

# **Training Requirements for Subspecialty Programmes in Paediatric Haematology and Oncology**

**(Modification from THE EUROPEAN TRAINING Programme in  
Paediatric Haematology and Oncology for SIOp)**

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## **Standards for Training Centres**

**(Modification from SIOp according to the Canadian standards)**

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This training document derived from the subspecialist training programmes in Tertiary Care Paediatrics, defined by the European Union of Medical Specialists (UEMS). This programme was drafted by the Education and Training Committee of the Société Internationale d'Oncologie Pédiatrique Europe (SIOPE, Chaired by Jillian R Mann) and the European Society of Paediatric Haematology and Immunology (ESPHI).<sup>1</sup> It was approved by the European Board of Paediatrics (EBP) in December 2000 and by the Confederation of European Societies of Paediatrics (CESP) which is the UEMS's Section of Paediatrics, in May 2001. UEMS gave its approval on October 19, 2001.

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## **1. INTRODUCTION**

This document sets out the minimum requirements for training in Tertiary Care Paediatric Haematology and Oncology. It defines the proposed Training Programme for the education of specialists in Paediatric Haematology and Oncology who will practice their skills and expertise within the framework of a specialised tertiary care unit.

Paediatric Haematology and Pediatric Oncology specialties overlap in some subjects and in many countries such as North America and Australasia, as well as in many countries in Europe, they are regarded as one specialty. Paediatric Haematology includes the care of children with leukaemia and non-malignant conditions such as coagulation disorders and haemoglobinopathies, and also children having bone marrow transplant. In some countries Paediatric Haematologists also run haematology laboratories, providing a diagnostic and consultative service for which they require additional training. This extra training is controlled by the relevant national body. Paediatric Oncology incorporates the care of children with leukaemia, tumours of the central nervous system and with other solid tumours and may include the care of children having bone marrow transplants or other stem cell rescue procedures.

In most specialised tertiary centres specialists in Paediatric Haematology and Pediatric Oncology work as a team, providing mutual cross-cover, individual specialists in the bigger centres often having specific interests and responsibilities, for example in coagulation disorders, bone marrow transplant, leukaemia or CNS tumours.

The suggested training programme has been designed in a modular fashion, the modules containing core knowledge and skills which are essential for all trainees in Paediatric Haematology and Oncology. Guidance is given for the minimum training required in each module. Trainees will be expected to spend

additional time in certain modules, depending upon their final career intentions.

It is recognised that Paediatric Haematology and Oncology are academic specialties with the majority of treatments for leukaemia and other cancers being managed within national or international clinical trials. Complex laboratory investigations are necessary both for diagnosis and clinical management as well as for better understanding of the diseases. Therefore, in addition to the minimum training described in this document, which should lead to the Certificate of Completion of Specialist Training (CCST), many trainees will choose to spend an extra period of several years undertaking laboratory or other research. While such research training and experience are not considered in this document, all trainees will be expected to become familiar with research methodologies.

## **2. BASED ON PAEDIATRIC TRAINING**

In Europe the task of harmonising training programmes and training assessments lies within the remit of the European Board of Paediatrics (EBP) which has been specifically charged by CESP to undertake this task. To achieve this, the EBP recommends the standards for specialist training in paediatrics, including training quality, syllabus and minimal standards for training centres. Recognition has been given to the diverse training needs of different types of Paediatrician and carefully constructed training programmes in core paediatrics are in existence.

Trainees accepted into Paediatric Haematology and Oncology will have completed their core training in Paediatrics according to their national regulatory requirements before starting their training in Paediatric Haematology and Oncology.

## **3. AIMS OF TRAINING**

On the basis of this training, specialists in The

trainee will also have an understanding of the scientific principles of haematological disorders and childhood cancers and of the specialty related laboratory test procedures (including safety aspects), interpretation of the results and management aspects of their specialty. The trainee is expected to be familiar with clinical skills (including risk benefit assessment), research methodologies, teaching and presentation methods, and ethical issues pertaining to research and clinical management. This should include in-patient and out-patient care and the routine application of specialised diagnostic and therapeutic methods. The specialist should understand the principles of clinical trials and obtaining consent, and be able to follow protocols and manage patients participating in them. Experience in teaching should be provided during the specialist training.

