ESPE Syllabus
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European Board of Paediatrics
The European Training Syllabus in Paediatric Endocrinology and Diabetes

Preface

Following a request (dated March 25 2012) by Dr Jean-Chris Mercier, chairman of the Tertiary Care Group of the European Academy of Paediatrics, section Paediatrics, European Union of Medical Specialists (Union Europeenne des Medicins Specialistes (UEMS)), Prof Feyza Darendililer, chairman of the syllabus subcommittee of the ESPE education and Training Committee, chaired by Prof Jan Lebl, has initiated the updating of the Syllabus Paediatric Endocrinology and Diabetes.

Composition of the syllabus subcommittee

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European Society for Paediatric Endocrinology

Working procedure

This text was originally produced in 1995, 1996 with subsequent revisions in 1997, 1998 and with a major revision in 2001 by Dr Peter Hindmarsh, as chairman of the ESPE working group on European training. Lastly, there have been revisions by Swedish colleagues in 3-2006. This version has been taken as starting point for updating and edited using the current European Syllabus in Paediatric Allergology (June 2011) as an example. Furthermore, the outline of requirements of certification and re-certification in paediatric endocrinology and diabetes in the Netherlands was used as reference. As stated this working paper only deals with tertiary care subspecialty training. Therefore sections on so-called level 1 and level 2 training, within and relating to training in general paediatrics and extensively described in previous versions are here omitted. However the main content is in many respects unchanged and refers to both paediatric endocrinology and diabetes.

A brief note on competency development has been included. The various components of training have been updated and are provided in a transparent table.

Contents

1. Introduction

This document sets out the minimum requirements for training in Tertiary Care Paediatric Endocrinology and Diabetes. Tertiary Care Paediatric Endocrinology and Diabetes was recognised as such by the Confederation of European Specialists in Paediatrics (CESP) at the Annual Meeting in Graz 1996 and is a subsection of the Tertiary Care Group of the European Academy of Paediatrics, section Paediatrics, European Union of Medical Specialists (Union Europeenne des Medicins Specialistes (UEMS)).

The situation with respect to National Bodies varies within the European Union (EU).
This document concentrates on the Training required for practice as a Tertiary Specialist.
In some EU Member countries paediatricians are experts in diabetes but not in other fields of paediatric endocrinology. This fact is recognized as a specialist in paediatric diabetes must not necessarily be a tertiary specialist in paediatric endocrinology. However, a tertiary specialist in paediatric endocrinology must have a good knowledge in diabetes, as defined in this document.

This syllabus intends to:

- Harmonise training programmes in Endocrinology and Diabetes between different European countries.
- Establish clearly defined standards of knowledge and skill required to practice Endocrinology and Diabetes at the tertiary care level.
- Foster the development of a European network of competent tertiary care centres for Paediatric Endocrinology and Diabetes.
- Improve the level of care for children with complicated or chronic endocrine disorders

2. Aim of tertiary care training

The aim of tertiary care training in Paediatric Endocrinology and Diabetes is to provide training to allow competent practice to be undertaken as a Tertiary Care Specialist in Paediatric Endocrinology and Diabetes whose practice would be expected to deal with complex endocrinology:

- Normal growth and puberty
- Short and tall stature
- Disorders of adrenals
- DSD/ambiguous genitalia
- Disorders of anterior and posterior pituitary
- Disorders of thyroid
- Diabetes and its complications
- Diabetes with poor metabolic control
- Disorders of puberty
- Hypoglycaemia
- Disorders of calcium metabolism and bone
- Liaison with adult and paediatric colleagues re: complex cases e.g. neurology, (neuro) surgery, urology, clinical genetics
- Early and late endocrine sequelae of oncological disorders and its treatment
- Obesity
- Endocrine control of fetal growth and development
- Endocrine assay methods

End Result of Training

The training programme envisaged and detailed below will provide for the needs of Tertiary Care Paediatricians who will deliver care for the conditions outlined.

The Tertiary Care Endocrinologist, at the end of training, should:

- Provide clinical care within the framework of a specialised Tertiary Care Unit in the inpatient/outpatient setting using various specialised diagnostic and therapeutic modalities.
- Liaise with the laboratory chemist
- Liaise with colleagues in Secondary Care Paediatrics in the provision of high quality local care.
- Liaise with and consult to other Tertiary Care Specialists.
- Develop an integrated pattern of care with colleagues in the Adult Speciality and Genetics
- Be trained in Clinical Research Practice and capable of conducting/establishing a Research Programme.
- Lead on health administrative issues and research activities.

3. Training period

Clinical training

A medical doctor who has successfully completed his/her training of at least 3 years in the general paediatrics will be eligible for access to further specialist training in paediatric endocrinology. A clinical training period of full-time employment of 24 months, preferably uninterrupted, is considered adequate.

4. Research training

Whereas there are no active guidelines at present for prosecution of a research programme within the European Syllabus of tertiary training, a research training (clinical or laboratory based) of at least 6 months, but preferably of 12 months is highly recommended. These arrangements will need to be negotiated at the national level.

5. Requirements for Training Institutions

The recognition of training institutions will ultimately be part of the remit of a CESP Standing Advisory Committee (SAC) for Endocrinology and Diabetes. It is anticipated that ESPE will act as the agent for the European Board of Paediatrics and CESP in executing this task. A list of the names and characteristics of existing national training centres in endocrinology and diabetes will be created and held by SAC/ESPE/EBP which will organise in a structural manner quality assurance of the recognised centres at periodic intervals every 5 years using the guidelines suggested by the UEMS.

Accreditation of Centres

For each EU Member country, a list of centres, units, training directors, tutors and teachers should be compiled and updated on an annual basis. Each centre is defined by the available modules or areas of teaching activity, tutors and teachers available and the size of the clinical practice as defined by the needs of the trainee.

Accreditation will initially be given by the National Paediatric Body and ultimately by ESPE. The process for National Representation in ESPE will be evolved with time and the inspection and approval process will follow the EU Guidelines (currently in preparation). At present ESPE will simply review National Inspections and act as arbiter in situations of disagreement.

A training centre can be a single institution or a group of related establishments.

Full Training Centre

The centre must provide adequate experience in all fields of endocrinology including emergency care. It is expected to provide all Training modules. The number of activities must be sufficient to provide at least a minimum experience for a trainee.

A group of related establishments can be considered a centre and each component considered as a unit contributing one or more modules.

The centre must have easy access and close relationships with other relevant specialities such as (clinical) molecular genetics, nuclear medicine, imaging facilities, (neuro-)surgery, urology and endocrine laboratory facilities.

Demonstration of involvement of other care teams particularly specialized diabetes nurses, paediatric nutritionists, social workers, and psychologists is essential for recognition and others who may contribute to the quality of care of patients with endocrine conditions. The centre must provide evidence of on-going clinical research and access to basic research. In countries that have approved centres for diabetes care then the Full Training Centre must be one of these.

The centre will be responsible for weekly clinical staff/seminar teaching and participation in regional/national meetings. Basic textbooks in endocrinology/diabetes should be immediately available and there should be easy access to a comprehensive reference library either in paper or electronic format.

Training Unit

Training Units are institutions that provide training in one or more aspects (Modules). They must provide adequate exposure in the defined area and a teacher who is deemed competent in these areas.

6. Requirements for Trainers in Paediatric Endocrinology/Diabetes

The training staff in a Centre should include at least two trainers. The Coordinator of Paediatric Endocrine/Diabetes Training must have been practising Paediatric Endocrinology and Diabetes **for at least 5 years** and have specialist accreditation.

There should be additional Paediatric Endocrine/Diabetes Tutors who should provide training in all aspects of the speciality and hold a research tradition in Paediatric Endocrinology. When an aspect of training cannot be provided in one centre it would be necessary for the trainee to be taught elsewhere by a trainer (Paediatric Endocrine/Diabetes Trainer) approved for that purpose.

A Trainer is a person who holds acknowledged expertise in one or several aspects of Paediatric Endocrinology/Diabetes. This person's contribution may be restricted to these areas of expertise. Both Tutors and trainers must have practised Paediatric Endocrinology/Diabetes for a **minimum of 2 years**.

The trainer should work out a training programme for the trainee in accordance with the trainee's own qualities and the available facilities of the institution. Regular review will be required to allow for flexibility and to allow for early identification of problems/deficiencies.

Trainers are expected to provide appraisal and assessment of progress. Appraisal consists of sorting out what is needed and what is the evidence that this has been executed. Assessment concentrates on what is needed. Trainee assessment should be provided in terms of:

- Training and career ambitions
- Training experience related to syllabus
- Achievements related to current plan

In order to provide a close personal monitoring of the trainee during his/her training, the number of trainees should not exceed the number of teachers in the centre. A tutor, preferably an external teacher, should be appointed to act as an impartial assessor/mentor for the trainee.

