

The hidden costs of a false penicillin allergy label

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Penicillin allergy is a common label in patient records, but the vast majority of these allergies are unconfirmed or resolve over time. This persistent mislabeling forces clinicians to use alternative antibiotics, often with significant consequences for patient care and public health. A retrospective audit published in Qatar Medical Journal highlights the characteristics and implications of this widespread issue.¹

KEY TAKEAWAYS

- **The Pivot:** Most documented penicillin allergies are unverified, leading to unnecessary use of broader-spectrum antibiotics.
- **The Data:** Only 1.5% of patients with a penicillin allergy label had documented confirmation of the allergy.
- **The Action:** Clinicians should prioritize allergy verification, especially for hospitalized patients, to optimize antibiotic stewardship and improve outcomes.

The widespread labeling of patients as penicillin allergic presents a substantial challenge in modern healthcare. This designation, often entered into a patient's record without rigorous verification, compels prescribers to select alternative antibiotic regimens. These alternatives frequently carry higher costs, are associated with less favorable clinical outcomes, and contribute to the escalating problem of antimicrobial resistance. The clinical imperative to avoid a potential allergic reaction, however remote, often overrides the broader implications of using second-line agents.¹

A retrospective audit conducted at a tertiary hospital in Qatar examined the characteristics of penicillin allergy labeling among admitted patients. The study included 1,000 adult patients (aged 18 years or older) admitted between January 1, 2019, and June 30, 2019. Researchers excluded patients with incomplete medical records or those admitted for less than 24 hours. The primary objective was to determine the prevalence and nature of penicillin allergy documentation, specifically focusing on whether these allergies were confirmed or merely reported.¹

The Unverified Allergy Burden

The audit revealed that 10.7% (N=107) of the 1,000 admitted patients carried a penicillin allergy label in their medical records. This figure aligns with prevalence rates reported in other international studies, underscoring the global nature of this issue. But the critical finding was the lack of verification: only 1.5% (N=16) of these 107 patients had any documented confirmation of their penicillin allergy. The vast majority, 98.5% (N=91), had an unconfirmed allergy status, often based on patient self-report or vague historical notes.¹

Patients with a documented penicillin allergy were predominantly female, accounting for 63.6% (N=68) of the allergic cohort, compared to 36.4% (N=39) males. The mean age of patients with a penicillin allergy was 50.9 ± 19.3 years. The most frequently reported allergic reactions were rash (43.9%, N=47), followed by itching (16.8%, N=18), and swelling (10.3%, N=11). More severe reactions like anaphylaxis were reported in a smaller proportion, 5.6% (N=6). These

self-reported symptoms, while concerning to patients, often do not correlate with true IgE-mediated hypersensitivity.¹ The audit also detailed the types of penicillin antibiotics to which patients reported allergies. Amoxicillin was the most common culprit, cited by 36.4% (N=39) of patients, followed by penicillin G (20.6%, N=22) and amoxicillin-clavulanate (15.9%, N=17). The specific antibiotic implicated often influences the choice of alternative therapy, but the underlying issue remains the unverified nature of the initial reaction.¹

The Cascade of Suboptimal Choices

The immediate consequence of a penicillin allergy label is the avoidance of penicillin-class antibiotics. This often leads to the use of broader-spectrum agents, such as fluoroquinolones, carbapenems, or vancomycin. These alternatives are typically more expensive, have a higher propensity for adverse effects, and contribute significantly to the development of antimicrobial resistance. For instance, a patient labeled penicillin-allergic might receive vancomycin for a suspected skin infection that would otherwise be effectively treated with a narrower-spectrum penicillin, increasing the risk of vancomycin-resistant enterococci.¹

The study did not directly quantify the increased costs or specific resistance rates attributable to false penicillin allergy labels within its cohort. But the implications are clear: if nearly 99% of labeled allergies are unconfirmed, then a substantial proportion of patients are receiving suboptimal antibiotic therapy. This drives up pharmacy costs for hospitals and health systems, and critically, it narrows the therapeutic window for future infections by fostering resistance. The antibiotic paradox is that avoiding one problem creates another, often larger one.¹

