



Allergen-Specific IgE Testing

*Supporting clinicians in the
accurate diagnosis of patient
allergies*

“ The term 'allergy' is popularly applied to a range of adverse reactions to various environmental exposures, resulting from inhalation, contact or ingestion. However, only a subset of these reactions represent true immunological hypersensitivity when defined as a damaging immune response to a usually innocuous substance, resulting from inappropriate reactivity to that substance. Diagnosis of a true immunological hypersensitivity is supported by a range of test procedures.

ASCIA website 2025 ”



How do allergies present?

Allergic reactions can affect many parts of the body and symptoms may vary from mild to severe. Symptoms include asthma or chronic cough, rhinitis (runny nose), conjunctivitis (weepy eyes), atopic dermatitis (itchy skin/eczema), urticaria (hives), or sometimes an upset stomach and bowel.

Anaphylaxis is a less common but far more serious allergic reaction that affects the whole body. It can be life-threatening and requires urgent medical treatment.

Laboratory investigations may be used to confirm an allergic reaction (e.g. serum tryptase following suspected anaphylaxis) or, more frequently, to identify specific provokers (allergens) for ongoing management of an individual's allergies.

How does a patient develop an allergy?

The development of an allergic response starts with initial sensitisation to an antigen, referred to as an allergen, and the production of **specific** Immunoglobulin

E (IgE). While the presence of this specific antibody mediates the reaction, only susceptible individuals will progress from asymptomatic sensitisation to the development of clinical allergy, with symptoms as described above. In these individuals, the relevant IgE molecules are bound to receptors on effector cells, and cross-linking these pre-formed antibodies by exposure to their specific allergen causes the release of those molecules directly responsible for the clinical allergic response, including histamine and others, such as newly formed mediators.

Since specific IgE is largely bound to cells, and is present in very low concentrations in peripheral blood, the total serum IgE may only loosely reflect the patient's allergic, or atopic, state.

While all secondary immune responses, including allergy, are a response to previous exposure, that exposure may be difficult to identify (e.g. food allergens in infants/toddlers). Hence, the exposure history is usually centred on the clinical manifestation of allergic

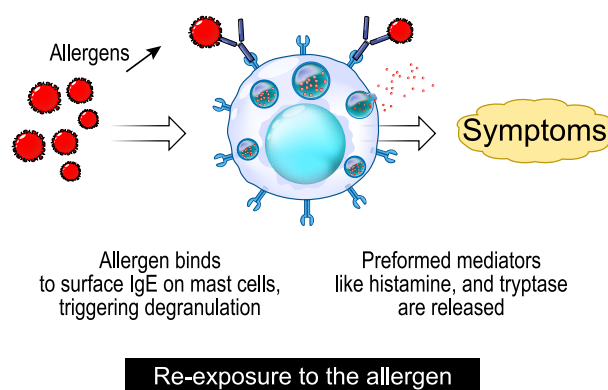
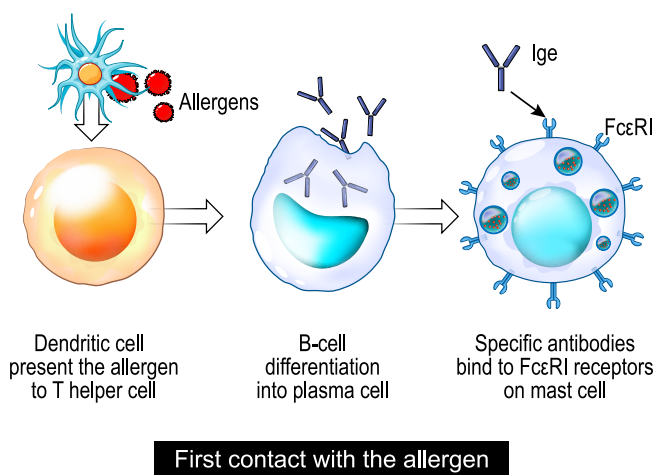


Figure 1. Initial contact and re-exposure to the allergen. Mast cell structure and the role of histamine, allergens and immunoglobulin IgE in allergic responses.

