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Background. Since its introduction in 2009, use of daptomycin for treatment of enterococcal infections has resulted in the emergence of DNSE. Between 2009 and 2013, daptomycin nonsusceptibility among *E. faecium* was closely associated with emergence of a unique and dominant clone ST736 in our institution. In 2014, we instituted targeted measures to optimize the use of daptomycin. In this study, we describe the significant phenotypic and genotypic impact of reduced daptomycin use on clinical enterococcal isolates.

Methods. Enterococcal clinical isolates were recovered from January 2014 through December 2017. Daptomycin susceptibility was determined by MicroScan WalkAway™ System and confirmed by *E*-test. Selected DNSE and vancomycin-resistant *E. faecium* (VREfm) clinical isolates were analyzed by next-generation sequencing (NGS) using the Illumina systems to provide multilocus sequencing type (MLST). Daptomycin utilization data were extracted from pharmacy records.

Results. Targeted antibiotic stewardship initiatives consisted of preapproval, daily review for optimization of dose and duration, rapid de-escalation, consideration for appropriate alternative antibiotics for select disease syndromes and stopping of inappropriate daptomycin therapy. Over 4 years, this lead to a 39% reduction in overall use of daptomycin. Besides direct cost saving, this reduced use was associated with significant reduction in daptomycin nonsusceptibility from 12% to 4%, lowering of MIC_{90} from 8 to 4 µg/mL, and a clonal shift from dominant ST736 to ST117.

	Daptomycin Usage Days of Therapy /1,000 Days (Monthly Average)	Phenotypic Changes			Genotypic Changes
		MIC_{50} (µg/mL)	MIC_{90} (µg/mL)	% DNSE	Dominant Genotype Among VREfm
2014	742	4	8	12	**ST736 (38%)** ST18 (21%) ST412 (12%) ST117 (11%)
2015	633	4	6	10	
2016	576	4	4	7	
2017	455	4	4	4	ST736 (5%) ST18 (4%) ST412 (11%) ST117 (41%)

Conclusion. A targeted antibiotic stewardship initiative to address rising rate of daptomycin nonsusceptibility among *E. faecium*, resulted in significant phenotypic and genotypic changes among clinical isolates. This study also shows successful integration of NGS in a clinical microbiology lab to validate phenotypic changes of daptomycin nonsusceptibility and to help design future infection control and antibiotic stewardship endeavors.

Disclosures. **A. Dhand**, Merck: Speaker's Bureau, Speaker honorarium. Astellas: Scientific Advisor, Consulting fee.

1799. Impact of Real-Time Electronic Notifications to Pharmacists of Rapid Diagnostic Blood Culture Results

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Background. Rapid diagnostic tests that utilize multiplex PCR technology provide faster time to pathogen identification, but maximizing the impact on outcomes is dependent upon who is available to respond to test results. In June 2017, pharmacists began receiving in-basket notifications of positive results from the institution's FilmArray BCID assay. The objective of this study was to determine the impact on antibiotic utilization associated with this method of communicating results.

Methods. This was a retrospective, observational, before-and-after study at an academic medical center with an established stewardship program. Inclusion criteria: Adult patients age ≥18 admitted to an ICU or oncology unit with ≥1 positive blood culture containing a gram-positive organism identified by FilmArray BCID. Patients with polymicrobial infection, concomitant infection caused by a different organism, antibiotics started before admission, or death prior to organism identification were excluded. Data were collected during a 4-month period before (PRE) and a 4-month period after (POST) implementation of in-basket notifications. Stewardship metrics and other outcome measures were compared between the two groups. Pharmacists received no targeted stewardship training on how to respond to results.

Results. Ninety-two patients met study criteria (49 PRE and 43 POST). Patients were age 62 ± 16, male (55%), and 77 (84%) were located in an ICU. Median Charlson Comorbidity Index was 4 and Pitt Bacteremia Score was 1. Sixty-seven patients were considered to have noncontaminant bloodstream infection. Median results for these patients are listed in the table. Patients with contaminants (n = 25) had 3.5 and 7 antibiotic-free days in the PRE and POST groups, respectively (P = 0.34).

Conclusion. In-basket notifications did not significantly improve antibiotic utilization or clinical outcomes. Active interventions and antimicrobial stewardship initiatives are needed in combination with rapid diagnostic tests.

