Allergy Diagnosis Reference Guide

Notes on Allergy

(Produced in consultation with Dr. Joanna Sheldon, Director, Protein Reference Unit, St Georges Hospital, Tooting and visiting Consultant Immunologist, East Kent Hospitals University NHS Foundation Trust)

It is estimated that approximately 20% of the population[1] have some sort of allergy and this number appears to be increasing. The symptoms associated with allergic disease are numerous and vary in their severity. These factors have led to an increase in the number of referrals to allergy clinics and a consequent increase in their waiting lists.

This is a brief summary of important information about allergy, with some hints for General Practitioners. We recommend that if you are referring blood for Specific IgE (RAST) tests – you contact your local NHS Pathology Laboratory and clinicians to check for any guidelines and protocols.

There are a number of very useful guidance documents relating to allergy that you can access using the web addresses shown below:

- The BSACI Guideline for the diagnosis and management of cow's milk allergy available at www.bsaci.org

- Food allergy in children and young people: Diagnosis and assessment of food allergy in children and young people in primary care and community settings. www.nice.org.uk/guidance/cg116

- Drug allergy: diagnosis and management of drug allergy in adults, children and young people. www.nice.org.uk/guidance/CG183

- Anaphylaxis: assessment to confirm an anaphylactic episode and the decision to refer after emergency treatment for a suspected anaphylactic episode. www.nice.org.uk/guidance/CG134

1. Jackson M A. Allergy: the making of a modern plague. *Clinical and Experimental Allergy*. 2001;**31**:1665-1671.

'Allergic' symptoms

Vary in severity: Can be potentially fatal, damaging to health or inconvenient

Include any or mixture of: Abdominal pain, anaphylaxis, asthma, atopic dermatitis, conjunctivitis, diarrhoea, eczema, headache, malabsorption, pneumonitis, pruritis, rhinitis, urticaria, vomiting.

Why Investigate?

- **Avoidance:** To be able to completely exclude or significantly reduce allergen contact.

- **Evidence Based Medicine:** To have appropriate evidence for treatment and management e.g. nut allergy requiring an Epipen.

- **Patient Compliance and Peace of Mind:** When patients 'need' a diagnosis.

Good reasons to Investigate

- If the patient has had a severe reaction e.g. anaphylaxis to latex or peanut

- If reactions are increasing in severity

- If exclusion will be difficult e.g. wheat is hidden in many foods and is very difficult to exclude from the diet

- Is the source of the allergen an integral part of the patients life e.g. pets, occupational allergens

How to Investigate

- ***History (see request form):*** Does the patient know (think) what causes the symptoms, has exclusion been attempted. **Many allergens can be identified simply from the history.**

- ***Skin testing:***
  - A useful adjunct to a good clinical history

- Allergic patients may have positive skin tests to several antigens - not all of which cause symptoms
- Can be difficult in young children
- Impossible with severe skin symptoms
- Must be done under medical supervision - (small) risk of anaphylaxis
- Can be insensitive for diagnosis of food allergy

- ***Total IgE:*** Age related reference range (Adult normal < 81 kU/L). Raised IgE concentrations are seen in allergic disease and in parasitic infections.
  Indications: To distinguish IgE mediated from non-IgE mediated disorders.

- ***Specific IgE:*** Over 450 individual allergens and allergen mixes are available. Careful history taking should be able to identify the most likely (about 5 is reasonable) allergens.

  Indications:
  - Severe dermatitis that excludes skin testing
  - Patient receiving symptomatic treatment (e.g. antihistamine)
  - Allergens that cannot be used for skin testing (e.g. toxic, insoluble)
  - Patients with suspected high sensitivity to the allergen where testing *in vivo* could be dangerous
  - Food allergies

- **Component resolved allergy testing:** Testing for individual protein components of allergens is now available. This may help in determining whether a patient is likely to have a severe reaction to an allergen or whether it is more likely to be a mild reaction and whether challenge testing is indicated. The requesting and interpretation of these tests is complex and they are available for patients who are being investigated by Consultant Allergists/Immunologists. If you do think your patient may benefit from component resolved testing it would be most appropriate to refer to an allergy clinic

The Investigation of Allergy in Adults

In adults, a normal total IgE generally excludes significant allergy. HOWEVER in patients who have had a severe reaction e.g. wasp/bee, latex, peanut, or if there are strong clinical indications, further testing (referral to allergist, specific IgE or skin testing) should be done.

