RECONCILE:

An Australian Survey of Multi-Disciplinary Low-risk Penicillin Allergy Delabelling

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BioGrid Connecting health information
Doherty Institute
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Disclosures

In relation to this presentation, I declare the following, real or perceived conflicts of interest: Nil

Penicillin Allergy

The Problem … and *some* solutions

10% — **Hospitalised Patients**
Trubiano et al, JAC June 2016

50%↑ — **Surgical site infections**
Blumenthal et al, CID 2018

70%↑ 26% — ***C. Difficile*** **and MRSA**
Blumenthal et al, BMJ 2018

$$↑ — **LOS and readmission**
Macy et al, JACI 2014

80% lose penicillin allergy after 10 years[1]

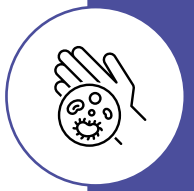
Validated assessment tools and clinical decision rules[2]

50% 'low-risk'[3]

1. *Trubiano et al, JAMA 2017*
2. *Trubiano et al, JAMA-IM 2020*
3. *Chua et al, CID 2021*

DOC SAFE & EFFECTIVE FOR 'LOW-RISK' PENICILLIN ALLERGY PHENOTYPES
Copaescu et al, JAMA Intern Med 2022

MULTI-DISCIPLINARY UPTAKE
Trubiano et al, OFID 2018; Brayson et al, JAC 2023; Steenvorden et al, BMC ID 2021



EMBEDDED WITHIN HEALTH SERVICE AMS PROGRAMS
Chua et al, CID 2021

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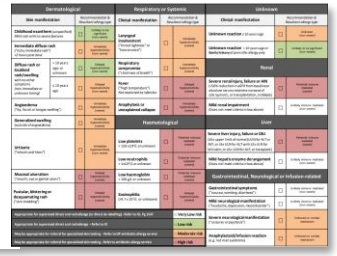
Penicillin Allergy Assessment

Pathways to testing strategies: What is 'Low-risk'?

J Allergy Clin Immunol Pract. 2019 Mar;7(3):1063-1065.e5. doi: 10.1016/j.jaip.2018.07.048. Epub 2018 Aug 29.

Pathways to improved antibiotic allergy and antimicrobial stewardship practice: The validation of a beta-lactam antibiotic allergy assessment tool

Misha Devchand [1], Karen F Urbancic [1], Sharmila Khumra [1], Abby P Douglas [2], Olivia Smibert [2], Emma Cohen [3], Michael Sutherland [4], Elizabeth J Phillips [5], Jason A Trubiano [6]



J Allergy Clin Immunol Pract. 2018 Jan-Feb;6(1):139-148.e2. doi: 10.1016/j.jaip.2017.04.045. Epub 2017 Jul 21.

Designing Predictive Models for Beta-Lactam Allergy Using the Drug Allergy and Hypersensitivity Database

Anca Mirela Chiriac [1], Youna Wang [2], Rik Schrijvers [3], Philippe Jean Bousquet [4], Thibault Mura [5], Nicolas Molinari [6], Pascal Demoly [7]

Allergy. 2020 Jun;75(6):1300-1315. doi: 10.1111/all.14122.

Towards a more precise diagnosis of hypersensitivity to beta-lactams - an EAACI position paper

Antonino Romano [1], Marina Atanaskovic-Markovic [2], Annick Barbaud [3], Andreas J Bircher [4], Knut Brockow [5], Jean-Christoph Caubet [6], Gulfem Celik [7], Josefina Cernadas [8], Anca-Mirela Chiriac [9 10], Pascal Demoly [9 10], Lene H Garvey [11 12], Cristobalina Mayorga [13 14], Alla Nakonechna [15 16], Paul Whitaker [17], María José Torres [14]

PEN	Penicillin Allergy	
F	< 5 years	+2
A	Anaphylaxis OR Angioedema	+2
S	SCAR	+2
T	Treatment	+1

Points	Risk upon OC
0	< 1%
1 – 2	5%
3	20%
4	50%

PEN-FAST < 3
96.3% NPV

(95% CI = 94.1% - 97.8%)

Trubiano et al, JAMA-IM 2020

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Penicillin Allergy Testing Strategies

Pathways to delabelling…

Low Risk (50%)
(Chua et al CID 2021)

DOC
(Copaescu et al JAMA-IM 2022)

96%
Negative
(Chua et al CID 2021)

10-fold ↑ penicillin use
(Chua et al CID 2021)

Moderate - High Risk

Skin-testing

OC
(if ST negative & dependent on phenotype)

Resources, time, training, $$$

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Low-Risk Penicillin Allergy Programs

State-of-play: Global

Review > Expert Rev Anti Infect Ther. 2024 Jan-Jun;22(1-3):59-69.
doi: 10.1080/14787210.2023.2296068. Epub 2024 Feb 12.

