



Position Paper: Evidence-Based Versus Non Evidence- Based Allergy Tests and Treatments

Allergy is a science and evidence-based medical speciality, which relies on understanding the biological mechanisms underlying allergic disorders. These disorders include asthma, allergic rhinitis (hay fever), food allergy, insect allergy, drug allergy and severe allergic reactions (anaphylaxis).

Accurate diagnosis requires an examination of the patient's clinical history by a qualified medical practitioner, to determine whether allergy or another immune condition is likely to be the cause of symptoms, combined with reliable allergy testing to confirm the diagnosis.

Evidence-based tests and treatments

It is important to be aware that appropriate diagnosis and treatment involves an exchange in information between a patient with symptoms and a trained medical professional with the experience and qualifications to make a diagnosis, supported at times with appropriate and reliable diagnostic testing. If a test is unreliable at distinguishing between health and disease, then a diagnosis reliant on test results will be flawed.

Evidence-based, proven allergy tests are:

- Skin prick tests and blood tests that measure allergen specific immunoglobulin E (IgE), which should always be used in conjunction with the clinical history.
- Food or drug allergen challenges, which should always be medically supervised using consistent protocols, to confirm or exclude food or drug allergies.

ASCIA does not recommend online allergy testing services. The widespread availability of online testing adds to potential harm, even if proven, evidence-based tests and treatments are ordered online, since advice is given in the absence of a personal consultation. This is because results may not be clinically relevant e.g. a false positive irrelevant food mix allergy test in someone with only hay fever.

Evidence-based, proven treatments which are close to being a cure for allergy are:

- **Allergen immunotherapy (AIT)**, in people with a confirmed allergy to inhaled allergens (e.g. hay fever, allergic asthma), and
- **Venom immunotherapy (VIT)** in people with severe allergic reactions (anaphylaxis) to stinging insect venom.

In controlled studies AIT (sublingual or injected) and VIT (injected) have been shown to reduce the severity and frequency of symptoms in most people.

Other proven allergy treatments include:

- Adrenaline (epinephrine) for treatment of life threatening severe allergic reactions (anaphylaxis).
- Allergen avoidance, which is essential in the management of severe allergies to foods, insects and drugs (medications). It is important to have strategies in place to minimise the risk of exposure to allergens that that can result in anaphylaxis.
- Allergen minimisation can be useful in the management of allergic rhinitis (hay fever). If it is possible to identify and minimise exposure to the confirmed allergens, this may reduce symptoms.
- Medications for the treatment of atopic eczema (e.g. topical corticosteroids), allergic rhinitis (hay fever) medications include non-sedating antihistamines (topical or oral), nasal sprays and eyedrops and medications for control of asthma.
- Emerging biological therapies that target the immune system pathways for disease control (e.g. Anti-IgE or anti cytokine monoclonal antibodies).

Oral immunotherapy (OIT) for food allergy is the subject of ongoing research being conducted in clinical trials in Australia and globally. More data needs to be collected about safety, tolerability, cost-effectiveness, quality of life and long-term outcomes before more widespread adoption outside of research studies.

Online allergy testing is not recommended by ASCIA

Evidence-based tests and treatments for allergic disease can greatly improve the management of allergic disease and quality of life. In contrast, the use of unscientific methods, including online allergy testing, that claim to test for, or treat allergies can result in misdiagnosis, ineffective treatments and negatively impact on health and wellbeing.

Online tests and treatments for allergies/intolerances are NOT recommended for the following reasons:

- **Use of unscientific methods for allergies or intolerances** can result in misdiagnosis and ineffective treatments, which lead to potential harm, additional healthcare encounters, increased costs for the patient or carer and a greater burden on the healthcare system. Some tests for food intolerances can lead to unnecessary food restrictions that cause nutritional problems, and growth issues in children.
- **Evidence-based allergy tests** should only be ordered, performed and interpreted in the context of a clinical history, by a clinical immunology/allergy specialist, other doctor or nurse practitioner who are trained in allergy.
- **Evidence-based allergy treatments** should only be prescribed following the interpretation of allergy test results in the context of a clinical history, by a clinical immunology/allergy specialist, other doctor or nurse practitioner who are trained in allergy.

Use of unproven allergy ‘tests’ and ‘treatments’ is common in Australia and New Zealand

There are only two types of therapies for disease; those that have been proven to be effective, and those that are unproven. The medical literature includes many treatments previously claimed or thought to be effective on theoretical grounds, later discarded as unproven when subjected to careful study.

