

# Alternative Antibiotic Use in Patients with Reported Penicillin Allergy: An Opportunity for Antibiotic Stewardship

**Cara Iorianni MD**, Terry Langfitt MD, Galaxy Mudda MD, Tiffany Lee MD, Andrew Bowman MD, Jimmy Yao MD, Ben Amoateng MPH, Vikas O'Reilly-Shah MD, PhD, Grant Lynde MD, MBA, Francis Wolf MD

## Introduction

- Timely administration of pre-operative antibiotics reduces the rate of postoperative wound infections.
- Cefazolin is the recommended first-line preoperative antibiotic for most surgical procedures.
- Second-line antibiotics, such as vancomycin or clindamycin, may be substituted in patients with a reported penicillin (PCN) allergy due to concerns for cross-reactivity.
- Second-line antibiotic use is associated with decreased efficacy, increased costs, adverse effects, decreased compliance with on-time administration, and the emergence of antibiotic resistance.

### Objectives:

1. To determine the prevalence of PCN allergy among surgical patients at Emory University Hospital and the perioperative antibiotics used in this population.
2. To assess whether a reported PCN allergy was associated with worse compliance in timely administration of antibiotics and/or increased rates of postoperative infections.

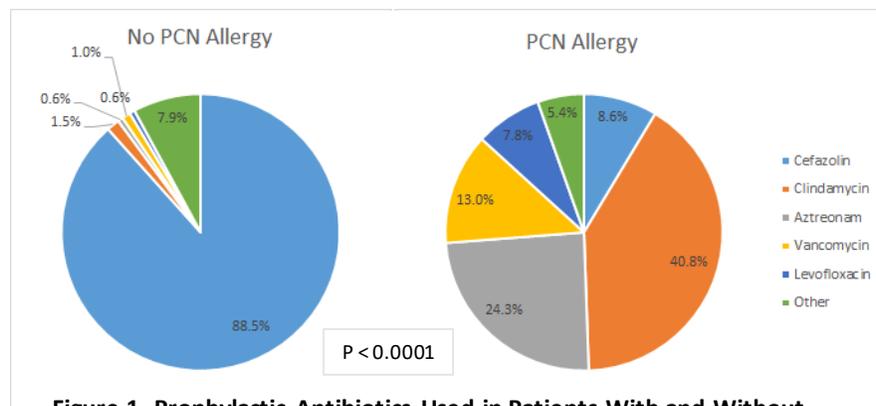
## Methods

- We analyzed electronic medical records from general, vascular, and plastic surgery cases from a 3-year period (2014-2016) at a single academic hospital.
- PCN allergies were identified by assessing all allergies in the electronic medical record using generic and trade names
- We compared rates of cefazolin administration versus alternative antibiotics, postoperative infections (surgical site infections and sepsis), and timely administration of the initial antibiotic dose between patients with and without a reported PCN allergy.

## Results

**6,121 surgical cases** were analyzed for allergy, antibiotic administration, and postoperative infection data - **58% were female, 73% were general surgery cases, and 55% were American Society of Anesthesiologists Physical Status 3**

**Prevalence of reported penicillin allergy: 14.6% (n=982)**



**Figure 1. Prophylactic Antibiotics Used in Patients With and Without Reported Penicillin Allergy**

**Table 1. On-Time Antibiotic Administration and Postoperative Infections in Patients With and Without Reported Penicillin Allergy**

	No PCN Allergy	PCN Allergy	P-value
<b>Failed On-Time Initial Antibiotic Dose</b>	8.6%	16.6%	<0.0001
<b>Postoperative Infection</b>	7.2%	9.2%	0.07

## Discussion

- Reported PCN allergy is common in our surgical patient population and leads to use of second-line prophylactic antibiotics, likely due to fear of cross-reactivity with cephalosporins.
- Reported PCN allergy was associated with decreased compliance in on-time administration of initial antibiotic dose and a trend towards increased rates of postoperative infection.
- Most patients with a self-reported PCN allergy test negative for a true, IgE-mediated allergy.
- In patients with a true allergy to PCN cefazolin is safe except in cases of a severe delayed reactions such as blistering skin rashes and organ-specific injury (nephritis, hepatitis).
- A simple pre-surgical allergy assessment could determine the safety of giving cefazolin to patients with reported PCN allergy.
- This presents a unique opportunity for anesthesiologists to increase the use of first-line antibiotics and assume a leadership role in antibiotic stewardship.

## References

1. Zagursky RJ, Pichichero ME. Cross-reactivity in  $\beta$ -Lactam Allergy. J Allergy Clin Immunol Pract. 2018 Jan - Feb; 6(1):72-81.
2. American Academy of Allergy, Asthma & Immunology. Choosing Wisely. Don't overuse non-beta lactam antibiotics in patients with a history of penicillin allergy, without an appropriate evaluation. [www.choosingwisely.org](http://www.choosingwisely.org). Accessed May 15, 2018
3. Blumenthal KG, Ryan EE, Li Y, Lee H, Kuhlen JL, Shenoy ES. The impact of a reported penicillin allergy on surgical site infection risk. Clin Infect Dis. 2018 Jan; 66(3):329-336.