

Impact of a Documented Penicillin Allergy on Pre-Operative Antibiotic Prophylaxis Selection at Lehigh Valley Health Network

Eryn Fitch

Amy Slenker MD

Lehigh Valley Health Network, amy_k.slenker@lvhn.org

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Published In/Presented At

Fitch, E., Slenger, A., (2018, 3, August) *Impact of a Documented Penicillin Allergy on Pre-Operative Antibiotic Prophylaxis Selection at Lehigh Valley Health Network*. Poster presented at LVHN Research Scholar Program Poster Session, Lehigh Valley Health Network, Allentown, PA.

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Impact of a Documented Penicillin Allergy on Pre-Operative Antibiotic Prophylaxis Selection at Lehigh Valley Health Network

Eryn Fitch and Amy Slenker, MD

Lehigh Valley Health Network, Allentown, Pennsylvania

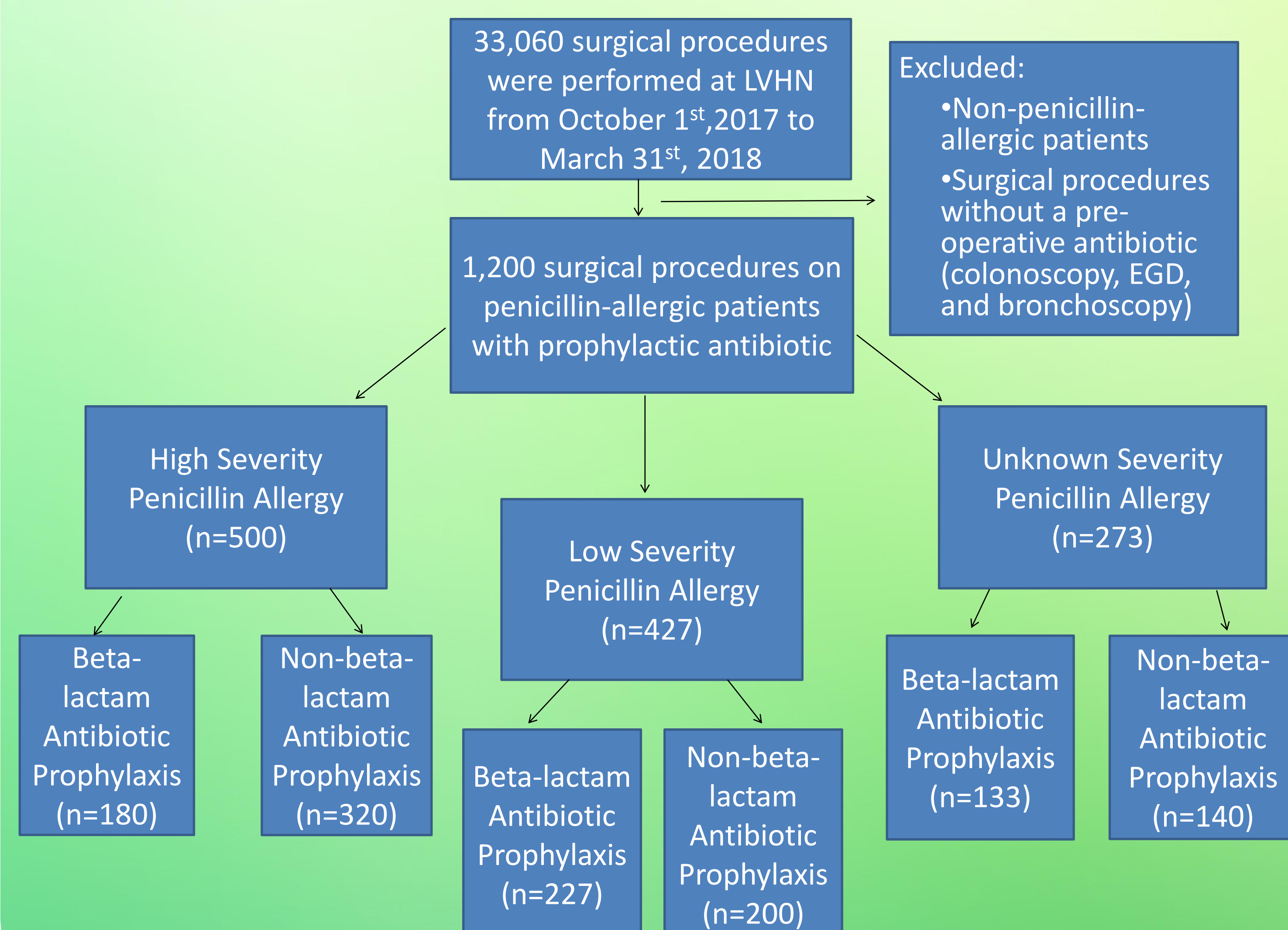
BACKGROUND

- Penicillin allergy is reported by approximately 10% of patients, although it is estimated that 0.02-0.04% of the population actually have a true life-threatening allergy.¹ Instead, the vast majority have experienced low severity or non-allergic adverse effects.²
- Patients who report penicillin allergies are often treated with broad-spectrum antibiotics, specifically non-beta-lactam antibiotics, as an alternative to penicillin that can result in increased cost and increased risk for multidrug resistant infections and *C. difficile* colitis.^{1,3}
- This is a concern for pre-operative patients because a reported penicillin allergy is associated with a 50% increase in the risk of developing a surgical site infection.⁴
- **Purpose: Review LVHN's current practice regarding pre-operative prophylaxis in the penicillin-allergic patient.**

OBJECTIVES

1. Identify rates of penicillin allergy in the pre-operative patient population and how often these patients receive a beta-lactam antibiotic (cefazolin) as prophylaxis.
2. Identify the types of reactions in the pre-operative penicillin-allergic patients and determine if the reaction severity is associated with the pre-operative antibiotic administered.
3. Identify if certain providers are more likely to avoid beta-lactam pre-operative antibiotics more frequently.