## **4 TRAINING PROGRAMME**

### **4.1 Structure of Programme**

The programme is structured to recognise that upon completion of training specialists in Paediatric Haematology and Oncology over the world do not all carry the same range of responsibilities. Many undertake the care of children with all types of non-malignant haematological disorder and also children with leukaemia, lymphoma, solid tumours and CNS tumours. They may also do bone marrow/stem cell transplantation and may have limited laboratory duties such as the reporting of blood and bone marrow films. In the larger centres some Paediatric Haematologists/Oncologists may specialise in, for example, leukaemia, neuro-oncology or transplantation while usually also carrying out other responsibilities in the specialty.

Paediatric haematology and oncology encompasses a wide range of complex disorders, the diagnosis and management of which are often difficult. Thus, specialisation within the sub-specialty is likely to continue, but all subspecialists in Paediatric Haematology and

Oncology need to have received the broad basic training outlined in this document. The programme therefore allows for further specialisation within the subspecialty. Thereby it is hoped that the programme will ensure high standards of training across the world and will facilitate the movement of doctors between countries, while also providing for the service needs of each country.

Appendix 1 shows the nine training modules. It is important that these should be flexibly interpreted. The period shown against each module is to indicate the minimum proportion of the 3-year programme that every trainee must spend in each. In most centres it is likely that several modules will run concurrently. If a centre is not able to provide training in a particular area, then the trainee must move to another centre for the relevant period.

### **4.2 Syllabus**

This is shown in Appendix 2. Modules 1 and 2 are delivered over the whole of the training period alongside other training. Module 1 is suitable for delivery by didactic teaching, preferably in courses held in large centres on a national or international basis. The other modules may be undertaken in any order.

The flexible module will be used to increase the experience of trainees according to their final career intentions. For example, a trainee may spend the flexible period increasing his/her experience in the care of children with CNS tumours, other solid tumours, coagulation disorders, haemoglobinopathies, or in laboratory work. Experience in research may also be gained during the flexible module, but trainees wishing to undertake a substantial research project will generally need to do so outside this 3-year tertiary care training programme.

### **4.3 Duration of Training**

The minimum period of specialist training in Paediatric Haematology and Oncology is 3 years

of which at least 2 years must be clinical. Additional training may be needed for certain career posts.

## **5. MONITORING OF TRAINING**

Each trainee's progress is monitored by the training director (tutor) in the primary training centre, by the national training body and by the trainee him/herself. The trainee should maintain a personal log book (portfolio) where relevant training experiences are recorded. The trainee's progress and portfolio are appraised with the trainee by the tutor at least every 6 months.

Successful completion of training is certified by the tutor and ratified by the national training body.

## **6. ACCREDITATION OF TRAINING CENTRES (in development)**

Accreditation will be given initially by the national training body. Expected standards for training centres are listed on pages 10 & 11.

## **7. NATIONAL TRAINING PROGRAMMES**

### **7.1 Countries with Existing Programmes**

National training programmes in Paediatric Haematology and Oncology or Paediatric Haematology and Paediatric Oncology separately that already exist or are in an advanced stage of development should be considered as compatible when they have a content that is comparable with but not shorter than this programme.

### **7.2 Countries without Existing Programmes**

National professional bodies should be encouraged to adopt a national training programme in Paediatric Haematology and Oncology and to structure it in close compatibility with this model. Until implementation of such a national training programme, individuals should have the opportunity to train according to this programme and to document their progress in a similar fashion.

## **8. ASSESSMENT OF TRAINEES**

Many countries do not at present have an exit examination in Paediatric Haematology and Oncology. It is desirable for exit examinations to be introduced on a national basis.

