amikacin, half were resistant to gentamycin, second- and third-generation cephalosporins and quinolones. Inappropriate empiric antimicrobial therapy was given to 46.8% of patients with ESBL-producing enterobacteriaceae ($P < 0.001$). Mortality rates were 21.5% in-hospital and 46.3% day-90 post discharge. Variables associated with mortality: initial diagnosis of skin and soft-tissue infections (SSTI) (OR = 14.44), inappropriate empiric antibiotic (OR = 5.038), high level of urea (OR = 1.017), and nasogastric tube (OR = 4.966). UTI (OR = 0.316) was a protective factor.

Conclusion. Diagnosis of SSTI, high urea levels, nasogastric tube, and inappropriate empiric antibiotic were associated with in-hospital mortality. The notable increased rate of ESBL-producing enterobacteriaceae should alert physicians to be aware of local microbial resistance profile, especially among LTCFs patients.

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

1007. Etiology of Sepsis; A Systematic Review of Emergency Department Sepsis

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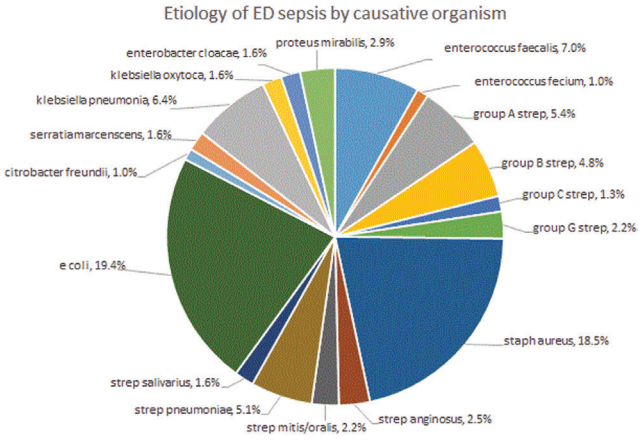
Background. Sepsis is a systemic response to an infection involving one or multiple organ failures frequently caused by bacteremia. Over a million cases of sepsis are reported in the United States annually with an estimated 25% mortality. Early recognition, diagnosis, and treatment of sepsis in the Emergency Department (ED) improves patient outcomes. Increased awareness of sepsis has fostered novel opportunities to improve diagnostics. EDs are increasingly targeted as areas of primary care for suspected septic patients. Understanding the etiology of ED sepsis supports empiric approaches and opportunities for targeted diagnostics. However, a systematic analysis of etiology of ED sepsis, spanning multiple years, is lacking.

Methods. A retrospective analysis conducted over 60 months at Hennepin County Medical Center, an inner-city level one trauma center with over 100,000 ED visits annually were examined. Positive blood cultures drawn in the ED were included in data analysis. Charts were reviewed for patient demographics and whether the culture was treated; infections that were not treated were considered contaminants, and relevant susceptibility patterns.

Results. A total of 8,013 blood cultures were drawn in the ED over an initial 12-month period. Of these, 8.4% (n = 674) were culture positive resulting in 731 microorganisms. Of these, 314 were treated as infections with the remaining considered contaminants. Overall contamination rate was 2.9%. Of clinically relevant positive blood cultures, 19.4% were *Escherichia coli*, 18.5% were *Staphylococcus aureus*, 27.1% were strep species (*group A strep* 5.4%, *group B strep* 4.8%, *strep pneumonia* 5.1%), 7.0% were *Enterococcus faecalis*, and 6.4% *Klebsiella pneumonia*. Among these species, they accounted for 78.4% of pertinent positive cultures. Gram-negative bacteremias accounted for 41% of infections compared with 59% for Gram-positive organisms.

Conclusion. A comprehensive understanding of the etiology of ED sepsis facilitates appropriate empiric antimicrobial prescribing for patients who present with sepsis in the ED. Data collected to date identifies five key bacterial species associated with over 78% of confirmed ED sepsis.