METHODS



RESULTS

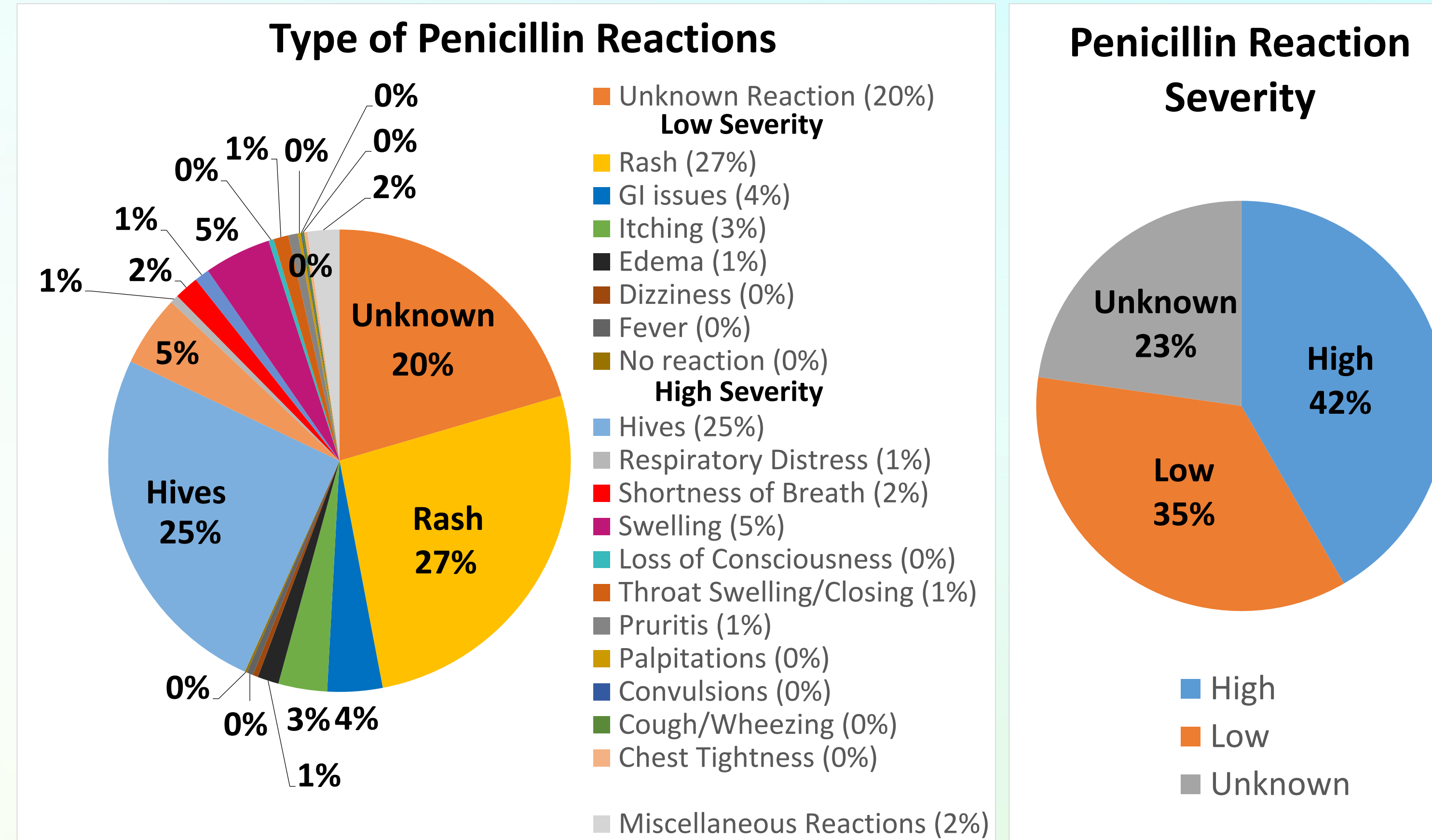


Figure 1: This is a count of documented penicillin-associated reactions. Penicillin-allergic patients may be counted more than once if they have multiple allergic reactions documented, but each patient is only counted once for reaction severity.⁵

Comparison of Pre-operative Antibiotic Administered based on the Severity of the Penicillin-associated Reactions

Type of Pre-Operative Antibiotic Used	Documented Penicillin Reaction (n=1200)	Low Severity Reaction (n=427)	High Severity Reaction (n=500)	Unknown Severity Reaction (n=273)
Beta-lactam	540 (45%)	227 (53%)	180 (36%)	133 (49%)
Non-beta-lactam Only	660 (55%)	200 (47%)	320 (64%)	140 (51%)

Table 1: Penicillin-allergic patients were separated based on severity of reaction based on usage of a beta-lactam or non-beta-lactam antibiotic prophylaxis.

