

Conclusion. Implementation of additional stewardship practices, including mandatory antimicrobial indication/duration and a 48-hour time out, decreased the use of antimicrobials, including those not monitored by our ASP. These efforts augmented, but did not replace existing stewardship efforts. These results support initiatives highlighted by national organizations to minimize unnecessary antimicrobial use through ASP.

Disclosures. All authors: No reported disclosures.

232. Do Antibiotic Timeouts Improve Antibiotic Utilization?

Patrick Kinn, PharmD, MPH¹; Michael Postelnick, RPh BCPS AQ ID²; Kristi Kuper, PharmD, BCPS³; Amanda Gibson, PharmD⁴; Amy Pakyz, PharmD, MS, PhD⁵ and Lucas T Schulz, PharmD, BCPS (AQ-ID)¹; ¹University of Wisconsin Health, Madison, Wisconsin, ²Department of Pharmacy, Northwestern Medicine, Chicago, Illinois, ³Vizient, Inc., Houston, Texas, ⁴University of Utah Health, Salt Lake City, Utah, ⁵Department of Pharmacotherapy and Outcomes Science, Virginia Commonwealth University, Richmond, Virginia

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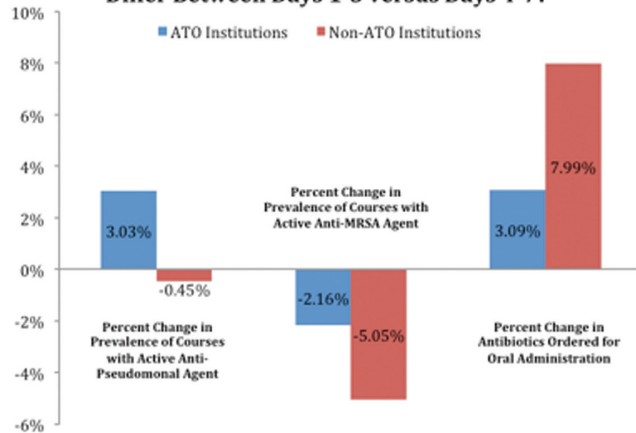
Background. The antibiotic timeout (ATO) is a stewardship tool that protocolizes review of objective clinical data after a predefined period of time and encourages antimicrobial regimen re-assessment.

Methods. Vizient member hospitals were utilized to recruit a variety of acute healthcare institutions, including institutions with and without an ATO process. Participating institutions submitted de-identified patient-level antibiotic therapy courses from a single day within a 5-week window to create a snapshot of overall antibiotic utilization. Therapy courses were evaluated on metrics including the prevalence of anti-pseudomonal agents, agents active against methicillin-resistant *Staphylococcus aureus* (MRSA), and oral (vs. intravenous) antibiotics. The outcome measures included: percent changes in prevalence of courses with antipseudomonal and anti-MRSA agents after day 3, and percent change in antibiotics ordered for oral administration after day 3. These outcome measures were compared between ATO institutions and non-ATO institutions.

Results. A total of 6,184 antibiotic therapy courses were collected from 61 participating institutions (17 ATO institutions; 44 non-ATO institutions). Of 71 institutions that completed enrollment survey, 10 did not complete submission of therapy course data. Antibiotic courses prescribed for prophylaxis ($n = 975$) and courses that extended beyond 7 days ($n = 1,192$) were excluded from analysis, resulting in an analysis group that included 4,017 therapy courses (1,396 from ATO institutions vs. 2,621 from non-ATO institutions). The prevalence of patients receiving anti-pseudomonal agents increased after day 3 by 3.03% ($P = 0.28$) at ATO institutions and decreased 0.45% ($P = 0.84$) at non-ATO institutions. The prevalence of patients receiving anti-MRSA agents decreased after day 3 by 2.16% ($P = 0.41$) at ATO institutions and decreased 5.05% ($P = 0.005$) at non-ATO institutions. Oral antibiotic use increased after day 3 by 3.09% ($P = 0.08$) at ATO institutions while use at non-ATO institutions increased 7.99% ($P = 0.0001$).

