



## Commentary

# Penicillin allergy delabeling in long-term care facilities: if not now, then when?

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### Current state and gaps in penicillin allergy management in long-term care settings

Approximately 10% of the United States (US) population has a penicillin allergy label (PAL), yet studies show that up to 90% of these individuals are not truly allergic and can safely receive penicillin.<sup>1–5</sup> This mislabeling contributes to negative health outcomes, including higher use of broad-spectrum antibiotics, increased healthcare costs, and greater risks of adverse effects such as *Clostridioides difficile* infection (CDI) and antimicrobial resistance.<sup>6–10</sup>

Efforts to remove inaccurate PALs—known as delabeling—have expanded over the past decade.<sup>4,11,12</sup> Historically performed by allergists in clinics, structured delabeling programs have been increasingly implemented across diverse clinical settings, including ambulatory clinics, emergency departments, general medicine wards, intensive care units, surgical wards, and inpatient rehabilitation facilities.<sup>12–18</sup> These programs often utilize comprehensive allergy history assessments, risk stratification tools like PEN-FAST, and direct oral drug challenges.<sup>1,4,12,19</sup> For patients with low-risk allergy histories, delabeling may be performed based on history alone or through oral amoxicillin challenges, whereas those with high-risk histories may require penicillin skin testing followed by oral amoxicillin challenges, or referral to an allergist for further evaluation.<sup>1,4,12,20</sup> Programs led by non-allergist healthcare providers, including pharmacists and infectious disease specialists, have demonstrated success across settings.<sup>12,21–23</sup>

Despite these advancements, structured penicillin allergy evaluation and delabeling programs remain limited in long-term care (LTC) settings.<sup>12</sup> Consequently, LTC residents with PALs continue to face barriers to optimal antibiotic therapy, placing them at a potentially increased risk for negative health outcomes. Studies report that nearly one in four LTC residents carries a PAL, and these residents are less likely to receive beta-lactam antibiotics, potentially leading to increased use of broad-spectrum antibiotics or antibiotics at higher risk for CDI such as fluoroquinolones.<sup>24–26</sup>

A recent call to action highlights the need to include underrepresented research participants to develop and evaluate the impact of interventions on health outcomes in heterogeneous populations.<sup>27</sup> These principles extend to other populations

marginalized beyond sex, race, and ethnicity, including older adults in LTC settings, who are frequently overlooked in research. LTC residents, already at greater risk for infections and adverse outcomes from broader-spectrum antibiotic use, face setting-specific barriers that can exacerbate existing health inequities.<sup>28,29</sup>

### Unique challenges in long-term care settings

Implementing penicillin allergy delabeling programs in LTC settings presents distinct challenges rooted in both structural and operational constraints. (Table 1) Staffing shortages, high turnover, burnout, and limited resources, exacerbated during the COVID-19 pandemic, create significant barriers to initiatives such as comprehensive penicillin allergy assessment and delabeling protocols.<sup>44–46</sup>

Another critical gap lies in the limited research on penicillin allergy delabeling in LTC settings. While recent studies have examined the prevalence of PALs and barriers to delabeling, evidence on the implementation of such programs in LTC remains scarce.<sup>24–26,30</sup> Although one small study demonstrated the feasibility of a penicillin allergy delabeling program in a post-acute rehabilitation facility, its cost-effectiveness, sustainability, and impact were not evaluated.<sup>18</sup> This research gap hinders the development and implementation of tailored, evidence-based delabeling strategies to optimize antibiotic prescribing practices in LTC populations.

