## 1551. Clinical Outcome Evaluation of an Antimicrobial Stewardship Program in an Accountable Care Organization

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**Session:** 168. Stewardship: Improving Outcomes

**Friday, October 6, 2017: 12:30 PM**

**Background.** On a national level it is known that the daily misuse of antibiotics leads to delayed recovery, increased hospital length of stay, recurrent infection and even death. At the organization-level, antimicrobial stewardship programs have been developed to tackle these issues. As these programs develop, research is greatly needed to assess the associated clinical outcomes. This study was conducted to compare such clinical outcomes as length of stay (LOS), 30 day readmission and mortality pre and post implementation of a formal antimicrobial stewardship program.

**Methods.** Retrospective review of randomized adult patients at a large community teaching facility receiving meropenem, linezolid, daptomycin, ticagrelol, micafungin, vancomycin, piperacillin/tazobactam, levofloxacin, between April 2010 to March 2011 (Pre Intervention: n = 228) and April 2012 to March 2013 (Post Intervention: n = 219). The assessment of clinical outcomes was achieved using logistic regression for 30 day readmission and status of deceased on discharge, and a generalized linear model with gamma distribution for ICU LOS and inpatient LOS.

**Results.** The Pre Intervention group had a 30 day readmission rate of 16.7% (38/228), a Status on Discharge of Deceased of 10.5% (24/228), an ICU LOS of 13.4% (14/228), and an Inpatient LOS of 11.6% (10.5/228). In contrast, the Post intervention group had a 30 day readmission rate of 7.3% (16/219; P = 0.001), a Status on Discharge of Deceased of 3.7% (8/219; P = 0.002), an ICU LOS of 9% (7.9/219; P = 0.01), and an Inpatient LOS of 8.8% (7.6/219; P = 0.018).

**Conclusion.** The multidisciplinary efforts of the program were associated with statistical significant decreases in 30 day readmission rates, mortality on discharge and ICU and inpatient LOS. These results assist in validating the true clinical outcome benefits of antimicrobial stewardship programs.

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

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## 1552. The Effect of the Preauthorization System on Oral Antimicrobials at a Maternal and Children's Hospital in Japan

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**Session:** 168. Stewardship: Improving Outcomes

**Friday, October 6, 2017: 12:30 PM**

**Background.** Antimicrobial stewardship programs (ASP) for oral antibiotics is limited, despite the fact that oral antibiotics account for 90% of total antibiotic consumption in developed countries. We aimed to analyze the effectiveness of ASP for oral antibiotics in a pediatric population.

**Methods.** We conducted a prospective study at a tertiary maternal and children’s hospital in Japan, consisting of 490 beds, with approximately 13,000 hospitalizations and 240,000 outpatient visits annually. Outpatient data on oral antimicrobial prescription, costs and proportions of resistant bacteria between 2013 and 2016 were analyzed. We conducted preauthorization and feedback as a means of intervention from October 2015 for targeted antimicrobials; vancomycin, linezolid, quinolones, faropenem, tebipenem pivoxil, polymyxin B. Antibiotic use density (AUD) was measured using days of therapy (DOT) /1000 visits. Interrupted time-series (ITS) analysis was performed to evaluate the effects of intervention.

**Results.** The main indications for use of targeted antimicrobials were urinary tract infections, pneumonia, and prophylactic administration in malignancy and were inappropriate in the majority prior to intervention. AUD and cost of targeted oral antimicrobials decreased from 11.0 DOT /1000 visits and 7,176 US dollars (USD) to 2.1 DOT /1000 visits and 1,665 USD, respectively (P < .001). ITS analysis showed that prescriptions for targeted antimicrobials decreased rapidly after initiation of preauthorization (-7.1 DOT /1000 visits; P < .001) (Figure 2-a). Prescriptions for non-targeted oral antimicrobial increased temporarily (+28 DOT /1000 visits; P < .001), but a decreasing trend was found after the initiation (P < .001) (Figure 2-b). During this study period, the susceptibility against quinolones did not change for E.coli, K.pneumoniae, and Pseudomonas.

**Conclusion.** Introduction of the preauthorization system for selected oral antimicrobials decreased the AUD of both targeted and non-targeted antimicrobials.

**Disclosures.** N. Kinoshita, Standardization and dissemination of a community based network of infection control targeting children MHLW H29-SHINKOGYOSEI-I PPAN-002: Board Member, Salary; I. Miyairi, Standardization and dissemination of data of infection control.
of a community based network of infection control targeting children MHLW H29-SHIKOGYOSEI-IPPA-002: Grant Investigator, Research grant

1553. Eight Years of Antimicrobial Stewardship Program (ASP) at a Large Academic Medical Center: Antibiotic Utilization, Hospital-onset Clostridium difficile infection (HO-CDI) and Resistance Trends

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Background. Antibiotic (ABX) use and outcome measures (rate of HO-CDI, local antimicrobial resistance) are recommended ASP metrics. These metrics can be used for internal benchmarking to assess ASP performance within an institution over time.

Methods. An adult ASP at our 750-bed academic medical center was implemented in 2008. ASP interventions include prospective audit and feedback, prior authorization with fluoroquinolone (FUQ) restriction as an ASP target and implementation of facility-specific guidelines for common infections. Newer ASP initiatives were Cepheid/Xpert for blood cultures with Gram-positive cocci in pairs and clusters with daily real-time ASP interventions (11/2014), oral vancomycin secondary prophylaxis for patients with prior CDI (4/2014) and optimization of beta-lactam (BL) dosing (piperacillin-tazobactam [PTZ] extended infusion hospital-wide 4/2013; cefepime [CEF] 4/2015 and meropenem 7/2015 protocols). ABX use is measured in days of therapy per 1000 patient-days (DOT/1000 PD) and length of therapy/admission when ABX are administered (DOT/ADM). NHEP definition is used for HO-CDI. For resistance trends the first unique isolate/patient/year regardless of source or susceptibility profile was included. Statistical analysis of trends during 8-years period 2009-2016 was performed by Poisson (SAS).

Results. Major shifts in ABX use include decrease in FUQ use (-17%, P < 0.01) with compensatory increase in ceftriaxone (CTX, +12%, P < 0.01), antipseudomonal BL (+3%, P < 0.01) and no change in carbapenem (+0.6%, P=0.5) as well as an increase in nafcillin and oxacillin (+7%, P < 0.01). There was a decrease in aggregate LOT/ADM (-4%, P < 0.03) with no change in DOT/1000 PD. We observed a decrease in HO-CDI rate (-17%, P < 0.01). Major resistance trends include reduction in Enterobacteriaceae spp. and Pseudomonas aeruginosa isolates nonsusceptible (NS) to FLQ (-4%, P < 0.01; -10%, P < 0.01, respectively) with increase in Enterobacteriaceae spp. NS to ceftriaxone, (+3%, P < 0.01). A decrease in P. aeruginosa NS to PTZ (+11%, P < 0.01) and no change for CEF was reported. There was no difference in Enterobacteriaceae spp. NS to PTZ or CEF.

Conclusion. Overall, reported trends aligned with ASP initiatives. Increased CTX NS is of concern and warrants an ASP-led strategy to decrease CTX use.

Disclosures. All authors: No reported disclosures.

1554. Clinical Impact of an Antibiotic Stewardship Program at Two Non-Teaching Community Hospitals

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Background. The clinical impact of antibiotic stewardship programs (ASP) in non-teaching community hospitals (NTCH) is largely unknown. We report our experience in two NTCH with limited resources where ASP was established.

Methods. In 2008, ASP was established at two NTCH: University of Maryland-Upper Chesapeake Medical Center (UM-UMCM) and University of Maryland-Harford Memorial Hospital (UM-HMH) each with 195 and 128 beds, respectively.

Empiric use of Level 1 antibiotics (piperacillin/tazobactam and vancomycin) was restricted to 72 hours, after which a positive culture or an ID consult was required to continue the antibiotics further. Empiric use of Level 2 antibiotics (carbenapenems, echinocandins, tigecycline, daptomycin, linezolid, ganciclovir, voriconazole, lipid amphotericin and other non-formulary antibiotics) required an ID consult within 24 hours. Pharmacists reviewed restricted antibiotics and clinical outcomes, managed drug levels for vancomycin and aminoglycosides, and facilitated IV to PO conversions. Annual antibiotic use and outcome measures (rate of Healthcare associated [HA] C. difficile infections and pseudomonas resistance to carbapenems and aminoglycosides) required an ID consult within 24 hours. The clinical impact of antibiotic stewardship programs (ASP) in non-teaching community hospitals (NTCH) is largely unknown. We report our experience in two NTCH with limited resources where ASP was established.

Results. Rates of HA C. difficile infections decreased by 73%. Pseudomonas resistance to carbapenems, gentamicin, and piperacillin/tazobactam decreased by 62%, 56%, and 33% respectively. Enterococcus resistance to vancomycin, and the rates of extended spectrum beta-lactam (ESBL) producing organisms remained stable. Total antibiotic purchase decreased by 30%; antibiotic cost per-patient-day decreased by an average of 41%. Physician compliance with our ASP was >90%.

Conclusion. Implementing an ASP at two non-teaching community hospitals not just reduced the overall utilization and cost of antibiotics, but also resulted in a significant reduction of healthcare-associated C. difficile infections and pseudomonas resistance to carbapenems and aminoglycosides.

Disclosures. All authors: No reported disclosures.

1555. Clinical Impact of Antimicrobial Stewardship Programs in Colombian Acute Care Hospitals

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