Despite advances in scientific knowledge about allergic disorders, many people with allergic disease consult unorthodox/alternative practitioners for diagnosis and treatment. The use of traditional health care philosophies and uncritical media attention to claims of new ‘cures’ for allergy may all contribute to some people using unproven diagnostic ‘allergy testing’ or treatments.

Unproven allergy testing and treatments are not regulated

There is currently no stringent regulation of unproven diagnostic techniques or devices, which can be approved by the Therapeutic Goods Administration (TGA) and sold in Australia without having to prove that they work.

Unlike claims to ‘cure’ cancer, unsubstantiated claims to detect or ‘cure’ allergic conditions or other immune disorders are only stringently regulated by government, medical boards or advertising regulators if the practitioner is a registered medical practitioner.

Questions to ask providers of unproven allergy tests and treatments

In the absence of government regulation of unsubstantiated claims for unproven, non-evidence-based allergy tests or treatments, patients should ask the same questions they ask about any tests or treatments before going ahead:

- What is the evidence it works?
- What are the risks and benefits?
- What might happen if I do not undertake this form of treatment?
- How much does it cost?
- Are there any side-effects?
- Why doesn't my own doctor suggest this type of treatment?
- What are the qualifications of the practitioner recommending the treatment?
- Why can this one test of treatment detect or treat so many different problems?
- Is there a Medicare rebate for this test?

Allergy tests and treatments need to be 'evidence-based'

When considering allergy tests and treatments, advice needs to be 'evidence-based'. There needs to be evidence that a particular test or treatment is reliable, based on studies of other patients with similar conditions.

NHMRC Evidence Hierarchy: designations of 'levels of evidence' according to type of research

Level	Intervention	Diagnostic accuracy	Prognosis	Aetiology	Screening Intervention
I	A systematic review of level II studies	A systematic review of level II studies	A systematic review of level II studies	A systematic review of level II studies	A systematic review of level II studies
II	A randomised controlled trial.	A study of test accuracy with: an independent, blinded comparison with a valid reference standard, among consecutive persons with a defined clinical presentation	A prospective cohort study	A prospective cohort study	A randomised controlled trial
III-1	A pseudo-randomised controlled trial (i.e. alternate allocation or some other method)	A study of test accuracy with: an independent, blinded comparison with a valid reference standard, among non-consecutive persons with a defined clinical presentation	All or none	All or none	A pseudo-randomised controlled trial (i.e. alternate allocation or some other method)
III-2	A comparative study with concurrent controls: <ul style="list-style-type: none"> ▪ Non-randomised, experimental trial ▪ Cohort study ▪ Case-control study ▪ Interrupted time series with a control group 	A comparison with reference standard that does not meet the criteria required for Level II and III-1 evidence	Analysis of prognostic factors amongst persons in a single arm of a randomised controlled trial	A retrospective cohort study	A comparative study with concurrent controls: <ul style="list-style-type: none"> ▪ Non-randomised, experimental trial ▪ Cohort study ▪ Case-control study
III-3	A comparative study without concurrent controls: <ul style="list-style-type: none"> ▪ Historical control study ▪ Two or more single arm study ▪ Interrupted time series without a parallel control group 	Diagnostic case-control study	A retrospective cohort study	A case-control study	A comparative study without concurrent controls: <ul style="list-style-type: none"> ▪ Historical control study ▪ Two or more single arm study
IV	Case series with either post-test or pre-test/post-test outcomes	Study of diagnostic yield (no reference standard)	Case series, or cohort study of persons at different stages of disease	A cross-sectional study or case series	Case series

Reference: <https://www.nhmrc.gov.au/sites/default/files/images/appendix-f-levels-of-evidence.pdf>

The levels of evidence shown in the table on the previous page have been developed to rate the quality of published evidence, with 'level I' being the highest quality of evidence, and 'level IV' being of lesser quality.

The aim of this information is to assist medical practitioners to more readily select a treatment for their patient, that is most likely to provide benefits.

Reliable tests need to distinguish between people with illness and those without. Therapeutic trials are designed to show that any improvement seen is due to the treatment, and not due to chance or coincidence. These studies also examine if a treatment may cause harm, as well as benefit.

Allergy falsely redefined

Some unorthodox/alternative practitioners who provide unproven, non evidence-based tests and treatments claim that conventional allergy testing only detects some types of allergies. They state that conditions such as headaches, migraine, irritable bowel, muscle tension, pain, addiction, premenstrual syndrome, fatigue or depression are due to 'hidden allergies', a claim for which there is no evidence.

