INTRODUCTION

This syllabus is a comprehensive document detailing the requirements expected from a trainee in paediatric oncology in Malta. The eligible applicant must have completed his/her basic specialist training and be in possession of a diploma in paediatrics from the Royal College of Paediatrics and Child Health (UK) or its equivalent.

The training in paediatric oncology lasts six years and includes 12 months in General Paediatrics, 12 months in Neonatology and four years in Paediatric Oncology. The suggested training programme has been designed in a modular fashion. The modules contain core knowledge and practical aspects related to a diagnostic and therapeutic approach together with expertise in practical procedures such as lumbar puncture, bone marrow aspiration and bone marrow biopsy. In addition, the trainee is also expected to be familiar with research methodologies and ethical issues pertaining to research and clinical management. The trainee is expected to spend a minimum of one year in a tertiary referral centre for paediatric oncology abroad. The tertiary referral centre must also have a programme for paediatric haemopoietic stem cell transplants for the treatment of both haematological and solid malignancies. This will expose the trainee to a wider selection of clinical conditions and situations, novel therapeutic approaches and the chance to work with experts at the forefront of paediatric oncology.

During training in Paediatric oncology, the trainee has to complete the eportfolio for General Paediatrics when working in Neonatology and General Paediatrics and has to meet the requirements for the Paediatric oncology eportfolio during the rest of the training. The logbook and eportfolio, together with an end of placement report from the tertiary centre abroad, are mandatory for a trainee’s application for the award of the Certificates of Completion of Specialist Training in Paediatrics and in Paediatric oncology and inclusion in the respective registers of the Malta Medical Council.

Criteria for entry into the paediatric oncology training programme in Malta

Candidates submitting their interest to be considered for entry into the paediatric oncology training programme must be in possession of:

a) Full registration with the Medical Council of Malta.

b) Completion of Basic Specialist Training in Paediatrics (CCBST or equivalent).

c) Success in an open call for application for the post of Higher Specialist Trainee in paediatric oncology in a locally recognised institution.

General requirements, duration and structure of higher specialist training in paediatric oncology

1) Unless otherwise specified any period of training referred to within this document is assumed to be full-time or part-time pro-rata. Any quoted duration of training is the minimum required (or pro-rata equivalent) for certification.

2) For the purposes of completion of training:

a) Training must be undertaken within an on-call rota.

b) In case the trainee is working on a ‘reduced hour’ or ‘part-time schedule’, training will be counted on a pro-rata basis taking into consideration an adequate balance of supervised clinical training and out-of-hours duties.
c) The trainee should have out-of-office hours experience in accordance with departmental rota requirements, but not less than 45 duties per year (equivalent to 1:8).

3) Part time trainees will have their training recognized pro-rata; a total of 13 weeks of maternity leave throughout the entire duration of training (in addition to the normal entitlement of leave) can be recognized as part of the training period; however any longer period of leave will not be considered as training.

4) The following training criteria must be satisfied for a CCST to be issued to the trainee:
   a) Training undertaken must be at least 50% of full-time training with total duration of training extended pro-rata.
   b) At least 50% of training must be undertaken in a training centre in Malta that is recognized by the SAC.
   c) The trainee shall record all stages of training and activities related to training in a log-book/e-portfolio.

5) All paediatric subspecialty trainees are expected to acquire dual certification. The trainee first acquires certification in General Paediatrics after a minimum of 4 years training in General Paediatrics at the level of HST and achievement of all required competencies. Subsequently, certification in **Paediatric Oncology** is acquired after a further 2 years of training with achievement of all required competencies. The total duration of training in **Paediatric Oncology** is 4 years full time (or part time equivalent) - 2 years between year 1 and 4 (which will run concurrently with training in General Paediatrics), and year 5 and 6 (Fig 1).

(The requirements for entry into the General Paediatric register are described in another document ENDORSED BY THE SAC. This document will focus on the requirements for Paediatric Oncology.)

6) The trainee is expected to spend a period of overseas training of not less than 1 year and up to a maximum of two years, full-time (or part-time equivalent) in an accredited tertiary paediatric oncology centre abroad that is recognized by the MPA and SAC. This period of training can be done at any time between year 4 and year 6 of subspecialty training, provided that the trainee has already achieved a minimum of 12 months experience in the subspecialty in the local centre, and, that the last 6 months of training (in year 6), are also done in a locally recognized institution within the Maltese territory. Training abroad will be vetted by the Postgraduate Training Coordinator/s for suitability, and approved by the MPA and the SAC. This period of training will have stipulated training targets that are aimed at filling specific gaps in the training undertaken locally, and/or to further expose the trainee to the full breadth of the specialty. The trainee is to submit a detailed record of training undertaken abroad, duly signed by a mentor/s at the institution. The trainee still needs to document his/her training on the local e-portfolio by inviting the mentors or supervisors in the new training centre to complete the required accomplishment forms.
7) Trainees shall be involved in the care of ambulatory patients (including children’s outpatient and paediatric day care unit) and of inpatients (including paediatric wards, NPICU and management of emergencies).

