Universitat Autònoma de Barcelona

2023/2024

# Medicine and Surgery II

Code: 106694
ECTS Credits: 6

| Degree | Type | Year | Semester |
|---|---|---|---|
| 2502442 Medicine | OB | 4 | 0 |

## Contact

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## Teaching groups languages

You can check it through this link. To consult the language you will need to enter the CODE of the subject.
Please note that this information is provisional until 30 November 2023.

## Teachers

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## Prerequisites

- Basic knowledge of general pathophysiology, of the cardiocirculatory system and the respiratory system.
- Knowledge of human anatomy, genetics, molecular biology and pharmacology.
- Sufficient knowledge of the psychological bases of health and disease states, as well as an adequate level of knowledge of interpersonal communication and professional behavior.
- The student will acquire the commitment to preserve the confidentiality and professional secrecy of the data

to which he may have access due to learning in the healthcare services. He must also maintain an attitude of professional ethics in all his actions.

## Objectives and Contextualisation

CARDIOVASCULAR: Students will learn to identify and know the pathophysiology of diseases that affect the heart and large vessels. He must learn to make an accurate differential diagnosis by using the appropriate complementary tests (electrocardiogram, chest x-ray, echocardiogram, vascular ultrasound, Doppler, ankle/brachial index, CT, magnetic resonance, biochemical markers, etc.). Know the diseases of the cardiovascular system, their risk factors and prevention; the pathophysiology and clinical expression of diseases of the myocardium, valvular system, the pericardium, the aorta, the arterial system, the venous system and the lymphatic system. The basis and clinical use of the various diagnostic procedures and techniques used in Cardiology and Vascular Surgery and Cardiac Surgery, the most suitable treatment for each of the diseases of the system, medical, instrumental or surgical, and the rehabilitation of the cardiovascular patient.

RESPIRATORY: Students will acquire the necessary knowledge about respiratory diseases, congenital or acquired, due to dysfunction, toxic, drugs, infection, allergy, occupation, environment, accidental inhalation, neoplasia, trauma or unknown origin; its manifestations, consequences, risk factors and prevention, diagnostic techniques and procedures, medical and instrumental treatment, including surgical techniques and lung transplantation, and rehabilitation.

## Competences

- Demonstrate understanding of the manifestations of the illness in the structure and function of the human body.
- Establish a diagnostic approach and a well thought-out strategy for action, taking account of the results of the anamnesis and the physical examination, and the results of the appropriate complementary tests carried out subsequently.
- Indicate the basic diagnosis techniques and procedures and analyse and interpret the results so as to better pinpoint the nature of the problems.
- Indicate the most suitable treatment for the most prevalent acute and chronic processes, and for the terminally ill.

## Learning Outcomes

1. Describe the effects on all organs and systems of diseases of the blood, the cardiovascular system, the digestive system, the respiratory system, the endocrine system, the nervous system, the genitourinary system, infectious pathologies and diseases of the elderly.
2. Describe the main pathological situations of the musculoskeletal system, the blood, the cardiovascular system, the digestive system, the respiratory system, the endocrine system, the nervous system, the genitourinary system, infectious pathologies and diseases of the elderly.
3. Design the treatment for the main infectious diseases, diseases of the blood, of the elderly, and of the hematopoietic system, the cardiovascular system, the digestive system, the respiratory system, the endocrine system, the nervous system, the renal and genitourinary system, the retroperitoneal system and the musculoskeletal system.
4. Explain the mechanisms by which illness affects the structure and function of the human body.
5. Identify tumour diseases, and the diagnosis and management of these.
6. Indicate the complementary examinations for diagnosing the main infectious diseases, diseases of the blood, of the elderly, and of the hematopoietic system, the cardiovascular system, the digestive system, the respiratory system, the endocrine system, the nervous system, the renal and genitourinary system, the retroperitoneal system and the musculoskeletal system.

7. State the most probable diagnosis for the main infectious diseases, diseases of the blood, of the elderly, and of the hematopoietic system, the cardiovascular system, the digestive system, the respiratory system, the endocrine system, the nervous system, the renal and genitourinary system, the retroperitoneal system and the musculoskeletal system.