Low-risk penicillin allergy delabeling: a scoping review of direct oral challenge practice, implementation, and multi-disciplinary approaches

Elise Mitri [1 2 3], Gemma Reynolds [4 5], Catherine J Hornung [3 6 7], Jason A Trubiano [1 2 3 4]

Definition of "low-risk"

36% Validated scales
31% Institution specific
4% Consensus guidelines
29% Undefined

Design of DOC

Discipline
Choice of DOC drug
DOC dose

Definition of positive DOC

35% reported;
37% delineated between immune and non-immune mediated

Follow-up

49% reported follow-up

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INPATIENT Penicillin Allergy Programs

A Multi-Disciplinary Approach

Contents lists available at ScienceDirect

International Journal of Infectious Diseases

journal homepage: www.elsevier.com/locate/ijid

Review

The effectiveness of interventions that support penicillin allergy assessment and delabeling of adult and pediatric patients by nonallergy specialists: a systematic review and meta-analysis ☆

Neil Powell [1,*], Jennie Stephens [2], Declan Kohl [3], Rhys Owens [4], Shadia Ahmed [5], Crispin Musicha [6], Mathew Upton [7], Bridie Kent [8], Sarah Tonkin-Crine [9], Jonathan Sandoe [5]

J Allergy Clin Immunol Pract. 2020 Jul-Aug;8(7):2294-2301. doi: 10.1016/j.jaip.2020.02.033. Epub 2020 Mar 7.

Direct Challenges to Penicillin-Based Antibiotics in the Inpatient Setting

Allison Ramsey [1], S Shahzad Mustafa [2], Anne Marie Holly [3], Mary L Staicu [4]

Affiliations + expand

PMID: 32156611 DOI: 10.1016/j.jaip.2020.02.033

Allergist
94% negative DOC

JOURNAL ARTICLE

The Who, What, When, and Where of Inpatient Direct Oral Penicillin Challenge—Implications for Health Services Implementation

Get access >

Jason Anthony Trubiano ✉, Sara Vogrin, Elise Mitri, Rebecca Hall, Ana Copaescu, Jamie Waldron, Joseph De Luca, Morgan Rose, Geoff Mackay, Belinda Lambros, Abby P Douglas, Natasha E Holmes, Kyra Y L Chua

Clinical Infectious Diseases, Volume 77, Issue 1, 1 July 2023, Pages 19–22,

non-Allergist
97% negative DOC

J Antimicrob Chemother. 2019 May 1;74(5):1438-1446. doi: 10.1093/jac/dky575.

Implementation of a pharmacist-led penicillin allergy de-labelling service in a public hospital

Tanya du Plessis [1], Genevieve Walls [1], Anthony Jordan [2], David J Holland [1]

Affiliations + expand

PMID: 30753497 DOI: 10.1093/jac/dky575

Pharmacist
92% negative DOC

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INPATIENT Penicillin Allergy Programs

A Multi-Disciplinary Approach

Multicenter Study > Clin Infect Dis. 2021 Aug 2;73(3):487-496. doi: 10.1093/cid/ciaa653.

The Penicillin Allergy Delabeling Program: A Multicenter Whole-of-Hospital Health Services Intervention and Comparative Effectiveness Study

Kyra Y L Chua [1], Sara Vogrin [2], Susan Bury [1 3], Abby Douglas [4], Natasha E Holmes [1], Nixon Tan [1], Natasha K Brusco [5 6], Rebecca Hall [1], Belinda Lambros [4], Jacinta Lean [4], Wendy Stevenson [1], Misha Devchand [1 3], Kent Garrett [3], Karin Thursky [4 7 8], M Lindsay Grayson [1 9], Monica A Slavin [4 8], Elizabeth J Phillips [10 11], Jason A Trubiano [1 4 9]

AMS Team – Improved Prescribing

> BMC Infect Dis. 2021 Oct 20;21(1):1083. doi: 10.1186/s12879-021-06794-1.

