

Delabeling Penicillin Allergy: An Integral Part of Antimicrobial Stewardship

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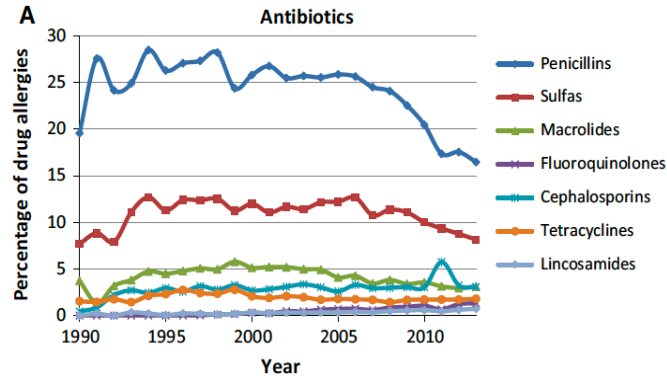
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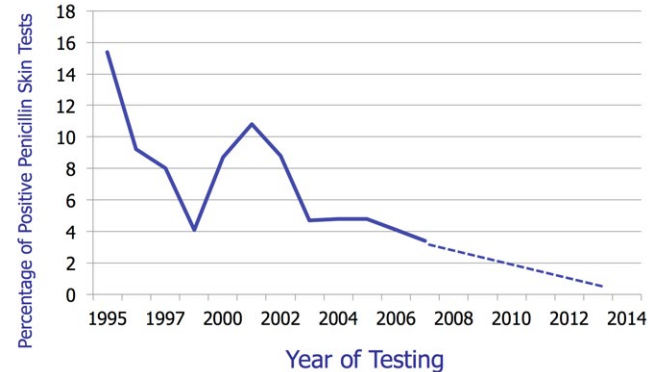
Division of Allergy & Immunology

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%

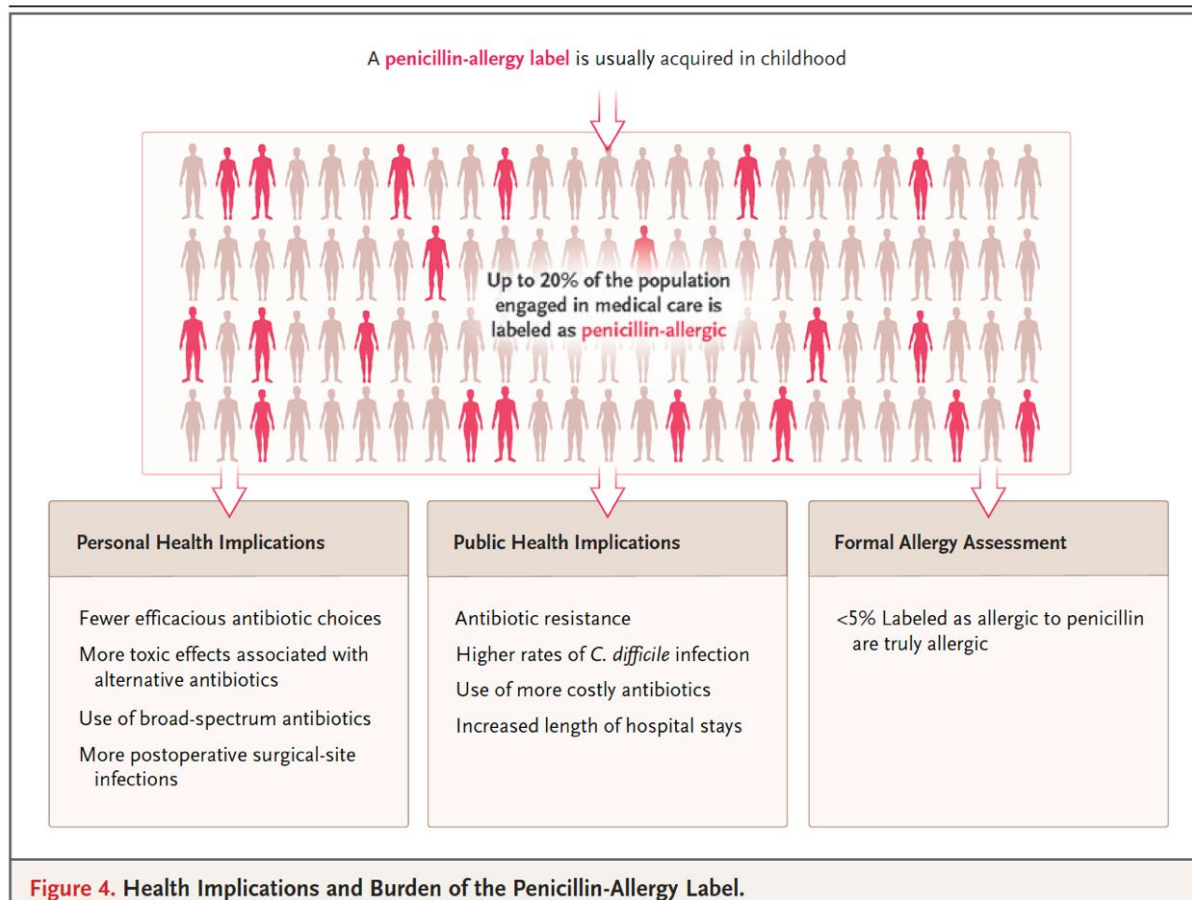


Allergy. 2016;71(9):1305-13.