Trainers will meet the trainee at the beginning of the programme to define the educational contract for that trainee. Reviews of progress should take place at 3 monthly intervals during the first year of training to appraise the individual.

An annual assessment should be undertaken to state competencies achieved and to allow progress within the teaching programme. Assessments should be detailed and contain statements of theoretical and practical experience accumulated by the trainee. It is expected that the trainee will also provide an account of the training received and problems encountered (portfolio). Reports will be submitted to the Coordinator.

7. Requirements of Trainees

In order to gain the necessary depth of experience each trainee should be actively involved in the management care of different endocrine patients during the whole period of his/her speciality training. This should include the care of outpatient and inpatients and patients with endocrine emergencies where possible.

The trainee should keep a written record of patients seen by themselves, procedures conducted, diagnosis and therapeutic interventions instigated and followed-up. This will constitute in part the logbook/portfolio.

The trainee will be required to keep his/her personal logbook or equivalent up-to-date according to National guidelines and European Union directives. The logbook must be endorsed by his/her tutor or authorised deputy. The trainee should attend and provide evidence of attendance at local, regional and national Endocrine and Diabetes Meetings.

Attendance at International Meetings such as ESPE, Endocrine Society, European Endocrine Society and ISPAD is considered essential for Tertiary Care training. It is recommended to give at least 2 - 3 presentations at these meetings. Attendance of ESPE summer school or winter school is strongly encouraged.

Competency (Canmeds)

Many countries have recently reformed their postgraduate medical education. New pedagogic initiatives and blueprints have been introduced to improve quality and effectiveness of the education in line with outcome-based education using the CanMEDS framework. A detailed description of effectiveness and merits, subject of current evaluation, is beyond the scope of the syllabus.

Canmeds consists of the following competencies

- Medical expert: integration of all Canmed roles applying medical knowledge, clinical skills and professional attitudes
- Communicator: effectively facilitates doctor-patient relationship and dynamic exchanges before, during and after medical encounter
- Collaborator: effectively work within healthcare system to achieve optimal patient care
- Manager :integral participant in health care organizations , allocating resources and contributing to health care system
- Health advocate: responsibly use expertise and influence the advance of health of individual patient, communities or populations
- Scholar: demonstrates lifelong commitment to reflective learning and to creation, dissemination, translation of medical knowledge
- Professional: committed to health and wellbeing of individual and society through ethical practice, professional led regulation and high personal standards of behaviour.

Participation in Audit project

The trainee should conduct one systematic style review of a topic and in addition prepare a detailed evidence based appraisal of a diagnostic test or a therapeutic intervention. The Trainee is encouraged to provide as evidence of training a series of Signs of Personal Development.

These should include:

Mandatory

I. Creation of Trainee Portfolio which would include, log-book including all patients listed in accordance with the various endocrine disease categories, abstracts of work presented, reviews, self-directed learning activities (SDLA) and evidence based appraisals. Creation of clinical management workbook. SDLA includes reading activities, tutor discussions, self-teaching projects, teaching and presentation and participation in computer/distance based learning schemes.

II. Papers published in national or international peer reviewed journals. At least one as first author.

III. Papers presented at major International Endocrine Meetings such ESPE, ISPAD and/or Endocrine Society meeting

Optional

I. Experience of endocrinology within a single centre and between centres including work in other countries.

II. Attainment of higher degrees (PhD).

In the longer term for European Board of Paediatrics Certification in Paediatric Endocrinology an examination may need to be considered in addition to the above. This would be a practical examination of the trainee's approach to a series of clinical situations.

8. Content Table

Degree of knowledge:

H = HIGH	Updated scientific knowledge
B = BASIC	Paediatric endocrinology/ diabetology textbook

Table 1: Summary of principles tertiary care paediatric endocrinology:

