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Session: P-07. Antimicrobial Stewardship: Program Development and Implementation

Background. Antibiotic stewardship initiatives can leverage metrics that make peer-peer comparisons. A commonly used metric measures how frequently a clinician prescribes antibiotics for acute respiratory infections (ARIs), as defined by diagnostic codes. However, it is unclear if clinicians differ in their use of ARI diagnostic codes. In this study, we evaluated differences in how frequently clinicians code for ARIs and factors that are associated with the use of ARI diagnostic codes in Emergency Department (ED) and Urgent Care (UC) visits across an integrated healthcare system.

Methods. We analyzed a retrospective cohort of all ED and UC patient-visits across 129 Veterans Affairs medical centers during 2016-2018. ARI visits were identified using ICD-10 codes for acute bronchitis, influenza, pharyngitis, sinusitis, and upper respiratory tract infections for clinicians with 100 or more visits. A generalized linear mixed model with a link logit function that accounted for clustering at the clinician and facility-level was used to calculate median odds ratios (OR) and to identify factors associated with increased likelihood of entering an ARI code.

Results. There were 6,016,499 patient-visits, and 519,389 (8.6%) were coded as an ARI (Table 1). The mean rate of ARI diagnoses across all visits was 8.9% (SD 2.5%) at the facility-level and 7.4% (SD 4.5%) at the clinician-level (Table 2). The median OR was 2.19 (95% CI 2.18, 2.22), suggesting there was between-clinician variation in coding for ARI diagnoses. Visits were significantly more likely to be coded as ARIs if seen by an advanced practice provider (OR=2.36, 95% CI 2.19, 2.54), if a fever was recorded (OR=4.20, 95% CI 4.18, 4.29), and if the visit occurred between December-March (OR=1.97, 95% CI 1.96, 1.98). Approximately 2/5th of the variability (41.4%) in assigning an ARI diagnostic code was explained by differences across individual clinicians.

Table 1. Characteristics of visits coded as ARIs and non-ARIs in Emergency Departments and Urgent Care Clinics across 129 VA Medical Centers, 2016-2018

	Total (n=6016499)	ARI visit (n=519389)	Non-ARI visit (n=5497110)
Median Age (IQR)	61 (48-70)	59 (45-68)	61 (48-70)
Male	5299689 (88.1)	441316 (84.9)	4858373 (88.4)
Immunosuppression	217732 (3.6)	15502 (2.9)	202230 (3.7)
Respiratory Viral Season	2013958 (33.5)	250163 (48.2)	1763795 (32.1)
Abnormal Temperature	52816 (0.9)	14896 (2.9)	37720 (0.7)
Chronic Disease	3326374 (55.3)	277158 (53.4)	3049216 (55.5)
Obesity	1106994 (18.4)	106202 (20.5)	1000792 (18.2)
Emergency Department visits	5160783 (85.8)	423950 (81.6)	4736833 (86.2)
Provider type			
Physician	3605553 (59.9)	304572 (58.6)	3300981 (60.1)
Advanced practice provider	1048791 (17.4)	122976 (23.7)	925815 (16.8)
Clinician-type not labeled	1362155 (22.6)	91841 (17.7)	1270314 (23.1)
US Census Region			
Northeast	745396 (12.4)	64185 (12.4)	681211 (12.4)
Midwest	1301490 (21.6)	118568 (22.8)	1182922 (21.5)
South	2629143 (43.7)	237620 (45.8)	2391523 (43.5)
West	1340470 (22.3)	99016 (19.1)	1241454 (22.6)

Table 2. Frequency at which clinicians used ARI diagnostic codes for Emergency Department and Urgent Care visits across 129 VA medical centers, 2016-2018

Location of visit and type of clinician	Unique clinicians (n) ¹	Mean percentage of visits coded as an ARI (SD)
Emergency Department		
Physician	2292	7.5% (3.5)
Advanced practice provider	409	10.9% (4.4)
Clinician-type not labeled	1974	5.7% (4.4)
Urgent Care Clinics		
Physician	366	10.6% (4.3)
Advanced practice provider	102	12.8% (4.4)
Clinician-type not labeled	364	7.3% (5.2)
All visit and clinician-types	5507	7.4% (4.5)

1. Limited to clinicians with ≥100 patient-visits during the study period.

Conclusion. There was substantial variability in how frequently ED and UC clinicians coded a visit as an ARI, and a large proportion of the variability was explained by differences across clinicians. Unmeasured factors could include different approaches to using diagnostic codes. ARI metrics based on diagnostic codes may need to account for differences in clinicians' coding behavior.