(or possible allergic) symptoms and signs. These may be obvious, particularly with a food allergy where oral symptoms may arise within seconds to minutes following exposure (Oral Allergy Syndrome – OAS), or they may require a more detailed examination of the environment. Some simple approaches may be useful in persons with limited allergies: pollens are prominent outdoors in spring and summer; moulds indoors, especially in winter (but possibly perennial); house dust mite indoors and all year; animal dander following specific exposures, etc. It is also true that there are many “overlapping” allergies due to the fact that the allergen is often a highly conserved, shared peptide in related species (e.g. certain foods, pollens, insects, etc).

This information is important in selecting laboratory testing of specific IgE, which can be used to manage severe or nuisance allergies through avoidance and/or immunotherapy.

What is allergen-specific IgE testing?

Laboratory allergy testing detects allergen-specific IgE in serum. Testing is available for a wide range of food and environmental allergens.

Laboratory allergy testing is an important tool in the diagnosis of IgE-mediated food allergy and insect venom allergy, as well as some forms of drug and latex allergy. It is also helpful in the management of patients with allergic conditions such as asthma, eczema or allergic rhinitis, assisting with the identification of relevant allergic triggers that can exacerbate symptoms.

Serum-specific IgE has the advantage of being ordered by the primary physician while waiting for specialist allergy review. The GP may use the specific IgE results to guide allergen avoidance while the patient waits for a specialist allergy review.

GP's Role in Allergy Diagnosis and Management

Key steps for diagnosing IgE-mediated allergy

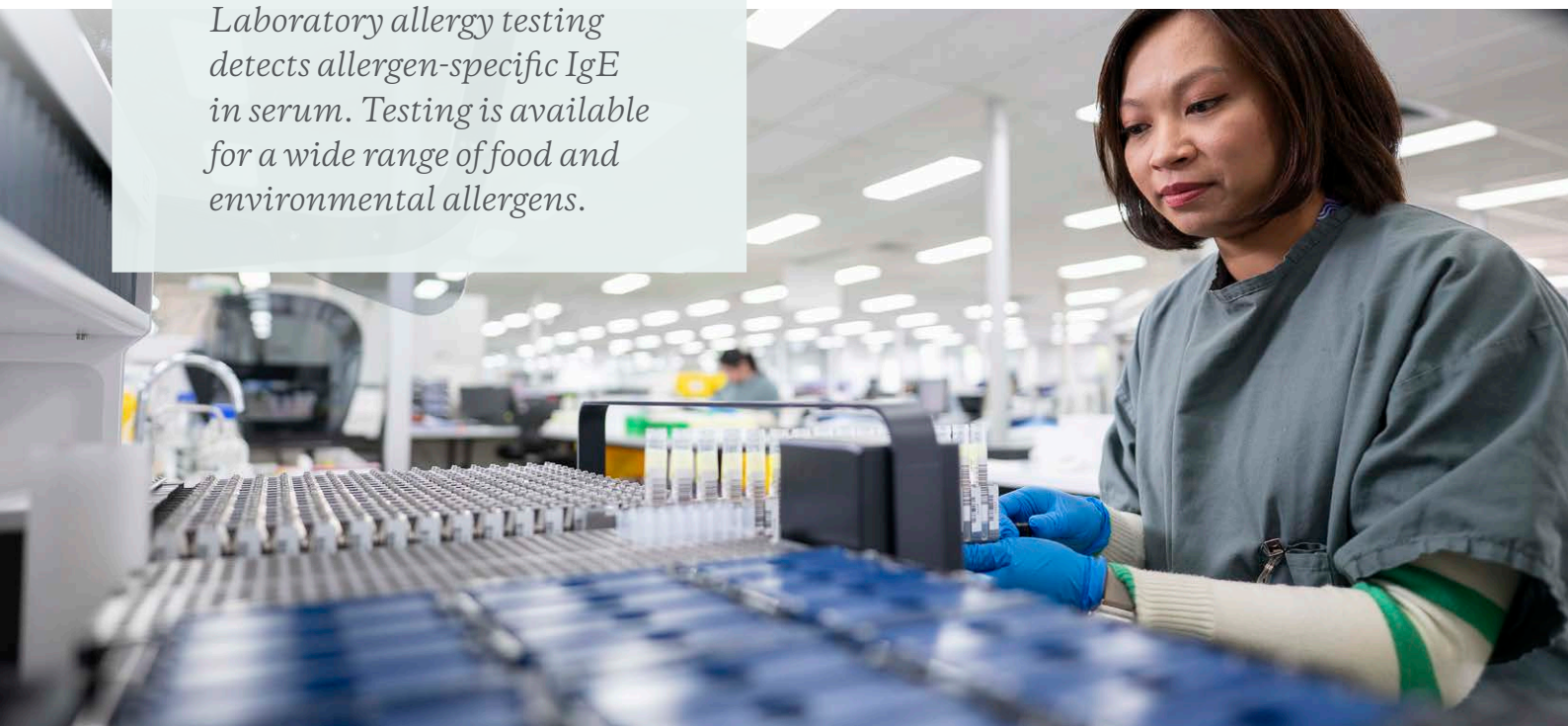
General practitioners should take a detailed history, with particular attention to timing of the onset of symptoms; nature and extent of symptoms (organ systems involved); duration of symptoms; reproducibility of symptoms and other factors that induce or modify symptoms (e.g. exercise, heat).

