1801. Impact of Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry (MALDI-TOF MS) on Clinical Outcomes in Patients with Gram Positive Blood Cultures in a Diverse, Multicenter Healthcare System With a Central Laboratory

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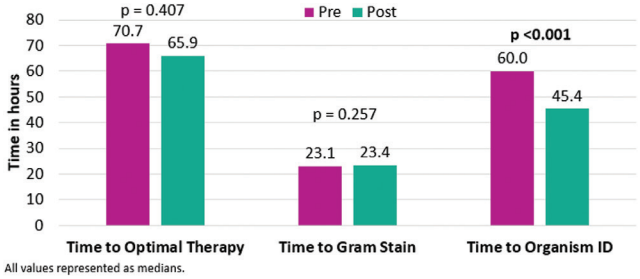
Background. Rapid diagnostic testing in combination with real-time antimicrobial stewardship intervention can reduce time to de-escalation of empiric antibiotics and discontinuation of unnecessary therapy. This study aims to evaluate the clinical impact of Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry (MALDI-TOF MS) for Gram-positive organism identification for blood cultures across a healthcare system comprised of pediatric, adult academic, and adult community hospitals utilizing a central microbiology laboratory with unique antimicrobial stewardship resources at each site.

Methods. This multicenter retrospective study compared patients with a positive blood culture for a Gram-positive organism identified via MALDI-TOF MS to a historical cohort identified using conventional methods. Primary outcome was time to optimal therapy (TTOT). Secondary outcomes included time to effective therapy, duration of therapy, time to microbiologic clearance, hospital length of stay (LOS), ICU LOS, recurrence, readmission, in-hospital mortality, and all-cause mortality.

Results. This study included 129 cultures (12% pediatric patients) in the conventional period and 129 cultures (19% pediatric patients) in the MALDI-TOF MS group. Of the total 258 blood cultures included, 147 (57%) represented true bloodstream infection and 111 (43%) were deemed to be contaminants. Despite a median reduction in time to organism identification (60.0 vs. 45.4 hours, $P < 0.001$), there was no difference in the primary outcome of overall median TTOT between the two groups (70.7 hours vs. 65.9 hours, $P = 0.407$). There were no significant differences for any secondary outcomes. Overall TTOT was longer as distance from the central laboratory increased (47.3 hours at central site vs. 76.9 hours at distance >30 miles). Among contaminants, median TTOT was reduced from 72.5 hours with conventional methods to 59.8 hours with MALDI-TOF MS ($P = 0.015$). ***Conclusion.*** Implementation of MALDI-TOF MS for organism identification may not reduce time to optimal therapy in patients with true Gram-positive bacteremia. However, it can result in a significant reduction in time to discontinuation of unnecessary therapy for patients with contaminated cultures. Figure 1. Differences in outcomes for conventional methods vs. MALDI-TOF MS



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

1802. Evaluation of Clinical Pharmacists Use of a Blood Culture Follow-up Protocol Utilizing Rapid Molecular Diagnostic Testing

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Background. Studies have shown molecular rapid diagnostic testing (RDT) have been associated with improved clinical outcomes in bloodstream infections when combined with antimicrobial stewardship (AMS) intervention. Mercy Medical Center implemented the RDT Verigene® Blood-Culture Gram-Negative and Gram-Positive panels. After implementation, our prior study that evaluated time to optimal therapy after implementation of Verigene along with AMS intervention showed an improved time to optimal therapy (65 vs. 33 hours, $P < 0.001$). However, the process implemented was labor intensive for the AMS team to provide coverage 7 days per week. Therefore, we incorporated clinical pharmacists (CP) to provide coverage during evenings and weekends.

Methods. We performed a single-center, retrospective analysis of adult patients who were identified as having a positive blood culture from January 2016 to October 2017. The primary outcome was appropriateness of the CP recommendation based on RDT results compared with AMS recommendations. Secondary outcomes were time to RDT follow-up, and time to optimal antibiotic therapy. A survey of CP assessed workflow and confidence in performing this task. We evaluated each pharmacist's recommendation based on RDT results, patient specific criteria, and antimicrobial reference tool. Suboptimal recommendations included: no de-escalation, no escalation to effective coverage, or lack of discontinuation.

Results. A total of 160 adult patients, 80 in each group were included. The AMS group provided optimal antibiotic therapy recommendations more often than CP (94% vs. 70%, $P < 0.001$). Time to follow-up by CP was significantly shorter compared with AMS (3.8 vs. 11; $P < 0.001$). The majority of the suboptimal recommendations were due to no de-escalation of antibiotic therapy. Time to optimal therapy was similar between groups (24.5 vs. 28; $P = 0.920$). A third of CP stated they are unlikely to recommend de-escalation to optimal therapy if patients were on effective therapy.

Conclusion. CP can be utilized to expand coverage of RDT follow-up. The AMS team did provide significantly more optimal antimicrobial recommendations compared with CP. This study shows there is a need for continued education of CP on the importance of de-escalating patients to optimal antimicrobial therapy.

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

1803. Clinical Impact of Rapid Blood Culture Diagnostics Differs by Time of Day and Gram Stain Type: Lessons From Implementation of Verigene® Blood Culture Testing in a Children's Hospital

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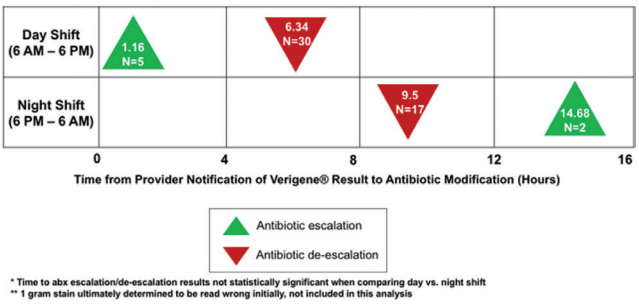
Background. Rapid blood culture diagnostics paired with antimicrobial stewardship (AS) enhances appropriate antimicrobial treatment for bloodstream infections (BSI). Ideal implementation strategies for blood culture diagnostics are not clear, including whether to perform molecular testing during off-hours or for all organism types.

Methods. To determine whether the clinical impact of the Verigene® Blood Culture Nucleic Acid Tests (VG) is influenced by time of day and Gram-positive (GP) or Gram-negative (GN) organism, we performed a single-center, retrospective evaluation of children with BSIs and VG testing April 2017–March 2018. VG testing was performed on all Gram stain positive blood cultures 24/7. AS providers were notified of VG results at all hours, but AS interventions occurred on weekdays, during office hours. Wilcoxon rank-sum and chi-squared tests were used for analyses.

Results. Two hundred fifty-seven isolates (GP:184, 72%; GN:73, 28%) were identified from 224 cultures by standard of care (SOC) conventional culture. VG and SOC results were concordant in 173/224 (77%) cultures overall, 168/197 (85%) monomicrobial cultures, and 5/27 (19%) polymicrobial cultures. Thirty-eight of 257 isolates (15%) were not targets on VG. Among on-panel organisms, discordance was similar for GN (4/48, 8.3%) and GP isolates (16/171, 9.4%). Among 95 opportunities for antibiotic optimization based on VG results, antibiotic changes occurred in 80 (84%), with 48 de-escalations, 11 escalations, and 21 averted antibiotic starts. More modifications were made for patients with GP vs. GN BSI (75 vs. 5, $P < 0.001$). For GP BSI, mean time from VG result to antibiotic modification was 8.92 hours overall, and faster during day shift than night shift, although not statistically significant ($P = 0.49$) (Figure 1). Among patients with GP BSI, 4 were not admitted and 21 had antibiotics discontinued within 24 hours.

Conclusion. At our children's hospital, VG testing implemented with AS resulted in antibiotic optimization, but not as promptly as expected. Antibiotic changes occurred more frequently for GP than GN BSI and occurred more quickly when VG testing occurred during the day vs. night. There is a need for strategies that improve the impact of rapid blood culture diagnostics, especially during off-hours and for GN BSI.

FIGURE 1. Impact of Verigene® Testing on Time to Antibiotic Escalation or De-escalation for Gram Positive Organisms, Day Shift vs. Night Shift



* Time to abx escalation/de-escalation results not statistically significant when comparing day vs. night shift
** 1 gram stain ultimately determined to be read wrong initially, not included in this analysis

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1804. Impact of Susceptibility Testing Method on Antibiotic Selection for Methicillin-Resistant *Staphylococcus Aureus* (MRSA) Bacteremia

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Background. The selection of intravenous (IV) antibiotics for methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia can be influenced by the vancomycin minimum inhibitory concentration (MIC). This study explores the changes in antibiotic use and inpatient mortality for patients with MRSA bacteremia after switching the MIC testing methods.

Methods. At University of Kentucky Medical Center, Etest™ was implemented in November 2013 for all *Staphylococcus aureus* blood isolates. In April 2016, this was changed to Phoenix™ automated system. Data regarding antibiotic usage for patients with MRSA bacteremia were collected from July 2014 to December 2015 (Etest™) and September 2016 to March 2017 (Phoenix™). Only patients started on IV vancomycin were included. Daptomycin and ceftaroline use was monitored by the antimicrobial stewardship team with focus on guideline adherence.

Results. A total of 119 and 62 patients were identified before and after switching to Phoenix™. MICs of 2 μg/mL were significantly decreased ($P < 0.001$) after changing to Phoenix™ (Table 1). Daptomycin use (alone or in combination) decreased from 37% (44/119) to 21% (13/62) ($P = 0.013$). Ceftaroline use (alone or in combination) decreased from 32% (38/119) to 19% (12/62) ($P = 0.036$). The reason for escalation in 13 of 44 (30%) patients with daptomycin and 6 of 38 (16%) patients with ceftaroline was an MIC of 2 μg/mL. Overall, IV vancomycin use (alone or in combination) increased from 50% (60/119) to 69% (43/62) ($P = 0.007$). All-cause inpatient mortality was 16% (19/119) before and 10% (6/62) ($P = 0.24$) after switching to Phoenix.

Conclusion. A switch in vancomycin susceptibility testing from Etest™ to Phoenix™ automated system was associated with a significant decrease in daptomycin and ceftaroline use and an increase in IV vancomycin use without any change in all-cause inpatient mortality.

Table 1: Difference in MIC Data and Antibiotic Utilization

Parameters	Etest™ ($n = 119$) *n* (%)	Phoenix™ ($n = 62$) *n* (%)	*P*-Value
MIC = 2 μg/mL	56 (47)	2 (3)	<0.001
MIC = 1.5 μg/mL	37 (31)	N/A	N/A
MIC ≤1 μg/mL	26 (22)	60 (97)	<0.001
IV vancomycin	60 (50)	43 (69)	0.007
Daptomycin	44 (37)	13 (21)	0.013
Ceftaroline	38 (32)	12 (19)	0.036
Other antibiotics[a]	4 (3)	4 (6)	0.27
All-cause inpatient mortality	19 (16)	6 (10)	0.24

[a]Include linezolid and trimethoprim/sulfamethoxazole.

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1805. Impact of Antimicrobial Stewardship Interventions Using Rapid Molecular Testing on the Appropriate Use of Antiviral Therapy and Reduction of Unnecessary Antibiotic Therapy for Patients Admitted With Acute Influenza

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Background. Rapid molecular tests combined with Antimicrobial Stewardship Program (ASP) interventions have provided opportunities to optimize patient outcomes and reduce unnecessary antimicrobial use. Our institution currently uses an FDA approved influenza/respiratory syncytial virus polymerase chain reaction (PCR) assay and multiplex respiratory panel. In addition, our institution commonly utilizes procalcitonin (PCT) levels. The ASP at Summa Health System – Akron Campus (SHS-AC) routinely recommends use of these rapid diagnostic tests to assist with antimicrobial and antiviral usage, including the discontinuation of antibiotics in influenza positive patients in the absence of a concurrent bacterial infection.

Methods. A retrospective review of all ASP interventions on influenza positive patients at SHS-AC was performed from December 2017 to March 2018. The ASP reviewed all patients on broad-spectrum antibiotics >48 hours and all influenza positive patients without Infectious Disease consultation. The appropriateness of antimicrobial and antiviral therapy was assessed, including assessment of culture and PCR results, PCT levels, indication of therapy, and renal function. For patients with a positive influenza PCR and low PCT without evidence of bacterial infection, the recommendation was to discontinue antibacterial use. Data collected included: intervention type, acceptance rate, PCT levels, and influenza subtype.

