



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Nuclear Medicine Techniques

2526-3-I0303D036

Aims

The course aims to provide the student with fundamental knowledge on radiopharmaceuticals used for diagnostic and therapeutic purposes, including cellular markers, their radiochemical, biokinetic and biodistribution characteristics, as well as their preparation and use. Knowledge of the basic technological characteristics and general principles of operation of equipment used in conventional nuclear medicine (gamma chambers) and positron emission tomography (PET) will also be provided; knowledge of scintigraphic and PET investigations used for the study of pathologies of the various organs/apparatuses, their acquisition protocols and image processing methods will also be provided; The basic knowledge of their main indications in the study of pathologies in the cardiovascular, respiratory, gastroenteric, urogenital, osteomuscular, neurological, endocrinological, infectious, paediatric and oncological fields will also be explored. Finally, the student will be provided with basic knowledge of therapeutic treatments in nuclear medicine.

Contents

Fundamental knowledge of radiopharmaceuticals for diagnostic and therapeutic purposes, equipment in conventional nuclear medicine (SPET gamma chambers and SPET/CT), PET tomographs, scintigraphic investigations and their clinical applications, PET investigations and their clinical applications, basic knowledge of radiometabolic therapy.

Detailed program

- Radiochemistry: laws and modalities of radioactive decay, preparation methods and selection criteria for radionuclides and main methods of radiopharmaceutical preparation; quality assurance management
- Radiopharmaceuticals: fundamental aspects of pharmacokinetics, mechanism of action and safety

Radiopharmaceuticals used for diagnostic and therapeutic purposes and classification
Radiopharmaceuticals with AIC and without. Reading and requirements for adherence to AIFA-approved
Summary of Product Characteristics sheets.

- Equipment in conventional nuclear medicine and PET: basics of SPET, SPET/CT gamma chamber and PET tomography technologies
- Techniques and radiopharmaceuticals in conventional nuclear medicine (scintigraphy): radiopharmaceuticals, quality controls on gamma chambers, organisational aspects of an Operating Unit, methodological protocols, procedures for cell markings (leucocytes), acquisition techniques and main clinical applications of scintigraphic investigations
- Techniques and radiopharmaceuticals in positron emission tomography (PET): radiopharmaceuticals, methodological protocols, acquisition techniques and main clinical applications of PET investigations
- Diagnosis and Therapy in Nuclear Medicine: basic knowledge of the clinical applications of scintigraphic and PET investigations in cardiovascular, respiratory, gastroenteric, urogenital, osteoarticular, neurological, endocrinological, paediatric infectious disease and oncology. Basic knowledge of radiopharmaceutical therapies (radiometabolic therapy, radioligand therapy and selective radioembolisation treatment (SIRT) of liver tumours).

Prerequisites

Teaching form

Teaching takes place in attendance, with frontal and interactive lessons (see individual modules).

Textbook and teaching resource

Fondamenti di medicina nucleare: Tecniche e applicazioni, Duccio Volterrani, Giuliano Mariani, Paola Anna Erba, ed. Springer.

The Teachers will provide further educational materials

Semester

First semester

Assessment method

Monza

Written and oral exams will assess student preparation, the ability to organize knowledge, and the ability to express oneself using appropriate technical language. The final grade will take into account the results obtained in both the written and oral exams. The written exam will consist of five multiple-choice questions for each of the modules: Radiochemistry, Radiopharmaceuticals, and Nuclear Medicine Equipment. The oral exam will cover the modules: Diagnostics and Therapy in Nuclear Medicine, Techniques and Tracers in Scintigraphy, and Techniques and Tracers in PET.

Bergamo

Written and oral exam, to evaluate preparation on the exam programme, the ability to organize knowledge and communication skills in a disciplinary context.

The written test will consist of 5 multiple choice questions for each module. The oral exam consists of a more in-depth assessment of knowledge of the topics covered in the course modules through open questions, with questions possibly relating to errors made during the written exam. The final evaluation will take into account the results obtained in both the written test and the oral test.

Office hours

By appointment required by mail

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION
