



UNION EUROPÉENNE DES MÉDECINS SPÉCIALISTES EUROPEAN UNION OF MEDICAL SPECIALISTS

Association internationale sans but lucratif International non-profit organisation

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Training Requirements for the Specialty of Allergology

European Standards of Postgraduate Medical Specialist Training

(old chapter 6)

Preamble

The UEMS is a non-governmental organisation representing national associations of medical specialists at the European Level. With a current membership of 37 national associations and operating through 43 Specialist Sections and European Boards, the UEMS is committed to promote the free movement of medical specialists across Europe while ensuring the highest level of training which will pave the way to the improvement of quality of care for the benefit of all European citizens. The UEMS areas of expertise notably encompass Continuing Medical Education, Post Graduate Training and Quality Assurance.

It is the UEMS' conviction that the quality of medical care and expertise is directly linked to the quality of training provided to the medical professionals. Therefore, the UEMS committed itself to contribute to the improvement of medical training at the European level through the development of European Standards in the different medical disciplines. No matter where doctors are trained, they should have at least the same core competencies.

In 1994, the UEMS adopted its Charter on Post Graduate Training aiming at providing the recommendations at the European level for good medical training. Made up of six chapters, this Charter set the basis for the European approach in the field of Post Graduate Training. With five chapters being common to all specialties, this Charter provided a sixth chapter, known as "Chapter 6", that each Specialist Section was to complete according to the specific needs of their discipline.

More than a decade after the introduction of this Charter, the UEMS Specialist Sections and European Boards have continued working on developing these European Standards in Medical training that reflects modern medical practice and current scientific findings. In doing so, the UEMS Specialist Sections and European Boards did not aimed to supersede the National Authorities' competence in defining the content of postgraduate training in their own State but rather to complement these and ensure that high quality training is provided across Europe.

At the European level, the legal mechanism ensuring the free movement of doctors through the recognition of their qualifications was established back in the 1970s by the European Union. Sectorial

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Directives were adopted and one Directive addressed specifically the issue of medical Training at the European level. However, in 2005, the European Commission proposed to the European Parliament and Council to have a unique legal framework for the recognition of the Professional Qualifications to facilitate and improve the mobility of all workers throughout Europe. This Directive 2005/36/EC established the mechanism of automatic mutual recognition of qualifications for medical doctors according to training requirements within all Member States; this is based on the length of training in the Specialty and the title of qualification.

Given the long-standing experience of UEMS Specialist Sections and European Boards on the one hand and the European legal framework enabling Medical Specialists and Trainees to move from one country to another on the other hand, the UEMS is uniquely in position to provide specialty-based recommendations. The UEMS values professional competence as *“the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served”*¹. While professional activity is regulated by national law in EU Member States, it is the UEMS understanding that it has to comply with International treaties and UN declarations on Human Rights as well as the WMA International Code of Medical Ethics.

This document derives from the previous Chapter 6 of the Training Charter and provides definitions of specialist competencies and procedures as well as how to document and assess them. For the sake of transparency and coherence, it has been renamed as “Training Requirements for the Specialty of X”. This document aims to provide the basic Training Requirements for each specialty and should be regularly updated by UEMS Specialist Sections and European Boards to reflect scientific and medical progress. The three-part structure of this documents reflects the UEMS approach to have a coherent pragmatic document not only for medical specialists but also for decision-makers at the National and European level interested in knowing more about medical specialist training.

Definition of the specialty

Allergology is the specialty that deals with the diagnosis, the comprehensive management and prevention of allergic and hypersensitivity diseases. The specialty does not only deal with single-organ diseases, but it applies by definition to systemic diseases. Therefore, a systemic approach to allergic and hypersensitivity diseases has to be the major component of education and training of residents in Allergology. Depending on national regulations, specialists in Allergology may also be involved in the diagnosis and care of immune deficiencies and auto-immune diseases (Clinical Immunology).

¹ Defining and Assessing Professional Competence, Dr Ronald M. Epstein and Dr Edward M. Houndert, Journal of American Medical Association, January 9, 2002, Vol 287 No 2

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Scope of the specialty

The worldwide rising prevalence of allergic diseases, underwrites the significance of the specialty focused on allergy. Allergy is an unwanted immunologically mediated hypersensitivity reaction to triggers/stimuli, such as proteins from pollens, mites, animals, molds, food, insects, drugs etc. Such antigens stimulating hypersensitivity mediated by an immunologic mechanism are referred to as allergens. Many allergies are IgE mediated, others are cell mediated, but non-allergic hypersensitivity reactions may also occur apparently without any immunological involvement. Allergy may manifest in many organs i.e. upper and lower airways, skin and gut with anaphylaxis as an extreme example of multi-organ involvement. For these reasons, the care of allergic patients requires thorough understanding of immunological mechanisms, biological and molecular characteristics of allergens and the environmental context of allergen exposure such as climate and housing conditions, pollution, microbial background, occupational aspects, specific hobbies. Involvement of different organ systems and comorbidities requires an overarching approach when diagnosing and treating patients with allergic diseases. Allergologists have a unique expertise in the diagnosis and management of food, insect, drug and occupational allergy and competence in therapeutic interventions as allergen avoidance measures, allergy immunotherapy (including allergen immunotherapy and treatment with biologicals, Calderon 2013) and drug desensitization. Specialists need to manage the allergic aspects of rhinoconjunctivitis, asthma and atopic dermatitis. Also, diseases like urticaria, angioedema, and mastocytosis are part of the clinical practice of the allergologist. Allergologists need to be trained in the management of anaphylaxis. In addition, allergists also deal with non IgE mediated disorders including non allergic rhinitis, idiopathic anaphylaxis; and with urticaria and angioedema, which may be allergic but when chronic are usually non allergic. Allergists have a role in excluding allergy as a cause of disease eg excluding allergy as a cause of rhinitis, urticaria or angioedema; or excluding drug allergy eg suspected antibiotic or local anaesthetic allergy.

Furthermore, the allergologists need to have knowledge about strategies to prevent allergies. Finally, the specialists should be able to educate patients in the management and prevention of allergic and hypersensitivity diseases.

A basic knowledge of immunological diseases such as immune deficiencies and auto-immune disease is required. Depending on national requirements the specialists may need to be trained in practical skills and acquire a more profound knowledge on these diseases to be able to manage patients with immunologic diseases.

Allergology in Europe

The training requirements of the specialty of Allergology have been established in 1994 and amended in 1997, 2001, 2002 and 2003. The requirements are published in 2004(1)

In 2013 a model of a well-structured collaboration between allergologists and other specialists involved in the care of allergic patients has been described(2). This blueprint proposes the concept of allergy centres providing a platform for collaboration between allergologists and other specialists and a facility for a multidisciplinary approach.

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According to a recent survey 19 out of 28 EU member states have an independent specialty of Allergology(3). In 4 member states the care of allergic patients is covered by subspecialists in Allergology only. In 5 EU member states no specialty or subspecialty in Allergology is present (table 1). In the table non-EU member states but full member of the UEMS are also shown.

Table 1. Specialties and subspecialties in Europe

| Specialty | Subspecialty only | No specialty or subspecialty |
|--|-------------------------------------|-----------------------------------|
| Bulgaria | Finland | Austria |
| Croatia | Germany | Belgium |
| Cyprus | Latvia | Denmark |
| Czech Republic* | Netherlands* | Ireland |
| Estonia* | Iceland* (non EU; full UEMS member) | Malta |
| France | Hungary* | Norway (non EU; full UEMS member) |
| Greece* | | |
| Italy* | | |
| Lithuania* | | |
| Luxembourg | | |
| Poland | | |
| Portugal* | | |
| Romania* | | |
| Slovakia* | | |
| Slovenia | | |
| Spain | | |
| Sweden | | |
| United Kingdom | | |
| Switzerland* (non EU; full UEMS member) | | |

*Countries with a specialty or subspecialty of Allergology and Clinical Immunology

In previous publications the specialty is named as specialty of Allergology and Clinical Immunology. At a European level all recognized specialties are listed in Annex V. In addition, countries with the specialty can decide to be listed on Annex V. Free movement of specialists is possible between those countries listed on Annex V. As Annex V comprises the specialty of Allergology only, the official name of the specialty is Allergology. However, at a national level the specialty of Allergology is associated with Clinical Immunology and named specialty or subspecialty of Allergology and Clinical Immunology in some countries. This applies for the Czech Republic, Estonia, Greece, Hungary, Iceland, Italy, Lithuania, the Netherlands, Portugal, Romania, Slovakia and Switzerland (Fyrquist 2018). For this reason, Clinical Immunology is covered by this ETR as an optional part of the training. Training in

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Clinical Immunology, however, may differ from country to country. Training may comprise the whole spectrum of clinical immunological diseases or be limited to immune deficiencies, whereas in other countries a small amount of exposure to immune deficiency and auto immunity is included in the program. This ETR basically focus on Allergology, but respects national initiatives towards inclusion of (parts) of Clinical Immunology as long as training requirements for the discipline of Allergology are met.

The vision of the UEMS Section and Board (S&B) of Allergology and the European Academy of Allergy and Clinical Immunology (EAACI) is to promote and to establish a full specialty of Allergology in all European countries. As in some European countries a full specialty does not exist, a taskforce of the S&B Allergology and EAACI has established the minimal requirements for training and certification of subspecialists in Allergology (Gerth van Wijk 2018). Separately, the training in tertiary care for paediatric allergologists has been described in the European Syllabus in Paediatric Allergology as approved by the European Board of Paediatrics and UEMS.

Establishment of the ETR Allergology

The establishment of this ETR is a 3-step process.

1. The UEMS S&B of Allergology has designated the task of writing a draft ETR to a working group consisting of the following members:
Roy Gerth van Wijk, chair and president of the S&B Allergology, past president of EAACI
Norbert Mülleneisen, secretary of the S&B Allergology
Pascal Demoly, training director in Allergology Montpellier, France, 2011-2015 EAACI vice-president for education and specialty
Peter Schmid-Grendelmeier, training director in Allergology Zurich, Switzerland, vice-president of Education EAACI
Jose Maria Olaguibel, board member S&B, training director Allergology Spain, president of the Spanish Ministry of Health National Commission for Allergology, member Executive Committee EAACI
Todor Popov, allergologist from Bulgaria
Olympia Tsilochristou, allergologist in the UK, past chair Junior Members of the EAACI.
2. Consultation and review by the UEMS S&B of Allergology
3. Consultation and review by EAACI:
 - a. The EAACI Specialty committee comprising representatives of the EAACI sections: Asthma, Dermatology, ENT, Immunology, Paediatrics, JMA (Junior members) and National Allergy Societies
 - b. The National Allergy Society Committee of EAACI consisting of representatives of all Allergy Societies in Europe.

The current ETR uses the old chapter VI text on training requirements and the paper entitled “Objectives of training and specialty training core curriculum in Allergology and clinical Immunology” (Malling 2004) as starting point.

I. TRAINING REQUIREMENTS FOR TRAINEES

1. Content of training and learning outcomes

Competencies required of Trainees

The competences of physicians for optimal care are described in the CanMEDS framework (Frank 2007) (4) (3) (2) (i.e. medical expert, communicator, collaborator, leader, health advocate, scholar and professional) and should apply for all physicians at all disciplines and hence to allergy specialists and subspecialists.

http://canmeds.royalcollege.ca/uploads/en/framework/CanMEDS%202015%20Framework_EN_Reduced.pdf

In general, competence in medicine should comprise 3 different dimensions: 1) cognitive: acquiring and using knowledge to solve real-life problems, 2) relational: communicating effectively with patients and colleagues, 3) affective: willingness, patience and awareness to use knowledge and skills to serve the patient.

When applying the competences as described in the CanMEDS framework to the allergologist, the specialist should be:

A medical expert in the field. The allergologist has the necessary knowledge and skills to adequately manage patients with allergic and hypersensitivity and certain non allergic diseases. As Allergology is multidimensional and multidisciplinary, the specialist has relevant knowledge and skills beyond single-organ systems and specific age groups. Knowledge and skills are integrated and implemented into daily clinical practice. The allergologist is skilled in clinical reasoning. Diagnostic and therapeutic procedures and interventions are carried out according to the principles of evidence based and cost-effective medicine. Unnecessary or harmful investigations or treatment need to be avoided. The specialist follows national and international guidelines. The specialist is aware of his or her strengths but also recognizes the limitations of knowledge and skills and refers the patient to other specialists when appropriate. The allergologist keeps his or her knowledge and skills up-to-date.



Key general competencies to be achieved here are:

- Practise medicine within their defined scope of practice and expertise.

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- Perform a patient-centred clinical assessment and establish a management plan.
- Plan and perform procedures and therapies for the purpose of assessment and/or management.
- Establish plans for ongoing care and, when appropriate, timely consultation.
- Actively contribute, as an individual and as member of a team providing care, to the continuous improvement of health care quality and patient safety.

A communicator. The allergologist is able to listen carefully and to obtain and synthesize relevant information from patients and families. He or she is able to establish an effective dialogue with patients and gives appropriate feedback. The specialist understands that factors as age, gender, disability, ethnicity, cultural and social background may have an influence on the patient's history, relationships and ability to comply with a therapeutic interventions. The specialist is able to guide and educate patients with regard to disease, its treatment, risk factors and prevention of disease. The allergologist establishes a relationship with trust, understanding and compassion. Shared decision making is a part of the therapeutic relation with the patient.

In other health care situations, the allergologist is able to communicate effectively with colleagues and other health care providers. He or she can present relevant information clearly, concisely and accurately both written or orally to maintain an efficient dialogue with patients and others.

Key general competencies to be achieved here are:

- Establish professional relationships with patients and their families.
- Elicit and synthesize accurate and relevant information, incorporating the perspectives of patients and their families.
- Share health care information and plans with patients and their families.
- Engage patients and their families in developing plans that reflect the patient's health care needs and goals.
- Document and share written and electronic information about the medical encounter to optimize clinical decision-making, patient safety, confidentiality, and privacy.

A collaborator.

Taking the systemic nature of allergy and allergic diseases into account the allergologist will work at the interface of different medical disciplines. The specialist is therefore able to work efficiently and in partnership with other healthcare professionals. He or she is able to act in multidisciplinary settings. The specialist is able to understand and value the roles, opinions and contributions of other health-care professionals. If appropriate, care of patients can be safely handed over to colleagues and other health care professionals.

Key general competencies to be achieved here are:

- Work effectively with physicians and other colleagues in the health care professions.
- Work with physicians and other colleagues in the health care professions to promote understanding, manage differences, and resolve conflicts.

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- Hand over the care of a patient to another health care profession to facilitate continuity of safe patient care.

A leader

The allergologist has a vision about his or her role and position in the health care organisation. In that position the specialist is responsible for the care of allergic patients and aims to take the lead in matters regarding allergy. The allergologist aims to optimise allergy care within the framework of health care. At a management level the specialist is able to lead his own practice and supporting personnel. For that purpose the allergologist has management skills in organisation and co-ordination of care.

Key general competencies to be achieved here are:

- Contribute to the improvement of health care delivery in teams, organizations, and systems.
- Engage in the stewardship of health care resources.
- Demonstrate leadership in professional practice.
- Manage career planning, finances, and human resources in a practice.

A health advocate

The allergologist will advocate health promotion for allergic patients both in the own practice and at a general level. This can be done individually or by the scientific/professional organisations in the field of allergy.

The allergologist will be able to identify determinants of health for a management and prevention plan and ensure that patients are able to access appropriate health and social services in the management of individual patients. The specialist will identify patient groups at risk for allergic disease and its complications and apply available knowledge about primary and secondary prevention. The allergologist will identify issues and opportunities for improving allergy health care at a general level.

Key general competencies to be achieved here are:

- Respond to an individual patient's health needs by advocating with the patient within and beyond the clinical environment.
- Respond to the needs of the communities or populations they serve by advocating with them for system-level change in a socially accountable manner.

A scholar

The allergologist must undertake a lifelong learning in Allergology. Apart from self-learning, the specialist must contribute to the education of students, patients, colleagues and the general public. He or she should appraise the sources of medical information critically and understand the importance of ongoing research, participate and contribute to research.

Key general competences to be achieved here are:

- Engage in the continuous enhancement of their professional activities through ongoing learning.
- Teach students, residents, the public, and other health care professionals.

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- Integrate best available evidence into practice.
- Contribute to the creation and dissemination of knowledge and practices applicable to health.

