For secondary endpoints: improvement in sensitivity of different antibiotics for *P.aeruginosa* was noticed. Increased 48-hours antibiotic stop review (2 vs 722), increased number of cultures reviewed (380 vs 518), increased 7-days antibiotics review (24 vs 78), and increased restricted antibiotics (142 vs 432) were observed.

Conclusion: Transforming the ASP program at MHSC with Cardinal Health from resulted in improved efficiency, increased number of ASP-related interventions/day, decreased antibiotics DOT, decreased antibiotics-related cost/patient day, and increased sensitivities of drugs against *Pseudomonas aeruginosa*.

Disclosures: Stephanie L. Do, PharmD, Cardinal Health (Employee) Saboor Shahzad, BS. PharmD, Cardinal Health (Employee) Terence Lok, PharMD, MS, Cardinal Health (Employee) Hye Hyun An, PharMD Candidate 2022, Cardinal Health (Employee) Suzanna Arnone, PharMD, Cardinal Health (Employee)

48. Association of Rapid Pathogen Identification and Pharmacist Intervention on Time to Optimal Antimicrobial Therapy for Bloodstream Infections at Two Community Hospitals

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Session: P-3. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background: As many as 1 in 3 patients with bloodstream infections at community hospitals receive inappropriate empiric antimicrobial therapy. Studies have shown that the coupling of real-time intervention with rapid pathogen identification improves patient outcomes and decreases health-system costs at large, tertiary academic centers. The aim of this study was to assess if similar outcomes could be obtained with the implementation of real-time pharmacist intervention to rapid pathogen identification at two smaller, rural community hospitals.

Methods: This was a pre-post implementation study that occurred from September of 2019 to March 2020. This study included patients ≥18 years of age admitted with one positive blood culture. Patients were excluded if they were pregnant, had a polymicrobial blood culture, known culture prior to admission, hospice consulted prior to admission, expired prior to positive blood culture, or transferred to another hospital within 24 hours of a positive blood culture. Endpoints of patients prior to intervention were compared to patients post-implementation. The primary endpoint was time to optimal antimicrobial therapy. Secondary endpoints included time to effective antimicrobial therapy, in-hospital mortality, length of hospital stay, and overall cost of hospitalization.

Results: Of 212 patients screened, 88 patients were included with 44 patients in each group. Both groups were similar in terms of comorbidities, infection source, and causative microbial. No significant difference was seen in the mean time to optimal antimicrobial therapy (27.3±35.5 hr vs 19.4± 30 hr, p=0.265). Patients in the post-implementation group had a significantly higher mean hospitalization cost ($24,638.87± $11,080.91 vs $32,722.07±$13,076.73, p=0.013). There was no significant difference in time to effective antimicrobial therapy, in-hospital mortality, or length of hospital stay.

Conclusion: There were no between-group differences in the primary outcome of time to optimal therapy, with a higher mean hospitalization cost after implementation. These results suggest further antimicrobial stewardship interventions are needed, along with larger studies conducted in the community hospital settings.

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49. Clinical Utility of Oseltamivir Restriction Policy

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Session: P-3. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background: Inappropriate use of oseltamivir and antibiotics for upper respiratory tract infections may increase risk of microbial resistance. Restriction policies have been used to curtail inappropriate use of oseltamivir and antimicrobials in suspected or confirmed influenza patients. We assessed the impact of Infectious Diseases (ID) consult on the management of oseltamivir and concomitant antibiotics.

Methods: A single-center, retrospective study of patients ≥ 17 years, admitted for greater than 24 hours who received oseltamivir from October 1, 2018 to May 1, 2019 were evaluated. Demographics, Charlson Weighted Index of Comorbidity (CWIC), length of hospital stay (LOS), discharge disposition, rapid flu test, respiratory viral panel, sputum and blood cultures, antibiotic regimen and duration were collected. Continuous variables were analyzed using Students t-test and categorical variables with Chi square test.

Results: 298 patients were screened and 182 patients met the inclusion criteria. Please see table below for results. Oseltamivir was appropriately continued in 92.9% in the ID consult group compared to 89.3% in the non-ID consult group (p = 0.51). Antibiotic interventions were appropriate in 63.2% of the ID consult group compared to 40% in non-ID group (p = 0.36).

