Skin prick testing: Guidelines for GPs

Labtests

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Summary:

- **Skin prick testing identifies IgE antibodies to specific allergens**
- **It is more sensitive and cheaper than serum specific IgE testing (EAST/RAST)**
- **It is not useful for non-IgE related conditions (chronic urticaria, non specific rashes, isolated GI symptoms, behavioral disturbances etc)**
- **Requested allergens should be appropriate for the condition under investigation**
- **Allergy is a clinical diagnosis; patients should have symptoms consistent with an Ig-E mediated reaction on exposure to the allergen**
- **Labtests can test for common foods and aeroallergens; fresh foods, drug and venom testing is not available in the community.**
- **All requests must be received on the dedicated SPT request form (SPT1)**

Skin prick testing

The purpose of skin prick testing is to determine whether a patient has detectable IgE antibodies to a specific allergen. Skin tests are considered **positive** if there is a wheal response with a mean diameter of **3mm** or greater. The larger the wheal, the more likely it is that the patient will develop symptoms on exposure to that allergen; however, there is no correlation with clinical severity. A **negative** test (zero mm wheal) virtually excludes that allergen as a cause of allergy.

All skin prick tests include a positive and negative control. If the negative control has a detectable wheal response (i.e., not zero mm) this is consistent with dermatographism and other skin test results cannot be interpreted. If the positive control has a negative wheal response (i.e., less than three mm) this is consistent with an antihistaminergic effect and other skin test results cannot be interpreted. In these circumstances, blood tests (EAST/RAST) are preferable.

Allergy is a clinical diagnosis. A patient with a positive skin prick test result who does not have any clinical symptoms on exposure to that substance is sensitized, but not allergic.

In the clinical setting, allergy usually manifests as either an acute allergic reaction or as atopy.

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Acute allergic reaction:

- Urticaria, angioedema, anaphylaxis
- Usually within 30-60 mins of exposure
- Allergens usually ingested (food, drugs) or injected (venom, drugs), although contact urticaria can occur

Atopy:

- Atopic dermatitis (eczema), asthma, allergic rhinitis (hay fever)
- Usually chronic conditions, can worsen acutely
- Allergen(s) can be ingested, inhaled or contacted via skin exposure

Skin testing is **not useful** in the following conditions:

- non specific rashes
- conditions not caused by IgE (coeliac disease, lactose deficiency etc)
- food intolerances (bloating, diarrhea, headaches, fatigue)
- behavioural disorders
- respiratory reactions to irritants (smoke, perfumes, cleaning products etc)
- chronic urticaria

Safety of skin prick testing

Anaphylaxis is the most severe potential adverse event, but it is rare. Rates of systemic reactions – not all of which are anaphylaxis – have been estimated at 0.008 to 0.03% in adults. In one study, 5 systemic reactions were reported in 497 656 SPT done in >18 000 patients.

Young children are at greater risk of reaction. Rates of systemic reactions were 0.5% in children under 6 months in one study of > 1000 children; all those who reacted had active eczema and were tested to fresh foods rather than commercial extracts. These factors (eczema, under 6 months, and fresh food SPT) all contribute to increased risk. Labtests do not currently do skin prick testing in children under 6 months of age and do not do fresh food skin prick testing in order to reduce these risks.

Only one death has ever been reported with skin prick testing. This was in an adult patient with poorly controlled asthma who was tested with 90 allergens using the old-fashioned scratch technique, which results in exposure to greater amounts of allergens. No deaths have been reported with the current technique.

Not currently tested at Labtests for safety considerations

- Children under 6 months
- Pregnant women
- Skin prick testing to fresh foods
- Intradermal testing (drugs, insect venom)

See above for details of increased reaction risk in children under 6 months and those tested with fresh foods. Although adverse reactions to testing are not more likely during pregnancy, an adverse reaction can compromise foetal well-being and even cause miscarriage, and for these reasons blood testing is preferred. Intradermal testing has a significantly higher rate of reaction due to the increased allergen exposure and is only offered in a hospital setting.

