

1. SYSTEMDISEASE 1

SYSTEMDISEASE

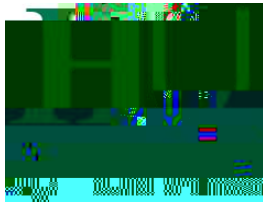
Faculty and Open Faculty: Calzoni, Galini, Corbelli, Colombo, Genovesi, Ferrante, Fiamore, Fesce, Lodigiani, Miceli, Parico, Reggiani, Reinos, Renne, Rorali, Stefanini, Tillo, Toracca

Coordinator: Gianluigi Corbelli

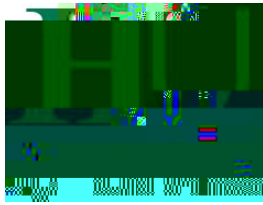
Tutors in the Simulation Labs: Rubino, Miraglia, Tommasini, Scialoi, Parico, Ulla, Geonetta, Aera, Lanza, Carevai, Bianchi, Miceli, Reggiani, Calzoni

Credits: 17

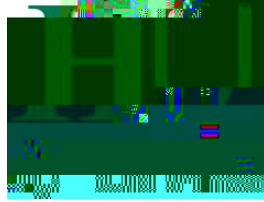
Overview of the Course



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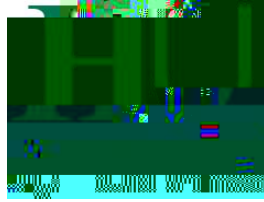


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- Describe pathophysiology, clinical course and principles of therapy of hypertensive disorders of pregnancy (pre-eclampsia/eclampsia, chronic hypertension, gestational hypertension)

Dysproteinemia and Amyloidosis



Basics of history for patient evaluation in cardiovascular medicine

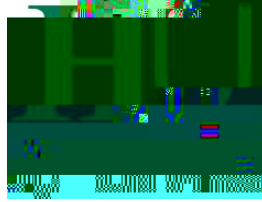
Learning goals

- **Students should acquire knowledge on how to perform a comprehensive history taking and general examination of the patient with cardiovascular disease**
- **Students should be able to recognize cardiac sounds and correlate them to the underlying pathology**

The Electrocardiogram

Learning goals

- **Describe how to perform an ECG: Theory of bipolar peripheral leads and unipolar precordial leads of the baseline human ECG; Description of the theory of dominant vector orientation and its influence on**



- **Recognize normal cardiac anatomy on chest X-ray (assessment of heart size and normal contours of the heart) and echocardiography. Fundamentals of cardiovascular anatomy on cardiac CT and cardiac MR**
- **Imaging findings in common cardiovascular diseases**
- **Describe the basic principles of imaging stress tests**

Coronary artery diseases 1: pathophysiology and medical management

Learning goals

- **Discuss myocardial ischemia from pathophysiology to clinical presentation**
- **Clarify the diagnostic tools for assessing myocardial ischemia**
- **Define the basis of therapeutic approaches**

Acute coronary syndromes and cardiogenic shock

Learning goals

- **the basic mechanisms of acute coronary syndromes**
- **the different presentations of acute coronary syndromes**
- **Discuss risk stratification in patients with acute coronary syndromes**
- **Define the management of patients with non-ST segment elevation and ST segment elevation**
- **Describe the pathophysiology and define the management of cardiogenic shock**

Heart failure 1: basic mechanisms and pathophysiology

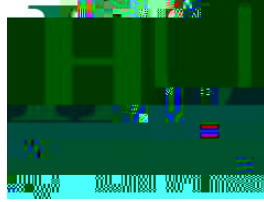
Learning goals

- **Discuss the epidemiology and prognosis of heart failure with reduced and preserved ejection fraction**
- **Describe the definition of heart failure and recognize the different underlying causes and precipitating factors**
- **Discuss the pathophysiology of heart failure and systolic and diastolic dysfunction**

Cardiac arrhythmias 1: basic mechanisms and pathophysiology

Learning goals

- **Distinguish the epidemiology, pathophysiology, diagnosis and clinical features of arrhythmias and conduction system diseases**