8) Progression through subspecialty training in paediatric oncology (Year 1 through to Year 6) is dependent on satisfactory appraisal, which may include written or oral examinations, done by clinical/educational supervisors (1-2 formal assessments per year).

9) The trainee is expected to participate and contribute to teaching activities within the department, participate actively in local and international meetings, and contribute to the medical literature through scientific publications.

10) In the last year of training the trainee is expected to sit for the Paediatric Oncology examination. Obtaining a pass in this exam is one of the prerequisites for entry into register of Paediatric Oncology.

Figure 1. Outline of training timeline in paediatric oncology
AWARDING OF CCST IN PAEDIATRIC ONCOLOGY:

Entry into the specialist register in Paediatric Oncology requires all of the following:

1. All the criteria of the training programme/curriculum are satisfied, documentation of training in the eportfolio is complete and the trainee passes all appraisals during the period of training
2. The bulk of the training in Paediatric Oncology (>50% of HST duration) is undertaken in a recognized institution within the territory of the Republic of Malta.
3. The trainee undertakes the last 6 months of his/her training in a recognized institution within the territory of the Republic of Malta
4. The trainee passes the oral assessment in paediatric oncology
5. The trainee has undertaken a period of training in a recognized tertiary center abroad lasting not less than 1 year and not more than 2 years duration.
6. The trainee shows evidence of participation in research, achieved a minimum of 1 publication in a peer reviewed journal, and contributed presentations in local and international scientific meetings relevant to the subspecialty.

CONTENT OF THE PROGRAMME: SYLLABUS/CURRICULUM

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Specialist training programme in Paediatric Oncology

Background

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Timeline

The trainee is required to fulfill the competencies of the modules in the time frames as listed below:

Competences in Modules 1 and 2 must be completed during the first 2 years of attachment in Paediatric Oncology*

Module 3 to 5 must be completed throughout the duration of training in paediatric oncology

Module 6 must be undertaken in the last 2 years of training
Module 1

Core knowledge

- Cancer epidemiology
- Genetic and environmental factors predisposing to malignancies
- Tumour clinical presentation, potential metastatic sites and tumour staging
- Emergencies at diagnosis and during treatment, including spinal cord compression, raised intracranial pressure, tumour lysis syndrome, abdominal obstruction, septic shock, mediastinal compressive syndrome and arterial hypertension.
- Imaging including FDG-PET in lymphoma and in other tumours, MRI in brain tumours, MIBG scintigraphy in neuroblastoma, and other new radiological procedures that may be important for the assessment of response and treatment strategies.
- Principles of chemotherapy and new agents: pharmacokinetics, pharmacodynamics, mechanism of drug resistance, side effects and complications related to chemotherapy
- Interactions between chemotherapy and concomitantly administered drugs
- Treatment for haematological malignancies and solid tumours according to current national/international protocols at diagnosis and relapses
- Supportive care, including infection management, pain control and blood products transfusion
- Principles of bone marrow and stem cell transplant
- Role of radiotherapy in different tumours including the principles of treatment planning and the short and long term effects of radiotherapy treatment in children
- Principles of surgery and tissue collection for diagnosis and biological studies
- Prognostic factors and therapeutic implications
- Molecular markers as diagnostic and prognostic tools
- Possible neurological, endocrinological, cognitive, behavioural and social sequelae of different tumours and their treatment
- Ethical issues, consent, data protection
Module 2
Diagnostic and therapeutic approach

- Clinical, laboratory and radiological investigations for the appropriate staging of different tumours
- Interpretation of radiological investigations and laboratory findings
- Treatment planning at diagnosis or relapse, according to current national/international protocols including the prescribing of chemotherapy regimens
- Recognition and treatment of the main emergencies at diagnosis and during treatment
- Treatment of infectious diseases according to current guidelines
- Accurate pain evaluation and adequate treatment
- Palliative care and the holistic approach to the patient and his family
- Intrathecal drug administration and safety issues according to good clinical practice
- Management of acute reactions to drugs and extravasation of chemotherapy agents
- Haematopoietic stem cells transfusion procedure and treatment related complications
- Tumour and treatment-related follow up plan
- Communication with parents, children and adolescents
- Interaction and coordination with other professionals involved in the care of children and adolescents with cancer (e.g. nurses, psychologists, physiotherapists, dieticians etc...)
- Specific needs for ethnically and socially diverse families

