



MEDICINE AND SURGERY

Course: Infectious diseases

Year: 4th

Period: 2nd semester

Credits: 6

Objectives

Knowledge and understanding:

1) Infectious Diseases

Students who attend to class regularly, participate actively in discussions and complete assigned readings will improve their ability to:

- Recognize the relationship to infectious agents, host and the environment in causing colonization, infection and disease.
- Apply basic infection control interventions and understand the principles of antibiotic use and stewardship.
- Analyze the diagnostic dilemmas and management opportunities of a broad range of major syndromes affecting the neurological, respiratory, cardio-vascular, digestive, and urinary systems.
- Understand the clinical and public health implications of major global endemic diseases, including HIV/AIDS, tuberculosis and malaria

2) Clinical microbiology

Students will improve their ability to:

- **Discuss general methods for Laboratory Diagnosis of Infectious Disease:**
Know the workflow in the diagnostic process, principles and techniques of sample collection, microscopy, isolation and culture of bacteria and viruses in the laboratory diagnosis of infectious diseases.
Know Immunologic tests to search for antigens from microbial agents in the patient's sample and their antibodies.
Know Nucleic acid-based and Non-nucleic acid-based identification methods.
- **Discuss specific methods for laboratory diagnosis**
Know methods for laboratory diagnosis of selected infections.

Making judgements; Communication skills; Learning skills.

By the end of the course students will have

- developed some abilities to communicate and work in team



- acquired some learning skills such as study in a group, organize knowledge, revise and retain information, select information.

Prerequisites

Knowledge of Microbiology, Immunology, Immunopathology, System Diseases.

Contents

The course is divided into 2 modules: Infectious diseases and Clinical microbiology. The syllabus is organized by learning outcomes specific for each lecture or for a group of lectures.

1) Infectious Diseases program

Introduction to Infectious Diseases

- What are Infectious Diseases
- How to get infected
- Community/Hospital acquired Infections
- Prophylactic measures and isolation procedures for epidemiological control of ID
- Principles of appropriate antibiotic use
- Antimicrobial stewardship

Cardiovascular Infections

- *Endocarditis*: Deepened knowledge of the disease: definition, incidence, risk factors, epidemiology, clinical findings, diagnosis and principles of treatment

Cutaneous and Soft tissue Infections

Knowledge of the main clinical features and key-points in order to distinguish the different forms.

Epidemiology, diagnosis, principles of treatment

- *Impetigo, Cellulitis, Erysipelas*
- *Staphylococcal Toxic Shock Syndrome*
- *Necrotizing fasciitis and gas gangrene*
- *Filariasis and Larva migrans*
- *Childhood exanthems*

Urinary tract infections (UTI)

Knowledge of the main clinical features and key-points in order to distinguish the different forms.

Epidemiology, diagnosis, principles of treatment

- *Inappropriate use of antibiotics in UTI*
- *UTI in special populations*

Gastrointestinal and intrabdominal infections

- *Clostridium difficile colitis*: deepened knowledge of the disease. Epidemiology, pathogenesis, risk factors, control strategies and isolation, clinical findings, diagnosis, principles of treatment
- *Infectious diarrhoea and enteric fever*: Epidemiology, risk factors, control strategies, clinical findings, diagnosis, principles of treatment
- *Pyogenic and amoebic hepatic abscess*: Epidemiology, pathogenesis, risk factors, clinical findings, diagnosis and principles of therapy of liver abscesses



- *Hydatid cyst disease*: Epidemiology, pathogenesis and parasite life cycle, control strategies, clinical findings and principles of therapy

Bone and joint infections

- *Haematogenous and nonhaematogenous osteomyelitis*: pathogenesis, clinical findings, diagnosis and principles of treatment
- *Implant-associated infections*: Clinical findings, diagnosis, treatment and prevention of
- *Infective arthritis*: Clinical findings, diagnosis, treatment of

Upper and lower respiratory tract infections

- *Community-acquired and hospital-acquired pneumonia*: deepened knowledge of the disease. Definition, incidence, risk factors, epidemiology, clinical findings, diagnosis and principles of treatment
- *Ventilator associated pneumonia (VAP)*: Definition, incidence, epidemiology, clinical findings, diagnosis and principles of treatment
- *Legionellosis*: Incidence, prevention, clinical findings, diagnosis and principles of treatment
- *Influenza*: Incidence, prevention, clinical findings, diagnosis and principles of treatment of

Tuberculosis

- Deepened knowledge of the disease. Epidemiology, pathogenesis, clinical presentation of pulmonary and extra-pulmonary tuberculosis. Diagnosis and principles of treatment.

Sexually transmitted infections (STI)

- *Syphilis*: Deepened knowledge of the disease. Epidemiology, pathogenesis, clinical presentation, diagnosis and principles of treatment. Prevention strategies.
- *Herpes simplex virus (type 1 and type 2), Human papillomavirus, Chlamydia trachomatis, Neisseria gonorrhoeae, Trichomonas vaginalis*: clinical presentation, diagnosis and principles of treatment. Prevention strategies.

Sepsis

- Deepened knowledge of the disease. Definition, clinical management and principles of treatment

Systemic Infections

Epidemiology, clinical presentation. Diagnosis and principles of treatment.