- **Illustrate the cellular and molecular mechanisms involved in the electrical activity of the heart; the anatomy and physiology of the conduction system and the electrical vectors throughout the cardiac cycle**
- **Indicate how to recognize the characteristic appearances of an explanation for the ECG in the main pathological conditions**
- **Discuss the classification and definition of bradycardia, tachycardia, supraventricular arrhythmia (including atrial fibrillation and flutter) and ventricular arrhythmia**

Essential hypertension

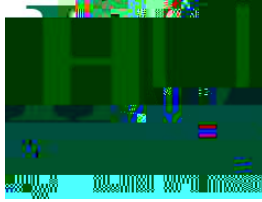
Learning goals

- **Discuss the pathophysiology and clinical impact of arterial hypertension and of the vascular consequences of systemic diseases**
- **Discuss the therapeutic approaches for treating hypertension and vascular diseases**

Coronary artery disease 2: invasive diagnostics and treatment

Learning goals

- **Illustrate the invasive diagnostic tools for assessing coronary artery disease and myocardial ischemia**
- **Define the basis of therapeutic approaches, with a focus on the clinical indicators for myocardial revascularization**
- **Discuss the treatment options for myocardial revascularization**
- **Discuss the indicators for percutaneous and surgical myocardial revascularization**
- **Discuss optimal medical management after myocardial revascularization**



- Describe the basic functioning of the implantable cardioverter-defibrillator (ICD) and its indications for arrhythmia prevention
- Discuss the flowchart of therapeutic options in arrhythmias, with clinical examples

Clinical and surgical approaches for great vessel disease

Learning goals

- Discuss the epidemiology, pathophysiology, diagnosis and clinical features of aortic aneurysms and occlusive artery diseases in different anatomical settings
- Define the basis of open and endovascular therapeutic approaches
- Introduce planning and sizing for vascular diseases

Cardiac valve diseases

Learning goals

- Define the pathophysiology and clinical presentation of cardiac valve diseases
- Discuss the clinical evaluation of cardiac valve diseases
- Discuss the diagnostic tools for assessing cardiac valve diseases
- Discuss the treatment options and indications for intervention for cardiac valve diseases
- Discuss the optimal medical management after interventions for cardiac valve diseases
- Multidisciplinary integration
 - Radiology: describe the role of non-invasive cardiac imaging in the diagnosis of cardiac valve diseases

Endocarditis

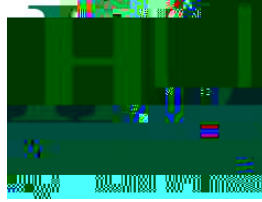
Learning goals

- Illustrate the epidemiology and the etiological agents of infective endocarditis
- Discuss the clinical presentation and complications of infective endocarditis
- Discuss diagnostic tools for assessing infective endocarditis
- Discuss antimicrobial therapy for infective endocarditis
- Discuss the recommendations for prophylaxis of infective endocarditis
- Discuss the indications for and timing of surgery for infective endocarditis

Assessment of congenital cardiac abnormalities in adults

Learning goals

- Discuss the anatomy and the development of the heart, veins and great vessels, the major congenital malformations and the principles of nomenclature
- Discuss the physiology of the fetal and transitional circulations; aetiology of congenital heart disease, including the developmental anatomy of the heart and vasculature
- Discuss the pathophysiology, natural history and complications of valve and outflow tract lesions; septal defects; patent ductus arteriosus; Eisenmenger syndrome; coarctation of the aorta; Ebstein's anomaly; aortic and pulmonary artery malformations; venous anomalies; transposition of the great



ateias (complete and congenitally connected); tetralogy of Fallot; congenital malformations of coronary arteries; cyanotic congenital heart disease and secondary erythrocytosis; and pulmonary hypertension in congenital heart disease

- Discuss the adult patient with simple congenital heart defects (grown-up congenital heart disease (GUCH), including those who have undergone surgery
- Discuss and recognize physical signs of congenital heart disease and its complications

