On multivariable logistic regression analysis, only relapsed/refractory malignancy was identified as an independent predictor of global clinical failure (odds ratio, OR, 9.43; 95% confidence interval, CI, 1.17–76.9; $P = 0.035$). Duration of treatment was not associated with global clinical cure (OR, 2.92; 95% CI, 0.51–16.7; $P = 0.23$).

Conclusion. No differences in clinical outcomes were seen in patients with active hematologic malignancies who received 2 weeks vs. >2 weeks of antibiotic therapy for the treatment of U-SAB, although confirmation of our findings in a larger study is warranted.

Figure 1: Clinical Outcomes in Patients with Hematologic Malignancies and Uncomplicated SAB Treated with Standard vs Prolonged Antibiotic Duration

	Standard course (n=45)	Prolonged course (n=44)	p-value
Global clinical cure	37 (82%)	42 (96%)	0.09
Relapse SAB	3 (7%)	2 (5%)	> 0.99
Hospital length of stay†	19 (7, 32)	25 (10, 38)	0.25
Unplanned hospital readmission	11 (24%)	14 (32%)	0.49
Vancomycin-induced nephrotoxicity	6 (29%)	1 (7%)	0.20

†Median (inter-quartile range); otherwise reported as number (%)

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1072. Streamlining to Oral β-Lactam vs. Fluoroquinolone as Definitive Therapy for Enterobacteriaceae Bacteremia

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Background. Oral treatment strategies for Enterobacteriaceae bacteremia (EB) are controversial, with both β-lactams (BL) and fluoroquinolones (FQ) used in clinical practice. FQ may be preferred for their high bioavailability, but other oral antibiotics are needed due to concerns of resistance and adverse effects. As an effort to facilitate antibiotic stewardship, BL should be explored as an additional oral option for EB treatment.

Methods. This retrospective study compared clinical characteristics and outcomes in patients with EB treated with BL vs. FQ as definitive oral therapy between January 2013 and July 2017. Adult patients diagnosed with their first incidence of EB and transitioned from IV antibiotics to either study antibiotic class were included. Primary and secondary outcomes assessed recurrence, collateral damage, readmission, and all-cause mortality.

Results. A total of 173 patients were included (BL $n = 59$, FQ $n = 114$). Median age was 70 years, Pitt bacteremia score was 2 (range 0–7), and Charlson Comorbidity Index was 5 (0–12); all were comparable between groups. Urinary source of infection was most common (57%). The majority of oral BL courses used cefpodoxime (63%). More patients in FQ vs. BL had a prior transplant (9% vs. 0%, $P = 0.05$), presence of abscess (11% vs. 0%, $P = 0.01$), and Infectious Diseases consultation (63% vs. 34%, $P = 0.0001$). Onset of EB in an intensive care unit was more common in BL vs. FQ (24% vs. 10%, $P = 0.01$). Median duration of IV and oral therapy was 5 vs. 4 days, $P = 0.22$ and 11 vs. 12 days, $P = 0.17$ in BL and FQ, respectively. Recurrence within 90 days was 7% in BL and 4% in FQ, $P = 0.49$ (adjusted OR 1.44, 95% CI 0.31–6.66; $P = 0.64$). Multivariate analysis identified liver cirrhosis (OR 16.89, 95% CI 1.06–268.32; $P = 0.05$) as an independent predictor of recurrence within 90 days. All secondary outcomes were similar between BL vs. FQ: superinfection within 90 days (10% vs. 9%, $P = 0.76$), *C. difficile* infection within 90 days (3% vs. 1%, $P = 0.27$), 30-day readmission (15% vs. 20%, $P = 0.43$), all-cause 30-day mortality (0% vs. 3%, $P = 0.55$).

Conclusion. In our cohort of patients with EB, clinical outcomes were similar between those treated with oral BL compared with FQ. Oral BL may be considered for definitive treatment of EB, although further investigation in larger studies is needed.

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1073. Predictors of Vancomycin Switch or Escalation in Patients With Methicillin-Resistant *Staphylococcus aureus* Bloodstream Infection

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Background. Vancomycin (VAN) is the primary agent for the treatment methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections (BSI). VAN is frequently combined with or switched to a second anti-MRSA agent for the treatment of serious BSI because VAN monotherapy has been linked to treatment failures. We aimed to determine the potential risk factors for patients with MRSA BSI who switched or had therapy escalated.

Methods. This was a multicenter, retrospective cohort study of adults (≥18 years) initially treated with VAN (>24 hours) for MRSA BSI between 2006 and 2018. Patients with a respiratory source were excluded. Baseline clinical and infection characteristics were compared between patients who received VAN as the sole anti-MRSA agent and continued on VAN until discharge and patients who switched or had a second anti-MRSA agent added during their admission (switch/escalate group). Multivariable logistic regression was performed to identify independent predictors of therapy switch or escalation.

