addition to an antimicrobial stewardship team responsible for the proper use of antimicrobial agents were included in the study. AMU data (such as DOT [Days of Therapy / 100 patient days]) are entered semi-automatically from medical fee statement (receipt) file at each facility. ASP intervention is divided into four categories 1) pre-authorization, 2) prospective audit and feedback (PAF), 3) PAF and required notification (RN), 4) RN. The Kruskal-Wallis test is performed to see overall difference and the Dunn test with the Bonferroni correction is done for each pair of categories.

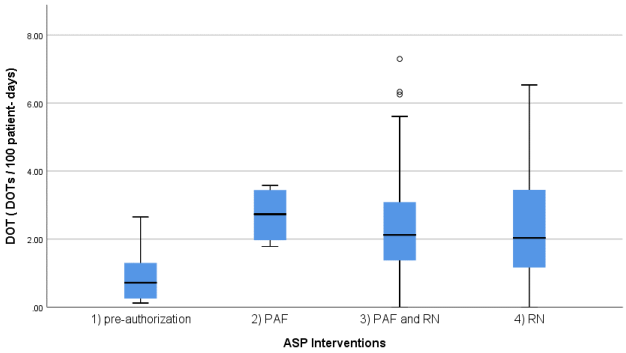
Results: A total of 114 hospitals were included in the analysis. The median number of beds at participating facilities were 430 [IQR: 281–602], the median average hospital stay was 13.0 days [IQR: 11.4–15.2] and total number of inpatients per month was 10087 [6247–14536]. PAF and RN were the most common ASP interventions for carbapenems (62.5%), followed by RN (33.6%). The median DOT [IQR] of participating facilities were 2.1 [1.2–3.1] and 1) 0.7 [0.2–1.1], 2) 2.7 [2.1–3.4], 3) 2.1 [1.4–3.1] and 4) 2.0 [1.2–3.5] by ASP categories. There are significant differences between 1) and 2), 1) and 3), and 1) and 4) (p=0.014, p< 0.01 and p< 0.01, respectively) while the differences between 2) and 3), 2) and 4), and 3) and 4) are not significant (p=1.00).

Table 1. Summary statistics of healthcare facilities by ASP Interventions

	Total	ASP Intervention			
		1) pre-authorization	2) PAF	3) PAF and RN	4) RN
Number of data	1022	36 (3.5 %)	4 (0.4 %)	639 (62.5 %)	343 (33.6 %)
Number of beds	**430 [281-602]**	**515 [183-604]**	**450 [261-639]**	**440 [300-651]**	**347 [261-468]**
Total number of inpatients per month	10087 [6247-14536]	12970 [4235-14848]	10881 [7302-14475]	11376 [6160-16692]	8070 [6362-11921]
DOT (DOTs /100 patient - days)	**2.1 [1.2-3.1]**	**0.7 [0.2-1.1]**	**2.7 [2.1-3.4]**	**2.1 [1.4-3.1]**	**2.0 [1.2-3.5]**

Median and IQR are presented.

Figure 1. DOT by ASP Interventions



Conclusion: Only 3.5% of ASP interventions belong to 1) pre-authorization category and this might be due to the complexity of registration process. This category was found to have the lowest DOT among all ASP interventions in Japanese healthcare facilities. The variances of DOT were especially large in categories 3) and 4), and more detailed analyses would be necessary to evaluate their efficacies accurately.

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224. Effect of Easing Overnight Restrictions on Antimicrobial Starts

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Session: P-8. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

Background: Some institutions allow administration of restricted antibiotics overnight until evaluation the following day (i.e. first dose free) to adapt to limitations in personnel resources. Whether this method results in higher number of overnight requests compared to strict 24/7 preauthorization has not been fully described.

Methods: In October 2019, Duke University Hospital (DUH) changed from strict preauthorization to allow initiation of two restricted agents (meropenem and micafungin) between the hours of 11pm to 7am. We performed an interrupted time series (ITS) analysis to evaluate the phase shift and change in trend in the number of new meropenem and micafungin orders per week before (Jan 2019-Oct 2019) and after (Oct 2019- Mar 2020) the process change. First antimicrobial orders for meropenem and micafungin were counted for unique patient encounters. We fit a Gaussian distribution function to the number of orders per hour of day to estimate the percent of orders initiated overnight (11p-7a) and during day/evening hours (7a-11p) before and after the process change.