Myocarditis and diseases of the pericardium

Learning goals

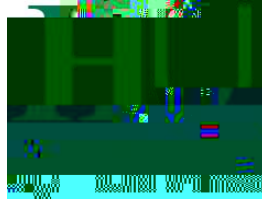
- Discuss the aetiology underlying the disease and the pathophysiology of myocarditis
- Discuss the diagnosis and therapeutic approaches of myocarditis
- × Discuss the aetiology underlying the disease and the pathophysiology of pericarditis
- Discuss the diagnosis and therapeutic approaches of pericarditis

Primary cardiomyopathies

Learning goals

- Review the epidemiology and basic aetiology of primary cardiomyopathies
- Discuss the etiology, classification and pathophysiology of the diseases
- Discuss the possible therapeutic strategies
- Multidisciplinary approach in the diagnosis and management of primary cardiomyopathies

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Principles of Cardiovascular Surgery

Learning goals

- Describe the surgical approaches to cardiac diseases.
- Describe the basic techniques for cardiac surgery (coronary artery bypass surgery, valvular replacement/repair, correction of congenital diseases)
- Describe the principles of extracorporeal circulation

DIAGNOSTIC IMAGING (nephrology)

- Illustrate indications and technique of the main methods of investigation through images of the urinary apparatus (chest X-ray, urography, cystography, ultrasound, CT and MRI).
- Consider the essential of imaging for the recognition of renal masses, renal ureteral bladder stones, inflammatory diseases, prostate diseases
- Recognize the main imaging of renal pathology using radiological semiotics, also on the basis of renal contrastographic anatomy (one easy to interpret images) (consider calculi, hydronephrosis, renal and bladder neoplasms and prostate pathology).
- Discuss the main techniques of interventional radiology in urology- nephrostomy, atriography and renal stenting, embolization of renal bleeding and embolization of varicocele
- Describe the radiopharmaceuticals available to assess renal function
- Describe the role of scintigraphy in the diagnosis of renal diseases.

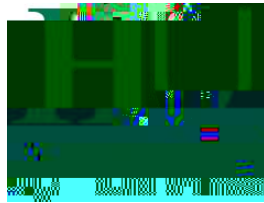
DIAGNOSTIC IMAGING

Suggested textbooks

- William Herring Learning Radiology (11th Edition), Elsevier
- Gurdman et al. Essential Radiology, Thieme

Imaging of the kidney and urinary system

- Illustrate indications and technique of the main methods of investigation through images of the urinary apparatus (chest X-ray, urography, cystography, ultrasound, CT and MRI).
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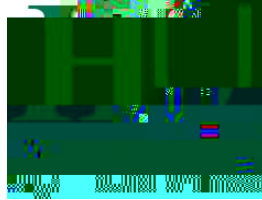
Cardiovascular imaging

- **Illustrate the main non-invasive vascular imaging techniques (CT angiography and MRA), also with reference to coronary CT, and discuss the indications and limits for the diagnosis of aneurysm and aortic dissection, stenocclusive peripheral arterial disease and arteriovenous malformations**
- **Explain the principles of cardiac imaging based on chest X-ray and the use of echocardiography and cardiac MRI in valvular and myocardial (ischemic, inflammatory and neoplastic) and pericardial disease**
- **Illustrate the technique and indications of the various types of arteriography (with particular reference to coronary catheterisation and the arteriography of the carotid, renal and celiac mesenteric arteries and those of the lower limbs) and venography (lower limbs, upper limbs, superior and inferior vena cava and portal venous system)**
- **Using the semi-quantitative arteriography of the arterial lesions, recognize the images of aneurysm, stenosis and occlusion of the main arterial trunks (one easy to interpret diagrams).**
- **Illustrate the indications and methods of performance of the main techniques of vascular interventional radiology (angioplasty, stenting, embolization and positioning of aortic filter).**
- **Describe the radiopharmaceuticals available to image myocardial perfusion and measure ventricular function**
- **Describe the standard limits of myocardial scintigraphy in the diagnosis of CAD, in comparison with other imaging modalities**

PATHOLOGY

Suggested textbooks

- **Aster, J C, Abbas, A K (2018). Radiology of Vascular Disease. Elsevier**



- Correlate the clinical presentation with the type and the extent of vessel involvement
- Illustrate the evolution of gross and microscopic changes in myocardial infarction
- Illustrate the complications of myocardial infarction

