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Background. The Infectious Diseases Society of America's guideline for implementing antibiotic (abx) stewardship recommends routine review of abx use. Several studies demonstrate antibiotic time out (ATO) programs result in de-escalation, but there is limited evidence of improved outcomes. The aim of this study was to evaluate the clinical impact of ATO.

Methods. This retrospective study included hospitalized patients at The Ohio State University Wexner Medical Center receiving abx and a documented ATO from 7/1/2017 to 6/30/2018. ATO patients were matched by infection type to abx-treated patients lacking an ATO note. Patients were excluded if they were identified as a protected population, were in the ICU at the time of ATO, had an ATO within 48 hours of discharge, cystic fibrosis, or febrile neutropenia. The primary objective was to evaluate abx optimization in patients with documented ATO vs. those without ATO. Abx optimization was defined as the selection of ideal abx based on guidelines, culture and susceptibility results, or expert opinion when undefined. Secondary outcomes included vancomycin-associated acute kidney injury (VAN-AKI), infection-related length of stay (LOS), all-cause 30-day readmission or mortality, abx days, and nosocomial *C. difficile* infection (CDI) rates. The Student t-test/Fisher's exact test and Wilcoxon-rank sum were utilized as appropriate.

Results. One hundred ATO patients were compared with 100 non-ATO patients. Baseline characteristics and infection types were similar between groups. ATO resulted in improved optimization of abx selection ($P = 0.05$) and duration ($P < 0.01$), and reduced piperacillin/tazobactam (P/T) and vancomycin (VAN) utilization. No difference was observed in VAN-AKI (22 vs. 20%, $P = 0.73$), 30-day readmission (28 vs. 27%, $P = 0.87$), mortality (5 vs. 5%, $P = 1$), or CDI rates (6 vs. 5%, $p = 0.76$) in the ATO vs. non-ATO group. However, inpatient abx days (12 vs. 8, $P = 0.004$) and infection-related LOS (10 vs. 8, $P = 0.0006$) were shorter in the non-ATO group.

Conclusion. ATO improved optimization of abx selection and duration, and reduced P/T and VAN use. Despite this, clinical outcomes were not improved.

Disclosures. All authors: No reported disclosures.

1037. A Pharmacist-Driven 48 Hour Antibiotic Time Out Pilot at a Large Academic Medical Center

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Background. The Centers for Disease Control and Prevention published The Core Elements of Hospital Antibiotic Stewardship Programs in 2014, which recommended that all clinicians perform an antibiotic time out (ATO) after 48 hours. The best methods to operationalize these recommendations remain unclear. Given our information technology barriers, we developed a targeted, pharmacist-driven, 48 hour ATO pilot.

Methods. This pre-post intervention pilot study included hospitalized adults admitted to one of the four wards between 5/1/18 and 6/30/18. Patients who received ≥48 hours of broad-spectrum intravenous antibiotics (vancomycin, piperacillin–tazobactam, cefepime, a carbapenem, or a fluoroquinolone) were prospectively identified via TheraDoc (Premier Inc., Charlotte, NC). An infectious diseases (ID) trained pharmacist reviewed patients on a daily basis during June. The primary outcome was days of therapy (DOT), which was assessed with Spearman's rank-order correlation. All *P*-values were from 2-sided tests, and results were deemed statistically significant at $P < 0.05$.

Results. A total of 151 unique patients were identified during the study period. The most common antibiotic indications were skin and soft-tissue infection (31.1%), urinary tract infection (22.5%), and intraabdominal infection (22.5%). An ID physician was consulted on 59% of patients. The pharmacist reviewed an average of 7 patients (3 unique) each day during the intervention month. A total of 27 recommendations were made with 15 (56%) being accepted. The most common recommendations were to de-escalate therapy ($n = 8$), stop antibiotics ($n = 6$), and add a stop date to the antibiotic order ($n = 4$). DOT in the pre- and post-intervention period did not differ ($P = 0.28$).

