**152. Applying A Difference-in-Difference Analysis to Assess Effect of Antimicrobial Stewardship Strategies on Changes in Antimicrobial Use**

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

***Background:*** About 30–50% of inpatient antimicrobial therapy is sub-optimal. Health care facilities have utilized various antimicrobial stewardship (AS) strategies to optimize appropriate antimicrobial use, improve health outcomes, and promote patient safety. However, little evidence exists to assess relationships between AS strategies and antimicrobial use. This study examined the impact of changes in AS strategies on antimicrobial use over time.

***Methods:*** This study used data from the Veterans Affairs (VA) Healthcare Analysis & Informatics Group (HAIG) AS survey, administered at 130 VA facilities in 2012 and 2015, and antimicrobial utilization from VA Corporate Data Warehouse. Four AS strategies were examined: having an AS team, feedback mechanism on antimicrobial use, infectious diseases (ID) attending physicians, and clinical pharmacist on wards. Change in AS strategies were computed by taking the difference in the presence of a given strategy in a facility between 2012–2015. The outcome was the difference between antimicrobial use per 1000 patient days in 2012–2013 and 2015–2016. Employing multiple regression analysis, changes in antimicrobial use was estimated as a function of changes in AS strategies, controlling for ID human resources in and organizational complexity.

***Results:*** Of the 4 strategies, only change in availability of AS teams had an impact on antimicrobial use. Compared to facilities with no AS teams at both time points, antibiotic use decreased by 63.9 uses per 1000 patient days in facilities that did not have a AS team in 2012 but implemented one in 2015 (p=0.0183). Facilities that had an AS team at both time points decreased use by 62.2 per 1000 patient days (p=0.0324).

***Conclusion:*** The findings showed that AS teams reduced inpatient antibiotic use over time. While changes in having feedback on antimicrobial use and clinical pharmacist on wards showed reduced antimicrobial use between 2012–2015, the differences were not statistically significant. These strategies may already be a part of a comprehensive AS program and employed by AS teams. In further development of stewardship programs within healthcare organizations, the association between AS teams and antibiotic use should inform program design and implementation.

***Disclosures:*** **All Authors**: No reported disclosures

**153. Development of a Pathway for Removal of Inappropriate Penicillin Allergy Labels in Hospitalized Patients**

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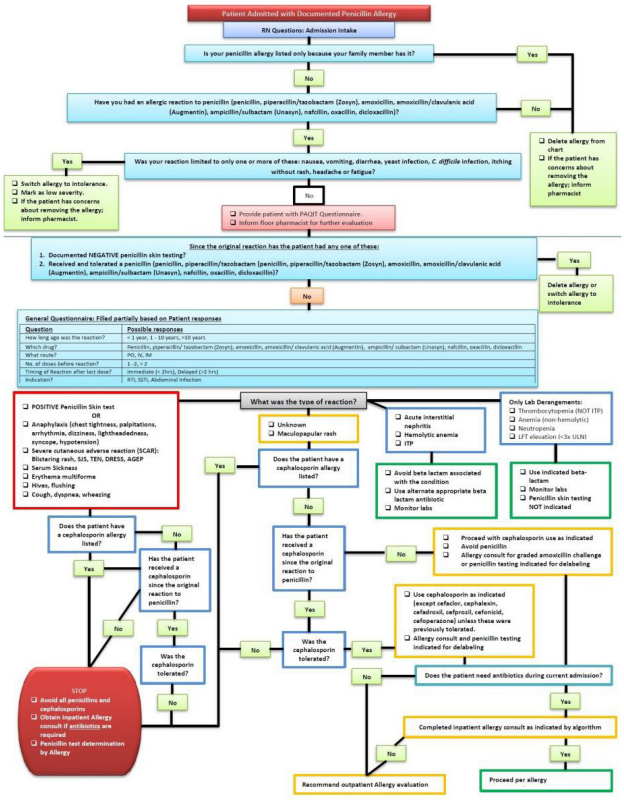
**Penicillin Allergy Quality Improvement Team (PAQIT)**

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

***Background:*** More than 90% of reported penicillin allergies are found inaccurate when formally assessed. These allergy labels lead to decreased utilization of first-line beta-lactam antibiotics, and adverse clinical outcomes. The objective of this study was to develop a multi-disciplinary approach to decrease inaccurate labeling among hospitalized patients with documented penicillin allergy.

***Methods:*** A team of clinicians, pharmacists, and nurses utilized the DMAIC quality strategy to improve accuracy of penicillin allergy labeling. Allergic reactions were stratified to develop a penicillin allergy de-labeling algorithm (**Figure 1**). Admission to the intensive care unit (ICU) for anaphylaxis was defined as a balancing measure. We reviewed baseline data from patients with a documented penicillin allergy admitted to a single inpatient floor at Mayo Clinic, Rochester between June and October 2019. A cause and effect diagram was used to conduct a root cause analysis. The intervention was then applied to patients who reported penicillin allergy admitted to the same floor from November 2019 to January 2020. Study data were collected and basic descriptive statistics generated.

Figure 1: Penicillin allergy delabeling algorithm




***Results:*** 96 patients were included in the control group with mean age of 71 years (range 65–84 years) and 55% females. Breakdown of documented allergic reactions are represented in **Figure 2**. 58 (60%) received an antibiotic for a median duration of 1.5 days (IQR: 0 – 6). Of these, 7(12%) received penicillin-class antibiotics, and 41 (70.6%) received non-beta-lactam antibiotics. 2 (2%) of these patients were de-labeled without any penicillin skin tests. Detailed metrics of each PDSA cycle are shown in **Table 1**. During PDSA cycle 2, inaccurate penicillin documentation was removed in 9/19 (47.4%) of hospitalized patients. There were no ICU admissions for anaphylaxis.

Figure 2: Graphic representation of proportion of type of documented allergic reactions to penicillin

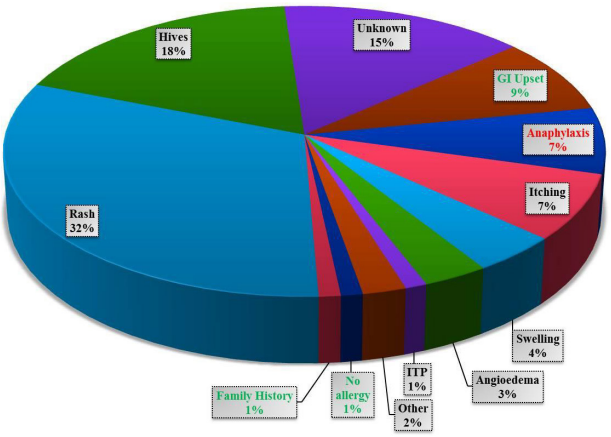


Table 1: Metrics and outcomes at baseline and during successive PDSA cycles

| | Baseline, n (%) (Jun 11, 2019 – Oct 31, 2019) | PDSA Cycle 1, n (%) (Nov 11, 2019 – Dec 11, 2019) | PDSA Cycle 2, n (%) (Dec 12, 2019 – Jan 11, 2020) |
|---|---|---|---|
| Documented penicillin allergy | 96 | 16 | 24 |
| Nursing intervention (%) | 0 (0) | 4 (25) | 19 (80) |
| Eligibility for intervention by pharmacists (%) | -- | 3/4 (75) | 11/19 (58) |
| Intervention by pharmacists (%) | -- | 1/3 (33) | 9/11 (82) |
| Eligibility for review by allergists after pharmacists' review (%) | -- | 1/1 (100) | 7/9 (77) |
| Intervention by allergists | -- | 0 | 0 |
| Penicillin allergy de-labeled per protocol (%) | 2 (2%) | 0 (0) | 9/19 (47.4) |
| Eligible for cephalosporin use (%) | -- | 1/4 (25) | 7/19 (37) |

***Conclusion:*** Various factors contribute to penicillin allergy mislabeling. Our comprehensive algorithm addresses nuances of penicillin allergic reactions and increased accurate penicillin allergy labeling in 47.4% of the cases. Beta-lactam use also increased to 37% through our pilot project while maintaining patient safety. A multi-disciplinary and patient-centered approach aligned with institutional workflows is necessary to improve patient outcomes.