The Investigation of Allergy in Children

In children, a normal total IgE cannot exclude significant allergy so if clinically indicated, irrespective of the total IgE, further Specific IgE investigations should be carried out.

- *commonest food allergies in children:* dairy products and egg - usually transient and outgrown in early childhood
- *Peanut, true nut and sesame allergies are increasing* - usually life long
- Latex allergy - not commonly seen in children
- *Aeroallergens* include dust mites, pollens, pets and moulds - causing asthma and rhinitis

These type 1 allergies, mediated through IgE, are usually "immediate", and are by far the most common to cause concern, with a small risk in some of anaphylaxis.

The investigation and management of children with allergies requires careful and detailed history taking of the allergic episodes, of the personal and family history of atopy, and of the child's environment.

Unnecessary treatment of food exclusion in young, growing children is inconvenient and potentially harmful and must be avoided. In the unusual situation where the cause of the symptoms is not identified from the history, then further investigation is needed. Oral food challenge is the gold standard test - generally these are performed in secondary care only. Neither specific IgE (RAST) nor skin prick tests are sensitive or specific enough to make a definitive diagnosis in all cases. Thus, results of these tests need to be interpreted with caution, and always in combination with a detailed patient history. If non type 1 allergy is presenting, for example in some children whose eczema seems to be associated with certain foods, IgE measurements and Skin Prick testing are inappropriate investigations.

Blood samples for specific IgE (RAST) testing

For adults a 4 - 7 mL blood sample is required in a standard tube (no anticoagulant).
With children, consider that 1 mL blood will allow you to test for a maximum of 8 allergens.

Specific IgE - Interpretation

Specific IgE concentration kUa/L	Specific IgE Grade	Level of Allergen Specific IgE Antibody
100+	6 - strong positive	Very high. Refer to patient history
52.5+	5 - strong positive	Very high. Refer to patient history
17.5+	4 - strong positive	Very high. Refer to patient history
3.5+	3 - positive	High Grades 1-3 vary in significance dependant on allergen. Consider patient history and risk of severe reaction/anaphylaxis
0.7+	2 - positive	Moderate
0.35+	1 - low, weak positive	Low Grade 1 to inhaled allergens is of doubtful significance. Grade 1 to foods or moulds of greater significance
<0.35	0 - negative	Absent

Specific IgE – Significance

- We report specific IgE in units which can be used to decide whether an allergen challenge is indicated in a patient. Previously this was reported in grades 0 to 6. Conversion from units to grades is shown in the above table.

- Positive IgE (RAST) only indicates that the patient has the POTENTIAL to react

- Results should be interpreted in the light of the clinical history

- Some patients may show positive specific IgE results but no symptoms associated with that 'allergen'

Notes about some common allergens

Egg allergy:

- can be a reaction to either egg white or yolk
- avoid foods containing egg yolk, white or ovalbumin
- avoid products containing lecithin e.g. some ice creams and margarine
- take care with pastries where egg may be used as a glaze
- some vaccines are contraindicated - e.g. Flu vaccine

Dog/Cat allergy:

Mild allergy:

- keep animal out of bedroom
- brush dog (get someone else to) outside the house
- discourage pet from licking you
- use washable pet bedding and wash or hose it down frequently
- use vacuum cleaner with filter to remove allergens from furniture, carpets and curtains

Severe allergy:

- total avoidance is necessary
- rigorous cleaning needed to remove all traces of allergen from floor, walls, furniture (even if pet has not been in room for some time)
- beware of travelling in dog/cat owner's car
- when visiting dog/cat owners house leave coats and jackets outside
- avoid moving to a house where dog/cat has lived
- check whether pets are allowed in hotel or holiday accommodation
- avoid keeping a pet if you have a baby or young child and have a strong family tendency to develop allergy
- keep goldfish or tropical fish (they are allergy free)

Latex allergy:

- symptoms include contact dermatitis, urticaria, rhinoconjunctivitis, asthma, anaphylaxis
- numerous products contain latex - gloves, shoes, elastic, condoms, balloons, car tyres, feeding bottle teats etc. PLUS a number of medical products
- use gloves made of vinyl or polythene
- avoid condoms, caps or diaphragms made of pure latex
- cross-reactivities may make patient sensitive to banana, avocado, kiwi, spinach, chestnut and melon
- inform doctors and dentists of sensitivity to rubber products - particularly before an operation