Conclusion. A month-long, targeted, pharmacist-driven, 48 hour ATO pilot was unable to demonstrate a reduction in DOT. Furthermore, only 56% of pharmacist recommendations were accepted despite targeting low-acuity infections, which may have limited our ability to observe a reduction in DOT. Larger studies are warranted to further evaluate how ATOs influence DOT over time.

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1038. Impact of an Electronic Antibiotic Timeout on the Utilization of Frequently Prescribed Antibiotics in Hospitalized Patients

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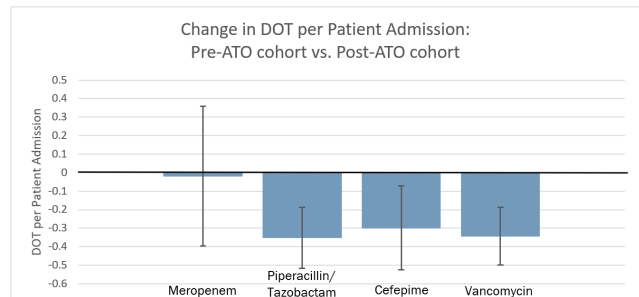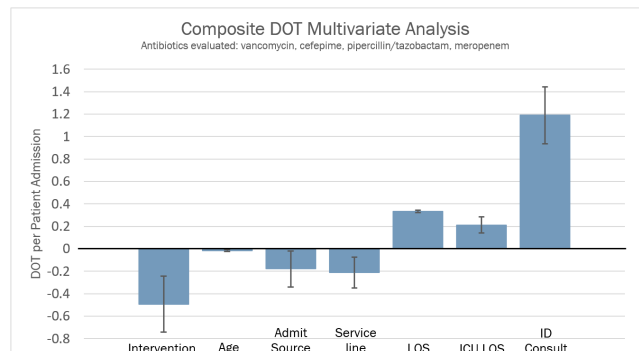
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Background. Methods to operationalize antibiotic timeouts (ATO) among hospitalized patients are often constrained by the high volume of antibiotic orders that surpass the capabilities of the antimicrobial stewardship program (ASP) to intervene. Houston Methodist Hospital implemented a streamlined electronic ATO process that alerted providers to evaluate the need for continued antibiotics on day 4 of predefined anti-infective therapy. Unresolved alerts were reviewed by clinical pharmacists the following day. The objective of this study was to determine the impact of this electronic ATO on frequently prescribed antibiotics.

Methods. This was a quasi-experimental study in a 924-bed quaternary care hospital comparing days of therapy (DOT) in patients admitted prior to (February 2017 – January 2018) and after implementing an ATO process (March 2018 – February 2019). Antibiotics evaluated included vancomycin, cefepime, piperacillin/tazobactam, and meropenem. ATO alert logic was simulated retrospectively to capture the pre-ATO cohort. The primary outcome was mean composite DOT per patient admission. Secondary outcomes included total hospitalization cost, Clostridioides difficile infection (CDI) and multidrug-resistant organism (MDRO) rates.

Results. A total of 8,458 patients met ATO alert criteria for inclusion in the pre-ATO timeframe and 6,901 patients with an ATO alert in the post-ATO group; 2,642 (38%) prompted a pharmacists' review. The average composite DOT was 11.5 per admission in the pre-ATO cohort compared with 11.1 in the post-ATO cohort ($P = 0.02$). After multivariate linear regression, the ATO was significantly associated with a decrease of 0.5 DOT per patient admission ($P < 0.001$). Other factors associated with a reduction in DOT included age ($P < 0.001$), service line ($P = 0.003$), and admission source ($P = 0.031$). Mean hospital costs per admission were significantly reduced in the post-ATO group: $67,613 vs. $66,615 ($P = 0.01$). There was no difference in rates of CDI and MDRO.

Conclusion. Implementation of our electronic ATO process demonstrated significant reductions in overall DOT for frequently prescribed antibiotics and decreased total hospital costs across a diverse patient population. This process provides a real-world strategy to operationalize a large-scale ATO as an adjunct to an ASP.

Composite DOT Multivariate Analysis
Antibiotics evaluated: vancomycin, cefepime, pipercillin/tazobactam, meropenem

Change in DOT per Patient Admission:
Pre-ATO cohort vs. Post-ATO cohort

Disclosures. All authors: No reported disclosures.

1039. Forty-eight-hour Antibiotic Time-out: Impact on Antibiotic Duration and Clinical Outcomes

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Background. A core element of the Centers for Disease Control and Prevention Antimicrobial Stewardship standard for the inpatient setting includes a 48-hour antibiotic time-out (ATO) process to reassess antibiotic indication. We implemented an automated alert in the electronic health record (EHR) that identifies patients that have received >=48hours of antibiotic therapy. The alert requires the clinician (physician or

pharmacist) to note an indication for continuation or plan for discontinuation. Within the alert, a dashboard was developed to include relevant patient information (e.g., temperature, white blood cell count, microbiology, etc). We sought to evaluate the impact of the ATO alert on the duration of therapy (DOT) of cefepime (CFP), ceftazidime (CTZ) and vancomycin (VAN), for the treatment of pneumonia (PNA) and urinary tract infections (UTI) for adult and pediatric patients.

Methods. This quasi-experimental, retrospective analysis included adult and pediatric patients that received ≥48 hours of CFP, CTZ, or VAN for UTI or PNA between April 1, 2017 and July 31, 2017 (pre-48H ATO) and October 1, 2018–December 31, 2018 (post-48H ATO). Fields at order-entry to specify an antibiotic indication were not available prior to our EHR interventions. A randomized subset from the Pre-48Hr ATO group was selected for detailed analysis. The primary endpoint was to evaluate the average DOT of CFP/CTZ combined, VAN alone, and the combination of CFP/CTZ/VAN. We also evaluated length of stay (LOS), all-cause inpatient mortality, and 30-day readmissions.

Results. A total of 157 antibiotic orders (*n* = 94 patients) were evaluated in the pre-48h ATO group, and 2093 antibiotic orders (*n* = 521 patients) post-48H ATO group. Pre-48H ATO, 85 patients received CFP/CTZ and 72 VAN. Post-48H ATO, 322 patients received CFP/CTZ and 198 VAN. PNA was the most common indication pre- and post-48H ATO. DOT significantly decreased pre- vs. post-48H ATO (Figure 1). LOS was 2 days shorter (*P* = 0.01) in the post-48H ATO group, mortality and 30-day readmissions was similar between groups (Table 1).

Conclusion. Average antibiotic DOT for CFP/CTZ, and VAN significantly decreased following the implementation of the 48H ATO at our medical center. LOS was reduced by 2 days, while mortality and 30-day readmissions were similar before and after.

Figure 1: Average Duration of Cefepime/Ceftazidime and Vancomycin Initiated for UTI or PNA
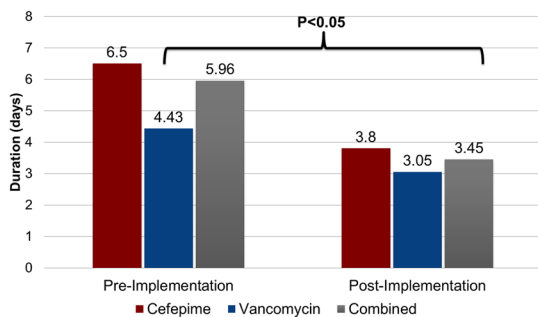

Table 1: Clinical outcomes

	Pre-48H ATO (n=94)	Post-48H ATO (n=521)	P-value
LOS (days, median)	18	15	0.01
30d readmissions (%)	32 (34)	126 (24)	0.08
Mortality (%)	7 (7.4)	64 (12.3)	0.16

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1040. Effects of An Antimicrobial Stewardship Team-led *Staphylococcus aureus* Bacteremia Management Bundle: A Quasi-Experimental Study

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Background. Mortality associated with *Staphylococcus aureus* bacteremia (SAB) has prompted the development of "bundle"-based approaches to improve outcomes. Components of bundled strategies include appropriate antibiotic selection, early source control, documenting negative cultures, echocardiogram, and adequate treatment duration. In 7/2016, the UNC Antimicrobial Stewardship Program (ASP) began prospective monitoring of SAB patients. Here we describe the impact of these ASP efforts.