***Disclosures:*** **All Authors**: No reported disclosures

**154. Development of an Electronic Algorithm to Target Outpatient Antimicrobial Stewardship Efforts for Adults with Acute Pharyngitis**

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

***Background:*** Although most antibiotic use occurs in outpatients, antibiotic stewardship programs (ASPs) have primarily focused on inpatients. A major challenge for outpatient ASPs is lack of accurate and accessible electronic data to target interventions. We developed and validated an electronic algorithm to identify inappropriate antibiotic use for adult outpatients with acute pharyngitis.

***Methods:*** In the University of Pennsylvania Health System, we used ICD-10 diagnostic codes to identify patient encounters for acute pharyngitis at outpatient practices between 3/15/17 – 3/14/18. Exclusion criteria included immunocompromising conditions, comorbidities, and concurrent infections that might require antibiotic use. We randomly selected 300 eligible subjects. Inappropriate antibiotic use based on chart review served as the basis for assessment of the electronic algorithm which was constructed using only data in the electronic health record (EHR). Criteria for appropriate prescribing, choice of antibiotic, and duration included positive streptococcal testing, use of penicillin/amoxicillin (absent b-lactam allergy), and 10 days maximum duration of therapy.

***Results:*** Of 300 subjects, median age was 42, 75% were female, 64% were seen by internal medicine (vs. family medicine), and 69% were seen by a physician (vs. advanced practice provider). On chart review, 127 (42%) subjects received an antibiotic, of which 29 had a positive streptococcal test and 4 had another appropriate indication. Thus, 74% (94/127) of patients received antibiotics inappropriately. Of the 29 patients who received appropriate prescribing, 27 (93%) received an appropriate antibiotic. Finally, of the 29 patients who were appropriately treated, 29 (100%) received the correct duration. Test characteristics of the EHR algorithm (compared to chart review) are noted in the Table.

***Conclusion:*** Inappropriate antibiotic prescribing for acute pharyngitis is common. An electronic algorithm for identifying inappropriate prescribing, antibiotic choice, and duration is highly accurate. This algorithm could be used to efficiently assess prescribing among practices and individual clinicians. The impact of interventions based on this algorithm should be tested in future work.

Test Characteristics of Electronic Algorithm for Inappropriate Prescribing, Agent, and Duration

| Test Characteristic | Value |
|---|---|
| **Inappropriate Prescribing** | |
| Sensitivity | 100% (94/94) |
| Specificity | 97% (200/206) |
| Positive Predictive Value | 94% (94/100) |
| Negative Predictive Value | 100% (200/200) |
| **Inappropriate Agent** | |
| Sensitivity | 100% (2/2) |
| Specificity | 100% (25/25) |
| Positive Predictive Value | 100% (2/2) |
| Negative Predictive Value | 100% (25/25) |
| **Inappropriate Duration** | |
| Sensitivity | NA (0/0) |
| Specificity | 100% (27/27) |
| Positive Predictive Value | NA (0/0) |
| Negative Predictive Value | 100% (27/27) |

***Disclosures:*** **All Authors**: No reported disclosures

**155. Development of antibiotic classification for measuring antibiotic usage in Korean hospitals using a modified Delphi method**

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**The Korean Society of Infectious Diseases, The Korean Society for Antimicrobial Therapy, and Health Insurance Review & Assessment Service**

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

***Background:*** In 2019, the project about developing a system for measure and benchmark antibiotic usage in each hospital was launched. As the basic work for the project, we developed 'antibiotic classification for measuring antibiotic usage in Korean hospitals' using a modified Delphi method.