A professional

The allergologist is committed to deliver the highest care possible to the allergic patient. Care should be carried out according to medical ethical standards including the use of informed consent, advanced directives, research ethics and respect for the autonomy of the patient.

Key general competencies to be achieved here are:

- Demonstrate a commitment to patients by applying best practices and adhering to high ethical standards.
- Demonstrate a commitment to society by recognizing and responding to societal expectations in health care.
- Demonstrate a commitment to the profession by adhering to standards and participating in physician-led regulation.
- Demonstrate a commitment to physician health and well-being to foster optimal patient care.

a. Theoretical knowledge

Trainees should be knowledgeable about basic immunology, genetics/epigenetics and epidemiology, allergens, clinical expression, diagnosis and therapy of the disorders dealt with by an allergologist. Furthermore, trainees should be familiar with the principles of performing research. The topics are listed in **appendix 1**.

Trainees successfully taking the EAACI/UEMS Knowledge Exam, have the theoretical knowledge of allergy/immunology topics as described in the related Catalogue which is proposed to the participants in the Exams (Sixth version, 2/2013). These exams must be considered as an excellent tool to test one's theoretical knowledge in the field of allergology and knowledge of clinical immunology, the latter tailored to the importance of clinical immunology in the national curricula.

b. Practical and clinical skills

b.1. Allergology

All trainees need to have detailed practical and clinical skills in the following areas (see for a detailed description **appendix 2**):

The history and diagnosis and management of allergic diseases:

- Comprehensive and structured history taking
- In vivo investigations
- In vitro investigations
- management

Clinical conditions:

- Upper airways: allergic and non-allergic rhinitis, rhinoconjunctivitis, rhinosinusitis and nasal polyps
- Conjunctivitis, keratoconjunctivitis
- Asthma
- Occupational, irritant or work-exacerbated rhinitis or asthma
- Allergic bronchopulmonary aspergillosis (ABPA)
- Hypersensitivity pneumonitis or extrinsic allergic alveolitis
- Atopic dermatitis
- Contact dermatitis
- Work-related contact dermatitis
- Urticaria (allergic and non-allergic)
- Angioedema
- Food allergy and other forms of food hypersensitivity
- Drug allergy and other forms of drug hypersensitivity
- Insect allergy
- Anaphylaxis (allergic and idiopathic)
- Eosinophilic esophagitis and eosinophilic gastro-enteritis
- Mastocytosis and mast cell associated syndrome (MCAS)

Specific interventions:

- Allergen avoidance
- Allergen immunotherapy
- Non-allergen immunotherapy (Biologicals)
- Pharmacotherapy
- Prevention of allergy
- Drug desensitization

b.2. Clinical immunological diseases

All trainees should have some basic knowledge of the presentation of clinical immunological diseases. A more detailed diagnosis and management of patients with clinical immunological diseases is optional and should be tailored to the regulations and training requirements in those countries that recognize Allergology and Clinical Immunology as one specialty. These disorders may comprise: immune deficiencies, systemic immune diseases, vasculitis and other inflammatory disorders. See also **appendix 2**

2. Organisation of training

a. Schedule of training

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The Allergology specialty training program must be preceded by a basic medical training according to national rules.

The duration of training in Allergology should be a minimum of 5 years.

Two years minimum of Common Trunk to provide broad general medicine experience (preferably in the first two years)

24 months Internal Medicine including both adult and pediatric aspects

Options: Clinical Pharmacology, Epidemiology, Occupational and Environmental medicine, Emergency medicine/Intensive care, Ophthalmology, Infectious diseases

Three years minimum (preferably in the final three years)

24-30 months Allergology in accredited institutions

2-3 months Immunology Laboratory oriented in accredited institutions

2-3 months Dermatology, 2-3 months Pulmonology, and 2-3 months Oto-Rhino-Laryngology in accredited institutions

Training in adjacent specialties should be focused on achieving the relevant competences required for the (differential) diagnosis and management of patients with allergic diseases.

b. Assessment and evaluation

Definition of assessment, description of formative and summative assessments,

Assessment: Process by which information is obtained relative to some known objective or goal. (a broad term that includes testing)

Evaluation: Inherent in the idea of evaluation is "value." Process designed to provide information that will help us make a judgment about a given situation

Although the methodology and framework used could vary depending on the particularities of the training in each country. Trainees should be assessed using a number of different systems in order to provide feedback on progression and to ensure they have successfully acquired the competencies stipulated in the curriculum.

The intent of this assessment system should be to:

- enhance learning by providing formative assessment, enabling trainees to receive immediate feedback, measure their own performance and identify areas for development;
- drive learning and enhance the training process by making it clear what is required of trainees and motivating them to ensure they receive suitable training and experience;
- provide robust, summative evidence that trainees are meeting the curriculum standards during the training programme;
- assess trainees' actual performance in the workplace;
- ensure that trainees possess the essential underlying knowledge required for their

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Specialty;

- identify trainees who should be advised to consider alternative career directions.

It is highly recommended an integrated assessment system that measures the progress of trainees using a framework of workplace-based assessments, a portfolio of procedures and a knowledge-based assessment:

I) Workplace-based assessments will take place throughout the training programme to allow trainees continually to gather evidence of learning and to provide trainees with formative feedback. They will build progressively to a complete picture of evidence that Trainees has satisfactorily mastered all aspects of the clinical skills. Moreover, trainees should have a high level of expertise in appraisal of research evidence. Robust and objective methods of evaluation should be used such as:

- Mini-Clinical Evaluation Exercise or Direct Observation of Procedural Skills;
- 360 ° Multi-Source Feedback (teamwork, Patients education, professional behaviour);
- Case-Based Discussion;
- Patient Survey;
- Audit Assessment;
- Teaching Observation.

The highest level of clinical skills should be covered by the concept of the Entrustable Professional Activity (EPA) which means that a trainee can be trusted to perform the job (carry out a procedure or manage the disease) and not whether he is just competent to do it. The training is aiming at this level 5 for all relevant skills, with the exception of some very specialised areas which may warrant for obtaining level 4 (competent to handle without assistance, including complications). The assessments to valuate the level of skills should be done in the last 3 years. See appendix 2. An example of a generic EPA in Allergology is enclosed in appendix 3. This EPA could be used for a series of allergic disorders. The development of EPA's is however an ongoing process and the concept is not widely known among trainers in Allergology in Europe. It is also to the national authority to decide to what extent these assessments should take place.

II) Portfolio: The portfolio includes analysis of training activities received and technical procedures performed, reports of self-reflection of the resident and well-crafted critical incidents, evidence of having presented clinical or teaching sessions, pieces of evidence of having presented communications to congresses or conferences, and/or having published scientific articles. The portfolio should be discussed yearly with the supervisor.

III) Knowledge-based assessment: according to the framework of the acquisition of competences exams to assess the acquired theoretical knowledge will be regularly performed. National authorities will require trainees to take nationally implemented board exams. As an effective way of harmonization of the theoretical knowledge, the EAACI/UEMS

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Knowledge Exam is proposed, which is considered an excellent tool to test one's theoretical knowledge in the field of Allergology and Clinical Immunology, the latter tailored to the importance of clinical immunology in the national curricula. Preferably, the EAACI/UEMS exam should be implemented in the ETR as exit exam. This is the case for Switzerland, but not yet for other countries. The EAACI/UEMS exam is one of the 34 European exams listed by CESMA. In the near future appraisal of the EAACI/UEMS exam by CESMA is foreseen.

Finally, to facilitate the implementation of this complex multi-facet system of evaluation and assessment a web-based framework is recommended.

c. Governance

Governance of the training is the responsibility of the national medical authorities and national allergy society. Procedures should be in place to appoint and register trainers and training institutes, approve training schemes, select trainees, assess the progress in training and to approve the registration of allergologists.

A periodic quality control system should ideally be in place to evaluate the quality of the training program regularly. This could be done by national visitation/audit teams and/or UEMS visitation teams.

II. TRAINING REQUIREMENTS FOR TRAINERS

1. Process for recognition as trainer

a. Requested qualification and experience

The program is led by a training director. The training director must be accredited by the national authorities in accordance with the applicable national rules.

The training director is a medical specialist who has been registered as an allergologist for at least 5 years. The director is a clinical expert in Allergology.

