

News and commentaries

Allergy and Clinical Immunology Services in Europe*

Allergology and Clinical Immunology (ACI) is an area of clinical medicine with a precise identity, relevant recent scientific achievements and well-defined educational and professional needs.

In spite of the high individual and socio-economic impact of allergic diseases in Europe, the organization of ACI services is imperfect and varies among countries according to their health policies and priorities.

In the firm belief of the role of ACI specialists in addressing clinical issues related to the involvement of the immune system in health and diseases—such as vaccination, immunodeficiencies, susceptibility and response to microbial agents, autoimmune and allergic diseases, immune aspects of transplantation and malignancies, *in vivo* and *in vitro* immunological tests, vaccinations, immuno-modifiers—the European Academy of Allergology and Clinical Immunology appointed an ad hoc Task Force to produce standards for ACI Services in Europe.

The resulting position paper should be used as a consulting reference for National Health Services as a necessary pre-requisite for the free circulation to patients and health care professionals.

**S. Bonini¹, I.J. Ansotegui²,
S. Durham³, A.J. Frew⁴, J. Lötvald⁵,
K. Nekam⁶, T. Popov⁷, R. Dahl⁸,
J. Gayraud⁹, R. Gerth van Wijk¹⁰,
K. Kontou-Fili¹¹, M. Kowalski¹²,
A. Todo-Bon¹³, U. Wahn¹⁴**

¹Second University of Naples and INMM-CNR, Rome, Italy; ²Department of Allergy and Immunology, Santiago Apóstol Hospital, Santiago, Spain; ³Department of Allergy and Clinical Immunology, Imperial College, National Heart and Lung Institute, London, UK; ⁴Inflammation and Repair Division, School of Medicine, University of Southampton, Southampton General Hospital Infection, Southampton, UK; ⁵Department of Respiratory Medicine and Allergology, Göteborg University, Gothenberg, Sweden; ⁶Department of Allergy and Clinical Immunology, Polyclinic of the Hospital Brothers of St. John of God, Budapest, Hungary; ⁷Clinical Center of Allergology, Medical University of Sofia, Sofia, Bulgaria; ⁸Department of Respiratory Diseases and Allergology, Aarhus University Hospital, Aarhus, Denmark; ⁹UEMS Allergology and Clinical Immunology Section, Tarbes, France; ¹⁰Department of Allergology, University Hospital Rotterdam, Rotterdam, the Netherlands; ¹¹Dept of Allergology and Clinical Immunology, Division of Internal Medicine, LGD Hospital of Athens, Athens, Greece; ¹²Department of Clinical Immunology and Allergy, Medical university of Lodz, Lodz, Poland; ¹³Servicio Inmunoalergia, Centro de Pneumologia, University de Coimbra, Coimbra, Portugal; ¹⁴Department of Dermatology and Allergy, Allergy Centre Charité, Universitätsmedizin Berlin, Berlin, Germany.

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Drafting group: S. Bonini (Chairman), I.J. Ansotegui; S. Durham; A.J. Frew; J. Lötvald; K. Nekam; T. Popov

Task Force members: R. Dahl; J. Gayraud; R. Gerth van Wijk; K. Kontou-Fili; M. Kowalski; A. Todo-Bon; U. Wahn.

Prof. Sergio Bonini
Internal Medicine
Second University of Naples
INMM-CNR 100 Via Fosso del Cavaliere
00133 Rome
Italy

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History and background

Allergology and Clinical Immunology (ACI) is an area of clinical medicine with a precise identity which deals with maintenance of the healthy state as well as with diagnosis, prevention and treatment of several diseases caused by over or under – activity of the immune system that have high individual and socio-economic impact.

Allergology and Clinical Immunology – which found its origins in the first half of the twentieth century – was revolutionized in the 1960s by the fundamental discoveries on the structure and functions of the immune system, immunodeficiencies and allergic hypersensitivity reactions responsible for clinical diseases (1). At present, ACI represents one of the areas of medicine which underwent most significant scientific development, as documented by the number of discoveries, scientific publications and Nobel Prizes awarded.

