

## Abstract

**Background:** The presence of allergies in the medical record may result in less efficient and more costly antibiotic use. Allergy services are often consulted when the optimal antibiotic is limited by a history of antibiotic allergy. While these consults are meant to help short- and long-term antibiotic selection, the impact of allergy consultation is poorly studied.

**Materials/methods:** Included patients were ≥18 years old with at least one β-lactam allergy listed in the medical record of Northwestern Memorial Hospital, had an inpatient or outpatient allergy service consult, and were hospitalized between January-June 2009; outpatient allergy service consult had to be completed prior to hospitalization. Patient demographic, outcomes of allergy consult, and antibiotic use information were collected.

**Results:** Forty patients were included and were predominantly female (n=24, 60%) and Caucasian (n=29, 73%), with mean age 57.6 years (SD 18), median length of hospital stay 14.5 days (IQR 5.5-23.5), and median days to allergy service consult 4.5 (IQR 3-10). Penicillin allergy was listed most commonly (n=37, 93%) whereas cephalosporin allergy (n=10, 25%) and carbapenem allergy (n=1, 2.5%) were less common. Allergic reaction manifestation was only documented in 85% of reported allergies (most commonly rash/itching (n=14, 35%)). Indication for allergy consult was evaluation for true penicillin allergy (n=22), evaluation of rash (n=7) assessment for alternative antibiotic due to infection with resistant bacteria (n=6), and other (n=5). The allergy service recommended changes to the patient’s allergy record in 73% (n=29) of cases. Allergy service recommendations were followed 93% of the time and antibiotics were changed post-consult in 70% of cases. The allergy list was updated post-consult for 63% (n=25) of patients.

**Conclusion:** Consistent with prior studies, most patients with β-lactam allergies were able to tolerate a related compound with allergy consultation. Despite documenting the safety of using β-lactams in these patients, about 40% did not have documentation of allergy updated, placing these patients at risk for receiving less efficient and more costly antibiotics with subsequent infections. Future studies should focus on cost reduction and the development of a stewardship intervention following allergy consult.

## Background

- Listing β-lactam antibiotic allergy in the electronic medical record (EMR) reduces antibiotic options to treat infections
- Allergy Service consults can be obtained to:
  - Validate an antibiotic allergy
  - Define alternative antibiotic options in the setting of documented allergy
- There is a lack of evidence regarding:
  - How often antibiotic allergy records are updated based on Allergy Service consult findings
  - Compliance with Allergy Service recommendations

## Objective

- To determine the frequency that β-lactam allergies are updated in the EMR after an Allergy Service consult

## Methods

### Study Design

- Retrospective cohort study to evaluate the accuracy of β-lactam antibiotic allergy listed in the EMR after Allergy Service consult at an academic medical center

### Patient Population

- Patients with a documented β-lactam allergy in the EMR and hospitalized at Northwestern Memorial Hospital or Prentice Women’s Hospital between 01/01/2009 and 06/30/2009
  - Patients ≥18 years of age
  - Patients were required to have had at least one Allergy Service inpatient or outpatient consult
    - Outpatient consult needed to be completed prior to hospitalization

### Statistical Analysis

- **Primary outcome:** Percentage of allergy records that were updated after Allergy Service consult
- Descriptive statistics were calculated using Intercooled Stata, version 13 (Statacorp, College Station, TX)

