Methods. From April 14, 2016 to March 13, 2017, blood cultures from unique patients in the emergency department or medical intensive care units at Barnes-Jewish Hospital signaling positive and Gram-stain positive for GNB or yeast were eligible for inclusion. Standard-of-care (SOC) diagnostics were conducted in parallel with AXDX, though AXDX could be delayed up to 8 hours depending on research technician availability. Differences in AXDX ID and AST between AXDX and SOC were determined. Clinical outcomes included appropriateness of initial empiric antimicrobial therapy, potential for early antimicrobial de-escalation with AXDX, and mortality.

Results. Of 341 screened blood cultures, 123 met inclusion criteria; 101 had organisms that were on-panel for AXDX, 88 GNB and 13 C. glabrata or C. albicans. For GNB, mean time from blood culture positivity to ID and AST using SOC was 19.8 and 53.5 hours, respectively, and 1.4 and 6.7 hours using AXDX (from time AXDX started). For Candida spp., mean time to ID was 33.1 hours for SOC, 1.4 hours for AXDX. Antibacterial de-escalation was possible based on AXDX testing in 52.9% of patients with GNB infections. A total of 27 (27.3%) patients received ILAT. In-hospital mortality was higher (48.1%) in the ILAT group than in those receiving appropriate initial anti-biotics (12.5%), P < 0.001. AXDX could have improved antimicrobial therapy in 89.8% of GNB and 92.3% of Candida spp. cases.

Conclusion. The Accelerate Pheno™ system is a novel fast diagnostic that significantly reduces the time to ID and AST for GNB and ID of Candida spp. bloodstream infections, with the potential to impact clinical outcomes. Prospective clinical trials are needed to evaluate the impact of this new system on clinical outcomes and antimicrobial stewardship.

Disclosures. C. A. D. Burnham, Accelerate Diagnostics: Investigator, Research support; M. Kollef, Accelerate Diagnostics: Consultant, Research support

2120. Validation of an Antimicrobial Stewardship Driven Verigene® Blood Culture Gram-Negative Treatment Algorithm to Improve Appropriateness of Antibiotics

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Background. Gram-negative bacteremia (GNB) is associated with significant morbidity and mortality, emphasizing the need for timely, effective antimicrobial therapy. Current conventional diagnostic methods, Verigene® Blood Culture Gram-Negative (VBC-GN) is a microarray rapid diagnostic test that identifies eight target GNB organisms and six genetic resistance determinants. This study examined the potential clinical impact of VBC-GN coupled with a proposed antimicrobial stewardship (AMS)-derived treatment algorithm to guide timely, appropriate antimicrobial therapy in GNB.

Methods. Retrospective, single-center, study of adult patients ≥ 18 years) with GNB at University of Maryland Medical Center (UMMC) from September 2015 – May 2016. Patient clinical characteristics, co-morbidities, and antimicrobials administered were collected. Appropriateness of antimicrobial therapy was by vi in susceptibility Appropriateness of actual empiric antimicrobials received as standard care were compared with theroretical antimicrobials as guided by the UMMC AMS treatment algorithm. In addition, investigators (KCC and ELH) independently evaluated appropriateness of empiric and algorithm antimicrobial recommendations.

Results. 188 patients (median age 57.0 (IQR 46.5 – 65.0) years) with GNB were included and 143 (76.1%) were positive for target GNB organisms. Eight (4.3%) cases were GNB and 23 (12.2%) were CTX-M producers. Gold standard for target GNB organism (30.3%), and genitourinary was the most common source (29.3%). There was a good level of agreement between reviewers regarding appropriateness of empiric therapy (Kappa = 0.735) and algorithm recommendations (Kappa = 0.855). Overall, the proposed algorithm would have resulted in 88.4% of cases receiving appropriate antimicrobial therapy vs. 78.1% actual empiric antimicrobial (P = 0.014). The AMS treatment algorithm would have resulted in 14.4% appropriate de-escalation, 4.8% inappropriate de-escalation, 3.3% appropriate escalation, and 16.0% unnecessary escalation.

Conclusion. Proposed antimicrobials by AMS-derived treatment algorithm applied in comparison with diagnostic testing would result in a significantly higher proportion of patients receiving appropriate antimicrobial therapy vs. standard care.