## APPENDIX 1

### MODULAR TRAINING PROGRAMME IN PAEDIATRIC HAEMATOLOGY/ ONCOLOGY

<b>Module</b>	<b>Minimum Duration in Proportion to the 3 year Training Period</b>
Scientific basis	Delivered throughout the 3 years
Generic practical training	Delivered throughout the 3 years
Laboratory in hematology and oncology and Clinical non-malignant paediatric haematology (including haemostasis/ thrombosis)	(3) months (3) months (flexible 6 months together)
Leukaemia/lymphoma	3 months
Bone marrow/stem cell	(3 months, highly recommended but not mandatory)
CNS tumours	3 months
Other solid tumours	3 months
Flexible for longer training in the above modules, other training in the specialty or research	18 months
TOTAL	3 years of which at least 2 years must be spent in clinical training

#### Footnote for Appendix 1

The period shown for each module indicates the minimum proportion of the 3 year training programme that every trainee must spend in each. The flexible period of 18 months will be spent preparing the trainee for his/her anticipated future career. For example, trainees expecting to work mainly caring for children with malignant disease would spend most of this time caring for children with leukaemia/lymphoma, CNS and solid tumours, whereas those planning to work mainly in non-malignant haematology would spend the majority of the time increasing their experience in clinical and laboratory haematology  $\pm$  leukaemia and bone marrow/stem cell transplant.

In countries where Paediatric Oncology and Paediatric Haematology are separate subspecialties, Paediatric Oncologists training 6 months in laboratory hematology /-oncology and/or clinical non malignant hematology will be eligible for this programme. Similarly, Paediatric Haematologists training 6 months for CNS and other solid tumours will meet the requirements of this training programme.

## APPENDIX 2

### SYLLABUS FOR TRAINING IN PAEDIATRIC HAEMATOLOGY/ONCOLOGY

#### **Module 1 - Scientific Basis of Paediatric Haematology and Oncology**

(suitable to be delivered by didactic course-based teaching on national/international basis)

Epidemiology of cancer and leukaemia

Biology of cancer and leukaemia

Genetics of cancer (cyto- and molecular) and gene therapy

Immunology of cancer

Imaging

Principles of surgery

Principles of chemotherapy, pharmacology, pharmacokinetics, new drug evaluation

Principles of radiotherapy, radiobiology

Emergencies

Supportive care: use of blood products, antibiotics, nutritional support, growth factors etc

Psycho-social aspects

Epidemiology of non-malignant haematological diseases

Haemopoiesis

Coagulation, thrombosis, anticoagulation

Blood transfusion, tissue typing, transplantation immunology

Organisation of care

Statistics, incidence, survival

Clinical trial methodology

Research methodology and audit

Ethical Issues, consent, litigation, data protection

#### **Module 2 - Generic Training in Practical Skills Required in Paediatric Haematology and Oncology**

Optimal use of diagnostic services

Ensuring good clinical practice

Supportive care, including central lines

Care of adolescents

Long-term follow-up

Late effects

Palliative care, pain evaluation and treatment

Academic skills: research, audit, teaching, data reporting, trial documentation

Communication/counselling parents and patients

Psycho-social aspects

Organisation and managerial skills

Leadership of multidisciplinary team

Attendance at appropriate national and international meetings.

### **Module 3 - Laboratory Haematology / Oncology**

Blood transfusion

Bone marrow, blood, CSF cytology and morphology (including to be able to report the results – training throughout the programme plus evaluation of skills required)

Flow cytometry

Cytogenetics/ Molecular diagnosis

Immunophenotyping

Histo/cytochemistry

Coagulation

Thrombophilia and anticoagulation

Haemoglobin electrophoresis

### **Module 4 – Clinical non-malignant Paediatric Haematology**

Anaemias including nutritional

Haemoglobin disorders (haemoglobinopathies, thalassaemia etc)

Haemolytic anaemias

Haemostatic disorders, platelet defects, thrombocytopenia, thrombophilia

Neutropenia

Bone marrow failure (aplastic anaemia)

Blood transfusion practice and safety

Neonatal haematology and immunology

Immunodeficiency disorders (congenital and acquired)

Haematological manifestations of systemic diseases including infections, e.g. malaria

Antenatal diagnosis and genetic counselling

Participation in clinico-pathological meetings

### **Module 5 – Clinical Malignant Haematology, (Leukaemia, Myelodysplasia, MDS) and Lymphoma**

Diagnosis, including cytology, morphology, cytogenetics and immunophenotyping (including being able to report the results)

