

Specific IgE (Allergy) Tests

IgE-mediated allergy usually presents with symptoms of immediate hypersensitivity within a short period of allergen exposure. Clinical features may include one or more of itching, urticaria, angioedema, conjunctivitis, rhinitis, wheezing, stridor or hypotension. Specific IgE antibodies may be involved in some individuals with atopic eczema.

Most clinical allergy services undertake skin prick tests as these give immediate results and are cheaper. Specific IgE testing is used when skin prick tests are unavailable, the patient cannot stop taking anti-histamines, in the presence of extensive eczema, or with severe anaphylaxis where there is a concern about the risk of systemic symptoms with skin prick testing.

It is important to note that **the presence of specific IgE does not make a diagnosis of 'Allergy' and negative tests do not necessarily exclude 'Allergy'**. Individuals may have positive specific IgE to common food and environmental proteins (allergens) but may be asymptomatic on exposure *i.e.* they are not clinically allergic. Conversely, specific IgE may be negative for some allergens (particularly fruits, vegetables, latex, drugs) in the presence of clinical symptoms on exposure. Thus, wherever possible, **one should test for the specific suspected allergen based on the clinical features and the temporal relationship with the putative allergen exposure**. Resist the temptation to test for IgE to multitudes of allergens without clear evidence of clinical significance. Symptoms occurring more than 2 hours after exposure are unlikely to represent immediate hypersensitivity for the vast majority of allergens. Do not request allergy tests where the clinical features are not consistent with IgE-mediated disease *e.g.* migraine, fatigue, irritable bowel syndrome, arthralgia. Allergy is rarely a cause of chronic urticaria. Where there is a clinical diagnosis of chronic allergic disease but the allergen is unclear then patient diaries should be used to determine the appropriate allergens to request. Following systemic anaphylaxis specific IgE testing should be deferred for 2-3 weeks to reduce the chance of false negative tests.

There is some evidence that, at least in children, high specific IgE levels to allergens are associated with an increased likelihood of clinical symptoms on allergen exposure but, on the other hand, there is no correlation between the amount of specific IgE present and the severity of symptoms on exposure.

Specific IgE to certain panels containing common allergens may be useful in some circumstances. If the screening test is positive then specific IgE to the constituent allergens of the mixed panel may be reflex tested. Specific IgE tests are not necessarily available for all possible allergens.

Levels of specific IgE > 0.35 kuA/L are considered positive. However, detectable levels below this cut-off may still be clinically relevant, especially in very young children.

Patients with very high levels (> 1000 U) of total IgE often have low level specific IgE to many allergens tested and the interpretation of their clinical significance may be difficult. Thus test only for clinically relevant allergens.

Seasonal Rhinitis or Asthma	Test for IgE to the relevant seasonal allergen if applicable. Grass pollen for summer symptoms and tree pollen for spring symptoms. Consider Mould mix for autumn symptoms. This is really only necessary if desensitization therapy is planned as the clinical diagnosis is usually evident. Measuring specific IgE to silver birch pollen may also be useful to support a clinical diagnosis of Oral Allergy Syndrome (see below).
Oral Allergy Syndrome	This is a relatively common food allergy caused by Specific IgE to tree pollens (in particular Silver Birch) that cross-reacts with some fruits, vegetables and nuts (especially hazel and almond, but also peanut and walnut). The allergens are heat-labile so those affected can eat cooked fruits (<i>e.g.</i> apple pie). Similarly, this heat lability can lead to false negative specific IgE tests for fruits. Thus negative tests here do not exclude allergy.
Perennial Rhinitis or Asthma	Test for IgE to 'Rhinitis Panel'. This includes Grass and Tree pollens, House Dust mite, Mould mix, cats, dogs and feather mix. The most relevant perennial allergens are house dust mite and animal allergens.
Eczema	Test for individual allergens, if relevant , as determined by the patient

	history. Food Mix Panel may be utilised with individual allergens tested if the combined panel is positive. Sensitivity to aeroallergens (House Dust Mite, animals) may be of significance in some patients with atopic eczema.
Chronic Urticaria and / or Angioedema	These conditions are rarely due to specific IgE mediated disease. Test for individual allergens, if relevant , as determined by the patient history / symptom diary. Note that ACE inhibitors may induce intermittent angioedema despite daily drug ingestion. The mechanism here is not IgE-mediated.
Anaphylaxis	Test for individual allergens where relevant. For Nut allergy a combined nut panel may sometimes be used, with individual nuts tested where the combined nut panel is positive. A similar mixed panel may be used for fish or shellfish. Some patients have anaphylaxis only if food ingestion is followed by exercise. The main allergens involved here are omega-5–gliadin or shellfish.
Drug Allergy	There are limited tests available for drugs and antibiotics. It is important to note that the sensitivity of specific IgE for these allergens is low <i>i.e.</i> a negative test does not exclude allergy.
Natural Rubber Latex Allergy	Specific IgE for immediate hypersensitivity (not irritant or contact allergic dermatitis) may aid in the diagnosis but this assay is not 100% sensitive for latex allergy. Thus a negative test does not exclude allergy. Latex allergy may be associated with allergy to tropical fruits (especially banana, kiwi, avocado).
Bee and Wasp Venom Allergy	Many individuals stung by these insects will develop both IgE and IgG antibodies to the venom but the risk of anaphylaxis with future stings is not defined by these tests. These should only be tested to confirm the presence of specific IgE to the venoms in support of commencement of specific immunotherapy (desensitisation) for anaphylaxis / systemic allergic symptoms.

Mast Cell Tryptase

This is measured to assess anaphylaxis or anaesthetic reactions. NICE guidance (2011) states that: "After a suspected anaphylactic reaction in adults or young people aged 16 years or older, take timed blood samples for mast cell tryptase testing as follows:

- a sample as soon as possible after emergency treatment has started
- a second sample ideally within 1–2 hours (but no later than 4 hours) from the onset of symptoms.

After a suspected anaphylactic reaction in children younger than 16 years, consider taking blood samples for mast cell tryptase testing as follows if the cause is thought to be venom-related, drug-related or idiopathic:

- a sample as soon as possible after emergency treatment has started
- a second sample ideally within 1–2 hours (but no later than 4 hours) from the onset of symptoms."

These may help to confirm that the reaction involved mast cell degranulation. Elevated levels do not prove that the symptoms were mediated by IgE. Persistently high levels raise the possibility of mastocytosis.

Specific IgG to Aspergillus and avian proteins.

IgG antibodies to *Aspergillus fumigatus* are associated with Allergic Bronchopulmonary Aspergillosis, aspergilloma and invasive aspergillus disease. In patients with Cystic Fibrosis an IgG level of > 90 mgA / L is associated with a high likelihood of ABPA. In non-CF patients an IgG level of > 40 mgA / L is predictive of ABPA or aspergillus-related lung disease but the tests should be interpreted with the clinical features.

IgG antibodies to avian proteins > 10 mgA / L correlate with significant exposure to avian proteins.