

48. Local Implementation of an Antibiotic Stewardship Intervention for Asymptomatic Bacteriuria Through Centralized Facilitation Required Minimal Costs and Effort

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Session: P-04. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background. The cost of an antibiotic stewardship intervention is an important yet often neglected factor in antibiotic stewardship research. We studied the costs associated with successful implementation of the “Kicking CAUTI” intervention to decrease treatment of asymptomatic bacteriuria (ASB).

Methods. A central coordinating site facilitated roll-out of an audit and feedback intervention to decrease unnecessary urine cultures and antibiotic treatment in patients with ASB in four Veterans Affairs medical centers. Each site had a physician site champion, a part-time research coordinator, and 1-2 additional participants (often pharmacists). Participants kept weekly time-logs to collect the minutes associated with intervention tasks, and percent full-time effort (FTE) and costs were computed. For weeks with missing logs the average minutes for each activity associated with each type of professional was imputed. Salary information was obtained from the Bureau of Labor Statistics and Association of American Medical Colleges.

Results. Research coordinator time comprised of majority of the personnel time, followed by the physician site champions (Figure 1). Each intervention site required about 10% FTE/year of a research coordinator, and 3.5% FTE/year and 3.8% FTE/year of a physician and pharmacist respectively. The coordinating site required 37% FTE/year of a research coordinator, and 9% FTE of a physician to spearhead the intervention. Research coordinators predominantly spent their time on chart-reviews and project coordination. Physician champions predominantly spent their time on delivering audit and feedback and project coordination. The intervention cost USD 22,299/year per site on average, and USD 45,359/year for the coordinating site.

	Site 1 Average (min-max)	Site 2 Average (min-max)	Site 3 Average (min-max)	Site 4 Average (min-max)	Intervention Sites Average	Coordinating Site Average (min-max)
Infectious Diseases Physician	2.91 1.25 – 6.10	3.37 1.56 – 8.82	4.30 1.52 – 12.52	3.55 1.97 – 6.64	3.53 1.58 – 8.52	9.26 5.68 – 34.58
Research coordinator	8.80 5.99 – 27.07	12.27 5.98 – 26.74	10.08 5.08 – 22.19	8.46 5.26 – 20.01	9.90 5.58 – 24.00	36.93 29.17 – 47.92
Infectious Diseases Pharmacist	2.84 0.91 – 7.03	5.00 0.13 – 8.90	6.29 1.00 – 47.22	1.12 0.03 – 1.98	3.81 0.52 – 16.28	N/A
Nurse practitioner	N/A	1.37 0.15 – 2.82	N/A	N/A	1.37 0.15 – 2.82	N/A

N/A=Not Applicable (this professional type was not on the local site's team)

Conclusion. The Kicking CAUTI intervention was successful at reducing urine cultures and associated antibiotic use, with minimal time from the local team members. The research coordinators' time was primarily spent on collection of research data, which will not be necessary outside of a research project. Our model of centralized facilitation makes economic sense for widespread scale-up and dissemination of antibiotic stewardship interventions in integrated healthcare systems.

Disclosures. Barbara Trautner, MD, PhD, Genentech (Consultant, Scientific Research Study Investigator)

49. Impact of a Rapid Genotypic Platform for Gram-negative Bloodstream Infections, Paired with an Antimicrobial Stewardship Intervention, on Time to Optimal Antimicrobial Therapy

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Session: P-04. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background. Gram-negative bacteremia is associated with significant morbidity and mortality. Development of an algorithm for antimicrobial selection, using institution-specific antibiogram data and rapid diagnostics (RDT), achieves timely and appropriate antimicrobial therapy. The objective of this study is to assess the impact of a pharmacy-driven antimicrobial stewardship initiative in conjunction with ePlex[®] BCID on time to optimal antimicrobial therapy for patients with gram-negative bloodstream infections.

Methods. This retrospective, observational, single-center study included adult patients with a documented gram-negative bloodstream infection in whom the ePlex[®] BCID was employed. A pharmacist-driven antimicrobial stewardship intervention was initiated on December 1, 2020; pre-intervention (December 2019 – March 2020) was compared to the post-intervention (December 2020 – February 2021) period. The following organisms were included: *Citrobacter spp.*, *Escherichia coli*, *Klebsiella aerogenes/pneumoniae/oxytoca*, *Proteus spp.*, *Enterobacter spp.*, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii*. Polymicrobial bloodstream infections or those who had an ePlex[®] panel performed prior to admission were excluded. The following clinical outcomes were assessed: time to optimal antimicrobial therapy, length of stay (LOS), and inpatient-30-day mortality.

