# Hybrid Professional Master's Degree

## Cardiovascular Critical Care in the Emergency Department

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## Cardiovascular Critical Care in the Emergency Department

Course Modality: **Hybrid (Online + Clinical Internship)**
Duration: **12 months**
Certificate: **TECH Technological University**
Teaching Hours: **1,620 h.**
Website: **www.techtitute.com/us/medicine/hybrid-professional-master-degree/hybrid-professional-masters-degree-cardiovascular-critical-care-emergency-department**

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01

# Introduction

According to the latest studies, cardiovascular pathologies are the main cause of death in the world due to the popularization of a sedentary lifestyle, poor diet and lack of physical activity. In this scenario, the role of the cardiologist in the Emergency Department is crucial to preserve the integrity of people in the Emergency area, so it requires constant updating in their skills to optimize clinical work. This has led TECH to offer this program, with which the doctor will be updated in the treatment of Pulmonary Hypertension or Arrhythmias in acute phase, among others, combining a 100% online theoretical education with a practical and face-to-face internship in a hospital center of recognized prestige.

*Thanks to this Hybrid Professional Master's Degree, you will apply the most innovative techniques for the treatment of acute phase Arrhythmias in your work methodology"*

Arterial hypertension, heart attacks and cardiomyopathies are just a few examples of conditions that are more prevalent in hospitals around the world. Many of the patients suffering from these types of cardiovascular pathologies require urgent attention and a series of critical care to safeguard their lives and enable future recovery. As a result, the protocols and technologies used in emergency departments are constantly evolving to enable rapid diagnosis and treatment to ensure the well-being and stability of the patient. These advances, of course, must be known by the cardiologist to face all the situations presented by his profession.

For this reason, TECH has designed this Hybrid Professional Master's Degree in Cardiovascular Critical Care in the Emergency Department, through which the professional will update and expand their knowledge in this field to develop a first level health praxis. During 12 months of 100% online theoretical learning, the student will be able to acquire the new techniques used with the patient who is under cardiovascular critical care and will learn how to handle a pacemaker in emergency situations to submit the person to surgery. They will also delve into the monitoring needs of the patient suffering from an acute Arrhythmia.

After successfully completing the completely online teaching phase, in which students can manage their study schedules as they wish according to their needs, they will enjoy a internship program in a high-level hospital. In this center, accompanied by their tutor and integrated in an excellent medical team, they will transfer all their theoretical knowledge to the work field to enhance their health practice.

This **Hybrid Professional Master's Degree in Cardiovascular Critical Care in the Emergency Department** contains the most complete and up-to-date scientific program on the market. The most important features include:

- Development of more than 100 clinical cases presented by Cardiology specialists with extensive experience in dealing with critically ill patients
- 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
- Updated techniques for the management of acute coronary Syndrome in the emergency department, with a view to the solvent resolution of possible complications
- Management of the procedures and care required by the patient under cardiovascular critical care
- Innovative guidelines for the treatment of acute cardiac pathology
- All of this will be complemented by theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection
- Furthermore, you will be able to carry out a clinical internship in one of the best medical centers

*With this program, you will determine the necessary conditions to monitor a patient suffering from an Arrhythmia, applying the most updated scientific criteria"*

*Once you have finished your theoretical training, you will enjoy a 3 week internship program in a first level hospital center"*

*Complete this Hybrid Professional Master's Degree and become a leading professional in the field of cardiovascular critical care.*

*This program is an excellent tool to update your knowledge in the area of cardiovascular critical care, online and without giving up your daily tasks.*

In this proposal for a Professional Master's Degree, of a professionalizing nature and hybrid learning modality, the program is aimed at updating physicians specialized in Cardiology who perform their medical practice with patients in critical situations. The contents are based on the latest scientific evidence, and oriented in a didactic way to integrate theoretical knowledge in health practice, and the theoretical-practical elements will facilitate the updating of knowledge and allow decision making in patient management.

Thanks to its multimedia content elaborated with the latest educational technology, it will allow the medical professional to obtain a situated and contextual learning, that is to say, a simulated environment that will provide an immersive learning programmed to train in real situations. This program is designed around Problem-Based Learning, whereby he must try to solve the different professional practice situations that arise during the course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

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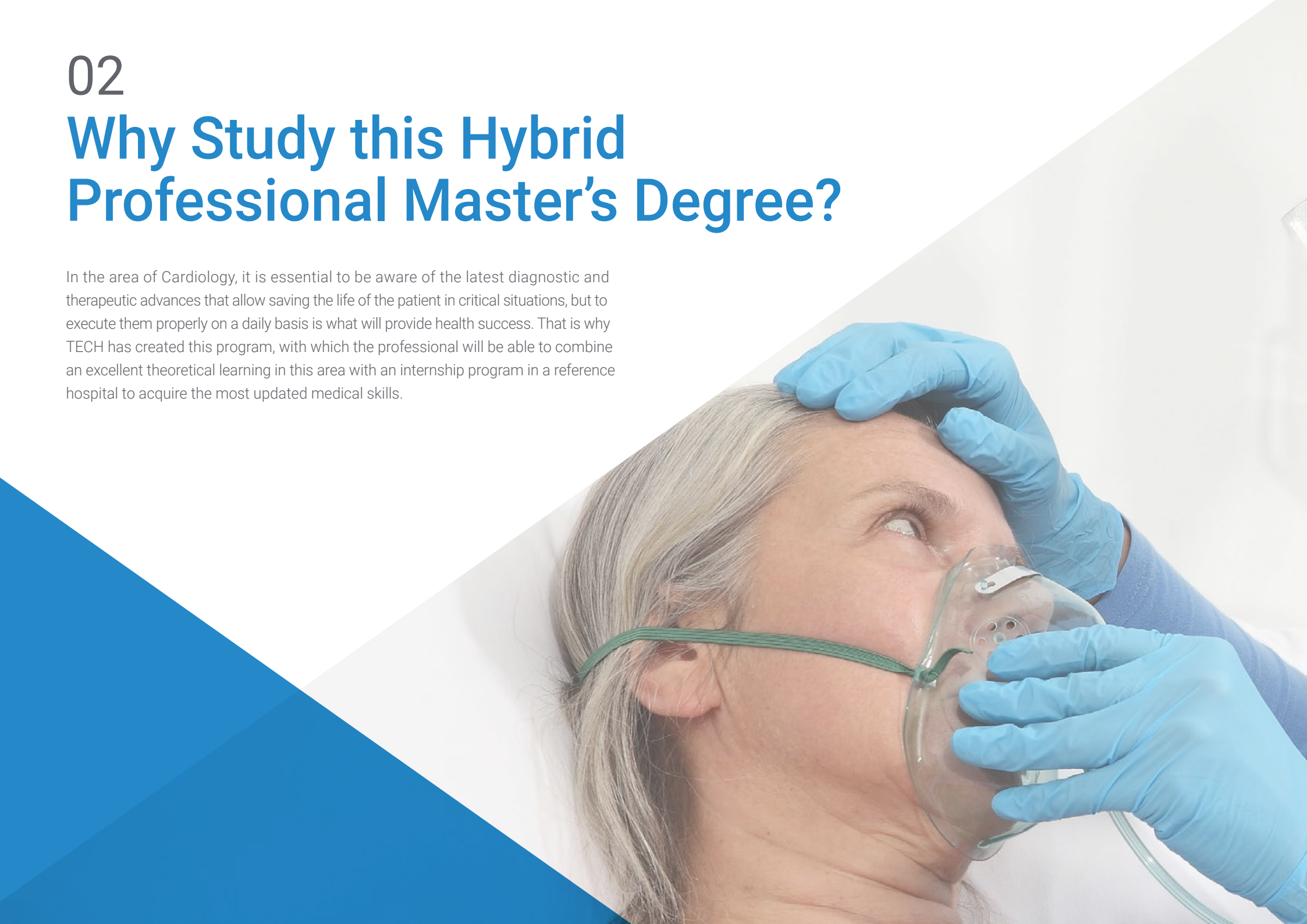
# Why Study this Hybrid Professional Master's Degree?

In the area of Cardiology, it is essential to be aware of the latest diagnostic and therapeutic advances that allow saving the life of the patient in critical situations, but to execute them properly on a daily basis is what will provide health success. That is why TECH has created this program, with which the professional will be able to combine an excellent theoretical learning in this area with an internship program in a reference hospital to acquire the most updated medical skills.



*TECH gives you the exclusive possibility of combining the best theoretical learning in the pedagogical panorama in cardiovascular critical care with a 3-week internship program in a prestigious hospital"*

### 1. Updating from the latest technology available

Cardiovascular critical care is constantly evolving in terms of drugs, diagnostic procedures and treatments that allow rapid intervention to save patients' lives. Therefore, this TECH Hybrid Professional Master's Degree will allow the physician to manage all these health innovations in a theoretical and practical way.

### 2. Gaining In-Depth Knowledge from the Experience of Top Specialists

In the theoretical period of this program, the didactic materials are elaborated by specialists who actively practice Cardiology, so the knowledge offered to the student will be completely updated. Additionally, in the internship program, they will join a team made up of great professionals in this field who will provide them with the most efficient skills on a daily basis.

### 3. Entering First-Class Clinical Environments

TECH carefully selects all the centers available for internships. Thanks to this, the specialist will have guaranteed access to a prestigious clinical environment in the field of cardiovascular critical care. In this way, they will be able to verify the work methodology in a demanding, rigorous and exhaustive area, always applying the latest theses and scientific postulates in their daily practice.

### 4. Combining the Best Theory with State-of-the-Art Practice

On many occasions, academic learning requires a lot of time, a high theoretical load and has a shortage of practical applicability. For this reason, TECH has created this program, which in only 12 months allows students to combine useful theoretical learning with a 3-week internship program in a prestigious hospital to broaden their skills in cardiovascular critical care.

### 5. Expanding the Boundaries of Knowledge

TECH offers the possibility to carry out the internship of this Hybrid Professional Master's Degree in prestigious hospitals. Therefore, the specialist will be able to catch up with professionals practicing in first class hospitals. A unique opportunity that only TECH, the largest online university in the world, could offer.

*You will have full practical immersion at the center of your choice"*

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# Objectives

The Hybrid Professional Master's Degree's Degree in Cardiovascular Critical Care in the Emergency Department has been designed to provide the cardiologist with the most up-to-date knowledge in dealing with this type of patient. Thanks to this program, they will be able to acquire the protocols for the administration of new drugs, the most advanced diagnostic techniques or the procedures to treat acute coronary diseases. To adapt the learning, a series of general and specific objectives have been established.

*This Hybrid Professional Master's Degree will provide you with the necessary tools to expand your skills in your medical specialty in a theoretical and practical way"*

## General Objective

- The general objective of the Hybrid Professional Master's Degree in Cardiovascular Critical Care in the Emergency Department is to allow the physician to update the diagnostic and therapeutic procedures of Cardiology by combining an extensive theoretical learning with aninternship program in a prestigious hospital center

*This academic program gives you the opportunity to update your knowledge in the treatment of arrhythmias for adult and pediatric patients"*

## Specific Objectives

### Module 1. Heart Failure and Cardiogenic Shock

- Explain the anatomical and functional alterations present in heart failure, as well as the echocardiographic manifestations corresponding to these pathophysiological alterations
- Correlate the metabolic alterations produced in heart failure and the influence that medical treatment has on them

### Module 2. Acute Coronary Syndrome (ACS) in Emergencies

- Describe the pathophysiological and anatomical alterations in coronary circulation which leads to the appearance and clinical manifestation of ischemic heart disease
- Master the recommendations collected in clinical practice guides in relation to the treatment of acute coronary syndrome
- Identify the possible complications existing in the context of acute coronary syndrome