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Offered testing but where precautions are taken

- Poorly controlled asthma – will be asked to stay for longer observation period if test(s) positive, due to an increased risk of reaction
- Previous anaphylaxis – will be asked to stay for longer observation period if test(s) positive, although studies do not confirm an increased risk of reaction

Other concerns

Patients with recent history of anaphylaxis (within 4 weeks) may have false negative results due to the time taken for mast cells to regranulate. Postponing testing is recommended.
Patients on beta blockers may be more likely to react and are harder to treat with adrenaline in the event of anaphylaxis. GPs should consider blood testing (EAST/RAST) in this patient group. Labtests do not currently screen for these patients.

When skin testing is uninterpretable

- Patients with dermatographism (negative control will read as positive)
- Patients on medication with antihistamine activity (positive control will read as negative)

These patients should consider blood testing instead.

Alternatives to skin prick testing

Specific IgE testing (EAST, formerly called RAST) on blood samples

Advantages

More allergens available
Can do in patients where skin testing is unhelpful (dermatographism, on antihistamines, abnormal skin)
No risk of systemic reaction

Disadvantages

Turnaround time
More expensive
Less sensitive

Oral challenge testing can be done in hospital settings. Other methods of allergy testing are either experimental (e.g. basophil release assay) or have no scientific basis (e.g. hair testing, muscle testing, IgG antibodies to foods – please see https://www.allergy.org.au/patients/allergy-testing/unorthodox-testing-and-treatment for more information).

Testing in under 2 year olds

Current guidelines from the Australasian Society of Clinical Immunology and Allergy state that skin prick testing in under 2 year olds is a specialist test. Labtests do not offer SPT to children under 6 months for safety reasons, and these patients should be referred to Paediatric Immunology (Starship) if public assessment is required.

In children aged 6 to 24 months, we will test the food panel only, unless there is a specific request for environmental allergens. If these are requested we will do house dust mite, cat and dog.

In most cases, community testing in this age group is for eczema and possible food reactions. Testing for the full environmental allergen screen in eczema is unlikely to be helpful, especially seasonal pollens that the child may not have yet been exposed to; data suggests most children need to experience at least two pollen seasons before

developing allergy. House dust mites and household pet allergen can play a role in eczema, hence their selection for testing.

If additional testing for environmental allergens is thought necessary for a patient in this age group, please discuss with the immunopathologist.

Allergens

Allergic rhinitis/rhinoconjunctivitis; this is usually due to aeroallergens. Spicy foods can exacerbate non-allergic rhinitis (gustatory rhinitis) and IgE testing will not be helpful. First line investigation should be with aeroallergen testing (Sampson H, Eigenmann PA (1997). Allergic and non-allergic rhinitis: Food allergy and intolerance. In Mygind N,Naclerio r, eds. Allergic and non-allergic rhinitis. Copenhagen: Munksgaard).

Asthma; usually due to aeroallergens. Isolated asthma (i.e. without urticaria, angioedema or another system involved) is not usually due to hidden or undiagnosed food allergy. First line investigation should be with aeroallergen testing (Kewalramani A, Bollinger ME (2010). The impact of food allergy on asthma. J Asthma Allergy: 3: 65-74).

Atopic dermatitis/eczema; patients with atopic dermatitis are commonly sensitized to multiple allergens. However, this is usually secondary to the underlying defect in skin barrier function. Primary treatment should be skin care; exclusion diets and/or a search for allergic triggers can result in significant morbidity, especially in children, and exclusion of two or more food groups (e.g. milk, wheat) should only be undertaken with dietician support (Bath-Hextall et al (2008). Dietary exclusions for established atopic eczema. Cochrane Database Syst Rev. Jan 23; Tait C, Goldman RD (2015) Dietary exclusion for childhood atopic dermatitis. Can Fam Physician: 62(7): 609-611). There is some data for dust mite desensitization in patients with atopic dermatitis but again this is not first-line therapy. Please consider only doing SPTs on these patients if there is a clear history of an acute reaction to a particular food or concomitant airways disease.