Adolescents and young adults with cancer

- Tumour behaviour, biology and treatment in adolescents and young adults
- Specific psychological needs in adolescents and young adults with cancer
- Consent, aspects and ethical aspects in adolescents and young adults with cancer

Minimum number of procedures to be performed*

- 30 Lumbar punctures
- 30 Bone marrow aspirations
- 15 Bone marrow biopsies

Minimum number of patients to be evaluated*

- 25 patients with haematological malignancies
- 20 patients with brain tumours
- 15 patients with other solid tumours

*Timeline for cases evaluated and procedures performed is over the four year training period in paediatric oncology.
Module 3

Leukaemia

- Constitutional and genetic conditions predisposing to leukaemia
- Management of the treatment-related complications including tumour lysis, coagulopathy, thrombosis, infections, septic shock
- Treatment according to the different types of leukaemia
- Indications for bone marrow transplant
- Current role of radiotherapy and associated complications
- Cytogenetic and molecular aspects affecting prognosis and treatment in infants and children
- Clinical, laboratory and molecular response to treatment for prognosis and treatment plan
- Management of testicular, CNS and bone marrow relapse
- Management of myelodysplastic syndrome and rarer forms of childhood leukaemia such as chronic myeloid leukaemia and juvenile myelomonocytic leukaemia

Hodgkins Lymphoma

- Histological subtypes and influence on prognosis
- Role of FDG-PET at diagnosis and in the assessment of response and treatment intensity
- Potential late effects related to chemotherapy and radiotherapy: increased risk of second cancers mainly in patients receiving radiotherapy, cardiac and lung dysfunction, damage of reproductive function

Non-Hodgkins Lymphoma

- Histological subtypes in children and adolescents
- Possible diagnosis on pleural effusion or ascitic fluid
- Management of complications at diagnosis, including tumour lysis, mediastinal compressive syndrome, intestinal obstruction, airway compression and spinal cord compression
- Molecular genetic aspects important for diagnosis (i.e. t(8;14), t(8; 22) and t(2;8) in Burkitt lymphoma; t(2;5) in anaplastic large-cell lymphoma)

Renal tumours

- Differential diagnosis of a renal mass
- Pathology of renal tumours
- Management of tumour-related hypertension
• Congenital anomalies associated with Wilms tumour and current screening strategy
• Cytogenetic and molecular aspects of Wilms tumours
• Relationship between histology of Wilms tumour, treatment and prognosis
• Principles of treatment of bilateral Wilms tumours
• Nephroblastomatosis and Wilms tumour
• Treatment of non Wilms renal tumours

Neuroblastoma
• Updated Neuroblastoma classification
• Stage 4S Neuroblastoma
• Knowledge of paraneoplastic syndrome (opsoclonus-myoclonus-ataxia and secretory diarrhoea)
• Management of clinical related problems, i.e. hypertension, spinal cord compression
• Laboratory findings: urinary catecholamines, neurone specific enolase, ferritin and lactate dehydrogenase
• Treatment and prognosis according to age, stage, histology and molecular genetic aspects (such as MYCN amplification)
• Role of MIBG scintigraphy for diagnosis, assessment of response and treatment

Bone tumours
• Predisposing factors (i.e. previous radiotherapy) and genetic aspects associated with osteosarcoma and Ewing's tumours
• Differential diagnosis of a suspected bone tumour, according to anatomic site and radiological aspects
• Radiological investigations to characterise the primary tumour and look for distant metastasis
• Molecular genetics aspects important for diagnosis (e.g. t(11;22) in Ewing sarcoma)
• Role of neoadjuvant chemotherapy to facilitate surgery and the importance of tumour response to chemotherapy
• Adjuvant chemotherapy according to histopathological response to treatment
• Surgical approach, including the use of prostheses
• Principles of rehabilitation
• Relevance of histological margins at resection and possible indications for further surgery or adjuvant radiotherapy in Ewing sarcoma

Soft tissue sarcoma
• Histological subtypes of soft tissue sarcoma and the effect of histology on prognosis and treatment
• Molecular genetic aspects that are important for diagnosis e.g. t(2;13) in alveolar rhabdomyosarcoma
• Prognosis and treatment of rhabdomyosarcoma according to stage, histology, tumour volume and anatomic site of the primary lesion
• Prognosis and treatment of non-RMS soft tissue sarcoma

