

Degree in Medicine and Surgery

Integrated course: SYSTEMATIC PATHOLOGY I 11 ECTS

SDS : MED-10, MED-11, MED-21, MED-22, MED-23

Coordinator: Francesco Prati

Module: Respiratory System Diseases MED/10 2 ECTS

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Module: Heart Surgery MED/23 2 ECTS

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Module: Vascular Surgery MED/22 3 ECTS

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Module: Chest Surgery MED/21 1 ECTS

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Module: Cardiovascular System Diseases MED/1 ECTS

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PREREQUISITES:

No specific prerequisites are required; however is considered to be fundamental for the Cardiac Surgery the knowledge of Human Anatomy, Histology, Microbiology, Human Physiology, and General Pathology.

LEARNING OBJECTIVES

The learning objectives of the Integrated Course are:

- knowledge about epidemiology, etiology, pathogenesis, diagnosis, prognosis and treatment of the cardiovascular and respiratory system diseases;
- knowledge of cardiac diseases, known to be the main cause of premature deaths. All cardiovascular diseases, either ischemic or of different etiologies, are responsible for reducing quality of life and physical capacity, disability and eventually death. Understanding the pathology and learning how to reach a timely diagnosis helps in achieving the best form of treatment, avoiding progressive worsening of the pathology and of the symptoms.
- Knowledge of diseases related to the extreme consequences of the main pathology linked to aging, namely atherosclerosis, is central to the training of the modern health worker. In fact, it is important to keep in mind the progressive increase in the average age and the progressive growth of the diabetic "pandemic", which is one of the most serious determinants of atherosclerosis. The knowledge, which is to say the prevention and treatment, of peripheral vascular diseases is able to increase the average age of the population (e.g. by preventing the rupture of aortic aneurysms) and to improve their quality of life by avoiding their disability (e.g. preventing cerebrovascular accidents and lower limb loss due to gangrene). In recent years, there has been a steady growth in the demand for angiological training by General Medicine, as well as in the demand for mass diagnostic tests (such as ultrasound Doppler), and vascular specialists.

Knowledge of the main diagnostic and/or therapeutic techniques most commonly used in clinical practice complete the course.

LEARNING OUTCOMES

Knowledge and understanding:

At the end of the course the student will be able to:

- Know and discriminate between the main cardiovascular, vascular, respiratory and pulmonary symptoms, defining their severity and importance
- Propose a symptom-based diagnostic flow chart of cardiovascular, respiratory immunoallergic, lymphatic and respiratory system pathologies, in order to reach a diagnostic hypothesis; this diagnostic hypothesis must be corroborated by clinical and pathophysiological elements
- Assign a specific overall therapeutic course for each proposed and recognised clinical picture
- Know the basics of the main diseases of the cardiovascular, vascular, respiratory and pulmonary systems
- Know the clinical presentation, diagnostic procedure and differential diagnosis of the main cardiovascular diseases



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- To know the principles of medical and surgical therapy of the main diseases of the cardiovascular, vascular, respiratory and pulmonary system
- To know the clinical presentation, diagnostic procedure and differential diagnosis modalities of the main cardiovascular, respiratory immunoallergic, lymphatic system and respiratory system diseases
- Know the main surgical procedures of the venous and lymphatic system
- Know the devices commonly used in patients

Applying knowledge and understanding:

The general objective of the integrated teaching of Systematic Pathology I is the development of analytical methodological skills. For each individual module of the teaching students will have to know the principles of evidence-based medicine, relate them to each specific clinical situation and be able to also identify clinical situations characterized by atypical presentations, proposing an appropriate diagnostic and therapeutic procedure for each of them. Students are also expected to develop their learning skills, integrating information from textbooks with evidence from scientific publications, in order to consolidate and expand their acquired knowledge also independently.

Communication skills:

The course promotes communication skills in order to improve the individual's ability to argue with effectiveness and precision of expression. These skills will be achieved specifically through Professor-student interactions in the context of different scenarios. Students are expected to learn an adequate technical-scientific language by also acquiring universally accepted diagnostic and prognostic scores; furthermore, they are expected to develop communication skills with the patient starting from the collection of the anamnesis up to the communication of the diagnosis and its prognosis and therapy.

Making judgements:

At the end of the lectures, the student will have learnt the fundamental elements relating to the most important pathologies of the individual modules of the integrated course and will be able to carry out a logical procedure to critically analyse the information received from the patient in order to make a differential diagnosis even with the rarest pathologies. The student will have developed the ability to integrate the acquired scientific knowledge by applying it to specific clinical situations, in order to formulate an appropriate assessment to guide diagnostic and therapeutic decision-making.

COURSE SYLLABUS



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Module: Cardiovascular System Diseases (MED/11)

- Atherosclerosis and vulnerable plaque
- Coronary Thrombosis, Coronary Blood Flow Hypertension
- Cardiovascular Risk Factors: Diabetes, Hyperlipidemia, Smoking
- Evaluation and Management of Stable Ischemic Heart Disease
- Cardiovascular Pharmacology
- Acute Coronary Syndromes: Definition, Evaluation and Management of Non-ST Segment Elevation Myocardial Infarction and ST-Segment Elevation Myocardial Infarction, Sudden Cardiac Death
- Cardiovascular Diagnostics: electrocardiography, electrocardiographic exercise testing, echocardiography, computed tomography, magnetic resonance, cardiac catheterization and cardiac angiography
- Heart Failure: pathophysiology, diagnosis and management
- Atrial Fibrillation, Atrial Flutter and Atrial Tachycardia
- Wolff-Parkinson-White Syndrome
- Ventricular Arrhythmias
- Classification of Cardiomyopathies (CMP), Dilated CMP, Hypertrophic CMP, Restrictive CMP and Arrhythmogenic CMP
- Bradyarrhythmias, Pacemakers and Defibrillators
- Myocarditis and Pericardial Diseases

**Module: Respiratory system
(MED/10)**

- Introduction to pathologies of the respiratory system. Special anatomy and physiology of the respiratory system, clinical semeiotics of the main symptoms and signs of respiratory diseases: cough, dyspnoea, haemoptoe and chest pain, rales, wheezing, cyanosis, digital hippocratism. Other non-specific symptoms and signs associated with respiratory disease
- Techniques and basic principles of interpretation of laboratory tests and respiratory physio- pathology, respiratory function tests, arterial blood gas analysis and oximetry; walk test; pol- ygraphic monitoring during sleep, clinical semiotics of the main symptoms and signs of res- piratory diseases: cough, dyspnoea, haemoptoe and chest pain, rales, wheezing, cyanosis, digital hippocratism. Other non-specific symptoms and signs associated with respiratory dis- ease
- Respiratory infectious diseases: community acquired (CAP) and nosocomial (HAP)

pneumonia, pneumonia in the immunocompromised host, aspiration pneumonia (ad ingestis), lung abscess. Definition, Epidemiology, Main Pathogens, Risk Factors, Pathophysiology, Pathological Anatomy, Clinical and Instrumental Diagnosis, Natural History, Complications and Therapy

- Pulmonary tuberculosis. Definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications and therapy
- Lung Cancer: definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications and therapy
- Acute and chronic respiratory failure. Definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications and therapy. Oxygen therapy and non-invasive mechanical ventilation: basic principles, indications, side effects.
- Pulmonary embolism, pulmonary arterial hypertension and other pathologies of the pulmonary circulation: definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications and therapy
- Diffuse infiltrative lung diseases: idiopathic pulmonary fibrosis, sarcoidosis and other pulmonary interstitial diseases; definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications therapy;
- Bronchial asthma and respiratory immunoallergic diseases: definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications and therapy
- Chronic obstructive pulmonary disease (COPD): definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications and therapy
- Pleural Pathology: pleurisy and pleural effusions; pneumothorax; mesothelioma. Definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications and therapy. Thoracentesis and management of pleurostomy.
- Bronchiectasis. Definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications and therapy.
- Obstructive sleep apnea syndrome (OSAS). Definition, epidemiology, risk factors, pathophysiology, pathological anatomy, clinical and instrumental diagnosis, natural history, complications and therapy.

Module: Vascular Surgery (MED/22)



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- Atherosclerosis and principles of Hemodynamics.
- Clinical semiotics and instrumental diagnosis of vascular apparatus and pathologies
- Peripheral vascular disease.
- Acute limb ischemia.
- Cerebrovascular insufficiency.
- Celiac-mesenteric insufficiency, acute and chronic.
- Renovascular hypertension.
- Aortic aneurysms.
- Peripheral aneurysms
- Aortic dissections.
- Vascular trauma.
- Diseases of the venous system.
- Diseases of the lymphatic system.
- Thoracic outlet syndrome.
- Vasospastic diseases.

Module: Chest Surgery (MED/21)

Basics of surgical anatomy of chest

Fundamentals of diagnosis and imaging examinations in thoracic surgery
Preoperative physiological evaluation

Chest wall diseases: Pectus deformities, Thoracic outlet syndrome, chest wall tumors

Pleura: Pneumothorax, Chylothorax, Empyema, Pleural effusion, Solitary fibrous tumors, Malignant pleural mesothelioma

Trachea: tracheobronchial injuries, stenosis and fistulae, Tracheal tumors

Mediastinum: Myasthenia gravis, Thymic tumors, Mediastinal germ cell tumors, Lymphomas, and other hematologic diseases

Lung: Surgery for emphysema, Lung abscess, Lung cancer screening, Solitary pulmonary nodule, Staging lung cancer, Lung cancer, Superior sulcus tumors, Carcinoid tumors, Metastatic tumors of the lung
Esophagus: Benign tumors, esophageal malignancies, Staging, Indications to surgery, Esophageal functional diseases, Differential diagnosis, Decision making process and Indication to surgery of functional diseases of foregut

Module: Heart Surgery



1) Ischemic heart diseases. Surgical therapies. Rationale and methodology

2) Valvular disease

Main causes of valve diseases

Congenital, Rheumatic disease, Ischemic disease, Endocarditis,
Degenerative Aortic stenosis

Ethiology, Physiopathology

Diagnosis: Symptoms, Semeiotic, Ecg changes, Echocardiogram, Catheterism
Therapy: Medical, Valvuloplasty, TAVI, Surgical

Aortic insufficiency:

Ethiology, Physiopathology

Diagnosis: Symptoms, Semeiotic, Ecg changes, Echocardiogram, Catheterism
Therapy: Medical, TAVI, Surgical

Mitral stenosis:

Ethiology, Physiopathology

Diagnosis: Symptoms, Semeiotic, Ecg changes, Echocardiogram, Catheterism
Therapy: Medical, Valvuloplasty, TAMI, Surgical

Mitral insufficiency:

Ethiology, Physiopathology

Diagnosis: Symptoms, Physical examination, Ecg changes,
Echocardiogram, Catheterism

Therapy: Medical, Percutaneous Interventional ,

Surgical Tricuspid insufficiency:

Ethiology, Physiopathology

Diagnosis: Symptoms, Semeiotic, Ecg changes, Echocardiogram, Catheterism
Therapy: Medical, Percutaneous Interventional , Surgical

Tricuspid stenosis and pulmonary
disease Ethiology,

Physiopathology

Diagnosis Symptoms, Semeiotic, Lab. Tests, Ecg changes, Echocardiogram,
Catheterism



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Therapy: Medical, Percutaneous Interventional ,
Surgical Infective endocarditis
Aneurismi dell' aorta
ascendente Etiology,
Physiopathology
Diagnosis Symptoms, Semeiotic, Lab. Tests, Ecg changes, Echocardiogram,
Catheterism

Therapy: Medical, Percutaneous Interventional , Surgical

3) Congenital disease

Atrial septum defect (physiopathology, diagnosis and treatment)
Ventricular septum defect (physiopathology, diagnosis and treatment)
Tetralogy of Fallot (physiopathology, diagnosis and treatment)
Aortic coarctation (physiopathology, diagnosis and treatment)
Pulmonary atresia (physiopathology, diagnosis and treatment)
Trasposizione dei grossi vasi (physiopathology, diagnosis and treatment)

COURSE STRUCTURE

The course consists of 110 academic hours (20 hours of Respiratory System Diseases, 30 hours of Cardiovascular System Diseases, 20 hours of Chest Surgery, 20 hours of Vascular Surgery, 20 hours of Heart Surgery), during which the main topics concerning the cardiovascular, vascular and respiratory system diseases will be addressed with the support of multimedia material through an interactive mode with the students, who are required to attend class.

COURSE GRADE DETERMINATION

The examination consists of two parts: a written test and an oral test. The written test consists of multiple-choice questions, with one correct answer, on topics covered in the lectures. The student answers 60 questions on the five teaching subjects (each correct answer is awarded a mark of 1).

To take the oral test, the student must have obtained a minimum score of 36/60 on quizzes covering all five subjects. The tests are multiple-choice with only one correct answer. The written examination constitutes a barrier or selection test; it is in the oral test that the student is given the opportunity to demonstrate his or her preparation by discussing the course topics, reasoning on issues relating to the subjects and demonstrating that he or she has acquired the ability to express himself or herself in an appropriate scientific language. The final assessment will be based primarily on the outcome of the oral examination.

Hence, the whole examination will be evaluated as it follows:

➤ Insufficient: severe poor knowledge of the subject, very limited skill in the analysis of specific



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items.

➤ 18-20: knowledge of the subjects of sufficient quality characterized by frequent imperfections.

Analysis and reasoning skills of sufficient quality.

➤ 21-23: standard knowledge of the specific subject; analysis and reasoning skill of acceptable quality.

➤ 24-26: good knowledge of the subjects and good analysis and reasoning skills; arguments are expressed in a rigorous way.

➤ 27-29: very good knowledge of the specific scientific subjects, valid analysis and reasoning skills,

significant skill in making judgements.

➤ 30-30L: outstanding knowledge of the specific knowledge of the scientific tasks. Exceptional analysis, reasoning and making judgments skills.

READING MATERIALS

- *Hurst's*. The Heart, 14 edizione.

- *ESC Textbook of Cardiovascular Medicine*.

- *Harrison's Principles of Internal Medicine*, 20e J. Larry Jameson, Anthony S. Fauci, Dennis L. Kasper, Stephen L. Hauser, Dan L. Longo, Joseph Loscalzo;

- *Handbook of Patient Care in Vascular Diseases* (6th edition, by Rasmussen/Clouse/Tonnessen, Wolters

Kluwer (Lippincott Williams & Wilkins Handbook;

- *Pocket Manual of General Thoracic Surgery*. Amin Madani, Lorenzo Ferri, Andrew Seely (Eds). 2015 Edition. Springer. ISBN-13: 978-3319174969, ISBN-10: 3319174967;

- *Cardiac Surgery*, Kirklin /Barrat-Boyes. Ed Churchill, Livingstone;