

| | NON-PUI (n = 4,751) | PUI, PCR NEGATIVE (n = 1,530) | PUI, PCR POSITIVE (n = 1,002) | p-value |
|--|------------------------|-------------------------------------|-------------------------------------|---------|
| Male, n (%) | 2,234 (47.0) | 792 (51.8) | 506 (50.6) | 0.002 |
| Race, n (%) | | | | |
| Black | 3,306 (70.0) | 1,090 (71.2) | 787 (78.5) | <0.001 |
| White | 407 (8.6) | 104 (6.8) | 49 (4.9) | |
| Other/Unknown | 1,038 (21.9) | 336 (22.0) | 166 (16.6) | |
| Age, median (IQR) | 59.0 (26.0) | 61.0 (26.0) | 67.0 (19.0) | <0.001 |
| Expired, n (%) | 224 (4.7) | 163 (10.7) | 341 (34.0) | <0.001 |
| Length of Stay, days, median (IQR) | 6.0 (6.0) | 7.0 (9.0) | 9.0 (10.0) | <0.001 |
| Patients that Received Specific Antibiotics, n (%) | | | | |
| Cefepime | 1,052 (22.1) | 497 (32.5) | 385 (38.4) | <0.001 |
| Ceftriaxone | 1,431 (30.1) | 579 (37.8) | 601 (60.0) | <0.001 |
| Doxycycline | 782 (16.5) | 396 (25.9) | 528 (52.7) | <0.001 |

Table 1. Baseline characteristics and antimicrobial prescribing stratified by COVID-19 status.

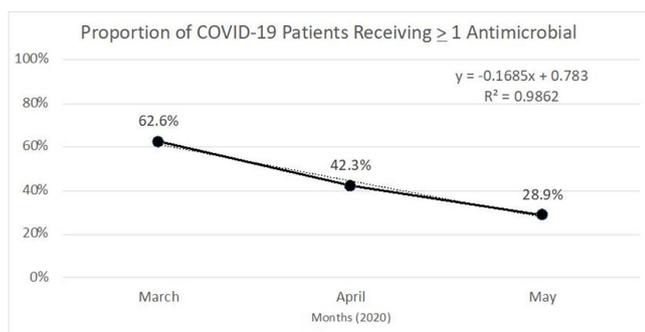


Figure 1.

decreased over time, likely due to (1) faster TATs, (2) real-time education to clinicians and subsequent de-escalation of unnecessary antimicrobials, and (3) development of treatment guidelines as new research emerged.

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Poster Presentation

Subject Category: Antibiotic Stewardship

Evaluation of Penicillin Allergy Prevalence and Antibiotic Prescribing Patterns for Patients within the Emergency Department

Ashlyn Norris; Lindsay Daniels; Nikolaos Mavrogiorgos; Kalynn Northam; Mildred Kwan; Gary Burke and Renae Boerke

As the point of entry into healthcare for many patients, the emergency department (ED) is an ideal setting in which to assess penicillin (PCN) allergies. An estimated 10% of the United States population has a reported PCN allergy; however, few studies have evaluated the prevalence and impact of PCN allergies on antibiotic selection within the ED. Patients with a documented PCN allergy are more likely to be exposed to costly alternative broad-spectrum antibiotics that have higher rates of adverse events, including *C. difficile* infections. We sought to determine the prevalence of PCN allergies within the UNC Medical Center ED. Key secondary outcomes included the percentage of patients with a documented PCN allergy who (1) received alternative antibiotics (carbapenems, aztreonam, fluoroquinolones, clindamycin, vancomycin), (2) received β-lactam antibiotics and experienced an allergic reaction during their ED visit, and/or (3) had received a β-lactam antibiotic during a past hospitalization or ED visit without their chart being appropriately updated. A retrospective evaluation included patients aged >18 years with a documented PCN allergy who were discharged from the ED between January 1, 2017, and December 31, 2019. Over the study period, there were 14,635 patient encounters with a documented PCN allergy that comprised 8,573 unique patients. The prevalence of PCN allergies was 14.3% for all ED encounters. PCN allergy-labeled

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patients received alternative antibiotics in 59.4% of ED encounters in which antibiotics were prescribed. Of the 454 β-lactam antibiotics (62 penicillins, 380 cephalosporins, 12 carbapenems) administered to PCN allergy-labeled patients within the ED, there were zero allergic reactions. Also, 18.6% of PCN allergy-labeled patients had received and tolerated a β-lactam antibiotic during prior hospitalizations or ED visits (1.7% penicillins, 14.4% cephalosporins, 2.6% carbapenems) without appropriate updated documentation to reflect β-lactam antibiotic tolerance. These findings confirm the utilization of non-β-lactam antibiotics in PCN allergy-labeled patients, highlighting the importance of accurate and updated allergy documentation in the electronic medical record. These findings also demonstrate the need for improved allergy documentation and protocols to proactively assess penicillin allergy labels while in the ED.