Allergology and Clinical Immunology is not an organ specialty (such as Respiratory Medicine, Gastroenterology, etc.) and does not refer to specific diseases but to individuals (2). Certainly, several diseases that may involve the immune system such as diabetes, asthma or glomerulonephritis, are treated competently by organ-based specialists. However, only ACI specialists have the professional education required for facing the clinical issues related to the involvement of the immune system in health and disease, such as vaccination, immunodeficiencies, susceptibility and response to microbial agents, autoimmune and allergic diseases, immune aspects of transplantation and malignancies. Moreover, a large number of diagnostic *in vivo* and *in vitro* techniques are based on the interaction between antigens and antibodies (such as skin tests with tuberculin, microbial agents, professional and environmental allergens; immunoassays for hormones and infectious agents; flow-cytometry, etc.). This requires specific methodological competences for their performance and interpretation. Finally, several treatments (vaccines, immune-modifiers, cancer therapies, etc.) require a good understanding of the function and manipulation of the immune system.

Accordingly, ACI is a broad clinical specialty which relates to 100% of European citizens, from birth to elderly, as well as to relevant environmental and socio-economic issues of our Society (3).

The present situation in Europe

Allergology and Clinical Immunology is part of the core curriculum of undergraduate students in Medicine in all European Countries. At postgraduate level, there is a consensus on having specific professional education in ACI. However, in some countries ACI represents a full specialty, in others a subspecialty and in others a professional competence (Table 1).

In each European Country there is a scientific society dealing with ACI. All National European Societies refer to the European Academy of Allergology and Clinical Immunology (EAACI, <http://www.eaaci.net>) which is part of the International Association of Allergology and Clinical Immunology – World Allergy Organization (IAACI-WAO, www.worldallergy.org). ACI Societies have been working in a very close collaboration with national and international regulatory bodies to produce standards for health care such as disease guidelines, measures of environmental control, socio-economic issues, etc. Moreover, patients suffering from allergic and immunologic diseases have gathered in well-established societies harmonized and coordinated by supranational grouping such as EFA.

For all the above reasons, ACI is currently considered to be a health and scientific priority and a large number of projects and networks of excellence have been recently funded with massive investments by the European Union within the fifth and sixth Framework Programmes (4). On the other hand, at the level of health care, the organization of ACI is imperfect and there is an ongoing debate about which areas should be covered by the specialty (5–7). Although ACI Services exist in all European countries, their area of competence, structuring, autonomy and recognition by the National Health System is heterogeneous among countries and sometimes even within the same country (Table 1).

The current situation has some inconveniences:

1 The large amount of new scientific information and progress in ACI produced by the scientific environment has not so far translated into better clinical care. ACI represents one of the best clinical examples of what has been referred to as ‘Lost in Translation’ (8).

2 The lack of a well-defined professional specialty training and career structure has reduced the attractiveness of the specialization and, therefore, the number of specialists in ACI.

3 As a consequence, important issues relating to the maintenance of the healthy state (vaccination, environmental control, etc.) as well as the management of the extremely large and increasing number of patients with allergic and immunologic diseases are referred to different area specialists. For example whereas it is highly appropriate that pneumologists are responsible for the pharmacotherapy and acute hospital management of acute life-threatening asthma, the global input from a consultant allergist is valuable for the identification and treatment of underlying causes of asthma. Similarly ENT doctors may evaluate rhinitis whereas the allergist should be responsible for instigating allergy diagnosis environmental control measures and where appropriate, allergen immunotherapy. The same principles apply to the dual role of allergists and dermatologists in the management of atopic eczema.

Table 1. Clinical immunology, rheumatology, oncology, pneumology, ENT, dermatology, ophthalmology, infectious diseases, paediatrics, internal medicine, laboratory medicine, pathology (depending on the country)

Country	Do services exist?	Are they Autonomous? Linked to?1		Area covered (or suggested as to be covered)								
				CI	L	A	AD	ID	T	C	I	EH
Albania	X	X		X								X
Austria	X	X				X		X		X		X
Belgium	X	X	X	X	X	X	X	X				
Bulgaria	X	X				X	X	X				X
Croatia	X	X				X	X	X	X	X	X	X
Czechia	X	X				X	X	X	X			
Denmark	X		X	X	X	X		X				X
Finland	X	X		X	X	X	X	X	X	X	X	X
France	X	X	X			X	X	X	X	X		X
Greece	X	X		X	X	X	X	X				X
Germany	X	X	X			X	X	X				
Holland	X	X		X	X	X	X	X	X		X	X
Hungary	X	X				X	X	X	X	X	X	X
Iceland		X		X	X	X	X	X	X	X	X	X
Italy	X	X	X	X	X	X	X	X	X	X	X	X
Macedonia			X			X	X		X	X	X	X
Norway	X		X	X	X	X	X	X				X
Poland	X	X				X						
Portugal	X	X	X			X	X	X				
Romania	X	X				X	X	X	X	X	X	X
Russia	X	X				X	X	X	X	X	X	
Serbia & MN	X		X			X	X		X		X	X
Slovenia	X		X			X	X		X		X	X
Spain	X	X				X	X	X				X
Sweden	X	X		X	X	X						
Switzerland	X	X				X	X	X	X			
Turkey	X	X				X		X				
UK	X		X	X	X	X						
Ukraine	X	X				X	X	X	X	X	X	X