Conclusion. Antibiotic therapy course data collected across multiple sites provided no evidence for improved antimicrobial utilization among institutions that have implemented an antibiotic timeout compared with institutions without a timeout.

Figure 1: How Did Antibiotic Therapy Courses Differ Between Days 1-3 versus Days 4-7?



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233. Evaluation of an Antimicrobial Time-Out on Antimicrobial Utilization at a Large Health System

Steven Richardson, PharmD¹; Elizabeth Neuner, PharmD, BCPS (AQ-ID)¹; Vasilios Athans, PharmD, BCPS¹; Pavithra Srinivas, PharmD, BCPS¹; Jill Wesolowski, PharmD¹; Steven Gordon, MD² and Thomas Fraser, MD²; ¹Department of Pharmacy, Cleveland Clinic, Cleveland, Ohio, ²Department of Infectious Diseases, Cleveland Clinic, Cleveland, Ohio

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Background. Infectious Diseases Society of America and Society for Healthcare Epidemiology Guidelines for Implementing an Antibiotic Stewardship Program (ASP) and the CDC Core Elements of Hospital ASP include antimicrobial time-outs (ATO) as an example of a recommended action. There are limited data evaluating the impact of ATOs on antimicrobial use. Cleveland Clinic Health-System (CCHS) implemented a 72-hour ATO for antimicrobials with an empiric indication and no stop date within the electronic health record. This study aimed to assess the effect of an ATO on antimicrobial utilization.

Methods. Retrospective, quasi-experimental study of patients between October 1–December 31, 2016 and 2017 who received at least one systemic antimicrobial agent while admitted to a US-based CCHS hospital. Primary objective was to compare the days of therapy (DOT) per 1,000 patient-days of broad-spectrum agents before and after ATO implementation. Secondary objectives included comparing indications for use, actions taken as a result of the ATO, and rate of *Clostridium difficile*. Antimicrobial groupings per National Healthcare Safety Network AUR Module.

Results. In 4Q2016, there were 75,982 antimicrobial orders in 31,945 encounters, of which 5,029 encounters had an empiric antimicrobial active at 72 hours. In 4Q2017, there were 78,418 antimicrobial orders in 33,378 encounters, which led to 38,129 ATOs in 6,138 encounters. Mean duration of therapy was 71 hours in 4Q2016 vs. 62 hours in 4Q2017, $P < 0.05$ (Figure 1). DOT/1,000 patient-days did not differ (Figure 2). Orders with the indication of pathogen directed did not change (14.1% vs. 14.4%; $P = 0.11$). Of 16,009 ATOs acknowledged by clinicians, 2,195 (14%) prompted antimicrobial discontinuation, while 684 alerts (4%) prompted de-escalation. There was no difference in encounters with positive *C. difficile* PCR, 123 (2.4%) vs. 152 (2.5%).

Conclusion. Implementation of an ATO for all antimicrobials within an electronic health record decreased duration of therapy but not DOT/1,000 patient-days. Further study is needed to define optimal ATO characteristics (targeted vs. all antimicrobials, 48 vs. 72 hours, etc.) and potential impact on utilization and appropriate antimicrobial usage.

Figure 1.

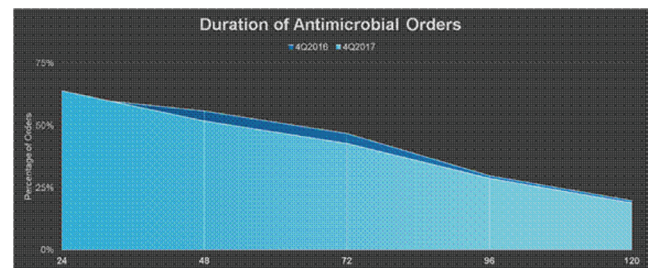
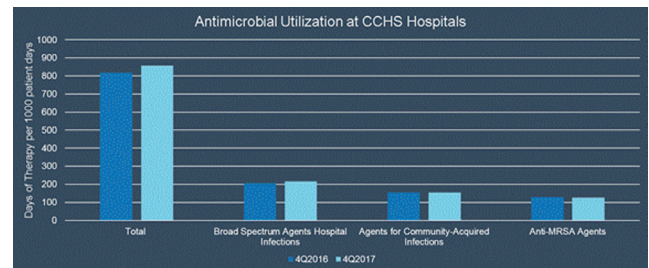


Figure 2.