Regulatory requirements also hinder penicillin allergy delabeling efforts.<sup>47</sup> LTC facilities face stringent oversight and burdensome documentation mandates, which can discourage additional interventions aimed at addressing inaccurate PALs. Concerns about regulatory scrutiny and liability further exacerbate hesitancy among healthcare providers when managing allergies in vulnerable LTC populations.<sup>30</sup>

The national shortage of allergists, combined with insufficient education and awareness among LTC healthcare providers further complicate these implementation efforts.<sup>30,48</sup> LTC residents, particularly in rural settings, often lack access to specialist care including allergists, leaving LTC clinicians without the resources or confidence to manage penicillin allergy delabeling safely.<sup>49</sup> Many LTC healthcare providers are unfamiliar with the evidence supporting penicillin allergy delabeling, and misconceptions about penicillin allergies and the perceived risks of using beta-lactam antibiotics in LTC residents with PALs can contribute to overly cautious antibiotic prescribing practices.<sup>30</sup>

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**Table 1.** Challenges and potential solutions for implementing penicillin allergy delabeling in long-term care settings

| Challenges  | Potential Solutions  |
|---|--|
| <b>Staffing shortages, high turnover, burnout, and limited resources</b>      | <b>Standardize protocols</b> using risk stratification tools like PEN-FAST to streamline delabeling with minimal resource demand. Advocate for <b>reimbursement</b> to offset costs. <sup>1,9,30-34</sup>  |
| <b>Research gaps</b>  | <b>Advocating for funding</b> to generate evidence on the feasibility, sustainability, and outcomes of delabeling programs in LTC settings. <b>Expand research scope</b> to include cost-effectiveness, scalability, and the role of geriatric-focused interventions. <b>Publish findings in geriatric literature.</b> |
| <b>Regulatory requirements and documentation burden</b>                       | Develop <b>streamlined documentation</b> protocols to simplify regulatory compliance while maintaining evidence-based practices. <sup>1,30</sup>   |
| <b>Lack of access to allergy specialists</b>                                  | Use <b>telemedicine</b> to connect LTC facilities with allergists for remote supervision and consultation. <sup>35</sup>   |
| <b>Lack of education and awareness among LTC healthcare providers</b>         | Provide <b>comprehensive training</b> through webinars, online courses, and practical tools to enhance LTC providers' confidence and competence. <sup>36-42</sup>  |
| <b>Complex resident care, including cognitive impairment and polypharmacy</b> | Engage families and caregivers through education and <b>shared decision-making</b> to support delabeling in residents with cognitive impairment or complex medical histories. <sup>41,43</sup>   |

LTC, long-term care.

Additional challenges arise from the complexity of resident care.<sup>50</sup> Cognitive impairment and dementia, prevalent among LTC residents, may interfere with accurate reporting of allergic reactions.<sup>30,51</sup>

### Potential solutions and call to action

Proposed solutions can be categorized into short-term and long-term goals. Short-term goals focus on strategies that are easily integrated into individual LTC healthcare provider workflows or facility-level practices. These include enhancing education, training, and counseling for LTC healthcare providers, residents, and families about the benefits of penicillin allergy delabeling while dispelling misconceptions about PALs.<sup>30,52</sup> Free resources such as webinars, online courses, and educational videos can build provider confidence.<sup>36,37,52</sup> Additionally, family education and shared decision-making, proven effective in pediatric settings, can improve caregivers' understanding of the penicillin allergy evaluation and delabeling process, supporting informed decision-making for LTC residents with cognitive impairment or dementia.<sup>53</sup> LTC healthcare providers can also utilize existing guidelines and resources on beta-lactam cross-reactivity risks to make more informed antibiotic choices.<sup>4,54</sup>

Long-term goals require systems-level changes to address structural and operational barriers effectively. Developing

streamlined, standardized protocols and tools is critical to promoting consistent and effective penicillin allergy delabeling in LTC settings.<sup>12,20</sup> Risk stratification tools, such as PEN-FAST, offer low-resource, evidence-based solutions for identifying residents with low-risk allergy history suitable for penicillin allergy delabeling.<sup>19</sup> These tools can be integrated into routine care through protocols that define clear criteria for verifying PAL, outline step-by-step procedures for conducting direct oral challenges, and provide guidelines for documenting outcomes.<sup>30,55</sup> Additionally, expanding access to telemedicine for remote allergy consultations offers a cost-effective way to connect LTC facilities with allergists for supervision of allergy testing.<sup>56,57</sup> For example, the use of telemedicine during the COVID-19 pandemic demonstrated the feasibility of penicillin allergy delabeling in other settings.<sup>35</sup>

Addressing the two distinct LTC populations—short-stay and long-stay residents—adds complexity. Short-stay residents require continuity of delabeling into outpatient settings, while long-stay residents necessitate reliable documentation within electronic medical records. These factors underline the need for detailed, setting-specific approaches rather than generic solutions.