CI, clinical activities; L, laboratory; A, allergy; AD, autoimmune diseases; ID, immunodeficiencies; T, transplantation immunology; C, cancer immunology; ID, infectious diseases; EH, environmental health

Furthermore these diseases frequently co-exist and the absence of the global expertise offered by an allergist, which complements the individual specialty approach, is detrimental for individuals and increases the costs for the community, not least because multiple consultations are otherwise required.

The objective of the EAACI Task Force on Allergy Services

On the basis of the above considerations, the EAACI felt the need to appoint a Task Force aimed at producing standards for ACI Services to be used as a unique consulting reference for National Health Services (NHS) in their autonomous planning of health organization. This should result in a more homogeneous structure of ACI Services in Europe, a necessary prerequisite for the free circulation of patients and healthcare professionals.

General principles for structuring of ACI Services

The organization of health services in each European Country varies according to the health policy and priorities of individual States as well as on resources, epidemiological and socio-economic issues, and the existing organization of other areas of medicine. Accordingly, no rigid criteria should be defined but a flexible framework, to be adapted by individual NHSs.

This document will address the Areas to be covered by ACI Services, the different levels at which ACI issues should be addressed, indicate the minimal requirements for each organizational level. Individual Health Services will adapt the number and type of ACI Services for each level and depending on regional differences. An example of national documents which should stem from the general guidelines provided by EAACI are represented by the actions taken in UK (9).

Areas to be covered by ACI Services

The following areas are considered within the competence of ACI specialist although there is no consensus among Countries and other specialists will also be involved in some of these areas, depending on the organization of NHSs:

Diseases

Allergic diseases

Allergic asthma; allergic rhinitis; allergic eye diseases; urticaria, eczema, allergic skin diseases and anaphylaxis represent the most frequent conditions which affect *c.* 25% of the general population. These conditions are often present together or subsequently in the same individual, thus requiring a comprehensive approach for diagnosis and treatment. Within allergic diseases, food, drug, insect venom and occupational allergy represent areas requiring the specific competences of an ACI specialist.

Autoimmune diseases

Nonorgan specific autoimmunity (Rheumatoid arthritis, Systemic Lupus erythematosus, Scleroderma, etc.). Organ-specific autoimmunity (Type I diabetes, autoimmune thyroiditis, other autoimmune endocrine diseases, etc.).

Immunodeficiencies

Whilst primary immunodeficiencies mainly refer to the paediatric field, secondary immunodeficiencies – such as AIDS or drug-induced IDFs – also occur in adults.

Malignancies

Apart from immunoproliferative diseases (some leukaemias, myeloma, mastocytosis, etc.) some malignancies as well as cytostatic treatment significantly affect the immune system and increase susceptibility to infections.

Transplantation

Selection of patients for organ transplantation as well as monitoring of transplanted patients involve issues of primary competence for ACI specialists.

Diagnostic techniques

Both *in vivo* and *in vitro* diagnostic techniques are based on the antigen–antibody reaction and/or phenotypic and functional studies of cells of the immune system.

The most commonly used *in vivo* tests include:

- Skin tests (allergy prick tests, patch test for contact and professional dermatitis, tuberculin tests, tests for immunodeficiencies).
- Provocation tests with allergen (bronchial, nasal, conjunctival).
- Imaging techniques with labelled antigen or antibody.
- Clinical examination as well as functional and imaging studies of targets of the allergic reaction (spirometry, non-specific provocation, etc.)

Laboratory techniques that request expertise in their interpretation by ACI specialists include:

- Immunoassays for detection of antigens and antibodies; flow cytometry; cytology (immunohistochemistry, immunofluorescence, etc.); functional studies of immune cells.

