hours of a systemic antibiotic were included. Patients with neutropenia or polymicrobial infections were excluded. The primary outcome was the proportion of patients who received a modification of therapy within 24 hours of final culture results. Secondary outcomes included modification at any point in therapy, time to modification of therapy, time to de-escalation, and days of therapy of broad-spectrum antibiotics.

Results. There was a total of 88 patients who met inclusion criteria, 37 patients pre-ATO and 51 patients post-ATO. The primary outcome of modification of therapy within 24 hours of final culture results was not significantly different for patients in the pre-ATO and post-ATO groups (19% vs. 20%, P = 0.94, respectively). The secondary outcome of modification of therapy at any point in therapy was not significantly different between the two groups (62% vs. 66%, $P = 0.67$). Of the 47 patients who received a modification of therapy, the mean time to modification was significantly shorter in the post-ATO group (52.8 hours vs. 45.26 hours, $P < 0.05$,). All other secondary outcomes were not significantly different between study groups.

Conclusion. The ATO alert was not associated with a higher rate of antibiotic modification within 24 hours of culture results in patients with GNB, although there was a significant reduction in the time to antibiotic modification. Further efforts are needed to improve the time to modification and optimize antibiotic prescribing practices.

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1034. Automating Assessments of Vancomycin Appropriateness

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Background. Assessing appropriateness of hospital antibiotic use is typically a labor-intensive task for antimicrobial stewardship teams and relies heavily on clinician judgement rather than a systematic process. Vancomycin is a frequently used agent that is a common stewardship target. We developed an algorithm to automatically classify the appropriateness of vancomycin days of therapy (DOTs) based upon electronic health record data.

Methods. We constructed a retrospective cohort of Oregon Health and Science University (OHSU) Hospital and Doernbecher Children's Hospital patients admitted August 1, 2017 to July 31, 2018 receiving vancomycin. Data were collected on demographic, encounter, pharmacy, microbiology, and surgery data. An electronic algorithm was applied to classify vancomycin DOTs as appropriate, inappropriate, or indeterminate. Inappropriate use was defined as any case in which there was an opportunity for de-escalation as identified using microbiology data, ICD-10 codes, and procedure codes.

Results. We included 4,231 encounters; 493 (12%) were pediatric patients. Our algorithm automatically classified 59%, 3%, and 38% of encounters as having either appropriate, inappropriate, or indeterminate DOTs, respectively. Forty-four percent of all encounters received no more than a 24-hour course of vancomycin and were considered appropriate empiric therapy; half of these were attributed to surgical prophylaxis. Nine percent of all encounters had vancomycin administered within 3 days of a blood, sputum or tissue culture in which either a methicillin-resistant *Staphylococcus* species or an ampicillin-resistant, vancomycin-susceptible *Enterococcus* species was isolated and were classified as appropriate. Six percent of all encounters had cultures in which only Gram-negatives, fungi, or yeast were isolated and were therefore considered appropriate in the empiric period (≤48 hours) but inappropriate thereafter.

Conclusion. Automated assessments of antibiotic appropriateness could facilitate more informed antimicrobial stewardship initiatives and serve as a valuable stewardship metric. Characterization of indeterminate vancomycin use may inform increased automated classification. Further effort is needed to validate these assessments.

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1035. Implementation of an Antimicrobial Stewardship Program-Led, Multifactorial Pneumonia Diagnosis and Treatment Bundle

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Background. Pneumonia remains a leading cause of hospitalization and accounts for significant antibiotic use. This study aims to evaluate the impact of bundled antimicrobial stewardship program (ASP) interventions, including procalcitonin and surveillance cultures, on broad-spectrum antimicrobial use in patients with suspected pneumonia.

Methods. This is a pre-post, quasi-experimental study conducted at Michigan Medicine. During the intervention period, an ASP member reviewed adult patients admitted to 3-floor medical services with antibiotics initiated for suspected pneumonia. The ASP member (1) recommended the use of procalcitonin when clinically appropriate, (2) used institutional guidelines to guide empiric antibiotic selection based on risk for drug-resistant pathogens, and (3) ordered a methicillin-resistant *Staphylococcus aureus* (MRSA) surveillance culture in patients receiving empiric anti-MRSA therapy. The primary endpoint was anti-MRSA and anti-pseudomonal (PSA) antibiotic use measured as days of therapy (DOT) per 1000 days-present on the services of interest. Antibiotic use and clinical data were extracted from an electronic database. Pneumonia diagnosis codes were used to identify the study population.

Results. A total of 549 patients were included: 310 in the pre-intervention (December 1/2017 - 3/31/2018) and 239 in the intervention (December 1/2018 - 3/31/2019) periods. Baseline demographics were similar between groups (Table 1). Less than 15% of patients had a microbiological diagnosis via respiratory culture in both study periods (Table *2*). Respiratory cultures were ordered less commonly in the intervention period; however, the rate of culture positivity was higher (28% vs. 48%, $P < 0.01$). Process measures improved in the intervention period with an increase in the proportion of patients with MRSA surveillance cultures (13% vs. 39%, $P < 0.01$) and procalcitonin monitoring (77% vs. 83%, $P = 0.07$). Compared with the pre-intervention period, anti-MRSA antibiotic use decreased from 172 to 158 DOT per 1000 days-present (Δ -8%) and the use of anti-PSA antibiotics decreased from 348 to 316 DOT per 1000 days present (Δ -9%).

Conclusion. The implementation of an ASP-led pneumonia bundle led to reductions in anti-MRSA and anti-PSA antibiotic use.

Table 1: Baseline Demographics

Variable	PRE-INTERVENTION (N=310)	INTERVENTION (N=239)	P-value
Age (median, IQR)	66 (55-78)	66 (54-76)	0.58
Male n (%)	159 (51)	131 (55)	0.44
Race n (%)			
Caucasian	247 (80)	172 (72)	0.04
Other or unknown	63 (20)	67 (28)	0.04
Ethnicity n (%)			
Non-Hispanic or unknown	301 (97)	233 (97)	>0.99
Hispanic	9 (3)	6 (3)	>0.99
Body Mass Index (median, IQR)	26.7 (22.3-32.4)	27.1 (22.8-31.8)	0.87
Charlson Comorbidity Index (mean±SD)	4.56 ± 3.98	4.44 ± 3.97	0.72

Table 2: Respiratory Culture and Diagnostic Characteristics

Variable	PRE-INTERVENTION (N=310)	INTERVENTION (N=239)	P-value
No Microbiological Diagnosis n (%)	275 (89)	205 (86)	0.36
Negative Respiratory Cultures n (%)	88 (32)	37 (18)	<0.01
No Cultures Ordered n (%)	187 (68)	168 (82)	<0.01
Microbiological Diagnosis n (%)	35 (11)	34 (14)	0.36
Positive Respiratory Cultures (of those with cultures ordered) n (%)	35/123 (28)	34/71 (48)	<0.01
MRSA Surveillance Culture Ordered n (%)	41 (13)	93 (39)	<0.01
Positive MRSA Screen n (%)	2 (5)	3 (3)	0.64
Procalcitonin Ordered n (%)	238 (77)	199 (83)	0.07

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1036. Clinical impact of an antibiotic time out initiative at an academic medical center

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