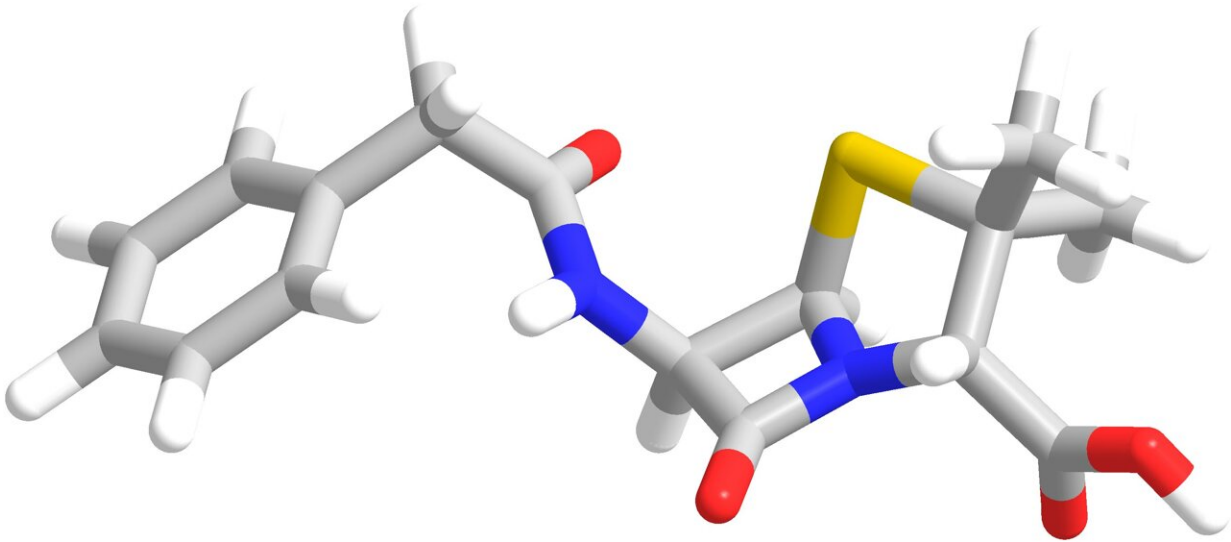


# 90% of penicillin allergy labels in Hong Kong found to be false

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Chemical structure of Penicillin G. The sulfur and nitrogen of the five-membered thiazolidine ring are shown in yellow and blue respectively. The image shows that the thiazolidine ring and fused four-membered  $\beta$ -lactam are not in the same plane. Credit: Public Domain

A collaborative research team led by Dr. Philip Li from the LKS Faculty of Medicine, The University of Hong Kong (HKUMed) has pioneered a new nurse-led penicillin allergy triage and testing strategy—the Hong Kong Drug Allergy Delabelling Initiative (HK-DADI), and demonstrated its effectiveness and safety compared to traditional allergy testing.

Their findings have also led to the development of new guidelines for penicillin [allergy](#) testing and establishment of new nurse-led drug allergy clinics in Hong Kong. The research article is now published in the *Journal of Clinical Immunology: In Practice*.

## **Research background and findings**

Although every 1 in 50 of the Hong Kong population have beta-lactam antibiotic (e.g. penicillin) 'allergy' labels, 90% of these labels are found to be incorrect after formal allergy evaluation. Incorrect penicillin allergy labels can be very dangerous since they can be associated with increased mortality, hospitalization, health care costs and development of multi-drug resistant organisms. The adverse effects of incorrect drug allergy labels are even more pronounced among susceptible individuals such as elderly and immunocompromised patients.

Traditionally, the evaluation of suspected drug or penicillin allergy comprises of history-taking and allergy testing (including allergy skin testing and drug provocation tests) performed by Allergists. Unfortunately, Hong Kong has one of the lowest Allergist-to-population ratios in the world, which severely limits the availability of allergy testing for the public.

Building upon its previous research on drug allergy in Hong Kong, HKUMed designed a new nurse-led penicillin allergy testing strategy—HK-DADI—to overcome the limited number of Allergists in Hong Kong. Under HK-DADI, patients would be interviewed by trained nurses to evaluate patients with suspected penicillin allergy and would be triaged into 'low-risk' or 'non-low-risk' according to HKUMed's protocol.

Low-risk patients (accounting for about 70% of all evaluated patients) would attend a dedicated low-risk penicillin allergy nurse clinic with

penicillin allergy testing performed—and if negative (that is, non-allergic to penicillin), the patients will have their incorrect 'allergies' delabelled. Non-low-risk patients would be further evaluated by Allergists.

After evaluating more than 310 patients, 90% of penicillin allergy labels were found to be incorrect and thus delabeled. The delabeling rate of HK-DADI was similar to the traditional pathway (performed by Allergists). No patients developed severe or systemic reactions during or after the evaluation. Compared to the traditional pathway, nurse-led evaluation led to an even higher rate of future penicillin use after delabeling (19% vs 32% after an average of 10 months) and mitigated the need for unnecessary allergy skin testing.

## **Research significance**

"Incorrect penicillin allergy labels can be potentially lethal and should be delabeled if proven incorrect after appropriate allergy testing. Unfortunately, allergy services are severely limited by the lack of Specialists in Immunology & Allergy in Hong Kong," remarked Dr. Philip Li, Division Chief of Rheumatology & Clinical Immunology and Clinical Assistant Professor, Department of Medicine, School of Clinical Medicine, HKUMed.

"The HK-DADI represents a novel multi-disciplinary approach using the combined expertise of physicians and nurses to streamline penicillin allergy testing for the majority of patients in need."

Dr. Li further commented that "Given the lack of Specialists in Immunology & Allergy, more multidisciplinary initiatives should be employed to alleviate the overwhelming demand for allergy services in Hong Kong. Hopefully, this is just the first of many much-needed allergy collaborative services to come."

Findings from this study have also led to the development of new local guidelines for penicillin allergy testing in Hong Kong, enabling non-allergists to independently perform [penicillin](#) allergy testing for low-risk patients. Furthermore, new dedicated nurse-led HK-DADI clinics have now been set up across Hong Kong to tackle the tremendous burden of incorrect drug allergy labels across the territory.

**More information:** Andy K.C. Kan et al, Comparative Effectiveness, Safety, and Real-World Outcomes of a Nurse-Led, Protocol-Driven Penicillin Allergy Evaluation From the Hong Kong Drug Allergy Delabelling Initiative (HK-DADI), *The Journal of Allergy and Clinical Immunology: In Practice* (2022). [DOI: 10.1016/j.jaip.2022.08.052](https://doi.org/10.1016/j.jaip.2022.08.052)

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