For accurate identification of the responsible allergen in IgE-mediated allergy, the most commonly used methods in clinical assessment include serum-specific IgE, skin prick testing and elimination followed by clinical oral food challenge procedures.



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The most common allergens

Both skin prick testing and serum-specific IgE are useful for identifying the presence of allergen-specific IgE in a given patient and are useful in the assessment of allergic rhinitis. However, the presence of antibodies does not equal disease, and results must be interpreted in the clinical context. Thus, serum-specific IgE is best used as a tool to confirm allergen specificities once a clinical diagnosis of allergy has been made.

Clinical Labs provides a large selection of serum-specific IgE tests which can be considered according to the patient's symptoms. The use of mixed panels may be useful in some cases where identification of the responsible stimulus is difficult, but it is inferior to a discrete assessment of the likely precipitating factors.

Allergens in the body: an allergic reaction to plant pollen

Respiratory allergens

Respiratory symptoms commonly reflect allergy to inhaled allergens, although they may accompany other allergic symptoms in a wide range of exposures. The most frequent responses occur due to:

- House dust mite
- Pollens
- Animal dander
- Moulds

Food allergens

Food ingestion may result in a variety of clinical manifestations ranging from OAS and skin reactions to life-threatening anaphylaxis. Most food allergens are primarily managed by avoidance, so it is important to correctly identify the relevant allergen since diets can be intrusively restrictive, triggering poor adherence. While both skin prick tests and serum-specific IgE are useful for identifying the presence of allergen-specific IgE in a given patient, skin prick tests may be impractical, commonly in young children, patients with widespread skin conditions, or those unable to cease antihistamines.

Food elimination or challenge may be required but should be conducted under specialist advice or supervision.

Allergen immunotherapy, for some correctly identified allergens, may produce long-term tolerance and candidate patients should be assessed by a specialist allergist.

Common food allergens

- Egg
- Cow's milk
- Peanut
- Tree nuts (most commonly cashew, pistachio, hazelnut and walnut)
- Sesame
- Soy
- Fish
- Shellfish
- Wheat



Some less common food allergens, such as red meats, may also be clinically important.

Insect venoms

These are important causes of allergy including anaphylaxis. Insect allergens may otherwise cause respiratory or skin symptoms, and assessment can also be assisted by serum-specific IgE, which is available for most clinically important insect venoms.

Adverse drug reactions

Adverse drug reactions are probably the most complex clinical event requiring consideration of an allergic response. Adverse drug reactions can be classified as Type A if they are predictable due to the known properties of the drug, and Type B if they are unpredictable or idiosyncratic. Type B reactions include allergic reactions that may be IgE-mediated immediate responses, including anaphylaxis, or several cell-mediated immune responses. The clinical history is crucial in assessing drug reactions of all types. While serum-specific IgE is available in the investigation of some potential drug allergies, a specialist clinical assessment may be required. It is important to consider the de-labelling of some patients who believe that they are penicillin-allergic, since potentially important therapeutic interventions may be unnecessarily curtailed.



Benefits of allergen-specific IgE testing

- *Can be ordered by a GP while the patient awaits their specialist appointment*
- *Can be performed when there is extensive skin disease*
- *Not affected by medications (e.g. the patient does not need to stop antihistamines or steroids)*

How to interpret the serum-specific IgE results

A positive specific IgE does not always equate to clinically significant allergy and must always be interpreted in the context of clinical history.