Targeted funding for research from agencies (eg, Centers for Disease Control and Prevention, Agency for Healthcare Research and Quality, and Centers for Medicare & Medicaid Services) is critical to advancing penicillin allergy delabeling in LTC settings. Research can support the development of tailored approaches and scalable models to improve implementation. Greater engagement in geriatric-focused research and practice is essential to bridge knowledge gaps. Publishing in geriatric journals, presenting at relevant conferences, and collaborating with organizations like the American Geriatrics Society can promote the adoption of evidence-based strategies. Geriatricians, with their close connections to LTC residents and families, are key advocates for integrating these practices. Advocacy for supportive policies is equally important. Policymakers should incorporate penicillin allergy delabeling into antibiotic stewardship programs, with reimbursement mechanisms to offset costs and ensure feasibility. National initiatives like the Penicillin Allergy Verification and Evaluation Act could provide scalable models for systematic implementation.<sup>31</sup>

### Conclusion

Penicillin allergy delabeling in LTC settings is a critical component of improving antibiotic stewardship and ensuring equitable access to effective antibiotic treatment. However, without targeted research funding and tailored implementation strategies, these efforts risk imposing additional burdens on already strained LTC systems. Prioritizing health equity and actionable policy solutions is essential to addressing these challenges effectively.

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## References

- Shenoy ES, Macy E, Rowe T, Blumenthal KG. Evaluation and management of penicillin allergy: a review. *JAMA* 2019;321:188–199.
- Zhou L, Dhopeswarkar N, Blumenthal KG, et al. Drug allergies documented in electronic health records of a large healthcare system. *Allergy* 2016;71:1305–1313.
- Lee CE, Zembower TR, Fotis MA, et al. The incidence of antimicrobial allergies in hospitalized patients: implications regarding prescribing patterns and emerging bacterial resistance. *Arch Intern Med* 2000;160:2819–2822.
- Khan DA, Banerji A, Blumenthal KG, et al. Drug allergy: a 2022 practice parameter update. *J Allergy Clin Immunol* 2022;150:1333–1393.
- DesBiens M, Scalia P, Ravikumar S, et al. A closer look at penicillin allergy history: systematic review and meta-analysis of tolerance to drug challenge. *Am J Med* 2020;133:452–62.e4.
- Krah NM, Jones TW, Lake J, Hersh AL. The impact of antibiotic allergy labels on antibiotic exposure, clinical outcomes, and healthcare costs: a systematic review. *Infect Control Hosp Epidemiol* 2021;42:530–548.
- Macy E, Contreras R. Health care use and serious infection prevalence associated with penicillin “allergy” in hospitalized patients: a cohort study. *J Allergy Clin Immunol* 2014;133:790–796.
- Macfadden DR, Ladelfa A, Leen J, et al. Impact of reported beta-lactam allergy on inpatient outcomes: a multicenter prospective cohort study. *Clin Infect Dis* 2016;63:904–910.
- Blumenthal KG, Lu N, Zhang Y, Li Y, Walensky RP, Choi HK. Risk of meticillin resistant *Staphylococcus aureus* and *Clostridium difficile* in patients with a documented penicillin allergy: population based matched cohort study. *BMJ* 2018;361:k2400.
