

Requirements for Physician Training in Allergy

Key Clinical Competencies Appropriate for the Care of Patients with Allergic or Immunologic Diseases – A Provisional Position Statement of the World Allergy Organization

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“Requirements for Physician Training in Allergy: Key Clinical Competencies Appropriate for the Care of Patients with Allergic or Immunologic Diseases” is a Provisional Position Statement (PPS) of the World Allergy Organization (WAO).

WAO envisages that the final Position Statement will be one of the most important documents to be produced on behalf of the Specialty of Allergy, and the PPS is now open for wide consultation and a period of commentary. The PPS is being formally submitted to WAO Member Societies for their review and comments in May 2006, with a timeline for comments to be received within 90 days. The final version of the Position Statement, after reconciliation, will be submitted to the WAO House of Delegates for ratification as a formal WAO document during the World Allergy Congress in Bangkok, Thailand, in December 2007.

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Introduction

Allergic diseases are extraordinarily prevalent worldwide, and the incidence of allergy is increasing everywhere [1–7]. Because allergic and immunologic processes overlap all organ systems, allergy is not always taught in medical schools as a separate subject. Indeed, lack of recognition of the specialty and of the need to teach students about allergic and immunologic diseases results in allergy not being included at all in some medical curricula [8]. With an estimated 22% of the global population suffering from allergic and immunologic diseases, it is time to recognize and strengthen education in allergy and immunology [8].

The World Allergy Organization (WAO), an alliance of 74 national and regional allergy societies, created this consensus document to establish educational guidelines for worldwide application, to identify and correct allergy training deficiencies and to define appropriate training goals. In creating this consensus, it is recognized that each country has its own principles and goals in medical education at the undergraduate and postgraduate levels. This document defines what a medical practitioner should know in order to care for allergic patients.

Background

Diseases with an allergic etiology can affect many organ systems and occur in response to a wide variety of environmen-

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tal factors. Allergic diseases are among the most common causes of chronic medical problems in both adults and children and are associated with a high morbidity. They carry a large socioeconomic burden [9–12] and can result in catastrophic anaphylaxis or fatal asthma attacks. Systemic hypersensitivity diseases include, among others, asthma, rhinoconjunctivitis, otitis, rhinosinusitis, urticaria, angioedema, eczema, food allergy, drug allergy, insect allergy, occupational allergic diseases, and anaphylaxis. Conventionally, allergic diseases have been divided into those associated with immunoglobulin E (IgE)-mediated hypersensitivity and those involving other forms of hypersensitivity [13]. As a medical specialty based in immunology, the allergy specialty (in some countries, called allergology) is concerned with prevention and diagnosis of the disease and management and rehabilitation of patients with allergic and related diseases.

In some countries, the allergy specialty is combined with clinical immunology. Immune processes are fundamental to host defense. Malfunction of the immune system causes infections, reduces immune surveillance, leads to autoimmune phenomena, and impacts every organ system. Clinical immunology relates to immune system dysfunctions and immunologically mediated diseases, which by definition also include allergic diseases. In some other countries, allergy is positioned as a component of organ-specific specialties such as dermatology, pulmonology, rheumatology, gastroenterology, and otorhinolaryngology. This positioning results in the specialty of allergy not always being recognized separately, and there is often no defined standardization of specialty training requirements for allergy. WAO as a global society proposes that the best way to achieve a uniform quality level of care for the many millions of patients with allergic diseases is to define the key levels of competence required for both specialists and primary care clinicians who see patients who have allergic disorders.

Given the very high prevalence of allergic diseases and the different medical systems throughout the world, patients may be managed by primary care physicians, including internists or pediatricians (which in this document is defined as first-level care), by organ-based specialists who receive some specific training in allergy and/or immunology (defined as second-level care), and/or by fully trained specialists in allergy (third-level care). WAO believes that an acceptable level of competence is required for all physicians who see allergy patients but who are not allergy specialists.

A strong cooperative network with vertical links among first-level care providers, organ-based specialists, and allergists is necessary for the optimal management of allergy patients [14, 15]. Which physician sees which patient and to whom the patient is referred reflects both the availability of physicians specifically trained in allergy and immunology and the levels of competence of the referring physicians. It is essential for proper medical management that first- and second-level physicians are cognizant of the importance of an accurate diagnosis and the appropriate point at which to refer a patient to the next level of care.

This document recommends the appropriate levels of competence necessary to manage allergic patients at each of the three defined levels and clarifies the appropriate time point in the disease for referral to an allergist. Once agreement upon these recommendations is achieved, WAO will develop a more specific core curriculum and appropriate educational and training programs for medical students, general practitioners, pediatricians, internists, organ-based specialists, and allergy specialists.

It is proposed that the levels of competence for knowledge and skills be divided as described in the following paragraphs.

First-Level Care

This level includes recommendations for the knowledge and skills in allergy required for general practitioners, internal medicine providers and pediatricians. It also includes the knowledge and skills recommended for family practitioners, as well as specialists in regions where organ-based specialists are not formally trained in the allergic aspects of their specialty and where trained allergists are not available. These recommendations also will apply to nurse practitioners and physicians' assistants if they are part of the health care community.

Knowledge at this level should include a background in immunology obtained during medical training and should include an understanding of hypersensitivity mechanisms (Gell & Coombs I-IV); major mechanisms of host defence; the role of immunoglobulins in host defence; knowledge of lymphocyte function; the roles of leukocytes, especially eosinophils; and the functions of mast cells and basophils.

Knowledge at the first level of care should include the following areas:

1. Adequate clinical knowledge about the main allergic diseases, including rhinoconjunctivitis, rhinosinusitis, otitis, asthma, urticaria, angioedema, eczema, food allergy, insect allergy, anaphylaxis, drug allergy, and immunodeficiency, so that the diagnosis and treatment of both acute and chronic diseases are possible. Where feasible, such care should be carried out in collaboration with or with access to an allergist or an allergy referral center.
2. Adequate knowledge in the interpretation of the main diagnostic allergy tests, skin prick tests, and serological tests for IgE and an understanding of pulmonary function test interpretation. Such training generally would not include competency in performing skin tests or the more sophisticated pulmonary function tests.
3. Sufficient training to recognize patients with a level of persistence or severity, who experience exacerbations that are life-affecting, or who have difficult-to-manage allergic disease who should be referred to an allergy specialist for evaluation and initiation of treatment before the disease advances to a severe or life-threatening stage.

4. Immunotherapy (injective, sublingual) is performed by first-level providers in some countries. WAO suggests that this is only appropriate as follows:
- The immunotherapy has been prescribed by a specialist.
 - The first-level provider has had adequate training in allergy and the management of anaphylaxis in order to provide this service safely.
 - The location where immunotherapy is performed fulfills all the conditions for patient safety.

It is recommended that immunotherapy be initiated by an allergist or in a referral center and that a suitably trained first-level provider provides maintenance treatment only.

Second-Level Care

Recommendations for key competencies at the second level of care apply to organ-based physicians such as those in dermatology, pulmonology, gastroenterology, otorhinolaryngology, and rheumatology, who see allergy patients or act as allergy specialists, receiving referrals of allergy patients for diagnosis and management. In some healthcare systems, second-level care providers receive training specifically in allergy. Knowledge at this level should include a fundamental background in allergy and immunology, an understanding of common allergic diseases, and the knowledge and skills to perform and interpret diagnostic tests in order to competently treat uncomplicated allergic diseases.

In most countries, background training in allergy and immunology is obtained through rotations in allergy and immunology centers provided during residency in internal medicine or pediatrics. Thereafter, during the 2–3 years of training in specialties such as dermatology, pulmonology, otorhinolaryngology, gastroenterology, or rheumatology, adequate opportunities for instruction in allergy and immunology should be required. Organ-based specialists at this level should be required to have the knowledge base required of any first-level, primary care physician, plus additional knowledge of host defence and clinical immunology and some understanding of cytokines and chemokines, genetics and environmental factors, and allergens and their relationship to human diseases.

The recommendations for second-level, organ-based specialists include the following:

- Broad clinical knowledge of major allergic and immune-deficiency diseases.
- Knowledge sufficient to diagnose and treat the common, uncomplicated cases of allergic disorders, according to national and international guidelines.
- Adequate skills to perform and interpret allergy skin tests, as well as the ability to interpret the other tests useful for the diagnosis, treatment, and prevention of allergic diseases.
- Administration of various forms of immunotherapy (in collaboration with allergy specialists and referral centers) after adequate training, but only if such therapy is performed in a setting where patient safety is ensured.

- Recognition of when and where to refer complicated or difficult-to-manage patients.
- In medical systems where the second-level specialist is the only provider of expert care for allergy and immunology patients, the training should include all of the elements detailed in the section on third-level care.

Third-Level Care

The third level of care should include full knowledge of allergic diseases and the skills to diagnose, treat, and, where possible, prevent allergic diseases [16–18].

Core training is necessary in either adult internal medicine or pediatrics. In some countries (e.g., the United States), trainees in allergy with background training in pediatrics or internal medicine are trained to take care of patients in all age groups.

The recommendations for the training of a third-level, fully certified allergist are as follows:

Knowledge Training Objectives

- Immune mechanisms involved in the development of immunologically mediated diseases and, in particular, allergic sensitization and disease formation.
- Genetic and environmental factors, including infectious diseases, involved in the genesis of allergic diseases.
- Pathogenesis of rhinoconjunctivitis, otitis, rhinosinusitis, asthma, atopic dermatitis, urticaria, and angioedema; drug and food allergy; insect allergy and anaphylaxis; and the concept that many allergic diseases are systemic in etiology.
- Relationship between tissue inflammation and repair.
- Mechanisms of IgE-mediated immediate and late-phase allergic reactions.
- Mechanisms of non-IgE-mediated allergic reactions and other disorders in the differential diagnosis of allergic diseases. These diseases include, but are not limited to, nonallergic rhinitis; drug-induced rhinitis; acute and chronic rhinosinusitis; nonallergic asthma; cough; bronchitis; non-IgE-mediated anaphylaxis; idiopathic urticaria; eczema; otitis; conjunctivitis; eosinophilic esophagitis, gastroenteritis and colitis; celiac-like syndromes; food induced enteropathies leading to gastroesophageal reflux, oesophagitis, gastritis and gut motility disorders including constipation.
- National and global epidemiology of allergic diseases.
- Local airborne, contact, and occupational allergens.
- Classification and relative importance of all relevant allergens and their biological characteristics, including heat, digestive stability, and cross-reactivity; understanding of local pollen counts and the characteristics of various aeroallergens and routes of allergen exposure.
- Therapy
 - Use and route of administration of antihistamines; mast cell stabilizers; bronchodilators; nasal, oral, topical, and

inhaled glucocorticosteroids; decongestants; leukotriene modifiers; theophylline; adrenergic agonists; anticholinergics; mucolytics; antibiotics; adrenaline; and all other pharmacologic and immunologic agents used to treat allergic and immunologic diseases.

- b) Use of emollients, antibiotics, topical glucocorticosteroids, immune modulators and all other agents and techniques used to manage eczema and other allergic skin disorders.
 - c) Use of immune modulators, such as specific allergen immunotherapy, monoclonal antibodies, including anti-IgE, and immunoglobulin replacement used to treat allergic and immunologic disorders. Knowledge of immune modulators that are being developed for clinical use in allergic and immunologic disorders.
 - d) Methods and value of allergen-avoidance techniques.
 - e) Avoidance diets and nutritional implications of dietary modification.
 - f) Knowledge of national and international guidelines for the management of allergic and immunologic disorders in adults and children, with particular emphasis on safety and efficacy of all therapies.
11. Investigation and management of adverse reactions to drugs and vaccines.
 12. Methods to measure cells and mediators in biological fluids and tissues.
 13. Primary and secondary prevention of allergy, particularly in children.
 14. Understanding of the social and psychological issues associated with allergic diseases.
 15. Diagnosis and management of occupational allergic diseases.
 16. Methods to monitor home or work environments for allergens associated with allergic diseases.
 17. Understanding of environmental factors such as pollutants and occupational allergens and of viral respiratory tract infections that affect allergic sensitization and disease development.
 18. Diagnosis and treatment of patients with humoral and cellular immunodeficiencies, hereditary and acquired complement deficiencies, and phagocytic disorders.

Skills Training Objectives

1. Clinical skills
 - Differential diagnosis, evaluation, and management of the following:
 - Eczema
 - Rhinoconjunctivitis
 - Conjunctivitis
 - Rhinosinusitis
 - Atopic dermatitis
 - Asthma, cough, dyspnea, and recurrent wheeze
 - Acute and chronic urticaria, including physical urticarias
 - Angioedema, including hereditary angioedema
 - Anaphylaxis
 - Food allergy and intolerance
 - Drug and vaccine allergies or intolerance
 - Insect allergy/hypersensitivity
 - Oral allergy syndrome

Latex allergy

Occupational allergy, asthma, eczema

Otitis

Common variable immunoglobulin deficiency and related immunodeficiencies

Primary immunodeficiencies

Secondary immunodeficiencies

Complement deficiencies

Abnormalities of phagocytic cells

2. Management of patients with multiple or complex allergies.
3. Management of patients with multiple food allergies, requiring avoidance diets.
4. Provision of allergen avoidance advice.
5. Safe supervision of food and drug challenges.
6. Assessment of patients for immunotherapy. Proper administration of immunotherapy including immunotherapy dose adjustment and management of complications. Supervision of immunotherapy protocols. Recognition and management of allergic reactions associated with immunotherapy.
7. Recognition of indications for and the skills to perform, interpret, and understand the limitations of skin prick, intradermal, patch, and delayed-type skin tests, and specific in-vitro IgE antibody tests.
8. Interpretation of natural allergen and environmental exposures.
9. Evaluation and differentiation of non-IgE mediated hypersensitivity reactions.
10. Investigation and management of behavioral problems related to allergic and immunologic diseases.
11. Improvement of patient compliance with pharmacotherapy regimes through personalized disease management plans.
12. Knowledge of drug desensitization protocols.
13. Management in the community of patients at risk of anaphylactic reactions, incorporating an understanding of integrated care pathways.
14. Diagnosis, treatment, and referral of primary and secondary humoral and cellular immunodeficiencies. Such diseases include, but are not limited to Bruton's agammaglobulinemia, severe combined immunodeficiency, thymic dysplasia, adenosine deaminase deficiency, Wiskott-Aldrich syndrome, ataxia telangiectasia, and various lymphocyte activation defects.
15. Safe and effective administration of intravenous gamma globulin.
16. Recognition and management of hereditary and acquired complement deficiencies.
17. Knowledge about and treatment of phagocytic cell disorders, such as Chediak-Higashi syndrome, chronic granulomatous disease, leukocyte adhesion defects, and a variety of congenital and acquired neutropenias.

Technical Skills and Knowledge Training Objectives

1. Performance and interpretation of skin prick, intradermal, patch tests, and delayed hypersensitivity tests.
2. Performance of diagnostic testing for suspected drug, biological, or vaccine allergy.
3. Safe preparation and administration of immunotherapy vaccines.
4. Performance of allergen provocation tests, such as nasal,

conjunctival, bronchial, and oral challenges, and food and medication challenges.

5. Performance of patch testing for contact dermatitis.
6. Performance or knowledge of rhinoscopy and laryngoscopy, nasal endoscopy, acoustic rhinometry*, and rhinomanometry*
7. Performance of basic lung function testing, including spirometry and bronchial provocation tests (methacholine or histamine challenges, measurement of flow-volume loops and pulse oximetry, and pre- and post-bronchodilator testing).
8. Knowledge of how and when to measure exhaled nitric oxide, and how and when to perform whole body plethysmography and impulse oscillometry*.
9. Knowledge of how and when to use various tests to measure airway inflammation and/or constriction, including bronchodilator-induced bronchodilation, induced sputum* and/or bronchial and bronchoalveolar lavage*.
10. Assessment of environmental hazards in occupational allergy and knowledge of live insect sting challenges.
11. Management of exclusion diets and provocation diets.
12. Knowledge of and ability to interpret measurements of immune function, including serum immunoglobulin levels, IgG subclass levels, pre and post-immunization antibody titers, isohemagglutinin titers, and other ancillary tests for use in the differential diagnosis of congenital or acquired humoral immunodeficiency.
13. Measurement and interpretation of laboratory tests to diagnose hereditary angioedema and complement deficiencies.
14. Measurement of phagocytic function.
15. Interpretation of electrocardiograms, chest radiographs, computerized tomography scans and magnetic resonance images of the chest and sinuses, and interpretation of the main laboratory tests (blood, serum, microbiological, urine, fecal tests).

Attitudes

1. Ability to work with colleagues in other disciplines.
2. Appreciation of the scope and limitations of allergy testing.
3. Appreciation of the limitations and problems created by so-called complementary medicine or alternative allergy practices.
4. Understanding of the role of patient support groups and ability and willingness to work with patient support organizations.
5. Appreciation of all the issues relating to patient confidentiality and the ethical standards expected of all physicians.
6. Understanding of research protocols, the ethics of experimental design, data analysis, bio-statistics, good clinical practice, and good laboratory practice, and a willingness to become involved in either clinical or basic translational research.
7. Knowledge of the country-specific legal framework for the reporting of occupational diseases and assisting patients in obtaining compensation for occupational diseases.
8. An ability to be a clinical decision maker, communicator, collaborator, manager, healthcare advocate, and scholar.

*Some of these skills should be at least taught and understood by the trainee but may not be performed personally, in accordance with national guidelines and established practice parameters.

Implementation of Training

A minimum of 24 months of training is necessary in an accredited clinical allergy and immunology training program. Depending on past training, further experience may be desirable in chest medicine, dermatology, gastroenterology, otorhinolaryngology, and basic immunology. A minimum of 6 weeks of training in an immunology laboratory is recommended. Additional desirable components of training include experience in research and teaching at either or both the undergraduate and postgraduate level.

The trainee should have training in evidence-based medicine, research study design, data analysis, biostatistics, and critical review of the literature.

Cross-training in both adult and pediatric allergy is preferred during the 24-month training program.

Where possible, a LogBook for documentation and proof of training should be required to qualify as an allergy specialist. Allergy training can be altered in accordance with national guidelines. Specialized centers are required in many situations for the care of patients with primary and secondary immunodeficiency diseases; therefore, special training of the allergist/immunologist in this area of expertise is necessary, and should be undertaken at institutions where appropriate training is available.

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