

**EAACI-task force \***  
**for**  
**EAACI-UEMS Examination**

**Catalogue of topics to be examined in the**  
**EAACI-UEMS examination in**  
**Allergology/clinical Immunology**

**Second version**  
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published *after* the exam**

## Foreword:

The EAACI-UEMS exam will cover all areas of allergology and some important areas of clinical immunology. Ca 30% of the questions will be devoted to basic and clinical immunology and 70% to allergology. Some areas important for differential diagnosis (e.g. lactose intolerance, mastocytosis, etc.) and often seen by allergologists will also be examined.

The examination is based on multiple choice questions and will only address knowledge. It is intended to identify experts in the field of allergology and clinical immunology, who can take care of patients with such diseases in an optimal way and are able to respond to questions by colleagues not specifically trained in allergology/clinical immunology. Therefore, the clinical aspects are emphasized. We expect that an allergologist/clinical immunologist has once read an immunology text book and is more familiar with basic immunology than his colleagues devoted to other areas. Therefore, some basic immunology will be part of the examination as well (however, far less than in the board examination in the USA).

We are aware that allergology and in particular clinical immunology is taught and practiced quite differently in different areas of Europe. Therefore it is impossible to make an European exam which is taking into account all the subtle and not so subtle differences in the different countries. Nevertheless, we hope to define with this examination areas which all European Allergologists/clinical Immunologists agree on.

It is imperative for us to try to achieve a high standard of allergology and clinical immunology throughout Europe. This EAACI-UEMS exam is based on the UEMS recommendations for teaching allergology and clinical immunology (*Allergy*. 2004; 59:579-88). To facilitate the preparation for the exam we put together a list of topics of the exam, which are basically based on the UEMS recommended training program. A list of recommended books and articles will be placed on the EAACI-homepage as well.

We hope you appreciate this initiative of the EAACI and are thankful for suggestions

Werner J. Pichler,  
for the EAACI-task force „European Exam“.

## Basics / Epidemiology Allergology/Immunology (ca. 25-30%)

### 1.1 Basic principles of immune response (ca. 10%)

- Innate and adaptive immunity
- Lymphoid organs, cell trafficking
- HLA-System/immunogenetics
- Antigen presenting cells
- T lymphocytes, function and subsets
- T-regulatory cells
- B lymphocytes, immunoglobulins
- Inflammatory mediators (histamine, tryptase, leukotriens, etc.)
- Cytokines
- NK-cells and NK-T cells
- Adhesion molecules (ICAMs, VCAM, selectins,.... etc.)
- Biologicals (cytokines, modified cytokines, solubilized receptors, fusion proteins...)
- Therapeutic antibodies to cytokines, adhesion molecules, receptors
- Complement system
- Tolerance mechanism
- Immediate type reactions
- late type reactions with eosinophilic or neutrophilic inflammations
- cytotoxic mechanism
- granulomatous reactions
- peculiarities of cutaneous, bronchial, oral/gastrointestinal immune response
- anaphylaxis, classifications
- Immunity against different classes of infectious agents (viral, bacterial, fungal, protozoan)
- Autoimmune mechanism, organ specific and systemic
- so-called "intolerance" reactions

### 1.2 Epidemiology/genetics (5-10%)

- prevalence and development
  - pollen allergy (hay fever)
  - perennial allergy
  - asthma
  - atopic dermatitis
- mortality of atopic, IgE mediated diseases
- mortality of non-IgE mediated allergic diseases or intolerance reactions
- epidemiology of drug allergy
- hygiene hypothesis
- costs, public health aspects of IgE mediated allergic diseases
- genetics of atopy, IgE-formation
- genetics of asthma and atopic dermatitis
- immuno-genetics of drug allergy and race dependence

### 1.3 Allergens <sup>1)</sup> (5-10%)

- allergens, haptens
- nomenclature
- (recombinant) allergens of plant origin
- fungal and animal allergens
- pan-allergens, families, characteristics
- hymenoptera allergens
- relationship of chemical characteristics of individual allergens to symptoms
- standardization of allergen extracts
- cross-reactivity of protein allergens

## 2. Clinic, diagnosis and therapy of allergic diseases

### 2.1. Allergology (30-40%)

#### 2.1.1. Allergic respiratory diseases

- seasonal allergic rhino conjunctivitis / bronchial asthma <sup>3)</sup>
- perennial allergic rhinopathy / bronchial asthma <sup>4)</sup>
- professional inhalative allergies <sup>5)</sup>

#### 2.1.2. Allergic skin diseases

- urticaria (allergic and not allergic)
- angioedema (allergic and not allergic)
- atopic dermatitis
- protein contact dermatitis
- contact dermatitis (European standard)
- photo contact allergy

#### 2.1.3. Anaphylaxis

- all forms of anaphylaxis
- exercise induced anaphylaxis
- food, drug, hymenoptera, immunotherapy induced anaphylaxis

#### 2.1.4. Food hypersensitivity <sup>6)</sup>

- allergies
- intolerances (e.g. lactose)

#### 2.1.5. Drug hypersensitivity <sup>7)</sup>

- hapten recognition; p-i concept
- mechanism of drug induced diseases (Gell & Coombs, updated)
- pseudo allergy and intolerance reactions (ASS, etc)
- $\beta$ -lactam allergies (anaphylaxis, exanthems, cross-reactivity, testing)
- drug exanthemas (maculopapular, pustular, bullous, vesicular) plus clinical picture
- systemic reactions (MPE, DRESS/DHS, SJS/TEN, AGEP)
- interstitial nephritis, pneumonitis
- drug induced hepatitis

#### 2.1.6. Insect venom allergies

- hymenoptera
- others
- venom immunotherapy

#### 2.1.7. Other diseases

- hereditary / aquired angioedema
- mastocytosis, urticara pimentosa
- celiac disease
- extrinsic allergic alveolitis  
- protein or hapten induced

#### 2.1.8. Diseases with hyper eosinophilia

- allergic bronchopulmonary aspergillosis/mycosis
- allergic fungal sinusitis
- acute and chronic eosinophilic lung diseases
- Churg-Strauss syndrome

- hypereosinophilic syndromes

### 2.1.9. *Controversial symptoms*

- multiple chemical sensitivity syndrome
- sick building syndrome
- chronic fatigue syndrome

## 2.2. Diagnosis of allergic diseases (5-10%)

### 2.2.1. *specific*

- in vivo tests
  - indication
  - contra indication
- skin tests
  - prick, scratch
  - intradermal
  - epicutaneous
  - atopy patch test
- provocation tests
  - cutaneous
  - conjunktival
  - nasal
  - inhalative-bronchial
  - oral
- in vitro tests
  - specific IgE determinations
  - ELISA
  - basophil activation tests (flow cytometry)
  - lymphocyte activation (transformation) tests (proliferation, flow cytometry)
  - Western blots

### 2.2.2. *non specific*

- in vivo tests
  - metacholine bronchial provocation test
  - ergometry
  - physical tests: pressure, cold, dermographism,
  - autologous serum test

## 2.3. Therapy (10%)

### 2.3.1. *prophylactic/preventive*

- primary and secondary prevention

### 2.3.2. *symptomatic therapy (effect and side effect)*

- anti histamines (1. and 2./3. generation)
  - topical
  - systemic
- corticosteroids
  - topic
  - systemic
- mast cell stabilizing agents
- theophylline
- parasympatholytics
- leukotriene antagonists

- long and short acting beta2-antagonists
  - topic
  - systemic
- therapeutics for atopic dermatitis
  - tacrolimus, pimecrolimus
  - topical corticosteroids, classes of topical CS
  - emollients

### 2.3.3. allergen-specific therapy (effect and side effect)

- allergy vaccination (allergens vs. allergoids)
  - sub cutaneous
  - long time – short time
  - sublingual
- experimental therapies