## Content

RESPIRATORY MEDICINE (PNEUMOLOGY)

THEORY (TE)

1. Techniques and diagnostic procedures in Pneumology. Pulmonary function studies. Studies of sleep-disordered breathing. Bronchoscopy. Lung and pleural biopsies. Chest ultrasound. induced sputum.
2. Acute and chronic respiratory failure. Concept. Classification. Etiology. Pathogeny. Diagnosis. Treatment. Acute respiratory distress syndrome (ARDS).
3. Ventilation disorders: hypoventilation and hyperventilation. Definition and etiology. Pathophysiology. Clinic and Diagnosis. Primary alveolar hypoventilation. Hypoventilation Syndrome. Rib cage diseases. Neuromuscular respiratory syndromes. Hyperventilation syndrome.
4. Breathing disorders during sleep. Characteristics of ventilation during sleep. Concept of apnea and hypopnea. Concept of obstructive, central and mixed apnea. Obstructive sleep apnea (OSA): definition, pathogenesis, clinical characteristics, prevalence, diagnosis and treatment. Characteristics of childhood OSA. Central apnea: definition and characteristics.
5. Chronic Obstructive Pulmonary Disease (COPD). Chronic bronchitis, emphysema, and chronic airflow limitation. Definitions. prevalence. Etiology. Pathogeny. Pathophysiology. clinical forms. Small airway disease. bullous emphysema. Alpha 1-antitrypsin deficiency emphysema. Unilateral hyperclear lung. Diagnosis. Prevention. Treatment.
6. Asthma. Concept. prevalence. Etiology. Pathogeny. Pathophysiology. Symptoms. Phenotypes. Diagnosis. Differential diagnosis. Pharmacotherapy. Asthmatic exacerbation. Severe uncontrolled asthma.
7. Bronchiectasis. Immunodeficiencies with respiratory manifestation: immunoglobulin deficiency. Bronchiectasis, types, clinic. Cystic fibrosis in the adult. Immobile cilia disease. Broncholithiasis. Intrabronchial foreign bodies.
8. Respiratory infections. Common cold, flu, COVID-19. Community-acquired pneumonia, classification, clinical-etiological forms, diagnosis, complications, treatment. lung abscess
9. Nosocomial pneumonia. Concept, epidemiology, etiology, diagnosis, treatment. Pulmonary infection in the immunosuppressed patient. Pulmonary infections in transplant patient. Manifestations of AIDS based on CD4 counts. Diagnosis. bacteria. Virus. Pulmonary mycoses
10. Pulmonary tuberculosis and atypical mycobacteriosis. Concept. Epidemiology. Pathogeny. Clinical manifestations: primary infection, late forms. extrapulmonary forms. Tuberculosis and AIDS. Diagnosis, obtaining samples. Differential diagnosis. Forecast. Treatment and control side effects. Therapeutic failure and recurrence. Prophylaxis. Contact study.
11. Pulmonary hypertension. Causes, diagnosis and treatment.
12. Thromboembolic disease I (pulmonary), etiology, pathophysiology, diagnosis and treatment. Pulmonary vasculitis, types, diagnosis and treatment.
13. Occupational and environmental diseases. Pneumoconiosis, Asbestosis, silicosii other inorganic dust diseases. Occupational asthma.
14. Pulmonary eosinophilia, types, diagnosis and treatment. Extrinsic Allergic Alveolitis, etiology, pathogenesis, clinic, diagnosis, differential diagnosis, treatment.
15. Interstitial and infiltrative lung diseases. Classification. Interstitial pneumonias, types, clinic, diagnosis, treatment, prognosis and evolution. Other interstitial pneumonias, alveolar proteiniosis. lymphangioleiomyomatosis.
16. Sarcoidosis. Clinic, classification, diagnosis and treatment. Other granulomatosis, pulmonary Langerhans cell histiocytosis, allergic granulomatosis with angiitis (AGE), granulomatosis with polyangiitis (ANCA-associated).

17. Pulmonary involvement due to systemic diseases. Respiratory condition to the patient with hematological disease. Hepatopulmonary syndrome. Respiratory complications in connective diseases.
18. Lung neoplasms I. Epidemiology, classification, histology, clinic, paraneoplastic syndromes, radiology, diagnosis.
19. Lung neoplasms II. Staging, solitary pulmonary nodule,non-surgical treatments.
20. Benign pleural pathology. Etiology. Classification. Diagnosis. Tuberculous pleurisy.

SEMINARS (SEM)

1. The study of lung function in the clinic. Spirometry. bronchodilator test. Patterns of ventilatory alteration. Diffusion capacity of CO. Static lung volumes. Gas exchange. Ergometry.
2. Seminars on clinical cases of transversal respiratory processes (3 seminars). Clinical cases of p.e. patients with hemoptysis, chronic cough, smoking or need for lung transplantation. Students will actively participate in the seminar.

ADVANCED CLINICAL SIMULATION PRACTICE (PSCA)

1. Non-invasive respiratory systems (ventilation, oxygen therapy, etc). In small groups of students and in the simulation classroom, the teacher will explain in a practical way (using the different devices used) the fundamentals of the techniques that make it up.

RESPIRATORY SURGERY (THORACIC C.)

THEORY (TE)

1. Lung neoplasms III. Surgical staging, surgical treatment and according to stages.
2. IV lung neoplasms. Benign lung tumors. Lung metastases.
3. Pathology of the mediastinum. Diagnosis and treatment of mediastinal tumor and infectious pathology.
4. Chest trauma. Pathological forms and therapeutic management.
5. Pathology of the chest wall. Malformations, diagnosis and treatment of chest wall tumors.
6. Lung transplantation, lung volume reduction surgery. Airway surgical pathology.

SEMINARS (SEM)

1. Pneumothorax, hemothorax, kilothorax, and malignant pleural effusion. Diagnosis and treatment of pleural pathology. Pleural mesothelioma: diagnosis and treatment.
2. Surgical technique. Thoracentesis. Pleural drainage placement, technique and indication. Approach routes in thoracic surgery and types of surgical resection. Open surgery, minimally invasive surgery and robotic surgery.

CARDIOVASCULAR MEDICINE (CARDIOLOGY)

THEORY (TE)

1. Ischemic heart disease I (physiopathology and risk factors). Describe the mechanisms of coronary atherosclerosis. Identify cardiovascular risk factors. Explain the mechanisms of regulation of coronary circulation and myocardial oxygen consumption. Explain the concept of myocardial ischemia.
2. Ischemic heart disease II (diagnosis). Describe the clinical forms of myocardial ischemia. Number and contrast the different diagnostic tests. Describe the electrocardiographic changes of myocardial ischemia.
3. Ischemic heart disease III (stable and unstable angina). Identify the patient with stable angina and establish diagnostic measures, prognostic assessment and therapeutic line. Identify the patient with unstable angina and establish diagnostic measures, prognostic assessment and therapeutic line.
4. IV ischemic heart disease (myocardial infarction). Identify the patient with myocardial infarction and establish diagnostic measures, prognostic assessment and therapeutic line.
5. Arrhythmias I (bradyarrhythmias). Describe the physiological bases of the normal rhythm of the heart. List the atrioventricular conduction disorders and establish the electrocardiographic diagnosis. Indicate the diagnostic tests and establish the risk.

6. Arrhythmias II (Supraventricular tachyarrhythmias). List supraventricular arrhythmias with special emphasis on atrial fibrillation and establish the electrocardiographic diagnosis. Indicate the appropriate diagnostic tests
7. Arrhythmias III (ventricular tachyarrhythmias). Describe the pathophysiological bases of ventricular arrhythmias. Establish the electrocardiographic diagnosis and assess the risk. Indicate the appropriate diagnostic tests.
8. IV arrhythmias (antiarrhythmic treatment). Describe the current treatments for arrhythmias, both pharmacological (including antiarrhythmic drugs as indications for anticoagulation) and indications for ablation and ablation techniques.
9. Syncope and sudden death. Describe the pathophysiological bases of syncope and sudden death. List the causes. Assess the risk. Indicate diagnostic tests and establish therapeutic measures
10. Heart failure I (concept, clinical picture and diagnosis). Describe the pathophysiological mechanisms that lead to heart failure. Identify the different clinical forms of presentation. Establish diagnostic tests.
11. Heart failure II (treatment). Assess the risk and establish pharmacological treatment. Identify patients eligible for special treatments such as cardiac resynchronization and heart transplantation. Know the activity of specialized treatment units (heart failure units).
12. Diseases of the myocardium I (myocarditis, dilated cardiomyopathy). Describe the pathophysiological mechanisms of myocardial involvement. Identify the different clinical forms and assess the risk. Indicate diagnostic tests and establish therapeutic measures.
13. Myocardial diseases II (hypertrophic and restrictive cardiomyopathy). Describe the pathophysiological mechanisms of myocardial involvement. Identify the different clinical forms and assess the risk. Indicate diagnostic tests and establish therapeutic measures.
14. Pericardium diseases. Describe the pathophysiological mechanisms of pericardial involvement. Describe the main clinical forms, assess the risk and establish therapeutic measures.
15. Valvulopathies I (mitral). Describe the pathophysiological mechanisms of mitral valve involvement. List the main causes. Describe the hemodynamic alterations. Identify the severity of the disease based on clinical data and diagnostic tests. Recognize the most frequent clinical forms of mitral valve disease. Assess the risk. Establish therapeutic measures. Know the indications for surgery.
16. Valvulopathies II (aorta). Describe the pathophysiological mechanisms of aortic valve involvement. List the main causes. Describe the hemodynamic alterations. Identify the severity of thedisease based on clinical data and diagnostic tests. Recognize the most common clinical forms of aortic valve disease. Assess the risk. Establish therapeutic measures. Know the indications for surgery.
17. Infective endocarditis. Identify the pathophysiological mechanisms of infectious involvement of heart valves. Describe the main clinical forms. Estimate the risk and apply pharmacological and surgical therapeutic measures.
18. Diseases of the thoracic aorta. Identify causal mechanisms. Describe the clinical forms and establish the risk. Indicate diagnostic tests and establish therapeutic measures.
19. Adult congenital heart disease. Know the main congenital heart diseases that occur in adulthood. Describe its pathophysiological and clinical expression. Indicate the most appropriate diagnostic tests. Describe the residual lesions and usual sequelae of surgically intervened congenital heart disease. Know the therapeutic measures to be used especially in cyanotic congenital heart disease.