Results: Hospital data included 1728 new meropenem and micafungin orders over a 61-week period (~28 per week). The total number of meropenem and micafungin orders was constant between Jan 2019 and October 2019 (+0.07 orders/week, 95% CI -0.13 to 0.27, Figure 1) and the phase shift during the first week of October was non-significant (-4.38 orders, 95% CI -12.34 to 3.58). The number of orders increased after October 2019 (+0.70 orders/week, 95% CI 0.13 to 1.25), however a sensitivity analysis removing the largest outlier eliminates significance. The percent of total orders between 11am to 7pm increased from 13.3% to 17.2% after the intervention (Figure 2). Overall antibiotic use remained similar through the study period.

Figure 1. Estimated Approvals per Week

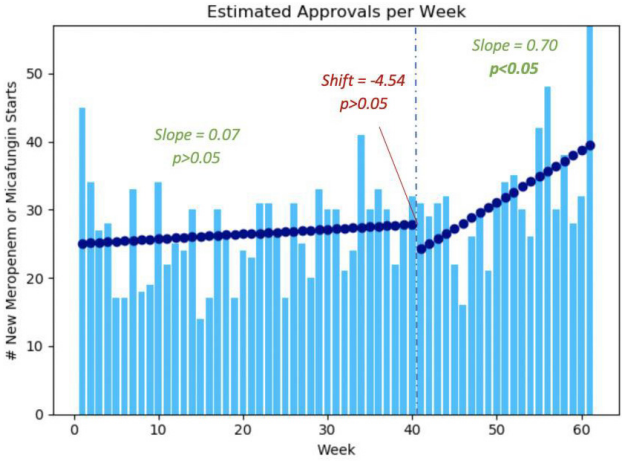
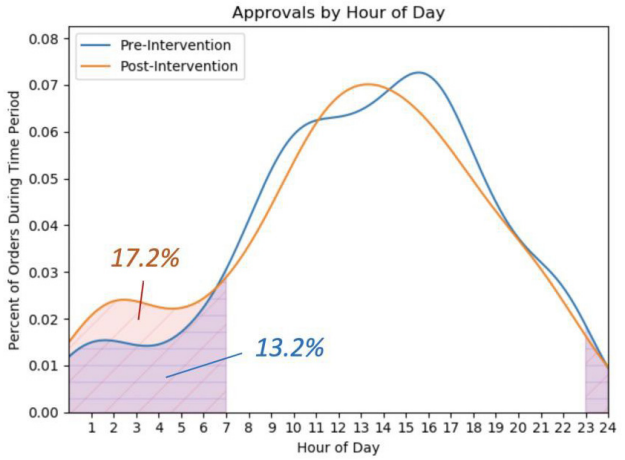


Figure 2. Approvals by Hour of Day



Conclusion: There was no significant immediate change in overnight prescribing of meropenem and micafungin, however a trend towards increased number of orders appeared after removing overnight restriction requirements. Instead of "stealth dosing", where providers wait to enter restricted antibiotic orders until evening hours, we observed a small increase in starts in early morning hours (1am-6am). Preauthorization approaches must adapt to personnel resources and quality of life for antimicrobial stewards.

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225. Evaluating Appropriateness of Antibiotic Prescribing in Pediatric Inpatients

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Session: P-8. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

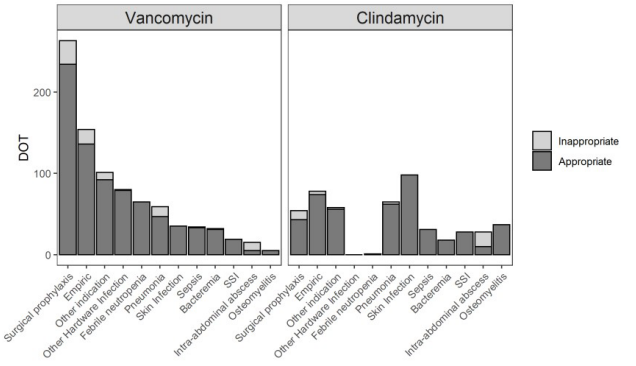
Background: Antibiotic appropriateness is the gold standard for informing antimicrobial stewardship efforts to optimize prescribing. The objectives of this study were to evaluate appropriateness of antibiotics for resistant gram-positive infections in pediatric inpatients and identify factors associated with inappropriate prescribing.

Methods: We included pediatric inpatients between July 2017 and July 2018 where an antibiotic typically used for resistant Gram-positive infections (per NHSN) was administered. We developed an algorithm based on laboratory data and diagnosis codes to categorize each antibiotic day of therapy as appropriate, inappropriate, or indeterminate. If indeterminate, we reviewed charts to assess appropriateness. We calculated total, appropriate, and inappropriate days of

therapy (DOT) overall and per patient-day. We evaluated clinical characteristics and indications as potential predictors of inappropriate DOT using Chi-squared or Kruskal-Wallis tests.

