colistin and tigecycline, compared with surviving patients (Table 1). Genotype, colistin MIC, and colistin resistance were not associated with mortality (Figure 1 and 2). In multivariable analysis, neutropenia (aOR, 3.25; 95% CI, 1.18–8.95), catheter-related infection (aOR, 0.33; 95% CI, 0.11–0.99), biliary tract infection (aOR, 0.20; 95% CI, 0.04–0.99), a high Pitt bacteremia score (aOR,1.42; 95% CI, 1.20–1.67), and combination therapy with colistin and tigecycline (aOR, 0.36; 95% CI, 0.14–0.92) were independent risk factors for mortality (Table 2).

Conclusion. Clinical factors such as the site of infection, severity of bacteremia, and specific combination therapy rather than microbiologic factors contributed to mortality in CRAB bacteremia. Appropriate combination therapy may help improving outcomes in CRAB bacteremia.

Table 1. Clinical and microbiologic characteristics and management of CRAB bacteremia, according to 30-day mortality

Characteristic of patients or isolates	Deceased patients (n = 90)	Surviving patients (n = 74)	*P* value
Age, mean years ± SD	62.1 ± 16.0	65.6 ± 12.7	0.12
Male gender	58 (64)	53 (72)	0.33
Underlying disease/condition			
Hematologic malignancy	33 (37)	13 (18)	0.01
Solid tumor	18 (20)	26 (35)	0.03
Chronic kidney disease	10 (11)	14 (19)	0.16
Chronic obstructive pulmonary disease	8 (9)	4 (5)	0.39
Recent chemotherapy	30 (33)	15 (20)	0.06
Recent surgery	20 (22)	18 (24)	0.75
Immunosuppressant use	13 (14)	15 (20)	0.32
Steroid use	31 (34)	15 (20)	0.04
Neutropenia	32 (36)	7 (10)	<0.001
Ventilator care	46 (51)	36 (49)	0.75
Charlson comorbidity index, mean score ± SD	3.6 ± 2.5	4.4 ± 2.9	0.07
Type of infection			
Catheter-related infection	6 (7)	15 (20)	0.01
Intraabdominal infection	11 (12)	12 (16)	0.46
Biliary tract infection	2 (2)	17 (23)	<0.001
Pneumonia	48 (53)	19 (26)	<0.001
Skin & soft tissue infection	5 (6)	4 (5)	1.00
Primary bacteremia	18 (20)	5 (7)	0.02
Septic shock	67 (74)	20 (27)	<0.001
Pitt bacteremia score, mean score ± SD	4.7 ± 3.2	1.7 ± 1.8	<0.001
CRAB isolate characteristic			
Colistin susceptibility			
MIC ≤0.5 mg/L	55 (61)	36 (49)	0.11
MIC 1.0 mg/L	26 (29)	23 (31)	0.76
MIC 2.0 mg/L	3 (3)	9 (12)	0.03
MIC ≥4.0 mg/L	6 (7)	6 (8)	0.72
Multilocus sequence type			
ST191	43 (48)	37 (50)	0.78
ST451	13 (14)	10 (14)	0.86
ST784	13 (14)	9 (12)	0.67
Other	21 (23)	18 (24)	0.88
Inappropriate empirical treatment	61 (68)	47 (64)	0.57
Inappropriate definitive treatment	36 (40)	12 (16)	0.01
Appropriate definitive treatment	54 (60)	62 (84)	0.01
Colistin use for definitive treatment	43 (48)	50 (68)	0.01
Combination therapy for definitive treatment	48 (53)	47 (64)	0.19
Colistin containing regimen	40 (44)	40 (54)	0.22
Tigecycline containing regimen	19 (21)	24 (32)	0.10
Colistin and tigecycline containing regimen	13 (14)	20 (27)	0.04

Table 2. Result of analyses of risk factors for mortality in patients with CRAB bacteremia