Results Summary

	ID Consulted (n = 154)	ID Not Consulted(n = 28)	P-value
Age mean (yrs.)	59.9 ± 18.6	54 ± 19	0.13
Males, n (%)	59 (38.3)	10 (35.7)	0.79
LOS mean (days)	5.4 ± 4.8	3 ± 2.4	0.01
CWIC	1.7 ± 1.7	0.9 ± 1.2	0.02
African Americans, n (%)	102 (66.2)	18 (64.3)	0.39
Rapid flu test positive, n (%)	114 (74)	15 (53.6)	0.28
Positive respiratory viral panel, n (%)	18 (11.7)	2 (7.1)	0.48
Sputum culture positive, n (%)	8 (5.2)	0 (0)	
Blood culture positive, n (%)	5 (3.3)	0(0)	
Antibiotics received, n (%)* Duration (days)	87 (56.5) 1.88	10 (35.7) 1.39	0.04
Discharge disposition, n (%) Home Facility AMA Deceased	 120 (77.9) 29 (18.8) 2 (1.3) 3 (1.9)	 26 (92.9) 2 (7.1) 0 0	
*Only antibiotics prescribed for respiratory infections and bacteremia were included			

Conclusion: Oseltamivir interventions were appropriate and similar in between groups. Further, there was higher percentage of appropriate antibiotic interventions in the ID physician group. Duration of antibiotics was longer in the ID physicians consulted group which may be due to higher severity of illness in the group.

Disclosures: **All Authors**: No reported disclosures

50. Comparative Incidence of Acute Kidney Injury in Septic Patients Treated with Vancomycin in Combination with Piperacillin/Tazobactam vs. Cefepime

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Session: P-3. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background: Empiric antibiotic therapy for sepsis of unknown origin is typically broad spectrum and covers *P. aeruginosa* and methicillin-resistant *S. aureus* (MRSA). Nephrotoxicity is a well-known adverse event of IV vancomycin and literature suggests that combination with piperacillin/tazobactam may increase risk for acute kidney injury (AKI) as compared to combination with other beta-lactams. However, evidence is conflicting. The primary outcome of this study was to compare incidence of AKI in septic patients treated with IV vancomycin and piperacillin/tazobactam (VZ) vs. cefepime (VC). Secondary outcomes include hospital length of stay, inpatient mortality, and impact to direct variable cost.

Methods: Adult patients discharged with a sepsis diagnosis code who received VZ or VC for ≥24 hours in 2012–2019 were retrospectively identified. AKI was defined using RIFLE criteria. Patients were excluded for ESRD on HD, AKI occurring < 48 hours after treatment initiation or >7 days after discontinuation, pregnancy, febrile neutropenia, or meningitis. Statistical analysis controlled for many factors including age, race, gender, Elixhauser comorbidity burden, hours to first antibiotic dose, length of stay, and receipt of concomitant nephrotoxins.

Results: A total of 12,405 patients were evaluated; 7,818 received VZ and 3,096 received VC. Patients given VC had a 40% reduction in risk of AKI compared to those given VZ (IRR 0.600; 95% CI 0.46–0.78). These patients also had a 4% reduction in risk of having one additional inpatient day (IRR 0.961; 95% CI 0.937–0.985). Patients who received VZ and experienced AKI were 82.3% more likely to die inpatient compared to patients that did not (IRR 1.822; 95% CI 1.50–2.21). Patients treated with VC incurred less in average direct variable cost than those treated with VZ (p = 0.034) and those who suffered AKI also incurred more on average than those without AKI (p = 0.005).

Conclusion: Compared to septic patients treated with VZ, those treated with VC had significantly decreased risk of AKI as defined by RIFLE criteria. Patients who received VZ were at higher risk for a longer hospital stay and, if they also experienced AKI, inpatient mortality. VZ was associated with higher direct variable cost and patients with AKI incurred more dollars per encounter than those without AKI.

Disclosures: **All Authors**: No reported disclosures

51. Development and Assessment of a Process to Describe the Timing of Antibiotic Changes in Adult Inpatients

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Session: P-3. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background: Hospital antimicrobial stewardship programs (ASP) perform prospective audit and feedback to optimize use of antimicrobials; however, workflow inefficiency continues to be a distinct challenge. We developed a method to describe the volume and timing of antimicrobial changes to inform decisions on optimal timing of ASP review and intervention.