- *Toxoplasmosis*
- *EBV Infection*
- *CMV infection*
- *Leptospirosis*

Central nervous System Infections

- *Acute bacterial meningitis*. Deepened knowledge of the disease. Epidemiology, microbiology, pathogenesis, clinical features, diagnosis, principles of treatment, chemoprophylaxis
- *Viral infections of the CNS*. Epidemiology, microbiology, clinical features, diagnosis, principles of treatment

Zoonosis and Vector borne diseases

- *Malaria*. Deepened knowledge of the disease. Epidemiology, control strategies, parasite life cycle, clinical findings, diagnosis, principles of treatment, prophylaxis

Epidemiology, microbiology, clinical presentation. Diagnosis and principles of treatment of:

- *Rickettsiosis*
- *Brucellosis*

- *Leishmaniosis*
- *Lyme disease*
- *American and African trypanosomiasis*

Travel Medicine

- *Preparing before travel*
- *After travel: differential diagnosis of possible diseases*

Emerging Infectious Diseases

Epidemiology, transmission, knowledge of the main clinical features and key-points of the different diseases. Principles of diagnosis.

- *West Nile*
- *Zika Virus*
- *Ebola*
- *Dengue*
- *Chikungunya*
- *Coronaviruses and COVID-19*

Vaccines

- *History and classification of vaccines*
- *The changing face of vaccines and vaccination*
- *Vaccination of special populations: protecting the vulnerable*
- *Vaccine impact: benefits for human health, herd protection*

HIV and AIDS

History and social stigma. Deepened knowledge of the disease. Pathogenesis, diagnosis, clinical presentation, principles of therapy

- *AIDS-related opportunistic infections: “don’t miss” diagnosis.*

Pneumocystis jirovecii pneumonia, cytomegalovirus infection, toxoplasmosis, progressive multifocal leukoencephalopathy, Kaposi’s sarcoma, esophageal candidiasis: Clinical presentation and principles of therapy

2) Clinical microbiology

General methods in Clinical Microbiology

Principles and techniques of Microscopy in the laboratory diagnosis of infectious diseases.

Principles and techniques of microbial culture: classical methods employed to isolate and cultivating microbial agents.

Principles and techniques of Immunologic tests: methods used to search for antigens from microbial agents in the patient’s sample and their antibodies (agglutination tests such as latex agglutination, enzyme immunoassays, Western blot, precipitation tests, and complement fixation tests).

Principles and techniques of Nucleic acid–based identification methods. Molecular methods: Polymerase Chain Reaction (PCR), Reverse-Transcriptase PCR, Real Time PCR, automatic sequencing.

Principles and techniques of Non-nucleic acid–based identification methods (e.g. Mass spectrometry).



Specific methods for laboratory diagnosis in selected infectious diseases.

Methods for laboratory diagnosis of respiratory tract infections, urinary tract infections, bloodstream infections and sepsis, gastrointestinal infections, hepatitis, central nervous system infections, endocarditis, Skin and soft tissue infections, arthritis, osteomyelitis.

3) Joint lessons

- *Covid-19* (Public Health, Clinical Microbiology, Infectious Diseases): epidemiological, pathogenetic, diagnostic, clinical issues and preventive strategies. Principles of treatment
- *Rash* (Dermatology, Infectious Disease): Clinical approach to the patient with rash. Differential diagnosis.

Teaching Methods

Lectures: the main purpose of lectures is to transfer knowledge to students by guiding them through the most relevant subjects of the disciplines. All lectures will be held synchronously, either in presence or using Teams.

Discussion of Clinical Cases: the purpose of these activities is to activate and solidify knowledge acquired during lectures and independent study, in a collaborative learning setting. For these activities, students will be divided in groups. Participation is mandatory. Students that cannot be on Campus for reasons related to the pandemics will participate in Teams.

Problem based learning (PBL) a PBL will be presented and discussed with students. Students are encouraged to actively participate to the lectures with questions and comments.

Verification of learning

Exam: the final exam consists of multiple-choice questions (33 questions: 26 of Infectious Diseases and 7 of Clinical Microbiology). Evaluation: 1 point for correct answer. To pass the test you need to answer to at least 18 questions correctly (14/26 of Infectious Diseases and 4/7 of Clinical Microbiology) (mark 18/30)

33 correct answers = 30 with laud

An oral exam will follow on demand by the student or by the teachers.

Registration to final exams is mandatory through LMS.

Texts

- Elaine C. Jong, Dennis L. Stevens. Netter's Infectious diseases. Second Edition
- M. Moroni, S. Antinori, C. Mastroianni, V. Vullo. Manuale di Malattie Infettive. Edizione Masson. Terza edizione
- *Clinical Infectious Diseases*, Volume 57, Issue 4, 15 August 2013, Pages e22–e121, **A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2013**



Recommendations by the Infectious Diseases Society of America (IDSA) and the American Society for Microbiology (ASM) (<https://doi.org/10.1093/cid/cit278>)

- M. Laposata, Laboratory Medicine, Mc Graw-Hill Education

Readings: Supplemental course readings and journal articles are listed on the LMS