



MEDICINE AND SURGERY

Course: System diseases 1

Year 3rd

Period: 1st semester

Credits: 17

Objectives

This course introduces the students to clinical medicine through the study of the diseases of the kidney and urinary system (nephrology) and the diseases of the heart and vessels (cardiology).

The course will cover most of the relevant diseases on a comprehensive basis, i.e. including pathology, pharmacology and imaging in relation to the diseases of the organ.

Prerequisites

To take System diseases 1 exam Mechanisms of diseases and Foundations for system diseases exams must have been passed

Contents

Diseases of the kidney and urinary system (Nephrology)

This module is designed to provide comprehensive teaching of the pathophysiology and clinical aspects of kidney diseases and electrolyte disorders. The most recent diagnostic and therapeutic tools in the management of patients with kidney diseases will be discussed.

Students are invited to refer to the textbooks in order to investigate the issues covered in the lessons.

Lesson 1 – Introduction to Nephrology 1. Overview of Kidney Anatomy and Physiology

Lesson 2 – Introduction to Nephrology 2. Semiological and Diagnostic Approaches to Kidney Diseases

Lesson 3 – Sodium and Potassium Disorders



Lesson 4a – Calcium, Phosphorus and Magnesium Disorders

Lesson 4b – Acid Base Disorders

Lesson 5 – Acute Kidney Injury (AKI): Overview and Pre-renal AKI

Lesson 6 – Intra-renal AKI

Lesson 7 – Post-renal AKI

Lesson 8 – Kidney and Urinary Tract Tumors

Lesson 9 – Fabry Disease and Other Rare Nephropathies

Lesson 10a – The Approach to Glomerular Diseases Syndromes

Lesson 10b – Major Primitive Glomerulonephritis

Lesson 11 – Hypertension and the Kidney

Lesson 12 – Vasculitis, Systemic Lupus Erythematosus (SLE) and other Secondary Glomerulonephritides

Lesson 13 – Diabetes and Diabetic Nephropathy

Lesson 14 – Urinary Tract Infections (UTIs)

Lesson 15 – Chronic Kidney Diseases 1. Overview, Classification and Nutritional Approach

Lesson 16 – Chronic Kidney Diseases 2. Bone Disease, Anemia and Cardiovascular Disease

Lesson 17 – Hepatorenal and Cardiorenal Syndromes

Lesson 18 – Cystic Diseases and Other Hereditary Kidney Disorders

Lesson 19 – Dialysis

Lesson 20 – Renal Transplantation

Lesson 21 – Kidney and Aging

Diseases of the heart and vessels (Cardiology)

This module will focus on some relevant aspects of cardiology, which shall be discussed with a predominantly pathophysiological approach.



- Lesson 1 – Risk factors and Epidemiology of Cardiac Diseases
- Lesson 2 – Basic Semeiotics for Patient Evaluation in Cardiovascular Medicine
- Lesson 3 – The Electrocardiogram
- Lesson 4 – Tools for Assessing Cardiovascular Diseases
- Lesson 5 – Coronary Artery Diseases 1: Pathophysiology and Medical Management
- Lesson 6 – Heart Failure 1: Basic Mechanisms and Pathophysiology
- Lesson 7 – Heart Failure 2: Clinics and Therapeutics
- Lesson 8 – Cardiac Arrhythmias 1: Basic Mechanisms and Pathophysiology
- Lesson 9 – Vascular Diseases: Venous Thromboembolisms (VTE), Deep Vein Thrombosis (DVT), and Pulmonary Embolism (PE)
- Lesson 10 – Acute Coronary Syndromes and Cardiogenic Shock
- Lesson 11 – Essential Hypertension
- Lesson 12 – Coronary Artery Disease 2: Invasive Diagnostics and Treatment
- Lesson 13 – Cardiac Valve Diseases
- Lesson 14 – Endocarditis
- Lesson 15 – Cardiac Arrhythmias 2: Clinics and Therapeutics
- Lesson 16 – Assessment of Congenital Cardiac Abnormalities in Adults
- Lesson 17– Myocarditis and Diseases of the Pericardium
- Lesson 18 – Primary Cardiomyopathies
- Lesson 19 – Clinical and Surgical Approaches for Great Vessel Disease
- Lesson 20 – Cor Pulmonale: Pulmonary Hypertension
- Lesson 21 – Principles of Cardiovascular Surgery

Diagnostic Imaging

The main contents of the course will be addressed in specific lectures fully dedicated to imaging or in multidisciplinary lessons.

The topics listed below, but not covered during classes, will require self-study. Dedicated readings will be suggested at the end of each lecture.

PATHOLOGY

NEPHROLOGY

PATHOLOGY: CARDIOLOGY

Pharmacology

The course focuses on the pathologies of the cardiovascular and renal systems, and on the possible therapeutic approaches to such pathologies.

The pharmacological approach to the cardiovascular and renal systems is discussed by taking two distinct perspectives and subsequently integrating them: initially, the various molecular targets of



pharmacological intervention are considered (ion channels, transporters, enzymes, transmitter receptors), the clinical effects of stimulating or inhibiting each of such targets are discussed, and the drugs that are available to these scopes are examined in detail; afterwards, all these drugs will be reexamined in terms of their use in facing major clinically relevant conditions – such as cardiac ischemia, heart failure, hypertension and arrhythmias.

Lesson 1 – Drugs Targeting Ion Channels

Lesson 2 – Drugs Targeting the Adrenergic System

Lesson 3 – ACE Inhibitors and Vasodilators

Lesson 4 – Diuretics

Lesson 5 – Anti-coagulant, Anti-platelet, Antithrombotic and Thrombolytic Drugs

Lesson 6 – Cardiac Insufficiency and Ischemia

Lesson 7 – Hypertension

Lesson 8 – Antiarrhythmic Drugs

Teaching Methods

Lectures, PBL, Case Method, Simulation

Students will learn and increase their proficiency in history taking and physical examination through experience in wards and in the simulation center. Simulation is a technique that replaces or amplifies real experiences through guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner.

The vocational activities consist of 3 different learning environments, 2 weeks in each (3 sessions):

*Wards: to conduct medical interviews and to perform physical examinations under the supervision of faculty physicians

*Clinical case discussion room: to conduct a medical interview from a nephrological and cardiological patient (mostly with the participation of real patients)

*The skills lab: to learn specific maneuvers in a safe and organized environment under tutorship of task trainers and with virtual reality



Verification of learning

The System Diseases I Exam consists of two parts: written and oral.

Texts

- Pathophysiology of Heart Disease: A Collaborative Project of Medical Students and Faculty- Leonard S. Lilly – Wolters Kluwer Ed (recommended**).
- Harrison's Principles of Internal Medicine, McGraw Hill (recommended*)
- Goldman's Cecil Medicine L. Goldman, A. I. Schafer, Elsevier
- Bates' Guide to Physical Examination and History Taking, Lynn S. Bickley
- Robbins and Cotran, Pathologic Basis of Disease, 8th Edition (Pathology)
- Robert F. Reilly et al. Nephrology in 30 Days (2nd edition). Lange
- Scott J. Gilbert et al. National Kidney Foundation Primer on Kidney Diseases (6th edition). Elsevier
- Robert Novelline, Squire's fundamentals of radiology, Harvard University Press, 2017 (7th edition) Large Comprehensive Textbook Covering All Modalities and Organ Systems
- William Herring, Learning Radiology, Elsevier, 2019 (4th edition)
- Pattern Based Approach to Radiology Interpretation Rather Than System Based, Practical and Image Dense