SEMINARS (SEM)

1. ECG analysis seminar. Know the electrocardiographic pattern the differential diagnosis of bradio- and tachyarrhythmias.
2. Clinical cases (2 seminars). 2 clinical cases of different pathologies (ischemic heart disease and heart failure) will be resolved. Students will actively participate in the development of each case, participating in the preparation of the differential diagnosis, request for diagnostic tests and treatment. The cases will follow the structure of those who will later appear in the written practical exam.

ADVANCED CLINICAL SIMULATION PRACTICE (PSCA)

1. Cardiac auscultation. In small groups of students and in the simulation classroom, the teacher will explain in a practical way the fundamentals of cardiac auscultation in conditions of cardiovascular pathology (murmurs, third sound, pericardiac knock, etc).

CARDIOVACULAR (C. VASCULAR AND C. CARDIAC)

THEORY (TE)

1. Aortic and peripheral aneurysms. Other pathologies of the abdominal and thoracic aorta. Aneurysms of the abdominal and thoracic aorta and other peripheral arteries. Acute aortic syndrome. Definition, diagnosis and treatment.
2. Diabetic foot. Diabetic foot type. Prevention. podiatric measures. Possible treatments. Amputations.
3. Chronic venous insufficiency + lymphatic pathology. Etiology, clinic and classification. Conservative and surgical treatments. complications.
4. Thromboembolic disease II (deep vein thrombosis). Etiology, pathophysiology, diagnosis and treatment. compression syndromes.
5. Acute ischemia and vascular trauma. Injuries with vascular involvement: types and treatments. Differential diagnosis of acute ischemia: thrombosis-embolism. Prognostic criteria. Therapeutic approach: medical, endovascular and open surgical treatment.
6. Miscellaneous. Vascular malformations (Klippel-Trenaunay, Parkes Weber). Congenital, acquired and surgical arteriovenous fistulas. Others: carotid chemodectomas, vena cava leiomyosarcoma.
7. Valve surgery. Heart transplant. Repair or prosthetic replacement. mechanical prostheses. Biological prostheses. Complications in the evolution of the patient with a prosthesis. Indications for surgery in cardiomyopathies and heart failure. Heart transplant.
8. Surgery for ischemic heart disease. Indication for coronary revascularization. Coronary revascularization techniques. Surgical treatment of complications of myocardial infarction.
9. Chronic MMII ischemia and thromboangiitis obliterans. Etiology. Stadiums. Medical treatment. Indication of surgery and techniques

SEMINARS (SEM)

1. Differential diagnosis of lower limb ulcers.
2. Diagnosis in vascular pathology (physical examination, ankle/brachial index, Doppler ultrasound and plethysmography).