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234. Improving Antimicrobial Prescribing and Rate of Infectious Diseases Consult Utilizing a Best-Practice Alert and Targeted Education for *Staphylococcus aureus* Bacteremia

Katherine Yang, PharmD¹; Tejal Gandhi, MD²; Chris Zimmerman, PharmD³; Robert Chang, MD, FACP, SHFM⁴; Jerod Nagel, PharmD, BCPS⁵; ¹University of Michigan College of Pharmacy, Ann Arbor, Michigan, ²Internal Medicine, Division of Infectious Diseases, Michigan Medicine, Ann Arbor, Michigan, ³Michigan Medicine, Ann Arbor, Michigan, ⁴Internal Medicine, University of Michigan Medical Center, Ann Arbor, Michigan and ⁵Department of Pharmacy, Michigan Medicine, Ann Arbor, Michigan

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Background. Delays in time to appropriate management and antimicrobial therapy in patients with *Staphylococcus aureus* bacteremia (SAB) lead to dramatic increases in mortality, cost, and length of hospital stay. This study assesses the impact of antimicrobial stewardship pharmacist (ASP)-led Verigene education sessions paired with a physician targeted EPIC best practice alert (BPA) on time to appropriate therapy and rate of infectious diseases (ID) consult for patients SAB.

Methods. This single-center pre-post study included adult patients with SAB from October 2016 through January 2018. A BPA was implemented in August 2017, and fired for any patient with SAB and no ID consult. The BPA provided four recommendations: (1) repeat blood cultures till clearance, (2) obtain ID consult, (3) start vancomycin for SAB with *mecA* gene (i.e., MRSA) and nafcillin or cefazolin for SAB without *mecA* gene

(i.e., MSSA), and (4) obtain echocardiogram. The ASP also provided education on antimicrobial therapy choices and optimization to clinical pharmacists and ID physicians. The hospital utilized Verigene Gram-positive blood culture nucleic acid test during both study periods and ASP review of SAB cases without an ID consult in the preintervention phase. The primary outcome was time to appropriate therapy defined as the time a positive blood culture was drawn to the time of first appropriate antibiotic administration.

Results. A total of 223 patients with SAB were included; 134 were in the 10-month historic group (October 2016–July 2017) and 89 were in the 5-month postintervention (PI) group (August 2017–January 2018). The BPA fired for 86% ($n = 77$) of patients in the PI group. Average time to appropriate therapy for all SAB patients and patients with MSSA significantly improved following the intervention (35.1 vs. 20.4 hours, $P = 0.004$; 53.2 vs. 30.3 hours, $P = 0.001$). During the intervention phase, therapy was more frequently changed between the time of Verigene results and antibiotic susceptibilities (77.6% vs. 86.5%, $P = 0.254$). The rate of ID consult also significantly improved following the intervention (89.6% vs. 97.8%, $P < 0.02$).

Conclusion. Implementing an SAB BPA and education on interpretation of Verigene results for SAB significantly improved time to appropriate therapy for all patients with SAB, patients with MSSA bacteremia, and rate of ID consult.

Disclosures. All authors: No reported disclosures.