- Mattingly TJ, Fulton A, Lumish RA, et al. The cost of self-reported penicillin allergy: a systematic review. *J Allergy Clin Immunol Pract* 2018;6:1649–54.e4.
- Macy E, Adkinson NF, Jr. The evolution of our understanding of penicillin allergy: 1942–2022. *J Allergy Clin Immunol Pract* 2023;11:405–413.
- Samarakoon U, Accarino J, Wurcel AG, Jaggars J, Judd A, Blumenthal KG. Penicillin allergy delabeling: opportunities for implementation and dissemination. *Ann Allergy Asthma Immunol* 2023;130:554–564.
- Stul F, Heytens S, Ebo DG, Sabato V, Piessens V. Safe penicillin allergy delabeling in primary care: a systematic review and meta-analysis. *J Allergy Clin Immunol Pract* 2024;12:2415–26.e1.
- Chua KYL, Vogrin S, Bury S, et al. The penicillin allergy delabeling program: a multicenter whole-of-hospital health services intervention and comparative effectiveness study. *Clin Infect Dis* 2021;73:487–496.
- Marwood J, Aguirrebarrena G, Kerr S, Welch SA, Rimmer J. De-labelling self-reported penicillin allergy within the emergency department through the use of skin tests and oral drug provocation testing. *Emerg Med Australas* 2017;29:509–515.
- Koo G, Stollings JL, Lindsell C, et al. Low-risk penicillin allergy delabeling through a direct oral challenge in immunocompromised and/or multiple drug allergy labeled patients in a critical care setting. *J Allergy Clin Immunol Pract* 2022;10:1660–3.e2.
- Plager JH, Mancini CM, Fu X, et al. Preoperative penicillin allergy testing in patients undergoing cardiac surgery. *Ann Allergy Asthma Immunol* 2020;124:583–588.
- Galipean J, Jacob J. Effectiveness and feasibility of a penicillin allergy delabeling program in the postacute inpatient rehabilitation setting. *Infect Control Hosp Epidemiol* 2024;45:1–3.
- Trubiano JA, Vogrin S, Chua KYL, et al. Development and validation of a penicillin allergy clinical decision rule. *JAMA Intern Med* 2020;180:745–752.
- Stone CA, Jr, Trubiano J, Coleman DT, Rukasin CRF, Phillips EJ. The challenge of de-labeling penicillin allergy. *Allergy* 2020;75:273–288.
- Turner NA, Wrenn R, Sarubbi C, et al. Evaluation of a pharmacist-led penicillin allergy assessment program and allergy delabeling in a tertiary care hospital. *JAMA Netw Open* 2021;4:e219820.
- Krishna MT, Bhogal R, Ng BY, et al. A multicentre observational study to investigate feasibility of a direct oral penicillin challenge in de-labelling ‘low risk’ patients with penicillin allergy by non-allergy healthcare professionals (SPACE study): implications for healthcare systems. *J Infect* 2024;88:106116.
- Arasaratnam RJ, Guastadisegni JM, Kouma MA, Maxwell D, Yang L, Storey DF. Rising to the challenge: an ID provider-led initiative to address penicillin allergy labels at a large veterans affairs medical center. *Open Forum Infect Dis* 2024;11:ofae396.
- Foong KS, Fowle L, Doron S, et al. Antibiotic allergy prevalence and documentation quality in Massachusetts long-term care facilities: a cross-sectional survey. *Ann Allergy, Asthma Immunol* 2024;133:335–340.e1.
- Foong KS, Doron S, Fowle L, et al. Documented penicillin allergy and beta-lactam antibiotic use in Massachusetts long-term care facilities: opportunities for penicillin allergy delabeling. *Antimicrob Stewardship Healthcare Epidemiol* 2024;4:e166.
