UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Diagnostics and Radiation Oncology

2526-3-H4102D020-H4102D067M

Aims

1. Understanding the application of integrated imaging modalities, including conventional radiology (computed tomography, ultrasound, and magnetic resonance imaging), Nuclear imaging (Scintigraphy and PET/CT) in cancer imaging.
2. Understanding the importance of each imaging modality in diagnosis, staging, prognostication, treatment response assessment and follow-up of patients with cancer.
3. Understanding the complementarity of different imaging modalities.
4. Learning the main imaging protocol
5. Learning how to read a diagnostic flow-chart and a clinical guideline for each cancer type
6. Understanding the role of imaging in guiding surgery and radiotherapy
7. Understanding the main challenges of the use of imaging in guiding the treatment and in treatment assessment

Contents

1. Refresh of imaging techniques
2. Imaging protocols: what you need to know to properly inform and prepare your patients
3. Imaging technique – how to make the proper choice for the diagnosis of solid tumors in the central nervous system, thorax, abdomen, breast, prostate and haematopoietic system
4. How to stage patients with solid and haematologic tumors by integrating different imaging modalities:
   a. the key point of diagnostic imaging.
   b. Strength, and weakness of cross sectional imaging techniques.
   c. How to properly assess actual tumor spread in the view of optimal treatment planning.
   d. Performances analysis: pro and cons, dosimetric burden, costs, availability.

5. Image guided therapy
6. Image for treatment planning and treatment assessment
7. Principle of AI in diagnostic imaging

Detailed program

1. Diagnostic imaging refresh
2. Imaging in screening, diagnosis, staging and treatment planning/monitoring in:
   a. Breast cancer
   b. Prostate Cancer
   c. Urological cancers
   d. Lung cancer
   e. Bone tumors
   f. Haematological tumors: MM and lymphoma
   g. Melanoma
3. Role of AI in diagnostic imaging

Prerequisites

Preparatory courses for Vertical Tracks

Teaching form

Lessons and small group activities, case reading, Problem Based Learning and Case Based Learning

Textbook and teaching resource

Diseases of the Abdomen and Pelvis 2023-2026, Diagnostic Imaging. Editors: Juerg Hodler, Rahel A. Kubik-Huch, Justus E. Roos, Gustav K. von Schulthess, Springer 2023 (open access). Chapters 11, 16
Computed Tomography of the Lung, A Pattern Approach. Editors: Johny A. Verschakelen, Walter De Wever, Springer 2018
Tutorials in Diagnostic Radiology for Medical Students, Editors: Ciaran E. Redmond, Michael Lee, Springer 2020
Handbook of Evidence-Based Radiation Oncology. Editors: Eric K. Hansen, Mack Roach III. Springer 2018
Breast Imaging, Diagnosis and Intervention. Editors: Michael Fuchsjäger, Elizabeth Morris, Thomas Helbich, Springer 2023
Molecular & Diagnostic Imaging in Prostate Cancer - Clinical Applications and Treatment Strategies. Editor Heide Schatten, Springer 2023
Nuclear medicine textbook, Methodology and Clinical Applications. Editors: Duccio Volterrani, Paola Anna Erba, Ignasi Carrió, H. William Strauss, Giuliano Mariani. Springer 2019. Chapters

14, 15, 16, 17, 18, 22, 23, 35, 38
Basic Radiotherapy Physics and Biology. Editors: David S. Chang , Foster D. Lasley , Indra J. Das , Marc S. Mendonca , Joseph R. Dynlacht. Springer 2021

Semester

Second term

Assessment method

Self-evaluation with cased based discussion, problem solving activities on specific issues during the course.
Final exam: integrated oral exams consisting of the discussion of a relevant clinical topic as part of the course program, requiring the integration of from different perspectives covered by each of the teaching units of the course.
Evaluation criteria: theoretical knowledge, synthesis skills, ability in the application of diagnostic methods to a specific clinical problem or contest.

Office hours

By appointment fixed by e-mail

Sustainable Development Goals

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