Results. Two hundred thirty-three total recommendations were made by the ASP on influenza positive patients, with a 96.6% acceptance rate. Interventions included the following: obtain PCT level (54/233), de-escalate or stop antibiotics based on culture, PCR, and PCT results (116/233), obtain influenza or respiratory PCR (8/233), initiate oseltamivir (37/233), and other (18/233).

Conclusion. ASP intervention combined with PCT levels and PCR results contributed to the reduction of unnecessary antibiotic use, and the initiation of oseltamivir therapy in influenza-positive patients.

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1806. Implementation of Rapid Diagnostic Testing Without Active Stewardship Team Notification for Gram-Positive Blood Cultures in a Community Teaching Hospital

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Background. Rapid diagnostic testing (RDT) for Gram-positive blood cultures has previously shown to significantly decrease time to appropriate antibiotic therapy as compared with traditional microbiological methods. Implementation of RDT with antimicrobial stewardship team (AST) notification may significantly improve RDT use and decrease time to optimal therapy; however, in community hospitals with limited resources AST notification may not be feasible. This study aimed to determine the impact of RDT implementation without AST notification on time to appropriate antibiotic therapy for blood cultures growing Gram-positive cocci (GPC) in clusters in a community teaching hospital.

Methods. A retrospective quasi-experimental study was conducted evaluating adult inpatients with a blood culture positive for GPC in clusters. The primary outcome of this study was to compare the time to appropriate therapy for Staphylococcal bacteremia in the pre-RDT group (January 1–June 30, 2016) vs. post-RDT group (January 1–June 30, 2017). Secondary endpoints included comparing the number of anti-MRSA doses administered to patients whose cultures grew coagulase-negative staphylococcus (CoNS) determined contaminants and length of stay (LOS) between groups.

Results. Two hundred fifty-two patients were included in the study (pre-RDT $n = 143$, post-RDT $n = 109$). There were 58 patients with *Staphylococcus aureus* bacteremia (SAB) and 194 patients with CoNS. Mean time to active therapy for SAB following Gram-stain result was similar between groups (pre-RDT 4.1 hours vs. post-RDT 1.06 hours, $P = 0.157$). The median time to discontinuation of antibiotics for CoNS contaminants was significantly decreased in the post-RDT group (26.38 vs. 8.27 hours, $P = 0.006$) and the median number of anti-MRSA doses was also significantly decreased (1 vs. 0 dose, $P = 0.003$). In the post-RDT group, significantly fewer patients with CoNS cultures had empiric anti-MRSA therapy ordered after Gram-stain (50% vs. 24.4%, $P = 0.042$). Mean LOS was significantly shorter for patients with CoNS contaminants in the post-RDT group (10.1 vs. 7.5 days, $P = 0.036$).

Conclusion. Implementation of the RDT without AST notification significantly improved time to de-escalation, decreased empiric anti-MRSA antibiotic exposure, and resulted in significantly shorter LOS for patients with CoNS contaminated blood cultures.

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1807. The Impact of Rapid Diagnostic Testing and Antimicrobial Stewardship on the Time to Escalation/De-escalation of Antimicrobial Regimens for Gram-Negative Bloodstream Infections at a Large Community Hospital

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Background. Prompt identification of an etiologic pathogen is vital for the optimal management of bloodstream infections (BSIs). Rapid diagnostic testing (RDT) has implications for the treatment of BSIs, particularly for cases with resistant Gram-negative (GN) organisms. The purpose of this study was to assess the impact of Verigene's Gram-negative blood culture nucleic acid test (BC-GN), in conjunction with a pharmacy-driven antimicrobial stewardship team (AST), on time to antimicrobial optimization in GN BSIs.

Methods. This was a retrospective pre- and post-intervention study at a 950-bed community hospital in South Texas. Clinical isolates from adult patients with GN BSIs were included across two study periods: from July 1, 2012 to July 31, 2014 in the pre-intervention group (prior to BC-GN with AST) and from July 1, 2015 to July 31, 2017 in the post-intervention group (after BC-GN with AST). RDT results were transmitted