Risk factor	Univariate analysis result		Multivariable analysis result	
	Odds ratio (95% CI)	*P* value	Odds ratio (95% CI)	*P* value
Solid tumor	0.46 (0.23 – 0.93)	0.03		
Hematologic malignancy	2.72 (1.30 – 5.67)	0.01		
Neutropenia	5.28 (2.17 – 12.86)	<0.001	3.25 (1.18 – 8.95)	0.02
Catheter-related infection	0.28 (0.10 – 0.77)	0.01	0.33 (0.11 – 0.99)	0.04
Biliary tract infection	0.08 (0.02 – 0.34)	<0.001	0.20 (0.04 – 0.99)	0.04
Pneumonia	3.31 (1.70 – 6.44)	<0.001		
Primary infection	3.45 (1.21 – 9.80)	0.02		
Septic shock	7.87 (3.91 – 15.81)	<0.001		
Pitt bacteremia score	1.53 (1.31 – 1.78)	0.01	1.42 (1.20 – 1.67)	<0.001
Inappropriate definitive treatment	3.44 (1.63 – 7.28)	0.01		
Colistin use for definitive treatment	0.44 (0.23 – 0.83)	0.01		
Combination therapy with colistin and tigecycline	0.46 (0.21 – 0.99)	0.04	0.36 (0.14 – 0.92)	0.03

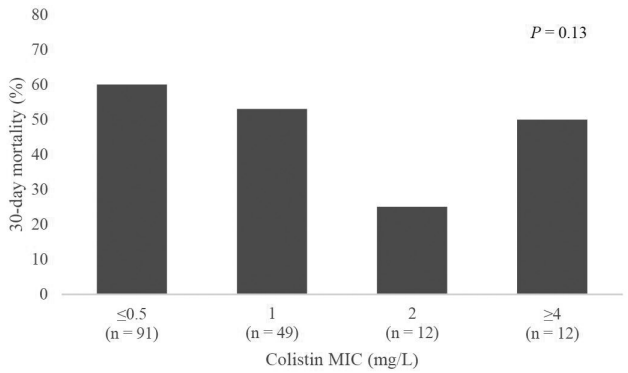

Figure 1. 30-day mortality according to colistin MIC of CRAB blood isolates

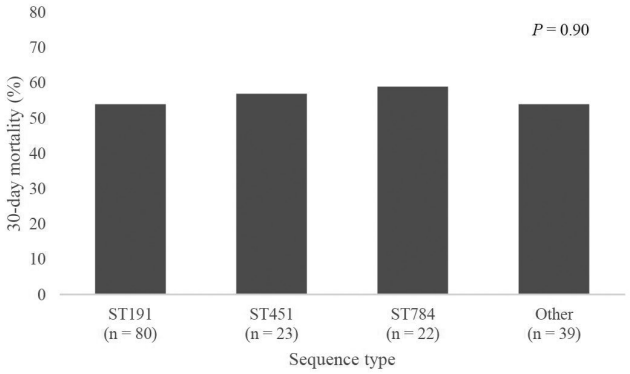

Figure 2. 30-day mortality according to genotype of CRAB blood isolates

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

136. Factors Associated with Reduced Vancomycin Susceptibility in Pediatric Staphylococcus aureus Bacteremia

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Session: 37. Bacteremia, CLABSI, and Endovascular Infections
Thursday, October 3, 2019: 12:15 PM

Background. Vancomycin is often used empirically for treatment of pediatric *Staphylococcus aureus* bacteremia while susceptibility testing is being performed. Reduced vancomycin susceptibility (RVS) occurs when the minimum inhibitory concentration (MIC) for vancomycin is elevated, potentially resulting in decreased efficacy. Patient factors associated with RVS in pediatric *S. aureus* infections have not been well studied.

Methods. Children aged <18 years admitted from 2012 to 2016 to two tertiary care children's hospitals with a blood culture positive for *S. aureus* were identified. Demographics, presence of comorbidities, hospitalizations in the year prior to the infection, surgical procedures in the 30 days prior to the infection, presence of a central venous catheter at diagnosis and methicillin-resistant (MRSA) vs. methicillin-susceptible *S. aureus* (MSSA) were abstracted from the electronic medical record using a structured data collection form. RVS was defined as a MIC >1 µg/mL as reported by the clinical microbiology laboratory. Wilcoxon rank-sum and Fisher's exact test to compare continuous and categorical variables, respectively. A multivariable logistic regression model was used to evaluate the association of RVS with patient factors, MRSA vs. MSSA, admitting hospital, and year.