Results. A total of 195 patients were included (66 VAN and 129 switch/escalate). The mean (SD) age of the study population was 56 (15.5) years, 68.2% were male, and 81.0% were African-American. Most (80%) of patient had community-onset BSI. The median (IQR) Charlson Comorbidity index and Acute Physiology and Chronic Health Evaluation (APACHE) II scores were 3 (1–5) and 14 (8–20), respectively. The major sources of BSI were skin/soft tissue (24.6%), infective endocarditis (24.1%), and bone/joint (23.1%). Median (IQR) time to switch/escalation was 67 (44–97) hours. In multivariable logistic regression analysis, infective endocarditis (aOR 6.2, 95% CI 2.2–16), hospitalization in the past 90 days (aOR 2.0, 95% CI 1.0–4.0), and APACHE II (aOR 1.07, 95% CI 1.01–1.12) were independently associated with switch/escalation.

Conclusion. We have identified a number of baseline clinical and infection characteristics that should be taken into account for clinicians to predict the likelihood of switch or escalation in vancomycin treated patients with MRSA BSI. Further studies evaluating the impact of up front alternative therapies in these higher risk patients are needed.

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1074. Management and Outcomes of Infective Endocarditis Due to Nutritionally Variant Streptococci

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Background. Nutritionally variant streptococci (NVS) are an infrequent cause of infective endocarditis (IE) and management recommendations are based on weak levels of evidence largely derived from case reports, small case series, and animal models of experimental endocarditis. Moreover, taxonomic changes have led to some confusion in designation of these organisms.

Methods. We retrospectively collected and analyzed data from 33 patients with NVS IE from 1970 to 2017. Only patients who met modified Duke Criteria for IE were included.

Results. Mean patient age was 55 years and 61% were males. The most common comorbidities included diabetes mellitus (12%), malignancy (3%), heart failure (16%), coronary artery disease (25%), and chronic liver disease (9%). Predisposing valve abnormalities included rheumatic heart disease (11%), bicuspid aortic valve (22%), transplant valvulopathy (3%), mitral valve prolapse (3%), and congenital heart disease (11%). Cultures were reported as NVS (70%), *Granulicatella* species (18%) and *Abiotrophia* species (12%). Echocardiogram findings included vegetations (67%), new regurgitation (55%), perivalvular abscess (3%), mitral valve prolapse (3%), and ruptured mitral valve chordae (3%). Both prosthetic (26%) and native valve IE (74%) was seen, and the valves involved were aortic (37%), mitral (50%) and both aortic and mitral (13%). Complications were seen in 27% of patients, including heart failure (17%), splenic infarct (11%), stroke (8%), mycotic aneurysm (3%), and glomerulonephritis (2%). In vitro susceptibility to penicillin, ceftriaxone, and vancomycin was 88%, 80%, and 100%, respectively. The majority (77%) of patients were treated with a combination of β-lactam and aminoglycoside. Median duration of treatment was 33 days.

Surgery was performed in 50% of patients with no significant difference in survival between those who were treated with combined medical/surgical treatment and those treated with medical therapy alone. Overall survival at 1, 4, and 10 years was 93%, 83%, and 66%, respectively.

Conclusion. IE due to NVS is a rare entity and is associated with a high rate of serious complications and may involve multiple valves. Long-term, two-thirds of the patients survived more than 10 years.

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1075. A Retrospective Comparison of Native Valve Endocarditis and Prosthetic Valve Endocarditis in a Large Tertiary Care Teaching Hospital From 2007 to 2015

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Background. Studies comparing native valve and prosthetic valve endocarditis (NVE and PVE) have mixed findings on the risk factors and outcomes between the two cohorts. This retrospective review of infective endocarditis (IE) at a teaching hospital in the United States aims to compare the clinical and microbiological features between NVE and PVE.

Methods. Patients were retrospectively identified from 2007 to 2015 using appropriate IE-related ICD-9 codes. Cases that met definite Modified Duke Criteria for IE were further classified as either PVE or NVE, and were reviewed for epidemiology, causative organism(s), affected valves and associations, risk factors, dental procedures in the past 6 months, and 30-day mortality.

Results. A total of 363 admissions met criteria for definite endocarditis, with 261 NVE cases and 59 PVE cases. Forty-three cases that were either associated with an infection involving both native and prosthetic valves or intracardiac devices were omitted from this study. Most risk factors, such as hemodialysis and intravenous drug use, did not show any significant difference amongst the two groups. IE involving the aortic valve as well as a previous history of IE were more likely to be seen in PVE (both $P < 0.0001$). Dental procedures done in the preceding 6 months before IE admission were more likely to be associated with PVE than NVE ($P = 0.0043$). PVE showed a higher likelihood of 30-day mortality compared with NVE ($P = 0.067$). The causative organisms of PVE were more likely to be caused by common gut pathogens such as Klebsiella and Enterobacter species.

Conclusion. PVE cases had a significantly higher chance of involving the aortic valve as well as having a history of IE. PVE cases were also significantly more likely to be associated with a dental procedure done in the preceding 6 months than with the NVE cases. This implies that patients with prosthetic valves, who are currently covered under the 2007 AHA guidelines to receive prophylaxis prior to dental procedures, are still at a high risk of developing PVE. It may be prudent to reconsider adding a post-procedure dose of antibiotics, instead of a single preprocedure dose, to extend the protection of this high-risk population with prosthetic valves. Furthermore, PVE cases showed higher rates of 30-day mortality compared with NVE with near significance, which is likely multifactorial.

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1076. What Is the Positivity Delay of Blood Cultures in Infective Endocarditis?

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Background. Blood culture is a key test for the positive diagnosis of infective endocarditis (IE). In order to detect certain so-called fastidious bacteria and to avoid the absence of documentation, it is customary to repeat the blood cultures (at least three series) and to keep them for 21 days. However, objective data regarding the positivity delay of blood cultures in case of infective endocarditis are lacking.

Methods. To determine the time to positivity of blood cultures during IE, all patients with documented IE by bacterial blood culture and presented to the Endocarditis team of our center were prospectively included. The study was conducted in a university hospital between 2013 and 2017.

Results. During the study, 441 patients with IE were hospitalized and 401 IE had a bacteriological documentation (91%), including 380 by blood cultures. In 21 cases, the bacteriological documentation was made by serological tests or specific PCR assays. Information on positivity delay was available for 237 patients (135 IE on native valve and 102 on prosthetic valve) and 183 of them (77%) had 4 aero-anaerobic series or more blood cultures. Of the 988 series sampled, 978 (99%) were positive. The main documented bacteria were staphylococci (41%), streptococci (32%), and enterococci (21%). The median time to positivity of the first blood culture was 11.4 hours [interquartile = 7.3 hours–16.7 hours] and the maximum delay was 93 hours. There was no difference in positivity delay between the 123 community acquired IE and the 114 healthcare-associated IE: 11.2 hours vs. 11.4 hours. The median growth time was 9.9 hours for *S. aureus* vs. 18 hours for coagulase negative staphylococci, 11 hours for enterococci and 10.4 hours for streptococci. In the case of IE complicated by extracardiac emboli, the median positivity delay was 9.7 hours in the case of *S. aureus* vs. 12.3 hours for the other bacteria.

Conclusion. In case of IE, our study shows that the median time positivity of the first blood culture is about 11 hours and no blood culture becomes positive beyond the fourth day. Slow-growing bacteria are identified by other diagnostic methods. We can, therefore, wonder about the need to multiply and conserve blood cultures beyond a week to document IE.

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1077. Heart Transplantation as Salvage Treatment for Intractable Infective Endocarditis

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Background. Infective endocarditis (IE) remains a severe disease with contemporary in-hospital mortality rates of 20%. Although valvular replacement is performed in 50% of patients during the acute phase, heart transplantation remains the last resort in selected patients with extensive perivalvular lesions or end-stage cardiac failure.

Methods. Cases were identified through the International Collaboration on Endocarditis (ICE) network. All patients who underwent heart transplantation during the acute phase of IE, with at least three months follow-up, were enrolled. Data were extracted from medical charts on a standardized questionnaire. Only patients who fulfilled Duke criteria for definite IE were enrolled.

Results. Between 1991 and 2017, 19 patients (6 women, 13 men), with a median age of 52 years (interquartile range, 41–61) underwent heart transplantation for IE refractory to optimized medical treatment and/or other cardiac surgery in Spain ($n = 9$), France ($n = 6$), and Colombia, Croatia, Switzerland, and the United States (one patient each). IE affected prosthetic ($n = 10$), native valves ($n = 9$), primarily aortic (56%), and mitral (28%). Pathogens were oral streptococci ($n = 7$), *Staphylococcus aureus* ($n = 5$, including two methicillin-resistant), *Enterococcus faecalis* ($n = 2$), and *Mycoplasma hominis*, *Haemophilus para-influenzae*, *Candida albicans* (one patient each). Two cases were not documented. Main cardiac lesions were vegetations ($n = 17$), severe regurgitation ($n = 15$), peri-annular abscesses ($n = 9$), prosthetic valve desinsertion ($n = 4$), and intra-cardiac fistula ($n = 1$). Seventeen patients underwent cardiac surgery at least once before transplantation, and four patients were on circulatory assistance (left ventricular assist-device, or extra-corporeal membrane oxygenation, two patients each). Median delay between first cardiac surgery and transplantation was 28 days (IQR, 18–71). Six patients died (32%), including four during the first month post-transplant. Thirteen patients survived, with a median follow-up of 44 months post-transplantation (IQR, 13–88).

Conclusion. Heart transplantation may be considered as salvage treatment in highly selected patients with intractable infective endocarditis.

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