	PRE (n = 35)	POST (n = 32)	P-value
Time to active therapy (hours)	0.85	3.2	0.33
Time to optimal abx (hours)	47.4	44.4	0.43
Time to de-escalation (hours)	48.4	46.8	0.24
Defined daily doses	10.4	10.4	0.81
Days of therapy	13	11	0.70
In-hospital mortality, n (%)	9 (26)	8 (25)	0.98
Length of stay from positive culture (days)	9.6	7.9	0.94

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

1800. Clinical Impact of Real-Time Predictive Model to Facilitate Antibiotic Prescribing in Gram-Negative Bacteremia

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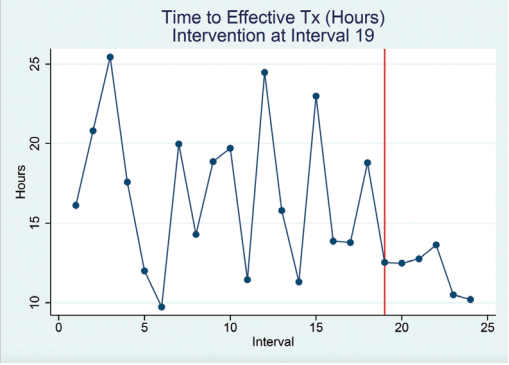
Background. Delay in effective antibiotic administration in severe infections such as bacteremia is associated with worse clinical outcomes. We implemented previously validated software that uses real-time predictive modeling to determine patient-specific antibiograms (PS-ABG). The software allowed prescribers to run the model on their individual patients. It also automatically evaluated positive blood cultures, alerting the antibiotic stewardship team if there was <90% chance of the organism being susceptible to current antibiotic therapy.

Methods. We performed a quasi-experimental study to evaluate clinical outcomes in patients with Gram-negative rod (GNR) bacteremia 18 months before (PRE) and 6 months after (POST) implementation of the software. Primary outcome was median time to effective antibiotic. Secondary outcomes included in-hospital mortality, utilization of antibiotics used for multidrug-resistant GNRs (MDR-GNR), median time to effective antibiotic in organisms resistant to at least one first-line antibiotic for sepsis, and length of stay.

Results. The change per month in the primary outcome did not differ between the PRE and POST periods (P = 0.48) (figure). Time to effective antibiotics in GNR bloodstream infections that were resistant to at least one first-line antibiotic for sepsis (cefepime, piperacillin–tazobactam, or levofloxacin) was lower following the intervention (15.8 hours vs. 13.7 hours, P = 0.11), and mortality decreased following the intervention (14.6% vs. 10.0%, P = 0.11) although these differences were not statistically significant. There was no difference in other secondary outcomes between PRE and POST groups: length of stay (7.7 vs. 7.5 days, P = 0.74) and days of therapy of MDR-GNR agents per 30 days of hospitalization (3.5 vs. 2.5, P = 0.09).

Conclusion. There was no difference in median time to effective antibiotic in all patients with GNR bacteremia. There was lower in-hospital mortality in the POST group and shorter time to effective antibiotic therapy in GNR bacteremia resistant to at least one first-line antibiotic for sepsis, although these differences were not statistically significant. Additional study in larger cohorts over longer periods is warranted to determine whether PS-ABGs improve clinical outcomes in patients with more resistant GNR bacteremia.



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

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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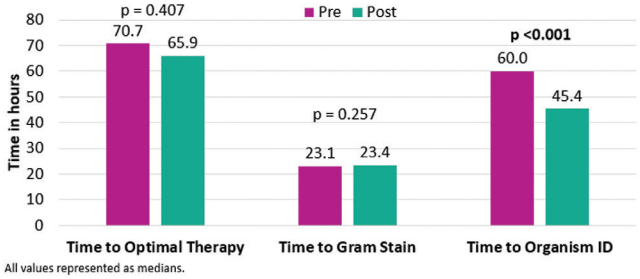
Background. Rapid diagnostic testing in combination with real-time antimicrobial stewardship intervention can reduce time to de-escalation of empiric antibiotics and discontinuation of unnecessary therapy. This study aims to evaluate the clinical impact of Matrix-Assisted Laser Desorption/Ionization 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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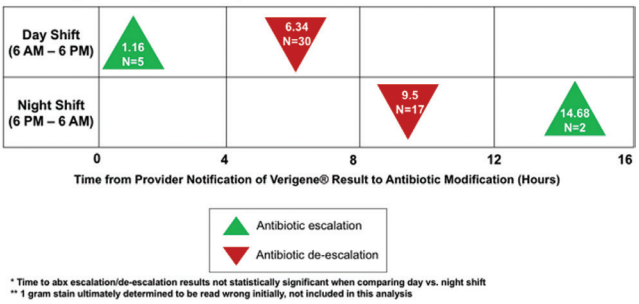
Background. Rapid blood culture diagnostics paired with antimicrobial stewardship (AS) enhances appropriate antimicrobial treatment for bloodstream infections (BSI). Ideal implementation strategies for blood culture diagnostics are not clear, including whether to perform molecular testing during off-hours 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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