Results. We identified 221 *S. aureus* bloodstream infections. Most (84%) had RVS though there were differences by the hospital, 74% vs. 87%, $P = 0.037$. Bloodstream infections in the setting of a musculoskeletal infection were most common (36%), followed by central line-associated bloodstream infections (22%). The median age was similar between RVS and non-RVS infections, 3 (25^{th}, 75^{th} %tiles: 0, 9) vs. 5 (0, 12) but, when adjusted for patient factors, younger children were more likely to have RVS infections than older children, aOR: 0.92 (0.85, 0.99). Black children were more likely to have RVS than white children on both univariate and adjusted analyses (table).

Conclusion. RVS is common among pediatric *S. aureus* bloodstream infections and appears to be influenced by patient age and race but not by the source of the infection or other clinical factors.

	Vancomycin MIC ≤1 µg/mL N=36 (16%)	Vancomycin MIC >1 µg/mL N= 185 (84%)	aOR (95% CI)	P*
Age, years	4.5 (0, 12)†	3 (0, 9)†	0.92 (0.85, 0.99)	0.03
Male sex	25 (69)	123 (66)	0.69 (0.29, 1.63)	0.40
Race				
White	19 (53)	65 (35)	1	-
Black	5 (14)	75 (41)	3.61 (1.10, 11.86)	0.04
Other/Not reported	12 (33)	45 (24)	0.65 (0.24, 1.77)	0.40
Any comorbidity	24 (67)	110 (59)	0.85 (0.22, 3.25)	0.82
Surgery in prior 30 days	6 (17)	30 (16)	1.21 (0.35, 4.15)	0.76
Hospitalization in prior year	21 (58)	74 (40)	0.40 (0.13, 1.21)	0.11
MRSA	8 (22)	35 (19)	0.42 (0.14, 1.21)	0.11
Primary source				
CLABSI or endovascular	12 (33)	44 (24)	1	
Musculoskeletal	12 (33)	67 (36)	1.13 (0.25, 5.11)	0.87
Skin or soft tissue	6 (17)	26 (14)	0.76 (0.16, 3.57)	0.72
Pneumonia	2 (6)	13 (7)	2.74 (0.39, 19.13)	0.31
None or other	4 (11)	34 (18)	2.58 (0.61, 10.91)	0.20
Site				
Penn State Children's Hospital	15 (26)	43 (74)	1	-
Children's National Medical Center	21 (13)	142 (87)	1.53 (0.60, 3.90)	0.37

MIC: minimum inhibitory concentration; aOR: adjusted odds ratio; CI: confidence interval; CLABSI: central line associated bloodstream infection; *P value for aOR; †median (25^{th}, 75^{th} percentiles)

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137. Impact of Rapid Susceptibility Testing on Outcomes in Patients with Bacteremia

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Session: 37. Bacteremia, CLABSI, and Endovascular Infections
Thursday, October 3, 2019: 12:15 PM

Background. Early organism identification via rapid diagnostics has been shown to reduce time to effective antimicrobial therapy and improve patient outcomes in patients with bacteremia, but antimicrobial susceptibility testing is still required to optimize therapy. The objective of this study was to determine the impact of an institution-specific rapid susceptibility testing method on outcomes in patients with bacteremia.

Methods. This was a retrospective pre- and post-intervention study of 100 adult patients with bacteremia. Patients were excluded if they had polymicrobial infection, fungemia, blood cultures collected at outside hospitals, or if they expired prior to susceptibility results. Patients were identified through a report containing positive blood cultures from October 2017 to February 2018 (pre-intervention [PrI]) and October 2018 to February 2019 (post-intervention [PoI]). The primary endpoint was the rate of clinical failure (a composite of 28-day mortality or bacteremia persisting greater than 6 days). Secondary endpoints included microbiologic outcomes, time to effective and optimal therapy, length of stay (LOS) and therapy adjustments.

Results. Baseline characteristics were similar between groups; a third of the patients were immunosuppressed (Table 1). The most common sources of infection were urinary and intra-abdominal, and the most common organisms identified were *E.coli* and *Klebsiella spp*. No significant difference in the rate of clinical failure was identified between PrI and PoI (24% vs. 18%, $P = 0.6242$) (Table 2). In the PoI, the time to identification, susceptibility results, and effective therapy was significantly shorter with similar time to optimal therapy and LOS. In the PoI, antimicrobial stewardship program (ASP) interventions were made significantly sooner after susceptibility results.

Conclusion. In this small, retrospective, single-center study, the implementation of a rapid susceptibility testing method was associated with reduced time to susceptibility results and more rapid interventions by the ASP, but no difference in the rate of clinical failure or time to optimal therapy was identified.