The training institute must have sufficient trainers. The training team will consist of medical specialists, registered in the specialty of Allergology. Preferably, there should be a ratio of two trainers for each trainee and one supervisor / mentor with an overview of trainees the entire training period. This number may vary according to the local possibilities, however the training team should be large enough to supervise the trainees.

b. Core competencies for trainers

Special Qualifications of the trainers when required (if not covered by EU Directive on Professional Qualifications)

Training directors should be familiar with all aspects of the curriculum and the needs of Trainees. They should be able to detect strengths and weaknesses of Trainees on the basis of clinical assessments. A specific course on training and educational skills is recommended for training directors. These requirements may also apply to the other members of the training team.

2. Quality management for trainers

Quality management of trainers is the responsibility of the national medical specialty boards. If there are courses for trainers, the trainers should follow them according to the national and local (hospital) regulations. Within the institution, trainers should be able to allocate time for courses, for supervision of trainees, for taking assessments and all other aspects of the training.

III. REQUIREMENTS FOR TRAINING INSTITUTIONS

The European Board of Allergology has developed guidance for the accreditation process for training centres, which is based on standards produced by the World Federation for Medical Education. It complies with the EU Directive on Professional Qualifications (Directive 2013/55/EU of the European Parliament and of the Council of 20 November 2013 amending Directive 2005/36/EC on the recognition of professional qualifications).

1. Legal frame

Training institutions offering postgraduate education in allergology should be recognised and accredited by the national competent authority. An organised training programme under the leadership of a programme director must be in place and the mission and outcome objectives must be clearly defined.

2. Qualifying institutions / centres

Postgraduate training in allergology should generally be carried out in university hospitals, comprehensive allergy centres, or affiliated teaching hospitals, while part of the training rotation should take place in general hospitals, outpatient clinics and/or the community. The teaching institutions must possess the infrastructure to provide training in Allergology. This must include a diverse and sufficiently large inpatient and outpatient service, adequate teaching staff, conference rooms and office space for trainees to ensure a proper learning environment. The training programme director together with the postgraduate education training department are responsible for the organisation and management of the training programme. Each training institution should have an internal system of medical audit or quality assurance, including a morbidity and mortality review process for reporting adverse events. (Critical incident reporting system).

3. Process for recognition as training center

a. Requirement on staff and clinical activities

Training centres / institutions should undergo initial accreditation by the national competent authority.

Logistics:

- They should have availability to consultation rooms, material and devices to perform the necessary clinical investigation, technical and laboratory premises.

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- They should have continuously in- and out-patients.
- The centres need to have established links with medical specialists covering the wide range of organ allergic manifestations so as to ensure the robustness of the diagnostic process.
- They should have a rapid referral system in place to implement urgent diagnostic and treatment decisions.

Staff:

- The training centre must have a budget and staff for training, research, quality management, patient education and information, public relations, coordination and planning
- Trainers for allergology need to be fully licensed allergologists/allergologists and clinical immunologists.
- Two years of professional experience is necessary to serve as a supervisor for a trainee in allergology.
- Preferably there should be a ratio of two trainers for each trainee and one supervisor / mentor with an overview of trainees the entire training period. The director of training program in allergology in particular institution is required to have five years of relevant experience in training of residents. Most importantly, the training team should be sufficiently large to supervise the trainees.
- Nurses, dieticians and other health allies working in the facility need to be specifically trained to deal with allergic patients.

Subsequent monitoring should be effectuated at least every five years based on well-defined criteria with emphasis on organisation and quality of the training process, facilities, appropriate assessment methods and measured outcomes such as trainee performance and qualification. Feedback from trainers and trainees must be incorporated in the review of the programme.

In Europe, a training centre can be recognised by the European S&B of UEMS Allergology, if the centre complies with the following:

- is recognised by the national competent authority as a formal training centre in Allergology in that country;
- has a training programme that is in accordance with the European training requirement (ETR) of allergology as described in this document;
- submits the training programme and its assessment system for approval by UEMS Board of Allergology.

b. Requirement on equipment, accommodation

Medical-technical equipment, library, opportunities for research and development

Equipment and standard operation procedures should be available for:

- Prick tests, patch tests, intradermal tests and advanced experimental methods.

- Lab equipment for in vitro standard allergology and immunology tests/immunoassays.
- Additional experimental testing.
- Designated rooms / space/ facilities for nasal, conjunctival and lung function and challenge tests, and for oral food challenge, drug challenge, insect sting provocation tests.
- Allergen-specific immunotherapy, application of other biological agents.

The location of equipment and procedures is not restricted to the allergy department/unit as long as the training hospital has these facilities available. Training centres / institutions should have access to emergency care (incl. life support)/ acute treatment of anaphylaxis.

It is also desirable to have in place dietary counselling / intervention, patient education programmes.

Online access to relevant medical and scientific journals and databases covering allergology, the organ specialties and general medicine; quiet space for retreat and reading.

Facilities for multidisciplinary case discussions.

UEMS can provide expert teams for national authorities for accreditation/ auditing of allergy training centres or clinical centres. Training and clinical allergy centres need to be accredited by the relevant national authorities based preferably on UEMS defined common criteria.

2. Quality Management within Training institutions

Structure for coordination of training

Framework of approval – how are they approved

The selection and appointment of trainees should be in line with a policy established by the national competent authority, and the selection process must be transparent. The number of training positions must be in accordance with the resources of the training centre. The work delivered by trainees must comply with the European Working Time Directive. Part-time training should be allowed; duration of training should be extended accordingly.

The curriculum should be delivered through a variety of learning experiences. The foundation of postgraduate education in Allergology is practice-based training in conjunction with formal teaching sessions, with the aim of integrating theory and clinical activities. Trainees should be given opportunities for self-directed learning and professional development. The main goals and outcomes must be clearly outlined. To this purpose the learning objectives and milestones should be applied according to local circumstances. There must be an appropriate balance between teaching and service

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provided by trainees. The structure of rotas and on-call schedules should consider the needs of patients, continuity of care and the educational needs of the trainee.

There should be appropriate levels of clinical supervision throughout the training period with increasing clinical independence and responsibility. A system for support, counselling and career guidance of trainees must be in place.

Comprehensive assessment of trainees and documentation of their progress must be an integral part of the training programme. The use of diverse assessment tools and methods is recommended, as was stated previously in this document.

At the national level a standardised process of assessments should be in place. There should be a formal ruling in regard to completion of training and fulfilment of all training requirements. It is important that the national regulations are aligned with the requirements stated in this ETR, as the aim and mission of UEMS is to attain Pan-European standards.

Appendix 1. Theoretical knowledge (Topics from the UEMS/EAACI exam)

Trainees in Allergology should have extended knowledge of the immunological aspects of the allergic immune response and mechanisms, epidemiology, allergens and clinical aspects of disease. As medicine is an ever-evolving science, this list is prone to be dynamically changing in time.

The following levels of knowledge are used:

- [1] Knows of
- [2] Knows basic concepts
- [3] Knows generally
- [4] Knows specifically and broadly

BASICS / EPIDEMIOLOGY ALLERGOLOGY/IMMUNOLOGY

1.1 Basic principles of immune response [4]

- Innate and adaptive immunity [3]
- Lymphoid organs, cell trafficking [3]
- HLA-System/immunogenetics [3]
- Antigen presenting cells [4]
- T lymphocytes, function and subsets [4]
- T-regulatory cells [4]
- B lymphocytes, immunoglobulins [4]
- IgE vs IgG4 in allergen tolerance/immunotherapy [4]
- Innate lymphoid cells and their role in allergic responses [4]
- Mast cell biology [4]
- Inflammatory mediators (histamine, tryptase, leukotrienes, PAF, bradykinin etc.) [4]
- Cytokines [4]
- NK-cells and NK-T cells [3]
- Adhesion molecules (ICAMs, VCAM, selectins,... etc.) [3]
- Biologics :cytokines, modified cytokines, solubilized receptors, fusion proteins, therapeutic antibodies to cytokines, adhesion molecules, receptors : [4]
- Complement system [3]
- Tolerance mechanism [4]
- Gell I& Coombs classification of hypersensitivity reactions(updated) [4]
- Immediate type reactions [4]
- late type reactions with eosinophilic or neutrophilic inflammations [4]
- cytotoxic mechanism [3]

- granulomatous reactions [3]
- peculiarities of cutaneous, bronchial, oral/gastrointestinal immune response [4]
- anaphylaxis, classifications [4]
- Immunity against different classes of infectious agents (viral, bacterial, fungal, protozoa, helminths) [4]
- Autoimmune mechanism, organ specific and systemic [4]
- So called “intolerance” reactions [4]

1.2 Epidemiology/genetics

- prevalence and development, age dependency of atopic dermatitis, allergic rhinoconjunctivitis and asthma [4]
- mortality of atopic, IgE mediated diseases [4]
- mortality of non-IgE mediated allergic diseases or intolerance reactions [4]
- epidemiology of drug allergy and epidemiology of food allergy [4]
- hygiene and biodiversity hypothesis [4]
- costs, public health aspects of IgE mediated allergic diseases [4]
- genetics of atopy, IgE-formation [4]
- genetics of asthma and atopic dermatitis [4]
- immuno-genetics of drug allergy [4]

1.3 Allergens

- allergens, haptens [4]
- Indoor and outdoor exposure, aerobiology [4]
- nomenclature [4]
- (recombinant) allergens of plant origin [4]
- fungal and animal allergens [4]
- pan-allergens, families, characteristics [4]
- Hymenoptera allergens [4]
- Occupational allergens [4]
- relationship of chemical characteristics of individual allergens to symptoms [4]
- standardization of allergen extracts [3]
- cross-reactivity of protein allergens, cross-reactive carbohydrate [4]

2. CLINIC, DIAGNOSIS AND THERAPY OF ALLERGIC DISEASES

2.1. Allergology

2.1.1. Allergic respiratory diseases [4]

- intermittent and persistent (seasonal and perennial) allergic rhinitis, non-allergic rhinitis /allergic asthma

- chronic inflammation and airway remodelling
- rhinosinusitis and nasal polyps
- occupational and work-aggravated respiratory allergies, exercise-induced asthma (allergy and sports)
- differential diagnosis of respiratory diseases such as COPD, ACO

2.1.2. Allergic ocular diseases [4]

- Seasonal and perennial allergic conjunctivitis
- Allergic keratoconjunctivitis
- Blepharconjunctivitis and periocular eczema

2.1.3. Allergic skin diseases and other related skin diseases [4]

- urticaria (allergic and nonallergic, acute and chronic spontaneous urticaria, inducible urticaria)
- angioedema (allergic and not allergic)
- atopic dermatitis (atopic eczema)
- allergic contact dermatitis and haptens from the European baseline series, photoallergic and photoaggravated contact dermatitis, protein contact dermatitis

2.1.4. Anaphylaxis [4]

- all forms of anaphylaxis, immunological and nonimmune triggers, risk- and co-factors.
important triggers of anaphylaxis: foods, drugs, Hymenoptera insects, immunotherapy; exercise-induced anaphylaxis, food-dependent, exercise-induced anaphylaxis

2.1.5. Food hypersensitivity [4]

- Food-induced allergic disorders: IgE mediated (oral allergy syndrome/pollen food allergy syndrome, acute urticaria/angioedema, rhinoconjunctivitis/asthma, anaphylaxis, food-dependent, exercise-induced anaphylaxis), mixed IgE and cell mediated (atopic eczema/dermatitis, eosinophilic gastroenteritis), cell mediated (dietary protein-induced proctitis/proctocolitis, food protein-induced enterocolitis syndrome) Relevance of food allergy in eczema, asthma, age dependency, etc
- Allergenic foods from plants or animals: cow's milk, egg, wheat, soy, peanut, tree nut, fish, and shellfish; food allergens, cross-reactivity, effect of thermal or non-thermal food processing, food allergen labelling (including precautionary labelling), sources of cross-contamination, hidden allergens in foods
- nonallergic hypersensitivity to foods, intolerances (e.g. lactose, histamine, fava beans in G6PD deficiency)
- Food aversion (non-somatic disease)
- Elimination diets and dietary interventions, risk of nutritional deficiencies
- eosinophilic esophagitis and enteritis
- FPIES

2.1.6. Drug hypersensitivity [4]

- Classification of drug hypersensitivity reactions according to the type of the immune response, pathophysiology, clinical symptoms, chronology of the reaction, immediate/acute and nonimmediate/delayed allergic adverse drug hypersensitivity reactions, identification of the clinical picture, danger/severity signs
- Chemical basis of drug allergies, pharmaco- and immunogenetic basis of drug hypersensitivity, role of viruses in the pathogenesis
- IgE mediated drug allergy (e.g. beta-lactam allergy)
- pseudo allergy and intolerance reactions (NSAID's, etc)
- Disseminated and generalized exanthems as drug hypersensitivity reactions: maculopapular exanthem (MPE), drug reaction with eosinophilia and systemic symptoms (DRESS), symmetrical drug-related intertriginous and flexural exanthem (SDRIFE), acute generalized exanthematous pustulosis (AGEP), severe bullous exanthems (Stevens-Johnson syndrome, SJS; toxic epidermal necrolysis, TEN) 697: localized drug hypersensitivity reactions: fixed drug eruptions (FDE), photoallergic reactions, and specific clinical reaction patterns (hand-foot syndrome, flagellate dermatoses)
- immune mediated drug-induced interstitial nephritis, hepatitis
- drug-induced hematological cytopenias
- drug-induced vasculitis, drug-induced lupus

■ **2.1.7. Insect sting/bite allergies** [4]

- Stinging Hymenoptera venom allergy (bees, wasps, bumble bees, ants)
- Hymenoptera venom immunotherapy
- Biting Diptera saliva allergy (kissing bugs, horseflies, mosquitoes), Ixodes tick bite allergy

2.1.8. Other diseases [4]

- hereditary / acquired angioedema
- mastocytosis, urticaria pigmentosa
-
- alpha-gal syndrome
- hypersensitivity pneumonitis (extrinsic allergic alveolitis)

2.1.9. Diseases with hyper eosinophilia [3]

- allergic bronchopulmonary aspergillosis/mycosis
- allergic fungal sinusitis
- acute and chronic eosinophilic lung diseases
- eosinophilic granulomatosis with polyangiitis (EGPA). Previously Churg-Strauss syndrome
- Hypereosinophilic syndromes

2.1.10. Controversial symptoms [3]

- multiple chemical sensitivity syndrome
- sick building syndrome
- indoor mould related disease

- chronic fatigue syndrome

2.2. Diagnosis of allergic diseases

2.2.1. *specific* [4]

- in vivo tests - indication - contra indication and interpretation
- allergy skin tests: prick, intradermal, patch, other epicutaneous tests, atopy patch test
- provocation tests - cutaneous - conjunctival - nasal - inhalative-bronchial - oral; blinding interpretation, basic lung function tests, exercise challenge test

- in vitro tests

Specific IgE determinations (immunoassays for specific IgE against native extracts and recombinant allergen components): singleplex (such as fluorescence enzyme immunoassay, enzyme-enhanced chemiluminescence immunoassay), and multiplex (such as the microarray-, macro-array-based immunoassays). Molecular allergy diagnosis approach, component-resolved diagnosis. Lymphocyte activation tests (proliferation, flow cytometry, cytotoxic assays) – immunoblots, line blot immunoassays.

FeNO and other inflammatory biomarkers, tryptase

2.2.2. *non-specific* [4]

- in vivo tests – histamine and methacholine bronchial provocation test - ergometry - physical tests: pressure, cold, dermographism, autologous serum skin test (ASST)

2.3. Therapy

2.3.1. *prophylactic/preventive* [4]

- primary and secondary prevention

2.3.2. *symptomatic therapy (mechanisms of action, therapeutic effects and safety profile)* [4]

- H1 antihistamines (old and new generation) topical – systemic, H2 antihistamines
- corticosteroids - topic - systemic
- mast cell stabilizing agents
- Alpha and beta mimetics epinephrine, long and short acting beta2-antagonists
- theophylline
- parasympatholytics
- leukotriene antagonists
- therapeutics for atopic dermatitis: topical calcineurin inhibitors (pimecrolimus, tacrolimus), topical corticosteroids (potency classes, formulations), topical PDE4 inhibitor (crisaborole)

2.3.3. *allergen-specific therapy (mechanisms of action, therapeutic effects and safety profile)* [4]

- allergy immunotherapy: routes of administration (subcutaneous injectable, sublingual in a liquid or tablet form, oral immunotherapy and other investigational, epicutaneous and intra-lymphatic administration), allergens (unmodified and modified allergenic extracts such as allergoids or addition of adjuvants, hypoallergenic allergens), therapeutic schedules, safety profile
- experimental therapies