Methods: This retrospective study was performed at Duke University Hospital using anonymized antibiotic administration records from the DASON central database. Eligible antibiotic courses were administered to inpatients ≥ 18 years of age and had received ≥ 2 antibiotics administrations for ≥ 24 hours of treatment. A 2-month exploratory cohort (September to October 2017) was used to develop an antibiotic spectrum ranking (Table 1) and decision algorithm which was applied to a 1-year cohort (November 2017 to October 2018) for analysis of total change in antibiotic orders by day of the week. For each interval, the sum of antibiotic ranks was calculated and applied using specified definitions (Table 2) to determine the type of change occurring. The primary outcome was the number of total antibiotic changes that occurred on each day of the week. Secondary outcomes included the number and type (initiations, discontinuations, de-escalations, and escalations) of change. Descriptive statistics were used to describe the outcomes by day of the week.

Table 1: Antibiotic Spectrum Ranking

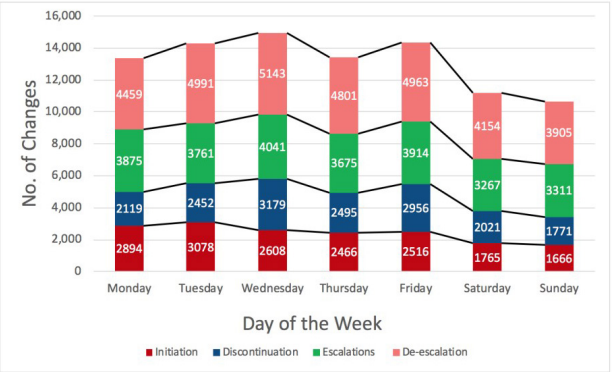
Spectrum Category	Narrow Spectrum	Broad Spectrum	Extended Spectrum, including multi drug resistant organisms and *Pseudomonas aeruginosa*	Protected
Rank	1	2	3	4
Antibacterials included	- amoxicillin - cephalosporins – 1st and 2nd generation - doxycycline - metronidazole - nafcillin - nitrofurantoin - oxacillin - penicillin - Trimethoprim/ Sulfamethoxazole	- amoxicillin/clavulanate - ampicillin/sulbactam - azithromycin - cephalosporins – ceftriaxone and oral 3rd generation - clarithromycin - clindamycin	- aminoglycoside - aztreonam - cefepime - ceftazidime - ertapenem - fluoroquinolones - piperacillin/tazobactam - vancomycin (IV only)	- ceftaroline - ceftazidime/avibactam - ceftolozane/tazobactam - colistin - daptomycin - imipenem/cilastatin - linezolid - meropenem - meropenem/vaborbactam - polymyxin - tedizolid - tigecycline

Table 2: Key Definitions

Change	any of the following: initiation, escalation, de-escalation, or discontinuation of an antibiotic occurring within an antibiotic course to a given patient as evidenced by bar coded administration data (as defined below)
Interval	AM and PM of each day of the week - 14 total intervals
Initiation	first antibiotic administration to a patient without antibiotic administrations within the prior > 72 hours
Discontinuation	last antibiotic administration to a patient without subsequent antibiotic administration for > 72 hours
De-escalation	reduction in the antibiotic rank within an antibiotic course from one interval to the next
Escalation	increase in the antibiotic rank within an antibiotic course from one interval to the next
Mean changes per patients on antibiotics	denominator used to display the mean changes per interval divided by the total patients on antibiotics for that day.

Results: The ranking and decision algorithm were applied to 16,993 unique antibiotic courses. Total changes occurred most on Wednesday (14,971, 16.2% [95% CI 15.7–17.1%]) and Friday (14,349, 15.6% [95% CI 15.0–16.2%]). Compared to intervals on weekdays (0.407 mean changes per patients on antibiotics [95% CI 0.401–0.413]), weekends had a lower number of changes (0.363 mean changes per patients on antibiotics [95% CI 0.349–0.377]). Initiations occurred most frequently on Tuesday (3,078, 18.1% [95% CI 16.3–19.9%]), and discontinuations on Wednesday (3,179, 18.7% [95% CI 17.4–20.5%]) (Figure 1).

Figure 1: Types of Changes per Day



Conclusion: We developed and applied a method to characterize antimicrobial changes. In our institution, the reductions in the number of changes observed on weekends provide an opportunity for ASP involvement to be incorporated and help facilitate appropriate antimicrobial changes.