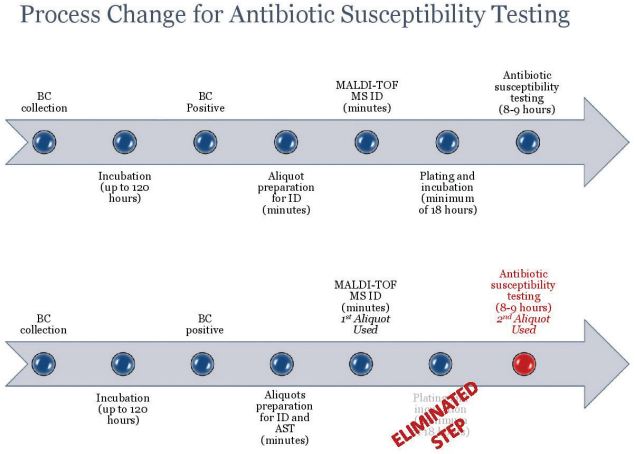
Table 1: Baseline characteristics

Characteristics	Total n=100	Pre-intervention n=50	Post-intervention n=50	p-value
Age, median (IQR)	69.5 (59.0 – 78.0)	69.0 (59.0 – 76.0)	70.5 (59.0 – 80.0)	0.4977
Female	37 (37.0)	19 (38.0)	18 (36.0)	0.8369
Comorbidities				
Immunosuppression	34 (34.0)	21 (42.0)	13 (26.0)	0.2837
Chronic obstructive pulmonary disease/pulmonary fibrosis	11 (11.0)	3 (6.0)	8 (16.0)	0.1997
Coronary artery disease/congestive heart failure	39 (39.0)	17 (34.0)	22 (44.0)	0.4124
Stroke/ischemic attack	13 (13.0)	8 (16.0)	5 (10.0)	0.5536
Diabetes	36 (36.0)	17 (34.0)	19 (38.0)	0.8352
Chronic kidney disease	18 (18.0)	9 (18.0)	9 (18.0)	1.0000
Cirrhosis	7 (7.0)	3 (6.0)	4 (8.0)	1.0000
Source of infection				
Urinary	32 (32.0)	13 (26.0)	19 (38.0)	0.3854
Intra-abdominal	21 (21.0)	10 (20.0)	11 (22.0)	
Respiratory	4 (4.0)	4 (8.0)	0 (0.0)	
Skin and soft tissue	6 (6.0)	3 (6.0)	3 (6.0)	
Catheter-associated	8 (8.0)	6 (12.0)	2 (4.0)	
Central nervous system	1 (2.0)	0 (0.0)	1 (2.0)	
Primary	16 (16.0)	8 (16.0)	8 (16.0)	
Multiple	3 (3.0)	2 (4.0)	1 (2.0)	
Other	9 (9.0)	4 (8.0)	5 (10.0)	
Organism				
Streptococcus pneumoniae	2 (2.0)	2 (4.0)	0 (0.0)	0.1724
Streptococcus spp.	1 (1.0)	1 (2.0)	0 (0.0)	
Staphylococcus aureus (MSSA)	13 (13.0)	5 (10.0)	8 (16.0)	
Staphylococcus aureus (MRSA)	8 (8.0)	6 (12.0)	2 (4.0)	
Enterococcus faecium	2 (2.0)	2 (4.0)	0 (0.0)	
Enterococcus faecalis	1 (1.0)	1 (2.0)	0 (0.0)	
Enterococcus spp.	1 (1.0)	1 (2.0)	0 (0.0)	
Escherichia coli	36 (36.0)	16 (32.0)	20 (40.0)	
Klebsiella spp.	19 (19.0)	9 (18.0)	10 (20.0)	
Serratia spp.	2 (2.0)	2 (4.0)	0 (0.0)	
Enterobacter spp.	6 (6.0)	3 (6.0)	3 (6.0)	
Proteus spp.	4 (4.0)	0 (0.0)	4 (8.0)	
Pseudomonas aeruginosa	1 (1.0)	0 (0.0)	1 (2.0)	
Other	4 (4.0)	2 (4.0)	2 (4.0)	

IQR – interquartile, MSSA – methicillin-susceptible *Staphylococcus aureus*; MRSA – methicillin-resistant *Staphylococcus aureus*

