

## **A more detailed description of medical oncology and the BSMO**

### **1. Introduction**

The Belgian Society of Medical Oncology (BSMO) is the sole scientific and a professional representative body for specialists in medical oncology.

Patients with cancer should be treated by multidisciplinary teams in which the Medical Oncologist has a critical role for the treatment with medicines. The Medical Oncologist is qualified by a thorough knowledge of general internal medicine and an in-depth higher education that focuses on all aspects of cancer including cancer biology and treatment.

This training allows medical oncologists to deal with all types of cancer. His/her generic knowledge of cancer allows the medical oncologist to maximally find solutions in these patients for whom guidelines are failing and to translate knowledge gained in one cancer type to another.

The medical oncology has a holistic view on the cancer patient and attaches equal importance to care and cure.

Members of the BSMO are also members of the European Society for Medical Oncology (ESMO) that initiated a formal examination in Medical Oncology in 1989 and a continued education, the ESMO-Medical Oncologist's Recertification Approval (MORA) program, introduced in 1994. The BSMO considers it critical that every member complies with the ESMO-MORA program.

### **2. Requirements for becoming a specialist in Medical Oncology**

The training comprises six years after obtaining an MD degree, beginning with training in Internal Medicine for three years, followed by a training program in Medical Oncology for three years. The specific training program in Medical Oncology is a full-time clinical training in the diagnosis and management of a broad spectrum of cancers. This includes the primary care of cancer patients, supervision of cancer patients in a designated medical oncology in-patient unit and outpatient clinics, an oncology ambulatory care supervised by a medical oncologist (day clinic), scheduled clinical conferences, performance of procedures on patients, review of imaging, pathology, and other diagnostic materials, other direct patient care, attending national and international scientific meetings, and critical reading and interpretation of the medical literature.

Clinical activities should include translational research involving patient contact, care, and treatment. Research experience for 1 or more years, including international training, is strongly recommended.

The Belgian Interuniversity Course in Medical Oncology (PGMO) is mandatory for a Medical Oncologist in training and is recommended as part of the continued education of established medical oncologists. Trainees become junior members of the BSMO once they embark in this training program.

The requirements for a BSMO training department can be consulted in the attached official decree.

### **3. Overview of competences to be acquired by medical oncologists.**

#### **Cancer biology**

- The biology of normal cells versus malignant cells.
- Understanding of gene structure, organization, expression, and regulation. Understanding of the cell cycle and its interaction with treatments.
- Understanding of tumor cell kinetics, proliferation, and programmed cell death, autophagy and the balance between cell death and cell proliferation.
- Understanding the interaction of cancer cells with stromal cells and host.
- A basic understanding of the opportunities and limitations of relevant molecular techniques including immunohistochemistry, FISH, gene expression profiling, proteomics, gene sequencing methodologies (including NGS) and other technologies used in molecular and tumor cell biology.

### **Tumor immunology**

- A basic understanding of the components of the immune system and the regulatory action of cytokines on the immune system.
- The basis for immunotherapies with immune checkpoint inhibitors and therapeutic vaccines.

### **Etiology, epidemiology, screening, and prevention**

- An understanding of genetic and environmental factors in the etiology of cancer.
- A basic knowledge of epidemiologic factors.
- Understanding of the basic principles of screening and risk assessment including sensitivity and specificity analysis and the cost-benefit ratio.
- Value and limitations of population-based screening programs.
- Knowledge of selection criteria for genetic testing.
- Preventive counseling of genetically predisposed individuals and capability for intake discussions for genetic counseling

### **Clinical research**

Knowledge about the design and conduct of clinical trials is critical:

- Design of phase I–II–III trials
- Review of the ethical, regulatory, and legal issues involved in trial design
- Criteria for defining response and other outcome measures to therapy
- Tools used to assess quality of life
- Basics of statistical methods and setting patient numbers required
- Toxicity assessment and grading
- Workings of institutional review boards and ethical committees
- How to obtain informed consent from patients
- Regulatory mechanisms for drug approval and marketing approval at the European and Belgian level.
- Awareness on the cost of treatments and the cost-effectiveness
- Ability to critically evaluate the published articles and their influence on clinical practice

### **Basic principles in the management and treatment of malignant diseases**

- Cancer patients are best managed in a multidisciplinary approach with integration of the various medical and paramedical specialties because of increasing complexity of treatment.
- A particular attention should be directed to the assessment of co-morbid medical conditions that may affect the toxicity and efficacy of a particular treatment
- Ability to make a personalized treatment plan involving multiple modalities
- Familiarity with the methods used in geriatric oncology

### **Pathology/laboratory medicine/molecular biology**

- Understanding the examination of biopsy material and surgical specimens under the guidance of a pathologist.
- Familiarity with diagnostic biomarkers including genomic studies relevant to the clinic.
- Awareness of the importance of prospective tumor banking
- Utility of biomarkers (serum tumor markers, cell membrane markers, DNA markers) and their limitations.

### **Staging procedures**

- Tumor–lymph node–metastasis staging system and how to stage a cancer patient. Indications for clinical, radiographic, and nuclear medicine imaging procedures in the diagnosis, staging and follow-up,

## **Therapy**

### *Surgery*

- By interacting with surgeons, develop an understanding of the indications and contraindications of surgery.
- Role of surgery in the staging, cure, and palliation of patients with malignant diseases.
- Indications of organ preservation and the sequencing of surgery with other treatment modalities.
- Risks and benefits of surgery as principle local therapy and the generic superiority of surgical removal of tumor compared to radiotherapy if morbidity is not prohibitive
- Aware of surgical morbidity.

### *Radiation oncology*

- Familiarity with the principles of radiation biology and the indications of radiation both curative intent and palliative.
- Familiarity with the principles of treatment planning and dosimetry.
- The place of radiation therapy in relationship to surgery and/or anticancer agents.
- Acute and late toxicities of radiation therapy.
- Up to three months of the training program in Medical Oncology can be organized in a department of Radiation Oncology.

### ***Anticancer agents (hormonal, chemo and biological treatments)***

- Knowledge of the indications and goals of treatment with anticancer agents in primary and recurrent malignancies.
- Usefulness of these agents in the neo-adjuvant, concomitant, and adjuvant setting, and their application as a radiation sensitizer.
- The importance of optimal dosing and treatment delay of specific anticancer agents in a curative setting.
- Assessment of a co-morbid medical conditions in order to determine the risk/benefit ratio of treatment with anticancer agents for that individual patient
- Knowledge of pharmacokinetics, pharmacogenomics and pharmacogenetics, and pharmacology in general of the various agents.
- The toxicity profile of each anticancer agent, including long-term hazards, how to adapt the dose and treatment schedule according to organ dysfunction, and how to handle these complications.
- Knowledge of toxicities and indications of supportive measures such as, but not limited to, hematopoietic growth factors and anti-emetics.
- In depth knowledge of targeted molecular therapies and biological therapies such as immune therapies.
- Various supportive and palliative strategies
- Palliative and supportive care is considered as an integrated part of medical oncology.