Wheat allergy:

- commonly used as ‘filler’ in many foods
- avoid bread, cakes, pastries - anything that may contain wheat flour, use oat, corn or rye instead.
- wheat is often used as a base material for beers, spirits and lagers
- wheat based glue is sometimes used on stamps and envelopes
- communion wafers are made of wheat
- wheat is used in tabletting some drugs
- don’t forget to consider coeliac disease if the allergy tests are negative

House dust mite:

- avoid household items that accumulate dust
- damp dust and use vacuum with filter
- avoid carpets, house plants, household clutter
- reduce humidity
- avoid tobacco smoke, aerosols, scented cosmetics, fumes from volatile substances
- concentrate on diminishing contact with HDM in bedroom - no soft toys
- air mattress and beat on dry sunny days
- use non-allergenic zip mattress and pillow covers
- hot wash cotton bedding

Peanut allergy:

- anaphylaxis is a possibility
- avoid chocolate, cakes, pastries, dressed salads - peanuts are easily concealed in numerous processed foods
- sensitisation may be via formula milk
- allergens are heat stable - heating and roasting may enhance allergenicity
- there may be cross-reactivity with other nuts (peanuts is a legume) but cross-reactivity with other legumes (peas, lentils, soybean) is rare

Fish and shellfish:

- symptoms may be dramatic and severe
- many patients react to all fish species because most fish share the common M allergen seen in cod fish

Tree, grass and weed pollens:

- trees flower in March/April
- grasses flower from April to September
- weeds typically flower in late summer and autumn
- many allergies to pollens can be identified by knowing the time of year the symptoms occur

ALLERGEN SPECIFIC IgE REQUEST FORM

Send completed form to the laboratory with blood sample.
If form is to be matched with a stored sample please fax to 01233 616200.
Enquiries: 01233 616716 - Immunology Laboratory, William Harvey Hospital, Ashford

SURNAME		**WARD/CLINIC/GP**
FORENAME		**CONSULTANT**
DATE OF BIRTH	**M/F**	**HOSPITAL NUMBER/ NHS NUMBER (Mandatory)**
PATIENT ADDRESS		**SAMPLE DATE**
		SAMPLE NUMBER

This must be completed by the requesting clinician following a full clinical history. Guidelines may be found in the laboratory handbook on Trust Net.

Has the patient ever had a severe reaction (e.g. anaphylaxis) to the suggested allergen/allergens?	YES/NO
Is there a family history of allergy?	YES/NO
Is the patient on any treatment? (please give brief details)	YES/NO
Were the symptoms present at the time of blood collection?	YES/NO

Symptoms (please tick as appropriate):

Asthma	Bronchitis	Catarrh	Hay fever	Nasal polyps
Abdominal pain	Diarrhoea	Headache	Migraine	
Angioedema	Arthralgia	Nettle rash	Urticaria	

When do the symptoms occur? (please tick as appropriate)
All year round, Jan, Feb, Mar, Apr, May, June, July, Aug, Sept, Oct, Nov, Dec

When are the symptoms most frequent? (please tick as appropriate)

Outdoors	Day time	At home	On waking
Indoors	Night time	At work/school	Other (please specify)

√	SYMPTOMS (For panels please tick most appropriate box/boxes)	SUGGESTED SPECIFIC IgE PANEL (Panels will be done unless individual allergens are requested in the bottom section)
	Asthma, all year round	House dust mite, cat, dog, moulds
	Asthma, all year round, worse at night	House dust mite, cat, dog, mixed feathers
	Seasonal rhinitis	House dust mite, cat, dog, mixed grass (mixed trees, mixed weeds)
	Eczema	House dust mite, milk in babies, mixed foods in children
	Insect venom anaphylaxis	Bee, wasp
	Peanut allergy	Peanut
	Wheat intolerance	Wheat
	Food allergy screen	Mixed foods (includes egg, milk, cod, wheat, peanut) Also available individually – please specify below
Contact with animals: (Please specify)		
Individual allergens: (Please specify)		

MEDICAL OFFICERS NAME: **SIGNATURE:**
CONTACT NUMBER: