consensus document

ALLERGIC RHINITIS IN SOUTH AFRICA – UPDATE 2014

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On behalf of the South African Allergic Rhinitis Working Group (SAARWG)

INTRODUCTION

The SAARWG met on the 8th and 9th February 2014 to discuss and review important concepts in allergic rhinitis diagnosis and management. The theme of that meeting was to lead clinicians through the ideal 'Allergy Clinic' and the diagnostic facilities that may be offered to patients who present for management at such a clinic. The content of that meeting forms the basis of this update. The main reason for this statement is two-fold. Firstly, patients with allergic diseases require careful examination and secondly, they may need a set of diagnostic modalities. All physicians who see such patients must be knowledgeable of the interpretation of such tests. This review will focus specifically on the clinical tools and diagnostic modalities employed in the management of those conditions.

THE IDEAL ALLERGY CLINIC

An important part of an allergy and asthma practice is the administrative and reception staff. They should be trained to speak to patients with insight. It is important, for example, that patients who need skin prick tests have not taken antihistamines for 72 hours prior to testing, and the reception staff need to be able to communicate this sort of information, when necessary. Certain pieces of equipment are essential (Table I). *(See next page).*

OTHER REQUIREMENTS

In addition to the administrative facilities and the 'cabinet' contents, other essential requirements for the clinic should be available as part of a typical practice. These include the following:

- A stadiometer for height measurement and a scale for weight measurement.
- A shelf in a secure refrigerator for the storage of skin prick test kits and immunotherapy supplies.
- A resuscitation trolley equipped with the requirements

Table I: Allergy and asthma education materials required

Allergy Education	Asthma Education
Placebo Epipen®	Placebo reliever MDI's
Adrenaline kit	Placebo controller MDI's
Needles and syringes	Placebo DPI's
Expired adrenaline	Spacers
Rubber ball	Anatomical models of the airways
Placebo nasal sprays	Educational posters

for the management of acute severe asthma, severe hypersensitivity reactions and anaphylaxis. Included in the list of requirements are an oxygen cylinder, a defibrillator, an 'ambubag', a suction device, laryngoscopes, endotracheal tubes, syringes, hypodermic needles, equipment for setting up intravenous access, intravenous fluids, oxygen masks, tubing, a nebuliser attachment, latex-free gloves, a 'sharps' bin, a diagnostic set, a baumanometer (or other blood pressure machine), a peak flow meter and medications such as adrenaline, antihistamines, glucocorticosteroids and bronchodilators.

- It is useful to have displayed on an accessible notice board a chart with pictures of all the asthma medications for education purposes, PEFR charts for adults and children for comparison against patient values, and action-plan flow diagrams for the management of emergencies such as acute severe asthma and anaphylaxis.
- An educated allergy and asthma nurse is an invaluable part of a successful clinic.

UPPER AIRWAY EXAMINATION

Allergic rhinitis is an extremely common, well known and often trivialised condition with well established guidelines for diagnosis and management.[1-3] Many individuals with allergic rhinitis never present to health care providers, with consequent lack of treatment or poor treatments, often receiving over-the-counter therapies and alternative treatments.

Many patients, both those who get the correct diagnosis, and those who do not, are poorly controlled. Possible reasons include poor application of management principals and techniques, poor diagnosis and poor expectations.

The nose itself, a generally ill-understood organ, appears to be central to these issues. Anatomy, airflow dynamics, physical and pathological connections to the rest of the upper respiratory tract, environmental issues of temperature and humidity control, pollution and exercise, age and sex can all have significant impact on management. Clinically pure allergic rhinitis seldom exists.

Nasal obstruction is a definition symptom of allergic rhinitis.[2] Nasal obstruction, itch, sneeze and rhinorrhoea are sensitive and reliable symptoms. Nasal obstruction in children appears to be a late complaint in allergic rhinitis and becomes significant when persistant.[4] In adults with long standing nasal obstruction, the nasal obstruction itself is commonly not recognised. Nasal obstruction is the predominant symptom in co-existing diseases, resulting in comorbidities and complications.

At a primary care level, what then is to be done, especially when guideline-based treatment does not work as expected? A renewed clear history, careful examination and additional testing is required.

The authors suggest that while the specific examination of the nose is the field of the trained rhinologist, there is a place for the more general examination of the nose in all cases of allergic rhinitis that can help in significantly reducing incorrect diagnoses, failed treatments and expensive investigations.

Numerous general clinical signs are very helpful, as well as the more specific ones with regard to the long-term conditions, including fixed nasal obstruction, especially when this occurs together with allergic rhinitis. These are easily recognised with minimal training:

- The "adenoid" face as opposed to the "allergic" face;
- Chronic lip retraction and tongue thrust;
- External nasal deformities – Nasal ptosis, nasal valve issues, middle third nasal collapse ("inverted V deformity"), deviated nose, caudal nasal septal deflections;
- Facial asymmetries;
- Swelling of the turbinates.

The authors suggest that every case of allergic rhinitis demands a basic nasal examination! Every case of poor response to adequate treatment with good compliance, demands a comprehensive total nasal examination. This requires specialist expertise.

EXAMINATION OF THE PAEDIATRIC CHEST

The examination of the child's chest is a critical part of examining 'allergic children'. Following plotting of the child's anthropometric measurements, which are critical for all children, measurement of respiratory rate and peripheral oxygen saturation, checking for clubbing and generalised lymphadenopathy must be done. The important features of a chest examination are reflected in Table II.

Table II: Chest examination of a child

1. Assess vital signs – respiratory rate
2. Measure oxygen saturation
3. Inspect the breathing patter – Hoover sign
4. Palpate position of trachea
5. Percuss for hyperinflation or dullness in bases
6. Listen for breath sounds, adventitious sounds

This examination is aimed at finding a hyperinflated chest (due to viral bronchiolitis in an infant or asthma in an older child) or signs of pneumonia in an acutely febrile, coughing infant.

INTERPRETATION OF THE CHEST RADIOGRAPH

There may be a number of reasons to perform a chest radiograph in a patient with allergic rhinitis, although this is not routinely needed, one particular reason being the common occurrence of allergic rhinitis in patients with asthma. Ideally erect, inspiratory, posterior-anterior (PA) and lateral chest films should be obtained. When reading the chest radiograph, the first step is to ensure that it is the correct patient's radiograph. Thereafter the orientation and quality of the film should be evaluated and through a stepwise approach, the films should be fully evaluated. The chest radiograph may be normal in asthmatic patients, particularly when their disease is well controlled, but there may be evidence of hyperinflation, particularly during episodes of acute exacerbation. Signs of hyperinflation include an increase in the rib count (measured anteriorly or posteriorly), flattening of the diaphragms and an increase in retrosternal and retrocardiac airspaces. These are relatively insensitive signs, but the presence of air between the heart and the left diaphragm on the PA film is suggestive of significant air-trapping. Occasionally complications of asthma may be seen such as the presence of bullae or a pneumothorax, or there may be features of allergic bronchopulmonary aspergillosis or even an alternative diagnosis to asthma, (e.g. airway obstruction).

SPIROMETRY TESTING

Many practitioners do spirometry testing in allergic patients. There are a number of essential elements to spirometry. Equipment must be of sufficient standard, and regularly calibrated, and it is crucial for correct interpretation that a good quality and therefore reliable flow-volume loop is performed. Some of the vital elements of a good test are rapid peak flow expiration, continuous expiration to FVC, avoiding coughing or laughing, followed by complete inspiration. Figure 1 *(see next page)* reflects the important elements that can be read from a flow-volume loop. Figure 2 *(see next page)* reflects the features of an asthmatic test (obstructive airway disease). To diagnose "airway reversibility" requires the demonstration of a 12% improvement in FEV_1 together with an increase in volume of 200 ml (in adults), following the administration of 2-4 puffs of a short-acting beta-agonist bronchodilator. In the case of the straightforward asthmatic patient this would usually be associated with improvement of the lung function parameters.