## Methodology

This guide describes the framework, contents, methodology and general rules of the subject, in accordance with the current study plan. The final organization of the subject in terms of the number and size of groups, distribution in the calendar and exam dates, specific evaluation criteria and examination review, will be specified in each of the Hospital Teaching Units ( UDH), which will explain this through their web pages and on the first day of class of each subject, through the professors responsible for the subject at the UDH.
As a general rule of teaching methodology, classes and seminars must have a practical sense, escaping as much as possible from the master class and basing it on clinical assumptions, oriented towards the training of general practitioners, avoiding super-specialization content. It must be remembered that it is a question of training general doctors, not specialists in the subjects of the subject. In each class, the objectives and final messages that the student must keep in mind and that will be essential for their future medical practice must be clearly specified.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

| Title | Hours | ECTS | Learning Outcomes |
|---|---|---|---|
| Type: Directed | | | |
| ADVANCED CLINICAL SIMULATION PRACTICE | 2 | 0.08 | 1, 3 |

| | | | |
|---|---|---|---|
| SEMINARS | 11 | 0.44 | 1, 2, 3, 4, 7, 5, 6 |
| Theory | 54 | 2.16 | 1, 2, 3, 4, 7, 5, 6 |
| Type: Autonomous | | | |
| PERSONAL LEARNING. READING ARTICLES REPORTS OF INTEREST | 66 | 2.64 | 3, 7, 6 |

## Assessment

It will be based on two partial exams for each part of the subject (Respiratory and Cardiovascular) and each exam will have three assessment modalities:

1. THEORETICAL (70% of the final grade for each part of the subject) through a closed-answer test type exam.
2. INTERPRETATION OF CLINICAL CASES OR COMPLEMENTARY TESTS (20% of the final mark for each part of the subject). Diagnostic and therapeutic resolution of clinical cases and/or interpretation of complementary tests (respiratory function tests, ECG, imaging tests, blood analysis or cytological-histological samples, or others). The system of short questions can be used, at the discretion of each teaching unit.
3. ACTIVE PARTICIPATION IN CLASS (10% of the final grade for each part of the subject). Through the evaluation of the students (distributed in groups) in the preparation and presentation of a theoretical lesson of the syllabus in class and/or with a daily individual evaluation in the theoretical classes and seminars (with personal computer systems, such as the telephone Phone).

The student who has not passed will have to take the final make-up test. And those who do not complete the evaluation tests, will be considered as "Not evaluated", exhausting the rights to register for the subject.

FINAL QUALIFICATION. The final assessment will take into account the student's continuous assessment throughout the course from the partial exams described above for each part of the subject, Respiratory and Cardiovascular. The final grade for the MIC-II subject will be the arithmetic mean of the aforementioned two parts (Respiratory and Cardiovascular), which must be approved individually.

This subject does not provide for the single assessment system.

## Assessment Activities

| Title | Weighting | Hours | ECTS | Learning Outcomes |
|---|---|---|---|---|
| ACTIVE PARTICIPATION IN CLASS | 10% | 2.3 | 0.09 | 1, 2, 3, 4, 7, 5, 6 |
| INTERPRETATION OF CLINICAL CASES/ TESTS | 20% | 4.7 | 0.19 | 7, 6 |
| THEORY | 70% | 10 | 0.4 | 1, 2, 3, 4, 7, 5, 6 |

## Bibliography


RESPIRATORY

BOOKS:

- Farreras A y Rozman C. Medicina Interna. 19ª edición. Elsevier. Barcelona 2020. https://bibcercador.uab.cat/permalink/34CSUC_UAB/1c3utr0/cdi_proquest_ebookcentral_EBC7045003

- Harrison. Principios de Medicina Interna. 20ª edición. Ed.McGraw-Hill, Interamericana. Madrid 2019. https://bibcercador.uab.cat/permalink/34CSUC_UAB/avjcib/alma991010637433606709
- C. Jiménez-Ruiz, G. Peces-Barba, R. Moreno Balsalobre y V. Plaza Moral. Manual SEPAR de Neumología y Cirugía Torácica. 4ª edición. Ed. SEPAR. Madrid 2021. https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991000972819706709
- Locicero III, J. Shields' General Thoracic Surgery. 8th edition. Ed. Wolters Kluwer. 2018. https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991010487543306709
- Tratado de cirurgia torácica SEPAR. Ed SEPAR- EDIMSA Madrid 2010. (no és d'accés lliure)
- Parrilla P, García-Granero E, Martín E, Morales-conde S, Navarro S, Targarona EM. Cirugía AEC. Asociación Española de Cirujanos. 3a edición. Ed. Panamericana. Madrid 2022. (Tenim la 2ed. 2010)

