

# Penicillin allergy de-labelling frequently asked questions

## Penicillin allergy de-labelling algorithm and oral challenge

### Why should I review a penicillin allergy label?

A penicillin allergy label limits the use of penicillin, which is often the best first-line antibiotic treatment. This leads to unnecessary use of broad-spectrum antibiotics and increased morbidity. It can also increase the risk of infections like methicillin resistant *Staphylococcus aureus* (MRSA), *Clostridioides difficile*, and vancomycin-resistant Enterococcus (VRE). It is also linked to longer hospital stays, increased readmission rates, greater healthcare costs and more critical care admissions. De-labelling patients with penicillin allergy labels who do not have a true penicillin allergy can reduce these risks and improve clinical outcomes (1).

### Can this algorithm be used for patients allergic to other beta-lactam antibiotics?

No, this algorithm is only for patients with a penicillin allergy.

Beta-lactam antibiotics (ones that have a beta-lactam ring in their structure) include penicillins (eg penicillin, benzyl penicillin), cephalosporins, monobactams and carbapenems. These antibiotics share a similar chemical structure which may cause cross-reactivity. If a patient has had severe reactions to other beta-lactams, they should avoid those drugs. You can still consider them for penicillin de-labelling with the algorithm if you suspect they have a penicillin allergy.

### How do I assess patients for penicillin allergy?

Assess patients for allergy by following the penicillin allergy de-labelling (PADL) algorithm. The algorithm provides a step wise approach to assess patients on their allergy status and potential eligibility for de-labelling.

### How can a patient with a documented penicillin allergy be de-labelled?

Use the PADL algorithm to assess the patient's history. If the history is inconsistent with penicillin allergy, then you may directly de-label the patient without oral challenge. The PADL algorithm includes specific low risk scenarios that do not require testing before you remove the allergy label.

You can also de-label patients after an oral challenge. Give the patient a dose of an oral penicillin and then observe them for any adverse effects.

### Is it safe to de-label a penicillin allergy based on history alone?

If patients have histories that don't suggest a true allergic reaction, you can safely de-label them without further testing. It is safe to de-label patients if symptoms reported with their histories are typical of intolerance eg minor gastrointestinal upset, nausea, headache or fatigue. However, if the patient is unwilling or reluctant to accept direct de-label, consider offering oral penicillin challenge.

**Why can some patients be de-labelled without an oral challenge?**

Some patients have a history that is inconsistent with penicillin allergy. Examples include family history of allergy without personal exposure, symptoms typical of intolerance rather than allergy, or documented tolerance of penicillin following the reported reaction. The PADL algorithm classifies these patients as low risk and they do not require oral challenge before de-labelling.

**Do I need patient consent before de-labelling a patient from history alone?**

You do not require formal written consent to directly de-label a patient based on history assessment alone. However, involve patients in the decision-making process and provide them with appropriate information before removing the allergy label. An oral challenge can be an option if the patient is unsure about de-labelling.

**Do I need patient consent before conducting a penicillin oral challenge?**

Obtain informed consent using the pre-test patient consent form before conducting a penicillin oral challenge. Counsel the patient on the oral challenge procedure and risks. Also provide them with the oral penicillin challenge information leaflet. Give them the opportunity to ask any questions prior to the challenge.

**What risks should I explain to my patient before conducting the penicillin challenge?**

The main risk is a severe allergic reaction or anaphylaxis, but this is very rare. Studies show that the penicillin challenge has been safe and most patients tolerate it without issues (2-4).

**Is it safe for patients on antihypertensive drugs to have an oral penicillin challenge?**

Patients on beta-blockers or angiotensin-converting enzyme (ACE) inhibitors may have a more severe drop in blood pressure if they react. This could make anaphylaxis more difficult to manage. However, if you assess a patient as suitable for oral challenge, that patient has a low risk of an allergic reaction. It is in the patient's interest to remove an incorrect penicillin allergy label so you should not exclude them from an oral challenge.

**Penicillin allergy patient scenarios that clinicians may encounter****"My family members have severe penicillin allergies. Should I be worried?"**

If the patient has never had a penicillin allergy, their family history alone doesn't mean they are allergic. Other histories that are inconsistent with penicillin allergy are symptoms that are typical of intolerance rather than allergic reactions. These include minor gastrointestinal upset, nausea, headache, fatigue or a history of tolerating penicillin following the index reaction. For these patients, follow the low risk pathway on the algorithm. Counsel the patient on direct de-labelling and proceed to de-label.

**"I think I had a penicillin allergy as a child but can't remember the details."**

If the patient cannot recall any severe allergic reactions, and it's been more than five years since the event, their risk of a current allergy is low. The patient might be eligible for an oral challenge after a review by a senior clinician.

**"I developed a rash after penicillin years ago but can't remember when."**

If the patient does not report, and you do not identify other features that suggest type 1 or 4 hypersensitivity, follow the medium risk pathway on the algorithm. Determine if the reaction resulted in hospital admission and whether it happened more or less than five years ago.

**"I had severe side effects like terrible diarrhoea after taking penicillin."**

Other factors may have contributed to the symptoms, or patient could be prone to significant side effects of penicillin. Follow the low risk pathway on the algorithm and manage side effects if they happen.

**"I think I had an allergic reaction to an antibiotic as a child, but I don't know if it was penicillin."**

This test only checks for penicillin allergy. A negative result won't tell you about other antibiotics, but ruling out penicillin allergy could still be useful.

**"I had a severe reaction (I collapsed), but it happened more than an hour after taking the medication."**

Consider the context and other symptoms. Collapse could indicate a severe allergic reaction and generally means clinicians should not perform an oral challenge.

### **During test clinician queries**

**"My patient's heart rate increased during observation. Does this mean they are allergic?"**

Probably not. There're lots of reasons the heart rate could have climbed, and if it was mild and isolated, this would not necessarily indicate allergy. Monitor the patient closely and consult with senior staff to discuss the results.

**"My patient reported itching during observation. Does this mean they are allergic?"**

Probably not. If it was mild and isolated, and there was no rash, an itch would not indicate allergy.

### **Oral challenge clinician queries**

**"My patient had a negative amoxicillin challenge. Does this mean they aren't allergic to other beta-lactams?"**

We use amoxicillin for the oral challenge as this is the most common used penicillin antibiotic. This allows the largest number of patients to be 'de-labelled' through this process. A negative penicillin oral challenge means, in general, that a patient has the same risk of reaction to subsequent penicillin-based antibiotics as a patient who has never had a label of penicillin allergy. Patients have a very low risk of reacting to other beta-lactam antibiotics although it is still possible if the allergy is based on a different component of the drug other than the beta-lactam ring.

### **"What if a patient reported an allergy to a penicillin or beta-lactam antibiotic that can't be tested with amoxicillin?"**

On rare occasions, a patient may report a history of allergy to a penicillin antibiotic that cannot be tested orally, eg IV piperacillin/tazobactam (Tazocin®). In such cases, an amoxicillin challenge may still be helpful. A negative test permits future amoxicillin use but does not support removing the piperacillin/tazobactam allergy label. On discharge, inform the GP that it is safe for the patient to take the tested drug (amoxicillin). The patient should continue to avoid other beta-lactams if you did not test for those allergies. Do not use the standard "No penicillin allergy" GP communication in this circumstance. Communicate the test details and their implications in the Immediate Discharge Letter. Such cases represent a minority of patients as the majority will report a single beta-lactam allergy label.

### **References**

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