

## Structured Curricular Training

### "Clinical Environmental Medicine"

#### Table of Contents

Introduction

Teaching and Learning contents in advanced training in Clinical Environmental Medicine

Unit I: Fundamentals

Unit II: Eco-toxicology, genetics epigenetics

Unit III: Clinical Environment medicine stressors

Unit IV: Effects and influences of environment associated burdens

Unit V: Diagnosis

Unit VI: Therapy

Unit VII: "Clinical Environmental Medicine" in the faculties

Unit VIII: General

#### Introduction

In the context of structured teaching and learning curricula of the German Medical Association for advanced medical education 1995 and 2003, Environmental Medicine was defined as:

*"Usually, a difference is made between a more population-oriented, primarily preventive component of Environmental Medicine and a patient focused, individual medical orientation; the latter is usually referred to as "Clinical Environmental Medicine". It includes the medical care of individuals with health problems or abnormal examination findings, which are brought by themselves or medically in conjunction with environmental factors."*

Since its start in 1995, the education and training program "Environmental Medicine" and later course "Clinical Environmental Medicine" have continuously offered and conducted through the "German Professional Association of Environmental Medicine (dbu)" in cooperation with the European Academy for Environmental Medicine (EUROPAEM) in the form of structured curricular continuing education courses.

The teaching and learning contents presented for the present curriculum for structured advanced training "Clinical Environmental Medicine" base on twenty years of experience in practice and teaching in this field. It includes both the clinical diagnosis, therapy and individual primary prevention as well as the intersections of Clinical Environmental Medicine with environment associated disciplines such as hygiene, toxicology, occupational medicine and public health.

The structured curricular advanced education program "Clinical Environmental Medicine" is especially geared toward doctors working in patient care (general medicine, dermatology, gynecology, otolaryngology, internal medicine, pediatrics, neurology, urology, etc.), as well as occupational physicians and Public Health Service professionals. A clearly structured competent mediated training course is an important measure for quality management in "Clinical Environmental Medicine".

The plan submitted here in bullet point form catalog of learning objectives can serve only as a guideline and due to the very rapid progress in the scientific knowledge deems that it will have to be constantly modified. It clarifies what knowledge doctors who have received specific training are expected to have within the field of "Clinical Environmental Medicine". However, the systematic organization of the curriculum into eight learning units is not designed to compel rigid processing of individual topics, rather, the interesting and lively course design themes from various teaching units have to be configured to the

individual course sections. The course organizer should present the material in a cross-sectional, practical to a great extent, problem-oriented manner. The curriculum offers a total of sufficient flexibility to respond to the needs of individual professional groups.

The student should be able to provide adequate medical care for patients with environmentally associated illnesses. This means perception and detection, diagnosis and treatment as well as primary prevention of environmental-related illnesses. This includes afflicted people who recognize either environmental health hazards or those where there is a suspicion of environmental health impairment. In the process, multi-systematic afflictions, chronic widespread diseases, such as cardiovascular system ailments, metabolism, malignancies, chronic pain syndromes, and exhaustion syndromes can be better clarified in the context of environmental conditions.

Where appropriate, we have consciously structurally and conceptually oriented the course to the requirements of the German Medical Association and adopted text units therefrom. This relates to the course book "Environmental Medicine" with the methodological recommendations, teaching and learning content for theoretical training courses for additional qualification in "Environmental Medicine", according to the guidelines for continuing education of the German Medical Association in 1995 as well as the structured curricular training and published teaching and learning content for training courses for environmental medicine according to the guidelines of the German Medical Association of 2006.

Of course, in the performance of individuals and job titles both genders are always equally meant.

## **Teaching and learning contents of postgraduate advanced education course "Clinical Environmental Medicine"**

### **Unit I: Fundamentals**

#### **1.1 Introduction**

- 1.1.1. Definitions, contents, tasks and goals of Environmental Medicine
- 1.1.2. Environmental associated illnesses
- 1.1.3. Communicating interfaces and similarities in Clinical Environmental Medicine with associated disciplines such as hygiene, toxicology, occupational medicine and public health
- 1.1.4. Recommended literature relevant to Clinical Environment Medicine (textbooks and manuals, periodicals, professional journals and electronic media).
- 1.1.5. Environmental Medicine institutions, professional associations and committees
- 1.1.6. Legal basis for environmental health protection

#### **1.2 Explanation of Basic terms:**

- 1.2.1 Emission, transmission, immission, exposition
- 1.2.2 Pathogenesis-Salutogenesis
- 1.2.3 At-risk groups within Clinical Environmental Medicine (persons with specific nutritional and behavioral as well as enzyme related issues, atopy, vulnerabilities).