Results: Among 591 included encounters, we assessed 708 total antibiotic courses. The algorithm allowed for classification of 422 encounters (71%) and the remaining 171 encounters (29%) were classified using manual record review. The most frequent antibiotics were vancomycin (68%) and clindamycin (29%). Patients received a median of 3 days of gram-positive agent therapy per visit, or 5 per every 10 patient-days. Most common indications for gram-positive therapy were surgical prophylaxis (28% of encounters) and empiric therapy (10%) (Figure 1). Of the 1,754 total days of therapy assessed, 94.8% were ruled appropriate. Thirty-one (4.4%) courses were classified as at least partially inappropriate among 27 unique encounters (4.6%). There was a median of 2 inappropriate days among those with any inappropriate therapy. The reason for inappropriate rulings for empiric or prophylaxis indications was most often "longer than necessary duration," which was the case for 16 of 21 (76%) occurrences.

Figure 1. Appropriate and Inappropriate Days of Therapy (DOT) by Indication and Antibiotic



Conclusion: Inappropriate antibiotic use for Gram-positive infections was low in our patient population for the agents studied. We identified limiting the duration for patients receiving prophylactic or empiric therapy as a potential stewardship intervention target.

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226. Evaluating the Unnecessary Use of Intravenous Broad-Spectrum Antibiotics in Patients Based on Systemic Inflammatory Response Syndrome Criteria in the Emergency Department (ED)

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Session: P-8. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

Background: Recognition of sepsis frequently occurs in the ED. To demonstrate the need to optimize antibiotic use for suspected sepsis and evaluate the reliability of systemic inflammatory response syndrome (SIRS) criteria in predicting bacterial infection, we quantified the rate of unnecessary intravenous (IV) broad-spectrum antibiotic use for suspected sepsis in the ED at an academic medical center.

Methods: Adult patients who were admitted to the ED between January 2018 and June 2018 with suspected sepsis (≥ 2 SIRS) and received ≥ 1 dose of IV broad-spectrum antibiotic were included in this retrospective study. The presence of bacterial infection was determined using Centers for Disease Control and Prevention (CDC)/National Healthcare Safety Network (NHSN) definitions, microbiologic, radiographic, and laboratory findings. Suspected infections lacked microbiologic data. The primary outcome was the percentage of confirmed and suspected infections. Secondary outcomes included 90-day *Clostridioides difficile* infection (CDI) and 90-day drug-resistant organism (DRO) infections.

Results: A total of 218 patients were included. The percentages of confirmed/suspected and absence of bacterial infections were 63.8% and 36.2%, respectively. Elevated SIRS (≥ 2) and Quick Sequential Organ Failure Assessment (qSOFA; ≥ 2) scores were not associated with the presence of bacterial infections. 82% of patients were discharged from the ED. Antibiotic exposure in days of therapy in the ED and/or hospital admission did not significantly vary between patients with confirmed/suspected bacterial infection and those with absence of bacterial infections. Among patients who lacked evidence of bacterial infections, 44% were prescribed outpatient antibiotics after being discharged from the ED. 90-day CDI and DRO infections were identified in 7 and 6 patients, respectively, regardless of the presence of bacterial infections.

Table 1. Baseline demographics of patients admitted to the ED with suspected sepsis

