Delabeling Penicillin Allergy: An Integral Part of Antimicrobial Stewardship

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A Label of Penicillin Allergy is Common but Most Labeled Patients are Not Allergic

- Penicillin is the most common reported drug allergy (6-25%)

- Rate of true penicillin allergy in patients reporting an allergy has declined to <2-5%

Why Penicillin Allergy Labels Matter

A penicillin-allergy label is usually acquired in childhood

- Up to 20% of the population engaged in medical care is labeled as penicillin-allergic

<table>
<thead>
<tr>
<th>Personal Health Implications</th>
<th>Public Health Implications</th>
<th>Formal Allergy Assessment</th>
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<tbody>
<tr>
<td>Fewer efficacious antibiotic choices</td>
<td>Antibiotic resistance</td>
<td>&lt;5% Labeled as allergic to penicillin are truly allergic</td>
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<tr>
<td>More toxic effects associated with alternative antibiotics</td>
<td>Higher rates of C. difficile infection</td>
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<tr>
<td>Use of broad-spectrum antibiotics</td>
<td>Use of more costly antibiotics</td>
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<tr>
<td>More postoperative surgical-site infections</td>
<td>Increased length of hospital stays</td>
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Figure 4. Health Implications and Burden of the Penicillin-Allergy Label.

Castells MC, Khan DA, Phillips EC. NEJM 2019;381:2338-51
- Penicillin and other beta-lactam antibiotics are the drug of choice for many infections
- Better outcomes are achieved when using these antibiotics

Large case-controlled studies in the U.S. and U.K. of over 50,000 patients labeled penicillin allergic found higher rates of infections with methicillin resistant *Staphylococcus aureus* (MRSA), vancomycin resistant enterococcus and *Clostridium difficile*.

**Recorded Penicillin Allergy and Risk of Mortality: a Population-Based Matched Cohort Study**


14% Higher Mortality with Penicillin Allergy Label
Penicillin allergy testing reduced health care utilization, outpatient visits, emergency visits, total hospital days and delabeling led to cost reduction of $1915 per patient per year

Pharmacist-led penicillin skin testing in hospitalized patients led to reduced broad-spectrum antibiotics and increased use of penicillin
Is it Really a Penicillin Allergy?

Evaluation and Diagnosis of Penicillin Allergy for Healthcare Professionals

Did You Know? 5 Facts About Penicillin Allergy
1. Approximately 10% of all U.S. patients report having an allergic reaction to a penicillin class antibiotic in their past.
2. However, many patients who report penicillin allergies do not have true IgE-mediated reactions. When evaluated, fewer than 1% of the population are truly allergic to penicillins.1
3. Approximately 80% of patients with IgE-mediated penicillin allergy lose their sensitivity after 10 years.2
4. Broad-spectrum antibiotics are often used as an alternative to penicillins. The use of broad-spectrum antibiotics in patients labeled “penicillin-allergic” is associated with higher healthcare costs, increased risk for antibiotic resistance, and suboptimal antibiotic therapy.1
5. Correctly identifying those who are not actually penicillin-allergic can decrease unnecessary use of broad-spectrum antibiotics.3

10% of the population reports a penicillin allergy but <1% of the whole population is truly allergic.

# Methods to Delabel Penicillin Allergy

<table>
<thead>
<tr>
<th>Setting</th>
<th>Method</th>
<th>Comment</th>
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<tbody>
<tr>
<td><strong>Outpatient</strong></td>
<td>Referral based skin test and challenge</td>
<td>With or without minor determinant mixture</td>
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<tr>
<td></td>
<td>Direct challenge</td>
<td>Low risk histories</td>
</tr>
<tr>
<td></td>
<td>Protocol driven</td>
<td>Allergy clinic</td>
</tr>
<tr>
<td></td>
<td>Other clinics</td>
<td>Other clinics</td>
</tr>
<tr>
<td><strong>Inpatient</strong></td>
<td>Allergy consultation</td>
<td>Least efficient</td>
</tr>
<tr>
<td></td>
<td>Proactive testing protocol</td>
<td>Pharmacists or other healthcare providers</td>
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<td></td>
<td>Intensive care unit testing</td>
<td>Skin testing</td>
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<tr>
<td></td>
<td>Emergency Department</td>
<td>Skin testing or direct challenge by non-allergy specialists or other healthcare providers</td>
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Call For Action

- Outreach to providers regarding importance of penicillin allergy delabeling
- Target populations with high benefit
  - Cancer, transplant, pregnancy, diabetes
- Encourage FDA support for complete penicillin testing reagents
- Increase Medicaid/Medicare reimbursement for testing
- Adoption of penicillin allergy testing as a component of antimicrobial stewardship
- Email Advocacy@aaaai.org for more information
Thank You

September 28th

What is National Penicillin Allergy Day?

National Penicillin Allergy Day is an annual celebration to raise awareness around the impact of carrying a penicillin allergy label and how it affects a patient’s healthcare treatment. It focuses on the importance of knowing a patient’s true allergy history while offering tools, activities, and ideas to help create penicillin allergy awareness throughout healthcare offices, facilities, and communities.

Why is correctly identifying those who are not actually allergic to penicillin so important?

- Inaccurate diagnosis of penicillin allergy can adversely impact medical costs for both patients and healthcare systems: research shows that antibiotic costs for patients reporting penicillin allergies are up to 63% higher than for those who do not report being penicillin-allergic.3

- Patients labeled penicillin-allergic may have a threefold increased risk of adverse events (ADE).4 In the hospital setting, history of penicillin allergy translates to about 10% more hospital days, 30% higher incidence of VRE infections, 23% higher incidence of C difficile infections, and 14% higher incidence of MRSA infections.5

- Correctly identifying those who are not actually allergic can improve antibiotic prescribing and combat the risk of super-bugs by allowing patients access to safer, less toxic antibiotics.4 By some estimates, up to half of all hospitalized patients in the US receive antimicrobials and up to half of antimicrobial use may be inappropriate.6 There is a causal relationship between inappropriate antimicrobial use and resistance; changes in antimicrobial use lead to parallel changes in the prevalence of resistance.7

With statistics this compelling, it’s important for patients and providers to know the facts about penicillin allergies.

For these reasons, Sept. 28—the date Alexander Fleming discovered penicillin in 1928—has been designated National Penicillin Allergy Day.