UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

## Oncology II

**2627-3-H4102D058-H4102D074M**

### Aims

This module aims to provide students with theoretical and practical knowledge and applicable skills concerning the use of nuclear medicine and radiotherapy techniques in hematological malignancies and related diseases, integrating and deepening the clinical foundations acquired during the oncohematology course and associated clerkships.
Educational Objectives
Theoretical Knowledge:

1. Understand the fundamental principles of diagnostic nuclear medicine, including the main radiopharmaceuticals used for hematological diseases such as lymphomas, leukemias, and multiple myeloma.
2. Learn about the most common nuclear imaging techniques (e.g., PET/CT with FDG, bone scintigraphy) and their applications in the diagnosis, staging, monitoring, and response assessment of oncohematologic diseases.
3. Become familiar with therapeutic applications of nuclear medicine, particularly radioimmunotherapy and radionuclide therapies specific for hematological malignancies.
4. Understand the principles of radiotherapy in hematology, focusing on involved site radiotherapy, total body irradiation (TBI) used in conditioning regimens, and advanced treatment techniques (IMRT, IGRT, proton therapy).
5. Deepen knowledge of regulatory, safety, and pharmacological aspects related to the use of radiopharmaceuticals and radiotherapy technologies specific to oncohematology.
   Practical and Interpretative Skills:
6. Interpret nuclear medicine imaging reports related to hematological malignancies (lymph node involvement, bone marrow disease, skeletal lesions).
7. Understand clinical indications, protocols, and management of patients undergoing radionuclide therapies and radiotherapy as part of hematologic cancer treatment plans.
8. Apply appropriate criteria for ordering and interpreting diagnostic nuclear medicine and radiotherapy procedures according to clinical guidelines for hematological diseases.
9. Collaborate effectively with hematologists, nuclear medicine specialists, radiologists, and radiotherapists

within a multidisciplinary oncohematology care team.
Transversal Competences:

10. Integrate clinical, biological, and imaging data for comprehensive evaluation of patients with hematological malignancies.
11. Communicate clearly with patients regarding diagnostic and therapeutic procedures, including potential risks and benefits.
12. Maintain professionalism and collaboration skills within multidisciplinary teams, ensuring compliance with safety and regulatory standards.
13. Develop autonomous competency in assisting, performing, and documenting nuclear medicine diagnostic and therapeutic procedures under supervision.

## Contents

This module aims to expose students to an important phase of the Patients' Journey of the cancer patient, when they are subjected to imaging techniques - for the purposes of screening, diagnosis, staging, restaging and monitoring the response to treatment - and advanced treatments of interventional radiodiagnostics, metabolic radiotherapy and radioligand therapy and external beam radiotherapy.
It is, in fact, our belief that understanding how this experience takes place is fundamental for all doctors who will be called upon to answer specific questions. Having the correct background information is essential in order not to create false fears or false expectations and increase the patient's compliance with this phase of his diagnostic-therapeutic path.
In particular, we believe that the evolution of modern medicine requires the understanding of all procedures, even those that are very specialized and highly complex, which are part of the integrated treatment of tumors. It is not uncommon, in fact, for patients to receive, as part of the therapeutic strategy of their neoplasm, several treatments integrated in a sequential perspective. Therefore, knowing the risk-benefit ratio helps to build this strategy, avoiding wasting opportunities and optimizing available resources
Practical Learning Objectives for Students at Clerkship Completion

1. Demonstrate critical interpretation skills of diagnostic nuclear medicine and radiotherapy reports within hematologic oncology context.
2. Exhibit effective communication with patients and multidisciplinary teams about nuclear medicine and radiation therapy treatments.
3. Apply operational protocols and best practices for safe management of radionuclide treatments and radiotherapy in hematological diseases.

## Detailed program

During this module, students will be exposed to the daily clinical activities of providing diagnostic tests for the purposes of screening, diagnosis, staging, restaging and monitoring of response to treatment and to advanced treatment sessions of interventional radiodiagnostics, metabolic radiotherapy and radioligand therapy and external beam radiotherapy.
In this way they will be able to have the basic knowledge to be able to answer the main questions that all doctors are asked to answer when they propose an image test to a patient.
The evolution of modern medicine requires the understanding of all procedures, even the very specialized and highly complex ones that are part of the integrated treatment of tumors. In fact, it is not uncommon for patients to receive, as part of the therapeutic strategy of their neoplasm, various treatments integrated in a sequential perspective. Therefore, knowing the risk-benefit ratio helps to build this strategy, avoiding wasting opportunities and optimizing available resources.
**Practical Introduction to Diagnostic Nuclear Medicine in Oncohematology**

Observation and active participation in administering diagnostic radiopharmaceuticals (e.g., ^18F-FDG for lymphoma) and acquisition of nuclear imaging studies (PET/CT, bone scintigraphy).
Shadowing nuclear medicine physicians during patient prep and study execution with emphasis on protocols, patient safety, and communication.
Guided image interpretation sessions correlating clinical history with imaging findings.
Case discussions based on real patient data integrated with multidisciplinary clinical input.
**Hands-On Learning in Radionuclide Therapy**
Direct participation in radionuclide therapies specific to hematologic malignancies, such as radioimmunotherapy (e.g., anti-CD20 agents).
Clinical monitoring of treated patients under supervision including management of side effects.
Attendance in multidisciplinary meetings planning radio-therapeutic approaches and reviewing outcomes.
Introduction to Radiotherapy Techniques in Oncohematology
**Observation in radiotherapy departments during simulation, treatment planning, and delivery (including TBI).**
Understanding the role of integrated imaging for radiation planning and monitoring.
Interaction with radiation oncologists regarding indications and risk-benefit analysis.
Participation in clinical management of patients receiving radiotherapy.
**Safety and Regulatory Aspects**
Direct engagement with protocols on handling radiopharmaceuticals and radioactive waste.
Observation and practical application of radiation safety measures.
Discussions on regulatory framework and professional responsibilities in oncohematology nuclear medicine and radiotherapy.
Communication and Professional Interaction

Active learning of patient communication emphasizing informed consent and addressing concerns related to nuclear medicine and radiotherapy.
Participation in multidisciplinary team meetings and reporting clinical experiences.
Training on clear information exchange with clinical teams and healthcare workers.

## Prerequisites

This clearkship required the basic knowledge of IMAGE DIAGNOSTICS and ONCO-HEMATOLOGICAL DISEASES.

## Teaching form

Internship and clincial case discussion.
Learning by Doing: Supervised progressive engagement in diagnostic and therapeutic procedures.
Clinical Mentorship: Individual or small group tutoring by specialists in hematology, nuclear medicine, and radiation oncology.
Debriefing Sessions: Reflective discussions on clinical cases and experiences.
Guided Case Studies: Reviewing patient data and imaging within clinical context.

## Textbook and teaching resource

Specicif literature, clinical and procedural guidelines

## Semester

2 semester 3rd year

## Assessment method

competences assessment during the internship

## Office hours

by appointment

## Sustainable Development Goals

GOOD HEALTH AND WELL-BEING