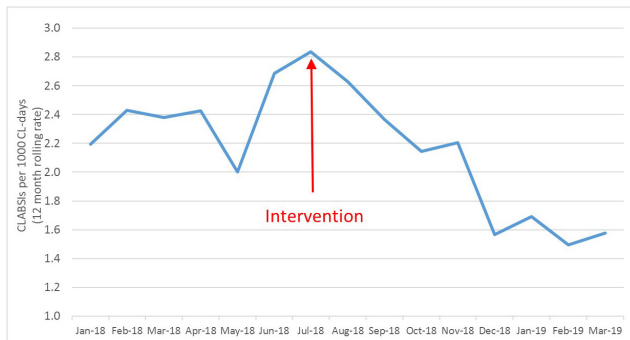
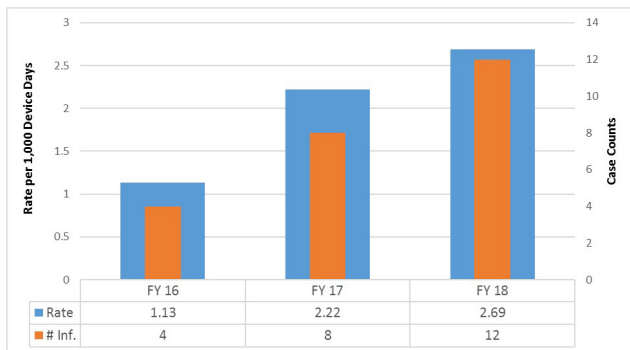


**Background.** Long-term acute care hospitals (LTACHs) care for chronically, critically ill patients with high utilization of central lines and high risk for morbidity from central line-associated bloodstream infections (CLABSIs). Our 38-bed LTACH noted a substantial increase in the incidence of CLABSIs (as defined by the National Healthcare Safety Network) between fiscal year (FY) 2016 and FY 2018 (Figure 1). Detailed case review identified a large number of CLABSIs which were clinically consistent with blood culture contaminants from central lines. Feedback from bedside staff also suggested gaps between practice and evidence-based measures for central line care.

**Methods.** A three-pronged CLABSI prevention project was implemented in July 2018 consisting of (1) staff education regarding daily chlorhexidine (CHG) bathing for all patients, combined with an electronic audit report to identify patients without active CHG orders; (2) change in practice to the use of venipuncture alone for blood culture collection, combined with an electronic audit report to identify blood cultures collected from central lines; and (3) a recurring 6-part educational series for nurses focused on central line care. The pre-intervention period was defined as the 12-month period between July 1, 2017 and June 30, 2018 (FY 2018). The primary outcome was the fiscal year CLABSI rate. A secondary outcome was the proportion of blood cultures drawn from central lines.

**Results.** After 9 months of the intervention, one CLABSI had been reported for FY 2019 year-to-date at a rate of 0.4 per 1,000 CL-days, representing an 86% decrease from the FY 2018 rate of 2.8 per 1,000 CL-days. The 12-month rolling CLABSI rate decreased to 1.6 per 1,000 CL-days (Figure 2). The proportion of blood cultures collected from central lines decreased from 10.5% (69/658) to 4.5% (15/334), representing a 57% reduction. The proportion of patients ordered and receiving CHG bathing in the intervention period was >95%.

**Conclusion.** A multidisciplinary effort focused on CHG bathing, central line care, and blood culture collection led to a substantial reduction in CLABSIs in our LTACH. The use of electronic audit reports was particularly useful in achieving high adherence to practice changes.



**Disclosures.** All authors: No reported disclosures.

### 1170. A Quality Improvement Study to Assess the Effectiveness of a Meaningful Use Protocol in the Reduction of PICC Line Use and Complications

William P. Dillon, DO<sup>1</sup>; Susan Szpunar, PhD<sup>1</sup>; Mamta Sharma, MD<sup>2</sup>; <sup>1</sup>Ascension St. John Hospital, Grosse Pointe Woods, Michigan; <sup>2</sup>Ascension St John Hospital and Medical Center, Grosse Pointe Woods, Michigan

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**Background.** The use of peripherally-inserted central catheters (PICC) has grown substantially over time because of their ease of insertion, cost-effectiveness and relative safety. With increased use; however, there are increased complications including catheter-related bloodstream infections (CLABSI) and PICC line-associated deep vein thrombosis (DVT). To help decrease complications a meaningful use protocol was implemented based on the Michigan Appropriateness Guide for Intravenous Catheters (MAGIC) to define appropriate indications for PICC line use. The objectives of this study were (1) to determine the rate of PICC line use at our hospital; (2) to determine

rates of complications associated with PICC lines, including CLABSI and DVT; and (3) to compare the metrics listed above before and after implementation of the meaningful use protocol.

**Methods.** We performed a retrospective chart review of all inpatient admissions before (June 1, 2017 to September 1, 2017) and after the implementation of the meaningful use protocol (June 1, 2018 to September 1, 2018). Patients who had a PICC line inserted at another institution or in the outpatient setting were excluded. We compared the rate of insertion, patient demographics, characteristics of the use of PICC lines and complications from the two periods. Data were analyzed using the chi-squared test, Student's *t*-test, the Mann-Whitney *U* test and the *z* test for proportions.

**Results.** We reviewed 281 patient charts, 166 before the implementation of the meaningful use protocol and 115 after implementation. Overall, the mean age was 55.8 ± 17.9 years, 58.7% male and 54.1% white. There were no significant differences between groups with respect to demographics, comorbidities, source of admission, or complications. Post-implementation there was a significant reduction in lines used for unknown reasons as well as lines used for multiple blood draws ( $P < 0.0001$ ). The overall rate of PICC line use decreased from 23 per 1,000 admissions to 17.2 per 1,000 admissions after the intervention ( $P = 0.007$ ).

**Conclusion.** Implementation of a meaningful use protocol reduced the rate of PICC line use at our institution by 25%. The proportion of lines used for unknown reasons decreased as well. Widespread implementation could have a significant impact on the reduction of PICC line use.

**Disclosures.** All authors: No reported disclosures.

### 1171. Impact of Catheter Management on the Clinical Outcome in Adult Cancer Patients with Gram-Negative Bacteremia

Johny Fares, MD<sup>1</sup>; Melissa Khalil, MD<sup>1</sup>; Anne-Marie Hajjar Chaftari, MD<sup>2</sup>; Ying Jiang, MS<sup>3</sup>; Ray Y. Hachem, MD<sup>3</sup>; Issam I. Raad, MD<sup>1</sup>; <sup>1</sup>The University of Texas MD Anderson Cancer Center, Houston, Texas; <sup>2</sup>MD Anderson Cancer Center, Houston, Texas; <sup>3</sup>MD Anderson Cancer Center, Houston, Texas

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**Background.** Over the last 2 decades, Gram-negative organisms have been on the rise as an etiology of bloodstream infections (BSI) in cancer patients. Management of the central venous catheter (CVC) in the setting of Gram-negative BSI remains challenging. The aim of our study was to evaluate cancer patients with different types of Gram-negative BSI, in the presence of an indwelling CVC, and assess the impact of line management on the outcome of the BSI.

**Methods.** We identified all the patients older than 14 years with CVC who had a documented BSI with a Gram-negative organism at M.D Anderson Cancer Center, from May 2017 until May 2018. Patients were divided into three groups. Group 1 (G1) included patients with central-line associated bloodstream infection and no mucosal barrier injury (non-MBI CLABSI) and/or those who met the catheter-related bloodstream infection (CRBSI) criteria; Group 2 (G2) consisted of patients who had a CLABSI with a mucosal barrier injury that did not meet the CRBSI definition; and Group 3 (G3) consisted of patients who had a non-line-related BSI. We assessed catheter management (CVC removed/exchanged or retained) at 2 days after the onset of bacteremia. We then determined the effect of line management on clinical and microbiologic outcomes through various measures.

