSI leaders, unit-based physicians and nurses, proceduralists, supply chain) met weekly to facilitate implementation, assess for CLABSI and monitor for complications.

777. Implementation of Antimicrobial Impregnated Catheters to Reduce Central Line Associated Bloodstream Infections (CLABSI) in a Pediatric Setting

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Session: P-37: HAI: Device-Associated (CLABSI, CAUTI, VAP)

Background. Antimicrobial impregnated catheters (AIC) are one strategy to prevent CLABSI with existing data for central lines required for short duration, however, the strength of evidence, particularly for children, is lacking. Recent 3-year CLABSI data at our institution show 60 (51%) infections occurred in central lines within 8 weeks of insertion, suggesting an opportunity for evaluation of an intervention targeting this time frame. We implemented AIC to evaluate their effectiveness in reducing CLABSI standardized infection ratio (SIR) in patients requiring central venous access for less than 8 weeks. We also monitored for complications (malignancy, line exchange, fungal infection).

Methods. A stepped wedge observational design was used to implement Minocycline + Rifampin impregnated catheters in a rolling fashion across the institution. Children > 3kg were eligible if admitted to a participating unit and required central venous access through a peripherally inserted central catheter (PICC), non-tunneled catheter, or tunneled non-cuffed femoral catheter for < 8 weeks. Units, prioritized based on CLABSI SIR, were added to the intervention monthly until AIC were used throughout the institution. A multidisciplinary team (infectious diseases and infection control experts, CLABSI leaders, unit-based physicians and nurses, proceduralists, supply chain) met weekly to facilitate implementation, assess for CLABSI and monitor for complications.
This figure describes the stepped wedge study design where units were phased into the intervention on a rolling monthly basis allowing for comparison between and within units. The shaded boxes represent time periods when units were using antimicrobial impregnated catheters and the white boxes represent time periods when units were using standard non-impregnated catheters.

**Results.** AIC were systematically implemented over a 7-month period. The institution’s CLABSI SIR decreased from 0.80 to 0.59 during this timeframe. There were no NHSH defined CLABSI in patients with an AIC during the intervention. Obstacles included shortage of catheters due to supply chain disruption, adjustment of technique for line insertion and cracked/broken lines. Infections and complications were reviewed by the multidisciplinary team and compared to historical rates with non-impregnated lines.

**Conclusion.** CLABSI SIR decreased at our institution during the intervention period. While many efforts likely led to this reduction (optimizing maintenance bundle, unit based CLABSI initiatives), we believe the use of AIC contributed to this improvement. There were no pediatric-specific safety events identified during implementation.

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### Table 1. Independent predictors of Infections of the Lower Respiratory Tract in ICU: results of multivariate analysis performed using a logistic regression model.

| Variable                  | Logistic coefficient | S.E. | Odds Ratio | p-value |
|---------------------------|----------------------|------|------------|---------|
| Comorbidity: Hypothyroidism | 1.03                 | 0.31 | 2.8        | 0.0002  |
| Comorbidity: Autologous bone marrow transplantation | 3.09              | 0.17 | 21.89      | 0.0008  |
| Length of hospital stay before admission to the ICU (days) | 0.03             | 0.01 | 1.03       | 0.0041  |
| COVID-19 infection | 1.63                 | 0.31 | 5.11       | 0.0097  |
| Number of secondary diagnosis at ICU | 0.27               | 0.03 | 1.31       | <0.001  |
| Constant | -5.10               |      |            |         |

### Table 2. Independent predictors of Bloodstream Infection Events in ICU (Central Line-Associated BSI + Non-central Line Associated BSI): results of multivariate analysis performed using a logistic regression model.

| Variable                  | Logistic coefficient | S.E. | Odds Ratio | p-value |
|---------------------------|----------------------|------|------------|---------|
| Blood transfusion at ICU | 1.22                 | 0.30 | 3.38       | 0.0002  |
| Comorbidity: Morbid obesity | 1.10               | 0.40 | 3.02       | 0.0051  |
| Seizures at ICU admission | 1.36                 | 0.57 | 3.88       | 0.0163  |
| Comorbidity: Immunosuppression | 0.93             | 0.28 | 2.54       | 0.0022  |
| COVID-19 infection | 1.20                 | 0.35 | 3.30       | 0.0026  |
| Comorbidity: diabetes with complications | 0.89            | 0.39 | 2.42       | 0.0139  |
| Number of secondary diagnosis at ICU | 0.19               | 0.03 | 1.21       | <0.001  |
| Constant | -5.04               |      |            |         |

**Figure 1.** Receiver operating characteristic (ROC) curve for the fitted models: area under the ROC Curves were higher than 0.85 for both models.

**Conclusion.** The built models make possible the identification of the expected infections and the unexpected ones. Three main course of actions can be taken using these models and associated data: (1) Before the occurrence of BSI and RESP: to place high risk patients under more rigorous infection surveillance. (2) After the occurrence of BSI or RESP: to investigate “unexpected” infections. (3) At discharge: to identify high risk patients with no infections for further studies.

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779. COVID-19 Pandemic and Catheter-associated Urinary Tract Infection Trends

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