Clinical history is the best indicator of a possible allergy. A positive allergen-specific IgE should be used together with the clinical history to support and confirm the diagnosis of clinical allergy. Higher concentrations of specific IgE are more likely in symptomatic allergy and may correlate with disease. However, it is important to remember that consumption of antibodies during anaphylaxis may produce false-negative results, necessitating a delay of 10 days to 3 weeks for optimal testing.

How sensitive/accurate is the testing?

Results obtained with modern serum-specific IgE detection technology correlate well with skin prick tests.

When to refer the patient to a specialist

Referral to a specialist allergist should be made in the case of all anaphylaxis, suspected food allergy (especially where allergen immunotherapy is considered), asthma requiring the use of preventer therapy, allergic rhinitis that has failed to respond to medical therapy, suspected latex and drug allergy, and systemic reactions following insect stings.

Selecting specific allergen(s) or mixes

Clinical history is the most important factor when considering serum-specific IgE testing and will direct you as to which allergen testing to order. Where clinical history informs requests for specific allergens, allergen-specific IgE testing offers accurate, easy to interpret and reliable results in the majority of cases.

The use of allergen mixtures (e.g. food mix) for specific IgE is not recommended. However, if there is no indication of the allergen*, panels are available which can screen for common food or respiratory allergens, though these suffer from a lack of sensitivity due to dilutional effect or may produce more false positives due to the additive effect.

**When the history is not helpful, the patient is too young to provide details, or the response appears allergic but the history is unobtainable or not discriminatory.*

How to Order Allergen-Specific IgE Testing at Clinical Labs

What to write on the request form:

Complete a Clinical Labs General Pathology Request Form, specifying serum-specific IgE testing. To indicate the specific allergens or mixes required, use the Allergen-Specific IgE Order Form, available at clinicallabs.com.au/doctor/allergy.

Please be as specific as possible with your selection, based on the detailed clinical history obtained from the patient.

Please note:

- Allergen mixes are best used to refine the direction of individual allergen requests, which have better sensitivity and specificity, prior to treatment.
- In children, due to lack of sensitivity and specificity, and to prevent unnecessary food avoidance, testing for individual allergens is preferred over mixes.
- When one penicillin allergen is ordered for sensitivity testing, such as Amoxycillin, Clinical Labs will routinely test all four available penicillins individually as standard practice.

Test cost and Medicare eligibility:

Medicare will fund up to four patient episodes of Allergen-Specific IgE testing within any 12-month period. Each episode may include four single allergens, four allergen mixes or any combination of four allergens and mixes. If tests are not ordered together, each additional episode will require a new referral and specimen collection. Any tests requested beyond this limit will incur an out-of-pocket cost to the patient.






Pricing information was accurate at the time of publication. For the most up-to-date pricing, please visit clinicallabs.com.au/doctor/allergy.











Allergen-specific IgE testing available at Clinical Labs

SINGLE ALLERGENS

	Grasses
	Bermuda Grass
	Johnson Grass
	Kentucky Blue (June) Grass
	Meadow Fescue Grass
	Orchard Grass
	Paspalum Grass (Bahia)
	Rye Grass
	Sweet Vernal Grass
	Timothy Grass
	Velvet Grass
	Weeds
	Common Ragweed
	English Plantain
	Trees
	Acacia
	Australian Pine
	Common Silver Birch
	Elm
	Eucalyptus
	Italian Cypress
	Olive Tree
	Sycamore
	White Pine
	Dust & Mites
	<i>D. farinae</i> (Mite)
	<i>D. pteronyssinus</i> (Mite)
	Moulds
	<i>Alternaria tenuis</i>
	<i>Aspergillus fumigatus</i>
	<i>Candida albicans</i>
	<i>Cladosporium herbarum</i>
	<i>Penicillium notatum</i>
	<i>Pityrosporum orbiculare</i>