Disclosures. J. K. Johnson, Nanosphere: Grant Investigator, Grant recipient

2121. Rapid Identification of Gram-Negative Bacteremia and Impact on Anti-Pseudomonal Antibiotic Consumption in Combination with Antibiotic Stewardship at a Community-Based Hospital System

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Background. Rapid diagnostics for blood cultures have shown to decrease unnecessary antibiotics; however, this has mostly been studied in gram-positive organisms. The Verigene Gram-Negative Blood Culture Test (BC-GN) identifies eight bacteria at species/genus level and six resistance genes, detected 2 hours from a positive blood culture. By identifying the gram-negative (GN) pathogen earlier compared with traditional methods, there is potential to decrease broad spectrum antibiotic utilization. The purpose of this study was to determine the impact of Verigene BC-GN with antibiotic stewardship on anti-pseudomonal (AP) antibiotic consumption in GN bacteremia among patients when AP therapy is not needed. Based on local susceptibility data, this included Escherichia coli, Klebsiella pneumoniae, Klebsiella oxytoca, and Proteus spp.

Methods. This multi-center, pre-post quasi-experimental study was conducted at the five hospitals that compose Scripps Healthcare. Verigene BC-GN results were communicated to physicians in real-time, then notified physicians for antibiotic evaluation. Education was provided to pharmacists and physicians regarding interpretation, and antibiotic selection recommendations were chosen based on specific antibiotic data. A retrospective chart review was performed one year prior and five months post-implementation of Verigene BC-GN. Patients > 18 years old with bacteremia caused by E. coli, K. pneumoniae, K. oxytoca, or Proteus spp. within 48 hours of admission were included. The primary endpoint was AP vs. non-AP antibiotic days of therapy per day admitted (DOT/DA), within the first five days of admission. Secondary endpoints included hospital and ICU length of stay (LOS) and mortality.

Results. AP antibiotic consumption significantly decreased after implementation of Verigene BC-GN (0.45 vs. 0.32 DOT/DA, P < 0.001) while non-AP antibiotic consumption significantly increased (0.61 vs. 0.75 DOT/DA, P < 0.0001). Overall LOS was 7.7 vs 11.2 days (P = 0.12) and in-hospital mortality was 7.0% and 4.3% (P = 0.18) pre and post-implementation, respectively.

Conclusion. Verigene BC-GN, with antibiotic stewardship, successfully demonstrated a shift in antibiotic utilization away from broad-spectrum AP antibiotics, in institutions where Pseudomonas coverage is not necessary.

Disclosures. All authors: No reported disclosures.

2122. Rapid Multiplex Gastrointestinal Pathogen Panel Testing Improves Antibiotic Stewardship in Patients with Suspected Infections Diarrhea Compared with Conventional Methods

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Background. The BioFire FilmArray® Gastrointestinal (GI) Panel is a 1 hour multiplex real-time PCR test that can detect the presence of 22 GI pathogens (viral, bacterial, and fungal) known to cause infectious diarrhea. Our tertiary-care academic medical center implemented the GI Panel for all cases of suspected infectious diarrhea replacing the previous conventional testing once utilized to detect GI pathogens.

Methods. The aim of this IRB approved, retrospective investigation was to determine the utility of the GI panel testing vs. the conventional testing to guide patient management. Cases were randomly selected, stratified by age group and result (specific pathogens or negative result) in the pre-implementation period (n = 119 of 1550 samples) from May 2014 through April 2015 and in the post-implementation period (n = 133 of 1187 samples) from May 2015 through April 2016.

Results. The rate of a positive test for any stool pathogen per patient was 34.2% (n = 342 of 999) for the GI panel and 11.6% (n = 162 of 1391) for conventional testing, P < 0.0001. Median time to test result from collection was 3.3 hours for the GI panel vs 45.4 hours for culture (P < 0.0001). Among patients started on antibiotics prior to result, discontinuation rate was 33% (n = 30/90) after GI panel results vs 5.4% (n = 2/37) after stool culture results, P = 0.0014. Antibiotics were initiated or adjusted after the result in 28.5% of patients (95/333) in the GI panel cohort compared with 60.5% (72/119) in the culture cohort. This was influenced by the method for selecting cases and the higher yield of viral pathogens in the GI Panel cohort. Mean time to antibiotic adjustment was 2.1 hours with the GI panel vs 22.0 hours in the culture cohort (P = 0.0155). Appropriateness of antibiotic use, adjudicated after the test result became available was significantly higher in the GI panel group (81%), compared with the culture group (41%), P = 0.0039.

Conclusion. After implementation of a rapid multiple GI pathogen panel to evaluate stool samples from patients with suspected infectious diarrhea, our institution saw benefits in antibiotic stewardship, including: higher diagnostic yield, faster results, higher rates of antibiotic discontinuation, shorter time to antibiotic adjustment and a lower rate of inappropriate antibiotic treatment.

Disclosures. All authors: No reported disclosures.

2123. Implementation of Matrix-Assisted Laser Desorption/Ionization Time-of-Flight (MALDI-TOF) and Antimicrobial Stewardship Intervention at an Academic Medical Center

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Background. Rapid diagnostic tests (RDTs), such as Matrix-Assisted Laser Desorption/Ionization Time-of-Flight (MALDI-TOF), have been shown to improve time to effective therapy and positively impact patient outcomes when used along with an antimicrobial stewardship team (AST) intervention in treating bloodstream infections (BSIs). The purpose of this study was to assess the impact of MALDI-TOF (implemented May 25, 2016) and AST intervention on management of BSIs at a smaller, resource-limited institution.

Methods. IRB-approved, single-center, pre-post quasi-experiment including all patients treated for BSI at the University of Toledo Medical Center from November 1, 2015-November 30, 2016. Patients transferred with documented BSI, expired prior to organism identification, or had blood culture positive for Mycobacterium, Nocardia, anaerobes, or molds were excluded. Primary endpoint: time to effective therapy. Secondary endpoints: time to optimal therapy, hospital length of stay (LOS), recurrent bacteremia, and 30-day readmission and all-cause mortality.

Results. Of 593 blood cultures screened, 261 included; 131 pre- and 130 post-MALDI-TOF implementation. Baseline characteristics similar between groups. Median (IQR) time to effective therapy was 6.1 h (2.3–20.0) pre-MALDI-TOF and 6.4 h (2.2–23.7) post-MALDI-TOF; P = 0.609. Median (IQR) time to optimal therapy was 67.3 (48.6–93.2) pre-MALDI-TOF and 67.2 (44.3–94.0) post-MALDI-TOF; P = 0.520. Secondary endpoints shown in Table 1. In a subset of cultures defined as contaminants, reduction was seen in time to discontinuation of therapy, however not statistically significant (93.8 hours (61.8–131.4) vs. 71.1 hours (57.5–106.3); P = 0.180).

Conclusion. Implementation of MALDI-TOF and AST intervention did not significantly improve an already prompt time to effective therapy in patients with BSIs at our institution. Time to optimal therapy was also similar, highlighting the need for more rapid susceptibility tests in order to support earlier de-escalation of therapy.

Table 1. Clinically Evaluable Endpoints

|                      | Pre-MALDI-TOF | Post-MALDI-TOF | P-value |
|----------------------|---------------|----------------|---------|
| Hospital LOS (days)  |               |                |         |
| Recurrent bacteremia | 6 (5.8)       | 4 (3.8)        | 0.736   |
| 30-day readmission   | 24 (22.2)     | 18 (17.3)      | 0.369   |
| 30-day, all-cause mortality | 16 (14.8) | 19 (18.3) | 0.498   |

Values reported as median (IQR) or n (%).

Disclosures. All authors: No reported disclosures.

2124. Impact of Verigene Multiplex PCR for Positive Blood Cultures and Gram-negative Bacteremia

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Background. Many patients with bacteremia due to Gram-negative organisms are not treated appropriately. This has been linked to high rates of multi-drug resistant organisms, hospital costs, length of stay, and mortality. The purpose of this study was to assess the effect of implementation of Verigene multiplex PCR on appropriate use of antibiotics, and the time to streamlining of therapy in this population.

Methods. This study included hospitalized patients with Gram-negative organisms isolated from blood cultures both six months before, and six months after the implementation of Verigene at a tertiary care academic medical center. An institutional review board approved this study. We excluded patients that had organisms isolated from autopsy sample and patients under the age of 18. Appropriately defined as any antibiotic therapy to which the organism was reported as being susceptible once susceptibility results were available. Streamlined therapy was defined as the narrowest antibiotic selection based off organism susceptibility. The primary outcome measure was the time to streamlining of therapy (before culture and susceptibility date were available). Data was compared by group (before and after Verigene implementation) using multiple logistic regression model in SAS.