De-labelling penicillin allergy in acutely hospitalized patients: a pilot study

Linde Steenvoorden [1], Erik Oeglaend Bjoernestad [2 3], Thor-Agne Kvesetmoen [1], Anne Kristine Gulsvik [1]

Affiliations + expand

PMID: 34670500 PMCID: PMC8527685 DOI: 10.1186/s12879-021-06794-1

non-Allergists – Increased penicillin use

> J Allergy Clin Immunol Pract. 2022 Jun;10(6):1660-1663.e2. doi: 10.1016/j.jaip.2022.01.041. Epub 2022 Feb 5.

Low-risk penicillin allergy delabeling through a direct oral challenge in immunocompromised and/or multiple drug allergy labeled patients in a critical care setting

Grace Koo [1], Joanna L Stollings [2], Christopher Lindsell [3], Mary Lynn Dear [4], Sunil Kripalani [5], George E Nelson [6], Allison B McCoy [7], Todd W Rice [4], Elizabeth J Phillips [8], Cosby A Stone Jr [9]; Vanderbilt University Medical Center Learning Healthcare System

Allergist – Increased penicillin use in ICU

> Clin Microbiol Infect. 2023 Oct;29(10):1338.e1-1338.e4. doi: 10.1016/j.cmi.2023.06.024. Epub 2023 Jun 22.

Removal of incorrect penicillin allergy labels in a UK hospital

Daniel Hearsey [1], Shuayb Elkhalifa [2], Jonathan Sandoe [3], Michael Wilcock [4], Rhys Owens [5], Bethan Gay [6], Charlotte Wildblood [6], Jane Mendonca [7], Nicola Leigh [4], Neil Powell [8]