Caution

It is important to consider positive test results in the clinical context. If a patient has a positive test to a food that they can eat without problems, stopping the food may lead to a loss of tolerance and subsequent allergic reactions on re-exposure. Sensitisation to multiple allergens (i.e. positive tests with no reactions on exposure) is particularly common in patients with severe eczema, and significant dietary changes such as long-term exclusion diets on the basis of skin prick testing alone should be discussed with a relevant clinical specialist.

Cross-reactivity may also be misinterpreted; patients with hay fever due to grass pollens commonly have positive skin prick tests to wheat because it is also a grass, but experience no problems eating wheat.

Similar findings occur with in patients with house dust mite allergy who can have cross-reactive positive tests to shrimp. If in doubt, discuss with an immunologist.

Labtests currently have three skin prick test panels available

- Aeroallergens (ENV) – allergens 1-9
- Foods (FOD) – allergens 10-16
- Full (FUL) – allergens 1-14

All patients will also have positive and negative controls recorded.

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No skin prick testing in infants under 6 months of age. Patients under the age of 2 years will only have the FOD panel done unless specifically requested; see (*).

All skin prick test requests must be made on the dedicated SPT form (SPT1). This requires ordering clinicians to state the test indication and select allergens. Once completed, the form should be given to the patient to take to the test so that they can complete the consent/patient information section. Failure to use this form may result in the patient being declined for testing.

Skin sensitivity test referral form

This is the part of the form that needs to be completed by the requesting clinician. Please tick one or more indications for testing and tick the allergens requested.

PLACE BARCODE HERE

SKIN SENSITIVITY TEST REFERRAL FORM SPT1

Labtests

Referrer to complete this section before appointment can be arranged.
Form to be presented at time of test.

Referrer name	Labtests Referrer code	Referrer signature and date	
Patient Surname	**Patient Given Names**	**Patient Title**	**DOB** / /

Sex	Address	Phone no.	NHI

TEST INDICATION	
Allergic rhinitis/conjunctivitis (hay fever)	☐
Asthma	☐
Atopic dermatitis (eczema)	☐
Food allergy	☐
Other (please state)	☐

AEROALLERGENS (ENV)			
1. House dust mite	☐	5. Aspergillus (mould)	☐
2. Cat hair	☐	6. Mixed grass	☐
3. Dog hair	☐	7. Perennial rye (grass)	☐
4. Alternaria (mould)	☐	8. Plantain (weed)	☐
		9. Birch (tree)	☐