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Impact of an Inpatient Nurse-Initiated Penicillin Allergy Delabeling Questionnaire

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Background: Penicillin allergy is the most common drug allergy, with ~10% of all patients in the United States reporting a penicillin allergy. A penicillin allergy label is associated with the use of inappropriate or broad-spectrum antibiotics, worse patient outcomes, increased bacterial resistance, and increased healthcare costs, yet no studies have explored the unique role nurses may play in allergy delabeling through history taking as a part of broader antimicrobial stewardship efforts. Here, we describe the impact of using an inpatient nurse-initiated penicillin-allergy questionnaire. **Methods:** We implemented a nurse-driven intervention focused on penicillin allergy delabeling in inpatient noncritical care units (surgery, neurology, medicine, oncology, and cardiovascular medicine) at an academic hospital from July 9, 2019, to July 24, 2020. Patients with a penicillin allergy listed in the electronic health record (EHR) were identified and invited to participate. The intervention consisted of a questionnaire administered by nurses who elicited details of penicillin allergy history. If a patient was deemed eligible for penicillin allergy removal, nurses requested approval from both the patient as well as a physician member of the study team. **Results:** In total, 306 patients with a penicillin allergy label were identified in the EHR, of whom 242 patients were eligible for and agreed to participate in the delabeling interview (Figure 1). Of the 34 (14%) of 242 patients potentially eligible for delabeling by the questionnaire based on their history, the study physicians agreed with delabeling for 23 (68%) of 34 patients. Of these 34 patients, 18 (53%) agreed with delabeling (pending physician approval), and 16 (47%) of these 34 patients were ultimately

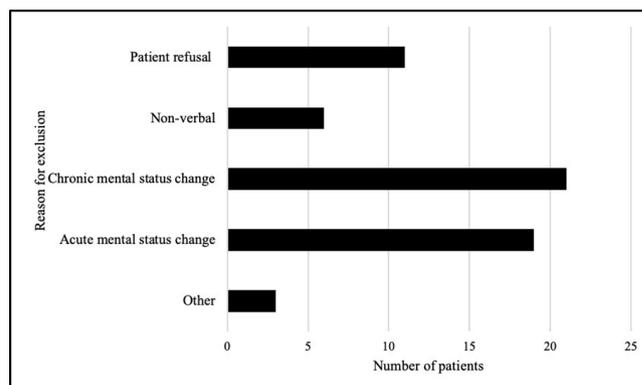


Figure 1. Reasons for patient exclusion

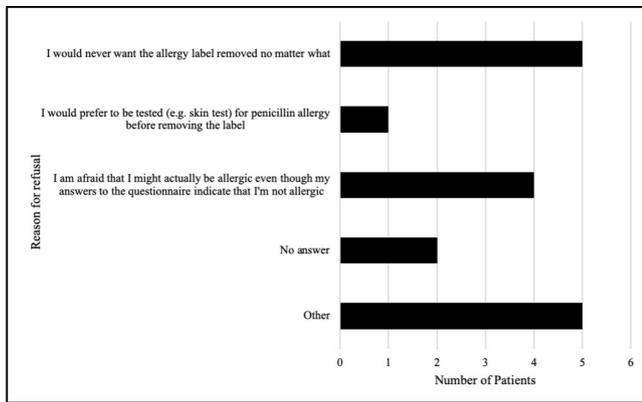


Figure 2. Reasons for patient refusal of penicillin allergy de-labeling

delabeled. For those who declined delabeling, never wanting the label removed under any circumstance and uncertainty about accuracy of the survey results were common reasons for refusal (Figure 2). Additionally, for the 13 patients who refused delabeling, 9 patients did not want or were unsure about following up with an allergy specialist. **Conclusions:** The nurse-driven penicillin-allergy delabeling questionnaire is a no-cost intervention that can successfully identify patients to delabel. In this study, this measure resulted in the removal of 16 (7%) of 242 penicillin allergy labels. However, patients frequently opted to keep penicillin allergy labels, expressing uncertainty and fear of removal. Future work should explore optimal methods to engage nurses and patients in allergy delabeling, as well as the impact on antibiotic use and patient outcomes.