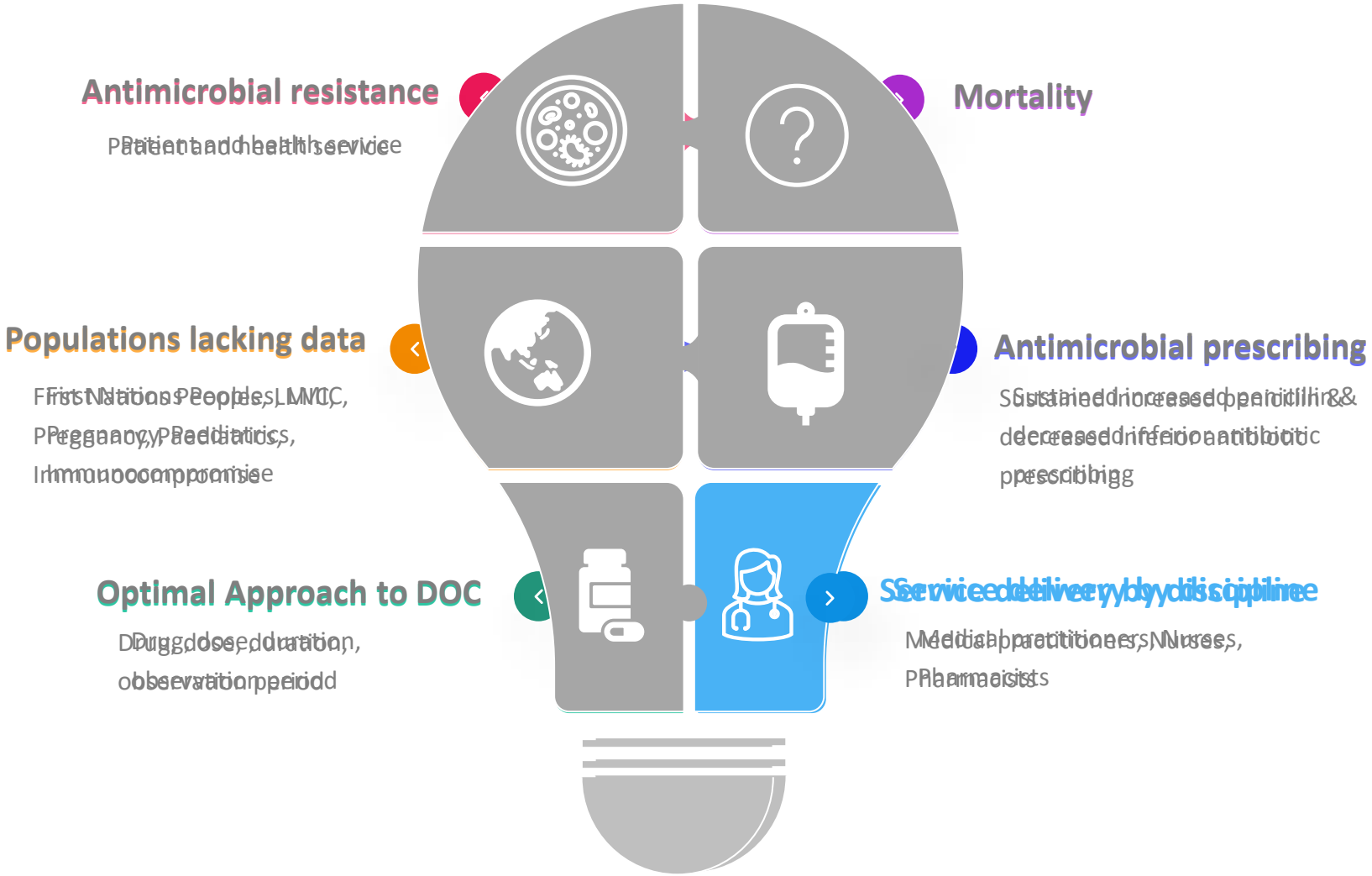
Affiliations + expand

PMID: 37354996 DOI: 10.1016/j.cmi.2023.06.024

Pharmacists – Increased penicillin use, decreased alternative antibiotic use

Inpatient Penicillin Allergy Programs

Missing puzzle pieces…



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State of Play: Low-risk Penicillin Allergy Delabelling

Australia

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austRalian survEy of multi-disCiplinary lOw-risk peNiCIllin aLlergy dElabelling

Study period	19th May 2023 – 1st July 2023
Participants	Australian clinicians – Allergists, non-allergist medical practitioners, nurses and nurse practitioners, pharmacists
Method	Electronic cross-sectional survey distribution - *Drug Hypersensitivity Symposium, Melbourne, 2023*

ascia australasian society of clinical immunology and allergy

National Allergy Centre of Excellence

ASID Australasian Society for Infectious Diseases

Advanced Pharmacy Australia

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Mitri et al, Unpublished data

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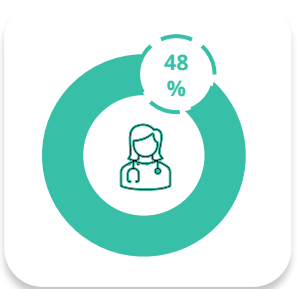
Participants