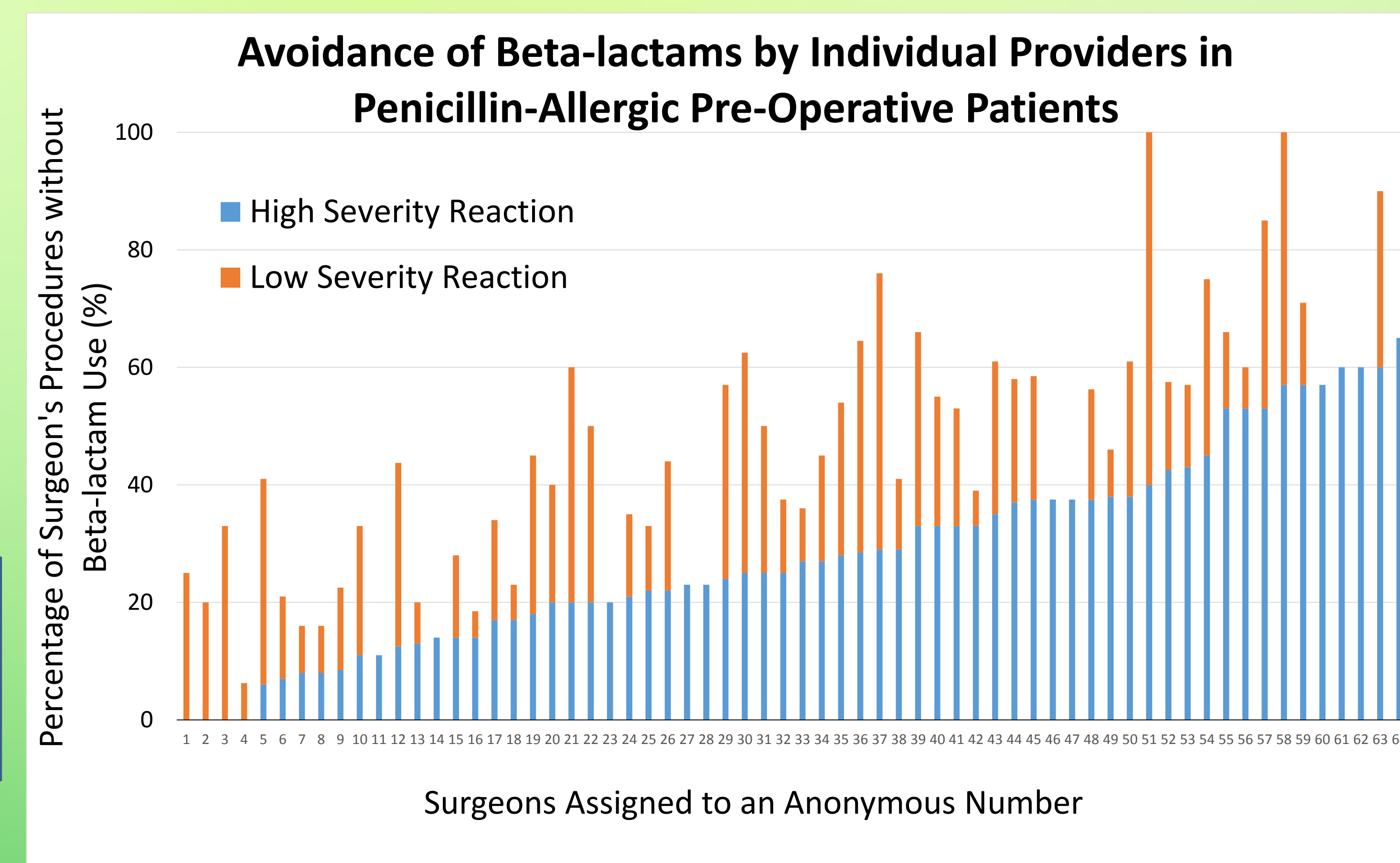


Figure 2: Percentage of surgeries for individual providers with non-beta-lactam use for both high severity and low severity reactions. Surgeons must perform at least 5 surgeries on patients with a penicillin allergy to be included.

DISCUSSION

- Reported penicillin allergies for surgical patients at LVHN was lower than the reported average in the general population (6% vs. 10%).
- There were many different types of adverse reactions documented. Forty-two percent of the reactions were high severity, 35% were low severity, and 23% were unknown (Figure 1).
- There is an increase in the usage of pre-operative beta lactam antibiotics for low severity compared to high severity reactions (53% vs. 36%), although there is an opportunity for improvement as 47% of the patients with low severity reactions are not receiving appropriate pre-operative prophylaxis.
- There is an inconsistency with beta-lactam use among providers. This could be due to lack of education on the advantages of using beta-lactams, lack of knowledge regarding when it is appropriate to challenge patients with a penicillin allergy, and lack of knowledge regarding the availability of outpatient penicillin skin testing.

CONCLUSIONS

- This study reveals an opportunity for improvement in the pre-operative prophylactic antibiotic choice in penicillin-allergic patients. Only 53% of penicillin allergic patients with a low-severity reaction are receiving appropriate antibiotics.
- This study reveals a need for education regarding penicillin allergies, appropriate choice of pre-operative antibiotics, the risks of avoiding beta-lactam antibiotics, and opportunities for outpatient penicillin skin testing.
- We suggest the following to improve the usage of beta-lactams in the pre-operative patient population by:
 - Standardization of guidance for how to proceed in patients with a low severity or non-allergic penicillin allergy
 - Maintain an accurate record regarding the patient's antibiotic allergies
 - Consider large-scale implementation of pre-operative penicillin skin testing when the reaction type or severity is unknown

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