Treatments

The following treatments have primary or profound effects (1) on the immune system:

- Vaccines-Allergen immunotherapy (desensitisation) in patients with IgE-mediated disease-Microbial products (such as CpG, M. Vaccae, etc.)-Anti-allergic drugs-Immune-response modifiers-Immunoglobulin treatment -Cytokines and Growth Factors-Anti-neoplastic drugs.

Adverse reactions to drugs often have an immunological basis.

Additional tasks

Additional tasks for ACI Services should include:

- 1 *Educational activities* ACI should be taught to all undergraduate and post-graduate medical students as well as biologists, pharmacists, nurses and laboratory technicians and this should be guaranteed by adequate structures in all academic and teaching hospitals. Since ACI is part of the health care of the entire population, General Practitioners need to have Continuing Medical Education in ACI. The task of the ACI specialist is to ensure that this happens and, where appropriate, to inform and/or deliver such educational activities. The provision of accurate information to the public is best addressed by the patient-oriented charitable organization with strong professional input and advice from ACI Services.
- 2 *Monitoring of environment* Allergic and immunologic diseases are not only influenced by occupational environment, but also by diet, exercise, life style and outdoor and indoor pollution. ACI Services should

ensure that relevant factors influencing health and disease are monitored and should contribute to the promotion of healthy lifestyles and environments.

- 3 *Consulting and Advisory Role* ACI specialists should provide consulting and advisory services for decisions related to environmental measures and socio-economic choices affecting allergic and immunologic diseases.

Levels of organization and minimal requirements

Many patients with mild allergic disease will self medicate or seek advice from the internet, from pharmacies or GPs and other community-based medical information services.

We recognize that the boundaries between community and specialist services vary in different countries and we are not going to discuss community based provision further within this document.

Level I

Level I refers to services offered at peripheral level and includes both Specialist Units for outpatients referred to them by GPs and peripheral hospitals with divisions of Internal Medicine and/or Paediatrics.

Allergy and Clinical Immunology Specialist Units should handle patients with allergic and immunologic diseases having a high prevalence in the population providing all tests needed for basic diagnosis or clear indications on referral places for further diagnostic evaluation. They should be able to anticipate all ACI disease, request and interpret the results of all diagnostic tests needed and guide the treatment and follow-up of patients by the general practitioner.

The number and location on the territory of ACI Specialists Units should be based on the local prevalence of ACI diseases as well as on other organizing and regional considerations.

All Divisions of Medicine and Paediatrics of Peripheral Hospitals (1) should have a specialist in ACI acting as a consultant for both inpatient and outpatient care.

All diagnostic and therapeutic services not provided by the peripheral hospital should be referred to a well-defined Level II centre.

Level II

Level II refers to ACI Services of Central Hospitals with multiple divisions and centralized laboratory facilities.

All Central Hospitals should have an ACI Service, provided in collaboration with other hospital services, offering all diagnostic and therapeutic options for patients with allergic and immunologic diseases. The centralized laboratory should provide all diagnostic tests required for each area of ACI diseases.

Level III

In addition to services provided at Level II ACI Services of Regional Hospitals assigned to Level III should:

- Have a data bank of all Level I and Level II ACI Services with documentation of the personnel and services available;
- Provide quality control of ACI Services of Level I and II;
- Represent a source of epidemiological data of ACI diseases;
- Offer referral service for special techniques or treatment not possible at Central Hospitals; Provide or coordinate environmental monitoring of the territory;
- Give advice to local authorities about environmental measures to be taken, drug and diagnostic test reimbursement policies, etc.; Provide CME to health professionals in ACI;
- Coordinate epidemiological surveys, clinical trials, drug surveillance.

Level IV

Centres of excellence for ACI should be established at National Level in academic centres or research hospitals. They should have research facilities and coordinate national networking of regional centres.

Undergraduate and Postgraduate teaching as well as CME is assured by Level IV ACI Centres of Excellence that should also offer an advisory support for national health policy in ordinary matters (research and medical practice priorities, reimbursement policy, etc.) as well as in occasional emergencies (AIDS, SARS, bioterrorism, etc.).

All European Level IV ACI Excellence Centres should be part of a permanent Network aimed at achieving harmonized guidelines and standard parameters of service throughout Europe.

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