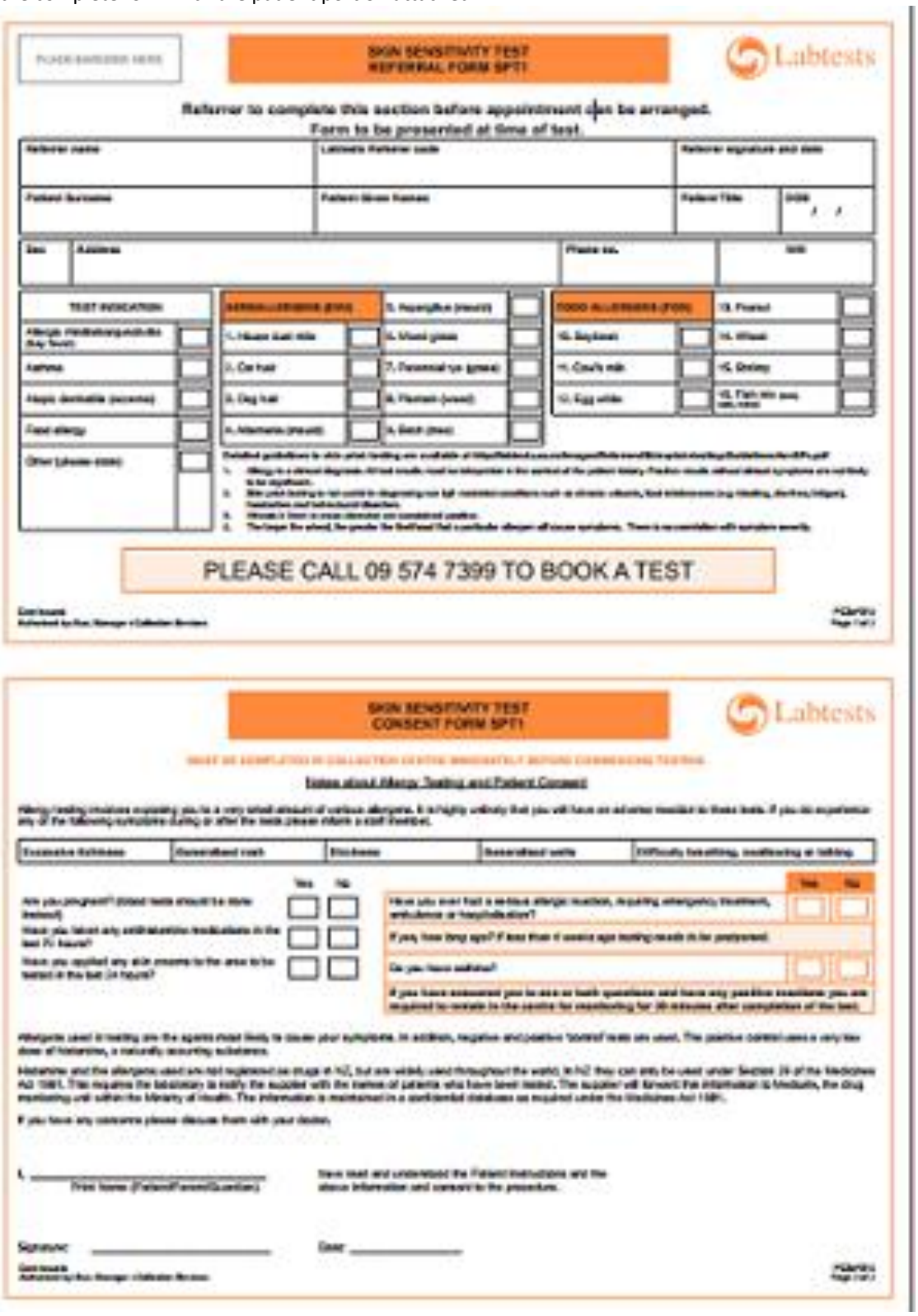
FOOD ALLERGENS (FOD)			
10. Soybean	☐	13. Peanut	☐
11. Cow's milk	☐	14. Wheat	☐
12. Egg white	☐	15. Shrimp	☐
		16. Fish mix (cod, sole, hake)	☐

Detailed guidelines to skin prick testing are available at http://labtests.co.nz/images/Referrers/Skin-prick-testing-Guidelines-for-GPs.pdf

1. Allergy is a clinical diagnosis. All test results must be interpreted in the context of the patient history. Positive results without clinical symptoms are not likely to be significant.
2. Skin prick testing is not useful in diagnosing non IgE mediated conditions such as chronic urticaria, food intolerances (e.g. bloating, diarrhea, fatigue), headaches and behavioural disorders.
3. Wheals ≥ 3mm in mean diameter are considered positive.
4. The larger the wheal, the greater the likelihood that a particular allergen will cause symptoms. There is no correlation with symptom severity.

PLEASE CALL 09 574 7399 TO BOOK A TEST

This is the complete form with the patient portion attached.



SKIN SENSITIVITY TEST
REFERRAL FORM SPT1

Labtests

Referrer to complete this section before appointment can be arranged.
Form to be presented at time of test.

PLEASE CALL 09 574 7399 TO BOOK A TEST

SKIN SENSITIVITY TEST
CONSENT FORM SPT1

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