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

1008. Cluster Analysis to Define Distinct Clinical Phenotypes Among Septic Patients With Bloodstream Infections

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Background. Prior attempts at identifying outcome determinants associated with bloodstream infection have employed *a priori* determined classification schemes based on readily identifiable microbiology, infection site, and patient characteristics. We hypothesized that even amongst this heterogeneous population, clinically relevant groupings can be described that transcend old *a priori* classifications.

Methods. Cluster analysis was applied to variables from three domains: patient characteristics, acuity of illness/clinical presentation, and infection characteristics.

Results. Among 3,715 patients with bloodstream infections from Barnes-Jewish Hospital (2008 to 2015), the most stable cluster arrangement occurred with the formation of four clusters. This clustering arrangement resulted in an approximately uniform distribution of the population: Clusters One (21.5%), Two (27.9%), Three (28.7%), and Four (21.9%). *Staphylococcus aureus* distributed primarily to Clusters Three (40%) and Four (25%), while *Enterobacteriaceae* were divided predominantly into Clusters Two (34%), Three (30%), and Four (22%). Nonfermenting Gram-negative bacilli grouped mainly in Clusters Four and Two (30% and 31%). More than half of the pneumonia cases occurred in Cluster Four. Clusters One and Two contained 33% and 31%, respectively, of the individuals receiving inappropriate antibiotic administration. Mortality was greatest for Cluster Four (33.8%, 27.4%, 19.2%, 44.6%; $P < 0.001$), while Cluster One patients were most likely to be discharged to a nursing home.

Conclusion. Our results support the potential for machine learning methods to identify homogenous groupings in infectious diseases that transcend old *a priori* classifications. These methods may allow new clinical phenotypes to be identified potentially improving the severity staging and treatment of complex infectious diseases.

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1009. Venous 1: A Prospective Multicenter Cohort Study of Enterococcal Bacteremia

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Background. Enterococci often cause hospital-associated bloodstream infections in critically ill and immunocompromised patients. Prospective studies to assess the clinical impact of enterococcal bacteremia (EB) are lacking. We conducted a prospective study to investigate the clinical and microbiological factors associated with mortality in EB.

Methods. Adults with EB were prospectively followed in three US tertiary hospitals from September 2016 to March 2018. Individuals with EB for whom follow-up blood culture data within 7 days of index culture were available were included. Microbiologic failure (MF) was defined as clearance of bacteremia ≥4 days after the first blood culture. The main outcome was hospital mortality.

Results. A total of 282 patients were included with 69 (24%) infected with vancomycin-resistant enterococci (VRE). The majority of patients were male (60%) with a median age of 63 years. Median length of hospitalization for VRE patients was longer (25 d) than non-VRE (13 days, $P < 0.001$). *E. faecium* corresponded to 77% of VRE isolates, whereas *E. faecalis* comprised 72% of non-VRE. The average time to first blood culture was 16 days for VRE vs. 4 days for non-VRE ($P < 0.001$). Patients with VRE were more likely to have hematological malignancy or bone marrow transplant ($P < 0.003$), whereas patients infected non-VRE were more likely to have solid tumors ($P = 0.02$). The most common antibiotic used was daptomycin as monotherapy for both VRE and non-VRE with a median dose of 8 mg/kg for both groups. Overall mortality was 25% (43% vs. 20% in VRE vs. non-VRE patients, respectively; $P < 0.0001$). Factors significantly associated with mortality in univariate analyses included ICU admission, prolonged hospitalization, hematological malignancy, use of immunosuppressive therapy, hemodialysis, neutropenia (<500 cell/mL), Pitt bacteremia score >3, infection with VRE and MF. ICU admission (RR 3.3; 95% CI 1.7–7.5, neutropenia (RR 4.1; 95% CI 1.3–12.9), Pitt bacteremia score >3 (RR 6.8; 95% CI 2.6–18.0), MF (RR 4.7; 95% CI 2.2–10.3) and infection with VRE (RR 4.1; 95% CI 1.1–16.6) remained significantly associated with mortality in multivariate analyses.

Conclusion. The presence of VRE in EB and MF are associated with increased mortality. EB represent a major burden of disease in hospital settings.

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1010. Effectiveness of Oral Antibiotics for Definitive Therapy of Gram-Positive Bloodstream Infections

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