235. If Symptoms Aren't Described, Antibiotics Aren't Prescribed: Implementation of a Multifaceted Toolkit Targeting Overtreatment of Asymptomatic Bacteriuria across a Large Health-system

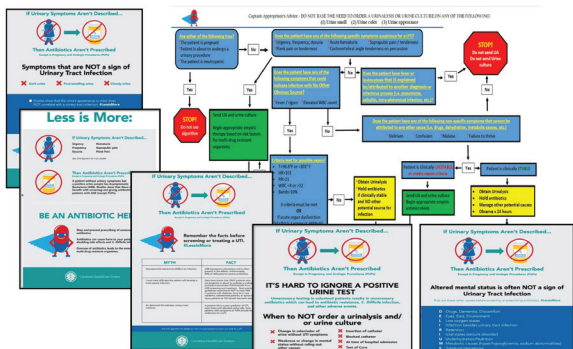
Julie E. Williamson, PharmD¹; Andrea Y. Logan, PharmD²; M. Sean Boger, MD, PharmD²; Steven Jarrett, PharmD¹; Stephanie J. Irausquin, PhD³ and Lisa Davidson, MD²; ¹Quality and Patient Safety, Atrium Health, Charlotte, North Carolina, ²Division of Infectious Diseases, Atrium Health, Charlotte, North Carolina, ³Information and Analytics Services, Atrium Health, Charlotte, North Carolina

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Background. Overtreatment of asymptomatic bacteriuria (ASB) is a major challenge for antimicrobial stewardship (ASP). A February 2017 review of our health-system showed >50% of inpatients with a positive urine culture (PUC) were treated despite no urinary tract infection (UTI) symptoms or compelling indications (CI) [pregnancy or pending urologic procedure]. In Fall 2017, we piloted a multifaceted toolkit (MTK) to support an ASB educational campaign (EC) at 26 hospitals.

Methods. A MTK of flyers, a urinary testing algorithm, and narrated slides (Figure 1) was distributed in Fall 2017 and implementation was customized by each hospital's ASP. Impact of EC on treatment of patients with no urinary symptoms (NUS) or altered mental status (AMS) alone were assessed retrospectively by sampling inpatient PUCs from February 1–28, 2018 in a manner identical to a pre-EC sample. Patients were excluded if: CI, age <18 years, neutropenic, or admitted on UTI therapy or with nephrolithiasis. Demographic, clinical, and laboratory data; UTI symptoms; microbiology results; and antimicrobial therapy received, were collected via an adapted CDC UTI assessment form. Each hospital was surveyed on MTK implementation.

Figure 1. MTK Components



Results. Preliminary pre- and post-EC data from the same 14 hospitals are shown. Patients with NUS decreased slightly post-EC, while those with ≥ 1 -specific symptom increased. Treatment of those with NUS declined post-EC, and those with AMS alone received less empiric therapy.

Figure 2. Patient Symptoms Pre- and Post-EC

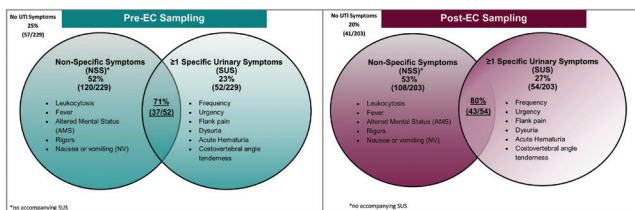
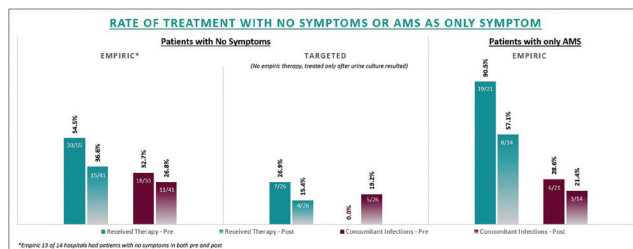


Figure 3. Treatment of Patients with NUS or with AMS as Only Symptom



Twelve hospitals (86%) completed the MTK survey. Six used all components, five some, and one none. Those who implemented the MTK cited flyers and slides as most useful and preferred the AMS flyer. Although available, only 55% of hospitals affirmed provider algorithm use.

Conclusion. Post-EC, less patients with a PUC had NUS, those with NUS were less likely to be treated, and those with AMS alone received less empiric therapy. MTK implementation appeared to impact ASB treatment, and perhaps, testing. Lower use of the testing algorithm may signal a need for simplification. More data are needed to identify which component(s) of the MTK are most effective.

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236. The Impact of Earlier Intervention by an Antimicrobial Stewardship Team on Appropriate Antimicrobial Therapy for Specific Antimicrobial Agents

Daiki Hagiwara, PhD¹; Keisuke Sato, PhD¹; Mitsuhiro Kamada, PhD¹; Norihiro Moriawaki, PhD¹; Takafumi Nakano, PhD¹; Shouichi Shiotsuka, PhD¹; Hidetoshi Kamimura, PhD¹; Atsushi Togawa, MD, PhD²; Yasushi Takamatsu, MD, PhD² and Tohru Takata, MD, PhD³; ¹Department of Pharmacy, Fukuoka University Hospital, Fukuoka, Japan, ²Fukuoka University School of Medicine, Fukuoka, Japan, ³Department of Infect Control, Fukuoka University Hospital, Fukuoka, Japan

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Background. The optimal timing of intervention to obtain significant effects with regard to reducing the consumption of antimicrobial agents or antimicrobial-resistant bacteria in facilities that lack the manpower to maintain an antimicrobial stewardship team (AST) is not well-known.

Methods. An observational retrospective study was performed at Fukuoka University Hospital between April 1, 2013 and March 31, 2016 to evaluate the optimal timing of intervention on appropriate antimicrobial therapy for specific antimicrobial agents, including broad-spectrum antimicrobial agents (piperacillin-tazobactam, carbapenems, fluoroquinolones) and anti-MRSA (vancomycin, teicoplanin, daptomycin, and linezolid) agents. In period 1, interventions were performed for patients using specific antimicrobial agents for >14 days. In period 2, interventions were performed for patients using anti-MRSA agents, and in period 3, interventions were performed for patients using any specific antimicrobial agents, regardless of the days of use, on a weekly basis. The effects on antimicrobial use, the antimicrobial-resistant bacteria, and the clinical outcomes among the three periods were compared.

Results. The AUDs of piperacillin-tazobactam and carbapenems decreased significantly (10.8 → 9.2 and 15.7 → 14.2; period 2 vs. period 3, $P < 0.05$). The rates of piperacillin-tazobactam, meropenem and levofloxacin resistance in *Pseudomonas aeruginosa* isolates decreased from 13.8%, 16.2%, 11.9% in period 1 to 10.4%, 8.7%, 6.5% in period 3, respectively. The annual costs of these antimicrobials decreased according to the period: period 1, US\$ 1,080,000; period 2, US\$ 944,000; and period 3, US\$ 763,000 (period 3 vs. period 1, $P < 0.01$). No recurrence was observed within 7 days after intervention and the mortality rate and length of stay did not change to a statistically significant extent in any of the study periods.

Conclusion. When interventions were performed once a week by an ASP team, accelerating the timing of intervention from patients with >14 days of use to all patients treated with the specific antimicrobial agents was significantly more effective for reducing the consumption of antimicrobials leading to reduction of the related costs and antimicrobial-resistant *P. aeruginosa* without compromising the patient outcomes.

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237. Antibiotic Assessment at Discharge-Room for Stewardship Intervention

Prakash Balasubramanian, MD¹; Paul Lata, PharmD¹; Meredith Peters, MD²; Christopher Crnich, MD, PhD^{1,3} and Susanne Barnett, PharmD^{1,4}; ¹William S Middleton Memorial Veterans Hospital, Madison, Wisconsin, ²University of Wisconsin Hospital and Clinics, Madison, Wisconsin, ³University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin, ⁴University of Wisconsin School of Pharmacy, Madison, Wisconsin

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Background. Currently, there is minimal literature detailing the utility or approach to antibiotic stewardship interventions at the transition of care. We sought to evaluate the utility of a stewardship approach where appropriateness of choice and duration of oral antibiotics prescribed at the time of discharge was assessed and, when indicated, recommendations for change provided.

Methods. Between June 2017 and April 2018, an antimicrobial stewardship team, comprising of a pharmacist and infectious disease provider, reviewed the electronic