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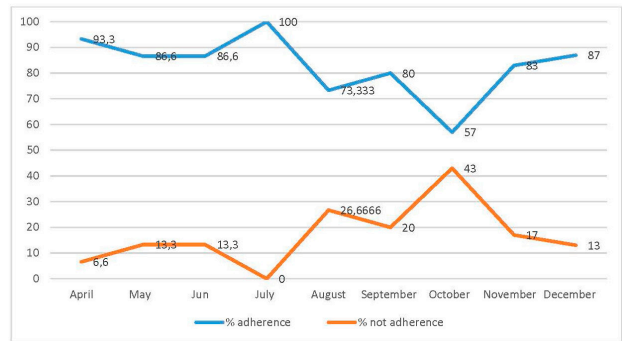
116. Impact of an Antimicrobial Stewardship Program in the First Year of Pandemic 2020 in a Large, Academic, Public Network Hospitals in Bogotá, Colombia

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Session: P-07. Antimicrobial Stewardship: Program Development and Implementation

Background. Antimicrobial resistance is a major public health threat internationally but, particularly in Colombia. High and increasing rates of carbapenemases are challenging. Implementing antimicrobial stewardship programs (AMS) in a large, academic, public network hospitals in Bogotá, Colombia, will help curb inappropriate antibiotic use.

Adherence to AMS Program 2020. Subred Integrada de Servicios de Salud Sur Occidente E.S.E Bogotá, Colombia.



Impact of an Antimicrobial Use Optimization Program in the First Year of Pandemic 2020 in a Large, Academic, Public Network Hospitals in Bogotá Colombia

Methods. AMS was established in April 2020 consisting of an administrative champion, Infectious Diseases staff, nurse, General Physician, microbiologist, and pharmacists. Antimicrobial stewardship program interventions included postprescriptive audit and establishment of institutional guidelines. The AMS tracked appropriate drug selection including loading dose, maintenance dose, frequency, route, duration of therapy, de-escalation, and compliance with AMS recommendations. Defined daily dose (DDD) of drugs and health economics evaluations of antimicrobials (April-December 2020). Recommendations are placed in the electronic medical record as a progress note.

Results. From April to December 2020, 1013 patients were evaluated by means of a prospective methodology. Unnecessary 689 days of hospitalization and 4420 days of antibiotic therapy were avoided. Among the top antibiotics discontinued were piperacillin tazobactam for the months of July, August, November and December, while for September and October was meropenem. The intensive care unit was the most frequently intervened service (52%), followed by hospitalization (43%) and the emergency department (5%). Over the course of the year, there was significant adherence to the program, with 100% in July, followed by 93.3% in April, 87% in December, 86.6% in May and June, 83% in November, 80% in September, 73.3% in August and 57% in October. The AMS program was able to save \$47,409 US in antibiotics and \$55,529 US in hospitalization, and 11% decrease in nephrotoxicity events (14 renal failures were avoided), which also saved additionally \$ 23,503 US for a total of an estimated cost saving for the network public hospitals of \$ 126,441 US by 2020.

Conclusion. Implementation of a multidisciplinary antibiotic stewardship program in this academic, large, academic, public network hospitals in Bogotá, Colombia demonstrated feasibility and economic benefits even in a Covid19 pandemic situation.

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117. How Does Antimicrobial Stewardship Provider Role Affect Prospective Audit and Feedback Acceptance by the Attending Physician?

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Session: P-07. Antimicrobial Stewardship: Program Development and Implementation

Background. Antimicrobial stewardship (AMS) teams are commonly multidisciplinary. The effect of AMS provider role on prospective audit and feedback (PAF) acceptance has previously been investigated with mixed results. PAF of restricted antimicrobials (carbapenems, linezolid, daptomycin, and tigecycline) in adult inpatients at our large Canadian academic centre has been performed since 2018. Actionable feedback is communicated via chart note plus one of a phone call, direct message, or

in-person discussion with the most responsible physician of the attending team in order to optimize the prescription if deemed necessary. The objective of this study was to assess the effect of AMS provider role on PAF acceptance.

Methods. A 3 year retrospective review of all PAF events was undertaken. All audited prescriptions were included. Logistic regression was used to determine odds ratios for acceptance for individual AMS provider roles of pharmacist, physician, and supervised post-graduate physician trainee.

Results. Out of 1896 prescriptions audited, actionable feedback was provided to the most responsible physician in 731 (39%) cases. 677/731 (93%) of audited antibiotics were carbapenems. The overall acceptance rate was 82% (598/731). Acceptance rate and odds of acceptance based on AMS provider role were as follows: pharmacist alone 171/208 (82%), OR 1.04, 95% CI 0.70-1.59, physician alone 141/160 (88%), OR 1.85, 95% CI 1.12-3.20, pharmacist-physician duo 211/268 (79%), OR 0.73, 95% CI 0.50-1.07, and supervised post-graduate physician trainee 75/95 (79%), OR 0.81, 95% CI 0.48-1.41.

Conclusion. The overall acceptance rate was high. There was a higher odds of acceptance if an AMS physician was providing PAF alone, highlighting the importance of physician involvement.

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118. Feasibility of a Proactive Amoxicillin Oral Challenge Program for Inpatients with Penicillin Allergy at the Miami VAMC

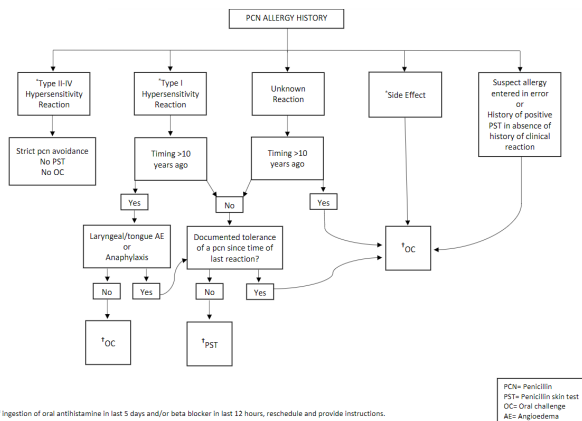
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Background. Ninety percent of patients who report penicillin (PCN) allergy are not truly allergic. Penicillin skin testing (PST) followed by oral challenge (OC) with amoxicillin (AMX) can evaluate unconfirmed PCN allergy. PST is taxing and requires trained staff, while OC is an acceptable alternative in patients with low-risk histories, who can safely undergo OC without PST. OC is performed in the outpatient Miami Veterans Affairs Medical Center (MVAMC) setting. Collaboration between Allergy, Antimicrobial Stewardship Program (ASP), and Hospital Medicine identified patients with low-risk histories and offered OC to inpatients.

Methods. A daily report of MVAMC inpatients with PCN allergy was reviewed for appropriateness of OC (Fig 1). Hospice patients and those medically unstable or unable to consent were excluded. Appropriate consenting patients were challenged with AMX 500mg PO and observed for 60 minutes. If no reaction resulted, the PCN allergy label was removed. Epinephrine and diphenhydramine were available in case of adverse reaction. Those who were not OC candidates were offered outpatient PST (Fig 1).