157 – Average 13.6 years of practice

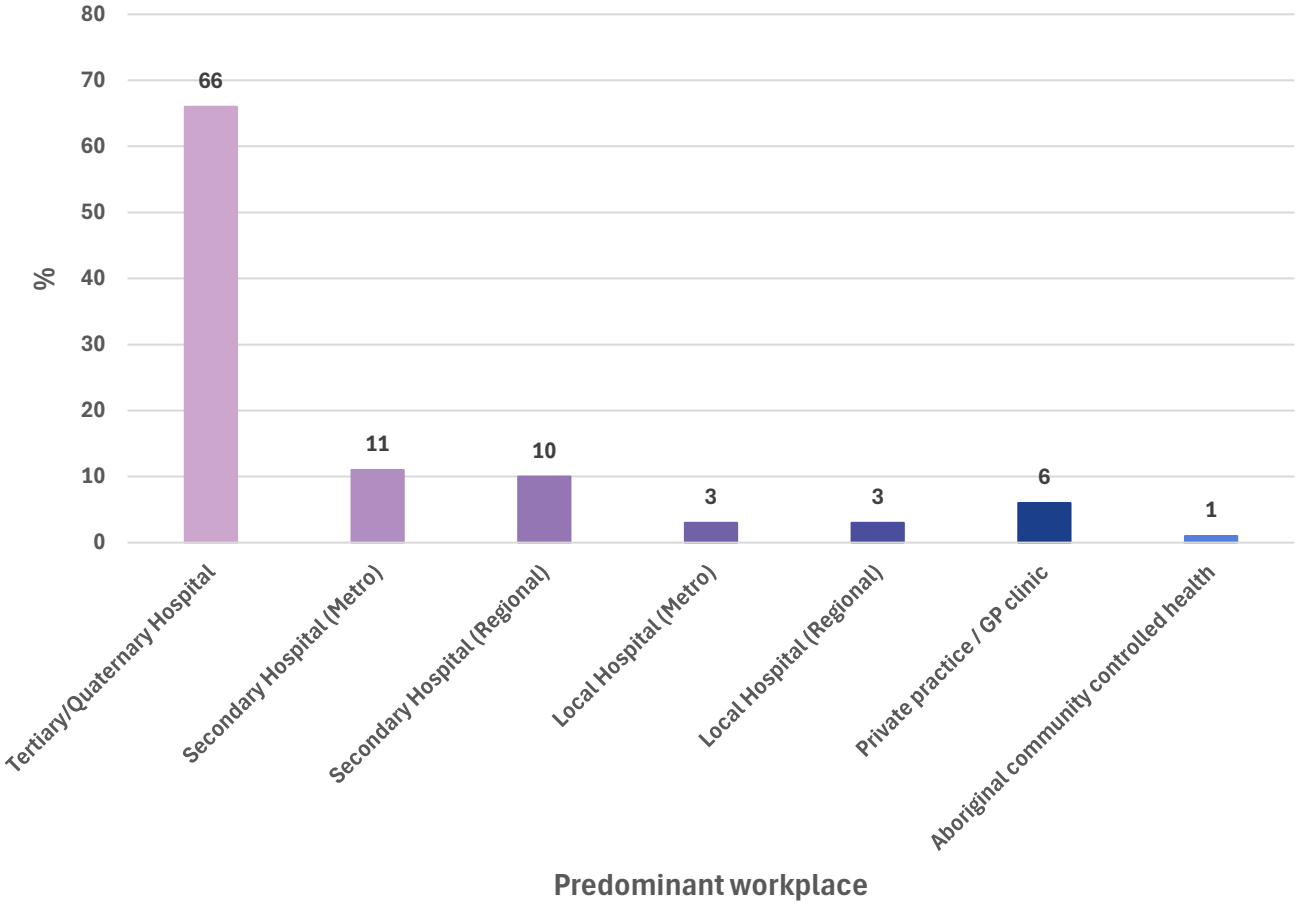
Allergist



non-Allergist

Pharmacist

Nurse or Nurse Practitioner



Mitri et al, Unpublished data

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Current activities

85% Perform penicillin allergy assessment and delabelling
70% inpatient setting, 43% outpatient setting, 12% private practice

79% Perform penicillin allergy assessment and documentation in the medical record

62% Perform ‘direct delabel’

62% Perform penicillin direct oral challenge

24% Perform skin-prick/intradermal testing +/- oral challenge

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Mitri et al, Unpublished data

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Beliefs

79%

DOC is the ‘gold standard’ for low-risk penicillin allergy delabelling in the inpatient setting

96%

Inpatient DOC for low-risk penicillin allergy should be performed

97%

Would follow a national consensus guideline for inpatient penicillin DOC.

Mitri et al, Unpublished data

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Beliefs

After completing appropriate training, the following disciplines should be able to independently perform penicillin allergy assessment

Allergist	non-Allergist Medical Practitioner	Pharmacist	Nurse or Nurse Practitioner
Strongly Agree / Agree			
141 (99%)	135 (94%)	121 (85%)	116 (81%)
Neutral			
2 (1%)	5 (3%)	14 (10%)	18 (13%)
Strongly Disagree / Disagree			
0 (0%)	3 (2%)	8 (5%)	9 (6%)

N = 143

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Mitri et al, Unpublished data

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Beliefs

After completing appropriate training, the following disciplines should be able to independently perform direct oral challenge in patients with an appropriately assessed penicillin allergy label.