In- and out-patient care

Emergencies

Risk stratification and choice of treatment

Ensuring appropriate samples and data are collected

Delivering treatment following clinical protocols

Response evaluation

Diagnosis and treatment of relapse

Late effects

Participation in clinico-pathological meetings

### **Module 6 - Bone Marrow Transplant/Stem Cell Transfusion (Clinical)**

Indications for transplant/stem cell transfusion

Tissue typing

Principles of:

- Donor selection
- Donor counseling
- Stem cell manipulation
- Conditioning/immune suppression/transplant immunology

Supportive care

Graft versus host disease

Acute complications and late effects.

### **Module 7 - CNS Tumours (Clinical)**

In conjunction with neuro-surgeon and radiotherapist, diagnosis, in- and out-patient care

Emergencies

Management of hydrocephalus

Investigation, imaging

Risk stratification and choice of treatment

Ensuring appropriate samples and data are collected

Delivering treatment following clinical protocols

Response evaluation

Rehabilitation

Management of neurological handicap, cognitive defects, endocrine dysfunction and other late effects

Diagnosis and treatment of relapse

Participation in Tumour Board Meetings including histopathology

**Module 8 - Solid Tumours Outside the CNS (Clinical)** – including neuroblastoma, nephroblastoma, soft tissue and bone sarcomas, germ cell tumours, retinoblastoma, liver tumours, endocrine and epithelial tumour,s and other rare tumors

In conjunction with paediatric surgical oncologists and paediatric radiotherapists, diagnosis, in- and out-patient care

Emergencies

Staging, risk stratification and choice of treatment

Ensuring appropriate samples and data are collected

Delivering treatment following clinical protocols

Response evaluation

Rehabilitation

Management of handicaps, endocrine dysfunction, prostheses and other late effects

Diagnosis and treatment of relapse

Participation in Tumour Board Meetings including histopathology

### **Module 9 – Flexible (see previous footnote )**

This may include further experience in aspects of any of the other 8 modules approved elective or time in research. This experience may be gained in the trainee's country or abroad. Research must be undertaken under expert supervision in which the trainee learns to plan, conduct, evaluate, publish and present research projects but not more than 6 months may be spent in full time research (recommended 3 months). Experience abroad will only be acceptable when undertaken in an institution considered suitable by the national body responsible for overseeing training.

## Standards for Training Centres

### Modified for SIOP according to the Canadian standards

There must be sufficient resources including teaching faculty, the number and variety of patients, physical and technical resources, as well as the supporting facilities and services necessary to provide the opportunity for all trainees to achieve the educational objectives and receive full training as defined by SIOP Paediatric Haematology and Oncology training requirements.

Standard	Descriptor
<p>1. There must be a sufficient number of qualified teaching staff to provide appropriate teaching and supervision of residents.</p>	<p><input type="checkbox"/> The number and qualifications of the teaching staff are appropriate to teach the residents who are assigned to the rotations in the specialty.</p> <p><input type="checkbox"/> The number and qualifications of the staff are adequate to supervise the residents, including on-call supervision.</p>
<p>2. The number and variety of patients or laboratory specimens available to the program must be sufficient to meet the educational needs of the residents</p>	<p><input type="checkbox"/> The numbers and mix of patients or laboratory specimens are appropriate according to the specialty specific requirements.</p>
<p>3. Clinical services and other resources used for teaching must be organized to achieve their educational objectives.</p> <p>3.1 All resources used for teaching must be organized according to the following general principles:</p> <p>3.1.1 Teaching staff must exercise the double responsibility of providing high quality, ethical patient care and excellent teaching.</p> <p>3.1.2 There must be an experience-based learning process, which provides training in collaboration with other disciplines for optimal patient care. This includes collaboration with other physicians and with other health care professionals.</p> <p>3.1.3 There should be an integration of teaching resources to include exposure to emergency, ambulatory, and community experiences where appropriate.</p> <p>3.1.4 Learning environments must include experiences that facilitate the acquisition of knowledge, skills, and attitudes relating to aspects of age, gender, culture, and ethnicity appropriate to the specialty or subspecialty.</p>	<p><input type="checkbox"/> Residents and faculty report satisfaction with how the clinical services and other resources are organized vis-à-vis teaching and learning.</p> <p><input type="checkbox"/> Department/Division Head is able to describe a system of annual review of faculty/clinical teaching staff re: patient care and teaching. This should include resident feedback.</p> <p><input type="checkbox"/> The program director can describe mechanisms to handle situations in which teaching staff are not exercising the double responsibility of high quality ethical patient care and excellent teaching.</p> <p><input type="checkbox"/> Residents and teaching staff describe an experiential learning cycle that allows for patient care experience, feedback, and reflection.</p> <p><input type="checkbox"/> Residents and teaching staff describe an environment in which they can easily obtain input from other disciplines with respect to patient care and learning.</p> <p><input type="checkbox"/> Residents and teaching staff report adequate exposure to emergency, in-patient, ambulatory, community experiences, including acute and chronic care, as appropriate to the specialty or subspecialty.</p> <p><input type="checkbox"/> Residents and teaching staff can list ways in which the acquisition of knowledge, skills, and attitudes related to aspects of age, gender, culture, and ethnicity appropriate to the specialty or subspecialty are facilitated.</p>