CNS tumours

• The different histological types of brain tumours and their treatment (medulloblastoma, low grade glioma, high grade glioma, brainstem glioma, ependymoma, germ cell tumours, craniopharyngioma, atypical teratoid/rhabdoid tumours and other rare brain tumours)
• Accurate staging including the use of MRI of the spine and CSF cytology in medulloblastoma, intracranial germ cell tumours and other selected tumours, including serum and CSF tumour markers in intracranial germ cell tumours
• Management of low grade glioma in children with NF1
• Cytogenetics and molecular abnormalities affecting prognosis and treatment (e.g. MYC genes and β-catenin in medulloblastoma)
• Complications and late effects as a result of tumour, surgery, radiotherapy and chemotherapy in relation to the patient's age and stage of development (e.g. the potential for neurological, endocrinological, cognitive and behavioural sequelae)
• Syndromes associated with CNS tumours
• Multidisciplinary team approach to rehabilitation

Hepatic tumours

• Differential diagnosis of right upper quadrant masses
• Congenital conditions associated with an increased risk of hepatoblastoma
• Role of serum α-fetoprotein in the diagnosis and management of liver tumours
• PRETEXT staging system in hepatoblastoma
• Treatment of hepatoblastoma and hepatocellular carcinoma
• Indications for liver transplantation in the management of hepatic tumours

Retinoblastoma

• Understand the inheritance pattern of bilateral retinoblastoma
• Know the epidemiologic, genetic, and clinical features of unilateral and bilateral retinoblastoma
• Recognize the clinical presentation of retinoblastoma and the clinical manifestations of trilateral retinoblastoma
• Be able to utilize imaging modalities appropriately to determine the extent and metastatic spread of retinoblastoma
• Know that the central nervous system and bone marrow are the most common metastatic sites of retinoblastoma
• Understand the staging of retinoblastoma according to the intraocular extent of the tumour
• Know the role of surgery, irradiation, chemotherapy and photocoagulation in the
treatment of retinoblastoma

- Know about screening and follow-up for children who are siblings of a patient with retinoblastoma
- Know the prognostic features and prognosis of retinoblastoma according to stage and histology
- Know the complications and late effects of retinoblastoma including the risk of the development of secondary malignancy in unilateral or bilateral retinoblastoma

The Histiocytosis

- Know how to diagnose, work up and treat a child with Langerhan Cell Histiocytosis
- Know how to diagnose, work up and treat a child with primary or virus associated haemophagocytic lymphohistiocytosis

Germ cell tumours

- Understand the embryo pathogenesis behind the various forms of germ cell tumours
- Know how to work up and stage a child with a germ cell tumour
- Understand the importance of tumour markers (alpha-FP and beta-HCG) in the treatment and follow-up of children with germ cell tumour
- Understand the role of chemotherapy in the various forms of germ cell tumour
- Understand the role of surgery and radiotherapy in the treatment of germ cell tumour
- Understand the management of a child with an intracranial germ cell tumour

Rare tumours

- Know how to access the CCLG rare tumours guidelines
- Understand the importance of wide consultation including with colleagues in adult specialties when managing ‘rare’ tumours in childhood
- Understand the principles of treatment in adrenocortical tumours, malignant melanoma, nasopharyngeal carcinoma and thyroid carcinoma

**Module 4**

Research and Audit

- Clinical trial methodology, including rationale and aims, study design, eligibility criteria, toxicity notification, response to treatment
- Involvement in clinical audits and other aspects of clinical governance
- Ethical aspects
- Data reporting
- New drug development and phase I-II studies
- Principles of statistics
- Publications in peer reviewed journals, poster and oral presentations in conferences related to paediatric oncology

**Module 5**

Continuous Medical Education and other qualifications

- Attendance at international courses/meetings/congresses related to paediatric oncology: at least three during training
- Attendance at national courses/meetings/congresses preferably related to oncology: at least one a year
- Participation in institution’s multidisciplinary team meetings related to paediatric oncology: radiology and pathology meeting, clinical MDT meeting and psychosocial MDT meeting.
- A post-graduate degree relevant to paediatric oncology is strongly recommended

**Module 6**

The trainee is expected to spend a minimum of one year in a recognised tertiary referral centre for paediatric oncology abroad. The tertiary referral centre must also have a programme for paediatric haemopoietic stem cell transplants for the treatment of both haematological and solid malignancies, together with a facility to deliver radiotherapy to paediatric patients. This will expose the trainee to a wider selection of clinical conditions and situations, novel therapeutic approaches and the chance to work with experts at the forefront of paediatric oncology.
Contacts

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