and hemorrhagic stroke were consistently higher among PWUD. Further investigation is needed to elucidate the sources of elevated stroke risk among PWUD and identify targets for intervention.

**Disclosures.** No reported disclosures

57. Evaluation of the 2019 European Heart Rhythm Association International Consensus Document in Patients with Cardiomyopathy

Electronic Devices Who Develop Staphylococcus aureus Bacteremia

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Session: O-12. Endocarditis

**Background.** Cardiomyopathic implantable electronic device (CIED) implantation has markedly increased over the past two decades. Staphylococcus aureus bacteremia (SAB) occurs in patients with CIED and determination of device infection among patients without clinical findings of pocket site infection is often difficult. Our study examined CIED infection rates, management, and outcomes of SAB in patients living with CIED using 2019 international criteria to define CIED infection.

**Methods.** We conducted a retrospective study of patients with CIED who were hospitalized at Mayo Clinic, Rochester, with SAB from January 1, 2012 to December 31, 2019. Patients who met CIED infection criteria following SAB based on the 2019 European Heart Rhythm Association International Consensus Document were identified. A time-to-event analysis was used to determine the impact, if any, of complete device extraction on outcomes.

**Results.** Overall, 110 patients with CIED developed SAB and 92 (83.6%) of them underwent transesophageal echocardiogram (TEE). Eighty-eight (80%) had CIED infection with 57 (51.8%) and 31 (28.2%) patients meeting criteria for definite and possible CIED infections, respectively. Forty-three (37.5%) patients with definite CIED infection underwent complete device extraction. For possible and rejected CIED infection, the rates of complete device extraction were 35.5% and 27.3%, respectively (p < .001 for each). The primary endpoint of a composite of one-year mortality and SAB relapse had a rate that was significantly lower in patients with CIED infection who underwent complete device extraction as compared to that of patients who did not undergo device extraction (25.9% vs. 76.5%, p < .001). No significant difference in outcomes was seen in the rejected SAB infection group (33.3% vs. 62.5%, p = .27).

**Conclusion.** The rate of CIED infections following SAB was higher than that reported previously. Increased use of TEE and a novel case definition with broader diagnostic criteria were likely operative, in part, in accounting for the higher rate of CIED infections complicating SAB. Complete device removal is critical in patients with either definite or possible CIED infection as defined by the 2019 consensus document to improve one-year mortality and SAB relapse rates.

**Disclosures.** Larry M. Baddour, MD; Boston Scientific (Individual(s) Involved: Self); Consultant; Botanyx Pharmaceuticals (Individual(s) Involved: Self); Consultant; Roivant Sciences (Individual(s) Involved: Self); Consultant Muhammad R. Sohail, MD; Medtronic (Consultant); Phillips (Consultant)

58. Cost-Effectiveness of Emerging Antibiotic Strategies for the Treatment of Drug Use Associated Infective Endocarditis

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Session: O-12. Endocarditis

**Background.** Drug use-associated infective endocarditis (DUA-IE) is typically treated with 4-6 weeks of in hospital intravenous antibiotics (IVA). Outpatient parenteral antimicrobial therapy (OPAT) and partial oral antibiotics (PO) may be as effective as IVA, though long-term outcomes and costs remain unknown. We evaluated the clinical outcomes and cost-effectiveness of four antibiotic treatment strategies for DUA-IE.

**Methods.** We used a validated microsimulation model to compare: 1) 4-6 weeks of inpatient IVA along with opioid detoxification, status quo (SQ); 2) 4-6 weeks of inpatient IVA along with inpatient addiction care services (ACS) which offers medications for opioid use disorder (SQ with ACS); 3) 3 weeks of inpatient IVA with ACS followed by OPAT (OPAT); and 4) 3 weeks of IVA with ACS followed by PO antibiotics (PO). We derived model inputs from clinical trials and observational cohorts. All patients were eligible for either in-home or post-acute care OPAT. Outcomes included life years (LYs), discounted costs, incremental cost-effectiveness ratios (ICERs), proportion of DUA-IE cured and mortality attributable to DUA-IE. Costs (US$) were annually discounted at 3%. We performed probabilistic sensitivity analyses (PSA) to address uncertainty.