## Results

**Table 1. Patient Demographics**

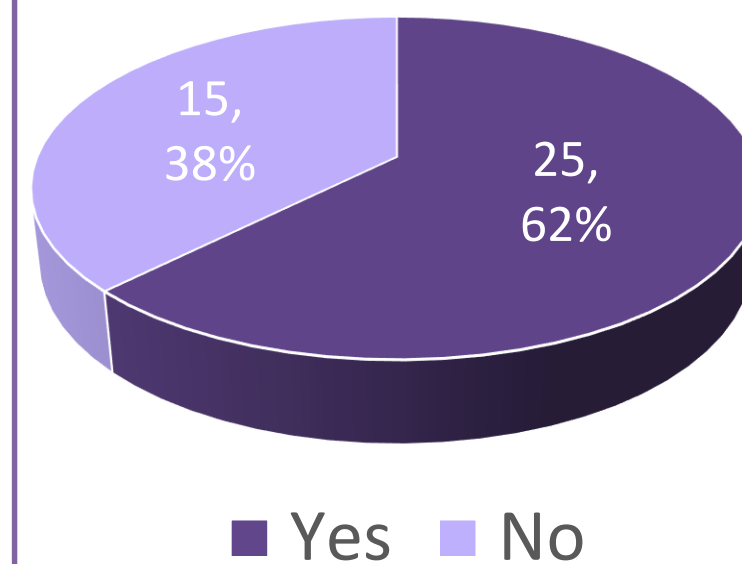
Variable	N=40
Age (mean, SD)	57.6 (18.0)
Gender, male (n,%)	16 (40)
Consult source, Cerner (n,%)	37 (92.5)
Allergies listed in medical record (n,%)	n=48
Penicillin	37 (92.5)
Cephalosporin	10 (25)
Carbapenem	1 (2.5)
Other antibiotic allergies listed in EMR (n,%)	29 (72.5)
Allergy reaction documented (n,%)	34 (85)
Allergy reaction severity (n,%)	n=36
Anaphylaxis	8 (22.2)
Hives	7 (19.4)
Rash/itching	14 (38.9)
Adverse drug reaction	4 (11.1)
Other	3 (8.3)

## Results

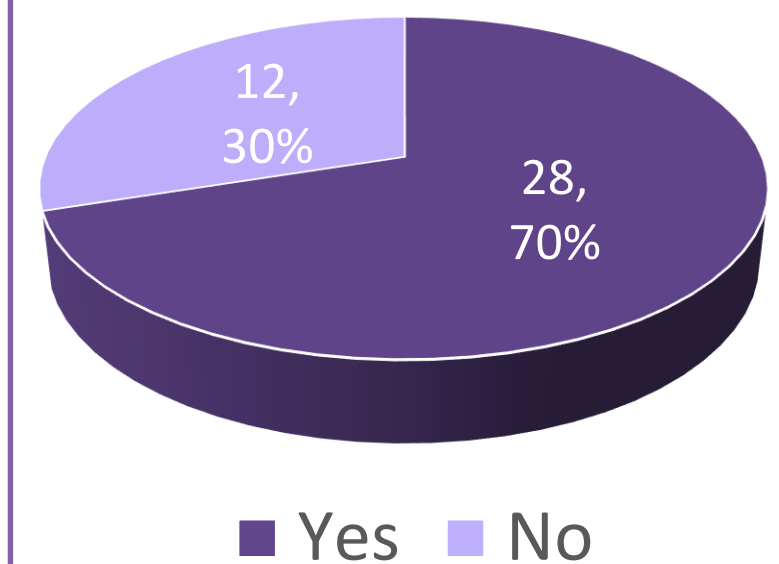
**Table 2. Allergy Consult and Antibiotic Outcomes**

Variable	N=40
Length of stay, days (median, IQR)	14.5 (5.5-23.5)
Days from admission to allergy consult (median, IQR)	4.5 (3-10)
Allergy Service recommended allergy record changes (n,%)	29 (76.3)
Allergy list updated with provider information (n,%)	23 (57.5)
Allergy considered a “true allergy” after consult (n,%)	25 (62.5)
Allergy Service recommendations followed (n,%)	37 (94.9)
Allergy determination method (n,%)	n=38
Patient history	9 (23.7)
Skin testing	29 (76.3)
Graded challenge recommended (n,%)	23 (58.9)
Desensitization recommended (n,%)	9 (23.1)
Infectious Diseases consult (n,%)	28 (70)
Antibiotic length of therapy, days (median, IQR)	18 (9-24)

**Figure 1. Allergy List Updated after Allergy Consult**



**Figure 2. Antibiotics Changed after Allergy Consult**



## Conclusions

- Although the Allergy Service recommended changes in approximately two thirds of patients seen, only 63% of these records were appropriately updated
- The majority of patient reported allergies were confirmed with skin testing
  - A “true allergy” was confirmed in about half of patients
- Future studies should report the specific reason for Allergy Service consultation
  - Most patients had a concomitant Infectious Diseases consult
  - This may have antimicrobial stewardship implications