Results. One hundred and sixty-three met criteria for inclusion; 98 patients in the pre-intervention group and 65 patients in the post-intervention group. The mean Pitt Bacteremia Score was 1 in both groups (p=0.741). The most common organism identified by ePlex[®] BCID was *E. coli* (65.3% vs 70.8%; p=0.676). Eight *E. coli* isolates were CTX-M positive; no other gene targets were detected. The most common suspected source of bacteremia was genitourinary (72.5% vs 72.3%; p=1.0). Time to optimal therapy was reduced by 29 hours [37 (31 – 55) vs. 8 (4 – 28); p=0.048]. Length of stay and mortality was similar between groups.

Conclusion. Implementation of a rapid blood culture identification panel along with an antimicrobial stewardship intervention significantly reduced time to optimal therapy. Further studies are warranted to confirm these results.

Disclosures. All Authors: No reported disclosures

50. Impact of Antibiotic Stewardship Interventions on Colistin Use and Acinetobacter Resistance

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Session: P-04. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background. Our hospital had a widespread use of colistin and tigecycline, and very high resistance of *Acinetobacter Spp.* to colistin. The hospital did not have any infectious disease (ID) pharmacist and had only one ID consultant physician. The objective of this study was to evaluate the impact of our intervention on the utilization of colistin and tigecycline and resistance of *Acinetobacter Spp.*

Methods. This was a before an observational before-and-after study at a tertiary medical center. An ID pharmacist trained in antibiotic stewardship program (ASP) was invited by a tertiary hospital to help create an ASP. The hospital also hired four ID assistant consultants to help the primary ID consultant and pharmacists. The ASP started by restriction of colistin and tigecycline. The study outcomes were antibiotic consumption and resistance of *Acinetobacter spp.*

Results. Colistin utilization decreased by 60%, and the resistance of *Acinetobacter spp.* to colistin significantly decreased from 31% to 3% in a year. In addition, tigecycline utilization decreased by 46%. On the other hand, there were no significant changes in carbapenem utilization and resistance, which could be explained by switching from colistin and tigecycline to carbapenems.

Conclusion. Adding an ID pharmacist and ID assistant consultants to the ASP team, and the strict restriction of colistin use was associated with significant reduction in colistin use and *Acinetobacter* resistance.

Disclosures. All Authors: No reported disclosures

51. Sustained Impact of an Antimicrobial Stewardship (AS) Initiative Targeting Asymptomatic Bacteriuria and Pyuria in the Emergency Department (ED)

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Session: P-04. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background. The sustainability of unique AS initiatives are largely unstudied. A multi-faceted initiative to reduce inappropriate treatment of asymptomatic pyuria (ASP) and asymptomatic bacteriuria (ASB) in the ED was implemented at our institution in 2016. A pre-post intervention analysis demonstrated reduction in the inappropriate treatment (tx) of ASP/ASB from 100% to 32% (p< 0.001) following the intervention. The purpose of this present study was to determine the sustained impact of the initiative and determine if re-education provided in Oct 2020 could further reduce inappropriate tx.

Methods. This was a retrospective, interrupted time series study conducted at an 885 bed academic medical center. Patients (pts) discharged from the ED in Nov 2019 – Feb 2020 (group 1) and Nov 2020 – Feb 2021 (group 2) were retrospectively screened in chronological order until 50 pts in each group met study criteria. Similar to the 2016 study, pts were included if they were ≥ 18 years old and had a positive urine culture or pyuria. Pts were excluded if they had symptoms of a urinary tract infection (UTI), another infection requiring antibiotics (ABX), indwelling catheter, ureteral stent, or nephrostomy tube, or if pregnant or immunocompromised. The primary outcome was the proportion of pts prescribed ABX within 72 hrs of ED discharge. The secondary outcome was the number of pts returning to the ED with symptomatic UTI within 30 days of discharge. Group 1 was compared to the 2016 study's post group

to determine the sustained impact of the initial initiative; group 2 was compared to group 1 to determine the impact of re-education, which involved a presentation to ED providers and a posted algorithm and fact sheet.