**Results.** The SQ scenario resulted in 18.64 LY at a cost of $416,800/person with 77.4% hospitalized DUA-IE patients cured and 5% of the population were attributable to DUA-IE. Life expectancy was extended by each strategy: 0.017y in SQ with ACS, 0.011 in OPAT, and 0.024 in PO. The OPAT strategy provided the highest cure rate (80.2%), compared to 77.9% in SQ with ACS and 78.5% in OPAT and X in SQ. OPAT was the least expensive strategy at $412,300/person. Compared to OPAT, PO had an ICER of $141,500/LY. Both SQ strategies provided worse clinical outcomes for money invested than either OPAT or PO (dominated). All scenarios decreased deaths attributable to DUA-IE compared to SQ. Findings were robust in PSA.

**Disclosures.** Simeon D. Kimmel, MD, MA, Ab Associates for a Massachusetts Department of Public Health project to improve access to medications for opioid use disorder in nursing facilities (Consultant)

59. Risk Factors for Recurrent Gram-Negative Bacterial Bloodstream Infections

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**Background.** Gram-negative bacteria bloodstream infections (GNB-BSI) are a significant cause of morbidity and mortality. Recurrent GNB-BSI is an incompletely understood phenomenon. In this study we identify risk factors for recurrent GNB-BSI.

**Methods.** Patients with GNB-BSI have been prospectively enrolled into the Bloodstream Infection Biorepository (BSIB) since 2002. From the BSIB, patients with >1 episode of GNB-BSI with the same bacterial species were identified. Chi-Square, Fisher Exact, and a multivariate linear regression models were used to identify clinical risk factors for recurrent GNB-BSI. Paired isolate samples from the initial and the recurrent episode of GNB-BSI in same patient underwent Pulse Field Gel Electrophoresis (PFGE) to differentiate Relapse (paired isolates identical) from Reinfection (paired isolates different).

**Results.** Among the 1,423 unique patients with GNB-BSI enrolled from 2002-2015, 60 (4.2%) experienced recurrent GNB-BSI with the same bacterial species. Median time to recurrent GNB-BSI was 133 d (IQR: 40-284.75 days). Causes of recurrent GNB-BSI included:

- **Escherichia coli (38%), Klebsiella species (30%), Pseudomonas aeruginosa (12%),** and Serratia marcescens (5%) and did not differ from causes of non-recurrent GNB-BSI (Figure 1).
- Risk factors for recurrent GNB-BSI included Black race (OR: 2.45 [CI: 1.4-4.2]), implanted cardiac device (OR: 2.39 [CI: 1.0-5.0]), and admission to surgical service (OR: 2.16 [CI: 1.24-3.75]). Forty-eight isolate-pairs from 43 patients with recurrent GNB-BSI underwent PFGE, relapse occurred in 31 (65%) and reinfection occurred in 17 (35%). Risk factors for GNB-BSI relapse included cardiac device (OR: 3.7 [CI: 1.7-8.3]), and admission to surgical service (OR: 3.7 [CI: 1.3-9.4]).

**Disclosures.** Simeon D. Kimmel, MD, MA, Ab Associates for a Massachusetts Department of Public Health project to improve access to medications for opioid use disorder in nursing facilities (Consultant)
Proportional comparison of the Gram-negative bacterial species identified in patients with recurrent and non-recurrent bloodstream infections.

**Conclusion.** Recurrent GNB-BSI is an uncommon complication of GNB-BSI. Recurrent GNB-BSI is most often driven by relapse, as opposed to reinfection, and is associated with black race, implanted cardiac devices and admission to surgical service.

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60. Creation and Comparison of a Machine Learning Decision Tree and Traditional Risk Score to Predict Ceftriaxone Resistance in Cancer Patients with E. coli Bacteremia

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**Session.** O-13. GNB bacteremia

**Background.** There are several clinical tools that have been developed to predict the likelihood of whether a cancer patient with E. coli bacteremia has a CRO-R infection in the last 6 months. The decision tree was more user-friendly, has fewer variables, and has a better positive predictive value in comparison to the risk score.

**Methods.** Adults age ≥ 18 years old with E. coli bacteremia at The University of Texas MD Anderson Cancer Center from 1/2018 to 12/2019 were included. Isolates recovered within 1 week from the same patient were excluded. The decision tree was constructed using classification and regression tree analysis, with a minimum node size of 10. The risk score was created using a multivariable logistic regression model derived by using stepwise variable selection with backward elimination at level 0.2. The decision tree and risk score statistical metrics were compared.

**Results.** A total of 629 E. coli isolates were screened, of which 580 isolates met criteria. Ceftriaxone-resistant (CRO-R) E. coli accounted for 36% of isolates. The machine-learning-derived decision tree included 5 predictors whereas the logistic regression-derived risk score included 7 predictors. The risk score cutoff point of ≥ 5 points demonstrated the most optimized overall classification accuracy. The positive predictive value of the decision tree was higher than that of the risk score (88% vs 74%, respectively), but the area under the receiver operating characteristic curve and model accuracy of the risk score was higher than that of the decision tree (0.85 vs 0.73 and 82% vs 74%, respectively).

**Conclusion.** The decision tree and risk score can be used to determine the likelihood of whether a cancer patient with E. coli bacteremia has a CRO-R infection in the last 6 months. The decision tree was more user-friendly, has fewer variables, and has a better positive predictive value in comparison to the risk score. However, the risk score has a significantly better discrimination and model accuracy than that of the decision tree.

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61. Short- versus prolonged-courses of antimicrobial therapy for patients with uncomplicated Pseudomonas aeruginosa bloodstream infection

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**Session.** O-13. GNB bacteremia

**Background.** The optimal duration of antimicrobial therapy for uncomplicated Pseudomonas aeruginosa bloodstream infection (BSI) is unknown. We compared the outcomes of short and prolonged courses of antimicrobial therapy in adults with uncomplicated pseudomonal BSI.

**Methods.** All patients with uncomplicated P. aeruginosa BSI admitted at a tertiary-care hospital from May 2016 to September 2020 were included. We compared the rate of recurrent P. aeruginosa infection and 30-day mortality among patients who underwent short (7-11 days) and prolonged (12-21 days) courses of antimicrobial therapy using propensity score analysis with the inverse probability of treatment weighting (IPTW) method.

**Figure 1. Clinical Decision Tree**

**Table 1. Regression Model and Assigned Points for Clinical Risk Score**

| Variable                                      | Odds Ratio (95% CI) | Assigned Points |
|-----------------------------------------------|--------------------|-----------------|
| Ceftriaxone-resistant E. coli colonization or infection (in the last 6 months) | 10.62 (3.99-30.10) | 11              |
| Ceftriaxone-resistant E. coli bacteremia (at the time of blood culture) | 4.91 (1.75-13.81)  | 5               |
| Long term acute facility (in the last 6 months) | 4.91 (1.77-13.68)  | 5               |
| Isolation of E. coli (in the last 6 months)  | 2.65 (1.45-4.89)   | 5               |
| 3rd generation cephalosporin antibiotics (in the last 6 months) | 2.37 (1.33-4.22)   | 5               |
| 4th generation cephalosporin antibiotics (in the last 6 months) | 1.74 (1.33-2.27)   | 5               |
| Pharmacology & infection: gentamicin/ciprofloxacin | 2.38 (0.81-6.97)   | 2               |

**Table 2. Statistical Metrics of Clinical Decision Tree and Clinical Risk Score**

**Conclusion.** The decision tree and risk score can be used to determine the likelihood of whether a cancer patient with E. coli bacteremia has a CRO-R infection. In both clinical tools, the strongest predictor was a history of CRO-R E. coli colonization or infection in the last 6 months. The decision tree was more user-friendly, has fewer variables, and has a better positive predictive value in comparison to the risk score. However, the risk score has a significantly better discrimination and model accuracy than that of the decision tree.