

# Advanced Master's Degree Cardiovascular Medicine and Surgery





## Advanced Master's Degree Cardiovascular Medicine and Surgery

- » Modality: online
- » Duration: 2 years
- » Certificate: TECH Global University
- » Accreditation: 120 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/us/medicine/advanced-master-degree/advanced-master-degree-cardiovascular-medicine-surgery](http://www.techtitute.com/us/medicine/advanced-master-degree/advanced-master-degree-cardiovascular-medicine-surgery)

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# 01

# Introduction

Heart disease tops the list of leading causes of death worldwide. The relationship of these heart diseases with hereditary or congenital issues, or with factors such as obesity or sedentary lifestyles, is of great concern to the international population. Fortunately, the advances that are made every year in terms of treatments, drugs and protocols to treat these patients are increasingly effective and accurate. For this reason, cardiology specialists must continually update their knowledge and perfect their techniques of intervention and management of these clinical cases, in order to be able to offer an accurate diagnosis and follow-up based on the latest scientific evidence, aspects that you can work on with the course of this qualification.





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*A 100% online qualification that is perfect for updating your cardiovascular knowledge in a comprehensive way and without having to worry about schedules or on-site classes"*

The risk of suffering a cardiac accident or hereditary or congenital heart disease is very high in society as a whole. According to the World Health Organization, these diseases have been the leading cause of death worldwide for more than 20 years. This is why there is an exacerbated fear of suffering from them in the population because the risk factors are wide-ranging and sometimes even impossible to detect early or to identify the causes once they have occurred.

However, the evolution that cardiovascular medicine has undergone in recent decades in terms of diagnosis, treatments and techniques for the prevention and intervention of heart pathologies has been enormous and highly beneficial for patients. In relation to this, specialists in this area should continuously dedicate their time to learn about the latest developments in these advances, in order to be able to address these types of clinical cases based on the latest scientific evidence in cardiology.

In order to facilitate this task and allow them to pursue a qualification that updates their knowledge in an exhaustive manner and that fits in with the busy schedule of their practice, TECH has developed this very complete program in Cardiovascular Medicine and Surgery. This is a multidisciplinary program that delves into the anatomy and pathophysiology of the cardiovascular system, the specifics of Acute Coronary Syndrome and its derived conditions and the broad spectrum that encompasses the area of Arrhythmias.

In addition, there will be hours of additional material in different formats, including clinical cases presented by the teaching team, experts in cardiovascular medicine with extensive experience in the intervention of common and rare diseases. On the other hand, the faculty of this syllabus includes prestigious International Guest Directors who will develop a series of exclusive and rigorous Masterclasses.

This **Advanced Master's Degree in Cardiovascular Medicine and Surgery** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ The development of case studies presented by experts in cardiology and surgery
- ♦ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ♦ Practical exercises where the self-assessment process can be carried out to improve learning
- ♦ Special emphasis on innovative methodologies in Cardiovascular Medicine and Surgery
- ♦ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work
- ♦ Content that is accessible from any fixed or portable device with an Internet connection



*With this Advanced Master's Degree you will receive exhaustive Masterclasses from true international referents, as Guest Directors"*

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*You will deepen your understanding of the importance of the Heart Team, which will help you hone your leadership skills in making team decisions about the approach to heart valve diseases”*

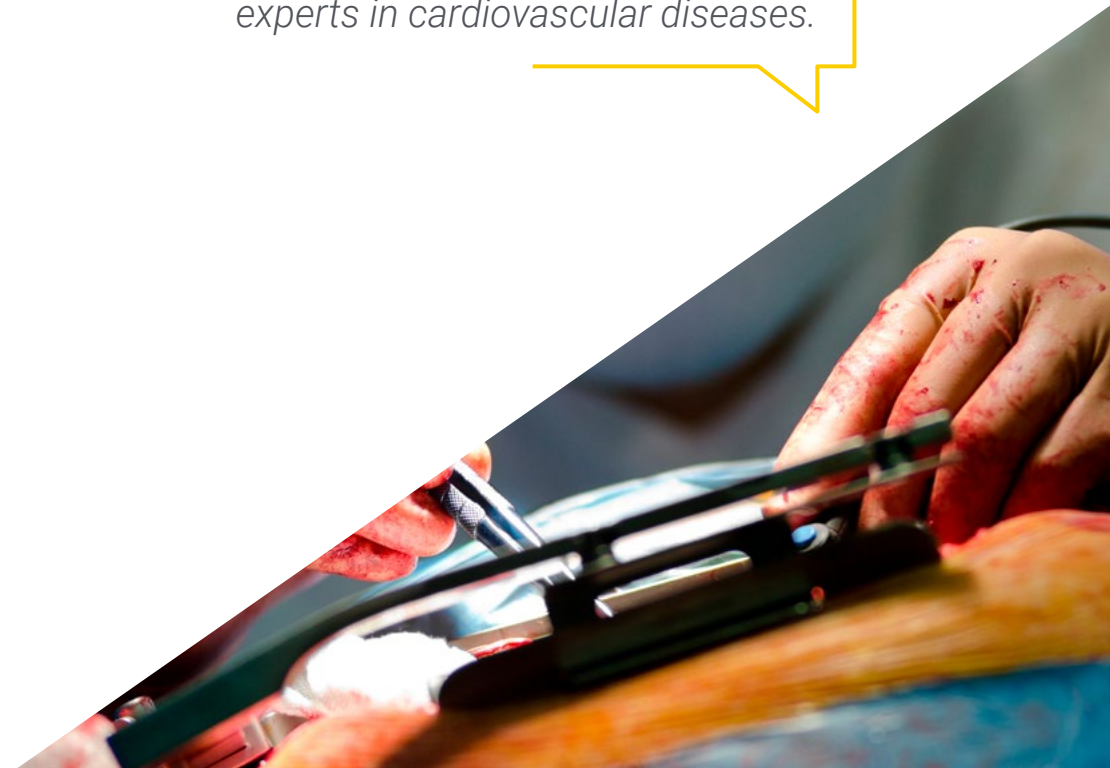
Its teaching staff includes professionals from the field of cardiac medicine, who bring to this program the experience of their work, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive learning experience designed to prepare for real-life situations.

This program is designed around Problem-Based Learning, whereby the student must try to solve the different professional practice situations that arise throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts.

*With this Advanced Master's Degree you will acquire a broad and up-to-date vision of the latest electrostimulation devices, as well as their implantation and explant.*

*It consists of 3000 hours of the best theoretical and practical content including real clinical cases presented by a team of experts in cardiovascular diseases.*



# 02

# Objectives

The relevance of cardiac medicine in society and the need, on the part of patients, to receive a specific medical approach in accordance with the latest scientific developments, is what has motivated TECH to design this program. In addition, the university is aware that these specialists have little time to follow an academic program, so it has designed this Advanced Master's Degree with the aim of helping them to keep up-to-date with the latest developments in relation to Cardiac Surgery, ACS and Arrhythmias.







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*You will find content dedicated exclusively to the pharmacological recommendations for each cardiac pathology, so that you can compare and implement them in your private practice"*



## General Objectives

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- ♦ Gain an in-depth knowledge of all cardiovascular diseases and their forms of treatment
- ♦ Broaden the knowledge and understanding of extracorporeal circulation as a whole
- ♦ Analyze the importance of new technologies involved in the management and control of cardiovascular diseases and imaging techniques
- ♦ Obtain the necessary knowledge to improve patient recovery, avoid complications and reduce mortality
- ♦ Obtain the most up-to-date knowledge to approach comprehensively and from the surgical point of view, as appropriate all heart valve diseases, ischemic heart, aortic pathology and congenital heart diseases
- ♦ Delve into the treatment of other cardiovascular diseases, transcatheter valve implantation and concomitant diseases
- ♦ Develop an in-depth knowledge of Acute Coronary Syndrome (ACS) starting with its pathophysiology and its importance as one of the main causes of death in civilized countries
- ♦ Professionalize skills in the assessment and differential diagnosis of chest pain in the emergency department, understanding the value of the different complementary techniques available
- ♦ Adequately classify the patient's initial risk and the most appropriate prehospital treatment and monitor measures in the prehospital phase
- ♦ Internalize reperfusion therapies, their limitations, advantages and protocols, understand the great importance of ischemia time
- ♦ Diagnose and manage the mechanical and arrhythmic complications that can occur in this syndrome
- ♦ Implement appropriate treatment measures during the hospital phase and the value of Coronary Units
- ♦ Develop the value and structure of Cardiac Rehabilitation programs
- ♦ Understand the treatments that have provided value in secondary prevention of these patients
- ♦ Delve into the diagnosis and treatment of arrhythmias based on clinical and electrocardiographic aspects, as well as invasive techniques and electrophysiological studies.
- ♦ Broaden knowledge in the operation, monitoring and implantation technique of the main implantable devices used for the treatment of arrhythmias.
- ♦ Delve deeper into the problems in cardiac rhythm disorder that can arise across the spectrum of patients.
- ♦ Achieve a mastery of the rhythm disorder problems present in the various scenarios faced by the cardiologists in their routine clinical practice



## Specific Objectives

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### Module 1. Anatomy and Pathophysiology of the Cardiovascular System

- ♦ Study embryology to understand the origin of cardiac anatomy
- ♦ Outline the basic aspects of the pathophysiology of the heart
- ♦ In-depth study of the conduction system, coronary anatomy, great vessels and peripheral vascular system
- ♦ Gain an in-depth knowledge of all cardiovascular diseases
- ♦ Analyze hemostasis and the different pathways of blood coagulation
- ♦ Know the new trends in cardiovascular pharmacology

### Module 2. Extracorporeal Circulation ECC

- ♦ Broaden the knowledge and understanding of extracorporeal circulation as a whole
- ♦ In-depth study of the new technologies implemented for their management and control
- ♦ Master protection and monitoring methods
- ♦ Master the techniques of cerebral cannulation and perfusion

### Module 3. Perioperative Care

- ♦ Acquire in-depth knowledge of all perioperative measures and strategies
- ♦ Update monitoring techniques in the operating room.
- ♦ Understand ways to improve for optimal recovery of the surgical patient
- ♦ In-depth study of the techniques to be applied prior to surgery to avoid complications and reduce mortality
- ♦ Achieve more efficient postoperative control
- ♦ Reduce transfusions of blood products as much as possible

### Module 4. Ischemic Heart Disease

- ♦ Obtain a multi-angle view of ischemic heart disease
- ♦ A comprehensive approach to ischemic heart disease
- ♦ In-depth study of angina and myocardial infarction
- ♦ Evaluate the diagnostic methods and natural history of coronary artery disease
- ♦ Understand the importance of the Heart Team in addressing different medical, percutaneous and surgical treatment strategies
- ♦ Delve into the surgical complications of myocardial infarction and the techniques to treat them

### Module 5. Heart Valve Diseases

- ♦ Understand the surgical approach to heart valve diseases
- ♦ In-depth study of the causes of heart valve diseases and their treatment
- ♦ Understand the importance of the heart team in decision making in the approach to heart valve diseases
- ♦ Deepen in all surgical techniques for its treatment, including mini-incision surgery
- ♦ Evaluate different results of the different types of prostheses and surgical techniques used

### Module 6. Aortic Pathology

- ♦ Delve into the notions of anatomy and physiology of the aortic root, given its involvement in the functioning and preservation of the aortic valve
- ♦ Learn more about surgical treatment techniques for acute aortic syndrome
- ♦ Review the main pathologies of the aorta artery by segments
- ♦ Observe the implications of acute aortic syndrome with its main surgical options
- ♦ Check different percutaneous treatment options

### Module 7. Congenital Heart Disease

- ♦ Provide an overview of congenital heart disease through a detailed review of the most common pathologies
- ♦ Study the physiology of congenital heart diseases in order to group them according to their physiological behavior
- ♦ Make an anatomical description of each group of anomalies
- ♦ Verify the different surgical options to correct congenital cardiopathies
- ♦ Evaluate the best time to correct congenital heart disease





### **Module 8. Treatment of Other Cardiovascular Diseases, Transcatheter Valve Implantation and Concomitant Conditions**

- ♦ Study in depth the different cardiovascular diseases and their surgical treatment
- ♦ Deepen knowledge about cardiac trauma and its surgical management
- ♦ Understand hereditary conditions such as myocardiopathies
- ♦ Delve into the diseases of the pericardium and the different cardiac tumors, both primary and secondary
- ♦ Analyze pulmonary thromboembolism, with its different surgical strategies.
- ♦ Evaluate end-stage heart failure, updating the new therapies by means of ventricular devices and cardiac transplantation
- ♦ Understand the importance of transcatheter therapies TAVI and mitral
- ♦ Gain an in-depth knowledge about certain extracardiovascular diseases that interfere with extracorporeal surgery

### **Module 9. New Technologies and Imaging Techniques. Statistics**

- ♦ Delve into the less common but influential aspects of Cardiac Surgery
- ♦ Evaluate new technologies in Cardiac Surgery for the improvement of therapies
- ♦ Raise the level of interpretation of cardiovascular imaging
- ♦ Elaborate and understand studies through statistical analysis
- ♦ Deepen the concepts of care management and research methodology
- ♦ Analyze the evolution of Cardiac Surgery and its future perspectives

### **Module 10. Clinical Presentation of Coronary Syndromes and Classification NSTEMI-ACS 1: Epidemiology, Pathophysiology and Classification**

- ♦ Recognize the various clinical manifestations of coronary artery disease
- ♦ Classify acute coronary syndromes and their reasons
- ♦ Adapt the epidemiology and the different clinical presentations of SCASET
- ♦ In-depth study of the different electrocardiographic manifestations of NSTEMI-ACS
- ♦ Stratify patients by thrombotic and hemorrhagic risk to individualize their treatment
- ♦ Delve into variant angina and coronary vasospasm as a cause of ACS

### **Module 11. NSTEMI-ACS 2: Imaging and Ischemia Detection Tests**

- ♦ Correctly evaluate patients with chest pain in the emergency department and the value of chest pain units
- ♦ Assess the use of transthoracic ultrasound at the bedside in patients with chest pain
- ♦ Master the use of ergometry and stress echo in the assessment of the patient with chest pain
- ♦ Internalize the use of CT in the triple rule-out (coronary artery disease, aortic dissection and coronary artery disease) of chest pain
- ♦ Recognize the usefulness of MRI in patients with chest pain and the value of imaging tests in general in the long-term follow-up of these patients

### **Module 12. NSTEMI-ACS 3: Medical and Revascularization Treatment**

- ♦ In-depth study of the different types of drugs used in the treatment of NSTEMI-ACS, which ones to use and for how long, with the exception of lipid-lowering drugs, which are reviewed in the prevention module
- ♦ Advise on the indications for revascularization of the patient with NSTEMI-ACS
- ♦ Control the different forms of revascularization possible and their respective advantages and disadvantages
- ♦ Master Percutaneous Revascularization Techniques
- ♦ Master the techniques of Surgical Revascularization

