Canterbury District Health Board
Te Poari Hauora ō Waitaha

Antimicrobial Stewardship Bulletin

CDHB Hospital Antimicrobial Stewardship Committee
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Penicillin allergy in adults

- Penicillin allergy is the most common adverse drug reaction (ADR) reported. However, while ~10% of adults believe they are penicillin allergic, most (~90%) do not have a true immune-mediated allergy.
- Inaccurate penicillin allergy labels cause harm.
- For World Antimicrobial Awareness Week (18-24 November), our DHBs are working to improve understanding of penicillin allergy. This includes inviting patients who think they are penicillin allergic to ask their doctor about it, so be prepared!
- This bulletin outlines the harms that may result from incorrect penicillin allergy labelling and offers a practical approach to de-labelling many patients that can be achieved in most health settings via interview and notes review alone.
- We encourage you to review your DHB's policies and guidelines (see blue box) or have a chat with your pharmacy team to understand what is expected of you, as approaches vary across the country. Additional information is found here.

INCORRECT PENICILLIN ALLERGY LABELS CAUSE HARM

- Penicillin 'allergy' labels often lead to use of second-line antibiotics that are less effective, broader spectrum and/or more toxic. Associated harms include:

INCREASED:

- Adverse reactions
- Antimicrobial resistance
- *Clostridioides difficile* associated diarrhoea
- Surgical site infections
- Length of hospital stays
- Healthcare costs
- Deaths

- Prescribers must establish and document allergy status before starting an antibiotic. Non-acutely, please question the accuracy of these labels. Removal of an allergy label can often occur after patient interview and allergy history reconciliation alone. Formal testing (oral challenge or skin test) may be needed in some cases.

Myth #1: Once penicillin allergic, always penicillin allergic
Reality: Immune systems change with time. ~50% of skin prick test positive penicillin allergies are lost over 5 years, and ~85% over 10 years.

Myth #2: Penicillin allergy labels are always accurate and current
Reality: Many reactions will be adverse effects (not allergies) or a penicillin will have been tolerated after the index reaction (NEGLIGIBLE RISK). Patient interview and notes review can enable about two-thirds of adult patients to be de-labelled (grey box).

Myth #3: True immune-mediated penicillin allergy means other β-lactams cannot be used.
Reality: Sometimes they can be. Cross-reactivity is < 2% with cephalosporins and < 1% with carbapenems but varies with chemical structure (see here). Follow guidelines or seek advice.

MOST PENICILLIN ALLERGY LABELS CAN BE REMOVED WITH PATIENT INTERVIEW AND NOTES REVIEW ALONE

- The 'culprit' medicine, nature of the reaction (severity, timing), what antibiotics have been tolerated since and risk of penicillin challenge is established via a patient interview and allergy/ADR history reconciliation. See Table.
- Actions relate to the risk that the reaction is a true allergy:
  - **NEGLIGIBLE RISK:** remove or correct the label in the clinical record including medication chart and national medical warnings system (CARM). Communicate the basis for this clearly to patient and GP (e.g. verbally, discharge summary).
  - **LOW RISK:** consider oral amoxicillin challenge. This needs availability of immediate anaphylaxis care and is usually done in hospitals. Follow DHB policies if available (blue box).
  - **MODERATE to HIGH RISK:** do not challenge with a penicillin without immunology/infectious diseases advice. Use alternative antimicrobials – see local guidelines or seek specialist advice.

TABLE: ASSESS FOR ALLERGY RISK FROM TOP TO BOTTOM

HIGH RISK: SEVERE PENICILLIN ALLERGY
DO NOT CHALLENGE WITH PENICILLINS. CONTACT INFECTIOUS DISEASES/IMMUNOLOGY IF ALTERNATIVE NOT AVAILABLE
- ❒ Anaphylaxis/collapse/hypotension
- ❒ Mucosal ulceration (mouth, eye or genital ulcer)
- ❒ Pustular, blistering or desquamating rash (skin shedding)
- ❒ Haematological reaction, e.g. low platelets, eosinophilia
- ❒ Severe kidney injury (including acute interstitial nephritis)
- ❒ Severe liver injury
- ❒ Previous reaction requiring hospitalisation

MODERATE RISK
DO NOT CHALLENGE WITH PENICILLINS WITHOUT INFECTIOUS DISEASES/IMMUNOLOGY ADVICE
- ❒ Respiratory symptoms, e.g. tight throat, wheeze
- ❒ Urticaria/angioedema/swelling in other areas
- ❒ Immediate (< 2 h post-dose) rash reaction
- ❒ Delayed rash reaction < 10 years ago
- ❒ Unknown reaction < 10 years ago

LOW RISK
SUITABLE FOR ORAL PENICILLIN CHALLENGE (USUALLY IN A HOSPITAL SETTING)
- ❒ Delayed rash reaction > 10 years ago
- ❒ Unknown reaction > 10 years ago
- ❒ Unspecified childhood reaction

NEGLIGIBLE RISK
CAN SAFELY DE-LABEL (IN HOSPITALS OR PRIMARY CARE)
- ❒ Expected GI side effects, e.g. nausea, vomiting, diarrhoea
- ❒ Thrush (any kind)
- ❒ Mild reversible kidney/liver/neurological dysfunction
- ❒ Allergy reported, but same antibiotic tolerated subsequently
- ❒ Family history of penicillin allergy only

PENICILLIN ALLERGY DE-LABELLING AT MIDDLEMORE HOSPITAL

A specialist pharmacist-led service showed 199/250 (80%) of adult inpatients with a penicillin 'allergy' label could be de-labelled. In most cases (160/199 i.e. 80%) this was after interview and notes review alone where the reaction was an adverse effect (e.g. nausea) rather than allergy (110/160 i.e. 69%) and/or a penicillin had been tolerated after the index event (127/160 i.e. 79%). The rest were de-labelled post interview and oral amoxicillin challenge (16%) or immunology assessment (4%). The prevalence of *reported* (11%) and *confirmed* (2%) penicillin allergy differed.

Du Plessis T *et al. Antimicrob Chemother* 2019;74:1438–46

PENICILLIN ALLERGY ASSESSMENT AT CDHB

- Our Adverse Reactions to Penicillins Hospital HealthPathway includes advice on oral amoxicillin challenges.
- Our Pink Book includes advice on alternatives to penicillins.
- A policy and assessment tool is a work in progress for 2022.

This bulletin has been adapted from resources from Auckland, Counties-Manukau, Northland and Waitematā DHBs (shared policy), Canterbury DHB and Capital & Coast DHB. Thank you to the pharmacists, doctors, nurses and consumers from across Aotearoa NZ who reviewed the various resources for this initiative.