



Allergy Testing Update August 2017

Allergic disease continues to increase in incidence and prevalence worldwide. Australia is one of the most affected countries with particularly high levels of food allergy and atopic dermatitis. The evaluation of allergic disease relies in part on the detection of Specific IgE antibodies against the allergen in question. Such evaluation plays a vital role in the diagnosis of allergic rhinitis, asthma, atopic dermatitis and food, latex, insect venom and certain forms of drug allergy. Skin prick testing, present in various forms, has been around for over 150 years. It is a bioassay that detects the presence of allergen Specific IgE antibodies present on the patients' cutaneous mast cells, with a positive result showing the characteristic wheal and flare. However, skin prick testing has a number of disadvantages; it can be laborious and time consuming, results are assessed subjectively, it is difficult to perform in those with severe eczema or other skin conditions and also requires patients to refrain from taking antihistamines for at least three days prior to testing.



Specific IgE ("RAST") Testing

In vitro detection of allergen specific IgE in the serum has been available for over forty years. Unlike skin prick testing patients are not required to stop antihistamines prior to testing. Initially developed via the RAST (Radioallergosorbent test) platform, technological advances have superseded this platform, although the name "RAST" has persisted as a request for Specific IgE antibodies. Such testing is now performed by a non-radioactive enzyme-immunoassay, such as

the ImmunoCAP, which is considered gold standard. Medlab uses a state of the art Phadia 250 and offers a broad range of allergens for testing including environmental, food, insect venom and drug allergens. The performance of *in vitro* testing has improved rapidly over the years and its performance is often comparable to skin prick testing in many clinical situations.



Interpretation

Results of specific IgE (or "RAST") testing are reported as an IgE value in KU/L and are also classified into seven different grades (from 0-6) based on these figures. The presence of specific IgE antibodies is called "sensitisation". However not all "sensitised" patients will demonstrate clinical allergy thus it is very important to incorporate clinical history as well as test results in the diagnosis of clinical allergy. It is important to remember that the specific IgE antibody level is *not* proportional to the severity of allergic disease, rather it is proportional to the probability of clinical allergy to the allergen investigated. (For example, specific IgE levels to food allergens are often used in the consideration of whether to perform a supervised food challenge; the higher the level of specific IgE, the less likely the patient will pass the challenge.)

Component Resolved Diagnostics

Component resolved diagnostic (CRD) is a recent technological advance in *in-vitro* specific IgE antibody testing. Standard testing can produce false positive results as it may detect antibodies to clinically irrelevant epitopes (or components) of the allergen protein tested. CRD involves microarray testing using recombinant allergens and antigenic components of allergens to assess the precise clinically relevant antigenic epitopes to which a patient's specific IgE binds. There is likely to be an explosion of CRD based testing in the coming years. Already such testing is used in certain clinical situations such as testing for **Ara-h** IgE in the diagnosis of peanut allergy, **Omega-5-gliadin** IgE for wheat allergy (particularly relevant in the diagnosis of wheat-dependent exercise-induced anaphylaxis) and **Alpha-gal** IgE in the diagnosis of the recently described mammalian meat allergy.

Non IgE mediated reactions

Not all reactions, particularly to food and to medications, are IgE-mediated. This is an important distinction as diagnostic testing is largely confined to the detection of specific IgE antibodies. For example, patients with symptoms of bloating, altered bowel habit or abdominal discomfort after eating certain foods often do not show detectable IgE antibodies. This does not necessarily mean symptoms are unrelated to the foods in question, only that they are not IgE-mediated. While alternative medical practitioners occasionally perform testing for specific IgG or IgG4 antibodies in the evaluation of food allergy or food intolerance such testing has not been scientifically validated and is not endorsed by the Royal College of Pathologists in Australasia (RCPA) and thus is not offered by Medlab. For such patients with non-IgE mediated food allergy, use of a food diary and input from a clinical dietician can be helpful.

Drug reactions

Currently specific IgE or RAST testing for drug allergy is largely confined to penicillin-based antibiotics although the field continues to expand. Medlab offers testing for the two relevant components; Penicillin G and Penicillin V, and to Amoxicillin.

Not all adverse drug reactions, even anaphylaxis, are IgE-mediated. Examples include anaphylactic like reactions to Aspirin and NSAIDs which are often the result of IgE-*independent* tryptase release. Other serious adverse drug reactions, such as Steven-Johnson Syndrome (SJS), are T-cell mediated. In both of the above cases testing for specific IgE antibodies would be unhelpful and specialist input is advised.



**For assistance in the interpretation
of results of allergy testing please
contact Medlab and ask to speak
to the immunologist.**

Allergy Testing

Conditions to test for

- Allergic rhinoconjunctivitis/asthma (aeroallergens; pollen, dust mite, animal dander, moulds)
- Atopic dermatitis/eczema (aeroallergens and occasionally foods; specialist input is particularly advised for result interpretation in such cases)
- For cases of anaphylaxis or symptoms of throat tightness, wheezing, urticaria, hypotension, abdominal cramping occurring shortly after allergen exposure
 - Food allergy
 - Drug allergy
 - Latex allergy
 - Stinging insect allergy (honey bee, paper wasp, yellow jacket wasp)

What to write on the form

“Specific IgE” or “RAST”, and list the allergens you wish to assess. For your convenience, we have developed standard panels depending on the clinical situation.

What to collect

One Gold SST 8.5ml tube required (min 2ml).

COSTS?

Due to the higher costs of performing these tests and limited Medicare rebate, certain panels can only be bulk billed, whilst in other situations the patient will be privately billed. For out of pocket costs to the patient, please refer to table below.

Panels that are always privately billed

Peanut and treenut panel	\$40
Ara h peanut panel	\$120
Extended food panel	\$40

Panels that can be bulk billed (only one panel can be bulk billed)*

Standard allergen panel (adult or child)
Extended food and pollen panel
Extended pollen panel
Seafood panel
Penicillin panel
Insect venom panel

* If more than one of these items are requested, one panel will be bulk billed, and then any remaining of these panels will be privately billed at \$25 a panel (e.g. if standard allergen panel, penicillin panel and seafood panel are all requested; then one panel is bulk billed, and the patient will be charged \$50.00 (\$25.00 X 2) for the remaining two panels).

Allergen Panels Available

STANDARD PANELS

Standard allergen panel (RAST A)

(adult 18 years old)

- House dust mite
- Grass and weed mix: grasses (rye, bahia, bermuda) and weeds (English plantain, ragweed, goosefoot)
- Mould mix: Penicillium, Cladsporium, Aspergillus and Alternaria

Standard allergen panel (RAST C)

(child < 18 years old)

- House dust mite
- Grass and weed mix: grasses (rye, bermuda, bahia) and weeds (English plantain, ragweed, goosefoot)
- Food staple mix: egg white, cow milk, fish, wheat, peanut and soy

Seafood panel (RAST S)

- Cod, herring, mackerel and plaice
- Tuna
- Salmon
- Shrimp



* Peanut Ara h profile (PEA)

- Peanut
- Ara h 1,2,3 and 8

* Peanut and treenut panel (RAST N)

- Peanut
- Almond
- Cashew
- Hazelnut
- Walnut
- Macadamia

Penicillin panel (RAST P)

- Penicillin G
- Penicillin V
- Amoxicillin

Insect venom panel (RAST V)

- Honey bee
- Common wasp
- Paper wasp

EXTENDED PANELS

Extended pollen panel (RAST E)

- Grass mix: bermuda, rye, timothy, johnson and bahia grasses
- Tree pollen mix: olive pollen, willow, white pine, eucalyptus, wattle and melaleuca
- Weed mix: ragweed, mugwort, English plantain, goosefoot, saltwort
- Animal mix: cat, dog, horse and cow dander



* Extended food panel (RAST F)

- Peanut
- Egg
- Cow milk
- Soy
- Wheat
- Cod, Herring, Mackerel, Plaice
- Shrimp

Extended food and pollen panel (RAST AF)

- Food staple mix: egg white, cow milk, fish, wheat, peanut and soy
- House dust mite
- Grass mix: bermuda, rye, timothy, johnson and bahia grasses
- Animal mix: cat, dog, horse and cow dander



* means this panel is always privately billed.