### **Module 13. NSTEMI-ACS 13: Clinical Picture, Presentation and Pre-Hospital and Emergency Assessment**

- ♦ Develop knowledge in the different clinical presentations of NSTEMI-ACS
- ♦ Assess the patient with NSTEMI-ACS in the phase prior to arrival at the hospital.
- ♦ Understand the electrocardiographic manifestations of this condition, its possible differential diagnoses and the evolutionary pattern over time
- ♦ Assess general treatment measures and initial monitoring and pharmacological treatment, as well as which treatments should not be used
- ♦ Internalize the importance of the decision of coronary reperfusion and activation of infarction code programs and the importance of timing and delays in this process

**Module 14. ACS with ST-Elevation 14 Patient Management in the Hospital. Coronary Unit**

- ♦ Deepen the knowledge of the usefulness of the Coronary Units in the prevention and early treatment of the complications of NSTEMACS
- ♦ Recognize the antianginal, lipid-lowering and antithrombotic treatment to be implemented in patients with NSTEMACS
- ♦ Understand the most frequent mechanical complication of this entity, CHF, from the mechanistic, treatment and prognostic point of view
- ♦ Identify the rest of the potential mechanical complications (cardiac rupture, VSD and MI) and their incidence, treatment and prognosis

**Module 15. NSTEMACS 3: TTE and Other Imaging Tests in Acute Patient Assessment and in the Hospital Phase**

- ♦ Monitor the usefulness of imaging techniques in the evaluation of patients with NSTEMACS with suspected mechanical complications
- ♦ Monitor the usefulness of imaging techniques in the prognostic assessment of the patient with long-term NSTEMACS
- ♦ Understand the new echocardiographic parameters that may be useful in the prognostic assessment of the patient
- ♦ Deepen the knowledge of MINOCA, patients with ischemic myocardial damage, but without evidence of obstructive epicardial coronary artery disease

**Module 16. NSTEMACS 4: Limitation of Infarct Size. Reperfusion Therapies**

- ♦ Recognize the time course of myocardial ischemic necrosis and understand the problem of ischemia time
- ♦ Assess the available strategies for reperfusion fibrinolysis and primary angioplasty, their advantages and disadvantages
- ♦ Control the necessary material and protocols to perform fibrinolysis or primary angioplasty
- ♦ Know in detail the anticoagulant and antiplatelet therapy in the catheterization laboratory
- ♦ Describe a protocol for antiplatelet treatment in patients who also need to take anticoagulant drugs
- ♦ Internalize hemodynamic support measures during primary angioplasty
- ♦ Control the usefulness of regional reperfusion networks in the treatment of infarction

**Module 17. ACS Secondary Prevention. Cardiac Rehabilitation Programs**

- ♦ Develop optimization in the long-term treatment of ACS
- ♦ Understand the most appropriate eating habits and management of obesity in patients with ACS
- ♦ Deepen in the particularities of diabetic patients with ACS and specific treatment measures in this important group of patients
- ♦ Understand the utility and structure of Cardiac Rehabilitation programs
- ♦ Recognize the opportunities offered by telemedicine in Rehabilitation and specifically in its ambulatory phase

### Module 18. Arrhythmias. Fundamental Concepts

- ♦ Understand the fundamental mechanisms that produce arrhythmias, including cellular physiology, the conduction system, cardiac anatomy of arrhythmias (including a radiological approach) and the role of genetics
- ♦ Review the most common antiarrhythmic drugs, focusing on their most important indications, contraindications and common adverse effects.
- ♦ Review basic diagnostic techniques and common procedures in the Electrophysiology room

### Module 19. Bradyarrhythmias

- ♦ Know the definition and types of Bradyarrhythmias, as well as their basic mechanisms
- ♦ Review the studies available for its diagnosis and characterization
- ♦ Study in depth the fundamental groups of Bradyarrhythmias (sinus node disease and AV block), with special emphasis on diagnosis and treatment
- ♦ Delve into the study of the patient with syncope, from mechanisms and causes to diagnosis and treatment
- ♦ Review in detail the current indications for pacemaker implantation

### Module 20. Supraventricular Tachyarrhythmias

- ♦ Know the definition and types of supraventricular tachyarrhythmias Understand the differential diagnosis between these types
- ♦ Understand the management of these arrhythmias in the acute (emergency) and chronic (consultation) setting
- ♦ Review the main aspects of the electrophysiological study of these arrhythmias.
- ♦ Deepen in the epidemiology, clinical presentation, characteristics of the electrophysiological study and ablation techniques in the 4 main types of supraventricular tachyarrhythmias (nodal reentrant tachycardia, AV reentrant tachycardia, common atrial flutter and focal atrial tachycardia)

### Module 21. Ventricular Tachyarrhythmias

- ♦ Review the key aspects of its diagnostic process, with a clinical and electrocardiographic approach. Review the electrocardiographic differential diagnosis between wide QRS tachycardias
- ♦ Know the approach to these arrhythmias in the acute (emergency) and chronic (consultation) patient setting
- ♦ Review the pharmacological treatment of these arrhythmias
- ♦ In-depth study of the specific electrophysiological study of these arrhythmias, as well as the therapeutic approach using ablation techniques
- ♦ Review the knowledge of ventricular extrasystoles, from their mechanisms and initial approach, to therapeutic strategies, including specific electrophysiological study



**Module 22. Devices (Pacemaker, ICD and Resynchronizer)**

- ♦ Review in detail the indication of pacemakers, their implantation technique, their basic operation, as well as the modes of programming and other aspects of monitoring
- ♦ Review in detail the indication for ICD, as well as the particularities of the implantation technique, operation and programming/monitoring
- ♦ Know the differential aspects of the novel physiological pacing techniques, as well as their current indications and future perspectives
- ♦ Learn about other current implantable devices: wireless pacemakers and subcutaneous ICDs. Review their indications
- ♦ Update on the electrode extraction technique and its indications

**Module 23. Atrial Fibrillation**

- ♦ Review the importance of atrial fibrillation: epidemiology and socioeconomic impact
- ♦ Review the main clinical aspects and initial diagnostic approach
- ♦ Provide a detailed update on the complete management of atrial fibrillation, starting with the prevention of thromboembolism and continuing with the clinical management strategy
- ♦ Deepen in the ablation technique of atrial fibrillation: indication, evidence, technique and expected results Review the future of this technique
- ♦ Review the particularities of AF in other specific contexts and anticoagulation therapy in the patient with ischemic heart disease

**Module 24. Arrhythmias and Heart Failure**

- ♦ Review the importance of rhythm disorders in heart failure
- ♦ Know in depth the importance of the AF-Heart Failure relationship, from its epidemiology to its prognostic implication
- ♦ Review the role of antiarrhythmic drugs, and especially ablation, in the management of AF in patients with heart failure
- ♦ Update on the assessment of ventricular arrhythmias in heart failure, delving into the role of genetics and MRI
- ♦ Review the current indications for CRS therapy and other devices in HF.
- ♦ Learn about the novel aspects of physiological stimulation therapies
- ♦ Review the concept of Tachycardiomyopathy with a broad approach, including its epidemiology, diagnosis and treatment, both pharmacological and electrophysiological

**Module 25. Arrhythmic Syndromes, Sudden Cardiac Death and Channelopathies**

- ♦ Have an in-depth knowledge of Sudden Cardiac Death: concept, epidemiology, causes, diagnostic study and clinical management
- ♦ Review the concept of channelopathies and their epidemiology
- ♦ Review the fundamental aspects of the most frequent channelopathies: Brugada Syndrome and Long QT Syndrome
- ♦ Learn the role of genetics in these entities. Review the indications of the family study and how to carry them out

### Module 26. Mycardiopathies and Arrhythmias

- ♦ Review the general aspects of arrhythmias associated with cardiomyopathies
- ♦ Review the characteristics of the most frequent arrhythmias in dilated cardiomyopathy and arrhythmogenic dysplasia
- ♦ Delve into the prevention and management of ventricular arrhythmias, reviewing the indications for ICD in these pathologies
- ♦ Learn about the role of genetics in this context
- ♦ Review the rhythm disorders associated with other less frequent cardiomyopathies

### Module 27. Arrhythmias in Other Clinical Contexts

- ♦ Review the most common arrhythmias in patients without heart disease and in athletes
- ♦ Review the most common arrhythmias in the critically ill cardiac patient. Know their epidemiology, diagnosis and management
- ♦ Know in detail the therapeutic algorithm of arrhythmic storm
- ♦ Review the indications and technique of transient pacemaker implantation
- ♦ Review the most frequent arrhythmias in the non-cardiac critical patient, after cardiac surgery and after TAVI, with special attention to their management
- ♦ Review, in general, the most prevalent arrhythmias in patients with congenital heart disease, as well as their fundamental implications and particularities of management





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*A program designed exclusively for medical professionals who, like you, are looking for a source of constant updating in their respective specialties”*

# 03 Skills

Thanks to the exhaustiveness with which this Advanced Master's Degree in Cardiovascular Medicine and Surgery has been designed, the specialist will be able to perfect their medical skills and competencies, as well as obtain a broad and up-to-date vision of the sector. This will boost your ability to act in the management of patients with severe and rare clinical conditions, allowing you to handle them with the guarantee and confidence that you have the necessary knowledge, based on the latest scientific evidence, to obtain successful results.





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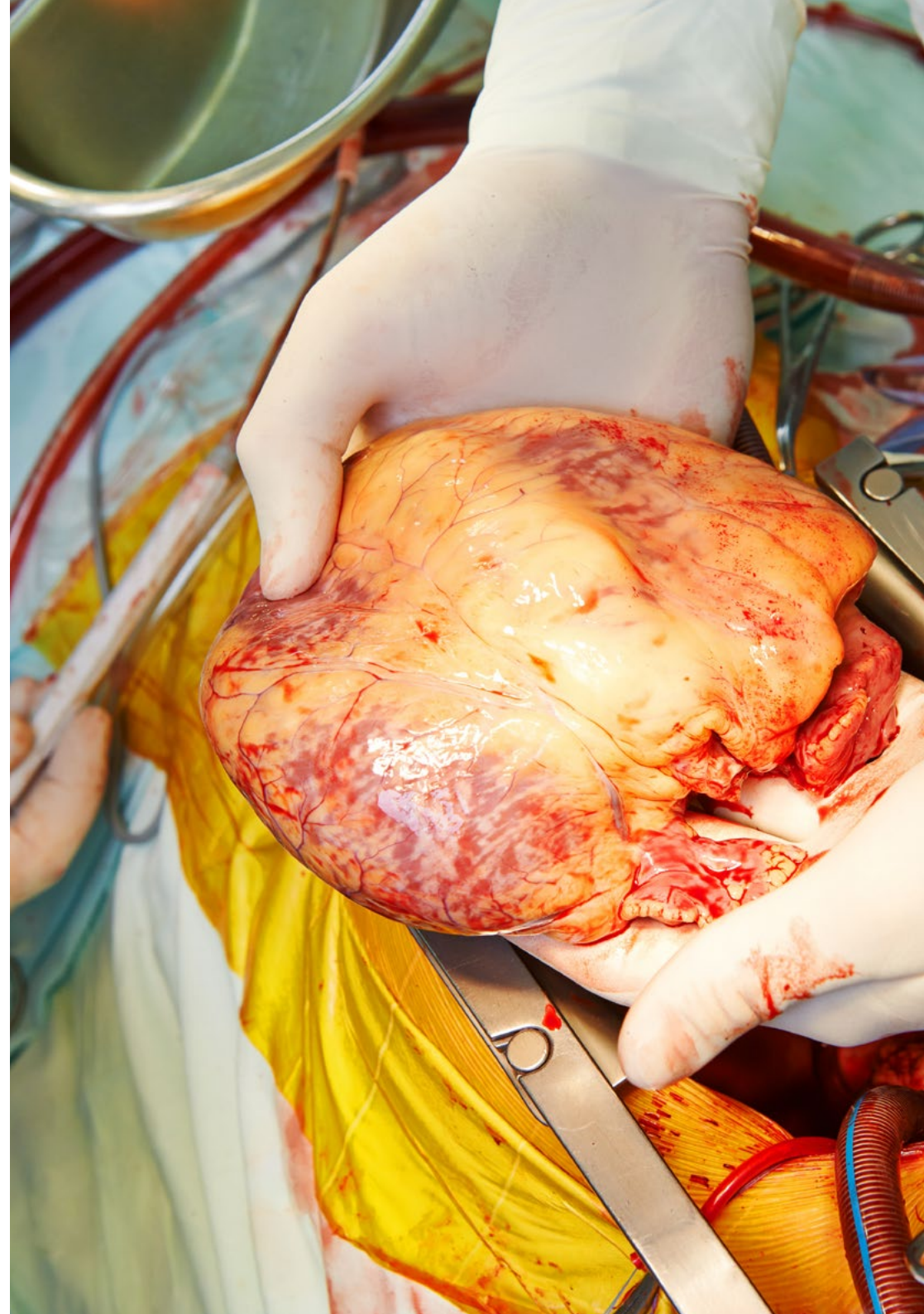
*Learn the latest scientific details on the basic diagnostic techniques used in arrhythmias and delve into the usual procedures for their application”*

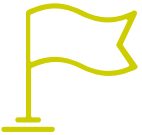


## General Skills

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- ◆ Acquire an in-depth knowledge that provides an opportunity in the context of Cardiac Surgery
- ◆ Apply acquired knowledge and problem-solving skills in large, solvent clinical settings
- ◆ Face complex clinical situations related to cardiovascular diseases, including reflections related to the application of knowledge
- ◆ Communicate your findings to both specialized and non-specialized audiences in a clear and unambiguous manner
- ◆ Develop autonomously in a learning process with an innovative study methodology of advanced prestige and technology
- ◆ Have a deep knowledge of Acute Coronary Syndrome (ACS) from its pathophysiology to its treatment and prevention
- ◆ In-depth knowledge of the keys to clinical management of patients with ACS, both in the out-of-hospital and in-hospital setting
- ◆ Be able to adequately address the differential diagnosis of chest pain in the Emergency Room
- ◆ You will be able to virtually attend revascularization procedures and how to implement cardiac prevention and rehabilitation programs
- ◆ Master the cardiac rhythm disorders that may present in a cardiology consultation or emergency room, from the healthy patient to patients with different types of heart disease
- ◆ Manage the latest advances in electroanatomical mapping systems.
- ◆ Manage all types of devices, from conventional pacemakers, through novel physiological pacing to leadless pacemakers and subcutaneous ICDs
- ◆ Master patient management, both in the emergency and ward settings, as well as in the office setting, to the patient with specific pathologies such as Heart Failure, Cardiomyopathies or Arrhythmic Syndromes