Lesson 3 Endocarditis

Learning Objectives

- Define rheumatic fever and rheumatic heart disease
- Describe the pathogenesis of rheumatic fever
- Illustrate the morphologic events and the clinical outcomes of rheumatic fever
- Illustrate complications of rheumatic heart disease
- Define and illustrate the clinical triad, symptoms and subacute infective endocarditis
- Describe the types of non-infected vegetations
- Compare and contrast the major forms of vegetative endocarditis
- Describe the complications of endocarditis

Pathologic basis of kidney, lower urinary tract and male genital system

Lesson 4 Introduction to renal pathology

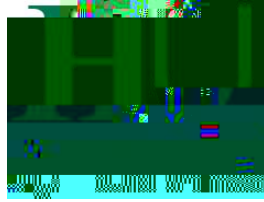
Learning objectives

- Illustrate the pathologic response of the glomerulus to injury
- List the pathogenetic mechanisms of glomerular injury
- Describe the main pathologic features of glomerular diseases comparing and contrasting primary glomerular pathies and systemic diseases with vascular involvement
- Illustrate the electron microscopic features of IgA glomerulitis
- Illustrate the contribution of immunofluorescence and electron microscopy in the diagnosis of the main glomerular pathies
- Describe the main tubulointerstitial diseases focusing on the patterns of tubular damage
- Correlate the onset and distribution of pyelonephritis with the main etiologies
- Describe the pathogenesis and morphologic features of nephroses

Lesson 5 Kidney tumors

Learning objectives

- Describe the main symptoms and signs of renal tumors
- Illustrate the main etiologies and microscopic features of the clear cell renal cell carcinoma



- **Indicate the epidemiology, risk factors and the morphological features of the neoplasms of the urothelium**
- **Describe the natural history of papillary and non-papillary neoplasms of the bladder with emphasis on in situ carcinoma, muscle invasiveness, multifocality, grade and staging**
- **Indicate the potential and limits of the different cytological and histological procedures in the diagnosis of urogenital tract tumors**
- **Indicate what information is needed for a pathological report of a urogenital tract tumor to be complete**

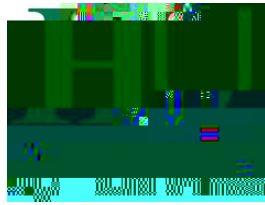
Lesson 7 Prostate pathology

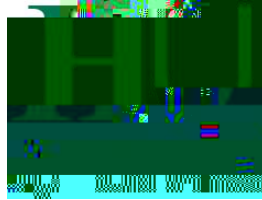
Learning objectives:

- **Describe the zonal anatomy of the prostate, considering the different diseases and symptoms related to it**
- **Illustrate the morphological characteristics of benign prostatic hyperplasia**
- **Illustrate the epidemiology, risk factors and natural history of prostatic neoplasms**
- **Illustrate the diagnostic strategy of prostate cancer**
- **List the prognostic parameters of prostate cancer**
- **Define and compare the Gleason score**

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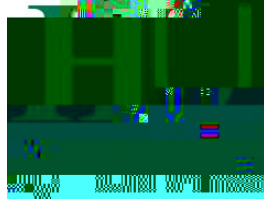


- **Identify the pharmacological targets in the system**
- **Discuss the drugs available to interfere with coagulation, platelet aggregation and thrombus formation and lysis**

THE CLINICAL APPLICATIONS OF CARDIOVASCULAR AND RENAL DRUGS

Lecture Cardiac insufficiency and ischemia

- **Examine the pathophysiological factors that influence cardiac contractility, cardiac work and oxygen demand**
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VASCULAR DISEASES: INDEPENDENT LECTURE ON 28/11 (830103) OR INTEGRATION TO PROCEEDINGS LECTURE ON 08/11/2017

Describe the main radiological techniques for the evaluation of aneurysms, acute aortic syndromes, peripheral arterial diseases

Describe the main indications of interventional radiology for vascular diseases

MULTIDISCIPLINARY INTEGRATION

Renal artery stenosis (22/11)