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52. Development and Implementation of a Short Duration of Antibiotic Therapy Algorithm for Uncomplicated Gram-Negative Bacteremia

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Session: P-3. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background: Recent literature suggests no difference in clinical outcomes between short (7 days) and prolonged course (14 days) antibiotic therapy for the treatment of uncomplicated Gram-negative bacteremia (GNB).

Methods: The objectives of the study were to develop and implement a treatment algorithm that identifies patients who are eligible for 7-day therapy for uncomplicated GNB and evaluate its impact on patient outcomes at The Johns Hopkins Hospital (JHH) in Baltimore. The algorithm was developed and implemented at JHH on 11/11/2019. From 11/11/2019 to 3/31/2020, the Infectious Diseases (ID) Pharmacy Resident and ID pharmacists reviewed cases of GNB on weekdays and contacted teams to provide algorithm-compliant treatment recommendations. To quantify the impact of the intervention on clinical outcomes, data from the same time period during the previous year (baseline) were collected and compared to those collected during the intervention. The primary outcome was duration of antibiotic therapy for GNB. Secondary outcomes included: duration of intravenous (IV) antibiotics, length of hospital stay (LOS), and recurrent bacteremia.

Results: A total of 345 patients with GNB were identified (142 baseline; 203 intervention) of which 59 and 55 patients met criteria for 7-day therapy, respectively. The Pitt bacteremia score (median 1), bacteremia source [urinary (43%), abdominal (23%)], and organisms [*E. coli* (48%) and *Klebsiella* spp. (33%)] were similar between the periods. More patients in the intervention period were treated for ≤8 days (60.0% vs. 37.3%; p=0.015), and the median duration of therapy was 2 days shorter (8 vs. 10 days; p=0.04). Median duration of IV antibiotic therapy (4 vs. 7 days; p=0.004) and median LOS (4 vs. 7 days; p=0.029) were also shorter in the intervention period. There were no differences in the rate of 30-day recurrent bacteremia between the periods (3.4% baseline vs. 1.8% intervention; p=0.60).

Conclusion: Our pharmacist-led intervention successfully shortened the duration of therapy, increased conversion from IV to PO therapy, and reduced LOS, without negatively impacting the number of patients with recurrent GNB.

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53. Effect of rapid identification of bloodstream isolates on antibiotic management using a pharmacist-based treatment algorithm

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Session: P-3. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background: The use of rapid molecular diagnostic testing to identify microorganisms and resistance markers has great potential to optimize medical care and assist with antimicrobial stewardship. We implemented the Verigene bloodstream infection testing panel along with a pharmacy notification system to clinicians and assessed efficacy of the system.

Methods: In November 2019, we implemented the Verigene gram positive and negative panels for patients with positive blood cultures. Our antimicrobial stewardship committee developed a recommended treatment algorithm for pharmacists to use when notified of Verigene results. The first positive bottle per patient and per admission was tested. Subsequent positive bottles were not tested on the Verigene unless a different morphology was noted on the gram stain. A gram stain was performed on all positive cultures and this result was called to the patient's nurse (if inpatient) and the covering physician was notified of the result. After the Verigene result was available, an assigned pharmacist was notified of these results (organism identification and resistance markers if identified). Pharmacists notified covering physicians of the test results and the recommended antibiotic management. Pharmacists documented the frequency that the test result changed the antibiotic management, including escalation, de-escalation or no change in therapy. The data from the first six months was summarized.

Results: From 11/19/19-5/18/20, a total of 575 test results were called into the pharmacist (average 3.2/day). Among these, 165 (28.7%) were considered likely contaminants, 106 had no change in therapy and 59 had antibiotic de-escalation. Among the remaining 410 patients, 156 had de-escalation, 53 had escalation, 30 were not on any antibiotics and appropriate antibiotics were started. Overall, antibiotic management changed in 298/575 (51.8%) of isolates run by Verigene in our institution including 215 (37.4%) de-escalations. The most frequent antibiotics that were stopped included vancomycin (142) and cefepime (53).

Conclusion: Our pharmacist-based algorithm for notification and treatment recommendation based on Verigene results was highly successful in optimizing antibiotic management and improving antimicrobial stewardship in our institution.

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