- Foong KS, Doron S, Wurcel A. Incomplete documentation of  $\beta$ -lactam allergy in long-term care facility residents increases risk of high-risk antibiotic use for clostridioides difficile infection. *Am J Health Syst Pharm* 2024;2024:zxae412.
- Wang TY, Corbie G, Allore HG, et al. Randomized clinical trials that advance health and health equity: JAMA internal medicine call for papers. *JAMA Intern Med* 2024;184:1011–1012.
- Daneman N, Bronskill SE, Gruneir A, et al. Variability in antibiotic use across nursing homes and the risk of antibiotic-related adverse outcomes for individual residents. *JAMA Intern Med* 2015;175:1331–1339.
- The Lancet Healthy Longevity. Tackling antimicrobial resistance to protect healthy ageing. *Lancet Healthy Longev* 2023;4:e584.
- Gillespie C, Sitter K, McConeghy KW, et al. Facilitators and barriers to verifying penicillin allergies in a veteran nursing home population. *J Allergy Clin Immunol Pract* 2023;11:2848–54.e3.
- American College of Allergy, Asthma & Immunology. New Penicillin Allergy Verification and Evaluation (PAVE) Act Improves Patient Outcomes, Reduces Costs and Fights Antimicrobial Resistance. Available at: <https://www.aaaai.org/about/news/news/2024/penicillin-allergy>. Published 2024. Accessed September 30, 2024.
- Blumenthal KG, Shenoy ES, Wolfson AR, et al. Addressing inpatient beta-lactam allergies: a multihospital implementation. *J Allergy Clin Immunol Pract* 2017;5:616–25.e7.
- Blumenthal KG, Wickner PG, Hurwitz S, et al. Tackling inpatient penicillin allergies: Assessing tools for antimicrobial stewardship. *J Allergy Clin Immunol* 2017;140:154–61.e6.
- Blumenthal KG, Peter JG, Trubiano JA, Phillips EJ. Antibiotic allergy. *Lancet* 2019;393:183–198.
- Ghassemian A, Sadi G, Mak R, Erdle S, Wong T, Jeimy S. Virtually supported penicillin allergy de-labelling during COVID-19. *Allergy Asthma Clin Immunol* 2023;19:17.
- American College of Allergy, Asthma & Immunology. Penicillin Allergy Center. Available at: <https://education.aaaai.org/penicillin-allergy-center/penicillin>. Published 2021. Accessed August 16, 2024.
- The Society For Healthcare Epidemiology of America. Penicillin Allergy Management: Removing Barriers to Optimal Antibiotic Prescribing. Available at: [https://contentsharing.net/actions/email\\_web\\_version.cfm?ep=flz0Rj5lM3LlPG-JGycC76lmrUbwAd0h55BNASKVMvC94Kx8DaXDBFdTmk9KgP75KebFvqMVQXDmw-ZXP3Jni1mMQS3pD4lM7\\_\\_qKJJdgdwJKu8Uajm9h8T8nb-unCeT](https://contentsharing.net/actions/email_web_version.cfm?ep=flz0Rj5lM3LlPG-JGycC76lmrUbwAd0h55BNASKVMvC94Kx8DaXDBFdTmk9KgP75KebFvqMVQXDmw-ZXP3Jni1mMQS3pD4lM7__qKJJdgdwJKu8Uajm9h8T8nb-unCeT). Published 2025. Accessed January 8, 2025.
- JAMA Network. Penicillin Allergy: Evaluation and Testing. Available at: <https://www.youtube.com/watch?v=peRu21bnNqo>. Published 2019. Accessed September 15, 2024.
- Massachusetts Department of Public Health. Beta-lactam allergy evaluation. Available at: <https://infectioncontrolma.org/antibiotic-stewardship.php>. Published 2024. Accessed August 15, 2024.
- Agency for Healthcare Research and Quality. Penicillin Allergies and Other Side Effects of Antibiotic Use. Available at: <https://www.ahrq.gov/antibiotic-use/long-term-care/best-practices/penicillin.html>. Published 2022. Accessed September 15, 2024.