## Specific Skills

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- ♦ Create a global and up-to-date vision of Cardiac Surgery, acquiring a useful and deep knowledge
- ♦ Approach all heart valve diseases from the surgical point of view
- ♦ Develop perioperative measures and strategies in surgical patients
- ♦ Master the new technologies implemented in Cardiac Surgery
- ♦ Generate interest to broaden knowledge in this area and discover its application to daily clinical practice
- ♦ Integrate less common aspects in Cardiac Surgery of great importance for the complete development of the specialty
- ♦ Approach different cardiovascular diseases, as well as valvulopathies and ischemic cardiopathy and their surgical treatment
- ♦ Know the most relevant diagnostic techniques and therapeutic aspects in this field of medicine
- ♦ Create a global and up-to-date vision of Cardiac Surgery, acquiring a useful and deep knowledge
- ♦ Approach all valvular pathologies from the surgical point of view
- ♦ Develop perioperative measures and strategies in surgical patients
- ♦ Master the new technologies implemented in Cardiac Surgery
- ♦ Generate interest to broaden knowledge in this area and discover its application to daily clinical practice
- ♦ Integrate less common aspects in Cardiac Surgery of great importance for the complete development of the specialty
- ♦ Approach different cardiac pathologies, as well as valvulopathies and ischemic cardiopathy and their surgical treatment
- ♦ Know the most relevant diagnostic techniques and therapeutic aspects in this field of medicine
- ♦ Understand the organization and operation of the Arrhythmia Units
- ♦ Know the role of electrophysiological study in the diagnosis and management of Bradyarrhythmias
- ♦ Know the techniques and procedures used in the diagnosis of supraventricular tachyarrhythmias, as well as the drugs indicated for their treatment
- ♦ Understand the concept of ventricular tachycardia, from the mechanism to the most frequent types
- ♦ Manage the theoretical foundations on which resynchronization therapy is based and review its current indications. Review the particularities of its implantation and the ways of programming and follow-up
- ♦ Review current knowledge on the implications and management of AHREs and subclinical AF.
- ♦ Know the fundamental aspects of ventricular dysfunction due to pacing and the relationship between LBBB and ventricular dysfunction
- ♦ Know the most prevalent tachyarrhythmias and conduction disorders in cardiac amyloidosis, as well as the particularities of their management
- ♦ Manage the current algorithms for out-of-hospital cardiac arrest care

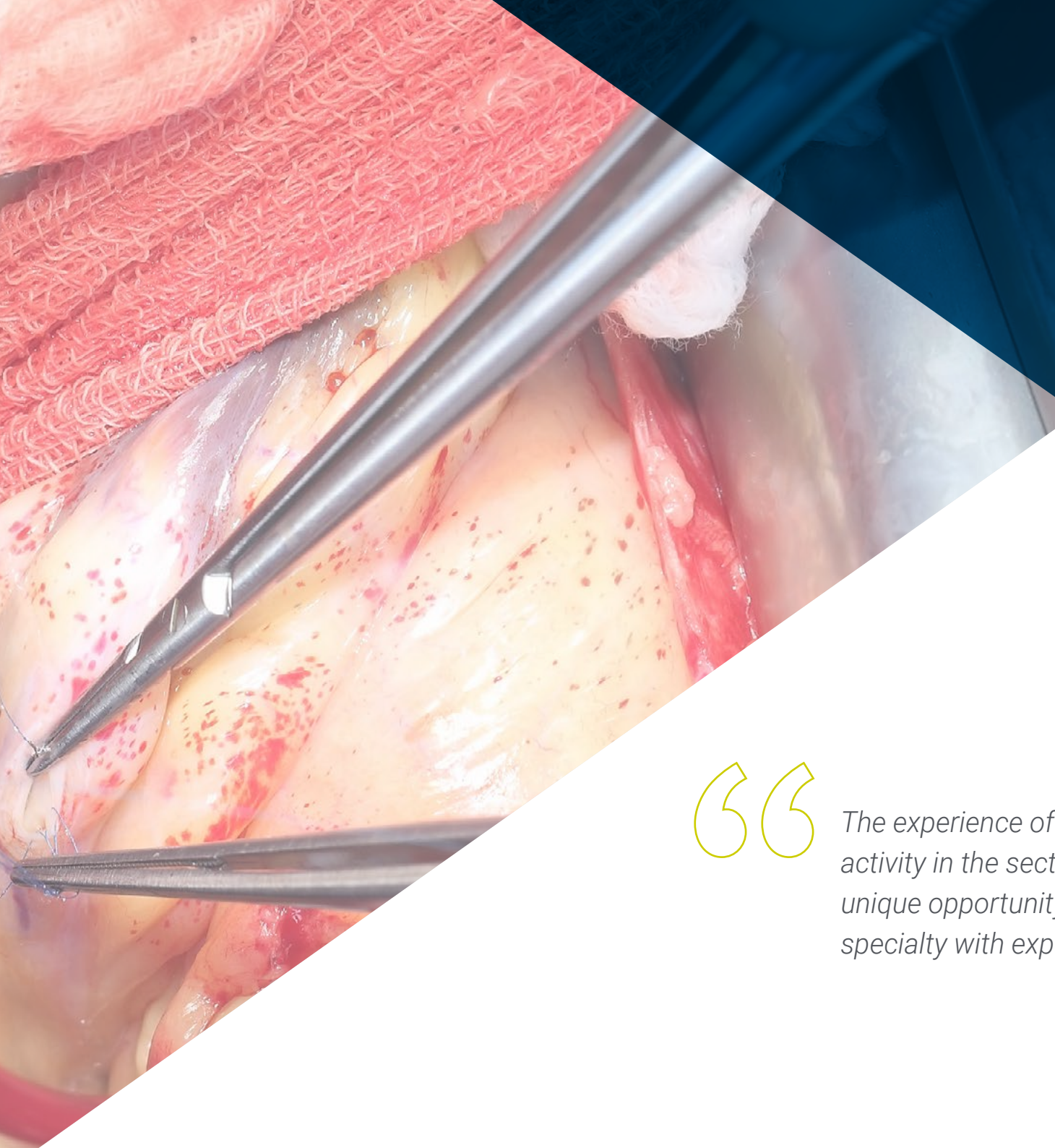
# 04

# Course Management

The management and teaching staff of this program is formed, as it could not be otherwise, by a group of professionals specialized in the different branches of cardiology with extensive experience in the management of patients with various cardiovascular diseases, both common and rare. However, this team has not only been chosen for their work resume, but also for their human qualities and commitment to the profession, aspects that will be clearly reflected in the syllabus.







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*The experience of the teaching team and their current activity in the sector will make this qualification a unique opportunity to share your concerns about the specialty with experts and colleagues”*

## International Guest Director

Awarded the “*Outstanding Patient Experience Award*” on multiple occasions for his excellence in patient care, Dr. Konstantinos Aronis has become a prestigious **Cardiac Electrophysiologist**. In this sense, his clinical specialty is based on the **Invasive Management of Arrhythmias** in patients suffering from **Adult Congenital Heart Disease**.

He has developed his professional work in health institutions of international reference, including the **Johns Hopkins Hospital** in Maryland or the **Beth Israel Deaconess Medical Center** in Massachusetts. In this way, he has contributed to optimizing the quality of life of numerous individuals suffering from diseases ranging from **Atrial Fibrillation** or **Ventricular Tachycardia** to **Structural Malformations of the heart**. To do so, he has employed a variety of advanced technological tools such as **Computational Modeling**, **Holder Monitors** and even **Magnetic Resonance Imaging**.

Among his main contributions, he has promoted the **Complex Ablation Program for Congenital Heart Diseases**. This has consisted in the use of **computed tomography** images to create **3D printed models** of hearts with complicated anatomies, which has made it possible to plan medical interventions with greater precision and efficiency. It has also carried out the first **intraoperative excision** for **Atrial Tachycardia**, performing the procedure in real time during cardiovascular surgery. This innovation made it possible to address cardiac rhythm disturbances that could not be treated conventionally without damaging nearby critical structures.

On the other hand, he combines this work with his facet as a **Clinical Researcher** in Cardiac Electrophysiology. In fact, he has published numerous **scientific articles** in high impact specialized journals. His clinical findings have contributed to the advancement of the knowledge of health professionals in areas such as **Atrial Fibrillation**, **Resynchronization** therapies or personalized **Cardiac Prototypes**.



## Dr. Aronis, Konstantinos

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- Physician at Johns Hopkins Hospital, Maryland, United States
- Cardiovascular Disease and Clinical Cardiac Electrophysiology Investigator at Johns Hopkins Hospital
- Translational Research Fellow at Beth Israel Deaconess Medical Center, Massachusetts
- Internal Medicine Residency at Boston University Medical Center, Massachusetts
- Internship in Computational Electrophysiology at the Institute of Computational Medicine at Johns Hopkins Hospital
- Doctorate in Internal Medicine from the University of Patras
- Degree in Medical Sciences from the University of Patras
- Member of: American College of Cardiology, American Heart Association and Heart Rhythm Society



*Thanks to TECH you will be able to learn with the best professionals in the world"*

## International Guest Director

With pioneering contributions in the field of **cell therapy** for **cardiovascular diseases**, Dr. Philippe Menasché is considered one of the most prestigious surgeons in the world. The researcher has been awarded several prizes such as the **Lamonica of Cardiology** laureates of the **French Academy of Sciences** and the **Matmut for Medical Innovation**, as well as the **Earl Bakken Award** for his scientific achievements.

His work has established him as a reference in the understanding of **Heart Failure**. In relation to this disease, he stands out for having participated in the **first intramyocardial transplant of autologous skeletal myoblasts**, marking a true therapeutic milestone. He has also led **clinical trials** on the use of **cardiac progenitors** derived from **human embryonic stem cells**, as well as the application of **tissue therapy combined** with these progenitors in patients with **terminal heart disease**.

His research has also revealed the **crucial role** of **paracrine signals** in **cardiac regeneration**. As a result, his team has succeeded in developing cell therapy strategies based exclusively on the **use of the secretome**, with the aim of optimizing the clinical effectiveness and transmissibility of these procedures.

At the same time, this specialist maintains an active work as a surgeon at the **European Hospital Georges Pompidou**. In this institution, he also directs the **Inserm 970 Unit**. On the other hand, in the academic field, he is a professor in the **Department of Biomedical Engineering** at the University of Alabama at Birmingham, as well as at the University of Paris Descartes.

He holds a **PhD in Medical Sciences** from the Faculty of Paris-Orsay. He has also served as Director of the **French National Institute of Health and Medical Research** and, for almost two decades, he managed the **Biosurgical Research Laboratory of the Carpentier Foundation**.



## Dr. Menasché, Philippe

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- Director of the National Institute of Health and Medical Research (INSERM), Paris, France
- Clinical Surgeon in the Heart Failure Unit of the European Hospital Georges Pompidou
- Regenerative Therapies for Heart and Vascular Diseases Team Leader
- Professor of Thoracic and Cardiac Surgery at the Paris Descartes University
- Academic Consultant to the Department of Biomedical Engineering at the University of Alabama at Birmingham
- Former Director of the Biosurgical Research Laboratory of the Carpentier Foundation
- Doctor of Medical Sciences from the Faculty of Paris-Orsay
- Member of: National Council of Universities, Medical and Scientific Council of the Agency for Biomedicine, Working Group on Regenerative and Reparative Cardiovascular Medicine of the European Society of Cardiology

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*Make the most of this opportunity to learn about the latest advances in this field in order to apply it to your daily practice”*

## Management



### Dr. Rodríguez-Roda, Jorge

- ♦ Chief of Cardiovascular Surgery Service at the Ramón and Cajal University Hospital
- ♦ Cardiac Surgeon of the Cardiac Surgery Unit at the Montepíncipe Hospital
- ♦ Clinical Professor in the Department of Surgery at the University of Alcalá de Henares
- ♦ Care Coordinator Department of the Gregorio Marañón General University Hospital
- ♦ Attending Physician of Cardiac Surgery at Gregorio Marañón General University Hospital, Central Hospital de la Defensa Gómez Ulla and Hospital del Aire
- ♦ Resident physician of the Cardiac Surgery, specialty in the Cardiovascular and Thoracic Surgery Service Puerta de Hierro University Hospital. Madrid
- ♦ Medical Officer in the Military Health Corps of Spain
- ♦ Degree in Medicine and Surgery from the Complutense University of Madrid
- ♦ Executive Master's Degree in Healthcare Organization Management ESADE
- ♦ Healthcare Organization Leadership Program at Georgetown University
- ♦ Resident Medical Intern in the specialty of Cardiac Surgery in the Department of Cardiovascular and Thoracic Surgery, Puerta de Hierro Autonomous University Hospital of Madrid.
- ♦ Diploma of Advanced Studies (DEA) of the Department of Surgery of the Faculty of Medicine of the Complutense University of Madrid
- ♦ General Practitioner in the Spanish National Health System and in the Public Social Security Systems of the Member States of the European Communities



### **Dr. Castro Urda, Víctor**

- Attending Specialist from the Arrhythmia Unit of the Cardiology Service of the Puerta de Hierro Hospital at Majadahonda
- Author of the Arrhythmia Action Guide for Primary Care
- Bachelor's Degree in Medicine and Surgery from the Complutense University of Madrid
- Research Proficiency in Medicine from the Autonomous University of Madrid
- Specialist in Cardiology at the MIR system and the Puerta De Hierro University Hospital
- Fellowship in Electrophysiology at the University Hospital UZB in Brussels, Belgium
- Fellowship in Diagnostic and Therapeutic Cardiac Electrophysiology at the University Hospital Puerta de Hierro Majadahonda
- Master's Degree in Diagnostic and Therapeutic Cardiac Electrophysiology at the Gregorio Marañón University Hospital and the Complutense University of Madrid
- Accreditation in Specific Training for the Practice of Interventional Cardiac Electrophysiology by the Section of Electrophysiology and Arrhythmias of the Spanish Society of Cardiology
- Invasive Cardiac Electrophysiology Accreditation granted by the European Heart Rhythm Association (EHRA)



### **Dr. Botas Rodríguez, Javier**

- ♦ Head of the Cardiology Service at the Alcorcón Foundation University Hospital
- ♦ Director of the Cardiac Catheterization Laboratory at the Alcorcón Foundation University Hospital
- ♦ Staff Cardiologist at the Gregorio Marañón General University Hospital
- ♦ Associate Professor of Cardiology of the Degree in Medicine at the Rey Juan Carlos University
- ♦ PhD in Medicine, Magna Cum Laude from the Faculty of Medicine at the Autonomous University of Madrid
- ♦ Residency and Specialization in Cardiology at the Gregorio Marañón General University Hospital
- ♦ PhD in Interventional Cardiology from Leland Stanford Junior University



### **Dr. Jiménez Sánchez, Diego**

- ♦ Attending Cardiologist at the University Hospital El Escorial, Madrid
- ♦ Attending Specialist Physician of the Arrhythmia Unit at the University Hospital Puerta de Hierro Majadahonda.
- ♦ Cardiologist at Milenium Medical Center Las Rozas
- ♦ Bachelor's Degree in Medicine and Surgery from the Autonomous University of Madrid
- ♦ Residency in the Specialty of Cardiology at the University Hospital Puerta de Hierro Majadahonda
- ♦ Fellowship in Electrophysiology of the Arrhythmia Unit at the University Hospital Puerta de Hierro Majadahonda
- ♦ Master's Degree in Diagnostic and Therapeutic Cardiac Electrophysiology at the CEU San Pablo University





### Dr. Vázquez López-Ibor, Jorge

- ◆ Attending Cardiology Specialist at the University Hospital El Escorial, Madrid
- ◆ Attending Cardiologist at the Heart Failure Unit of the Puerta de Hierro Hospital Majadahonda
- ◆ Bachelor's Degree in Medicine and Surgery from the Complutense University of Madrid
- ◆ Residency in the Specialty of Cardiology at the University Hospital Puerta de Hierro Majadahonda
- ◆ Theoretical and practical Master's Degree in Critical and Advanced Heart Failure (MICCA) at the Gregorio Marañón Hospital, Madrid
- ◆ Theoretical and practical Program in Cardiovascular Research at the National Center for Cardiovascular Research (CNIC)
- ◆ Fellowship in Advanced Heart Failure, Heart Transplantation and Pulmonary Hypertension at the Puerta de Hierro University Hospital Majadahonda

## Professors

### Dr. Varela Barca, Laura

- ◆ Resident Intern at the Adult Cardiac Surgery Department of the Ramón y Cajal University Hospital of Madrid
- ◆ Attending Physician of the Adult Cardiac Surgery Service of the Son Espases University Hospital of Palma de Mallorca
- ◆ Attending Physician of the Cardiac Surgery Department of the Jiménez Díaz Foundation University Hospital
- ◆ PhD from the University of Alcalá de Henares in Health Sciences
- ◆ Bachelor's Degree in Medicine. Faculty of Medicine, University of Valladolid
- ◆ Master's Degree in Cardiovascular Emergencies. Alcalá de Henares University

### Dr. García Rodríguez, Daniel

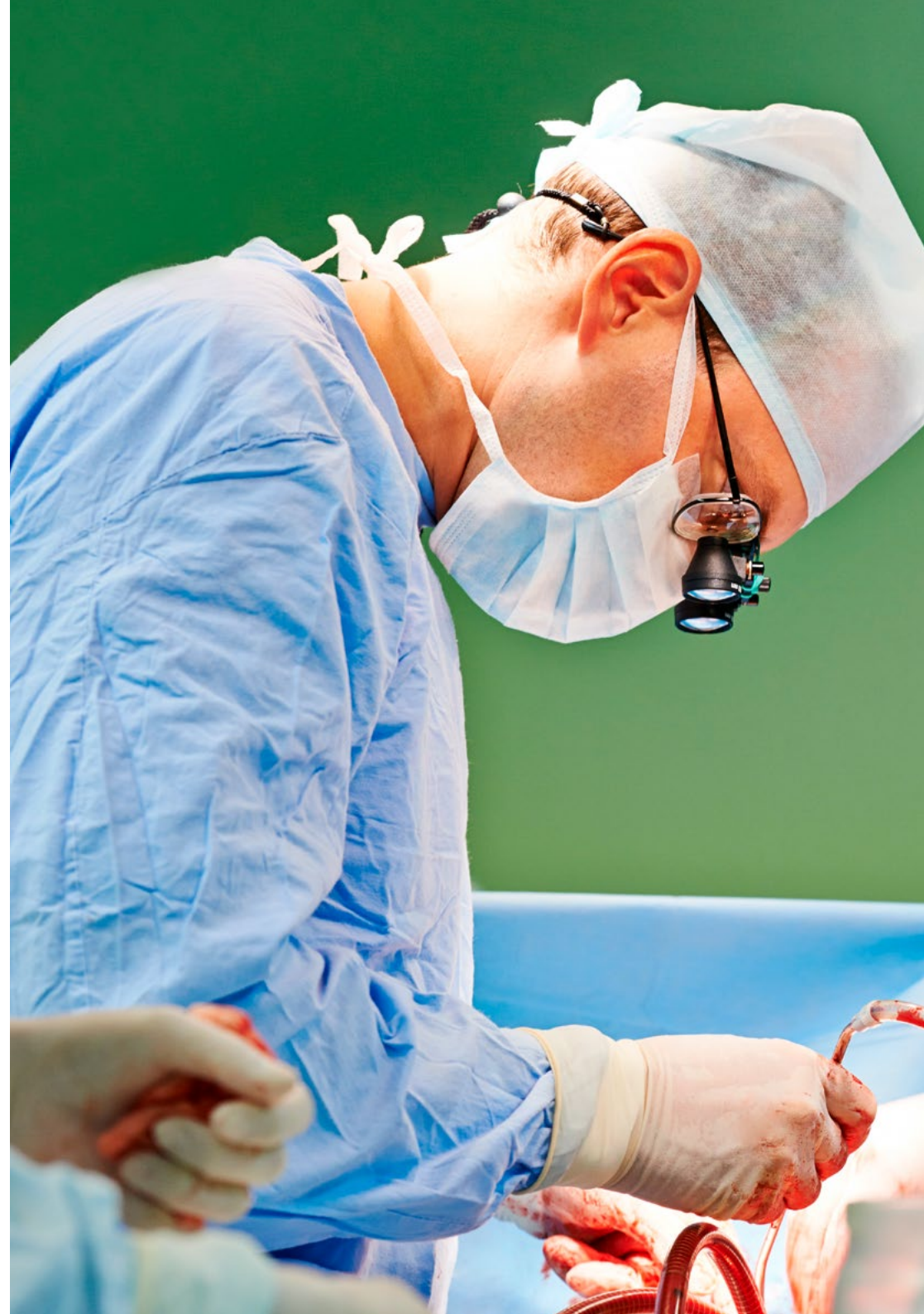
- ◆ Cardiologist
- ◆ Fellowship in Electrophysiology and Arrhythmias at the Arrhythmia Unit of the Puerta de Hierro University Hospital Majadahonda
- ◆ Degree in Medicine from the Autonomous University of Madrid
- ◆ Residency in the Specialty of Cardiology at the University Hospital Puerta de Hierro Majadahonda
- ◆ Master's Degree in Diagnostic and Therapeutic Cardiac Electrophysiology at the CEU San Pablo University

**Dr. Del Castillo Medina, Roberto**

- ♦ Cardiology Expert in Interventional Cardiology
- ♦ Specialist Physician at the Alcorcón Foundation University Hospital
- ♦ Researcher of the Infarction Code Working Group of the Interventional Cardiology Association
- ♦ Interventional Cardiology at Quirónsalud Sur Hospital
- ♦ Physician in the Acute Cardiac Care and Post-Surgical Recovery Unit
- ♦ Medical Specialist in Interventional Cardiology at the HM Montepíncipe Hospital
- ♦ Medical Specialist in Cardiology at Hospital San Rafael and Infanta Leonor University Hospital
- ♦ Master's Degree in Diagnostic and Therapeutic Electrophysiology from the Complutense University of Madrid
- ♦ Member of: Spanish Society of Cardiology

**Dr. García Magallón, Belén**

- ♦ Cardiology Expert
- ♦ Fellowship in the Heart Failure Unit of the Cardiology Service at the Puerta de Hierro Majadahonda University Hospital
- ♦ Residency in the Specialty of Cardiology at the University Hospital of Guadalajara
- ♦ Degree in Medicine from the Catholic University of Valencia San Vicente Mártir
- ♦ Master's Degree in Diagnostic Imaging in Cardiology from the Catholic University of Murcia





**Dr. Vaqueriza Cubillo, David**

- ◆ Specialist of Clinical Cardiology and Multidisciplinary Unit of Heart Failure Infanta Leonor University Hospital
- ◆ Specialist from the Cardiology Unit Beata María Ana de Jesús Hospital
- ◆ Bachelor's Degree in Medicine. Complutense University of Madrid
- ◆ Residency in Cardiology. 12 de Octubre University Hospital
- ◆ Online Master's Degree in Cardiology Miguel Hernández University

**Dr. López Menéndez, José**

- ◆ Specialist in Cardiac Surgery at the Ramón y Cajal University Hospital
- ◆ Specialist in Cardiac Surgery at the Central de Asturias University Hospital
- ◆ Clinical Professor in the Department of Surgery at the University of Alcalá de Henares
- ◆ Resident tutor. Internal Medical Resident training in Cardiac Surgery at the Gregorio Marañón General University Hospital
- ◆ Specialist Physician at the Central University Hospital of Asturias
- ◆ Doctor of the Official Postgraduate Program in Health Sciences and Biomedicine of the University of Oviedo
- ◆ Degree in Medicine and Surgery from the University of Oviedo
- ◆ Extraordinary End of Bachelor's Degree Award from the University of Oviedo
- ◆ Master's Degree in Research Methodology in Health Sciences from Autonomous University of Barcelona
- ◆ Master's Degree in "Innovations in Cardiac Surgery" by the Scuola Superiore Sant'Anna, University of Pisa. Italy
- ◆ Postgraduate in Statistics and Health Sciences at the Autonomous University of Barcelona
- ◆ Specialization in Cardiac Surgery at the Gregorio Marañón General University Hospital

**Dr. Pedraz Prieto, Álvaro**

- ♦ Specialist of the Cardiovascular Surgery Service at the Gregorio Marañón General University Hospital
- ♦ Specialist of the Intensive Care Medicine Department at the HM Montepríncipe University Hospital
- ♦ Collaborating Doctor of Practical Teaching in the Department of Surgery of the Faculty of Medicine at the Complutense University of Madrid
- ♦ Guest Observer in the Cardiovascular Surgery Service at the Icahn School of Medicine at Mount Sinai
- ♦ Degree in Medicine from the University of Salamanca
- ♦ Master's Degree in Research Methodology in Health Sciences from the University of Salamanca
- ♦ Specialist in Cardiovascular Surgery at the Gregorio Marañón General University Hospital

**Dr. González Mansilla, Ana**

- ♦ Attending Physician in Cardiology at the Gregorio Marañón General University Hospital
- ♦ Medical Specialist at the 12 de Octubre University Hospital
- ♦ Doctor of Medicine and Surgery from the Complutense University of Madrid
- ♦ Member of: Cardiovascular Research Network at the Gregorio Marañón Biomedical Research Foundation Hospital and Cardiovascular Research Network of the Carlos III Health Institute

**Dr. Miguelena Hycka, Javier**

- ♦ Specialist in Cardiac Surgery at the University Hospital Ramón y Cajal
- ♦ Tutor of Cardiac Surgery Service at the Ramón and Cajal University Hospital
- ♦ Master's Degree teacher of Cardiac Emergencies at the University of Alcalá
- ♦ Teacher in Master's Degree from Pacemakers, Resynchronizer and Cardiac Defibrillation in the University of Alcalá
- ♦ Doctor of Medicine and Surgery from the University of Zaragoza
- ♦ Degree in Medicine and Surgery from the University of Zaragoza
- ♦ Master's Degree in Research Methodology in Health Sciences, Autonomous University of Barcelona
- ♦ Diploma in Design and Statistics in Health Sciences by the Autonomous of Barcelona
- ♦ Diploma of Advanced Studies in the Faculty of Medicine by the University of Alcalá
- ♦ Specialization in Cardiac Surgery by the Ministry of Health and Consumption

**Dr. Martínez Losas, Pedro**

- ♦ Specialist Cardiology Physician at the University Hospital Infanta Leonor
- ♦ Bachelor's Degree in Medicine from the University of Alcalá de Henares
- ♦ Cardiologist at the San Carlos Clinical Hospital, Madrid
- ♦ Sub-specialty in Acute Cardiac Care with SEC Training Scholarship at the University Hospital La Paz
- ♦ Expert in Atrial Fibrillation at the University of Santiago de Compostela

**Dr. Pérez-Caballero Martínez, Ramón**

- ♦ Attending Physician of Pediatric Cardiac Surgery at the Gregorio Marañón General University Hospital
- ♦ Attending Physician of Pediatric Cardiac Surgery (Dr. R. Greco) at the Sanitas La Zarzuela Hospital
- ♦ Attending Physician of Pediatric Cardiac Surgery (Dr. R. Greco) at the Sanitas La Moraleja Hospital
- ♦ Attending Physician of Pediatric Cardiac Surgery (Dr. R. Greco) at the Nisa Pardo de Aravaca Hospital
- ♦ Attending Physician of Pediatric Cardiac Surgery (Dr. R. Greco) at the Quirónsalud University Hospital Pozuelo, Spain
- ♦ Attending Physician in Pediatric Cardiac Surgery at the Pediatric Heart Institute of the 12 de Octubre University Hospital
- ♦ PhD in Surgery from the Complutense University of Madrid
- ♦ Degree in Medicine from the Faculty of Medicine of Santander at the University of Cantabria
- ♦ Specialist in Cardiac Surgery at the Gregorio Marañón General University Hospital
- ♦ Honorary Collaborator of the Department of Surgery, Complutense University of Madrid
- ♦ Diploma of Advanced Studies. Synchronized Ventricular Assistance
- ♦ He has numerous publications in the Area of Cardiac Surgery and Transplantation in Pediatrics

**Dr. De Cortina Camarero, Cristina**

- ♦ Specialist Physician in the Cardiology Department at the University Hospital Infanta Leonor
- ♦ Attending Physician in the Cardiology Department at the Gregorio Marañón General University Hospital
- ♦ Assistant Cardiologist at the Los Madroños Hospital
- ♦ Assistant Cardiologist at the San Rafael University Hospital
- ♦ Dependent Researcher in the Non-invasive Cardiology Area of the Cardiology Service at the Gregorio Marañón General University Hospital
- ♦ Assistant Professor at the Complutense University of Madrid
- ♦ Doctorate in Cardiac Medicine from the Complutense University of Madrid
- ♦ Specialization in Cardiology at the Gregorio Marañón General University Hospital
- ♦ Master's Degree in Cardiac Imaging Diagnosis at UCAM, San Antonio Catholic University of Murcia
- ♦ Master's Degree in Cardiology from the Miguel Hernández University of Elche

**Dr. Hernando Marrupe, Lorenzo**

- ♦ Interventional Cardiologist. Alcorcón Foundation University Hospital
- ♦ Specialist in Cardiology. Príncipe de Asturias University Hospital
- ♦ Specialist in Cardiology. San Carlos Clinical Hospital
- ♦ Author and Co-author of several scientific publications
- ♦ Doctor of Medicine. Complutense University of Madrid

### **Dr. Domínguez Rodríguez, Fernando**

- ♦ Cardiologist of the Heart Failure and Familial Cardiopathies Unit at the Puerta de Hierro Majadahonda University Hospital
- ♦ Postdoctoral Researcher at the National Center for Cardiovascular Research (CNIC)
- ♦ Resident Cardiology Intern at the Puerta de Hierro Majadahonda Clinical Hospital
- ♦ Doctor Cum Laude in Medicine from the Autonomous University of Madrid
- ♦ Degree in Medicine and Surgery from the Complutense University of Madrid
- ♦ Residency in the Specialty of Cardiology at the Puerta de Hierro Majadahonda University Hospital
- ♦ Visiting Physician at the Cardiomyopathy Unit of the Charité Hospital, Berlin, Germany
- ♦ Fellowship in Familial Cardiopathies at the Familial Cardiopathies Unit of the Puerta de Hierro Majadahonda University Hospital
- ♦ Member of: European Society of Cardiology and Spanish Society of Cardiology