Results. Results from all time periods are summarized in Table 1. Improvement in inappropriate tx was still noted 3 years after the intervention (28% vs 32%; p = NS). Re-education did not further improve inappropriate prescribing, with 28% of group 2 pts still receiving tx.

Table 1.

Outcome	2016 Study		Current Study	
	Pre	Post	Group 1	Group 2
Pts tx'd for ASB/ASP	37/37 (100%)	12/37 (32%)	14/50 (28%)	14/50 (28%)
Pts tx'd for ASP w/o ASB	25/25 (100%)	6/27 (22%)	10/46 (22%)	10/45 (22%)
Pts returning to ED w/in 30 days	3/37 (8%)	4/37 (11%)	4/50 (8%)	4/50 (8%)

Conclusion. The decrease in inappropriate use of ABX for ASP/ASB was still noted 3 years after implementation of a multi-faceted AS initiative. Re-education did not result in further improvement.

Disclosures. James Johnson, PharmD, FLGT (Shareholder) Vera Luther, MD, Nothing to disclose

52. Direct Communication Improves Response Time to Acceptance of Antimicrobial Stewardship Interventions

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Session: P-04. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background. Hospital antimicrobial stewardship program (ASP) reviews broad-spectrum antibiotics and recommends interventions to optimise antimicrobial use. However, about 30% of interventions are not accepted. This project aims to improve the response rate and time for acceptance of ASP interventions by direct communication with providers (via call or text messaging) once an intervention was made.

Methods. Pre-direct communication (PC) phase lasted from 1st Jan - 31st Dec 2017. A typed intervention was placed into the patient's medical records for the team to review. Thereafter, a direct communication (DC) phase ran from 1st Jan 2018 - 31st Jan 2019. Teams were immediately notified of any ASP interventions made via a call or text message, in addition to the document placed in the medical records. Specialty, acceptance rates, type of intervention and time to acceptance was recorded. Overall acceptance was counted if team followed the ASP recommendations within 48 hours.

Results. A total of 621 interventions were made over the 25-month period (PC n=334, DC n=287). We found that direct communications did not improve the overall acceptance rates (PC 66% vs. DC 65%, p=0.791), but significantly improved same day acceptance rates (PC 15% [49/334] vs. DC 33% [96/287], p< 0.001). This trend for higher same-day acceptance was also noted regardless of specialty. It increased from 15% to 45% (p< 0.001) for medicine & 15% to 25% (p=0.025) for surgery. Furthermore, overall acceptance for medical discipline was significantly higher in the DC phase (68% to 80%, p=0.024); no significant difference noted for the surgical disciplines. Same-day acceptance also improved when we compared the most common types of interventions (culture based de-escalation, discontinue antibiotic, narrow empirical coverage). In addition, DC helped narrow empiric antibiotic choices, with improvements in both same-day and overall acceptance of interventions (increased from 8% to 43%, p< 0.001 and 57% to 78%, p=0.12, respectively).

Conclusion. Direct communication with clinicians boosted same-day acceptance for ASP interventions. In addition, it increased overall acceptance for medical disciplines, and to narrow empiric antibiotic use. Future efforts will focus on in-person strategy with surgical teams for fruitful results.

Disclosures. All Authors: No reported disclosures

53. Optimizing Transitions of Care Antimicrobial Prescribing at a Community Teaching Hospital

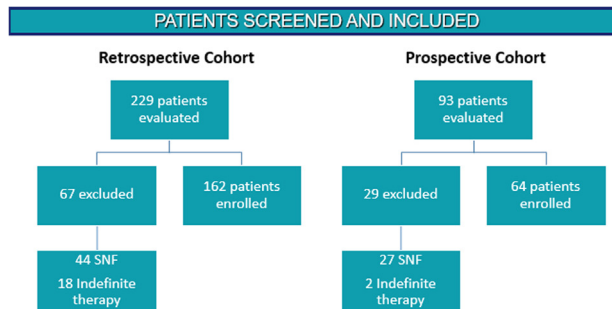
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Session: P-04. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background. Antimicrobial stewardship integral to patient care. Institutions with stewardship decrease antibiotic use, cost, and antibiotic-associated infections. However, few efforts have been formally made to address discharge antimicrobial prescribing, even though many patients started on antibiotic therapy in the hospital are prescribed oral antibiotics to complete their regimens.