41. Washington State Department of Health. Penicillin Allergy Delabeling. Available at: <https://doh.wa.gov/public-health-provider-resources/healthcare-professions-and-facilities/healthcare-associated-infections/mdro-and-antibiotic-stewardship/antibiotic-stewardship/penicillin-allergy-delabeling>. Published 2023. Accessed October 1, 2024.
42. Centers for Disease Control and Prevention. Is it Really a Penicillin Allergy. Available at: <https://www.cdc.gov/antibiotic-use/media/pdfs/penicillin-factsheet-508.pdf>. Published 2017. Accessed October 1, 2024.
43. American College of Allergy, Asthma & Immunology. Penicillin Allergy FAQ. Available at: <https://www.aaaai.org/tools-for-the-public/conditions-library/allergies/penicillin-allergy-faq>. Published 2023. Accessed September 15, 2024.
44. Grabowski DC. Senate finance committee hearing: not forgotten: protecting Americans from abuse and neglect in nursing homes. Available at: <https://www.finance.senate.gov/imo/media/doc/Grabowski%20Senate%20Finance%20testimony%20FINAL.pdf>. Published 2019. Accessed July 31, 2024.
45. U.S. Department of Health and Human Services. Lessons Learned During the Pandemic Can Help Improve Care in Nursing Homes. Available at: <https://oig.hhs.gov/reports/all/2024/lessons-learned-during-the-pandemic-can-help-improve-care-in-nursing-homes/>. Published 2024. Accessed July 31, 2024.
46. Sloane PD, Yearby R, Konetzka RT, Li Y, Espinoza R, Zimmerman S. Addressing systemic racism in nursing homes: a time for action. *J Am Med Dir Assoc* 2021;22:886–892.
47. Colón-Emeric CS, Plowman D, Bailey D, *et al.* Regulation and mindful resident care in nursing homes. *Qual Health Res* 2010;20:1283–1294.
48. American College of Allergy, Asthma & Immunology. Allergist Report: America Faces an Allergy/Asthma Crisis. Available at: <https://college.aaaai.org/sites/default/files/AllergistReport.pdf>. Published 2007. Accessed July 31, 2024.
49. Henning-Smith C, Kozhimannil KB, Casey MM, Prasad S. Beyond clinical complexity: nonmedical barriers to nursing home care for rural residents. *J Aging Soc Policy*. 2018;30:109–126.
50. Patient Safety Network. Long-term Care and Patient Safety. Available at: <https://psnet.ahrq.gov/primer/long-term-care-and-patient-safety>. Published 2024. Accessed August 15, 2024.
51. U.S. Department of Health and Human Services. Nursing Home Data Compendium 2015. Available at: [https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandCompliance/Downloads/nursinghomedatacompendium\\_508-2015.pdf](https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandCompliance/Downloads/nursinghomedatacompendium_508-2015.pdf). Published 2015. Accessed July 31, 2024.
52. Staicu ML, Jeffres MN, Jones BM, Stover KR, Wagner JL, Bland CM. Penicillin-allergy delabelling resources for clinicians practicing in resource-limited settings: a full educational resource review of the grey literature. *JAC Antimicrob Resist* 2023;5:dlad014.
53. Antoon JW, Grijalva CG, Carroll AR, *et al.* Parental perceptions of penicillin allergy risk stratification and delabeling. *Hosp Pediatr* 2023;13:300–308.
54. Zagursky RJ, Pichichero ME. Cross-reactivity in  $\beta$ -lactam allergy. *J Allergy Clin Immunol Pract* 2018;6:72–81.e1.
55. Copaescu AM, Vogrin S, James F, *et al.* Efficacy of a clinical decision rule to enable direct oral challenge in patients with low-risk penicillin allergy: the PALACE randomized clinical trial. *JAMA Intern Med* 2023;183:944–952.
56. Allen HI, Gillespie P, Vazquez-Ortiz M, Murphy AW, Moylett EM. A cost-analysis of outpatient paediatric penicillin allergy de-labelling using telemedicine. *Clin Exp Allergy* 2021;51:495–498.
57. Wells D, DeNiro KL, Ramsey A. Telemedicine in drug hypersensitivity. *Immunol Allergy Clin North Am* 2022;42:323–333.