

pediatric, surgery) with 61.6% reduction ($p < 0.00001$); and intensive care units with 52% reduction ($p < 0.00001$) during P2 compared to P1. Defined daily doses per 1000 patient days decreased from 314.9 in P1 to 93.4 in P2 ($p < 0.00001$). During P2, 58.3% (132/228) of carbapenem orders were found to be appropriate compared to 37.5% (190/506) in P1 ($p < 0.00001$). Sensitivity profile for *Pseudomonas aeruginosa* improved from 86% carbapenem sensitivity during P1 to 89% in P2. No *Carbapenem Resistant Enterobacteriaceae* isolates were identified. Cost savings of \$643 per 1000 patient days were recognized in P2 as a result of reduced carbapenem use.

Conclusion: There was a significant decline in total carbapenem utilization, an increase in proportion of appropriate use and considerable cost savings as a result of ASP interventions.

Disclosures: All Authors: No reported disclosures

188. Sustainability of Antibiotic Stewardship Programs: Perceptions & Experiences of Nursing Home Staff

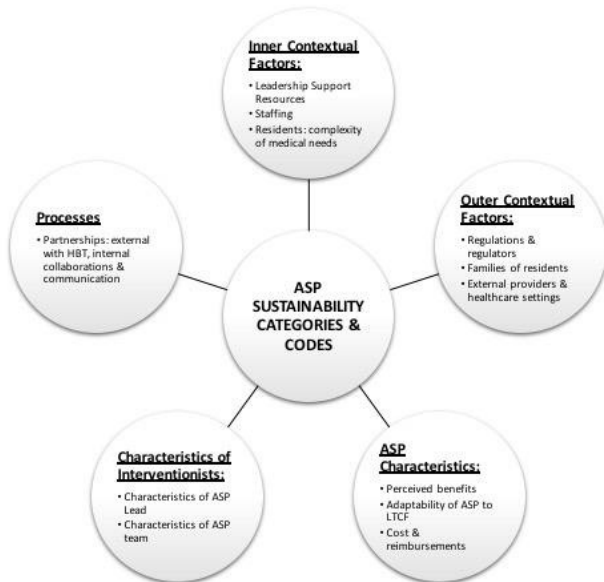
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Session: P-6. Antimicrobial Stewardship: Program Development and Implementation

Background: A hospital-based team (HBT) with antibiotic stewardship (AS) expertise provided knowledge, education, and training on AS to successfully implement antibiotic stewardship programs (ASPs) in 9 nursing homes (NHs). However, as integrating AS efforts into NH operations was challenging, we sought to understand the factors that influence ASP sustainability in NHs without the support of the HBT.

Methods: Using a qualitative descriptive design, we conducted 48 semi-structured interviews with clinical and administrative staff across the NHs. Interview data were de-identified and transcribed verbatim. Utilizing an integrated sustainability framework (Shelton, Cooper, & Stirman, 2018), a codebook (see Figure 1 for categories and codes) was developed to systematically code and analyze the data.

Figure 1 Categories & Codes



Results: Seven themes were identified (Figure 2): (1) An ASP is resource intensive for NHs with limited resources; (2) No matter how committed, a single person cannot sustain an ASP; (3) An ASP requires access to and interpretation of data not readily available at many NHs; (4) ASP sustainability requires external partnership, internal leadership support, and collaboration across longstanding disciplinary boundaries; (5) It is hard to “get to step two” and sustain an ASP because clinical “fires come first”; (6) Consistent and constant education on AS is important for sustainability; and (7) Outer contextual factors impede stewardship efforts.

An ASP was perceived as complex requiring resources beyond what was available in most NHs. Lack of funding, electronic health records, and adequate staff to care for

residents with complex medical needs influenced the ability of ASP leads to build and sustain the program. External providers, residents’ families, and regulators influenced antibiotic prescribing patterns, while consistent education and training, leadership buy-in, and collaborations were perceived as vital for long-term success.

Figure 2 Sustainability of ASPs in Nursing Homes: Themes

Theme 1	<ul style="list-style-type: none"> An ASP is Resource Intensive for NHs with Limited Resources Categories: ASP characteristics & Processes
Theme 2	<ul style="list-style-type: none"> No Matter How Committed, a Single Person Cannot Sustain an ASP Category: Characteristics of Interventionist
Theme 3	<ul style="list-style-type: none"> An ASP Requires Access to & Interpretation of Data not Readily Available at Many NHs Category: ASP Characteristics
Theme 4	<ul style="list-style-type: none"> ASP Sustainability Requires External Partnerships, Internal Leadership Support, & Collaboration Across Longstanding Disciplinary Boundaries Categories: Processes & Inner Contextual Factors
Theme 5	<ul style="list-style-type: none"> It is Hard to “Get to Step Two” & Sustain an ASP Because Clinical “Fires Come First” Category: Processes
Theme 6	<ul style="list-style-type: none"> Consistent & Constant Education on ASP is Important for Sustainability Category: Processes
Theme 7	<ul style="list-style-type: none"> Outer Contextual Factors Impede Stewardship Efforts Category: Outer Contextual Factors

Conclusion: Multiple interconnected factors impact ASP sustainability. We recommend that NHs prioritize and focus on three critical areas: (1) providing explicit leadership support, (2) maintaining partnerships with an AS expert and fostering internal inter-professional collaborations, and (3) providing consistent education and training for all staff.

Disclosures: Ghinwa Dumyati, MD, Roche Diagnostics (Consultant)

189. Validating a Hospitalist-Specific Antibiotic Prescribing Metric across Four Acute Care Hospitals

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Session: P-6. Antimicrobial Stewardship: Program Development and Implementation

Background: Peer comparison reduces unnecessary outpatient antibiotic prescribing, but no prescribing metric has been validated for inpatient comparison. We aimed to evaluate if an electronically derived antibiotic prescribing metric correlated with indicated antibiotic days in hospitalized patients.

Methods: We previously created a hospitalist-specific adjusted antibiotic use metric (observed:expected [O:E]) for National Healthcare Safety Network-defined broad-spectrum antibiotics. From May-Oct 2019 at four Emory Healthcare hospitals, we identified outlier hospitalists prescribing in the top (high O:E) and bottom (low O:E) 15th percentile. We randomly selected 10 days of antibiotic administration from each outlier and reviewed days with > 2 days of consecutive days of antibiotics. For pneumonia, chronic obstructive pulmonary disease (COPD), or urinary tract infection (UTI) we determined if each day of antibiotics was indicated, assuming the diagnosis was accurate. We compared high vs. low O:E providers and used regression modeling to determine if the metric predicted indicated days of antibiotics.

Results: Among 997 days, 510 (51%) were from high and 487 (49%) from low O:E providers. High O:E providers had a greater proportion of days with > 2 prior days of antibiotics (60%) compared to low O:E providers (54%, $p = 0.03$). In the subset of days with > 2 prior days of antibiotics ($n = 569$), high O:E providers had more patient-days with longer hospital stays, diabetes and Charlson comorbidity index (CCI) >3, and fewer days supervising (resident/advanced practice provider, Table 1). The primary diagnosis was pneumonia, COPD exacerbation or UTI in 260 (25%) days; 91% were indicated based on duration with no difference between high and low O:E providers (88% vs. 94%, $p = 0.1$). After controlling for days of hospitalization, CCI, immunocompromised status, and supervisory role, a high O:E was not associated with indicated antibiotic use (OR 0.5, 95% CI 0.2 – 1.3).

Description of days with a patient on greater than two days of antibiotics, comparing high- versus low-metric providers

Table 1: Description of days with a patient on greater than two days of antibiotics, comparing high- versus low-metric providers

	All days (n = 569)	Days from high-metric providers (n = 308)	Days from low-metric providers (n = 261)	P-value ¹
Age, median (IQR)	65 (50 – 77)	66 (52 – 76)	63 (47 – 79)	0.54
Female	299 (53)	159 (52)	140 (54)	0.6
Race				
White	301 (53)	156 (51)	145 (56)	0.2
Black	226 (40)	130 (42)	96 (37)	
Asian	21 (4)	14 (5)	7 (3)	
Other or Unknown	21 (4)	8 (3)	13 (5)	
Charlson comorbidity index >3	295 (52)	172 (56)	123 (47)	
End-stage renal disease	58 (10)	27 (9)	31 (12)	0.2
Diabetes	229 (40)	138 (45)	91 (35)	0.02
Immunocompromised ²	107 (19)	50 (16)	57 (22)	0.09
Days hospitalized ³ , median (IQR)	4 (2 – 7)	5 (3 – 9)	4 (2 – 6)	<0.001
Number of antibiotics received that day				
1	271 (48)	145 (47)	125 (48)	0.1
2	245 (43)	140 (45)	105 (40)	
>2	53 (9)	22 (7)	31 (12)	
Hospitalist supervising a resident or advanced practice provider	54 (9)	18 (6)	36 (14)	< 0.01
Infectious disease consult ⁴	211 (37)	107 (35)	104 (40)	0.2
Primary reason for antibiotics				
CAP	83 (15)	43 (14)	40 (15)	0.14
HAP or VAP	15 (3)	11 (4)	4 (2)	
COPD exacerbation	6 (1)	2 (1)	4 (2)	
UTI or pyelonephritis	156 (27)	82 (27)	74 (28)	
Sepsis or fever of unclear origin	19 (3)	10 (3)	9 (3)	
Skin and skin structure infection	120 (21)	70 (23)	50 (19)	
Abdominal infection	68 (12)	44 (14)	24 (9)	
Other	102 (18)	46 (15)	56 (21)	

All values are presented as number (%) unless otherwise stated

1. Compared high-metric (O:E) vs. low-metric (O:E) provider days using Chi square or Mann-Whitney U tests where appropriate
2. Defined as active solid or hematologic malignancy, HIV with a CD4 count < 200 in the last year, absolute neutrophil count < 500/mm³ during admission, taking immunosuppressive medications, or other immunocompromising diagnoses determined by study investigators during chart review
3. Until day of review
4. On that day or in the prior 3 days

Abbreviations: IQR, interquartile range; CAP, community-acquired pneumonia; HAP, hospital-acquired pneumonia; VAP, ventilator-associated pneumonia; COPD, chronic obstructive pulmonary disease; UTI, urinary tract infection

Conclusion: A high hospitalist antibiotic prescribing metric correlated with patients receiving > 2 consecutive days of antibiotics on any given day but did not predict unindicated antibiotic use for a subset of diagnoses. Evaluating indicated use by validating diagnoses may improve metric performance.

Disclosures: Jessica Howard-Anderson, MD, Antibacterial Resistance Leadership Group (ARLG) (Other Financial or Material Support, The ARLG fellowship provides salary support for ID fellowship and mentored research training)

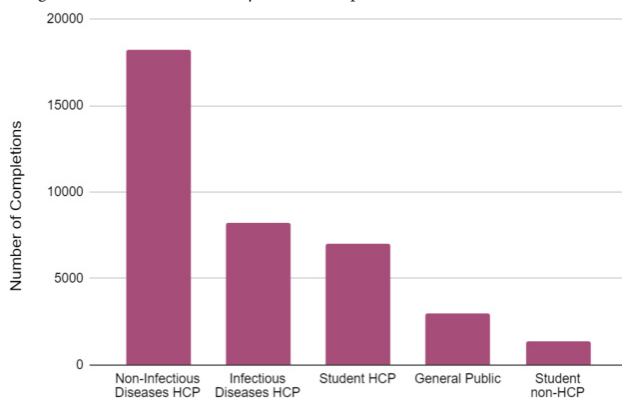
190. Which antibiotic are you? Evaluation of a global antibiotic awareness personality quiz

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Session: P-6. Antimicrobial Stewardship: Program Development and Implementation

Background: Improving understanding of the impact of antibiotic overuse is a key component of the global action plan to address antibiotic resistance. Play is an underutilized opportunity to engage adults in learning about antibiotic resistance and the importance of appropriate antibiotic use in mitigating this public health threat. Our objective was to evaluate the reach of a web-based antibiotic awareness personality quiz.

Figure 1. Antibiotic Personality Quiz Participants



Methods: A personality quiz (<http://www.tiny.cc/antibioticquiz>) was developed using an online platform (Tryinteract.com). The quiz included a series of short personality-based questions. Once complete, based on the responses provided, the respondent was automatically assigned an antibiotic that best matched their personality. This result was accompanied by key teaching points about the assigned antibiotic, a statement

about the importance of appropriate antibiotic use and links to find more information. The quiz was launched in November 2017 to coincide with World Antibiotic Awareness Week and disseminated via social media. It was updated iteratively each year. We evaluated usage statistics from November 7 2017 to June 7 2020.

Results: During the 31-month evaluation period, there were 287,868 views of the quiz, and it was completed 207,148 times. The quiz was shared extensively on social media (Facebook 1667 shares, Twitter 1390 clicks). From a subset of 37,825 recent participants who were asked about their profession, most identified as non-infectious diseases healthcare professionals (n= 18,235, 48.2%), followed by infectious disease healthcare professionals (n=8,119, 21.8%), and healthcare students (n=6,986, 18.5%) (Figure 1). Respondents were well-represented globally, including US, Canada, Spain, France, India, United Kingdom, and Indonesia.

Conclusion: This exploratory analysis suggests incorporation of play into social media campaigns may augment the size of the receiving audience. An antibiotic awareness personality quiz engaged a high volume and broad range of non-infectious disease experts in learning more about antibiotic resistance. Antimicrobial stewards and public health campaign leaders should incorporate play into awareness opportunities and evaluate their impact.

Disclosures: All Authors: No reported disclosures

191. The impact of antibiotic use on clinical outcomes in cancer patients treated with immune checkpoint inhibitors: a systematic review and meta-analysis

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Session: P-7. Antimicrobial Stewardship: Special Populations

Background: Observational studies and experimental models suggest that use of antibiotics close to the administration of immune checkpoint inhibitors (ICI) can negatively affect tumor response and patient survival. This observation may be attributed to microbiome dysbiosis and the resultant suppression of host immune response against neoplastic cells.

Methods: We conducted a systematic search of PUBMED and EMBASE databases and references of articles retrieved. We included studies published between 1/1/17 and 2/1/20, which evaluated the association between antibiotic use and clinical outcomes in cancer patients treated with ICI. Primary endpoints were overall survival (OS), progression free survival (PFS), response rate (RR) and progressive disease (PD) rate. We performed a study-level random-effects meta-analysis with pooling of hazards ratios (HR) for OS, PFS, and odds ratios (OR) for RR and PD (PROSPERO ID: CRD42020166473).

Results: We included 41 studies with a total of 10,857 patients. The most common malignancies were lung cancer (59.7%), melanoma (23.1%), renal cell and urothelial carcinomas (8.1%). OS and PFS were shorter, RR lower, and PD higher in patients receiving antibiotics, both in univariate analyses and after adjustment for other confounders. Heterogeneity was significant for all outcomes, less so for adjusted OS and PFS (Table). To our knowledge, this is the largest meta-analysis on the association between antibiotic use and efficacy of ICI, and the only one to address RR and PD to-date.

Association between antibiotics and clinical outcomes.

Outcome with antibiotic use	Number of studies	(adj.) HR (95%CI) for progression/death	OR (95%CI)	P	I ² (%)
OS	24	1.95 (1.54-2.47)		<0.0001	82
PFS	20	1.53 (1.36-1.71)		<0.0001	75
adj. OS	16	2.23 (1.80-2.75)		<0.0001	49
adj. PFS	16	2.15 (1.77-2.61)		<0.0001	46
RR	19		0.54 (0.35-0.82)	0.004	53
PD	12		2.14 (1.40-3.27)	0.0004	58

Conclusion: We demonstrated a significant association between antibiotic use and unfavorable clinical outcomes in patients with cancer receiving ICI. Such patients may be an important target group for antibiotic stewardship interventions. The high heterogeneity across all outcomes underscores the need for more detailed, patient-level studies with stratification by host, antibacterial and cancer treatment factors.

Disclosures: All Authors: No reported disclosures

192. A Hematology/Oncology Unit-Specific Antibigram Emphasizes the Need for Intensified Local Stewardship

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