Figure 1. Penicillin allergy history evaluation algorithm



Results. We evaluated 39 inpatients with PCN allergy from 3/10 - 5/27/21. Median age was 68 years; 94.9% were male (Table 1). The most common recorded reaction was unknown (Table 2). Thirteen (33.3%) did not qualify for OC, 7 (17.9%) refused, 2 (5.1%) were receiving a penicillin-derivative, 1 (2.6%) patient's primary team refused consult, 2 (5.1%) patients were discharged prior to OC. Fourteen (38%) patients underwent OC with 0 adverse reactions; 0 patients required epinephrine or diphenhydramine. After OC, 5 patients had changes to their antibiotic regimen as a result of a negative OC. Limitations included 5 patients on beta-blockers, and 5 patients unable to consent.

Table 1. Demographics of Evaluated Inpatients, N = 39 (%)

Median Age (years)	68
Interquartile Age (years)	62-74
Gender	37 male (94.9), 2 female (5.1)

Note that 1 patient out of the 39, underwent DPC with cefpodoxime 200mg PO instead of amoxicillin for a reported allergy to ceftriaxone.

Table 2. Reported Reactions, N = 41 (%)

Unknown	15 (36.6)
Generalized, non-specific rash	9 (22.0)
Urticaria	7 (17.1)
Swelling, non-specific	1 (2.4)
Angioedema or anaphylaxis	3 (7.3)
Nausea or vomiting	2 (4.9)
Bruising	1 (2.4)
Dyspnea	1 (2.4)
Diaphoresis	1 (2.4)
Syncope	1 (2.4)

Total N exceeds evaluated patient number as one patient reported multiple reactions to receiving penicillin.

Conclusion. Removing unnecessary PCN allergy labels using inpatient OC with AMX is safe and effective for those with low-risk allergy histories. Zero patients undergoing OC developed a reaction, suggesting that OC may be safely performed per our algorithm. Our protocol does not require specialized training and is reproducible in settings without an Allergy specialist. In the 3 months prior to this program there were 0 inpatient consults to evaluate PCN. Future plans include forming a multidisciplinary consult service.

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119. Performance of Infectious Diseases Specialists, Hospitalists, and Generalists in Case-Based Scenarios Illustrating Antimicrobial Stewardship Principles at 16 VA Medical Centers

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Session: P-07. Antimicrobial Stewardship: Program Development and Implementation

Background. As part of a project to implement and evaluate antimicrobial dashboards at selected VA facilities nationwide, we assessed provider attitudes and knowledge related to antibiotic prescribing among physicians working in inpatient settings at 16 VA facilities.

Methods. The online survey explored attitudes toward antimicrobial use and assessed respondents' management of four clinical scenarios: cellulitis, community-acquired pneumonia (CAP), non-catheter-associated asymptomatic bacteriuria (NC-ASB), and catheter-associated asymptomatic bacteriuria (C-ASB). Responses were scored by assigning +1 for an answer most consistent with guidelines, 0 for a less-guideline-concordant but acceptable answer and -1 for an incorrect answer. Scores were normalized to 100% correct to 100% incorrect across all questions within a scenario, and mean scores were calculated across respondents by specialty; differences in mean score per scenario were tested using ANOVA.

Results. One-hundred-thirty-nine physicians completed the survey (n=19 ID physicians, 62 hospitalists, 58 generalists). Attitudes were similar across the three specialties. There was a significant difference in cellulitis scenario scores (correct responses: ID=67.4%, hospitalists=51.2%, generalists=41.8% correct, p=0.0087). Scores were not significantly different across specialties for CAP (correct responses: ID 76.2%, hospitalists 63%, generalists 56.5%, p=0.0914) and NC-ASB (correct responses: ID 63%, hospitalists 55%, generalists 36.2%, p=0.322), though ID trended higher. Lowest scores were observed for C-ASB (ID 39.5% correct, hospitalists 4% incorrect, generalists 8.5% incorrect, p=0.12).

Conclusion. Significant differences in performance on management of cellulitis and low overall scores on C-ASB management point to these conditions as being potentially high-yield targets for antimicrobial stewardship interventions.

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120. Antimicrobial Prescribing Guidance and Communication Among Health Care Professionals in Five Guatemala Hospitals

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