

Beta-lactam antibiotic allergy assessment tool

Clinical manifestation		Recommendation and resultant allergy type		Clinical manifestation		Recommendation and resultant allergy type		Clinical manifestation		Recommendation and resultant allergy type	
Dermatological				Respiratory or systemic				Unknown reaction			
Childhood exanthem (unspecified) Details of rash timing unknown and no severe features or hospitalisation		<input type="checkbox"/>	Unlikely to be significant (non severe)	Laryngeal involvement ("throat tightness or hoarse voice")		<input type="checkbox"/>	Immediate hypersensitivity (severe)	Unknown reaction ≤ 10 years ago		<input type="checkbox"/>	Unlikely significant (non severe)
Immediate diffuse rash ("itchy immediate rash") < 2 hours after dose		<input type="checkbox"/>	Immediate hypersensitivity (non severe)	Respiratory compromise ("wheeze or shortness of breath")		<input type="checkbox"/>	Immediate hypersensitivity (severe)	Unknown reaction > 10 years ago or family history of penicillin allergy only		<input type="checkbox"/>	Unlikely significant (non severe, low risk)
Diffuse rash or localised rash with no other symptoms	≤ 10 years ago	<input type="checkbox"/>	Delayed hypersensitivity (non severe)	Fever not explained by infection or other cause ("high temperature")		<input type="checkbox"/>	Delayed hypersensitivity (severe)	Neurological or gastrointestinal			
	> 24 hours after starting antibiotic	<input type="checkbox"/>	Delayed hypersensitivity (non severe, low risk)	Anaphylaxis or unexplained hypotension or collapse		<input type="checkbox"/>	Immediate hypersensitivity (severe)	Gastrointestinal symptoms ("nausea, vomiting, diarrhoea")		<input type="checkbox"/>	Unlikely immune-mediated hypersensitivity (non severe, low risk)
Rash and mucosal ulceration ("mouth, eye or genital ulcers") Be alert for history of SCAR		<input type="checkbox"/>	Delayed hypersensitivity (severe)	Haematological				Neurological or CNS manifestation ("headache, optic neuritis, confusion, depression, mood disorder, low mood, psychosis")		<input type="checkbox"/>	Unlikely immune-mediated hypersensitivity (non severe, low risk)
Pustular, blistering or desquamating ("skin shedding") rash Be alert for history of SCAR		<input type="checkbox"/>	Delayed hypersensitivity (severe)	Platelets < 150×10 ⁹ /L or unknown		<input type="checkbox"/>	Potential immune-mediated hypersensitivity (severe)	Renal			
Angioedema ("lip, facial or tongue swelling")		<input type="checkbox"/>	Immediate hypersensitivity (severe)	Neutrophils < 1×10 ⁹ /L or unknown		<input type="checkbox"/>	Potential immune-mediated hypersensitivity (severe)	Renal failure or severe injury • >50% reduction in eGFR from patient's baseline • absolute serum creatinine increase of ≥ 26.5 micromol/L • transplantation • dialysis		<input type="checkbox"/>	Potential immune-mediated hypersensitivity (severe, if AIN)
Swelling (outside of angioedema)		<input type="checkbox"/>	Potential immediate hypersensitivity (severe)	Haemoglobin < 100 g/L or unknown		<input type="checkbox"/>	Potential immune-mediated hypersensitivity (severe)	Renal impairment Does not meet criteria for renal failure or severe injury (see box above)		<input type="checkbox"/>	Unlikely immune-mediated hypersensitivity (non severe, low risk)
Urticaria ("wheals and hives")		<input type="checkbox"/>	Immediate hypersensitivity (non severe)	Eosinophilia (> 0.7×10 ⁹ /L or unknown) Examine history for DRESS		<input type="checkbox"/>	Delayed hypersensitivity (severe, if DRESS)	Liver			
Results								Liver failure or severe liver injury • ≥5 x upper limit of normal for ALT or AST • ≥3 x upper limit of normal for ALT with ≥2 x upper limit of normal for bilirubin • ≥2 x upper limit of normal for ALP • decompensation • transplantation		<input type="checkbox"/>	Potential immune-mediated hypersensitivity (severe, if DILI)
Appropriate for direct delabeling – removal of allergy label without testing [oral rechallenge if required]						<input type="checkbox"/>	Low risk of allergy				
Appropriate for supervised direct oral rechallenge [NB1]						<input type="checkbox"/>	Low risk of allergy				
Appropriate for skin testing followed by oral rechallenge [NB2]						<input type="checkbox"/>	Moderate risk of allergy				
Appropriate for outpatient antibiotic allergy assessment with or without testing						<input type="checkbox"/>	High risk of allergy	Hepatic enzyme derangement Does not meet criteria for liver failure or severe injury (see box above)		<input type="checkbox"/>	Unlikely immune-mediated hypersensitivity (non severe, low risk)

AIN = acute interstitial nephritis; ALP = alkaline phosphatase; ALT = alanine transaminase; AST = aspartate aminotransferase; CNS = central nervous system; DILI = drug-induced liver injury; DRESS = drug reaction with eosinophilia and systemic symptoms; eGFR = estimated glomerular filtration rate; SCAR = severe cutaneous adverse drug reactions; ULN = upper limit of normal

NB1: In the appropriate setting, a direct oral rechallenge (ie oral rechallenge without prior skin testing) may be performed under specialist guidance.

NB2: Skin testing followed by oral rechallenge can be performed in the outpatient or inpatient setting. Patients with features of severe life-threatening allergy should have allergy testing performed in the outpatient setting (rather than inpatient setting) to ensure a detailed collateral history is obtained, that there is specialist allergy oversight and that there is resolution of acute illness. If these requirements can be achieved in the inpatient setting, then testing may proceed in this setting with caution.

Reproduced from Devchand M, Urbancic KF, Khumra S, Douglas AP, Smibert O, Cohen E, Sutherland M, Phillips EJ, Trubiano JA. Pathways to improved antibiotic allergy and antimicrobial stewardship practice:

The validation of a beta-lactam antibiotic allergy assessment tool. J Allergy Clin Immunol Pract. 2019 Mar;7(3):1063-1065.e5. doi: 10.1016/j.jaip.2018.07.048. <https://www.ncbi.nlm.nih.gov/pubmed/30172019>