UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Multimodal Imaging in Infectious and Inflammatory Bone Diseases

2627-3-H4102D132

Aims

This elective course offers a comprehensive exploration of multimodal imaging techniques applied to the diagnosis and management of infectious and inflammatory bone diseases. The focus is on integrating conventional radiology, ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), and nuclear medicine to provide a thorough patient evaluation. Students will be actively engaged in case-based learning and clinical observation to enhance their practical understanding.

Course Objectives
By the end of the course, students will be able to:

1. Understand the principles, advantages, and limitations of various imaging modalities used in the evaluation of infectious and inflammatory bone diseases.
   Knowledge and Understanding – Demonstrate detailed factual and theoretical knowledge of musculoskeletal imaging modalities and their clinical applications.
2. Interpret imaging findings from plain radiographs, ultrasound, CT, MRI, and nuclear medicine relevant to infectious and inflammatory conditions of the bone.
   *Applying Knowledge and Understanding – Apply theoretical knowledge to accurately interpret multimodal imaging studies.
3. Integrate multimodal imaging data to formulate differential diagnoses, guide disease staging, and inform clinical management strategies.
   Making Judgments – Critically evaluate and synthesize clinical and imaging information to support patient care.
4. Recognize the indications, contraindications, and limitations of imaging techniques in infectious and inflammatory musculoskeletal diseases.
   Knowledge and Understanding & Making Judgments – Apply criteria for appropriate and safe imaging use.
5. Appreciate the role of imaging in monitoring disease progression and therapeutic response in infectious and inflammatory bone diseases.
   Knowledge and Understanding & Applying Knowledge – Use imaging findings to assess disease status and guide therapeutic decisions.

Contents

1. Advanced Imaging Modalities in Infectious and Inflammatory Bone Diseases:
2. Infectious Bone Diseases:
3. Inflammatory Bone Diseases:
4. Multimodal Imaging Integration and Clinical Management:
5. Safety and Regulations:

Detailed program

1. Advanced Imaging Modalities in Infectious and Inflammatory Bone Diseases:
   Radiographs, ultrasound, CT, multiparametric MRI
   Nuclear medicine techniques including bone scintigraphy and PET/CT
2. Infectious Bone Diseases:
   Acute and chronic osteomyelitis imaging features
   Septic arthritis
   Bone tuberculosis imaging characteristics
   Prosthetic joint infections and imaging challenges
3. Inflammatory Bone Diseases:
   Rheumatoid arthritis and other inflammatory arthritides
   Imaging features of enthesitis and spondyloarthritis
   Differentiation between infectious and inflammatory lesions
4. Multimodal Imaging Integration and Clinical Management:
   Case-based learning demonstrating complementary roles of different modalities
   Multidisciplinary approaches to diagnosis and treatment planning
5. Safety and Regulations:
   Radiation safety and dose optimization (ALARA principles)
   Indications and contraindications for advanced imaging techniques
   Regulatory frameworks guiding imaging and radionuclide therapy

Prerequisites

Basic knowledge of diagnostic imaging, infectious diseases, and musculoskeletal pathology.

Teaching form

Lectures and interactive seminars
Case discussion and problem-based learning (PBL)
Clinical observation in radiology and rheumatology units
Self-directed study of imaging cases and literature

Textbook and teaching resource

Slides, dedicated textbook chapters, scientific articles, clinical guidelines, and clinical case studies

Semester

secondo semestre, 3rd year

Assessment method

Continuous clinical evaluation, Presentation and discussion of clinical cases

Office hours

by appointment

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION