220. Taking Off With Antimicrobial Intervention Rounds (AIR): Successes of a Pilot Stewardship Service at a Tertiary-Care VA Medical Center
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**Background.** Prospective audit and feedback is one of the core strategies of an antimicrobial stewardship program (ASP). Here, we hypothesized that the addition of AIR to our extant ASP would enhance appropriate use of parenteral (IV) antibiotics (ABs) on a large inpatient medical service.

**Methods.** Adult patients on medicine wards beginning in October 2017 and not followed by the infectious diseases (ID) service were included for stewardship intervention if they were on IV ABs ≥48 hours. Recommendations were classified into: (1) duration of therapy; (2) dose adjustment; (3) IV to oral conversion; (4) adverse event prevention; (5) AB avoidance; (6) anti-pseudomonal or (7) vancomycin de-escalation; (8) AB discontinuation; (9) ID consult; (10) Delta alternative AB; (11) allergy assessment; or (12) diagnostics. Early impact of the interventions was assessed after 3 months via the Standardized Antimicrobial Administration Ratio (SAAR) and compared with the 3-month pre-AIR period. The SAAR is used to benchmark facilities’ AB use against those of similar complexity; SAAR = 1 indicates observed = predicted use.

**Results.** For 158 interventions made, the most common syndromes were pneumonia (41%), skin and soft tissue (29.4%), and urinary tract infection (17.7%). Intervention categories other than 4, 9, and 11 had acceptance rates >85% (Figure 1). The SAAR decreased from the pre- to post-AIR period in terms of agents for: broad-spectrum use in HAI (SAAR relative ratio [RR]: 0.80, 95% CI [0.73–0.88]); MRSA (SAAR RR: 0.81, 95% CI [0.73–0.91]); and all indications (SAAR RR: 0.86, 95% CI [0.82–0.90]). During the same periods, surgical wards without AIR showed no Δ in AB use.

**Conclusion.** The majority of AB use recommendations delivered by a pharmacist-physician stewardship team were highly accepted by medical providers and led to a 15–20% decrease in overall AB use, without adverse effect during the immediate postintervention period. Potential clinical benefits, such as decreased rates of *Clostridium difficile* disease, will need to be measured as the AIR program advances. It is worth noting that interventions for AB allergy assessment were least accepted by providers, possibly due to time required to comply. Design of prospective audit and feedback programs may need to address this potential deficiency.

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221. Save the Quinolones! Impact of a Non-Restrictive Fluoroquinolone Reduction Initiative on Antibiotic Resistance in an Urban Teaching Hospital
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**Background.** The use of fluoroquinolones, one of the most commonly used antibiotic classes in the United States, is associated with adverse drug events, *Clostridium difficile* infection and antibiotic resistance in *Staphylococcus aureus* and other Gram-negative bacilli. Many hospitals have instituted resource-intensive interventions to minimize fluoroquinolone use. In hospital settings with fewer resources, education and awareness campaigns offer a more feasible approach. The purpose of this study was to assess the impact of a nonrestrictive fluoroquinolone reduction initiative on institutional antibiotic resistance.

**Methods.** This is a retrospective pre- and postinterventional ecological study. The fluoroquinolone reduction initiative consisted of house staff education on risks of fluoroquinolone use and alternatives. Buttons promoting “Save the Quinolones” were also distributed and worn to increase visibility. The preintervention period and postintervention periods were February 2016 to December 2016 and February

to December 2017, respectively. The primary outcome measure was the percentage of *S. aureus* susceptible to oxacillin isolated before and after the intervention. Secondary outcome measures were the rate of fluoroquinolone use, and the percentages of *Escherichia coli*, *Proteus mirabilis*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa* susceptible to levofloxacin. Antibiotic use data were collected as inpatient intravenous antibiotic days of therapy per 1,000 patient-days (DOT/1,000 patient-days). Chi-square test was used to compare outcomes.

**Results.** In the post intervention period, fluoroquinolone use decreased from 75 to 40.1 DOT/1,000 patient-days (−34.9%, 95% CI −37.5 to −32.5, P < 0.001). *S. aureus* susceptibility to oxacillin increased from 47.2% to 55.2% (95% CI 1.2 to 4.7, P = 0.02). *P. aeruginosa* susceptibility to levofloxacin increased from 60% to 70.7% (difference 10.7, 95% CI 0.8 to 20.6, P = 0.04). No difference in susceptibility rates of *E. coli*, *P. mirabilis* or *K. pneumoniae* was detected.

**Conclusion.** A nonrestrictive fluoroquinolone reduction initiative led to a significant decrease in fluoroquinolone use. This was associated with decreased antibiotic resistance in *S. aureus* and *P. aeruginosa*.

