

## **Radiation Oncology**

### **Course Name:**

**Radiation Oncology**

### **Course Duration and Structure:**

Duration of this course is 5 years.

### **Definition of the Program:**

This program is a specialized clinical educational program whose graduates, by learning the basics of 1. cancer prevention and oncology (etiological factors, epidemiology, molecular genetics, molecular biology, immunology, clinical pharmacology, medical statistics, protection and physics of radiotherapy and radiobiology) and 2. diagnosis affairs and 3. staging of cancer patients, will be able to cure patients with standard non-surgical treatments for all types of solid organ cancers. This specialized field of radio-oncology, in the form of a multi-specialty team, plays a fundamental role in planning the different stages of standard treatment for cancer patients.

### **Aims (General Objectives):**

The vision of this field in the next 10 years:

- Access to quality services in the country in a fair manner
- Improving the quality of education and research
- Becoming a leader in the field of educational standards, research and providing services in this field in the EMRO region
- Training of Organ Based Fellowships for cancers of important body organs including digestion, urology, head and neck and etc.

The mission of this field is to train clinical specialist doctors who are ready to accept the roles of policy making, research and education about cancer diseases and, observing the principles of medical ethics, with the help of their knowledge and skills, try to screen and prevent cancer in the society. Also, by choosing the best and most effective diagnostic and treatment methods, considering cost-effectiveness and emphasizing on maintaining the quality of life and longevity of patients, they should be effective in promoting the health of society.

## **Expected Competencies and Skills for Graduates at the End of the Program:**

### **A. Expected General Competencies:**

It is expected that graduates of this field will be able to:

- Participate in the prevention and early detection of cancer, including community screening,
- Perform clinical evaluation, diagnosis and staging of solid tumors,
- Based on specific conditions of each patient, explain the prognosis and outcome of patients with solid tumors in different stages of the disease,
- Accurately diagnose oncology emergencies and treat them with prompt and correct referral and care
- Treat patients with solid tumors, using standard non-surgical treatment methods,
- Carefully diagnose early and late side effects of various treatment methods, and take an appropriate action for suitable treatment or referral of this effects,
- Based on the side effects and specific clinical conditions of each patient, and also based on the individual needs of each patient or consultation with the multidisciplinary team, adjust the treatment plan,
- Choose and suggest appropriate follow-up methods with maximum benefit and minimum cost for patients,
- Choose the best way to deal with the patient by timely diagnosing the recurrence of the disease and distinguishing it from the late complications of the treatment,
- Know the basics of radiation physics, radiobiology and radiation protection and use them in professional activities,
- Participate in the design and implementation of clinical and interdisciplinary research related to cancer.

### **Expected Competencies & Procedural Skills:**

#### **Gathering and Recording Information:**

- Effective professional communication,
- Taking a specialized history,
- Evaluation and specialized examination of patients,
- Reasonable request for para clinical trials,
- Filing, recording information and preparing medical documents.

#### **Clinical Reasoning, Diagnosis and Decision Making for the Patient:**

- Interpretation of para clinical tests,
- Integration of clinical and para clinical findings,
- Inference and clinical judgment,
- Diagnosis,
- Clinical decision-making to solve the patient's problem.

#### **Patient Management (Patient Care):**

- Rational drug prescription (prescription writing and order),
- Choosing the most appropriate diagnostic-therapeutic approach and implementing it for the patient,

- Requesting and providing medical advice,
- Establishing the necessary coordination and patient referral,
- Patient education,
- Patient follow-up.

**Other Capabilities:**

- Research,
- Providing expert advice,
- Support and defend the rights of patients,
- Evidence-based medicine,
- Using computers and searching for scientific information in electronic sources.

**B. Expected Specific Competencies and Skills:**

- Different types of radiation therapy methods (external, brachytherapy, radiosurgery, stereotactic radiotherapy, radiation therapy during surgery, non-ionizing radiotherapy such as photodynamic therapy and electric field therapy),
- Working with all types of radiation therapy devices,
- Using modulating methods of standard cancer treatments (hyperthermia),
- Diagnostic, palliative and therapeutic aspiration or drainage,
- Prescribing and injecting a variety of chemotherapy drugs and other systemic treatments (oral, intravenous, intra-arterial, intrathecal, local, intra-cavitary) in Solid Tumors,
- Prescription and injection of radiopharmaceuticals in cancer,
- Use of infusion pump,
- Thoracocentesis and Pleurodesis,
- Necessary simulations to perform radiotherapy using (Pet CT Sim, Digital X ray, CT Sim, MR Sim),
- Designing types of treatment for external, internal and brachytherapy radiotherapy,
- Placement of external and brachytherapy applicators and implantation of intra-tissue catheters,
- Designing and manufacturing auxiliary devices for radiotherapy treatment (fixator, shield, blouse),
- Use and care of the infusion port.

**Core Procedural Skills Topics:**

- Body contouring,
- Treatment design (Planning) of tumors and their evaluation and optimization,
- Planting and placement of brachytherapy applicators,
- Injection of radiopharmaceuticals in cancer treatment,
- Intra-cavitary injection of drugs in the treatment of cancers,
- Local injection in the treatment of cancers,
- Intravenous and arterial injection of drugs in the treatment of cancers,
- Use of infusion pump,
- Diagnostic, palliative and therapeutic aspiration and drainage.

## **Educational Strategies:**

- This program is based on the following strategies:
  - Task-based learning
  - Problem-based learning
  - Subject-directed learning
  - Evidence-based learning
  - Disciplinary with subject integration (if needed)
  - A combination of student and professor-oriented learning
  - Community oriented learning
  - Hospital based training
  - Systematic learning
  - Compulsory training and in a small part of the course, elective one.

## **Teaching & Learning Methods:**

In this course, the following teaching methods and techniques will mainly be used:

- Collective training methods such as: hospital conferences - lectures - morning report - tumor board CPC and journal
- Club and review articles and...
- Training in small groups
- Self study
- Demonstration method for treatment planning
- Case Based Discussion
- Clinical experiences with supervision
- (PBL) Problem Based Learning