Methods. This was an IRB approved, quasi-experimental, pre-post study. Patients were included if they were >18 years and were discharged from the hospital with an oral antibiotic prescription. Patients discharged against medical advice, prescribed indefinite prophylactic antimicrobial therapy for legitimate reasons, or discharged to a skilled nursing facility were excluded. The retrospective group evaluated a random sample of patients discharged in 2/2020. The prospective group included patients discharged between 1/2021 - 6/2021. In the prospective group, a clinical pharmacist assessed the indication for antibiotics and pending discharge antibiotic prescriptions for physician review. Antibiotic choice and duration of therapy were based on local and national guidelines.

Patient Screening for Inclusion and Exclusion



Breakdown of patients screened, included, and excluded for study

Results. 86 (53.1%) of 162 retrospective patients from 2/2020 prior to implementation of the program demonstrated were discharged on inappropriate antimicrobial therapy with excessive duration being the principal driver for inappropriateness. In the prospective group of 64 patients, the rate of patients discharged on inappropriate antibiotics decreased to 28.1% (p=0.001). The duration of inappropriate therapy decreased from a mean of 4.6 days to 2.7 days (p=0.001). 45 (70.3%) of 64 prospective pharmacist interventions were accepted by providers.

Study Outcomes

OUTCOMES (* indicate statistical significance)

Appropriateness of Therapy			
Outcome	Retrospective N = 162	Prospective N = 64	P-value
Appropriate Therapy*	76 (46.9%)	46 (71.9%)	0.001
Interventions Accepted		45 (70.3%)	--

Types of Inappropriate Therapy among Patients with Inappropriate Therapy

Secondary Outcomes	Retrospective N = 86	Prospective N = 18	P-value
Inappropriate Duration	74 (86%)	17 (94.4%)	0.458
Days Inappropriate*	4.6 days	2.7 days	0.001
Spectrum	12 (14%)	3 (16.7%)	0.721
Frequency	11 (12.8)	1 (5.6%)	1
Dose	7 (8.1%)	1 (5.6%)	0.687

Outcomes including overall appropriate prescribing, appropriate duration, spectrum, frequency, and dose, as well as days of inappropriate therapy

Conclusion. Literature demonstrates that prospective evaluation of discharge antibiotics by a clinical pharmacist is effective in improving appropriateness of discharge antibiotic prescriptions, optimizing duration of outpatient antibiotics as well as reducing unnecessarily broad-spectrum therapy. The prospective results from this study demonstrate that this innovative approach can improve outpatient oral antibiotic prescribing and provide a framework for other institutions to implement similar programs.

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54. The Effect of Targeting High-Risk Patients for Antimicrobial Stewardship Intervention on Hospital-Onset Clostridioides Difficile Infection Rates

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Session: P-04. Antimicrobial Stewardship: Outcomes Assessment (clinical and economic)

Background. Clostridioides difficile infection contributes to significant burden on patients and the healthcare system, costing billions in excess costs every year for hospital care. Continued use of antibiotics after C. difficile infection diagnosis is a risk factor for recurrent infection. Also, individuals who have had a recurrence of C. difficile infection are at a higher risk of subsequent episodes.

Methods. This prospective, observational, pre-post study evaluated the effect of implementing a targeted antimicrobial stewardship initiative towards a high-risk target population on the rate of in-hospital C. difficile infection rates. High-risk targets were identified through an electronic health system report of admitted patients at a large academic medical center who were toxin assay positive or had a documented history of C. difficile infection. Subjects who met the criteria were assessed for interventions by the pharmacy-driven antimicrobial stewardship service. The primary outcome compared the hospital-onset C. difficile rates and standardized infection ratio (SIR) before and after implementation of the initiative. The SIR is reported to the National Healthcare Safety Network (NHSN) and is calculated as a ratio between the number of observed and predicted infections, which is adjusted for facility-specific factors that contribute C. difficile risk. Negative binomial regression was used to calculate the predicted C. difficile infections in the SIR. Poisson regression was used to generate a 95% prediction interval for the predicted C. difficile infection rate.