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222. The Impact of Education and Prospective Audit and Feedback on Reducing Ciprofloxacin Utilization at a Small Community Academic Hospital
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**Background.** Fluoroquinolones have been associated with severe and even disabling side effects. Increasing resistance has rendered these agents less favorable for empiric therapy. In light of these concerns and in response to a period of above-average use at a small community-based academic hospital, we implemented a quality improvement initiative to reduce utilization of ciprofloxacin.

**Methods.** The multidisciplinary Antibiotic Stewardship Program (ASP) at Barnes-Jewish West County Hospital, a 77-bed facility, developed and disseminated guidelines for ciprofloxacin use to all physicians via an electronic newsletter and in-person meetings with provider groups identified as having high ciprofloxacin utilization rates beginning in June 2017. Included in the guidelines were recommendations for more effective, safer alternatives to ciprofloxacin for common infection types. In December 2017, the ASP pharmacist initiated prospective audit and feedback (PAF) for all ciprofloxacin orders. Ciprofloxacin utilization was measured monthly in days of therapy (DOT)/1,000 patient-days utilizing medication administration data. Patient days were determined according to National Healthcare Safety Network (NHSN) conventions.

**Results.** During the preintervention period (June 2015 to June 2017), ciprofloxacin utilization rates averaged 73.3 DOT/1,000 patient-days, but in May 2017, use increased to 138.3. Following provider education, average utilization decreased to 56.9 DOT/1,000 patient-days from September 2017 to November 2017. With the addition of PAF, average ciprofloxacin utilization decreased to 43.6 DOT/1,000 patient-days from December 2017 to March 2018, a 41% reduction compared with the preintervention period. Utilization of other fluoroquinolones did not increase.

**Conclusion.** Education was a useful tool in reducing inappropriate ciprofloxacin use; however, a combination of prospective audit and feedback with education achieved the greatest impact on curbing ciprofloxacin use. This multimodal approach was effective and sustainable at a small hospital with limited antibiotic stewardship resources.

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223. Impact of Different Stewardship Strategies Applied to a Single Antibiotic Over Time
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**Background.** Recommended strategies for antimicrobial stewardship (AMS) include prospective audit with feedback (PAF) and preauthorization (PA). Depending on hospital culture, initiation of PA can be difficult. The impact of various single AMS strategies on antibiotic consumption has been described, although the impact of several strategies over time has not been reported.

**Methods.** At an academic institution, the impact of various single AMS strategies on daptomycin utilization was evaluated over time. A progression of four different approaches was used for restriction: Period 1 (P1): September 2012–June 2013—PAF. Period 2 (P2): July 2013–January 2016—8-day automatic stop. Period 3 (P3): February 2017–November 2017—additional stop. PA for >3-day use required. Period 4 (P4): January 2018–May 2018—PA. Transition to each strategy was supported by a policy change, approved through the Pharmacy and Therapeutics Committee and Hospital Medical Board. During P1–3, reserved medication orders were reviewed daily by AMS with recommended interventions when appropriate and providers were notified of pre-set stop dates (P2–3). During P4, ordering providers were required to
call AMS prior to initiation. Daptomycin utilization rates (DOT/1,000 PD) and mean unique patients receiving daptomycin were collected for each period.

**Results.** As restriction strategies enhanced, mean rate of daptomycin use (DOT/1,000 PD) progressively declined with a significant decrease during each period transition (Figure 1). P1→P2 (11.6 vs. 8.3; P < 0.01), P2→P3 (8.3 vs. 6.6; P = 0.017), and P3→P4 (6.6 vs. 3.2; P < 0.01). The mean number of unique patients on daptomycin decreased with implementation of new AMS strategies: P1→P2 (30.1 vs. 27.6; P = 0.18), P2→P3 (27.6 vs. 23.8; P < 0.01) and P3→P4 (23.8 vs. 13.3; P < 0.01). Of note, linezolid “balloon effect” only occurred following transition from P3 to P4 (6.1 vs. 10.5 DOT/1,000 PD; P < 0.01).

**Conclusion.** This single-center descriptive analysis of AMS restriction strategies reveals a progressive decrease in daptomycin use with stepwise implementation. This significant decrease was most profound with ultimate transition to PA. AMS programs unable to initially implement highly restrictive policies can consider using a stepwise approach to ease practitioners into the new model and still have a meaningful impact on antimicrobial utilization.

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224. Cost Analysis of a Significant Decrease in Vancomycin Use as a Result of an Antimicrobial Stewardship Intervention

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**Background.** A previous pre–post quasi-experimental study performed at an academic medical center assessed benefits of daily stewardship review with and without rapid diagnostic technology (RDT). The study found no difference in time to effective antibiotic therapy when comparing daily stewardship review to RDT and historical control groups. However, vancomycin duration of therapy significantly decreased with daily stewardship review compared with control (31.8 vs. 66 hours, P < 0.001). Subsequent elimination of this RDT saved the institution $53,000 in annual costs. However, the effect of the decrease in vancomycin use on this institution’s annual costs is unknown.