Methods. Quasi-experimental study of patients ≥16 years with SAB 9/2015-3/2016 (pre-intervention) and 9/201/2017 (post-intervention). Patients were excluded if the bloodstream infection was polymicrobial, therapy began at an outside hospital, or the patient was discharged or died within 72 hours of positive blood culture. Minimum adequate treatment duration was defined as 14 days for uncomplicated SAB; 28 days for complicated SAB; 42 days if endovascular disease or osteomyelitis present.

Categorical variables were compared using the chi-squared test, significance level of *P* < 0.05. The study was approved by the UNC IRB.

Results. 217 treatment courses were included; 114 pre- and 103 post-intervention. Rates of adequate empirical antibiotics were consistently high throughout the study (Table 1). Pre-intervention, individual bundle components occurred frequently: negative culture documented (95%), echocardiogram (80%), and adequate duration of an appropriate antibiotic (71%; Table 2). After ASP intervention, echocardiography and adequate treatment duration rates increased to 92% (*P* < 0.05, both outcomes), as did ID consultation rates (59% to 67%; P = 0.04). Overall bundle achievement increased from 54% to 82%. ASP interventions were documented for 11 (10%) and 32 (31%) of patients during the periods. Mortality and readmission within 6 months of discharge were unchanged (12% and 11%; 41% and 42%, respectively).

Conclusion. ASP intervention was associated with increased rates of bundle achievement but did not impact mortality or 6-month readmission. Despite adequate empiric therapy and relatively high rates of adherence to best-evidenced practices, SAB continues to be associated with significant mortality and high rates of 6-month readmission.

Table 1: Patient and Infection Characteristics

	Pre-Intervention N = 114	Post-Intervention N = 103
Sex, male	58 (51%)	58 (56%)
Age, yr (median, IQR)	56 (43-69)	56 (40-66)
Admitting Service		
Medicine	51 (45%)	66 (64%)
Surgery	37 (32%)	16 (16%)
Oncology	10 (9%)	8 (8%)
Family Medicine	7 (6%)	5 (5%)
Other	9 (8%)	8 (8%)
S. aureus		
MSSA	61 (54%)	47 (46%)
MRSA	53 (46%)	56 (54%)
Adequate Empiric Therapy	114 (100%)	102 (99%)
Source of Bacteremia		
Endovascular	18 (16%)	11 (11%)
Respiratory	8 (7%)	6 (6%)
Gastrointestinal	2 (2%)	7 (7%)
Genitourinary	3 (3%)	3 (3%)
Skin and soft tissue	24 (21%)	7 (7%)
Bone/joint related	15 (13%)	14 (14%)
Catheter	28 (25%)	20 (19%)
Other	3 (3%)	2 (2%)
Unknown	13 (11%)	33 (32%)

Table 2: Achievement of Best Practices for *S. aureus* Bloodstream Infection

	Pre-Intervention, N = 114	Post-Intervention, N = 103	p-value
Blood Cultures Repeated Until Negative	108 (95%)	97 (94%)	ns
Source Control Procedure, if Applicable	62/70 (89%)	49/60 (82%)	ns
Echocardiogram	91 (80%)	95 (92%)	0.009
Adequate Treatment Duration*	68/96 (71%)	87/95 (92%)	0.0002
ID consultation	63 (55%)	71 (69%)	0.04
Complete Bundle Achievement	62 (54%)	78 (76%)	0.001

*Adequate minimum treatment duration defined as: 14 days for uncomplicated SAB; 28 days for complicated SAB; and 42 days if endovascular disease or osteomyelitis present. Patients who died or transitioned to palliative care prior to the end of therapy were not evaluated for this outcome.

Table 3: Patient Outcomes Following SAB

	Pre-Intervention, N = 114	Post-Intervention, N = 103
Death During Admission	14 (12%)	11 (11%)
Readmission Within 6 Months	47 (41%)	43 (42%)

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1041. *Staphylococcus aureus* Bacteremia Bundle Adherence Pre- and Post-Implementation of Mandatory Infectious Diseases Consultation and Antimicrobial Stewardship Pharmacist Intervention

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