**Results.** A total of 300 patients were included with 100 patients in each group. The univariate analyses showed that in G1, CVC removal within 2 days of bacteremia was significantly associated with higher rate of microbiologic eradication of the bacteremia compared with delayed CVC removal (3 to 5 days) or CVC retention (98% vs. 72% vs. 78% respectively,  $P = 0.002$ ;  $P < 0.001$ ), and lower overall mortality rate at 3 months follow-up (3% vs. 22% vs. 17% respectively,  $P = 0.02$ ;  $P = 0.01$ ). By multivariate analysis, this association persisted ( $P = 0.018$  and  $P = 0.016$ , respectively). CVC removal within 2 days of bacteremia did not affect the outcome of BSI in G2 and G3.

**Conclusion.** CVC removal within 48 hours of the onset of Gram-negative bacteremia significantly improved the infectious outcome and the overall mortality in adult cancer patients with definite CRBSI and CLABSI without MBI.

**Disclosures.** All authors: No reported disclosures.

### 1172. The Proper Maintenance Duration for Peripherally Inserted Central Catheter (PICC) in order to Prevent Central Line-Associated Bloodstream Infection

Seonghun Park; Shinje Moon, MD, MSc; Hyunjoo Pai, MD, PhD; Bongyung Kim, MD, PhD; Department of Internal Medicine, Hanyang University College of Medicine, Seongdong-gu, Seoul-t'ukpyolsi, Republic of Korea

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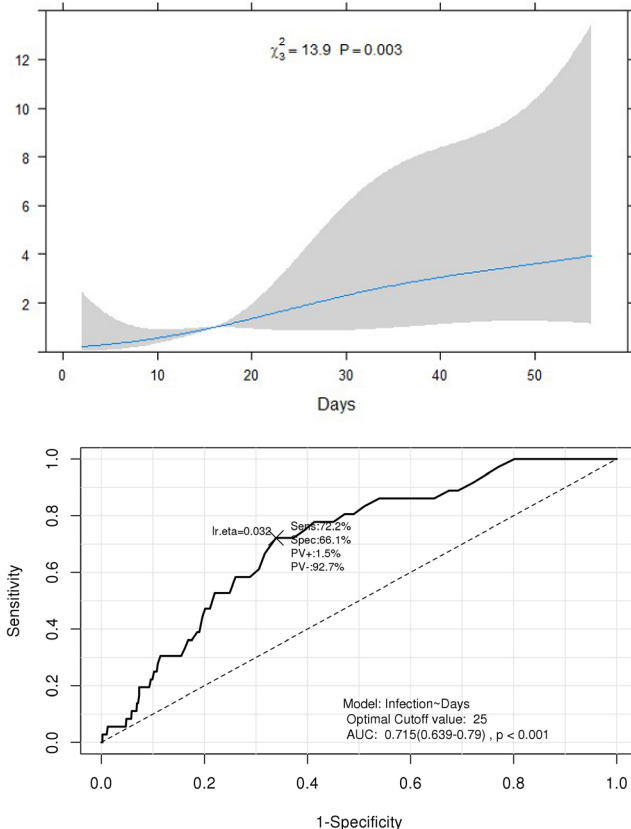
**Background.** Prolonged maintenance of central venous catheter including peripherally inserted central catheter (PICC) is a major risk factor for central line-associated bloodstream infection (CLABSI).