Khan DA. Allergy Asthma Proc 2020(in press).

Why Penicillin Allergy Labels Matter



- Penicillin and other beta-lactam antibiotics are the drug of choice for many infections
- Better outcomes are achieved when using these antibiotics

Shenoy ES et al. JAMA. 2019;321(2):188-99.

Table 1. Pathogens and Common Syndromes for Which β -Lactams Are Considered the Treatment of Choice

| Organism | Examples |
|---|---|
| Group A <i>Streptococcus</i> | Pharyngitis, skin and soft tissue infections (cellulitis, erysipelas, pyoderma), necrotizing fasciitis, myositis, acute rheumatic fever, acute glomerulonephritis, pneumonia, postpartum endometritis, toxic shock syndrome, bacteremia |
| Group B <i>Streptococcus</i> | Meningitis, puerperal sepsis |
| Viridans group streptococci and <i>Streptococcus gallolyticus</i> (bovis) | Endocarditis |
| <i>Listeria monocytogenes</i> | Meningitis |
| <i>Actinomyces</i> spp | Cervicofacial, pelvic, and respiratory infections |
| <i>Cutibacterium acnes</i> (formerly <i>Propionibacterium acnes</i>) | Bone and joint and central nervous system shunt infections |
| <i>Staphylococcus aureus</i> | Skin and soft tissue, bone and joint, and respiratory tract infections ^a |
| <i>Pasteurella multocida</i> | Skin and soft tissue infections, bacteremia, and respiratory tract infections |
| <i>Neisseria gonorrhoeae</i> | Urethritis, epididymitis, pharyngitis, conjunctivitis, cervicitis, proctitis, disseminated disease (septic arthritis, endocarditis) |
| <i>Neisseria meningitidis</i> | Meningitis |
| <i>Treponema pallidum</i> (syphilis) | Primary syphilis (chancre), secondary syphilis (rash, condylomata lata), tertiary syphilis (aortitis), meningitis |

^a Nafcillin and cefazolin are first-line treatment options for methicillin-susceptible *Staphylococcus aureus*. Penicillin is the first-line treatment option for penicillin-susceptible *Staphylococcus aureus*.

Health care use and serious infection prevalence associated with penicillin “allergy” in hospitalized patients: A cohort study

Eric Macy, MD, MS,^a and Richard Contreras, MS^b *San Diego and Pasadena, Calif*

Risk of methicillin resistant *Staphylococcus aureus* and *Clostridium difficile* in patients with a documented penicillin allergy: population based matched cohort study

BMJ. 2018;361:k2400.

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: J Gen Intern Med. 2019;34(9):1685-7.
a Population-Based Matched Cohort Study

14% Higher Mortality with Penicillin Allergy Label

The Effect of Penicillin Allergy Testing on Future Health Care Utilization: A Matched Cohort Study



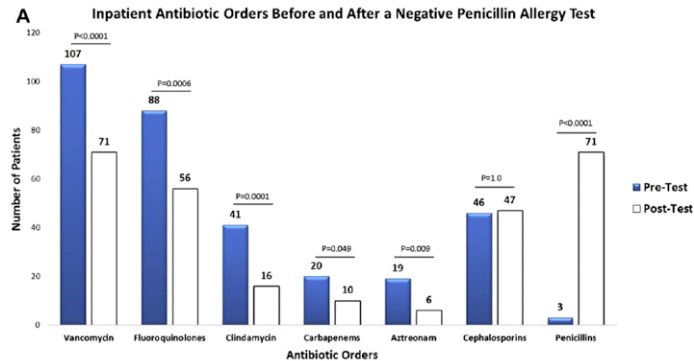
Eric Macy, MD, MS^a, and Yu-Hsiang Shu, MS, PhD^b *San Diego and Pasadena, Calif*

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

Original Article

J Allergy Clin Immunol Pract 2017;5:686-93.

A Proactive Approach to Penicillin Allergy Testing in Hospitalized Patients



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 (Type 1, Immunoglobulin E (IgE)-mediated)

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.¹
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.¹

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



AAAAI Position Statement

J Allergy Clin Immunol Pract 2017;5:333-4.



Penicillin Allergy Testing Should Be Performed Routinely in Patients with Self-Reported Penicillin Allergy



Methods to Delabel Penicillin Allergy

| Setting | Method | Comment |
|-------------------|--|---|
| Outpatient | Referral based skin test and challenge | With or without minor determinant mixture |
| | Direct challenge | Low risk histories |
| | Protocol driven | Allergy clinic |
| | | Other clinics |
| | | |
| Inpatient | Allergy consultation | Least efficient |
| | Proactive testing protocol | Pharmacists or other healthcare providers |
| | Intensive care unit testing | Skin testing |
| | Emergency Department | Skin testing or direct challenge by non-allergy specialists or other healthcare providers |



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,³ 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 antibiotics 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.¹

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.

National Sponsors