- drug and food desensitization protocols

2.3.4. allergen-unspecific therapy (mechanisms of action, therapeutic effects and safety profile) [4]

- anti-IgE-antibodies, anti-cytokines as anti-IL1, anti-IL5 and other biological drugs
- immunomodulatory therapy

2.3.5. therapy during pregnancy (evaluation of risk) [4]

- allergic rhinitis
- asthma
- atopic dermatitis, urticaria

2.3.6. emergency therapy (therapeutic effects and safety profile) [4]

- anaphylaxis
- asthma
- urticaria and angioedema
- epinephrine preparations, dosing, route of administration
- H1 and H2 antihistamines, corticosteroids and other medication
- emergency sets for patients, instruction
- emergency card

3. IMMUNOLOGY

Allergologists should have a broad general knowledge of immunological diseases. Trainees from the countries where allergology is combined with clinical immunology, should have a deeper knowledge on the topics presented below. The choice of topics that require detailed knowledge sufficient for the diagnosis and management of diseases depends on national needs and requirements.:

3.1. Immune deficiencies (primary and secondary) [3]

- primary immune deficiency like APS-1, IgA deficiency, IPEX, Wiskott-Aldrich,
- CVID, diagnosis, clinic, treatment
- immune deficiencies with high IgE
- not-HIV-associated secondary immune deficiency
- main symptoms of HIV induced diseases (AIDS)

3.2. Collagenosis and vasculitis [3]

- systemic lupus erythematosus
- overlap syndrome
- Sjögren syndrome
- progressive systemic sclerosis
- polymyositis, dermatomyositis, inclusion body myositis

- antiphospholipid antibodies syndrome
- primary vasculitis
- secondary vasculitis
- Churg-Strauss syndrome: symptoms, diagnosis, treatments, DD (see 2.1.8)
- Association of autoantibodies and disease

3.3. Granulomatosis [3]

- Sarcoidosis
- Wegener`s disease
- Behçet syndrome

3. 4. Autoimmunity: basic knowledge of symptoms and therapy (3.4., 3.5.) [3]

3. 4.1 Autoimmune cytopenia

- autoimmune haemolytic anaemia
- autoimmune thrombocytopenia
- autoimmune neutropenia

3. 4.2. Organ-specific auto immune diseases [2]

- autoimmune endocrinopathies
- primary biliary cirrhosis
- inflammatory bowel diseases
- glomerulonephritis and Goodpasture syndrome
- autoimmune skin diseases (pemphigus and pemphigoid)

3. 4.3. Neuro-immunological syndrome [2]

- immunological induced disturbance of neuromuscular transference (myasthenia gravis, Lambert-Eaton syndrome)
- Guillain-Barré syndrome, chronic polyneuritis and other immunological induced polyneuropathies
- multiple sclerosis

3.4.4. Recurrent fever syndromes (Mediterranean fever etc.) [2]

3. 5. Therapy (effect and side effect) [3]

- corticosteroids (systemic and local treatments) [4]
- immunosuppression (antimetabolites, alkylating agents, vinca-alkaloids, methotrexate, anti-malaria drugs, d-penicillamine, cyclosporine A, leflunomide, dapsone, thalidomide, androgen steroids, splenectomy) - indication - control - interaction - combination with pharmacological immunosuppression
- immunoglobulin substitution
- cytokine therapy (IFN in hepatitis),
- anti-cytokine therapy (TNF blocking in RA, in Crohn's disease, in psoriasis,...), anti-IL5, etc., experimental therapies
- anti-integrin etc. therapy
- specific vaccinations

In addition, not included in the UEMS/EAACI exam:

- Psychological aspects of allergic diseases [4]
- Knowledge on medical ethics, professional behaviour and principals of research [4]

Appendix 2. Practical and clinical skills

Practical and clinical skills are graded according to the following levels:

- [1] Has observed
- [2] Can perform procedures/can diagnose and manage the disease with assistance (direct supervision)
- [3] Can perform procedures/can diagnose and manage the disease but may need assistance (indirect supervision)
- [4] Competent to perform procedures/to diagnose and manage the disease but may need advice or help
- [5] Can be *trusted* to carry out the procedures/ to diagnose and manage the disease, independently, without assistance or need of advice (EPA)

All trainees need to have detailed practical and clinical skills in the following areas:

A. Allergology

The history and diagnosis of allergic and hypersensitivity diseases :

- **Comprehensive and structured history taking Initial [1] Advanced [5]**

Trainees have the knowledge and skills to take a comprehensive history focusing on the clinical aspects of the allergic disorders, specific and non-specific triggers (indoor, outdoor, occupational), cross-reactivity between allergens, seasonal influences, time-relationships with food- or drug intake, comorbid associations, burden of disease, family history, environment (school, housing conditions, occupational conditions)
- **In vivo investigations Initial [1] Advanced [5]**
 - Skin test: Trainees know the indications and contra-indications of and how to perform skin tests (skin prick tests, intracutaneous skin tests, patch tests) and how to interpret the relevance of the test outcomes. Trainees are also aware of the possibilities and limitations of the tests and how-to properly document the tests. Recommended is to perform prick tests, intracutaneous skin tests and patch tests respectively in at least 30 patients. The goal for trainees is to be aware of the reproducibility of the tests. Thirty is considered as the minimal number to carry out the test. For indications, contra-indications and interpretation more experience is needed.
 - Challenge tests: They know the principles, the indications and contra-indications, possibilities and limitations of nasal, conjunctival or bronchial challenges with inhalant allergens, oral provocation tests with food (open or double blind) and of challenges with medication. Trainees are able to carry out these tests, and have to perform at least 30 challenge tests. Thirty is considered as the minimal number to carry out the test. For indications, contra-indications and interpretation more experience is needed.
 -

In vitro investigations Initial [1] Advanced [5]

Trainees know the principles, methodology and how to perform/interpret or assess the results of:

- Total and allergen specific IgE
- IgE to allergen components (component resolved diagnosis)
- Basophil activation test (BAT)
- Mast cell tryptase
- Specific IgG
- Precipitins
- Complement components
- C1-esterase inhibitor
- Cryoglobulins
- Immunoglobulins
- Immunoglobulin subclasses
- Lymphocyte function/activation
- Neutrophil function
- Cytokines

Clinical conditions:

- **Upper airways: rhinitis, rhinoconjunctivitis, rhinosinusitis and nasal polyps Initial [1] Advanced [5]**

The fellows know the clinical presentation of allergic rhinitis. They should be able to distinguish between allergic rhinitis and the different forms of non-allergic rhinitis and chronic/recurrent rhinosinusitis as well. Trainees know the concept of united airways. They can treat this disorder according to current guidelines. They know indications for operations at the nose, the sinuses, the nasopharynx and the middle ear. They know when to refer patients to an ENT specialist.

Skills are: Physical examination of ear, nose and throat, rhinoscopy; they are familiar with techniques as rhinomanometry, nasal inspiratory peak flow, acoustic rhinometry, olfactory tests, nasal and/or flexible sinus endoscopy. Nasal provocation tests, if feasible, dependent on availability of registered extracts.

For patients with allergic rhinitis a management plan should be established comprising allergen avoidance, pharmacotherapy and allergen immunotherapy if required. Education of the patient is part of this plan.

- **Conjunctivitis Initial [1] Advanced [5]**

Trainees know the clinical presentation of allergic conjunctivitis and can distinguish it from other forms of conjunctivitis. They should be able to distinguish the common forms of allergic conjunctivitis (seasonal allergic conjunctivitis and perennial allergic conjunctivitis) from allergic keratoconjunctivitis. The circumstances that require the ophthalmologist's help, for diagnosis and management, should be known. As a common part of allergic rhinoconjunctivitis a management plan should be

established comprising allergen avoidance, pharmacotherapy and allergen immunotherapy if required. Education of the patient is part of this plan. The use of eye drops should be known, in isolated cases of conjunctivitis or in addition to ENT treatments in rhinoconjunctivitis.

Skills: Physical examination of the eyes. Establishment of a management plan in conjunction with managing allergic rhinitis, and in collaboration with ophthalmologists when needed. Trainees should be aware of conjunctival challenge test, if feasible, dependent on availability of registered extracts.