**Methods.** A single-center retrospective study was conducted in an 828-bed tertiary hospital in Korea between January 2010 and December 2017. All hospitalized patients who underwent ultrasound-guided PICC insertion were enrolled. Patients were excluded if they: (1) were under 19 years old, (2) died, were discharged, or were transferred to other medical institutions within 3 days of PICC placement, and (3) had at least one result of absolute neutrophil count (ANC) under 500 cell/ $\mu$ L during catheterization. CLABSI was diagnosed using the definitions of the National Health

Safety Network. CLABSI caused by PICC was defined as PICC-associated bloodstream infection (PABSI). For identifying the statistical correlation between catheter-days and PABSI, odd ratio for PABSI according to the continuous value of catheter-days was analyzed using restricted cubic spline splits with five knots. Receiver operating characteristic (ROC) curve was used to determine the diagnostic precision of applying catheter-days for PABSI. The optimal cut-off value of catheter-days was identified by maximizing the area under ROC curve (AUC).

**Results.** A total of 1,053 patients underwent ultrasound-guided PICC insertion during the study period. Of them, 36 cases were confirmed as PABSI (3.5%, 36/1,014; 1.14 per 1,000 catheter days). In the restricted cubic spline regression, catheter maintenance days showed a dose-dependent relationship with the risk of PABSI. The ROC for developing PABSI according to catheter maintenance duration showed that the AUC was 0.715 (95% CI 0.639–0.790) and the optimal cut-off value was 25 days.

**Conclusion.** The incidence of PABSI was 1.14 per 1,000 catheter days and the optimal cut-off value of catheter-days for preventing PABSI was 25 days.



**Disclosures.** All authors: No reported disclosures.

### 1173. Expanding the MAGIC: Engagement of Frontline Nursing Staff in Device Stewardship

Katherine Linsenmeyer, MD<sup>1</sup>; Kalpana Gupta, MD, MPH<sup>1,2</sup>; Suzanne Mosesso, RN<sup>1</sup>; Christine House, RN<sup>1</sup>; Judith Strymish, MD<sup>1</sup>; <sup>1</sup>VA Boston Healthcare System, Boston, Massachusetts; <sup>2</sup>Boston University School of Medicine, West Roxbury, Massachusetts,

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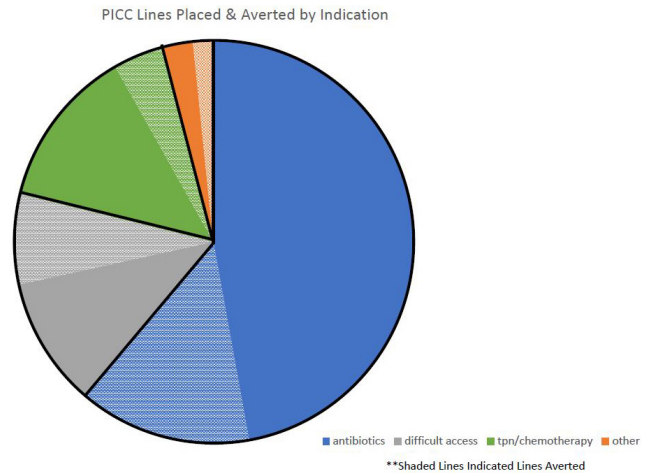
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**Background.** Nearly 40% of all peripherally inserted central catheter (PICC) placements may be inappropriate. Validated appropriateness criteria (Michigan Appropriateness Guide for Intravenous Catheters or MAGIC) were developed to improve patient safety and decrease adverse events from PICC line use. Recent studies have demonstrated the impact of MAGIC implementation with success but involve multimodal interventions that may not be sustainable. We evaluated the effect of a nursing-driven MAGIC-derived triage tool on online utilization.

**Methods.** We conducted a quasi-experimental before and after study evaluating the effect of a MAGIC-derived triage tool including all patients for whom a PICC consult was ordered. The triage tool was implemented January 1, 2018 as part of the consult order and required providers to identify an indication for placement. All consults were reviewed by the IV Team Nurses who collaborated with ID providers when warranted. Providers were contacted if MAGIC criteria suggested alternate access was more appropriate and encouraged to either place a mid or peripheral line or to consider an oral medication. Rates of line utilization and line infections pre-intervention and post-intervention were compared.

**Results.** Overall, 242 consults for PICC lines were placed during the one year intervention period January 1, 2018 to December 31, 2018. Indications included: antibiotics (54%), TPN/chemo (21%) difficult access (17%), no response (8%). Thirty-five PICCs were averted directly related to the intervention. Appropriate indication of PICC placement with the tool was 88%. During this same time period, the line utilization ratio (lines/1,000 patient-days of care) decreased from a mean of 3.8 (range 3.3 to 4.2 for years 2015–2017) to 2.6, a 32% reduction (IIR 0.72;  $P < 0.05$ ). Central line bloodstream infection rates (infections/1,000 line days of care) also decreased from a mean of 0.81 (range 0.56 to 1.18 for years 2015–2017) to 0.37, a 54% reduction (IIR 0.4;  $P = 0.10$ ).

**Conclusion.** Even in a setting of low line infection and line utilization rates, further reductions in potential device harm can be achieved using point of care feedback tools. This intervention empowers nursing involvement in device stewardship, thus expanding the range of their involvement in stewardship activities.



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### 1174. The Impact of Multidisciplinary Central Line Stewardship Program to Decrease CLABSI Rates and Central Line Utilization Rates in an Academic Urban Medical Center

Isha Bhatt, MD<sup>1</sup>; Mohamed Nakeshbandi, MD<sup>2</sup>; Michael Augenbraun, MD<sup>3</sup>; Gwizdala Robert, MPH<sup>3</sup>; Michael Lucchesi, MD, MS<sup>1</sup>; <sup>1</sup>SUNY Downstate Medical Center, Brooklyn, New York; <sup>2</sup>SUNY Downstate Medical University, Brooklyn, New York; <sup>3</sup>University Hospital of Brooklyn, Brooklyn, New York

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**Background.** Central Line-Associated Blood Stream Infections (CLABSI) is a major healthcare dilemma, contributing to increased morbidity, mortality, and costs. We sought to reduce rates of CLABSI and device utilization by implementing a multidisciplinary Central Line Stewardship Program (CLSP).

**Methods.** In July 2017, the CLSP, multidisciplinary quality improvement project, was implemented at an academic medical center to ensure proper indication for all CVCs in the hospital and removal when no longer indicated. A CLSP team of executive leaders and infection preventionists performed daily rounds on all CVCs to review indications and maintenance. Nursing staff reported all CVCs daily. Information Technology modified the electronic health record to require daily physician documentation of CVC placement and indications, and to suggest alternatives to CVC when possible. In the event of a CLABSI, a root cause analysis was conducted within 72 hours, and feedback was shared with the clinical staff. A retrospective review was conducted 18 months before and after CLSP implementation. As a facility in a state with mandatory reporting of hospital-acquired infections, institutional data were readily available through the National Healthcare Safety Network (NHSN). To compare rates of CLABSI and device utilization pre- and post-CLSP, we reviewed the Incidence Density Rate (IDR), the standardized infection ratio (SIR), and standardized utilization ratio (SUR). Data from the NHSN website were analyzed using statistical tools provided by the NHSN analysis module. Two-tailed significance tests were conducted with a set  $\alpha$  of 0.05.

**Results.** Post-CLSP, there was a statistically significant decrease in SIR from 1.99 to 0.885, with risk reduction by 44.3% ( $P = 0.013$ , 95% CI 0.226–0.831). CLABSI IDR per 1000 CVC days declined from 1.84 to 0.886 ( $P = 0.0213$ ). CVC utilization per 1000 patient-days reduced from 155.08 to 142.35 ( $P < 0.001$ ). There was also a trend toward fewer PICC line infections post-intervention (17 to 5).

**Conclusion.** With this novel CLSP, we achieved a significant reduction in rates of CLABSI and device utilization, suggesting that a multidisciplinary approach can promote sustainable prevention of line-associated infections through dedicated surveillance of CVC indications and maintenance.