#### **1.3 Environmental toxicology**

- 1.3.1 Disposition; toxico-dynamics; cytotoxicity, genotoxicity, organ toxicity; mutagenesis, carcinogenesis; immune-, neuro-, reproduction - toxicology; "low-dose toxicology"; summations of combined effects
- 1.3.2 Methods of toxicology: methods of detecting the toxic potential of a substance; review of experimental animal data; multiple exposures; regional clusters
- 1.3.3 Fundamentals of risk assessment, values / benchmarks / guidance values and standard setting; Meaning of limit values / benchmarks / guidance values for
  - a) the general public
  - b) the individual case

#### **1.4. Environmental epidemiology**

- 1.4.1 Special features of environmental epidemiology (minor risks)
- 1.4.2 Interpretation of environmental studies and publications

- 1.4.3 Fundamentals of epidemiology:  
epidemiological metrics, risk measures; variable types; study groups; representativeness,  
response rate; validity, reliability, sensitivity, specificity; study species; sample size; distortion  
options / bias; principles of data evaluation

## **Unit II: Eco -Toxicology, Genetics, Epigenetics**

### **2.1 Genetics, Epigenetics**

- 2.1.1 Susceptibility
- 2.1.2 Genetic polymorphisms
- 2.1.3 Genetics of detoxification phase I and II
- 2.1.4 Terms and fundamentals of epigenetics
- 2.1.5 Ramifications of epigenetic imprinting in Clinical Environmental Medicine

## **Unit III: Clinical Environmental Medicine Stressors:**

### **3.1 Biological stressors**

- 3.1.1 Bacteria, Borrelia
- 3.1.2 Viruses
- 3.1.3 Mold
- 3.1.4 Parasites

### **3.2 Chemical stressors**

- 3.2.1 Softener
- 3.2.2 Flame retardants
- 3.2.3 Solvents
- 3.2.4 Biocides in domestic materials
  - 3.2.4.1 Wood preservatives
  - 3.2.4.2 Formaldehyde
  - 3.2.4.3 Varnishes, paint and other surface coatings
  - 3.2.4.4 Mycotoxins
- 3.2.5 Alloplastic materials
  - 3.2.5.1 Surgery / Orthopedics
  - 3.2.5.2 Dentistry
  - 3.2.5.3 Ophthalmology
  - 3.2.5.4 Otolaryngology
  - 3.2.5.5 Urology
  - 3.2.5.6 Gynecology
- 3.2.6 Biocides in nutrition
- 3.2.7 Application in clothing
- 3.2.8 Particles / Nano-particles
- 3.2.9 Heavy metals

### **3.3 Physical stressors**

- 3.3.1 Heat/cold
- 3.3.2 Sound/noise
- 3.3.3 Electromagnetic fields (EMF)
- 3.3.4 Ionizing radiation
- 3.3.5 Excessive physical exertion

### **3.4 Psycho-social stressors**

- 3.4.1 Parent-children
- 3.4.2 Partner
- 3.4.3 Kindergarten/day care, school, university

- 3.4.6 Workplace
- 3.4.7 Social position
- 3.4.8 Circadian rhythm

## **Unit IV: Effects and environmental impact associated burdens**

### **4.1 Neuro-Endocrine-Immune-System (NEIS)**

- 4.1.1 Neurological effects
- 4.1.2 Hormonal effects
- 4.1.3 Immunological effects

### **4.2 Inflammation / Silent Inflammation**

### **4.3 Redox System**

### **4.4 Membrane stability**

### **4.5 Oxidative stress**

### **4.6 Nitrosative stress**

### **4.7 Mitochondrial dysfunctions**

### **4.8 Multisystem illnesses**

- 4.8.1 MCS Multiple Chemical Sensitivity
- 4.8.2 CFS Chronic Fatigue Syndrome
- 4.8.3 FM Fibromyalgia
- 4.8.4 PTSD Post Traumatic Stress Disorder

### **4.9 Sick-Building-Syndrome**

### **4.10 Intestinal dysbiosis**

## **Unit V: Diagnostics**

### **5.1 Perception, Anamnesis**

### **5.2 Trigger Perception**

### **5.3 Differential diagnostics in Environmental Medicine**

### **5.4 Physical examination**

### **5.5 Trigger evidence**

### **5.6 Human biomonitoring**

- 5.6.1 Toxin evidence
  - 5.6.1.1 Lipophilic toxin
  - 5.6.1.2 Heavy metals
- 5.6.2 Genetics (polymorphisms); susceptibility
- 5.6.3 Neuro-stress profile
- 5.6.4 Laboratory logistics

### **5.7 Nutrition; MALT / GALT**

- 5.7.1 Food allergies/ -intolerance/ -malabsorption
- 5.7.2 Intestinal dysbiosis
- 5.7.3 Case related research

### **5.8 Ambient monitoring (building biology)**

- 5.8.1 Fundamentals of environmental analysis and measurement
- 5.8.2 Specific analytics