Table 2: Outcomes

	Pre-Intervention (n=50)	Post-Intervention (n=50)	p-value
Clinical failure (%)	24.0	18.0	0.6242
28-day inpatient mortality, n (%)	7 (14)	7 (14)	1.00
Bacteremia > 6 days, n (%)	8 (16)	5 (10)	0.5536
Time to identification, median, hours (IQR)	28.7 (20.0-37.0)	18.0 (14.2-33.0)	<0.0001
Time to susceptibility results, median, hours (IQR)	54.5 (43.3-61.9)	38.1 (33.3-42.6)	<0.0001
Time to effective therapy, median, hours (IQR)	1.4 (0.0-10.2)	0.0 (0.0-0.0)	<0.0001
Time to optimal therapy, median, hours (IQR)	43.5 (14.8-71.0)	47.6 (36.1-62.7)	0.5147
Therapy adjustments			
Escalation, n (%)	5 (10.0)	4 (8.0)	-
De-escalation, n (%)	36 (72.0)	44 (88.0)	-
No change, n (%)	9 (18.0)	2 (4.0)	-
Time to therapy adjustments, median, hours	8.6 (2.5-50.3)	0.01 (0.00-0.05)	<0.0001



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

138. Prognosis Following Valve Replacement Surgery for Infective Endocarditis Among Persons Who Inject Drugs

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Thursday, October 3, 2019: 12:15 PM

Background. Infective endocarditis (IE) is a major cause of morbidity and mortality among persons who inject drugs (PWID) and rates have increased during the current opioid epidemic. Severe cases may require valve replacement surgery (VRS). These patients are typically younger with fewer comorbidities than those who undergo VRS for other indications. This study was designed to examine the prognosis for these cases.

Methods. The University of Vermont Medical Center is a 562-bed academic medical center. A retrospective cohort included all cases of IE among PWID who underwent VRS between November, 2009 and December, 2015. The cohort intentionally included surgeries performed prior to 2016 in order to provide sufficient follow-up time. Outcomes included survival, readmission, complications, adherence to follow-up, length of stay, rate of repeat VRS, microbiology, and recurrent bloodstream infections.

Results. The cohort included 31 patients. 80% were male and the median age was 31. The valves replaced or repaired included 18 aortic, 10 mitral, 9 tricuspid, and 1 pulmonic (7 patients had two valves involved). Organisms included *Staphylococcus aureus* (48%), *Streptococcus* spp. (22%), and *Enterococcus* (13%). The median length of stay for the index admission was 35 days. To date, at least 38% of the cohort has died. The median survival for those who died was 337 days (0–2,224). Adherence with initial outpatient follow-up visit was only 50%, with others either canceling or missing appointments. 39% followed up with infectious diseases and 39% with cardiothoracic surgery. 29% never followed up. The readmission rate was 51%, and 22% of the cohort was readmitted more than three times. 48% had a repeat bloodstream infection, 73% of which were with a different organism than the index infection. The rate of repeat VRS was 31%.

Conclusion. Our observational data reveal a high mortality rate with poor adherence to follow-up and a high rate of readmission among this rural cohort of PWID who have VRS for IE. The major limitation of this work is the passive follow-up from the medical record. The high mortality and morbidity of this disease suggests that more intensive, multispecialty post-operative care is needed for PWID who are treated surgically.

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

139. The Morbidity and Financial Burden of Infective Endocarditis in Persons Who Inject Drugs in the Deep South

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Background. In the context of the opioid epidemic, infective endocarditis (IE) poses an economic challenge in Alabama. The objective of this proposal is to analyze the outcomes and financial burden of IE in persons who inject drugs (PWID) at The University of Alabama at Birmingham (UAB) Hospital, the largest tertiary referral center in this rural, Southern state. We hypothesized that those with the most severe substance use disorder would be most costly.

Methods. This is a retrospective study of PWID receiving care for IE at UAB Hospital from October 1, 2016 to March 1, 2019. IE was defined by Infectious Diseases consultation. Clinical data were obtained from the electronic medical record (EMR). Deaths were obtained from both the EMR and the regional medical examiner. Hospital costs (direct costs, overall charges) were obtained from financial accounts. To stratify patients by severity of substance use disorder, we used a 9-item risk assessment for PWID (see table). We then evaluated the association between clinical factors and