Allergist	non-Allergist Medical Practitioner	Pharmacist	Nurse or Nurse Practitioner
Strongly Agree / Agree			
138 (97%)	136 (96%)	90 (63%)	98 (69%)
Neutral			
4 (3%)	6 (4%)	28 (20%)	31 (22%)
Strongly Disagree / Disagree			
0 (0%)	0 (2%)	24 (17%)	13 (9%)

N = 143

Mitri et al, Unpublished data

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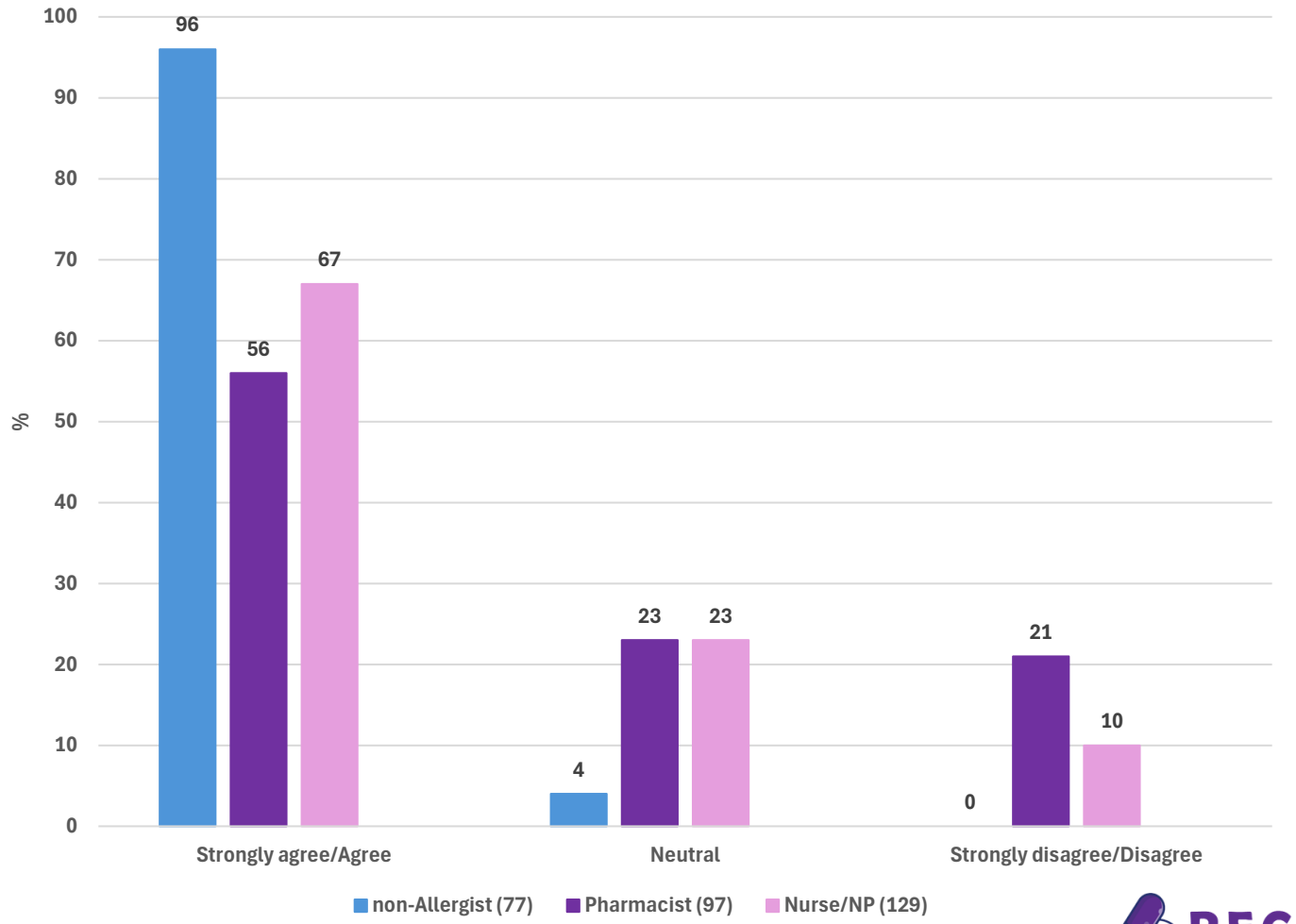
Beliefs

After completing appropriate training, the following disciplines should be able to independently perform direct oral challenge in patients with an appropriately assessed penicillin allergy label.