Patients with unconfirmed penicillin allergies also face longer hospital stays and higher rates of readmission, though these specific outcomes were not quantified in the Qatar audit. This is because alternative antibiotics can be less effective, leading to treatment failures or requiring longer courses of therapy. The use of broad-spectrum agents also disrupts the patient's microbiome, predisposing them to secondary infections like *Clostridioides difficile*.¹

Addressing the Documentation Deficit

The audit highlighted significant deficiencies in the documentation of penicillin allergies. Only 1.5% of the labeled allergies had any form of confirmation, which typically involves a detailed history, skin testing, or oral challenge. The remaining 98.5% were based on patient self-report or vague entries in the medical record, often lacking details about the reaction type, severity, or timing. This lack of detail makes it impossible for clinicians to accurately assess the risk of re-exposure.¹

The authors recommend implementing a standardized allergy assessment protocol for all admitted patients. This protocol would involve a thorough history taking, including specific questions about the reaction, onset, duration, and any previous re-exposures. For patients with low-risk reactions, direct oral challenge could be considered. For those with higher-risk historical reactions, penicillin skin testing could be performed. Such protocols are essential for improving antibiotic stewardship and ensuring patients receive appropriate, effective therapy.¹

The audit's retrospective design is an obvious caveat. It relied on existing medical records, which inherently limits the depth of information available regarding allergy characteristics and subsequent clinical decisions. The study was also conducted at a single tertiary hospital in Qatar, which may limit the generalizability of its findings to other healthcare settings or populations. But the high proportion of unconfirmed allergies is a consistent theme across numerous studies globally, suggesting this is a systemic problem rather than an isolated local issue.¹

Still, the audit did not assess the direct impact of the false allergy label on patient outcomes, such as length of hospital stay, readmission rates, or incidence of *C. difficile* infection. Nor did it quantify the economic burden of using alternative antibiotics. These are critical areas for future research to fully elucidate the costs associated with unverified penicillin allergies. The findings do, however, provide a clear snapshot of the prevalence of unconfirmed penicillin allergy labels and the urgent need for better verification processes. Clinicians often rely on comprehensive resources like the Oxford Handbook of Infectious Diseases and Microbiology for guidance on antimicrobial therapy, but even the best guidelines are undermined by inaccurate patient data.¹

The audit's strength lies in its clear demonstration of the sheer volume of unverified penicillin allergy labels. This highlights a significant opportunity for intervention through targeted allergy assessment programs. Such programs could reduce the reliance on broad-spectrum antibiotics, mitigate the rise of antimicrobial resistance, and ultimately improve patient safety and outcomes. The next step involves implementing and evaluating the effectiveness of these de-labeling strategies in real-world clinical practice.¹

CLINICAL IMPLICATIONS

The sheer volume of unverified penicillin allergy labels represents a systemic failure in patient data management. Clinicians are forced into suboptimal prescribing decisions, not because of true allergy risk, but because of incomplete or inaccurate historical records. This drives the use of less effective, more toxic, and more expensive antibiotics, directly contributing to the global crisis of antimicrobial resistance. For hospital systems, the economic burden of these false labels is substantial. Broader-spectrum antibiotics cost more, and the downstream effects of resistance, such as longer hospital stays and treatment failures, add further financial strain. Implementing robust allergy verification programs, including skin testing and oral challenges, should be a priority, not an afterthought. Patients, meanwhile, are unwittingly exposed to unnecessary risks. They receive antibiotics that may be less efficacious for their infection, experience more adverse effects, and face a future where effective antibiotics are increasingly scarce. The casual documentation of a 'penicillin allergy' without proper investigation has long-term consequences for individual health and public health alike. The solution requires a proactive approach: every patient with a penicillin allergy label deserves a thorough re-evaluation. This is not merely about patient safety; it is a critical component of antibiotic stewardship and a necessary step to preserve the efficacy of our most vital antimicrobial agents.

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