A	**BASIC KNOWLEDGE**	
1	General principles of molecular biology. Specific reference to the molecular regulation of the GH-IGF axis and steroid hormone action at the molecular level	H
2	Secondary messenger signalling systems used in the endocrine system	H
3	Transport, biochemical actions and control of hormone secretion	H
4	Embryology of the endocrine system	B
5	Embryology of the genital tract and molecular basis for sexual differentiation	B
6	Neuroendocrinology of the anterior and posterior pituitary hormones and their action	B
7	Basic principles of pubertal development	B
8	Steroid biosynthetic pathways	B
9	Embryology of the endocrine system	B
10	Principles of growth assessment	H
11	Basic immunology with an emphasis on autoimmunity	B
12	Implications of childhood endocrine disease for adult endocrinology	B
13	Endocrine complications of other paediatric diseases: oncology, radiotherapy, renal- respiratory disease	B
14	Principles of genetic counselling for endocrine disorders	B
B	**BASIC SKILLS**	
1	Ability to conduct an anthropometric assessment, assessment of skeletal maturation and prediction of final height	H
2	Ability to conduct staging of pubertal development	H
3	An understanding of the principles and practice of hormone assay methods, analysis of DNA, RNA and the use of diagnostic tests including practical experience in an endocrine laboratory with access to an up-to-date hormone assay service participating in national quality control schemes Principles of good laboratory practice and the limitations of commonly used endocrine tests including importance of sample collection	B
4	Competence in understanding pharmacokinetics/dynamics of (commonly) used therapeutic agents and applications	B
5	Development of effective communication techniques	B

6	Management of endocrine problems in adolescence, including adolescent perspectives of chronic illness.	B
7	Self directed learning projects, literature searching, presenting information and consultation practice	B
8	Application of imaging techniques to endocrine evaluation	B
9	Psychological implications of endocrine disease; psychological impact on endocrine disease	B
C	**BIOSTATISTICS**	
1	application of parametric and nonparametric statistics	B
2	Statistical modelling	B
3	Method comparison studies	B
4	Principles of screening and surveillance programmes	B
5	Study design	B
6	Principles of health economics	B
7	Evidence based endocrinology	B
8	Critical appraisal of literature principles of systematic reviews	B
9	Place of information technology in clinical and research practice	B
D	**MANAGEMENT AND COMPETENCE DEVELOPMENT**	
1	Time management	B
2	Chairing meetings and team participation	B
3	Appraisal and assessment	B
4	Health economics and service provision	B
E	**EDUCATION**	
1	Defining aims of teaching course/programme/lecture	B
2	Targeting different audiences	B
3	Preparation of teaching material	B
4	Distance based learning using web sites	B
5	Education in pedagogics	B
F	**DIABETES**	
1	Carbohydrate, fat and amino acid metabolism and its enzymatic and endocrine regulation	H
2	Physiology of insulin action	H
3	Physiological effects of insulin and insulin deficiency	H
4	Genetics, immunology, epidemiology and aetiology of type 1 diabetes	H
5	Presentation of type 1 diabetes in infancy, childhood and adolescence	H
6	Management of diabetic ketoacidosis, hyperglycaemia	H
7	Management of diabetic ketoacidosis, hypoglycaemia	H

8	Cerebral oedema management	H
9	Pharmacology of insulins	H
10	Diabetes associated with other diseases e.g. cystic fibrosis and mitochondrial disorders	H
11	Predictors of type 1 diabetes and intervention studies	H
12	Management of type 1 diabetes in adolescence	H
13	Obesity and type 2 diabetes. Concept of insulin resistance	H
14	Management of type 2 diabetes	H
15	MODY	H
16	Lipid disorders(H?), celiac disease, hypothyroidism associated with diabetes	H
17	Injection and monitoring skills	H
18	Insulin pumps and continuous glucose monitoring	H
19	Develop teamwork approach to diabetic care, dietician, nurse specialists, psychologist	H
20	Develop concepts re: impact of having diabetes for the family and community (i.e. school, sports club etc)	H
21	Administer and/or interpret tests to detect diabetic complications	H
22	Laboratory experience of glycated protein analysis	H
23	Outpatient glucose monitoring and knowledge of monitoring programs (using electronic devices; telehealth systems)	H
G	**GROWTH DISORDERS**	
1	Evaluation of growth and anthropometric measurements	H
2	GH deficiency: diagnosis and treatment	H
3	Diagnosis and differential diagnosis of short stature	H
4	Management of different etiologies of short stature, such as Turner syndrome	H
5	(Differential) diagnosis and management of SGA	H
6	(Differential) diagnosis and management of skeletal dysplasias, including SHOX haploinsufficiency	H
7	(Differential) diagnosis and management of GH resistance , including disorders of the GH-IGF axis	H
8	(Differential) diagnosis and management of tall stature (familial;idiopathic)	H
9	Management of Marfan syndrome	H
10	Management of Klinefelter syndrome	H
11	Management of Sotos syndrome	H
12	Undernutrition: diagnosis and management	B
H	**PUBERTAL DISORDERS**	
1	Interpretation of diagnostic procedures	H
2	(Differential) diagnosis and management of delayed puberty (central and gonadal origin)	H

