UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Contrast Media and Radiopharmaceuticals

2627-2-H4104D014-H4104D01402

Aims

The course aims to provide knowledge and skills on the pharmacological aspects of diagnostics medicinal products. Topics include the pharmacological aspects of diagnostics medicinal products, including fundamental of pharmacokinetics, pharmacodynamics, regulatory aspects related to the use of contrast media and radiopharmaceuticals in Diagnostic imaging and radionuclide therapy

Contents

1. Radiological contrast media: mechanism of action, pharmacokinetics and safety
2. Radiopharmaceuticals: mechanism of action, kinetics of biodistribution and safety. Normal biodistribution and pathological pattern of the most commonly used radiopharmaceuticals
3. Optical imaging probes: mechanism of action, kinetics behavior and safety
4. Regulatory affairs relative to their classification and reimbursement

Knowledge and Understanding – Understand the mechanisms, pharmacokinetics, safety profiles, and regulatory frameworks of contrast agents and radiopharmaceuticals.
Applying Knowledge and Understanding – Apply knowledge to interpret biodistribution and pathological imaging patterns.
Making Judgments – Evaluate safety considerations and regulatory compliance in the clinical use of these agents.

Detailed program

Pharmacology of Diagnostic Medicinal Products
Radiological contrast media: chemical and pharmacological characteristics of biological relevance that differentiate

contrast media; main clinical indication and clinical and evidence based rational for the clinical use of contrast media; main toxicity profile, adverse event, procedures to predict, prevent and manage contrast media related adverse event. Pharmacovigilance.
Radiopharmaceuticals: nature and characteristics of radioisotopes, with specific reference to those used in diagnostic imaging; and therapy. Fundamentals of radiochemistry, radiopharmaceuticals, radiopharmacology and radiobiology. Production and supply. Laboratory and equipment. Biodistribution profiles, pharmacokinetics, pharmacodynamics, normal and pathological biodistribution pattern. Main toxicity profile, adverse event. Dosimetric estimates.
Medicines for optical imaging: mechanism of action, instrumentation, kinetics of biodistribution and safety aspects.
Risk benefit assessment for contrast media;
Regulatory affairs relative to their classification and reimbursement

Prerequisites

Basic knowledge on chemistry, physics and physiology and pharmacology that will be presented during the course when necessary

Teaching form

Lectures. Active and interactive discussion on critical issues presented during the course. Scientific manuscript discussion in small group.

Textbook and teaching resource

Slides presented during the course; scientific papers; guide line and auto evaluation question to be discussed during lessons
European Pharmacopeia and specific legislation
Nuclear medicine textbook, Methodology and Clinical Applications. Editors: Duccio Volterrani, Paola Anna Erba, Ignasi Carrió, H. William Strauss, Giuliano Mariani. Springer 2019. Chapters 1-4

Semester

Second Semester

Assessment method

Self evaluation with written or oral self-assessment test (closed questions or multiple choice); specific scientific question, problem solving activities on specific issues during the course.
Final test:
The course exam consists of a written exam with multiple-choice questions or open questions. Oral exam

consisting of ample discussion on the basis of radiological images digitally provided with the aim of recognizing the key anatomical features and the autonomous reflection capacity on critical points of the program.is also possible. The questions aim at verifying the student's knowledge. Each multiple-choice question is given a score between 0 and 1; each open questions is given a score between 0 and 2. Laude is assigned in case of particularly deserving tests.
Evaluation criteria: theoretical knowledge, synthesis skills, ability in the application of diagnostic methods to a specific clinical or experimental contest.

Office hours

By appointment fixed by e-mail

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY