

## Abstract

**Introduction:** Surgical site infections (SSIs) account for 20% of all hospital-acquired infections (HAIs) and are associated with morbidity, mortality, and increased healthcare costs. In the United States, approximately 10% of patients self-report a penicillin allergy, yet less than 1% are truly allergic. A labeled penicillin allergy results in less effective administration of second-line antibiotics for surgical prophylaxis. Recent American Academy of Asthma, Allergy, and Immunology (AAAAI) Drug Allergy Practice Parameters from 2022 support the use of cefazolin, a first-line antibiotic, in patients with a labeled penicillin allergy for surgical prophylaxis. The updated guidelines can be used to optimize cefazolin administration in a community hospital setting without requiring on-site Allergy and Immunology for extensive beta-lactam workups. Currently, limited data support the impact of implementing updated penicillin allergy surgical prophylaxis guidelines on rates of cefazolin administration and safety.

**Objective:** Evaluate the impact of updated drug allergy practice parameters on the use of cefazolin versus second-line antibiotics for surgical prophylaxis in patients with documented penicillin allergies at a community hospital without on-site allergists. Additionally, assess the effects on patient safety, adherence to clinical guidelines, and potential healthcare cost savings.

**Methods:** This single-center, retrospective chart review was conducted on 2,671 patients at BJC Memorial Hospital between January 2022 and December 2023 and between January 2025 and July 2025. Patients aged 18 to 89 with a documented penicillin allergy who underwent surgical procedures were included. Data was extracted from electronic health records (EHRs) to capture demographics, documented penicillin reaction types, and the surgical prophylaxis antibiotic administered. The primary outcome was the rate of cefazolin administration for surgical prophylaxis among patients with a documented penicillin allergy before and after implementation of updated allergy surgical prophylaxis guidelines based on the 2022 AAAAI Drug Allergy Practice Parameters.

**Results:** Optimizing cefazolin use in patients with a penicillin allergy label resulted in a 34% absolute increase in cefazolin administration (37% pre-implementation vs. 71% post-implementation), representing a 1.9-fold (34% absolute) increase. The number needed to treat (NNT) was 3, indicating that one additional patient received cefazolin for every three patients treated according to the updated guidelines. No immediate or delayed adverse reactions were observed following cefazolin administration in the post-implementation group.

**Conclusions:** Implementation of updated penicillin allergy surgical prophylaxis guidelines in accordance with recent updates to the 2022 AAAAI Drug Allergy Practice Parameters may increase cefazolin administration with no immediate adverse reactions in surgical patients with a labeled penicillin allergy at a community hospital with limited access to resources. Beyond safety, increased cefazolin use may translate into annual healthcare cost savings exceeding \$140,000.