**Methods.** The purpose of the present study is to determine the difference in institutional costs associated with vancomycin after implementation of a stewardship intervention. A retrospective cost analysis was performed which included hospitalized adults on vancomycin for positive blood cultures from June to October 2014 (preintervention) and June to October 2015 (postintervention). The primary outcome was the amount of institutional cost saved, including drug, phlebotomy, laboratory, nursing, and pharmacy costs. Secondary outcomes included vancomycin DOT/1,000 patient-days, nephrotoxicity, in-hospital mortality, and length of stay.

**Results.** Total institutional cost savings associated with vancomycin over 5 months amounted to $2,900 for an extrapolated cost savings of $6,960 per year. Although this cost savings was minimal, there were decreases in each individual vancomycin cost component. Drug acquisition was associated with the largest cost reduction represented by a 26% decline. Next, phlebotomy and laboratory costs each decreased by 24%, while nursing and pharmacy costs decreased by 7% and 4%, respectively. There were no differences in vancomycin DOT/1,000 patient-days, nephrotoxicity, in-hospital mortality, or length of stay.

**Conclusion.** Vancomycin is associated with many hidden ancillary costs, and pharmacy and nursing labor remain substantial despite a reduction in its use. The tracking of antimicrobial stewardship actions is highly recommended; however, more research is needed to determine the optimal process for a vancomycin cost analysis.

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225. Antimicrobial Stewardship Program Interventions Targeting Intravenous Vancomycin Use at a Community Hospital Improves Prescribing and Safety

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**Background.** Intravenous vancomycin (VAN) continues to be a workhorse for suspected or documented methillin-resistant *Staphylococcus aureus* (MRSA) infections. VAN over-prescribing, and suboptimal dosing or monitoring can be detrimental to efficacy, safety, and resource utilization. A local antimicrobial stewardship program (ASP) was implemented in September 2015 as an expansion of a pre-existing health-system ASP. The local ASP included an infectious diseases (ID) pharmacist, partial FTE ID physician, ASP software, and a goal to decrease inappropriate vancomycin use and improve safety.

**Methods.** We performed a serial cross-sectional study assessing the impact of ASP interventions on VAN consumption and AKI incidence at a single-center community hospital from October 2015 through March 2018. ASP interventions included a revised vancomycin dosing and monitoring guideline, education, and prospective audit and feedback by clinical pharmacists working under the guidance of ID pharmacist and physician. Antibiotic days of therapy (DOT) were tracked and reported quarterly with Theradoc software. Acute kidney injury was defined as an increase of 20.5 mg/dL or 50% in serum creatinine from baseline in all hospitalized patients with baseline <2 mg/dL.

**Results.** Figure 1 demonstrates MRSA antibiotic utilization and AKI over time. VAN use declined from a peak quarterly use of 119 DOT/1,000 PD to a minimum of 74 DOT/1,000 PD (37.8% decrease). During the same timeframe AKI/1,000 PD decreased over 50%. R2 values of the trends are 76.5% and 83.1%, respectively. The use of VAN alternatives daptomycin (DAP), linezolid (LNZ), and ceftaroline (CPT) remained stable. There were 809 ASP recommendations made regarding VAN over-prescribing (primarily to de-escalate or discontinue VAN therapy) and 340 ID pharmacist interventions to improve VAN dosing and monitoring.

**Conclusion.** ASP initiatives, education, and interventions were associated with reduced VAN use and reduction in AKI at a community hospital.

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226. An Emergency Department Antimicrobial Stewardship Intervention to Improve Antibiotic Selection and Duration for Skin and Soft-tissue infections in Adult and Pediatric Outpatients

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**Background.** Skin and soft-tissue infections (SSTIs) are common infections seen in the Emergency Department (ED). However, adherence to IDSA guidelines for treatment, in terms of antibiotic selection and duration, is poor.

**Objective.** To evaluate the ability of a multifaceted intervention to improve adherence to the 2014 IDSA guidelines for the management of SSTIs in an academic adult and pediatric ED.

**Methods.** A non-randomized study of a multifaceted intervention for SSTI in the ED was employed which included educational presentations, implementation of an electronic order set based on 2014 IDSA guidelines, dissemination of ED-specific antibiograms, monthly departmental peer comparisons, and bimonthly individual feedback. SSTI visits were identified using ICD-10 codes L00, L02.x1, L03, L08.89, and L08.9. The primary endpoint was adherence to IDSA guidelines. Outcomes during