JOURNALS:

- Archivos de Bronconeumología https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991010531410406709
- Open Respiratory Archives https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991010363146206709
- European Respiratory Journal https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991009105909706709
- Thorax https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991010340030906709
- Lancet Resp Med. https://www.thelancet.com/journals/lanres/home
- Annals of thoracic Surgery https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991010358200906709
- European Journal of Cardiothoracic surgery https://bibcercador.uab.cat/permalink/34CSUC_UAB/cugbhl/alma991036524889706706
- Journal of thoracic oncology. https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991010359132006709
- Journal of thoracic disease

INTERNET RESOURCES:

- Societat Catalana de Pneumologia (SOCAP): www.socapnet.org
- Sociedad Española de Neumología y Cirugía Torácica (SEPAR): www.separ.es
- European Respiratory Society (ERS): www.ersnet.org
- American Thoracic Society (ATS): www.thoracic.org

CARDIOVASCULAR

BOOKS:

- Harrison Principios de Medicina Intern. Mc Graw Hill. https://bibcercador.uab.cat/permalink/34CSUC_UAB/avjcib/alma991010637433606709
- Tratado de Medicina Interna Farreras-Rozman. Elsevier. https://bibcercador.uab.cat/permalink/34CSUC_UAB/1c3utr0/cdi_proquest_ebookcentral_EBC7045003
- Braunwald Tratado de Cardiología. Elsevier. (2019). https://bibcercador.uab.cat/permalink/34CSUC_UAB/cugbhl/alma991000588499706709
- Heart disease. A text book of cardiovascular medicine. Braunwald E, Ross R, Topol EJ. Philapdelphia.
- Mayo Clinic Cardiology Review, Murphy (no és de lliure accés)
- Electrocardiografía clínica, Bayés de Luna, Antoni. Espaxs, S.A (paper)
- La electrocardiografia en la toma de decisiones en urgencias. H. Wellens. Elsevier. (paper)
- Rutherford's Vascular Surgery. Saunders. 2014 (Paper, 2010)
- Guies de pràctica clínica de la Societat Europea de Cirurgia Vascular (ESVS) https://www.ejves.com/content/guidelines

JOURNALS:

- Circulation. https://bibcercador.uab.cat/permalink/34CSUC_UAB/1eqfv2p/alma991000018879706709
- Journal of the American College of Cardiology. https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991010345429606709

- European Heart Journal.
  https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991004409559706709
- Revista Española de Cardiología.
  https://bibcercador.uab.cat/permalink/34CSUC_UAB/its9nv/alma991010728337106709
- European Journal of Vascular and Endovascular Surgery www.ejves.com.
  https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991010399741806709
- Journal of Vascular Surgery www.jvascsurg.org.
  https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991010399732206709
- International Angiology www.minervamedica.it/en/journals/international-angiology/
  https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991007558069706709
- Annals of Vascular Surgery www.annalsofvascularsurgery.com.
  https://bibcercador.uab.cat/permalink/34CSUC_UAB/16inrgf/alma991010400629306709
- Revista Angiología.
  https://bibcercador.uab.cat/permalink/34CSUC_UAB/cugbhl/alma991010766133706709

INTERNET RESOURCES:

- http://www.revespcardiol.org
- http://www.secardiologia.es
- http://www.theheart.org/index.cfm
- http://www.ctsnet.org/residents/ctsn/
- http://www.hemodinamica.com/becas/guidant/imagenes.html
- http://www.erl.pathology.iupui.edu/
- http://www.blue.temple.edu/~pathphys/general/tablecontents.html
- http://www.meddean.luc.edu/lumen/mede/grossanatomy/cross_section/vhpthorax.html
- http://visiblehuman.epfl.ch/stdappletv1.php
- http://www.escardio.org/Pages/index.aspx
- Sociedad Española Angiología y Cirugía Vascular: www seacv.es
- European Society for Vascular Surgery www.esvs.org
- Chapter of non invasive vascular diganose : www.cdvni.org
- Chapter of endovascular surgery: www.c-cev.org
- Chapter of Flebology:www.capitulodeflebologia.org
- Cirujanos vasculares de Habla Hispana: www.cvhh.net

## Software

No special computer program is used