3	(Differential) diagnosis) and management of precocious puberty (central and gonadal origin)	H
4	Management of premature thelarche	H
5	Management of PCOS	H
6	Management of menstrual problems in adolescent girls	H
I	**NEUROENDOCRINE DISORDERS**	H
1	Nueral control of glandular secretion	H
2	Hypothalamic-pituitary unit (embriology-anatomy-physiology)	H
3	Anterior pituitary (hypophyseotropic hormones and neuroendocrine axes)	H
4	Posterior pituitary	H
5	Pineal gland	H
6	Endocrine diseases of hypothalamic origin	H
7	Pituitary masses	H
8	Hypophysitis	H
9	Management of pituitary masses	I
10	Prolactin alterations	H
11	Gonadotropin alterations	H
12	Growth hormone alterations	H
13	Adrenocorticotropin alterations	H
14	Thyrotropin alterations	H
15	Genetics of anterior pituitary failure	H
16	Diabetes insipidus	H
17	Syndrome of inappropriate ADH secretion (SIADH)	H
18	Hypothalamic obesity	H
19	Brain malformations and neuroendocrine dysfunction	H
20	Laboratory tests	H
21	Neuroimaging	H
22	Genetic tests	H
J	**THYROID**	
1	Molecular and immunological mechanisms of thyroid disease.	H
2	(Differential) diagnosis, and management of congenital hypothyroidism (prim/sec/tert)	H
3	Management of the infant of a hypo/hyperthyroid mother	H
4	(Differential) diagnosis and management of hypothyroidism	H
5	Management of euthyroid sick syndrome/nonthyroidal illness	H
6	(Differential) diagnosis and management of hyperthyroidism	H
7	Management of thyroid carcinoma including MEN syndromes	H
8	Management of thyroid nodus and multinodular struma	H

K	**ADRENAL**	
1	Molecular and steroid biochemistry of adrenal disorders.	H
2	(Differential) diagnosis and management of hypocortisolism, including CAH	
3	Differential) diagnosis and management of hypercortisolism (central and adrenal origin), including iatrogenic causes	H
4	Management of adrenal tumors	H
5	Management of premature adrenarche	H
L	**DSD**	
1	Molecular and biochemical background to disorders of sexual differentiation. Multi-disciplinary approach to the management of the problem.	H
2	(Differential) diagnosis and management of 46 XX DSD	H
3	(Differential) diagnosis, and management of 46 XY DSD	H
4	(Differential) diagnosis and management of chrom DSD	H
5	Management micropenis (at birth and > 1 yr)	H
M	**GONADAL DISORDERS (MALE AND FEMALE)**	
1	Diagnosis, differential diagnosis and management of hypospadias	H
2	Diagnosis , differential diagnosis and management of crytorchidism	H
3	Management of gonadal dysgenesis (including vanishing testis syndrome)	H
4	Management of vaginal dysplastic syndromes including MRKH syndrome	H
N	**CALCIUM DISORDERS**	
1	Molecular and biochemical background to disorders of calcium and phosphate metabolism.	H
2	(Differential) diagnosis and management of (pseudo-) hypoparathyroidism	H
3	(Differential) diagnosis and management of hyperparathyroidism	H
4	Management of rickets	H
5	Management of hypo- / hypercalcaemia and hypo- / hyperphosphatemia	H
6	Management of osteoporosis including interpretation of bone density determination	H
O	**ENDOCRINE METABOLIC DISORDERS**	
1	Diagnosis and management (medical and surgical) of hypoglycaemia	H
P	**WATER AND SALT METABOLISM**	
1	(Differential) Diagnosis and management of hypoaldosteronism	H
2	(Differential) diagnosis and management of hyperaldosteronism	H
3	Management of central diabetes insipidus	H
4	Management of fluid balance during and postop cerebral surgery, including D,I, SIADH, cerebral salt wasting	H

Q	**OBESITY**	
1	(Differential) diagnosis and management of childhood obesity including syndromal, genetic and endocrine causes	H
2	Management of life-style obesity	H
3	Management of cholesterol / lipid disturbances	H
R	**OTHER**	
1	Management of polyglandular autoimmune endocrinopathy	H
2	Management of McCune Albright syndrome	H
3	Management of endocrinopathy following bone marrow /stem cell transplantation in oncology	H