Table 1: Multivariable Logistic Results (Risk factors for acquiring VRE colonization in the medical ICU and solid organ transplant unit

	OR (95% CI)
HCW Connections to VRE Patients	1.32 (1.20-1.44)
Patient on contact precautions (Y/N)	1.04 (0.96-1.13)
Rectal tube use (Y/N)	3.61 (2.85-4.58)
GI Tube use (Y/N)	1.13 (0.71-1.79)
Patient was in a long-term care or skilled nursing facility in the last six months	5.59 (3.45-9.06)
Amount of administered proton pump inhibitors (DDDs)	1.01 (0.99-1.02)
Amount of administered antibiotics (DDDs)	1.00 (1.00-1.00)
Received dialysis (Y/N)	3.15 (1.23-8.09)
Mechanical ventilation (days)	1.04 (0.98-1.10)
Comorbidity score	0.99 (0.91-1.07)
Age	0.99 (0.97-1.00)
Female	0.75 (0.64-0.89)
N	2,190

Note: CI = confidence interval, DDD = defined daily dose, GI = gastrointestinal, HCW = healthcare worker, OR = odds ratio, VRE = vancomycin-resistant enterococci, Y/N = yes/no

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

578. Microbiology Laboratory-Driven Standardized Urine Culture Reporting Increases Aminopenicillin Prescribing in Vancomycin-Resistant Enterococci Urinary Infections

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Session: 63. HAI: VRE Epidemiology
Thursday, October 3, 2019: 12:15 PM

Background. Vancomycin-resistant Enterococcus (VRE) urinary tract infections (UTI) are traditionally treated with therapies like linezolid or daptomycin. Multiple recent studies have demonstrated that aminopencillins (APs) have equivalent clinical efficacy outcomes as these therapies are able to achieve high urinary drug concentrations and may also have favorable comparative safety profiles and lower costs. Our institution implemented a standardized microbiology report for urine cultures positive for VRE which encouraged prescribing of APs and blinded sensitivity results.

Methods. This was a single-center, retrospective, observational study evaluating the impact of this microbiology report on prescribing outcomes in patients being treated for VRE UTI at a community regional medical center. The study was conducted over 7.5 years with January 2011 to September 2014 representing the pre-intervention cohort and October 2014 to July 2018 representing the post-intervention cohort. Patients were included if they were 18 years or older and received antibiotic therapy for a diagnosed VRE UTI. The primary outcome measure was terminal antibiotic therapy.

Results. Out of 388 patients with VRE positive urine cultures, 102 were included for analysis, 38 in the pre-intervention cohort and 64 in the post-intervention cohort. Cohorts were similar in terms of age, Charlson Comorbidity Index (CCI), β-lactam allergy, ID consultation, and urologic abnormalities. AP prescribing significantly increased from 3% (1/38) in the pre-intervention cohort to 44% (28/64) in the post-intervention cohort both in univariate (OR 29.8, 95% CI 3.7–222.8) and multivariate (OR 38.7, 95% CI 4.8–312.3) analyses. In the post-intervention cohort, age, gender, CCI, β-lactam allergy, and urologic abnormalities were not significantly associated with differences in aminopenicillin prescribing. There was no difference in in-hospital mortality between cohorts.

Conclusion. The results from this study demonstrate that a simple microbiology report for VRE positive urine cultures encouraging AP prescribing is significantly associated with an increase in AP prescribing for diagnosed VRE UTI and should be considered as a supplementary antimicrobial stewardship intervention.

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

579. Machine-Learning Based Models for Prediction of Recurrence-free Catheter Retention After ALT Treatment of CLABSI in a Pediatric Population

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Session: 64. HAI: Pediatric
Thursday, October 3, 2019: 12:15 PM

Background. Deciding whether to attempt salvage of an infected central venous catheter (CVC) can be challenging. While line removal is the definitive treatment for central-line associated bloodstream infection (CLABSI), salvage may be attempted with systemic antibiotics and antibiotic lock therapy (ALT). Weighing risk and benefit of CVC salvage is limited by uncertainty in the future viability of salvaged CVCs. If a CVC is likely to require subsequent removal (e.g., due to recurrent infection) salvage may not be beneficial, whereas discarding a viable CVC is also not desirable. Here we describe a machine learning approach to predicting outcomes in CVC salvage.

Methods. Episodes of pediatric CLABSI cleared with ALT were identified by retrospective record review between January 1, 2008 and December 31, 2018 and were defined by a single positive central blood culture of a known pathogen or two matching cultures of a possible contaminant. Clearance was defined as 48-hours of negative cultures and relapse was defined as a matching positive blood culture after clearance. Predictive models [logistic regression (LR), random forest (RF), support vector machine (SVM) and an ensemble combining the three] were used to predict recurrence-free CVC retention (RFCR) at various time points using a training and test set approach.

Results. Overall, 712 instances CLABSI cleared with ALT were identified. Demographic and microbiological data are summarized in Tables 1 and 2. Few (8%) instances recurred in the first 28 days. 58% recurred at any time within the study period. Rates of RFCR were 75%, 43%, 22% and 10% at 28, 91, 182 and 365 days. Machine learning (ML) models varied in their ability to predict RFCR (Table 3). RF models performed best overall, although no model performed well at 91 days.

Conclusion. ML models provide an opportunity to augment clinical decision making by learning patterns from data. In this case, estimating the likelihood of useful line retention in the future could help guide informed decisions on salvage vs. removal of infected CVCs. Limitations include the heterogeneity of clinical data and the use of an outcome capturing both clinical decision making (line removal) and infection recurrence. With further model development and prospective validation, practical machine learning models may prove useful to clinicians.

	CLABSI Events (N=712)
Distinct Individuals	322
Sex = Male (%)	387 (54)
Race = White (%)	493 (69)
Race = Black (%)	167 (23)
Race = Other (%)	52 (7)
Age (y) (mean [IQR])	8 [2-13]
Diagnosis = ONC (%)	172 (24)
Diagnosis = SGS (%)	155 (22)
Diagnosis = SOT (%)	216 (30)
Diagnosis = BMT (%)	27 (4)
RFCR at 28 days	531 (75)
RFCR at 91 days	303 (43)
RFCR at 182 days	155 (22)
RFCR at 365 days	71 (10)

Table 1: Data set demographics and outcomes. IQR: Interquartile range. ONC: oncology, SGS: short gut syndrome, SOT: solid organ transplant, BMT: bone marrow transplant. RFCR: recurrence-free catheter retention. y: years. An instance may belong to more than one diagnosis group.

	CLABSI Events (N=712)
CVC = Tunneled Line (%)	570 (80)
CVC = Implanted Port (%)	99 (14)
CVC = Other (%)	43 (6)
CVC age (d) (mean [IQR])	243 [43-290]
Polymicrobial infection (%)	154 (22)
Organism = GPC (%)	412 (58)
Organism = GNR (%)	380 (53)
Organism = YST (%)	71 (10)
Organism = OTH (%)	11 (2)
Lock = vancomycin (%)	287 (40)
Lock = gentamicin (%)	263 (37)
Lock =ethanol (%)	103 (14)
Lock = AMB (%)	56 (8)
Lock = other (%)	59 (8)

Table 2: Microbiological and central venous catheter (CVC) data. d: days. GPC: Gram-positive cocci, GNR: Gram-negative rods, YST: Yeast, OTH: Other. AMB: liposomal amphotericin B.