### 2.3.4. allergen-unspecific therapy (effect and side effect)

- anti-IgE-antibodies
- immunomodulatory therapy

### 2.3.5. therapy during pregnancy (evaluation of risk)

- allergic rhinitis
- asthma
- atopic dermatitis, urticaria

### 2.3.6. emergency therapy (effect and side effect)

- adrenalin preparations
- shock therapy
- emergency sets for patients
- emergency card

## 3. Immunology (10%)

### 3.1. Immune deficiencies (primary and secondary)

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

### 3.2. Collagenosis and vasculitis

- systemic lupus erythematoses
- overlap syndrome
- Sjörger 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

- Sarcoidosis
- Wegener`s disease

- Behçet syndrome

### 3. 4. Autoimmunity: basic knowledge of symptoms and therapy (3.4., 3.5.) (ca. 5%)

#### 3. 4.1 Autoimmune cytopenias

- autoimmune haemolytic anaemia
- autoimmune thrombocytopenia
- autoimmune neutropenia

#### 3. 4.2. Organ-specific auto immune diseases

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

#### 3. 4.3. Neuro-immunological syndrome

- 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.)

#### 3. 5.. Therapy (effect and side effect)

- corticosteroids (systemic and local treatments)
- immunosuppression (antimetabolites, alkylating agents, vinca-alkaloids, methotrexat, anti-malaria drugs, d-penicillamine, ciclosporine A, leflunomide, dapsone, thalidomide, androgen steroids, splenectomy)
  - indication
  - control
  - interaction
  - combination with pharmacological immunosuppression
- immunoglobulin substitution
- cytokine therapy (IFN $\alpha$  in hepatitis),
- anti-cytokine therapy (TNF $\alpha$  blocking in RA, in Crohn`s disease, in psoriasis,...), anti IL-5, etc., experimental therapies
- anti-integrin etc. therapy
- specific vaccinations

**The respective questions are grouped and evaluated according to the colors used**

**Legend:**

Group A: basic Immunology, autoimmunity, immunodeficiency

Group B: allergens, anaphylaxis, hymenoptera allergy, immunotherapy

Group C: Drug and food allergy

Group D: dermatological allergology: mastocytosis, urticaria/angioedema

Group E: respiratory allergology: asthma, rhinosinusitis

Group F: pediatric allergology

Group G: eosinophilia, ABPA, varia

## Appendix

- 1) Characterization of individual allergens :  
Pollens, house dust mites, cat, dog, latex, egg, milk, fish, shrimp, hymenoptera, apple, celery, ...
- 2) Risk factors:  
family history, allergen exposure, nutrition, infections, pollution, genetics, ....
- 3) Seasonal inhalative allergens:  
pollen, fungus (*Alternaria alternata*, *Cladosporium herbarum*, *aspergillus fumigatus*),...
- 4) Perennial inhalative allergens:  
house dust mites, storage mites, cockroach, animal epithelia, silk, fish food, plants (*ficus benjamina*),...
- 5) Professional inhalative allergens:  
flour, latex, mites, animal epithelia, wood, enzymes (e.g.  $\alpha$ -amylases), isocyanate, platinum, cobalt, formaldehyde, Colophonium, polyvinylchloride, phthalacidhydride,
- 6) Allergenic food (children):  
especially milk, egg, fish, sea food, peanuts, soja, grains
- 7) Allergenic food (adults): oral allergy syndrome; celery-mug weed-spice syndrome, birch pollen syndrome (pomaceous fruit-nuts syndrome), bird-egg syndrome, latex-fruit syndrome, mites-snail syndrome, milk, fish, sea food, peanuts, sesam, ...
- 8) Lipid transfer protein-, profilin-, bet v1-families etc. and cross-reactivity
- 9) Drug hypersensitivity:  
 $\beta$ -lactam antibiotics, quinolones, local anesthetics, prophyphenazone, acetylsalicylic acid, NSAID, diclofenac, insulin, muscle relaxants, radio contrast media, anti-epileptics, topical corticosteroids, etc.: principles of testing in vivo and in vitro
- 10) Pseudo allergies:  
volume replacements, NSAID, local anaesthetics...