	Confirmed and Suspected Infections (n = 139)	Absence of Infections (n = 79)	P-Value
Patient characteristics			
Age at admission, years, median (range)	50 (19-97)	54 (18-93)	0.087
Male, n (%)	56 (40.3)	19 (24.1)	**0.015**
White race, n (%)	62 (44.6)	40 (50.6)	0.39
Prior comorbidities			
Charlson Comorbidity Index, median (range)	3 (1-11)	3 (1-12)	0.52
Chemotherapy within last 30 days of admission, n (%)	19 (13.7)	10 (12.7)	0.83
Immunosuppressant(s) use at home, n (%)	3 (2.2)	4 (5.1)	0.24
History of solid organ transplant, n (%)	8 (5.8)	4 (5.1)	0.83
History of hematopoietic stem cell transplant, n (%)	9 (6.5)	6 (7.6)	0.75
Human immunodeficiency virus infection, n (%)	10 (7.2)	11 (13.9)	0.11
Clinical status upon ED admission			
SIRS, n (%)			
2	87 (62.6)	55 (69.9)	0.30
3	40 (28.8)	22 (27.8)	0.88
4	12 (8.6)	2 (2.5)	0.08
Quick SOFA score, n (%)			
2	5 (3.6)	6 (7.6)	0.19
3	0	0	
Glasgow Coma Score, median (range)	15 (4-15)	15 (13-15)	0.25
Temperature (< 96.8°F or > 100.4°F), n (%)	36 (25.9)	21 (26.6)	0.91
Heart rate > 90 beats/minute, n (%)	137 (98.6)	79 (100)	
Respiratory rate > 20 breaths/minute, n (%)	56 (40.3)	36 (45.6)	0.45
White blood cell count < 4 or > 12 (x10^3 cells/L), n (%)	77 (55.4)	25 (31.6)	0.39
Serum lactic acid			
mmol/L, median (range)	1.6 (0.7 - 3.2)	1.8 (0.6 - 3.7)	0.61
≥ 2 mmol/L, n (%)	6 (4.3)	2 (2.5)	0.50
Required vasopressors, n (%)	17 (12.2)	7 (8.9)	0.44
Site of infections			
Respiratory, n (%)	32 (23.0)	18 (22.8)	0.97
Skin and soft tissue, n (%)	17 (12.2)	1 (1.3)	**0.0047**
Abdominal, n (%)	12 (8.6)	9 (11.4)	0.51
Genitourinary, n (%)	63 (45.3)	25 (31.6)	**0.048**
Other, n (%)	15 (10.8)	26 (32.9)	**<0.001**
Antibiotic days of therapy			
During ED and/or hospital admission			
Broad-spectrum antibiotic exposure, days, median (range)	1.0 (0.5-10.5)	1.0 (0.5-7)	0.17
During ED and/or hospital admission and post-discharge			
Broad-spectrum antibiotic exposure, days, median (range)	1.0 (0.5-16)	1.0 (0.5-14.5)	**<0.001**
Total antibiotic exposure, days, median (range)	8.0 (0.5-65)	1.0 (0.5-14.5)	**<0.001**
Discharge from ED			
Discharge location, n (%)			
Discharged home	115 (82.7)	64 (81.0)	0.75
General ward admission	20 (14.4)	15 (19.0)	0.37
Intensive care unit admission	4 (2.9)	0 (0)	
Discharged with antibiotics, n (%)	104 (74.8)	35 (44.3)	**<0.001**
Discharged with oral broad-spectrum antibiotics, n (%)	43 (30.9)	10 (12.7)	**0.0025**

Conclusion: A third of the patients with suspected sepsis received IV broad-spectrum antibiotics in the ED but ultimately lacked bacterial infection. Our findings suggest that identification of bacterial infection and patients with sepsis using SIRS or qSOFA lack specificity and can lead to the overuse of unnecessary antibiotics in the ED.

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227. Evaluation of Empiric Vancomycin Utilization at 72 Hours Post Admission: is De-escalation of Vancomycin Appropriate?

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Session: P-8. Antimicrobial Stewardship: Trends in Antimicrobial Prescribing

Background: At both of our institutions in 2018, the average vancomycin days of therapy per 1,000 patient days was 112. The purpose of this study was to examine a 72-hour time-out as an effective de-escalation tool by evaluating the indication and clinical appropriateness of the continuation of empiric vancomycin therapy.

Methods: A retrospective chart review was performed from January 2018 to October 2018 at two community hospitals. Patients > 18 years who received at least 3 days of empiric vancomycin therapy were included. Patients were excluded if immunocompromised, pregnant, on hemodialysis, received vancomycin for surgical prophylaxis, or expired within 72 hours of vancomycin initiation. Criteria for appropriate continuation of vancomycin at 3 days: positive culture for methicillin-resistant *Staphylococcus aureus* (MRSA), presence of infection with or without defined sources with systemic signs of infection (i.e. white blood cells >12,000 cells/L or < 5,000 cells/L and/or elevated temperature ≥ 37.5°C), or pending wound/sputum cultures after vancomycin initiation.

Results: A total of 160 adult patients initiated on vancomycin were analyzed; 118 of 160 (74%) met appropriate criteria. The most common indications for vancomycin were: skin and soft tissue infections (SSTI) 82 patients (51%); pneumonia 37 patients (23%); and positive blood culture 20 patients (13%). Risk factors for MRSA were similar between both groups. Forty-four (28%) patients had cultures pending and 23 patients (14%) had a known non-MRSA pathogen at time of assessment. American Indian race (OR 3.01 (1.21, 7.53) p-value= 0.0174) and SSTI indication (OR 2.87 (1.24, 6.80) p-value= 0.0147) were associated with not meeting appropriate criteria.