	Animals
	Cat Epithelium
	Chicken Feathers
	Cow Dander
	Dog Dander
	Guinea Pig Epithelium
	Horse Dander
	Rabbit Epithelium
	Insects
	Cockroach
	European Hornet
	Honey Bee Venom
	Mosquito
	Paper Wasp Venom
	Yellow Jacket Wasp Venom
	Drugs
	Amoxicillin
	Ampicillin
	Penicilloyl G
	Penicilloyl V
	Occupational
	Isocyanate, HD1
	Isocyanate, MDI
	Isocyanate, TD1
	Latex
	Fruits & Vegetables
	Apple
	Avocado
	Banana
	Carrot
	Cauliflower
	Chilli Pepper
	Coconut
	Corn
	Garlic
	Green Bean

Fruit & Veg. (continued)	
	Green Pea
	Kiwifruit
	Lemon
	Mandarin
	Mango
	Mushroom
	Onion
	Orange
	Peach
	Pineapple
	Potato
	Strawberry
	Tomato
	Watermelon
	Nuts, Seeds & Legumes
	Almond
	Barley
	Brazil Nut
	Buckwheat
	Cashew
	Chick Pea
	Gluten
	Hazelnut
	Lentil
	Macadamia Nut
	Oat
	Peanut
	Pecan Nut
	Pine Nut
	Pistachio
	Rice
	Rye
	Sesame Seed
	Soybean
	Walnut
	Wheat



Fish & Shellfish

Codfish
Crab
Lobster
Mussel (Blue)
Octopus
Oyster
Prawn
Salmon
Scallop
Squid
Tuna
Whiting Fish



Meat

Beef
Lamb (Mutton)
Pork



Poultry

Chicken Meat
Egg
Egg White
Egg Yolk



Milk

Alpha Lactalbumin
Beta Lactoglobulin
Casein
Cheese (Cheddar)
Cheese Mould Type
Goat's Milk
Milk
Sheep's Milk



Miscellaneous

Bakers Yeast
Brewers Yeast
Cacao
Chocolate
Coffee
Honey
Tea

ALLERGEN MIXES



Grasses

Grass Mix 1

Orchard, Meadow Fescue,
Rye, Timothy, Kentucky Blue
(June)

Grass Mix 2

Bermuda, Rye, Timothy,
Kentucky Blue (June),
Johnson, Paspalum (Bahia)



Weeds

Weed Mix

Common Ragweed,
Mugwort, English Plantain,
Lamb's Quarters, Russian
Thistle



Trees

Tree Mix

Olive, Willow, White
Pine, Eucalyptus, Acacia,
Melaleuca



Dust & Mites

House Dust & Mite Mix

D. farinae (Mite), *D.*
pteronysinus (Mite), House
Dust (Hollister-Stier),
Cockroach



Moulds

Mould Mix

Penicillium notatum,
Cladosporium herbarum,
Aspergillus fumigatus,
Candida albicans, *Alternaria*
tenuis



Animals

Animal Mix

Cat, Horse, Cow, Dog
Danders

Animal Mix Feathers 1

Goose, Chicken, Duck,
Turkey

Animal Mix Feathers 2

Budgerigar, Parrot, Canary



Foods

Staple Food Mix

Egg White, Milk, Codfish,
Wheat, Peanut, Soybean

Nut Mix

Peanut, Hazelnut, Brazil Nut,
Almond, Coconut

Seafood Mix

Codfish, Prawn, Mussel
(Blue), Tuna, Salmon

Cereal Mix

Wheat, Oat, Corn, Sesame
Seed, Buckwheat

Fruit Mix

Orange, Apple, Banana,
Peach

Meat Mix

Pork, Beef, Chicken, Lamb

About the author:



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Speciality: Allergy and Immunology

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Associate Professor Smyth is a graduate of the University of Western Australia and a Fellow of, and current State Councillor of the RCPA. Associate Professor Smyth designed and implemented the Pathology programme for the School of Medicine at the University of Notre Dame Australia, Fremantle, where she is a founding member of, and Associate Professor in the School of Medicine. She has a Graduate Certificate in University Teaching, qualifying her to supervise candidates for higher degrees as well as teaching undergraduate students. She is most interested in autoimmunity but has extensive experience including autoimmunity, transplantation, immune deficiency and allergy. Her publications are predominantly in the field of Bone Marrow Transplantation. Dr Smyth joined St John of God Pathology (now Australian Clinical Labs) in 2016.

Local pathologists:



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