Mitri et al, Unpublished data

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Beliefs

After completing appropriate training, the following disciplines should be able to independently perform skin prick/intra-dermal testing in patients with an appropriately assessed penicillin allergy label

Allergist	non-Allergist Medical Practitioner	Pharmacist	Nurse or Nurse Practitioner
Strongly Agree / Agree			
140 (99%)	101 (72%)	60 (43%)	87 (62%)
Neutral			
1 (1%)	29 (20%)	32 (22%)	35 (25%)
Strongly Disagree / Disagree			
0 (0%)	11 (8%)	49 (35%)	19 (13%)

N = 141

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Mitri et al, Unpublished data

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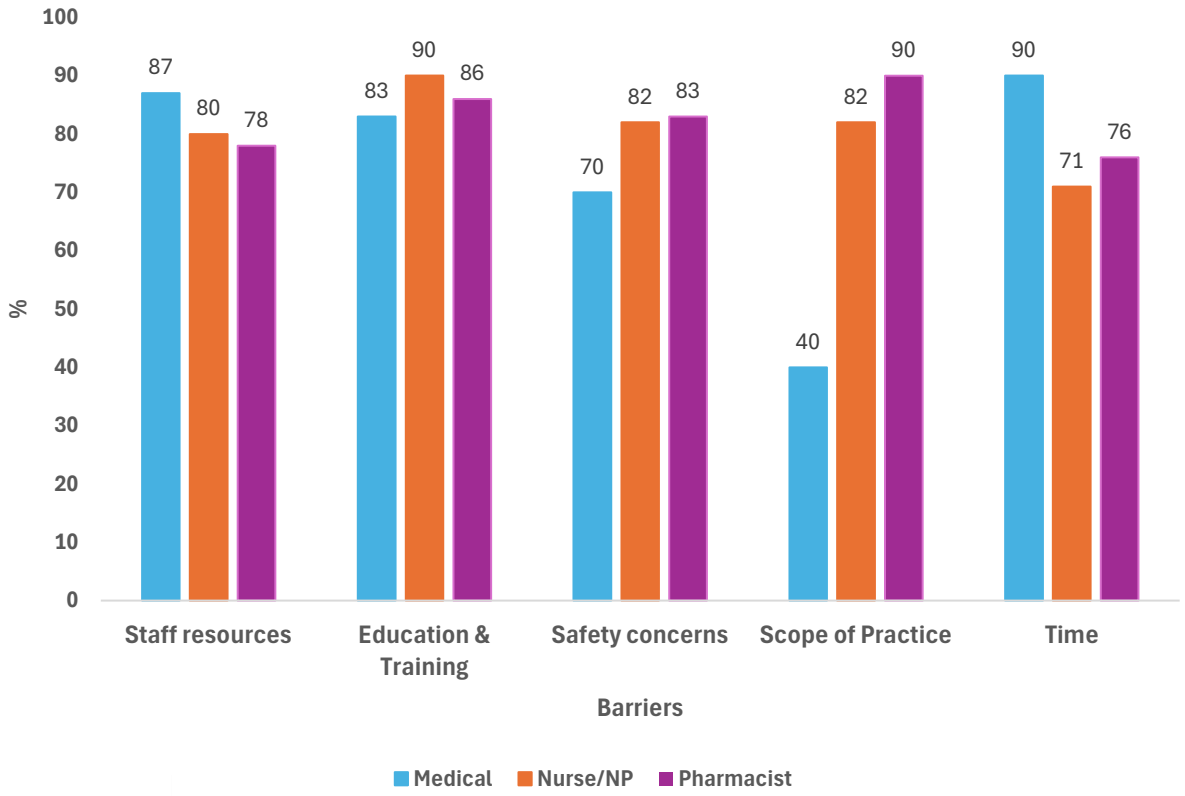
Barriers

What do you believe the barriers are to non-Allergist practitioners currently performing independent direct oral challenge for an appropriately assessed low-risk penicillin allergy label? Select multiple, if applicable.