### **Dr. Campuzano Ruíz, Raquel**

- ♦ Coordinator of the Cardiac Rehabilitation and Prevention Unit at the Alcorcón Foundation University Hospital
- ♦ Cardiologist in charge of Pulmonary Hypertension
- ♦ Cardiologist in charge of Ergospirometry at the Alcorcón Foundation University Hospital
- ♦ President Elect of the Cardiovascular Risk and Cardiac Rehabilitation section of the Spanish Society of Cardiology
- ♦ Bachelor's Degree in Medicine and Surgery at the Complutense University of Madrid
- ♦ Master's Degree in Cardiology at UMH
- ♦ Doctorate in Health Sciences and Biomedicine from the University of Alcalá
- ♦ Member of: Scientific Committee of the Spanish Society of Cardiology, SEC Teaching Commission and European Society of Cardiology

### **Dr. Juárez Fernández, Miriam**

- ♦ Cardiologist
- ♦ Area Specialist of the Coronary Unit Gregorio Marañón General University Hospital
- ♦ Collaborating Doctor of Practical Teaching of the Department of Medicine Complutense University of Madrid
- ♦ Lecturer in the Continuing Education Course, Practical Aspects in the Management of Atrial Fibrillation: Discussion of Clinical Cases
- ♦ Doctorate in the Faculty of Medicine. Complutense University of Madrid
- ♦ Bachelor's Degree in Medicine and Surgery. Autonomous University of Madrid
- ♦ Specialty of Cardiology. Gregorio Marañón General University Hospital
- ♦ Member of: Spanish Society of Cardiology

### **Dr. Pastor Fuentes, Agustín**

- ♦ Specialist in Complex Arrhythmia Interventional Procedures
- ♦ Head of Clinical and Interventional Cardiology Department Getafe University Hospital
- ♦ Physician Specialist of the Cardiology Department Getafe University Hospital
- ♦ Associate Professor of Medicine and Cardiology. European University of Madrid
- ♦ PhD in Medicine Complutense University of Madrid
- ♦ Degree in Medicine. University of Alicante
- ♦ Training in Clinical Cardiac Electrophysiology. Gregorio Marañón General University Hospital
- ♦ Master's Degree in Interventionism of Complex Arrhythmias. University of Alcalá



#### **Dr. Martin, Miren**

- ◆ Specialist in Cardiac Surgery at the Ramón y Cajal University Hospital
- ◆ Medical Internal Resident at Ramón y Cajal University Hospital
- ◆ Degree in Medicine and Surgery from the University of the Basque Country
- ◆ Master's Degree in Minimal Access Surgery from the University of Málaga
- ◆ Master's Degree in Cardiac Emergencies from the University of Alcalá
- ◆ Specialization in Clinical Research Methodology for Residents from the University of Alcalá.
- ◆ Specialist in Cardiac Surgery at the Ramón y Cajal University Hospital

#### **Dr. Toquero Ramos, Jorge**

- ◆ Cardiology Specialist in Electrophysiology and Arrhythmias
- ◆ Senior Consultant of the Electrophysiology and Arrhythmia Unit of the Cardiology Service at the University Hospital Puerta de Hierro Majadahonda
- ◆ Assistant Specialist Physician of the Arrhythmia Unit of the Cardiology Service at the University Hospital Puerta de Hierro Majadahonda
- ◆ Member of the Teaching Committee at the University Hospital Puerta de Hierro Majadahonda
- ◆ Clinical Teaching Collaborator at the Autonomous University of Madrid
- ◆ Doctor Cum Laude in Medicine from the Autonomous University of Madrid
- ◆ Bachelor's Degree in Medicine and Surgery from the University of Valladolid
- ◆ Residency in the Specialty of Cardiology at the University Hospital Puerta de Hierro Majadahonda
- ◆ Fellowship in Clinical Electrophysiology at the Arrhythmia Unit of the Cardiovascular Center of the OLV Aalst Hospital, Belgium
- ◆ Master's Degree in Diagnostic and Therapeutic Cardiac Electrophysiology at the Gregorio Marañón Hospital of Madrid and the Complutense University of Madrid

**Dr. Parra Esteban, Carolina**

- ♦ Assistant Cardiology Specialist at the Coronary Unit of the Hospital Puerta de Hierro Majadahonda
- ♦ Lecturer in the program: Simulation in the Comprehensive Management of Patients in Cardiogenic Shock, organized by the Cardiology Department of the University Hospital Puerta de Hierro Majadahonda and the Foundation for Biomedical Research
- ♦ Bachelor's Degree in Medicine and Surgery from the Autonomous University of Madrid
- ♦ Residency in the Specialty of Cardiology at the University Hospital Puerta de Hierro Majadahonda

**Dr. García-Izquierdo Jaén, Eusebio**

- ♦ Assistant Specialist Physician in the Arrhythmia Unit of the Cardiology Service at the Puerta de Hierro Majadahonda Hospital
- ♦ Clinical Researcher at Aortasana CM
- ♦ Fellowship in Electrophysiology at the Arrhythmia Unit of the Puerta de Hierro Majadahonda University Hospital
- ♦ Master's Degree in Diagnostic and Therapeutic Cardiac Electrophysiology at CEU San Pablo University
- ♦ Degree in Medicine from the Complutense University of Madrid
- ♦ Residency in the Specialty of Cardiology at the Puerta de Hierro Majadahonda University Hospital
- ♦ Member of the European Society of Cardiology

**Dr. Aguilera Agudo, Cristina**

- ♦ Assistant Specialist in the Cardiology Department of the Puerta de Hierro Hospital
- ♦ Personal Physician of Continuing Care at the University Hospital of Guadalajara
- ♦ Bachelor's Degree in Medicine and Surgery at the University of Granada
- ♦ Diploma in Statistics in Health Sciences at the Autonomous University of Barcelona
- ♦ Master's Degree in Diagnostic and Therapeutic Cardiac Electrophysiology, San Pablo CEU University
- ♦ Specialization in Cardiology at Puerta de Hierro Majadahonda University Hospital
- ♦ Member of the Spanish Society of Cardiology

**Dr. Vilches Soria, Silvia**

- ♦ Attending Specialist at the Family Cardiopathy Unit of the Gregorio Marañón University Hospital in Madrid
- ♦ Bachelor's Degree in Medicine and Surgery from the Autonomous University of Madrid
- ♦ Residency in the Specialty of Cardiology at the University Hospital Puerta de Hierro Majadahonda
- ♦ Fellowship in Familial Cardiopathies in the Familial Cardiopathies Unit at the University Hospital Puerta de Hierro Majadahonda
- ♦ Doctorate in Medicine and Surgery from the Autonomous University of Madrid
- ♦ Member of the European Society of Cardiology



**Dr. Cobo Marcos, Marta**

- ♦ Attending Cardiologist at the Heart Failure Unit of the Puerta de Hierro Majadahonda Hospital
- ♦ Coordinator of the Working Group on Cardiorenal Syndrome and Treatment of Congestion in Heart Failure of the Heart Failure Association of the Spanish Society of Cardiology
- ♦ Specialist Physician of the Cardiology Area of the Heart Failure and Familial Heart Disease Unit at the University Hospital Puerta de Hierro Majadahonda
- ♦ Heart Failure Unit Day Hospital Coordinator
- ♦ Attending Physician of the CSUR Unit of Familial Cardiopathies at the University Hospital Puerta de Hierro Majadahonda
- ♦ Clinical Teaching Collaborator at the Autonomous University of Madrid
- ♦ Fellow researcher in FIS and SEC projects
- ♦ Specialist in the Cardiology Area at the Alcorcón Foundation Hospital
- ♦ Specialist Cardiology Physician at the Carlos III Hospital, Madrid
- ♦ Visiting Physician at the Familial Cardiopathies Unit, The Heart Hospital, University College London, United Kingdom
- ♦ Visiting Physician in the Department of Cardiovascular Imaging, The Mount Sinai Hospital, New York, United States
- ♦ Resident Cardiology Intern at the University Hospital Puerta de Hierro Majadahonda
- ♦ Bachelor's Degree in Medicine and Surgery, Universidad Complutense de Madrid
- ♦ Specialty in Cardiology, University Hospital Puerta de Hierro Majadahonda
- ♦ Diploma in Research Methodology - Design and Statistics in Health Sciences from the Autonomous University of Barcelona
- ♦ Member of the Spanish Society of Cardiology

**Dr. Sánchez García, Manuel**

- ♦ Area Specialist of the Electrophysiology and Cardiac Stimulation Unit of the Cardiology Service at the Salamanca University Welfare Complex
- ♦ Specialist in Cardiology at the University Hospital HM Montepríncipe
- ♦ Bachelor's Degree in Medicine and Surgery from the Complutense University of Madrid
- ♦ Residency in the Specialty of Cardiology at the University Hospital Puerta de Hierro Majadahonda
- ♦ Fellowship in Electrophysiology and Arrhythmias in the Arrhythmia Unit at the University Hospital Puerta de Hierro Majadahonda
- ♦ University Master's Degree in Diagnostic and Therapeutic Cardiac Electrophysiology at CEU San Pablo University



*A unique, key and decisive learning experience to boost your professional development"*

# 05

## Structure and Content

Developing this Advanced Master's Degree has been a real challenge for TECH and its team of experts, who, despite being versed in Cardiology, have had to carry out an exhaustive research task to shape a complete, comprehensive, updated and adapted to the pedagogical criteria that define and differentiate this university. In addition, with an emphasis on the multidisciplinary factor that characterizes all the qualifications of this center, they have also included in their content hours of additional material in audiovisual format, research articles, dynamic summaries and complementary readings so that the graduate can take full advantage of this academic experience and delve into the most relevant aspects of the syllabus for their professional performance.





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*You will master in a very short time the techniques of percutaneous and surgical revascularization based on the latest developments in cardiac surgery”*

## Module 1. Anatomy and Pathophysiology of the Cardiovascular System

- 1.1. Embryology
- 1.2. Anatomy
  - 1.2.1. Cardiac Cavities
  - 1.2.2. Atrial Septum and Interventricular Septum
  - 1.2.3. Heart Valves
- 1.3. Biochemistry of the Heart
  - 1.3.1. Metabolic Regulation
  - 1.3.2. Regulation of Oxygen Consumption
  - 1.3.3. Plasma Lipoproteins
- 1.4. Conduction System
- 1.5. Coronary Anatomy and Coronary Pathophysiology
- 1.6. Large Vessels and Peripheral Vascular System
- 1.7. Physiology of the Cardiovascular Apparatus
- 1.8. Anatomic-Physiology of Pulmonary Circulation
- 1.9. Hemostasis and Blood Coagulation
- 1.10. Update on Cardiovascular Pharmacology

## Module 2. Extracorporeal Circulation ECC

- 2.1. The History of ECC
- 2.2. General Principles of ECC
- 2.3. ECC Components
  - 2.3.1. Mechanical Pumps
  - 2.3.2. Oxygenators
  - 2.3.3. Heat Exchanger
  - 2.3.4. Circuits and Filters
- 2.4. Hypothermia
  - 2.4.1. Physiology of Hypothermia
  - 2.4.2. pH Control
  - 2.4.3. Hypothermia Techniques

- 2.5. Myocardial Protection Methods
  - 2.5.1. Basic Principles of Cardioplegia
  - 2.5.2. Types of Cardioplegia
- 2.6. Secondary Effects of ECC
  - 2.6.1. Coagulation Alterations
  - 2.6.2. Pulmonary Alterations
  - 2.6.3. Neurological Alterations
  - 2.6.4. Renal Disorders
  - 2.6.5. Inflammatory Response
- 2.7. Monitoring During ECC
  - 2.7.1. Cardiovascular Monitoring
  - 2.7.2. Safety Devices
  - 2.7.3. Heat Exchanger
  - 2.7.4. Blood Gases
  - 2.7.5. Pressure
  - 2.7.6. Brain Saturation
  - 2.7.7. Flows
- 2.8. Cannulation Techniques
  - 2.8.1. Types of Cannulas
  - 2.8.2. Access for Cannulation
  - 2.8.3. Special Situations
- 2.9. Cerebral Perfusion

## Module 3. Perioperative Care

- 3.1. Preoperative Optimization
  - 3.1.1. Risk Assessment
  - 3.1.2. Nutritional Status
  - 3.1.3. Anemia
  - 3.1.4. Diabetes Mellitus
  - 3.1.5. ATB Prophylaxis

- 3.2. Intraoperative
  - 3.2.1. Monitoring
  - 3.2.2. Anesthetic Induction and Maintenance
  - 3.2.3. Fluid Use
  - 3.2.4. Pulmonary Hypertension
- 3.3. Cardiovascular System
  - 3.3.1. Volemia and Contractility
  - 3.3.2. Postoperative AMI
  - 3.3.4. Cardiopulmonary Arrest and Cardiopulmonary Resuscitation
- 3.4. Low-Energy Expenditure Syndrome
  - 3.4.1. Monitoring and Diagnosis
  - 3.4.2. Treatment
- 3.5. Respiratory System
  - 3.5.1. Postoperative Changes in Pulmonary Function
  - 3.5.2. Ventilator Management
  - 3.5.3. Pulmonary Complications
- 3.6. Kidney Function
  - 3.6.1. Kidney Pathophysiology
  - 3.6.2. Predisposing Factors for Kidney Failure
  - 3.6.3. Prevention of Kidney Failure
  - 3.6.4. Treatment of Kidney Failure
- 3.7. Nervous System. Neurological Damage
  - 3.7.1. Types of Neurological Damage
  - 3.7.2. Risk Factors
  - 3.7.3. Etiology and Prevention
  - 3.7.4. Neuropathy in Critically Ill Patients
- 3.8. Hematologic Complications
  - 3.8.1. Postoperative Bleeding
  - 3.8.2. Diagnosis of Coagulopathies
  - 3.8.3. Prevention of Bleeding
  - 3.8.4. Treatment

- 3.9. Infections
  - 3.9.1. Pneumonia Associated with Mechanical Ventilation
  - 3.9.2. Infection of Surgical Wounds
  - 3.9.3. Infections Associated with Catheter Devices
  - 3.9.4. Antibiotic Prophylaxis
- 3.10. Optimization of Blood Derivative Transfusion

## Module 4. Ischemic Heart Disease

- 4.1. Myocardial Ischemia and Myocardial Infarction
  - 4.1.1. Pathophysiology of Atheromatous Plaque
  - 4.1.2. Angina
  - 4.1.3. AMI
- 4.2. Diagnosis
  - 4.2.1. Clinical Symptoms
  - 4.2.2. Electrocardiographic Criteria
  - 4.2.3. Enzymatic Modifications
  - 4.2.4. Image
  - 4.2.5. Definition of AMI
- 4.3. Natural History and Prevention
  - 4.3.1. Mortality of AMI
  - 4.3.2. Prevention of Ischemic Heart Disease
- 4.4. Clinical Decisions
  - 4.4.1. *Heart Team*
  - 4.4.2. Analysis of Clinical Practice Guidelines
- 4.5. AMI Management
  - 4.5.1. AMI Code
  - 4.5.2. Thrombolytic Treatment
- 4.6. Percutaneous Treatment
  - 4.6.1. Complications
  - 4.6.2. Results