- **Asthma Initial [1] Advanced [5]**

Trainees know the clinical presentation of asthma. They should be able to distinguish asthma from other causes of shortness of breath. Distinction can be made between the different phenotypes of asthma. Trainees know the concept of the united airways. They can treat this disorder according to current guidelines, including specific considerations in the management of asthma in patients with comorbidities and in special populations. They have knowledge and can demonstrate the inhalation technique of all metered dose inhalers, nebulizers and dry powder inhalers in asthma procedures.

Clinical skills comprise:

Performance and interpretations of spirometry, PC20 histamine and methacholine challenge. Trainees are familiar with exhaled breath analysis (NO-analysis); sputum induction and processing; bronchial provocation tests. Interpretation of relevant imaging techniques. Use of validated questionnaires to evaluate disease severity and control.

A management plan should be established comprising allergen avoidance, pharmacotherapy and allergy immunotherapy (biologicals) if required. Education of the patient is part of this plan.

- **Occupational and work-aggravated rhinitis or asthma Initial [1] Advanced [4]**

The fellows know the clinical presentation of work-related respiratory disorders. Trainees can distinguish between occupational, irritant induced and work-exacerbated conditions. They are able to identify the possible triggers. Trainees know the possibilities and limitations of diagnostic procedures as skin tests, serum IgE, and challenge tests (at the work-place, nasal or bronchial). They recognise when referral to another specialist is indicated.

Skills: In addition to the skills as described under rhinitis and asthma, the fellows are able to take a structured history focusing on clinical conditions, exposure to triggers, the occupation and workplace environment. The fellows can establish a diagnostic plan based on the available diagnostic procedures. They can establish a management plan together with other relevant physicians (for instance occupational physicians).

- **Allergic bronchopulmonary aspergillosis (ABPA) Initial [1] Advanced [4]**

Trainees know the clinical presentation of ABPA, the diagnosis based on predisposing conditions, skin tests and laboratory findings and radiographic findings. A diagnostic

and management plan should be established in collaboration with pulmonary specialists.

- **Hypersensitivity pneumonitis or extrinsic allergic alveolitis Initial [1] Advanced [4]**
Trainees know the clinical presentation of hypersensitivity pneumonitis, the diagnostic criteria (clinical features, serum IgG, precipitins, HRCT) and relevant allergens, like checkpoint inhibitors etc.
A diagnostic and management plan including measures for allergen avoidance should be established in collaboration with pulmonary specialists.
- **Atopic dermatitis Initial [1] Advanced [5]**
The fellows know the clinical presentation of atopic dermatitis and are able to distinguish atopic dermatitis from other forms of dermatitis. Knowledge is present about the natural course of disease and the clinical manifestations in different age groups. They know the different triggers and factors that may lead to exacerbations. Trainees understand the significance and limitations of skin test and specific IgE results in relation to atopic dermatitis. They can treat this disorder according to current guidelines. They recognise when referral to another specialist is indicated.
Skills: examination of the skin, establishment of a management plan including allergen avoidance and allergy immunotherapy (biologicals) if necessary and education of the patient.
- **Contact dermatitis Initial [1] Advanced [4]**
The fellows know the clinical presentation of contact dermatitis and are able to distinguish contact dermatitis from atopic dermatitis. They know the most common causes of contact dermatitis. Trainees know the principles of diagnosis and treatment. They recognise when referral to another specialist such as dermatologist or specialist for occupational diseases is indicated.
- **Work-related contact dermatitis Initial [1] Advanced [4]**
In addition to the above-mentioned skills, trainees know the clinical presentation of contact dermatitis in relation to work. They can recognise when referral to another specialist is indicated.
- **Urticaria Initial [1] Advanced [5]**
The fellows know the clinical presentation of urticaria and can distinguish between acute, chronic, spontaneous and inducible urticaria, histaminergic urticaria versus vasculitis and urticaria as part of auto-inflammatory diseases. Trainees know the diagnostic tools for diagnosing inducible urticaria. They can treat this disorder according to current guidelines.
Skills: examination of the skin, use of validated questionnaires to evaluate disease severity, test for physical urticarial if needed, establishment of a management plan (including the use of biologicals) and education of the patient.
- **Angioedema Initial [1] Advanced [5]**
The fellows know the clinical presentation of the different forms of angioedema: idiopathic, pressure related, ACE-related and hereditary or acquired forms of C1-esterase inhibitor deficiency or dysfunction. Trainees know to apply the relevant

laboratory investigations. They can treat this disorder according to current guidelines and they can use the different biologicals and novel drugs.

Skills: establish a management plan and education of the patient.

- **Food allergy and other forms of food hypersensitivity Initial [1] Advanced [5]**

The fellows know the clinical presentation of IgE mediated food allergy and other forms of non-IgE mediated food hypersensitivity, including non-IgE mediated forms of milk hypersensitivity and lactose intolerance and parasitic infestations like anisakis. Moreover, they can distinguish between these disorders and clinical presentations, symptoms and problems that are not based on any form of food hypersensitivity. Knowledge is present about the natural course of disease and the clinical manifestations in different age groups. Trainees have knowledge about the different food allergens and their allergenic structures, possible cross-reactivity and implications for the expression of disease. They can interpret the results of skin tests, specific IgE and component resolved diagnosis, tailored to IgE mediated food allergy, know the indications, the contra-indications and the practicalities of a food challenge, open and double blind, placebo controlled. Trainees know the impact of food allergy and avoidance diets on daily life. They adhere to current guidelines.

Skills: Trainees are able to establish a diagnostic plan including open and double blinded placebo-controlled provocations. Trainees can establish a management plan including education to the patient/caregivers regarding prevention and advice on emergency treatment of severe allergic reactions. Trainees know to interpret diet diaries and can work with dieticians.

- **Drug allergy and other forms of drug hypersensitivity Initial [1] Advanced [5]**

The fellows know the clinical presentation of the different types of reaction to drugs and the underlying mechanisms. The fellows can distinguish between drug hypersensitivity and adverse reactions. They are able to obtain a structured history focussing on identifying the culprit drug. The fellows know the possibilities, the limitations and the practicalities of diagnostic procedures as skin tests (skin prick tests, intracutaneous tests with early and delayed read-out, patch tests), specific IgE test, basophil activation tests, tests to lymphocyte responses and challenge tests.

They can advise on alternative drugs. They adhere to current guidelines.

Skills: Trainees are able to establish a diagnostic plan including challenge tests.

Trainees can establish a management plan including desensitisation procedures and advice on alternative drugs.

- **Insect allergy Initial [1] Advanced [5]**

The fellows know the clinical presentation of the different types of reaction to insect stings (local and systemic). They have relevant knowledge about the different insect species. They have knowledge about the different diagnostic tools (skin prick and intracutaneous skin test, specific IgE to venom and component of venoms, sting challenges). They adhere to current guidelines.

Skills: Trainees can establish a management plan including immunotherapy if required, and education of the patient (i.e. avoidance strategies and advice on

emergency treatment of severe reactions). Trainees should pay attention to mastocytosis, if this is present.

- **Anaphylaxis Initial [1] Advanced [5]**

The fellows know the clinical presentation of anaphylaxis and the different grades of severity. They have knowledge about possible triggers, modifying factors like NSAIDs, exercise, or underlying diseases as mastocytosis. Trainees can apply the appropriate diagnostic procedures tailored to the disease cause. They adhere to current guidelines.

Skills: Trainees can establish a management plan in accordance with the underlying cause, including teaching the self-administration of adrenaline and education of the patient on preventing further anaphylactic reactions.

- **Eosinophilic esophagitis and eosinophilic gastro-enteritis Initial [1] Advanced [4]**

The fellows know the clinical presentation of eosinophilic esophagitis and gastro-enteritis, and the possibilities and limitations of investigation to food allergy in these disorders. They know the efficacy of dietary intervention. They adhere to current guidelines.

Skills: Trainees can establish a diagnostic and management plan of skin tests and dietary intervention in collaboration with other relevant specialists.

- **Mastocytosis and mast cell associated syndrome (MCAS) and other mast cell activation disorders Initial [1] Advanced [4]**

The fellows know the diagnostic criteria and clinical presentation of cutaneous and systemic mastocytosis. The fellows have knowledge about the therapeutic possibilities and advice on measures to prevent anaphylaxis.