Results. A total of 287 patients were included. 140 of the subjects were male (48.8%). Mean age in the pre-verigene group was 61.5 years (SD 17.1) and the mean age in the post-verigene group was 59.7 (SD 18.2). In 93 patients, cultures were collected in the ICU setting (32.4%). In nine post-verigene patients, ESBL with the CTX-M resistance marker was isolated. Six of these patients were switched from inappropriate therapy to a carbapenem. The time to appropriate antibiotics in the pre-verigene group was 0.4 days (SD 0.8) and in the post-verigene group 0.4 days (SD 1.0 P = 0.57). The time to streamlining of antibiotics following culture was improved in the post-verigene group (1.9) compared with the pre-verigene group (2.6 pre vs 1.3 post; P = 0.439).

Conclusion. The use of Verigene multiplex PCR was associated with improved time to streamlining of antibiotic therapy in patients with Gram-negative bacteremia.

Disclosures. All authors: No reported disclosures.

2125. Costs of Blood Culture Contamination: Justification for Rapid Diagnostics in a Community Hospital

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Background. We evaluated the cost impact of blood cultures contaminated with coagulase negative Staphylococci species (CoNS) at a community hospital in the Seattle metropolitan area. Data were used to justify acquisition of the rapid diagnostics system, Verigene.

Methods. All blood isolates of CoNS from January 2017 were included. Data were evaluated by patient. The cost analysis included length of hospital stay, days of vancomycin therapy, vancomycin dose concentrations, and pharmacist time spent on vancomycin drug monitoring. Documented adverse drug effects and renal dysfunction were recorded. Based on preliminary data using Verigene, we estimated a 1-day time to organism identification and antibiotic de-escalation following culture draw.

Results. 72 blood cultures with CoNS were identified among 51 patients. Physician-documented CoNS infection was present in 5 patients (10%). Of 46 patients with CoNS contamination, 26 (57%) were initially treated with vancomycin, 14 (30%) had therapeutic drug monitoring of vancomycin. One patient was hospitalized 4 additional days due to delay in implementing a cardiac pacing device while infection was ruled out. Four patients were monitored for infection which contributed to hospital stay; each had comorbidities also requiring ongoing hospitalization. Excess care included 20 drug concentrations, 39 days of vancomycin, and 4 additional days of hospitalization. This contributed to a cost/month of $12,992 which annualized to $187,104. One patient with documented CoNS infection had C. difficile infection while on vancomycin; 16 patients had baseline renal impairment either acutely on admission or due to chronic kidney disease.

Conclusion. Reducing time to identification of blood culture contamination represents an opportunity to improve patient care by minimizing unnecessary antibiotic therapy, drug monitoring, and reducing hospital length of stay. Our institution anticipates an annual cost savings of $143,504 based on rapid identification of CoNS in blood. This justifies the acquisition and operation of a rapid diagnostics system.

Disclosures. All authors: No reported disclosures.

2126. Impact of a Rapid Diagnostic for Bloodstream Infections with Antimicrobial Stewardship Intervention at a Comprehensive Cancer Center

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Background. Molecular based assays reduce time to organism identification for bloodstream infections (BSI) but have limited impact without Antimicrobial Stewardship (AS) intervention. The benefit of pairing molecular based assays with AS in immunocompromised hosts is unknown. Immunocompromised patients present unique challenges to AS efforts and evaluations of traditional AS interventions are needed in this patient population. The purpose of this analysis was to evaluate the utility of a molecular based assay for BSI with and without AS intervention at a cancer hospital.

Methods. A retrospective quasi-experimental pre-post study was performed to evaluate the impact of the FilmArray® Blood Culture Identification (BCID) panel with and without AS intervention on time to appropriate antimicrobial therapy defined as de-escalation to the narrowest spectrum agent taking into account need to cover concomitant infections and antibiotic allergies or intolerances. We included inpatients with positive blood cultures between 2014 and 2016 in three separate 100-day cohorts: prior to BCID implementation (pre); after BCID implementation without AS intervention (post); after BCID implementation with AS intervention (ASP) involving blood culture review and antimicrobial treatment recommendations.

Results. 130 of 155 subjects with a BSI during the study period were included. The ($n = 52$, post ($n = 43$), and ASP ($n = 35$) cohorts were balanced with the exception of more immunocompromised patients in the ASP compared with pre ($91% vs 65%$, P < 0.01) and post cohorts ($91% vs 72%$, P = 0.04). Time to appropriate antimicrobial therapy, although not statistically different, was shorter in the post and ASP groups.