- 5.8.3 Fibers, Radon, CO, CO<sub>2</sub>, particles
- 5.8.4 Case related research
- 5.8.5 Rehabilitation/reconstruction measures and control measurements

## **5.9 Effect monitoring;**

- 5.9.1 Immunology
  - 5.9.1.1 Inflammation
  - 5.9.1.2 Effector cell typing
  - 5.9.1.3 Lymphocyte transformation test
  - 5.9.1.4 Basophil degranulation test
- 5.9.2 Endocrinology
- 5.9.3 Metabolism
  - 5.9.3.1 Oxidative stress
  - 5.9.3.2 Nitrosative stress
  - 5.9.3.3 Redox system
  - 5.9.3.4 Membrane stability
- 5.9.4 Mitochondrial
- 5.9.5 Micronutrients
- 5.9.6 Intestinal dysbiosis
- 5.9.7 Functional disorders

## **5.10 Graded, step by step diagnostic methods**

## **5.11 Common Clinical Environmental Medicine problems**

## **5.12 Environmental Medicine and Medical Psychology, Psychosomatics**

# **Unit VI: Therapy**

## **6.1 Trigger-elimination**

- 6.1.1 physical
- 6.1.2 biological
- 6.1.3 chemical
- 6.1.4 psycho-social

## **6.2 Fields of exposure**

- 6.2.1 Domicile/ clothing
- 6.2.2 Workplace
- 6.2.3 Hobbies / pastimes
- 6.2.4 Nutrition
- 6.2.5 Concealed inflammatory sources, foci
- 6.2.6 Alloplastic materials

## **6.3 Optimization of individual vulnerability**

## **6.4 Treatment of intestinal dysbiosis (GALT)**

## **6.5 Optimization of nutrition**

## **6.6 Treatment of symptoms**

- 6.6.1 Chronic inflammations
- 6.6.2 Pain
- 6.6.3 Fatigue
- 6.6.4 Chemical hypersensitivity
- 6.6.5 Electro - hypersensitivity
- 6.6.6 Sensitization / Intolerance
  - 6.6.6.1 Alloplastic materials
  - 6.6.6.2 Nutrition
  - 6.6.6.3 Medications
  - 6.6.6.4 Other, non-incorporated foreign materials

## **6.7 Optimization of metabolic pathways and functions**

- 6.7.1 Supplementation of micronutrients
- 6.7.2 Inflammation / Foci
- 6.7.3 Elimination of oxidative and nitrosative stress
- 6.7.4 Treatment of mitochondrial dysfunction
- 6.7.5 Nutrition / MALT

## **6.8. Individual detoxification**

- 6.8.1 Drainage (elimination) of metals
  - 6.8.1.1 Chelate
  - 6.8.1.2 Adsorbents
  - 6.8.1.3 Complementary therapy
  - 6.8.1.4 Micronutrients
  - 6.8.1.5 Nutritional optimization
  - 6.8.1.6 Intestinal cleansing
  - 6.8.1.7 Therapeutic apheresis
- 6.8.2 Elimination of lipophilic toxins
  - 6.8.2.1 Physical therapies
  - 6.8.2.2 Massage / Lymphatic drainage
  - 6.8.2.3 Relaxation training
  - 6.8.2.4 Micronutrients
  - 6.8.2.5 Nutritional optimization
  - 6.8.2.6 Intestinal cleansing
  - 6.8.2.7 Therapeutic apheresis

## **6.9 Evaluation of the Therapy**

## **Unit VII: "Clinical Environmental Medicine" in fields of study**

Conference on chronic environmentally associated illnesses like  
MCS Multiple Chemical Sensitivity  
CFS Chronic Fatigue Syndrome  
FM Fibromyalgia  
PTSD Post Traumatic Stress Disorder  
SBS Sick Building Syndrome and  
Amalgam- /Heavy Metal Contamination

### **7.1 General Medicine**

### **7.2 Pediatric Medicine**

### **7.3 Internal Medicine (cardiovascular diseases, blood pressure, intestines)**

### **7.4 Rheumatology / Immunology / Allergology**

### **7.5 Orthopedics**

### **7.6 Pulmonology**

### **7.7 Neurology / Psychiatry**

### **7.8 Gynecology**

### **7.9 Dermatology**

### **7.10 Otolaryngology**

### **7.11 Urology / Nephrology**

### **7.12 Ophthalmology**

### **7.13 Oncology**

### **7.14 Dentistry**

## **Unit VIII: General Topics**

### **Case studies from participants and tutors**

- 8.1 Clinical Environmental Medicine general topics**
- 8.2 Environment Medicine relevant institutions**
- 8.3 Information gathering**
- 8.4 Literature review**
- 8.5 Medical reports**
- 8.6 Legal relevant environmental medical fundamentals**
- 8.7 Environmental Medicine expert opinion**
- 8.8 Quality roundtable**
- 8.9 Network**
- 8.10 FAQ**
- 8.11 Outlook**

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