"Home team concerns of patient being too unwell or high risk"

"Guideline or standard"

"Hospital protocol or Executive limiting"

"Practitioner tolerance of risk for a new procedure"

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Mitri et al, Unpublished data

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NAAN Inpatient Penicillin Allergy Guide

Guidance for implementation of inpatient DOC

97% Would follow a national consensus guideline for inpatient penicillin DOC

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National Antibiotic Allergy Network

INTERNAL MEDICINE JOURNAL | RACP Specialists. Together

Position Paper | Open Access

Adult penicillin allergy programmes in Australian hospitals: a practical guide from the National Antibiotic Allergy Network

Rory Hannah, Elise Mitri, Constance H. Katelaris, Jennifer O'Hern, Minyon Avent, Glenn Valoppi, Matthew Rawlins, Catherine Frith, Brendan McMullan, David Kong, Kyra Chua ... See all authors

First published: 23 October 2024 | https://doi.org/10.1111/imj.16543

Inpatient Penicillin Direct Oral Challenge Checklist

National Antibiotic Allergy Network

Identification and Allergy assessment		
	Low-risk allergy according to a validated scoring system or phenotypic criteria	PEN-FAST < 3 PEN-FAST clinical decision rule *Trubiano et al, 2020*
	Currently prescribed or likely to require antibiotics in the future	
	Medically stable	
Preparation		
Location requirements		
	Facility capable of managing an allergic reaction *(ICU or day unit not required)*	
	Clinician line of sight and space to recline patient	
Staff Roles – Medical / Prescriber responsibilities		
	Education, patient consent and documentation	NAAN Clinician Resources: Patient Information
	Organise challenge procedure including collaborative discussion with nursing to provide education and schedule an appropriate time	
	Capable of recognising and managing an allergic reaction	ASCIA Antibiotic Allergy Challenge Consent Form
Staff Roles – Nursing / Observer responsibilities		
	Capable of recognising an allergic reaction	
	Remain nearby patient and perform observations every 30 minutes	
	Document evolving signs and symptoms of allergic reaction, if required	
	Perform additional observations in the event of a reaction	
Oral Challenge		
Pre-Challenge		
	Prescribe amoxicillin 500mg single-dose oral challenge *(No requirement for IV access or pre-order of antihistamine or adrenaline)*	
	Confirm patient and staff to remain present for duration of challenge (minimum 60 minutes)	
Challenge Procedure		
	Record time of administration	
	Check the patient every 30-minutes, or if adverse event occurs	
Adverse Reactions – Utilise USDAR grading criteria		USDAR grading scale for immediate drug reactions *Khan et al, 2023*
	If mild subjective symptoms - medical review and observe for more definitive symptoms of a reaction	
	If objective evidence of allergic reaction - medical review and treatment, as required	ASCIA guide for management of allergic reactions
	Document evidence of positive challenge, if relevant	
Evaluation and Documentation		
Positive Oral Challenge – Utilise USDAR grading criteria		ASCIA guide for management of allergic reactions
	Provide treatment as required	
	Mild reactions - Continue observations for two hours, performing hourly observations	NAAN clinician resources: GP letter and Antibiotic Allergy Alert Card
	Moderate to severe reactions - Continue observations for four hours, performing hourly observations	
	Record positive challenge in medical record	National Allergy Council: Updating MHR for consumers
Negative Oral Challenge – Nil reaction at 60 minutes		National Allergy Council: Updating MHR for clinicians using conformant software
	Record negative challenge in medical record	
	Provide patient with contact information to report delayed reactions	
Documentation		
	Provide written information to patient, general practitioner and other relevant healthcare professionals	
	Update My Health Record	

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Inpatient Penicillin DOC Programs

Next steps…

1. INTERVENTIONAL

Ideal conditions

Waldram et al, JACI 2016
Savic et al, Br J Anaesth 2019

2. EFFICACY

Selective population and sample

Copaescu et al, JAMA Intern Med 2023
Mustafa et al, JACI-IP 2019

3. EFFECTIVENESS

Reflects source population
Greater sample variability

Trubiano et al, CID 2023
Hearsey et al, Clin Micrbiol Infect 2023

4. SUSTAINABILITY

Sustainable, real-world adoption

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