Standard	Descriptor
<p>3.1.5 There should be opportunities for residents to acquire the relevant knowledge to understand, prevent and disclose adverse patient events.</p> <p>3.2 There must be easy access to a major medical library and appropriate access to computers and facilities for information management, on-line references and computer searches either at the medical school or through a major hospital library.</p>	<p><input type="checkbox"/> Residents and teaching staff can name ways in which the program facilitates the learning of patient safety competencies.</p> <p><input type="checkbox"/> Residents have 24 hour access (physical or electronic) to the major medical literature, including appropriate texts and current journals at all sites.</p> <p><input type="checkbox"/> At all teaching sites there are easily accessible facilities for information management, on-line references, and computer searches.</p>
<p>4. The physical and technical resources available to the program must be adequate to meet the needs of the program as outlined by the national accreditation body.</p>	<p><input type="checkbox"/> The physical and technical resources of the program meet the specialty specific standards of accreditation.</p> <p><input type="checkbox"/> The teaching staff have adequate space to facilitate learning, including \ direct clinical observation, providing didactic teaching, and having confidential discussions with residents.</p>
<p>5. Supporting facilities and services must be available as outlined in the national standards of accreditation for programs in the specialty or subspecialty. In addition:</p> <p>5.1 Clinical services heavily committed to the care of seriously ill and injured patients must be supported by intensive care units organized for teaching.</p> <p>5.2 All consultative, diagnostic, and laboratory services necessary for patient care must be available.</p> <p>5.3 The facilities must include an emergency department with an adequate number and variety of patients presenting urgent problems in the discipline. Each resident must have opportunities, under appropriate supervision, to provide an initial assessment and consultative service to patients presenting with emergency conditions.</p> <p>5.4 Ambulatory care and/or community facilities must be available to provide residents with experience in the care of the broad range of non-hospitalized patients seen in the subspecialty. This experience should include, but not be limited to, pre-admission work-up and post-discharge follow-up care.</p> <p>5.5 A major portion of each resident's training should take place in sites in which there are other accredited programs in relevant health professions in order to facilitate professional collaboration.</p>	<p><input type="checkbox"/> Residents describe intensive care learning experience appropriate to the specialty or subspecialty.</p> <p><input type="checkbox"/> Consultative, diagnostic and laboratory services necessary for patient care are available.</p> <p><input type="checkbox"/> Residents and teaching staff report Emergency and acute care facilities necessary for patient care are available.</p> <p><input type="checkbox"/> Residents have opportunities to provide initial assessment and consultative services to patients presenting with emergency conditions.</p> <p><input type="checkbox"/> Residents describe ambulatory care learning experiences appropriate to the specialty or subspecialty.</p> <p><input type="checkbox"/> Resident training takes place in a context where there are accredited programs in other relevant specialties.</p>