Instead of relating allergy to IgE, or an inflammatory response mediated by the immune system, disease is attributed to either:

- (a) a disturbance of vital life force or energy ('Qi', yin-yang), or
- (b) are secondary to noxious external triggers such as environmental toxins and chemicals, food allergens/additives, or chronic infection with organisms like *Candida albicans*.

It is sometimes claimed by unorthodox/alternative practitioners that the body can generally cure itself if given the opportunity to correct these imbalances on the one hand, or avoid/eliminate environmental toxins, allergens or occult infection on the other. These philosophies use terminology loosely, blur and confuse the distinction between the terms 'fatigue' and 'immunity', and blend concepts of immunology, neurology and spirituality to explain the nature and causes of disease.

Types of unproven tests

A multitude of tests have been proposed to detect 'hidden allergies', based on concepts of disease pathogenesis very different to those underlying Western medicine. These have no scientific rationale, and have not been shown to be reliable or reproducible when subjected to formal study.

Not only are such tests unreliable in diagnosing allergic disease, they are also increasingly being promoted for the diagnosis and management of disorders for which no evidence of immune system involvement exists.

ASCIA strongly advises against the use of these tests for diagnosis or to guide medical treatment. No Medicare rebate is available in Australia for these tests, and their use is not supported in New Zealand.

Use of such techniques has been condemned by multiple international immunology/allergy associations.

Vega (electro-diagnostic) testing (Evidence Level II: inaccurate test)

Formal examinations of Vega testing have shown that it is unable to distinguish between healthy and allergic individuals, between control and allergen extracts, and results do not correlate with those obtained using conventional testing.

Bioresonance machines are a variation of Vega testing and claim to detect abnormalities in electromagnetic emissions by body tissues using electrodes.

Vega testing claims to detect disease by measuring changes in body electrical currents using a 'Vega machine'. This involves the patient holding one (negative) electrode in one hand, and the positive electrode is applied to acupuncture points over fingers or toes. An allergen (such as food extract) in a sealed glass container is brought into the electrical circuit. An alteration in current is interpreted as sensitivity to that substance.

Cytotoxic testing ('Bryan's test') and the Alcat test (Evidence Level II: inaccurate test)

Results from Cytotoxic testing ('Bryan's test') and the Alcat test have not been shown to correlate with results obtained using conventional allergy testing, and not associated with food related symptoms or challenges.

In cytotoxic food testing ('Bryan's test'), the size and shape of white cells is assessed after incubation with food extracts on a microscope slide. These results have been shown to not be reproducible, give different results when duplicate samples are analysed blindly, don't correlate with those from conventional testing, and 'diagnose' food hypersensitivity in subjects with conditions where food allergy is not considered to play a pathogenic role. The Alcat test is a variation of Cytotoxic testing. The results are analysed on a Coulter counter instead of under the microscope.

Iridology (Evidence Level II: inaccurate test)

Blinded studies of iridology have demonstrated that practitioners are unable to distinguish healthy individuals from those with disease, and even give different diagnoses using iris photographs from the same patients taken minutes apart.

Iridology claims to diagnose disease by examining iris patterns. Its theoretical basis is undermined by the fact that iris patterns (like fingerprints) are so unique and unchanging, that they can be used as biometric identification markers to distinguish one person from another.

Kinesiology (Evidence Level II: inaccurate test)

A controlled study has shown that kinesiology results are not reproducible and are no more accurate than guessing. Unfortunately, kinesiology and other unproven diagnostic techniques are used as the basis of unproven, non evidence-based treatments.

Kinesiology is based on the concept that exposure to exogenous toxins or allergens will be reflected in a reduction in muscle strength. In kinesiology that claims to test for food allergy, muscle strength is 'measured' before and after exposure to food. 'Provocation' to food occurs by having drops of food extracts given under the tongue or by holding a vial of food extracts in one hand. Children are assessed by testing the parent's strength first and again while holding the child's hand. The two test results are then subtracted to give the final results.

Immunoglobulin G (IgG) food antibody testing (Evidence Level II: inaccurate test)

Despite studies showing that IgG food antibody testing is ineffective and unreliable, it continues to be promoted in the community, particularly online.