- 4.7. Surgical Treatment
  - 4.7.1. Grafts
  - 4.7.2. Anastomosis
  - 4.7.3. Without ECC
  - 4.7.4. MIDCAB
- 4.8. Surgical Complications from AMI
  - 4.8.1. Ischemic Mitral Insufficiency
  - 4.8.2. VSD
  - 4.8.3. Free Wall Breakage
  - 4.8.4. Ventricular Aneurysm
- 4.9. Combined Coronary Surgery
- 4.10. Relevant Studies in Ischemic Heart Disease

## Module 5. Valvular Heart Disease

- 5.1. Etiopathogenesis
- 5.2. Valvular *Heart Team*. Specific Units
- 5.3. Types of Valve Prostheses
  - 5.3.1. Historical Evolution of Valve Prostheses
  - 5.3.2. Mechanical Prostheses
  - 5.3.3. Biological Prostheses
  - 5.3.4. Homograft
  - 5.3.5. Xenografts
  - 5.3.6. Autografts
- 5.4. Mitral Valve
  - 5.4.1. Anatomy and Function
  - 5.4.2. Pathophysiology
  - 5.4.3. Replacement and Repair Techniques
- 5.5. Tricuspid Valve
  - 5.5.1. Anatomy and Function
  - 5.5.2. Pathophysiology
  - 5.5.3. Replacement and Repair Techniques

- 5.6. Aortic Valve
  - 5.6.1. Anatomy and Function
  - 5.6.2. Pathophysiology
  - 5.6.3. Replacement and Repair Techniques
- 5.7. Pulmonary Valve
  - 5.7.1. Anatomy and Function
  - 5.7.2. Pathophysiology
  - 5.7.3. Replacement and Repair Techniques
- 5.8. Minimally Invasive Surgery
- 5.9. Results of Valvular Surgery. Studies
- 5.10. Endocarditis
  - 5.10.1. Etiology
  - 5.10.2. Indications
  - 5.10.3. Risk Factors
  - 5.10.4. Treatment

## Module 6. Aortic Pathology

- 6.1. Anatomy and Function of the Aortic Root
- 6.2. Pathology and Treatment of the Aortic Root
- 6.3. Thoracic Aortic Aneurysm
  - 6.3.1. Etiopathogenesis
  - 6.3.2. Natural History
  - 6.3.3. Treatment
- 6.4. Thoracoabdominal Aneurysm
- 6.5. Acute Aortic Syndrome
  - 6.5.1. Classification
  - 6.5.2. Diagnosis
- 6.6. Surgical Treatment of Acute Aortic Syndrome
- 6.7. Adjuvant Techniques in the Surgical Treatment of Acute Aortic Syndrome
- 6.8. Aortic Arch Surgery
- 6.9. Percutaneous Treatment
- 6.10. Aortitis

## Module 7. Congenital Heart Disease

- 7.1. General Physiology of Congenital Heart Disease
  - 7.1.1. Major Syndromes
  - 7.1.2. Palliative Techniques
- 7.2. Patent Ductus Arteriosus
  - 7.2.1. Aortopulmonary Window
  - 7.2.2. Fistula of the Sinus of Valsalva
  - 7.2.3. Aortoventricular Tunnel
- 7.3. Obstructions to Systemic Flow
  - 7.3.1. Aortic Subvalvular Stenosis
  - 7.3.2. Valvular Aortic Stenosis
  - 7.3.3. Supravalvular Aortic Stenosis and Aortic Coarctation
  - 7.3.4. Interrupted Aortic Arch
- 7.4. Atrial Septal Defect and Ventricular Septal Defect
  - 7.4.1. Atrioventricular Canal
  - 7.4.2. Truncus Arteriosus
- 7.5. Tetralogy of Fallot
  - 7.5.1. Pulmonary Atresia with VSD and MAPCAS
- 7.6. Transposition of the Main Arteries. Double Outlet Right Ventricle
- 7.7. Hypoplastic Left Heart Syndrome
  - 7.7.1. Three-Stage Management of Uni-Ventricular Physiology
- 7.8. Pulmonary Venous Return Anomalies
  - 7.8.1. Total and Partial Anomalous Pulmonary Venous Return
  - 7.8.2. Heterotaxia
- 7.9. Congenitally Corrected Transposition of the Great Arteries
- 7.10. Vascular Rings. Coronary Abnormalities

## Module 8. Treatment of Other Cardiovascular Diseases, Transcatheter Valve Implantation and Concomitant Conditions

- 8.1. Surgical Management of Cardiac and Great Vessel Trauma
  - 8.1.1. Blunt
  - 8.1.2. Open
- 8.2. Pericardial Diseases
  - 8.2.1. Pericardial Effusion and Tamponade
  - 8.2.2. Constrictive Pericarditis
  - 8.2.3. Cysts and Tumors
- 8.3. Cardiac Tumors
- 8.4. Pulmonary Embolism
  - 8.4.1. Pathophysiology, Prevention and Treatment
  - 8.4.2. Pulmonary Thromboendarterectomy
- 8.5. Ventricular Assists and ECMO
- 8.6. Cardiac Transplantation
  - 8.6.1. History of Heart Transplant
  - 8.6.2. Surgical Techniques
  - 8.6.3. Donor and Recipient Selection
  - 8.6.4. Immunosuppression
- 8.7. Transcatheter Valvular Treatment of the Aortic Valve
- 8.8. Transcatheter Valvular Treatment of the Mitral Valve
  - 8.8.1. Transcatheter Mitral Valve Implantation
  - 8.8.2. Transapical Neo-String Implantation
- 8.9. Cardiac Surgery and Concomitant Diseases
  - 8.9.1. Preoperative Assessment
  - 8.9.2. Fragility
  - 8.9.3. Renal Insufficiency
  - 8.9.4. Respiratory Failure
  - 8.9.5. Digestive Pathology
  - 8.9.6. Coagulation Disorders
  - 8.9.7. Pregnancy

## Module 9. New Technologies and Imaging Techniques. Statistics

- 9.1. New Technologies in Cardiac Surgery
  - 9.1.1. New Polymer Prostheses
  - 9.1.2. Vest/Duragraft
  - 9.1.3. 3D Printing
  - 9.1.4. Augmented Reality
  - 9.1.5. Robotics
- 9.2. Transthoracic Echocardiography
- 9.3. Transesophageal Echocardiogram
- 9.4. Imaging Techniques in Cardiac Pathology
  - 9.4.1. Cardiac CT
  - 9.4.2. Cardiac MRI
  - 9.4.3. Perfusion Studies
  - 9.4.4. PET/CT
- 9.5. Statistics I for Surgeons
  - 9.5.1. Sample Collection
  - 9.5.2. Graphic Representation
- 9.6. Statistics II for Surgeons
  - 9.6.1. Statistical Inference
  - 9.6.2. Proportion Comparison
  - 9.6.3. Comparison of Averages
- 9.7. Statistics III for Surgeons
  - 9.7.1. Regression Analysis
  - 9.7.2. Linear Regression
  - 9.7.3. Logistic Regression
  - 9.7.4. Survival Studies
- 9.8. Care Management
  - 9.8.1. Quality Criteria
  - 9.8.2. Records and Databases
  - 9.8.3. Criteria for the Timing of Cardiovascular Interventions

- 9.9. Research Methodology
  - 9.9.1. Design
  - 9.9.2. Ethics
  - 9.9.3. Critical Reading of Articles
  - 9.9.4. Evidence-Based Medicine
- 9.10. Past, Present and Future of Cardiac Surgery

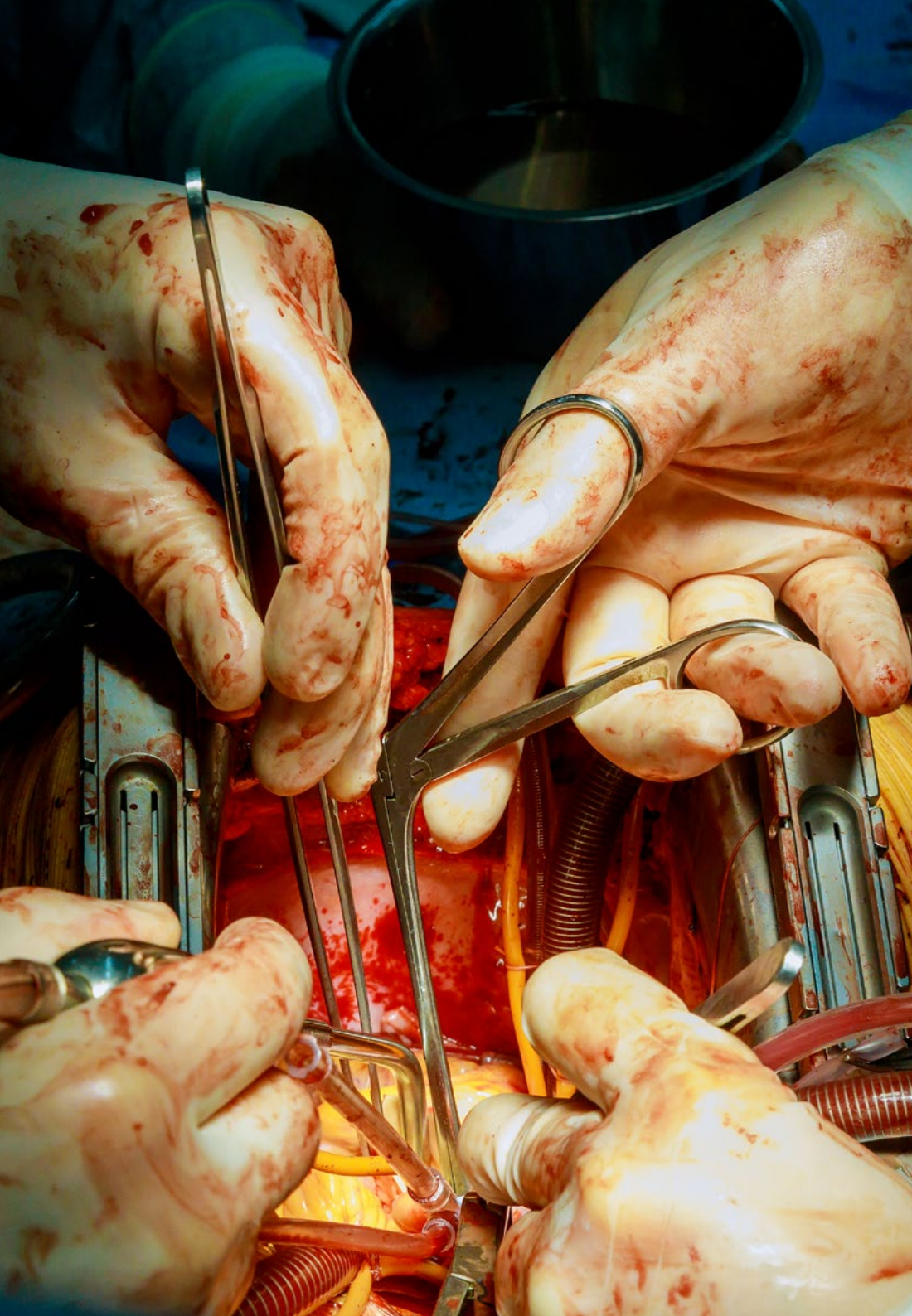
## Module 10. Clinical Presentation of Coronary Syndromes (SCA) and Classification NSTEMI-ACS 1: Epidemiology, Pathophysiology and Classification

- 10.1. Forms of Presentation of Coronary Heart Disease: Chronic Coronary Syndromes and Acute
- 10.2. Operational Classification of ACS Based on ECG, NSTEMI-ACS1 Epidemiology
- 10.3. Pathophysiology and Correlation with Anatomic Pathology
- 10.4. Unstable Angina and Non-Q AMI, Clinical Features
- 10.5. ECG and NSTEMI-ACS
- 10.6. Complementary Diagnostic Laboratory Tests and RXT in NSTEMI-ACS
- 10.7. Risk Stratification, Thrombotic Risk Scales
- 10.8. Risk Stratification, Hemorrhagic Risk Scales
- 10.9. Variant Angina and Coronary Vasospasm Clinical Features
- 10.10. Vasospasm Provocation Tests Treatment and Prognosis of Vasospasm

## Module 11. NSTEMI-ACS 2: Imaging and Ischemia Detection Tests

- 11.1. Differential Diagnosis of TD in the Emergency Department
- 11.2. Imaging Protocols in Emergency Department TD Units. Assessment and Algorithm for the Diagnosis of Patients with TD in the Emergency Department
- 11.3. Value of Transthoracic Echocardiography in the Assessment of the Patient with Suspected NSTEMI-ACS. Use of POCUS
- 11.4. Ergometry and Stress Echo/Stress Echo in the Patient with TD in the Emergency Department. Indications and Technique
- 11.5. Role of MRI in NSTEMI-ACS and Patients with Chest Pain. Indications and Technique
- 11.6. Anatomical Approach vs. Functional in the Diagnostic Assessment of the Patient with Chest Pain
- 11.7. Long-Term Follow-Up Using Imaging Techniques





## Module 12. NSTEMI-ACS 3: Medical and Revascularization Treatment

- 12.1. General and Monitoring Measures
- 12.3. Anti-Anginal Drugs: Beta Blockers
- 12.4. Anti-Anginal Drugs: Nitrates and Calcium Antagonists
- 12.5. Platelet Antiaggregants. Which Ones and For How Long?
- 12.6. Anticoagulant Drugs. Which Ones, How Much and Why?
- 12.7. Indications for Coronary Angiography and Revascularization
- 12.8. When Is Surgical Revascularization Indicated and When Is Percutaneous Revascularization Indicated?
- 12.9. Percutaneous Revascularization Techniques
- 12.10. Surgical Revascularization Techniques

## Module 13. NSTEMI-ACS 1: Clinical Picture, Presentation and Pre-Hospital and Emergency Assessment

- 13.1. Clinical Presentations of NSTEMI-ACS
- 13.2. Assessment of the Patient with NSTEMI-ACS in the Pre-Hospital Phase and in the Emergency Department (Clinical and Physical Examination). Initial Risk Stratification
- 13.3. ECG in the Acute Phase of NSTEMI-ACS and Correlation with Coronary Anatomy
- 13.4. ST-Elevation ECG: Differential Diagnosis
- 13.5. Evolving ECG Pattern in NSTEMI-ACS
- 13.6. General Treatment Measures and Initial Monitoring, Why Is It Important?
- 13.7. Initial Pharmacological Treatment of NSTEMI-ACS: Oxygen Therapy, Nitrates, Beta-Blockers
- 13.8. Pre-Hospital Antithrombotic Therapy: When and with What?
- 13.9. Indications for Coronary Reperfusion: The Problem of Timing

## Module 14. ACS with ST-Elevation 2. Patient Management in the Hospital. Coronary Unit

- 14.1. Role of the Coronary Care Unit, the Value of Monitoring and General Early Treatment Measures
- 14.2. Patient Stratification and Risk Scales
- 14.3. Complementary Laboratory Tests
- 14.4. Lipid-Lowering Drugs and Treatment Goals
- 14.5. Antianginal Drugs in NSTEMI-ACS
- 14.6. Platelet Antiplatelet Aggregation in NSTEMI-ACS
- 14.7. Anticoagulation Indications. Anticoagulants
- 14.8. Complications of NSTEMI-ACS: Chronic Heart Failure (CHF)
- 14.9. Complications of NSTEMI-ACS: Cardiogenic Shock, Medical Treatment and Mechanical Support
- 14.10. Mechanical Complications of NSTEMI-ACS: Cardiac Rupture, VSD and MI

## Module 15. NSTEMI-ACS 3: TTE and Other Imaging Tests in Acute Patient Assessment and in the Hospital Phase

- 15.1. CXR in NSTEMI-ACS
- 15.2. Value of Transthoracic Echocardiography in the Patient with NSTEMI-ACS
- 15.3. Transthoracic Echocardiographic Assessment of Mechanical Complications of NSTEMI-ACS
- 15.4. Echocardiographic Assessment of the Patient with Heart Failure or Cardiogenic Shock
- 15.5. Usefulness of Imaging Techniques in the Prognostic Assessment of the Patient with NSTEMI-ACS Diagnostic Assessment of Residual Ischemia and Myocardial Viability
- 15.6. New Techniques for Myocardial Deformation in NSTEMI-ACS
- 15.7. MINOCA. Causes and Prognosis
- 15.8. Usefulness of MRI in Patients With Myocardial Damage Without Epicardial Coronary Disease
- 15.9. Assessment of Myocardial Perfusion by Contrast Echocardiography and Correlation with Angiographic Findings

## Module 16. NSTEMI-ACS 4: Limitation of Infarct Size. Reperfusion Therapies

- 16.1. Myocardial Necrosis and Ischemia, the Problem of Ischemia Time
- 16.2. Strategies to Decrease Infarct Size: Fibrinolysis vs. Primary Angioplasty
- 16.3. Fibrinolysis, Advantages, Disadvantages and Protocols
- 16.4. Primary Angioplasty Technique and Requirements
- 16.5. Stents: Types and Results. Thrombus Extractors?
- 16.6. Antiplatelet and Anticoagulation Treatment During PCI
- 16.7. Long-Term Anti-Aggregation Treatment
- 16.8. The Problem of Antiplatelet Treatment in Patients Who Also Take Anticoagulant Drugs. Protocols
- 16.9. Hemodynamic Support During Primary Angioplasty. Available Methods and Results
- 16.10. Infarction Code Programs and Regional Reperfusion Networks

## Module 17. ACS Secondary Prevention. Cardiac Rehabilitation Programs

- 17.1. Optimization of Medical Treatment after ACS
- 17.2. Diet and Obesity Management
- 17.3. Prescription and Types of Exercise
- 17.4. Control of Arterial Hypertension before and after ACS
- 17.5. Dyslipidemia Control Before and After ACS
- 17.6. Smoking Control
- 17.7. Diagnosis and Management of Diabetes in Ischemic Heart Disease
- 17.8. Cardiac Rehabilitation Programs: Evidence, Phases, Components and Process of Care
- 17.9. Telemedicine in Cardiac Rehabilitation
- 17.10. Continuity of Care after ACS and Cardiac Rehabilitation. PHASE III Cardiac Rehabilitation

**Module 18. Arrhythmias. Fundamental Concepts**

- 18.1. Physiology
  - 18.1.1. Special Features of Myocardial Cells
  - 18.1.2. Action Potential
  - 18.1.3. Main Ionic Currents Involved
- 18.2. Genetics of Arrhythmias
- 18.3. Cardiac Conduction System
  - 18.3.1. Sinoatrial Node and AV Node
  - 18.3.2. His-Purkinje System
- 18.4. Mechanisms of Arrhythmias
  - 18.4.1. Automatism
  - 18.4.2. Triggered Activity
  - 18.4.3. Reentry
  - 18.4.4. Micro-Entry
- 18.5. Antiarrhythmic Drugs
  - 18.5.1. Type I
  - 18.5.2. Type I
  - 18.5.3. Type III
  - 18.5.4. Type IV
- 18.6. Basic Diagnostic Techniques Used in Arrhythmias
  - 18.6.1. Holter
  - 18.6.2. *Tilt Test*
  - 18.6.3. Pharmacological Tests
  - 18.6.4. Implantable Holter
  - 18.6.5. *Wearables* and Other Devices
- 18.7. Common Procedures Performed for the Diagnosis and Treatment of Arrhythmias
  - 18.7.1. EPS and Ablation
  - 18.7.2. Electroanatomical Mapping Systems. Navigation Systems
- 18.8. Cardiac Anatomy Focused on Arrhythmias
- 18.9. Radiological Anatomy
- 18.10. Organization and Operation of Arrhythmia Units

**Module 19. Bradyarrhythmias**

- 19.1. Bradyarrhythmia
- 19.2. Types of Bradyarrhythmias
- 19.3. Mechanisms/Physiopathology of Bradyarrhythmias
- 19.4. Diagnostic Studies for Bradyarrhythmias
- 19.5. Sick Sinus Syndrome
- 19.6. AV Blocks
- 19.7. Syncope
  - 19.7.1. Causes of Syncope
  - 19.7.2. Mechanisms of Syncope
  - 19.7.3. Diagnostic Study and Differential Diagnosis
- 19.8. Indication for Pacemaker Implantation. Indications for Transient PM Implantation
  - 19.8.1. Sinus Dysfunction
  - 19.8.2. AV Blocks
- 19.9. EEF Study of Bradyarrhythmias

**Module 20. Supraventricular Tachyarrhythmias**

- 20.1. Supraventricular Tachycardia
- 20.2. Types of Supraventricular Tachyarrhythmias. Clinical Differential Diagnosis
- 20.3. Acute Management of Supraventricular Tachycardia. [View from the Emergency Department](#)
  - 20.3.1. Clinical Presentation
  - 20.3.2. Complementary Tests
  - 20.3.3. Therapeutic Maneuvers and Pharmacological Treatment
  - 20.3.4. Discharge Treatment
- 20.4. Chronic Management of Supraventricular Tachycardia. [View From the Consultation Room](#)
- 20.5. Pharmacological Treatment of Supraventricular Tachycardias
- 20.6. Electrophysiological Study of Supraventricular Tachycardia
  - 20.6.1. Indications
  - 20.6.2. Description and Maneuvers

- 20.7. Nodal Reentrant Tachycardia
  - 20.7.1. Epidemiology
  - 20.7.2. Clinical Peculiarities
  - 20.7.3. Findings in Electrophysiological Study
  - 20.7.4. Ablation
- 20.8. AV Reentrant Tachycardia (Accessory Pathway)
  - 20.8.1. Epidemiology
  - 20.8.2. Clinical Peculiarities
  - 20.8.3. Findings in Electrophysiological Study
  - 20.8.4. Ablation
- 20.9. Common Atrial Flutter
  - 20.9.1. Epidemiology
  - 20.9.2. Clinical Peculiarities
  - 20.9.3. Findings in Electrophysiological Study
  - 20.9.4. Ablation
- 20.10. Other Macroreentrant Tachycardias
- 20.11. Focal Atrial Tachycardia
  - 20.11.1. Epidemiology
  - 20.11.2. Clinical Peculiarities
  - 20.11.3. Findings in Electrophysiological Study
  - 20.11.4. Ablation

## Module 21. Ventricular Tachyarrhythmias

- 21.1. Ventricular Tachycardias
  - 21.1.1. Mechanisms and Pathogenesis of Ventricular Tachycardias
  - 21.1.2. Types of Ventricular Tachycardias
- 21.2. Idiopathic Ventricular Tachycardia
- 21.3. Clinical and Electrocardiographic Diagnosis
- 21.4. Electrocardiographic Differential Diagnosis Between Wide QRS Tachycardias
- 21.5. Acute Management of Ventricular Tachycardia. Vision from the Emergency Department and the Critical Patient
  - 21.5.1. Clinical Presentation

- 21.5.2. Complementary Tests
  - 21.5.3. Therapeutic Maneuvers and Pharmacological Treatment
  - 21.5.4. Discharge Treatment
- 21.6. Chronic Management of Ventricular Tachycardia. View From the Consultation Room
- 21.7. Pharmacological Treatment of Ventricular Tachycardias
- 21.8. Electrophysiological Study and Ablation of Ventricular Tachycardia
- 21.9. Ventricular Extrasystole
  - 21.9.1. Mechanisms of Genesis of Ventricular Extrasystole
  - 21.9.2. Clinical Management
  - 21.9.3. Therapeutic Strategy
- 21.10. Ventricular Extrasystole. Study and Ablation

## Module 22. Devices (Pacemaker, ICD and Resynchronizer)

- 22.1. Pacemaker
  - 22.1.1. How a Pacemaker Works
  - 22.1.2. Indications for Pacemaker Implantation
- 22.2. Technique for Pacemaker Implantation
  - 22.2.1. Venous Canalization
  - 22.2.2. Surgical Pocket Creation
  - 22.2.3. Ventricular Electrode Implantation
  - 22.2.4. Atrial Electrode Implantation
- 22.3. Basic Programming of Pacemakers
  - 22.3.1. Programming at Discharge After Implantation
  - 22.3.2. Monitoring Protocol in the Consultation Room
- 22.4. ICD
  - 22.4.1. Operation of an ICD
  - 22.4.2. Indications for ICD Implantation
- 22.5. ICD II
  - 22.5.1. ICD Implantation Technique. Peculiarities with Respect to Pacemakers
  - 22.5.2. Programming at Discharge After Implantation
  - 22.5.3. Monitoring Protocol in the Consultation Room

- 22.6. Resynchronization Therapy
  - 22.6.1. Theoretical Basis
  - 22.6.2. Indications for Cardiac Resynchronization Device Implantation
- 22.7. Resynchronization Therapy II
  - 22.7.1. CRS Implantation Technique. Peculiarities with Respect to Other Devices
  - 22.7.2. Programming at Discharge After Implantation
  - 22.7.3. Monitoring Protocol in the Consultation Room
- 22.8. Physiological Stimulation
  - 22.8.1. Hisian Stimulation
  - 22.8.2. Left Bundle Branch Stimulation
- 22.9. Other Implantable Devices
  - 22.9.1. Wireless Pacemakers
  - 22.9.2. Subcutaneous ICD
- 22.10. Electrode Removal
  - 22.10.1. Indications for Electrode Extraction
  - 22.10.2. Extraction Procedure

## Module 23. Atrial Fibrillation

- 23.1. Importance of Atrial Fibrillation
  - 23.1.1. Epidemiology of Atrial Fibrillation
  - 23.1.2. Socioeconomic Impact of Atrial Fibrillation
- 23.2. Atrial Fibrillation in the Clinic
  - 23.2.1. Clinical Presentation and Symptomatology
  - 23.2.2. Initial Diagnostic Study
- 23.3. Assessment of Thromboembolic and Hemorrhagic Risk
  - 23.3.1. Anticoagulant Treatment. Clinical Evidence
  - 23.3.2. Direct Acting Anticoagulants
  - 23.3.3. Vitamin K Antagonists
  - 23.3.4. Earlobe Closure
- 23.4. Clinical Management of Atrial Fibrillation
  - 23.4.1. Rate Control Strategy
  - 23.4.2. Rhythm Control Strategy

- 23.5. Atrial Fibrillation Ablation I
  - 23.5.1. Indications
  - 23.5.2. Evidence of Efficacy
- 23.6. Atrial Fibrillation Ablation II
  - 23.6.1. Atrial Fibrillation Ablation Techniques
  - 23.6.2. AF Ablation Results
  - 23.6.3. Possible Complications of AF Ablation
- 23.7. Follow-Up after Atrial Fibrillation Ablation
- 23.8. Future Prospects in Atrial Fibrillation Ablation
- 23.9. AF in Specific Contexts: Postoperative Period, Intracranial Hemorrhage, Pregnancy, Athletes
- 23.10. Anticoagulant Therapy in Patients with Ischemic Heart Disease
- 23.11. Implications and Management of AHREfs and Subclinical AF

## Module 24. Arrhythmias and Heart Failure

- 24.1. Importance of Rhythm Disturbances in Heart Failure
- 24.2. AF and Heart Failure
  - 24.2.1. Epidemiology of AF in HF in Heart Failure
  - 24.2.2. Prognostic Implication of the Presence of AF in Patients with Heart Failure
- 24.3. AF and Heart Failure. Role of Ablation and Antiarrhythmic Drugs.
- 24.4. Risk Assessment of Ventricular Arrhythmias in HF
  - 24.4.1. Role of MRI
  - 24.4.2. Role of Genetics
- 24.5. Management of Ventricular Arrhythmias in Heart Failure
- 24.6. Indications for CRS Therapy and Other Devices in the Context of Heart Failure
  - 24.6.1. Conventional Resynchronizer
  - 24.6.2. Physiological Stimulation (Hisian and Left Bundle Branch)
- 24.7. Tachycardiomyopathy
  - 24.7.1. Concept and Epidemiology
  - 24.7.2. Diagnostic Study

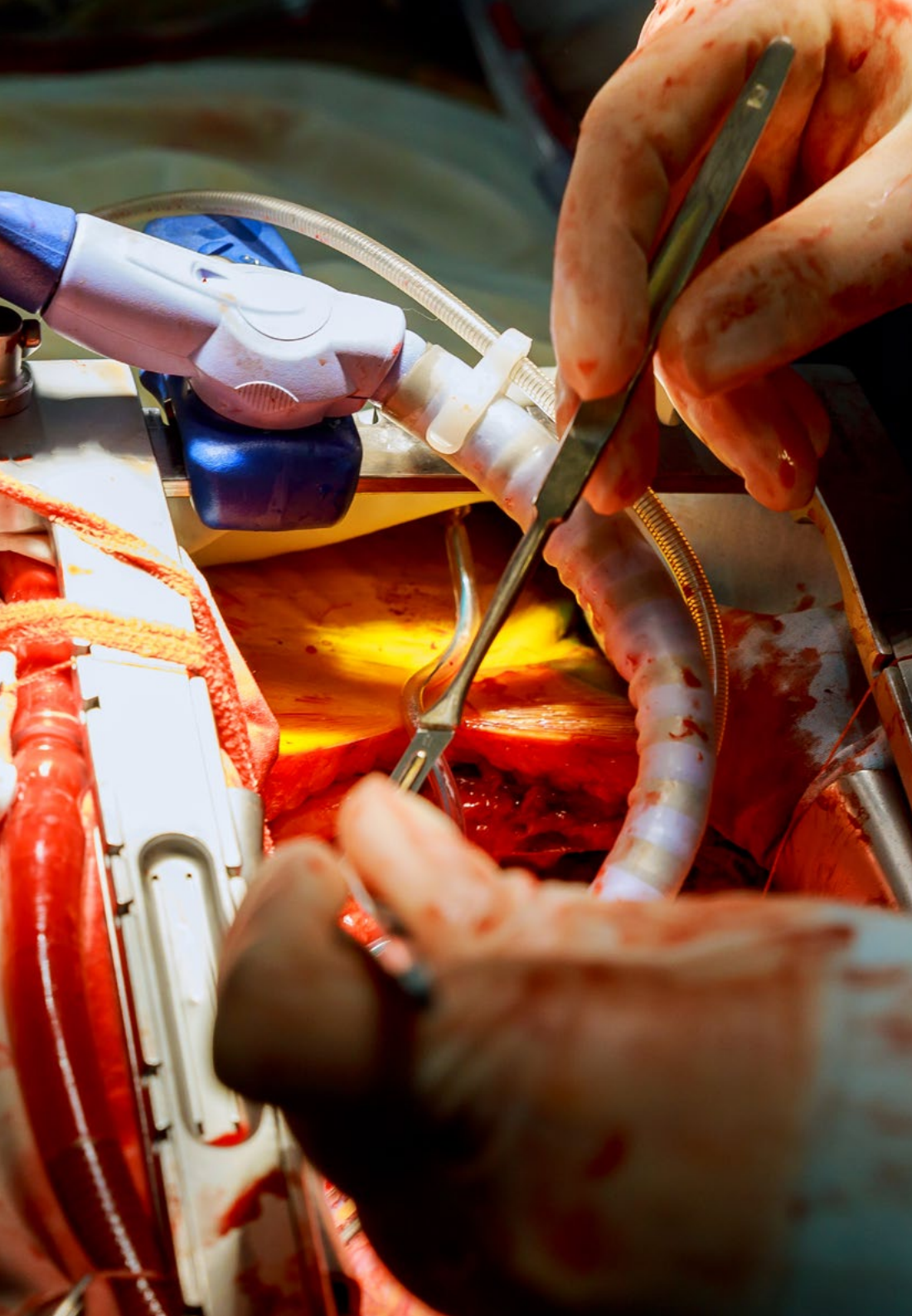
- 24.8. Management of a Patient with Tachycardiomyopathy
  - 24.8.1. Medical Treatment
  - 24.8.2. Indications and Ablation Approach
- 24.9. PM-Mediated Ventricular Dysfunction. Prevalence and Management
- 24.10. LBBB and Ventricular Dysfunction. Does Dyssynchronopathy Exist?

## Module 25. Arrhythmic Syndromes, Sudden Cardiac Death and Channelopathies

- 25.1. Sudden Cardiac Death
  - 25.1.1. Concept and Epidemiology of Sudden Cardiac Death
  - 25.1.2. Causes of Sudden Cardiac Death
- 25.2. Sudden Cardiac Death II
  - 25.2.1. Diagnostic Study after Recovered Cardiac Arrest
  - 25.2.2. Clinical Management. Prevention
- 25.3. Concept of Canalopathy. Epidemiology
- 25.4. Brugada Syndrome.
  - 25.4.1. Indications for Electrophysiological Study
  - 25.4.2. Indications for ICD
  - 25.4.3. Pharmacological Treatment
- 25.5. Long QT Syndrome
  - 25.5.1. Indications for ICD
  - 25.5.2. Pharmacological Treatment
- 25.6. Short QT Syndrome
  - 25.6.1. Indications for ICD
  - 25.6.2. Pharmacological Treatment
- 25.7. Early Repolarization and PTVC
  - 25.7.1. Indications for ICD
  - 25.7.2. Pharmacological Treatment
- 25.8. The Importance of Genetics
  - 25.8.1. Family Studies

## Module 26. Myocardiopathies and Arrhythmias

- 26.1. Association of Cardiomyopathies and Arrhythmias
- 26.2. Dilated Cardiomyopathy
  - 26.2.1. Atrial Arrhythmias
  - 26.2.2. Ventricular Arrhythmias
- 26.3. Prevention of Arrhythmias and Sudden Cardiac Death in Dilated Cardiomyopathy
  - 26.3.1. Indications for ICD
  - 26.3.2. Role of Genetics
- 26.4. Hypertrophic Cardiomyopathy. Indications for ICD
  - 26.4.1. Atrial Arrhythmias
  - 26.4.2. Ventricular Arrhythmias
- 26.5. Prevention of Arrhythmias and Sudden Cardiac Death in Hypertrophic Cardiomyopathy
  - 26.5.1. Indications for ICD
- 26.6. Arrhythmogenic Cardiomyopathy
  - 26.6.1. Description
  - 26.6.2. Most Frequent Arrhythmias and Peculiarities in their Management
  - 26.6.3. Prevention of Sudden Death. Indications for ICD
- 26.7. Amyloidosis
  - 26.7.1. Description
  - 26.7.2. Most Frequent Arrhythmic Disorders and Peculiarities in their Management
  - 26.7.3. Indications for PM
- 26.8. Other Cardiomyopathies and their Association with Cardiac Rhythm Disorders
  - 26.8.1. Dystrophies and Neuromuscular Diseases. Indications for ICD and PM
- 26.9. Study of AVB in Young Patients
  - 26.9.1. Diagnostic and Therapeutic Algorithm



## Module 27. Arrhythmias in Other Clinical Contexts

- 27.1. Arrhythmias in the Population without Heart Disease
- 27.2. Arrhythmias in Athletes
- 27.3. Arrhythmias in the Critically Ill Cardiac Patient
  - 27.3.1. Epidemiology
  - 27.3.2. Study and Clinical Management
  - 27.3.3. Management of Arrhythmic Storm
  - 27.3.4. Transient Pacemaker Indications and Implantation Technique
- 27.4. Out-of-Hospital Cardiac Arrest Care
- 27.5. Arrhythmias in the Non-Cardiac Critically Ill Patient
- 27.6. Arrhythmias in Patients Undergoing Cardiac Surgery and after TAVI
- 27.7. Arrhythmias in Infantile Congenital Cardiopathies
- 27.8. Arrhythmias in Adult Congenital Heart Diseases

“By enrolling in this Advanced Master’s Degree you will not only be accessing the most comprehensive and up-to-date cardiac curriculum, but also the largest medical school in the world. Would you like to be part of it?”

# 06

# Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.





“

*TECH will prepare you to face new challenges in uncertain environments and achieve success in your career”*

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In TECH's study methodology, the student is the main protagonist.

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“

*At TECH you will NOT have live classes  
(which you might not be able to attend)”*



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TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

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And what's more, they will be able to do so from any device, pc, tablet or smartphone.

“

*TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want”*

## Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



## Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

*Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.*



## A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



*The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule”*

### The effectiveness of the method is justified by four fundamental achievements:

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

## The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

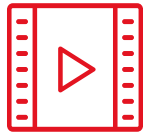
The students' assessment of the quality of teaching, quality of materials, course structure and objectives is excellent. Not surprisingly, the institution became the best rated university by its students on the Trustpilot review platform, obtaining a 4.9 out of 5.

*Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.*

*You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.*



As such, the best educational materials, thoroughly prepared, will be available in this program:



#### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



#### Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



#### Interactive Summaries

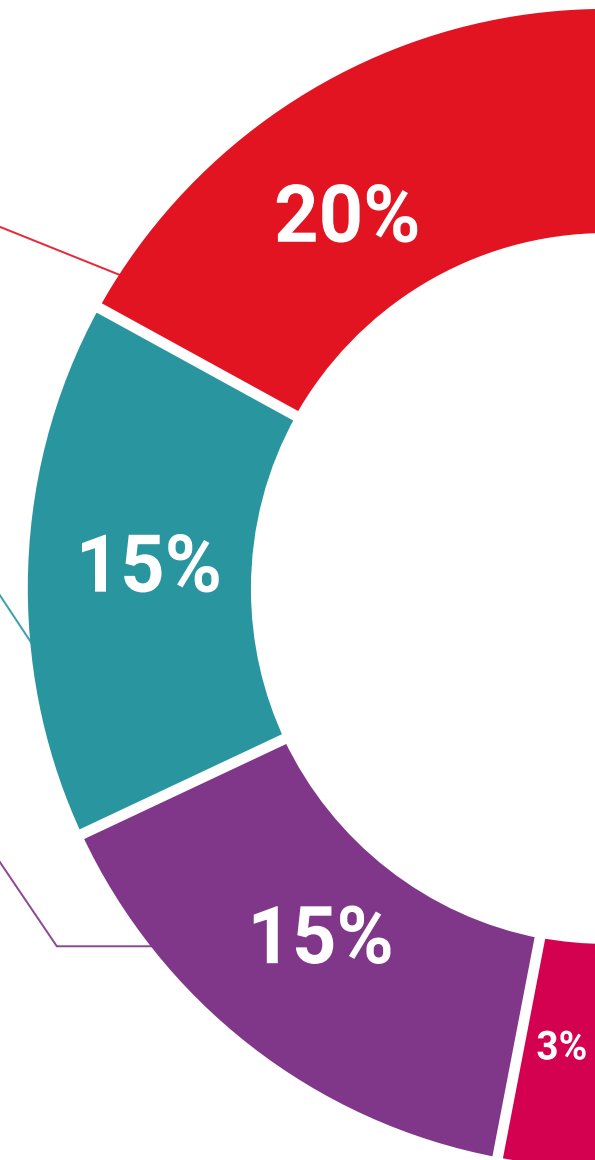
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

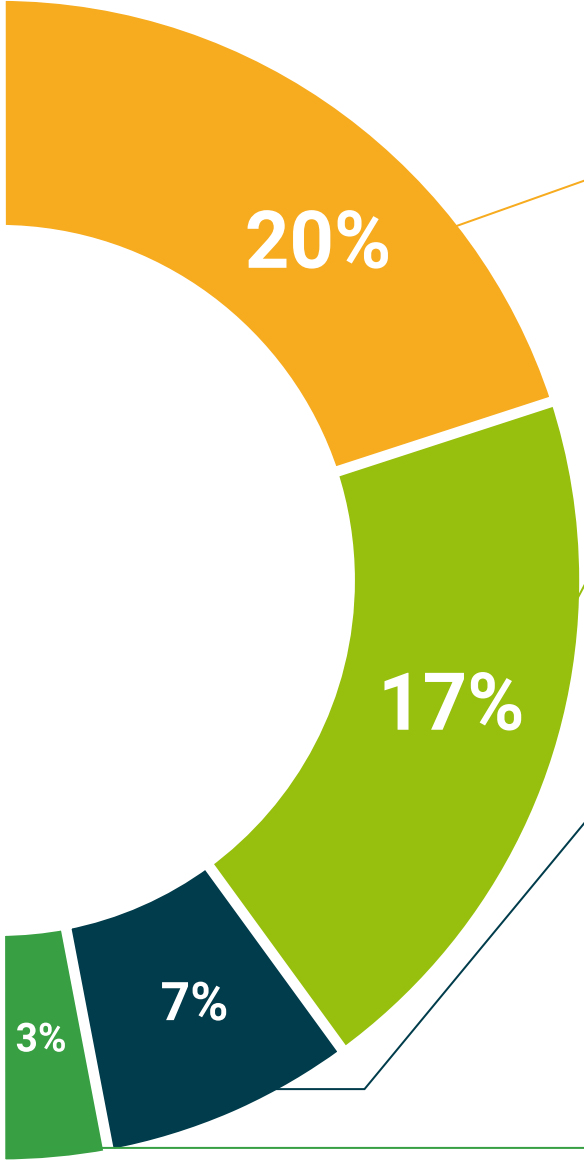


#### Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.







**Case Studies**

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.



**Testing & Retesting**

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.



**Classes**

There is scientific evidence suggesting that observing third-party experts can be useful.  
Learning from an expert strengthens knowledge and memory, and generates confidence for future difficult decisions.



**Quick Action Guides**

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical and effective way to help students progress in their learning.



# 07 Certificate

The Advanced Master's Degree in Cardiovascular Medicine and Surgery guarantees students, in addition to the most rigorous and up-to-date education, access to an Advanced Master's Degree's diploma issued by TECH Global University.



“

*Successfully complete this program  
and receive your university qualification  
without having to travel or fill out  
laborious paperwork”*

This private qualification will allow you to obtain an **Advanced Master's Degree diploma in Cardiovascular Medicine and Surgery** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University**, is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

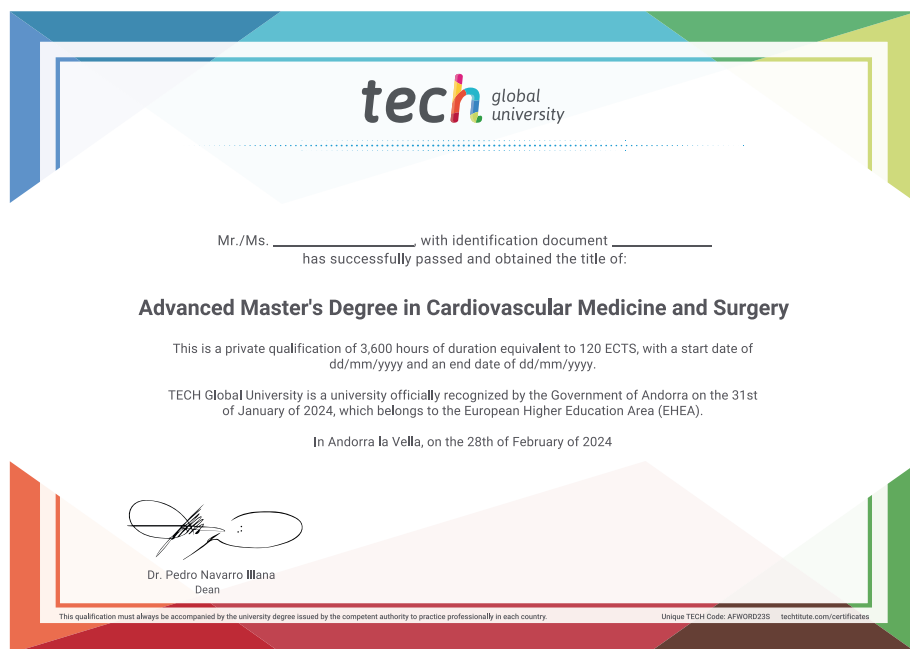
This **TECH Global University** private qualification, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Advanced Master's Degree in Cardiovascular Medicine and Surgery**

Modality: **online**

Duration: **2 years**

Accreditation: **120 ECTS**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
development language  
classroom



**Advanced Master's  
Degree**  
Cardiovascular Medicine  
and Surgery

- » Modality: **online**
- » Duration: **2 years**
- » Certificate: **TECH Global University**
- » Accreditation: **120 ECTS**
- » Schedule: **at your own pace**
- » Exams: **online**

# Advanced Master's Degree Cardiovascular Medicine and Surgery