ALLERGY TESTING

a. IMPORTANT SOUTH AFRICAN ALLERGENS

Southern Africa consists of a vast ethnic, cultural, and genetic diverse people, allergens, climate zones ("biomes"), and habitats of both fauna and flora. Westernisation and urbanisation of most of South Africa has imposed significant changes in host – environmental - gene interactions, leading to host immune responses which may range from tolerance to hypersensitivity.

South African allergens may be divided into 3 groups: a) Global, b) Truly indigenous and c) Global but with significant interest by researchers in southern Africa. Examples of group A include trees, such as plane, eucalyptus and oak, house dust mite, cockroaches, animal danders (cats, dogs, horses) and fungal spores (moulds). Group B includes Buffalo and Kikuyu grass, acacia trees, food products such as abalone, molluscs, fish, mopane worms, marula fruit and the African wild orange, and animal products (cobra venom (rinkhals), impala, wildebeest, African penguin and porcupine). Research being conducted on imbuia wood and spider mites are examples of group C.

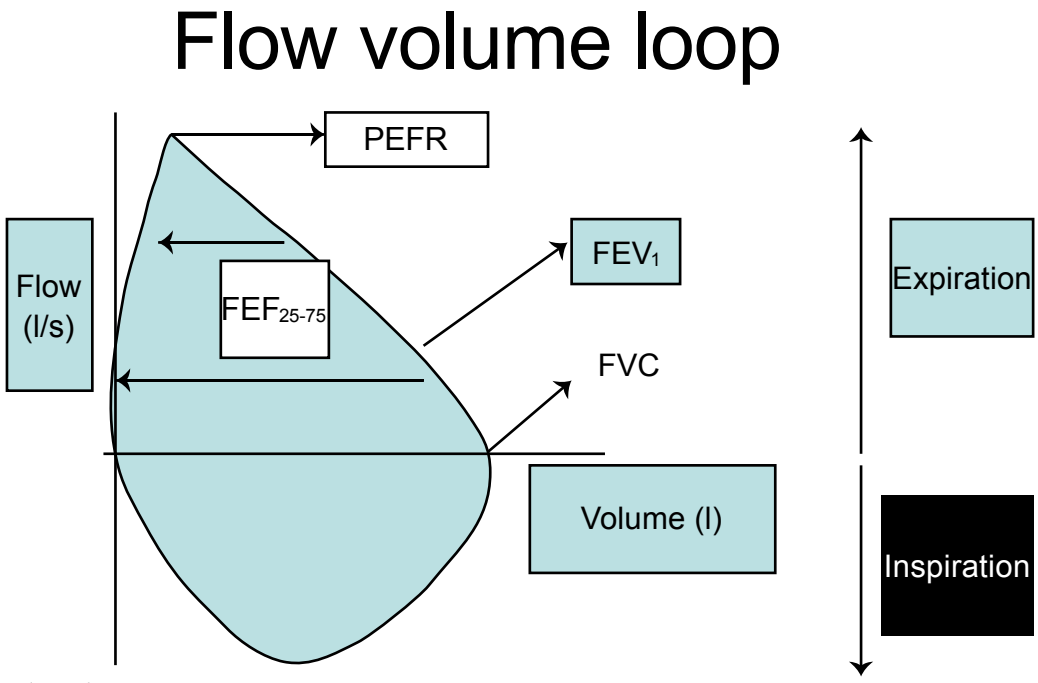

Figure 1. Flow volume loop

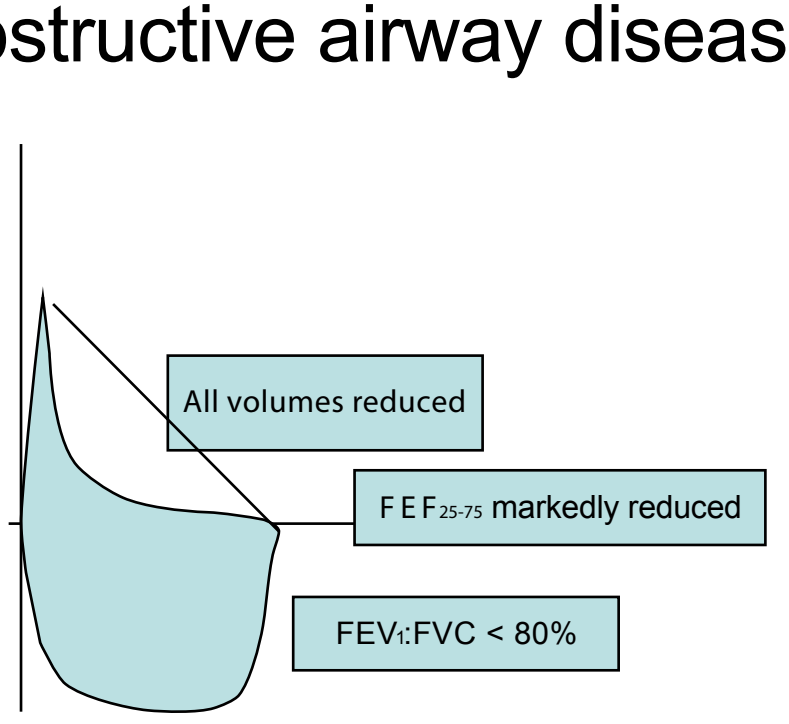

Figure 2. Obstructive airway disease

The clinical manifestations of exposure to these allergens include allergic rhinitis, asthma and atopic dermatitis. Allergic rhinitis is almost always precipitated by inhalant allergens, many of which produce poly-sensitisation (dust mite, cockroaches and moulds). Climate and humidity are important factors affecting common allergen occurrence in different regions of Southern Africa (Figure 3).

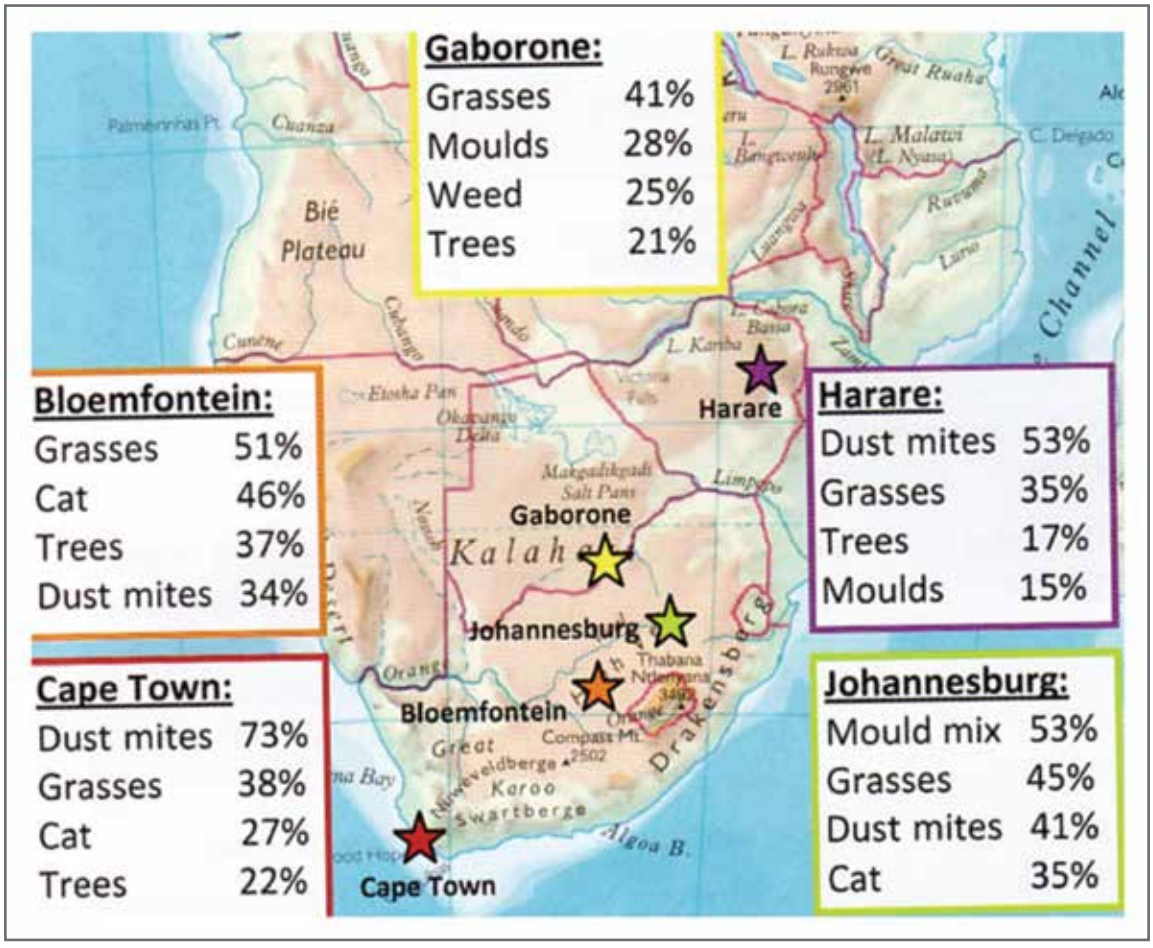

Figure 3. Allergen occurrence in Southern Africa[5]

b. IMMUNOGLOBULIN E (IGE) BASED ALLERGY TESTING

Previous Allergic Rhinitis Guidelines from this group have outlined the ideal set of IgE-based allergy tests that should be requested on a potentially allergic patient.[6] Those guidelines have reinforced the fact that measuring total IgE has no value in routine allergy diagnostics. Allergy tests are indicated for patients with symptoms confined to the nose or beyond the nose (Figure 4)*(see next page)*, (because often patients with allergic rhinitis have associated allergic conditions) the reader is referred to more comprehensive guidelines for South Africans with allergic conditions.[7-9]

c. COMPONENT RESOLVED ALLERGY TESTING

Molecular diagnostics allows the clinician to identify potential disease-eliciting molecules, predict cross-reactivity, severity of reactions and the probability of the development of tolerance. This knowledge can be used to advise patients on appropriate avoidance measures, reduce the number of food challenges and identify the relevant allergen for specific immunotherapy.

Component resolved allergy testing should not be used as a screening test or a first-line test, but as a second-line test in poly-sensitised patients to distinguish genuine sensitisations from cross-reactions. This is particularly important when selecting patients for specific immuno-therapy, as selection of truly eligible patients who should respond well to immunotherapy as well as the identification of the primary sensitising allergen are important for optimal and cost-effective patient management.

All allergy tests, including component resolved testing, should be evaluated within a framework of a patient's clinical history, since allergen sensitisation doesn't necessarily imply clinical responsiveness.

BIOTRANSFORMATION AND ALLERGY

Biotransformation seems to be a novel concept in allergy and immunology but ironically it has been used extensively

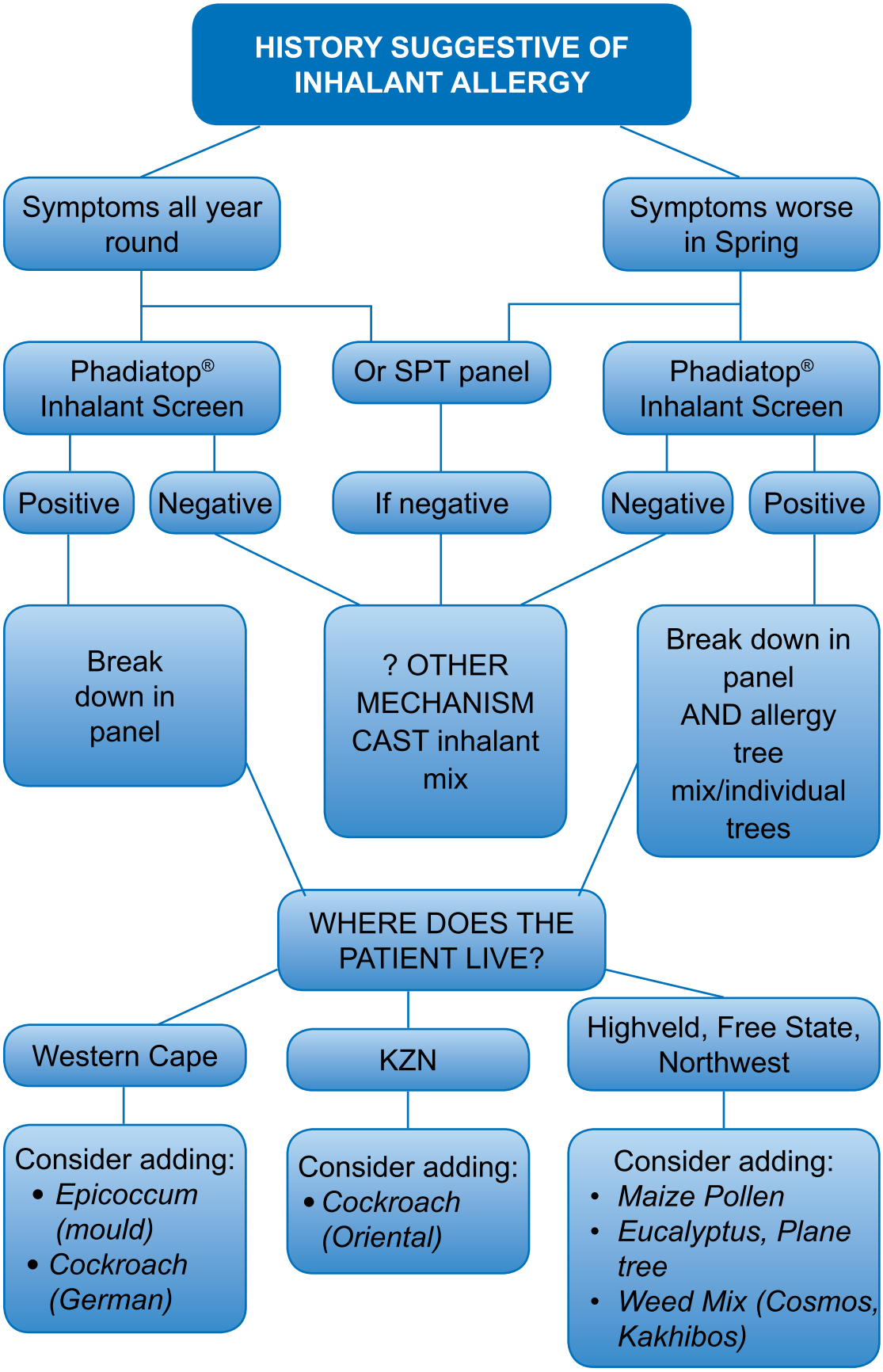
HISTORY SUGGESTIVE OF INHALANT ALLERGY
Symptoms all year round
Symptoms worse in Spring
Phadiatop® Inhalant Screen
Or SPT panel
Phadiatop® Inhalant Screen
Positive
Negative
If negative
Negative
Positive
Break down in panel
? OTHER MECHANISM CAST inhalant mix
Break down in panel AND allergy tree mix/individual trees
WHERE DOES THE PATIENT LIVE?
Western Cape
KZN
Highveld, Free State, Northwest
Consider adding:
• Epicoccum (mould)
• Cockroach (German)
Consider adding:
• Cockroach (Oriental)
Consider adding:
• Maize Pollen
• Eucalyptus, Plane tree
• Weed Mix (Cosmos, Kakhibos)

Figure 4.

in the medical field over decades. This concept may provide a differential diagnosis to those patients that do not quite fit the allergic picture/profile, using the concept of biotransformation to analyse them and ideally find a new solution to their disease profile.[10] Examples of these extraordinary patients include those with numerous drug reactions but with no common 'allergic' trigger, recurring upper airway infections/chronic otitis media and common variable immunodeficiency, difficult to control asthmatics with concomitant inflammatory diseases like ulcerative colitis and the 'allergic' rhinitic with no obvious causative allergen.

Biotransformation is the liver's ability to convert toxic substances to less toxic metabolites. During biotransformation hydrophobic molecules are converted to water soluble conjugates which can then be more easily excreted in bile and urine.

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