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Evaluation of Penicillin Allergies and an Allergy Assessment Pilot in the Emergency Department

Ashlyn Norris; Kalynn Northam; Lindsay Daniels; Mildred Kwan; Gary Burke; Nikolaos Mavrogiorgos and Renae Boerneke

Penicillin (PCN) allergy is one of the most frequently reported medication allergies, with ~10% of the US population reporting a PCN allergy. However, studies have shown that only 1% of the US population have a true IgE-mediated reaction to PCN. Delabeling and appropriately updating patient allergy profiles could decrease the use of alternative broad-spectrum antibiotics, rates of infectious complications [*C. difficile*, methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* (VRE)], antibiotic resistance, and overall healthcare cost. The emergency department (ED) is an important setting in which to assess PCN allergies and to delabel patients when appropriate because there are >130 million ED visits in the United States each year. We sought to determine the percentage of PCN allergy-labeled patients who could be delabeled through a PCN allergy assessment interview in an ED. Key secondary outcomes included the percentage of interviewed patients who could not be delabeled based on history alone but would be eligible for an amoxicillin oral challenge or a PCN skin test (PST). A prospective PCN allergy assessment pilot was performed for patients aged >18 years presenting to the UNC Medical Center ED between December 1 and December 17, 2020, with a documented PCN allergy. A pharmacist conducted penicillin allergy assessments on a convenience sample of patients presenting to the ED between 8 A.M. and 3 P.M. on weekdays. Based on patients' reported and documented histories, charts were updated with the most accurate information and allergies were delabeled if appropriate. In total, 95 patients were assessed; 62 (65.3%) were interviewed and 15 (24.2%) were delabeled. In addition, 26 patients (41.9%) were deemed eligible for an oral amoxicillin challenge, 19 (30.6%) qualified for a PST, and 2 (3.2%) patients did not

qualify for further assessment due to having an IgE-mediated reaction in the past 5 years. Of the 15 patients who were delabeled, 6 (40.0%) received antibiotics during their admission: 4 (73.3%) of those patients received a penicillin and 2 (36.7%) received a cephalosporin, all without adverse reactions. Patient assessments took ~20 minutes to complete, including chart review, patient interview, and postinterview chart updating. The results from this pilot study demonstrate the impact of performing PCN allergy assessments in ED. Interdisciplinary opportunities should be explored to develop processes that will improve the efficiency and sustainability of PCN allergy assessments within the ED to allow this important stewardship intervention to continue.

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Associations Between Patient Neighborhood Characteristics and Inappropriate Antimicrobial Use

Joseph Engeda; Jane Kriengkaykiat and Erin Epton

Background: Antimicrobials are among the most commonly prescribed medications in US hospitals; an estimated 50% of hospitalized patients receive an antimicrobial. Research has shown that antimicrobial prescriptions to vary by patient- and hospital-level factors; however, disparities by patient neighborhood characteristics have not been examined. We evaluated associations between hospital and neighborhood indicators of socioeconomic status (SES) and antimicrobial use (AU) for gram-positive bacterial infections (GPBs), and broad-spectrum use for community-acquired infections (BSCAs) and hospital-onset infections (BSHOs). **Methods:** This analysis was conducted among 86 acute-care hospitals in California that submitted AU data via the NHSN in 2019. Hospital-level AU was measured as standardized antimicrobial administration ratios (SAARs) calculated by dividing observed antimicrobial use by risk-adjusted predicted antimicrobial use for GPB, BSCA, and BSHO antimicrobial groupings and categorized as binary (>1 or <1); SAARs >1 indicate potential inappropriate prescribing. California Office of Statewide Health Planning and Development 2018 data were used to obtain hospital characteristics and patient age, race or ethnicity, insurance, and comorbidities (defined by Charlson comorbidity index) for hospitalizations where AU may have been indicated, based on *International Classification of Diseases Tenth Revision* (ICD-10) diagnosis codes. The California Healthy Places Index (HPI) was used to obtain composite neighborhood SES indicators for each patient at the ZIP code level, measured as tertiles. Covariates were aggregated to the hospital level. Poisson regressions were used to evaluate the association between hospital and neighborhood SES indicators and SAAR scores, controlling for potential hospital-level confounders. **Results:** Among 86 hospitals included in the analysis, the mean patient age for hospitalizations where AU may have been indicated was 66 years, the proportion of white patients was 55%, and the mean proportion of Medi-Cal users was 19%. After adjusting for confounders including age, race or ethnicity, insurance status, comorbidities, and number of hospital beds; higher median values of patient SES had a protective effect against hospitals having GP SAAR scores > 1 (relative risk [RR], 0.68; 95% CI, 0.50–0.93) but was not significantly associated with hospitals having BSCA SAAR scores >1 (RR, 0.79; 95% CI, 0.62–1.02) or BSHO SAAR scores >1 (RR, 0.80; 95% CI, 0.61–1.04). **Conclusions:** Considering SES in addition to summary antimicrobial use scores such as SAARs may help identify populations potentially at risk for inappropriate AU; however, patient-level information is still necessary to evaluate appropriateness of antimicrobial prescribing.

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