IgG antibodies to food are commonly detectable in healthy adult patients and children, independent of the presence or absence of food-related symptoms. There is no credible evidence that measuring IgG antibodies is useful for diagnosing food allergy or intolerance, nor that IgG antibodies cause symptoms. In fact, IgG antibodies reflect exposure to allergen but not the presence of disease resulting from consumption of food. The only exceptions are:

- (a) Gliadin IgG antibodies used to monitor the success of avoiding gluten in people with proven celiac disease
- (b) Research studies examining the immune response to oral immunotherapy for established food allergy.

VoiceBio® (Evidence Level: no evidence)

This technique is based on the concept that internal organs communicate with each other via sound waves, with each organ vibrating at certain frequencies, and with organ dysfunction being detectable by analysis of such frequencies using a computer assisted analysis of the patient's voice. There is no scientific rationale for this technique, and no evidence that results are useful for diagnosing any disorder, including allergies.

Other techniques

Other techniques such as pulse testing, stool or hair analysis, oral provocation/neutralisation or anti-Candida diets/therapies have no proven role in the diagnosis or management of allergy.

Unproven and non evidence-based tests and treatments

Claims of 'breakthrough treatments' continue to appear online and in the media, generally as variations of other unproven treatments. These treatments have not been subject to careful study or shown to be helpful when subjected to formal evaluation, but can appeal to the common but unrealistic desire of people to seek cures for allergic disease rather than control symptoms.

These treatments usually include:

- (a) dietary manipulation
- (b) oral supplements that claim to 'strengthen' the immune system
- (c) techniques to 'cure' or 'eliminate allergy', even when people have no evidence of allergic disease.

Allergy elimination techniques (Evidence Level: no published studies)

While proponents of allergy elimination techniques claim to be able to 'eliminate' almost any allergy or sensitivity, the approach lacks any scientific rationale or physiological basis, and there is not a single published study demonstrating its effectiveness for any medical condition.

In recent years unproven, non evidence-based 'allergy elimination techniques' have become popular. Also known as advanced allergy elimination and Nambudripad's allergy elimination in some countries, practitioners claim to treat a range of conditions (not necessarily with evidence of an immune basis), as well as symptoms attributed to inhalant allergens, or perceived chemical or environmental triggers.

This treatment is based on the concept that 'allergen' is perceived by the nervous system as a 'threat' to the body's well-being. Exposure to allergen disrupts the flow of nervous energies from the brain to the body via 'meridians', resulting in symptoms. The technique seeks to 're-programme' the brain by applying acupressure applied to both sides of the spinal column (where energy flowing along meridians intersects with nerve roots) while the patient is in direct contact or close proximity to purported allergen.

Adverse outcomes from unproven, non evidence-based testing and treatments

The potential for adverse outcomes following some unproven, non evidence-based diagnostic techniques and treatments is not always obvious. However, they are potentially more serious than the commonly debated issues surrounding adverse reactions to herbal medicines.

Examples of adverse outcomes include:

- Major dietary restrictions due to misleading results have the potential to impair growth and even cause malnutrition, particularly in more vulnerable groups such as young children.
- Trigger food-related anxiety in a proportion of older children and adults.
- Development of IgE-mediated (rapid onset) food allergy to foods withdrawn that were previously tolerated in young children with atopic eczema (shown in a 2019 study).
- Delayed access to more effective diagnostic techniques and treatments, with lost productivity from inadequately controlled disease.
- Individual and public health implications due to substitution of vaccines with proven effectiveness with unproven homoeopathic vaccines, or discouragement to undertake vaccination.
- Lost income and productivity results from inadequately controlled disease.
- Impact on employment and social functioning, due to unnecessary environmental and chemical avoidance, creating a perception of allergic or other organic illness when there are other explanations for their symptoms.
- 'Allergy elimination techniques' have the potential to cause particular harm, if people with severe allergies consider themselves protected from exposure.

Costs of unproven diagnostic techniques and treatments can be significant

In 2017 over \$600 million per year was spent on consultations, and over \$4.9 billion was spent on complimentary medicines in Australia.

While it can be argued that this is a cost borne by individuals rather than governments, further medical assessment is often required to rectify diagnosis and treatment, which results in additional costs for individuals and governments.

Further Reading

- Evidence based Medicine www.cebm.net/
- Cochrane Reviews www.cochranelibrary.com/
- Medline/PubMed database of published medical articles
www.ncbi.nlm.nih.gov/entrez/query.fcgi
- Quackwatch www.quackwatch.org/index.html

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