The fellows know the diagnostic criteria and clinical presentation and triggers of mast cell associated syndrome (MACS).

They adhere to current guidelines. They recognise when referral to another specialist is indicated.

Skills: The fellows can establish a diagnostic and management plan in collaboration with other relevant specialists. The management plan includes preventive measures and education of the patients.

Specific interventions:

- **Allergen avoidance Initial [1] Advanced [5]**

The fellows have extensive knowledge about possible sources of indoor and outdoor allergens. They are familiar with the current literature on possible measures to achieve effective allergen avoidance. Trainees give advice according to current guidelines.

Skills: They can give advice on evidence-based allergen avoidance, embedded in a total management approach of allergic disorders.

- **Allergy immunotherapy**

- **Allergen immunotherapy Initial [1] Advanced [5]**

The fellows have extensive knowledge about the different forms of allergen immunotherapy with inhalant allergens, food allergens and venom allergens.

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They have knowledge about the mechanisms of allergen immunotherapy, allergen extract standardisation, short and long-term efficacy, indications and contra-indications, it's course and effect on prevention. They have understanding of patient selection. Trainees adhere to current guidelines.

Skills: The fellows advise the patient about the possibilities of immunotherapy and can perform the different forms of immunotherapy, embedded in a total management program. They can design a plan of food immunotherapy. They can monitor and manage allergic reactions during treatment. They understand how to set up an immunotherapy service, including safety aspects and monitoring of patients

- **Biologicals Initial [1] Advanced [5]**

The fellows have extensive knowledge about the biologicals available for the treatment of allergic and immunologic diseases. Trainees are familiar with the efficacy, mechanisms of action, indications and contra-indications, safety and side effects and their place and limitations in the treatment of allergic diseases. Trainees are also familiar with new developments in this field. Trainees adhere to current guidelines.

Skills: The fellows can treat patients with the relevant biologicals.

- **Prevention of allergy Initial [1] Advanced [5]**

The fellows have extensive knowledge about possibilities and limitations of interventions to prevent allergic diseases ranging from early introduction of specific foods to immunotherapy.

Skills: The fellows are able to advise and educate patients regarding prevention of allergy according to current evidence-based information.

B. Clinical immunological diseases

All trainees should have some basic knowledge of the presentation of clinical immunological diseases. As previously explained, a more detailed diagnosis and management of patients with clinical immunological diseases is optional and should be tailored to the regulations and training requirements in those countries that recognize Allergology and Clinical Immunology as one specialty. These disorders comprise: immune deficiencies, systemic immune diseases, vasculitis and other inflammatory disorders.

According to national regulation and training requirements, trainees have knowledge of the pathophysiology, aspects of the history, the clinical presentation, diagnosis and management of the following diseases:

Immune-deficiencies

- T-cell immunodeficiencies
- Agamma/Hypogamma/ Dysgammaglobulinemia and other humoral immunodeficiencies among of which the Wiskott-Aldrich syndrome
- Secondary immune-deficiencies

Systemic auto-immune diseases

- Systemic lupus erythematosus
- Sjögren's syndrome
- Systemic and localized scleroderma
- Mixed connective tissue disease
- Dermatomyositis
- Polymyositis
- Antiphospholipid syndrome

Vasculitis

- Arteriitis temporalis/polymyalgia rheumatica
- M. Takayasu
- Polyarteriitis nodosa
- Cryoglobulinaemic vasculitis
- ANCA associated vasculitis
- Other forms of vasculitis (Henoch-Schönlein, urticarial vasculitis, etc.)
- Behçet disease

Other inflammatory diseases

- Uveitis
- Sarcoidosis
- Auto-inflammatory diseases (TRAPS, CINCA syndrome, Muckle-Wells etc)
- Hyper-IgE syndrome

Appendix 3. Example of a generic EPA Allergology

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| <p>The following EPA will be entrusted when your supervisor is confident that you can be trusted to perform the activity described to the required standard with the required level of supervision or none at all. Your supervisor will expect you to know when to ask for additional help; s/he will also trust you to seek assistance as appropriate and in a timely manner.</p> | |
| Title | Diagnosis and treatment of allergic diseases |
| Description | Perform the analysis for allergic disorders, prepare advice to reduce complaints in patients with established allergies, both medical and non-medical |
| Knowledge, skills and attitude required | Competence is demonstrated if the trainee has shown sufficient aspects of the knowledge skills and attitude described below |
| | <p><i>Clinical presentation</i></p> <ul style="list-style-type: none"> - The resident knows the different types of hypersensitivity reactions (ME). - The resident knows the pathophysiological mechanisms that underlie the various forms of hypersensitivity reactions (ME). - The resident knows the different forms of drug hypersensitivity and recognizes alarm symptoms indicating a serious reaction (ME) <p><i>Case history and physical examination</i></p> <ul style="list-style-type: none"> - The resident is able to take an allergic case history. This means asking about the nature of the symptoms, the development of the symptoms in relation to exposure to potential allergens and triggers and the course of the symptoms in relation to any given treatment (ME). - The resident explicitly asks whether exposure to allergens and triggers has occurred that are frequently the cause of hypersensitivity reactions (ME). - The resident asks about the consequences of the allergic disorder on social and social functioning and possible functional limitations (quality of life) (ME) - The resident recognizes the symptoms and abnormalities during physical examination that indicate a serious allergic reaction (ME). <p><i>Working diagnosis and plan</i></p> <ul style="list-style-type: none"> - The resident is able to indicate on the basis of information obtained from the anamnesis whether the cause of certain symptoms is possibly allergic or that another cause is more likely (ME). - The resident is able to classify the severity of the reaction (ME). - The resident knows the (contra) indications of sensitization tests and provocations (ME). - The resident can make a dose structure for provocations (ME) - The resident knows the difference between and advantages and disadvantages of an open versus a double blind provocation (ME). |

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| | <ul style="list-style-type: none">- The resident is able to safely guide a provocation and recognizes symptoms that give rise to stopping or continuing in an appropriate manner (ME).- The residents are able to interpret the results of awareness-raising tests and provocations in the context of the case history (ME).- The resident has knowledge of the causes of false positive, false negative results of sensitization tests (ME). <p><i>Treatment / guidance</i></p> <ul style="list-style-type: none">- The resident has extensive knowledge of the drug options available for the treatment of allergic diseases (ME).- The resident knows the (contra) indications for allergen-specific immunotherapy (ME).- The resident knows how to make adjustments to the subcutaneous immunotherapy schedule in case of delay or side effects (ME)- The resident is able to give the referrer and patient concrete advice about the safe use of medicines (ME, COM).- The resident can in practice treat anaphylaxis according to protocol (ME).- The resident is able to demonstrate the various adrenaline auto-injectors (trainer pen) to the patient and explain when there is an indication for setting the pen (ME, COM).- The resident can explain to patients with a food allergy how to read labels and can warn the patient about the risk of accidental ingestion (ME, COM).- The resident recognizes situations when supervision of the patient with a food allergy is indicated by a specialized dietitian (M, COL). <p><i>Organization and transfer of information</i></p> <ul style="list-style-type: none">- The resident is able to draw up an adequate report (letter) in which it is clearly explained whether there is an allergy, which and how allergens or triggers should be avoided, which drug treatment was started and how to act. in the event of an acute allergic reaction due to accidental exposure (COM).- capable of presenting a patient concisely during meetings and ensuring that messages have been received (COM).- The resident is capable of leading a multidisciplinary patient consultation (LEAD) <p><i>Consultation</i></p> <ul style="list-style-type: none">- The resident is able to independently carry out a consultation with a patient under the care of another specialty where an allergic disorder is suspected. He / she can give advice on further diagnostics and possible treatment. (ME, COL, LEAD) <p><i>Attention to improving care for patients with allergic diseases</i></p> <ul style="list-style-type: none">- The resident helps developing guidelines for the prevention of serious allergic reactions during medical procedures, radiological examinations and drug treatments (HA). |
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| | - The resident is able to provide information about preventive measures to prevent allergies to laymen and health care workers in primary and secondary care (HA COM, LEAD) |
| Assessment method | Continuous assessment during individual and clinical supervision |
| Suggested assessment method details | Case based discussions; multisource feedback |

COL, Collaborator; COM, Communicator; HA, Health Advocate; LEAD, Leader; ME, Medical Expert; PROF, Professional; SCH, Scholar

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