### Module 3. Arrhythmias and Cardiac Pacing Devices: Diagnosis and Management in the Acute Phase

- Describe the types of tachycardia and their differential diagnosis based on the electrocardiogram characteristics findings
- Analyze the pharmacological and invasive treatment options and the scientific basis that supports each one
- Explain the expected and most frequent electrical alterations depending on the patient profile and the underlying cardiac or extracardiac pathology, as well as the types of bradyarrhythmias and their risk of progression to cardiac arrest due to asystole

### Module 4. Echocardiography in the Cardiovascular Critical Patient in the Emergency Department

- Master the echocardiographic planes and the structures to look out for in each one of them
- Detect the hemodynamic calculations based on echocardiographic Doppler technology and their importance in the cardiovascular critical patient
- Identify the most common expected findings in an echocardiogram in a patient in surgery or undergoing structural or coronary interventionism

### Module 5. Procedures and Techniques in a Patient in Cardiovascular Critical Care

- Know acute complications in patients with acute myocardial infarction
- Manage the indication of intubation and invasive and non-invasive mechanical ventilation in a cardiovascular critical patient
- Observe the hemodynamic and respiratory impact of each type of ventilation

### Module 6. Special Situations in a Patient in Cardiovascular Critical Care

- Identify the need for drainage in a pericardial effusion
- Know how balloon counterpulsation works and the indications and contraindications for its implantation
- Define the possible complications and the natural evolution of the patient undergoing cardiac surgery

### Module 7. Action Guides in Acute Cardiac Pathology

- Explain the echocardiographic and hemodynamic alterations present in patients with indications of emergency surgery for acute valvular disease
- Master the key aspects in the treatment of myocarditis, pericarditis and pericardial effusion

### Module 8. Non-Invasive Cardiac Imaging and Functional Tests

- Diagnose non-invasive cardiac problems from imaging
- Detect non-invasive cardiac disorders and manage their functional tests

### Module 9. Pulmonary Hypertension

- Assimilate the main reasons for pulmonary hypertension and its treatment process
- Delve into pulmonary processes and their respective treatments

### Module 10. General Basis of Arrhythmias in Fetal and Pediatric Age Group

- Analyze the main causes of arrhythmias in fetal age
- Manage treatments that improve neonatal arrhythmia problems
- Evaluate young patients and perform a cardiac analysis

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# Skills

After completing the Hybrid Professional Master's Degree in Cardiovascular Critical Care in the Emergency Department, the physician will have high professional skills that will allow them to significantly improve their treatment of patients, mastering the most up-to-date diagnostic and therapeutic methods in this area.

*Thanks to this program, you will be able to handle the latest vasoactive substances and their administration mechanisms for the critically ill patient"*

## General Skills

- Apply acquired knowledge and clinical practice guidelines in the diagnosis and treatment of acute cardiac pathology
- Relate clinical findings to the underlying pathophysiology that causes them
- Choose the best treatment strategy in situations where the clinical problem does not conform to clinical practice guidelines
- Be aware of the possible complications that can arise from performing techniques in cardiovascular critical patients, and anticipate the possible occurrence of such complications

*Through this program, you will expand your skills in cardiovascular critical care to provide first-rate service to each of your patients"*

## Specific Skills

- Create an appropriate treatment plan for a patient with acute pulmonary edema and accurately evaluate the response to said treatment and adapt decision-making accordingly
- Differentiate the different types of shock of the cardiogenic profile
- Manage the main vasoactive drugs and adjust the administration of each one according to the indication based on the patient's situation
- Establish the indication of the need for circulatory support and choose the appropriate one according to the patient's profile
- Accurately diagnose the patient's acute coronary event profile
- Establish a treatment strategy that is most appropriate for the type of coronary event suffered by the patient
- Anticipate and appropriately deal with possible complications that can present themselves in the context of acute coronary syndrome
- Make a diagnosis of type of arrhythmia that a patient has, on the basis of electrocardiographic findings
- Correctly indicate the need for monitoring a patient with a rhythm disorder based on the possibility of it progressing to a more serious alteration
- Determine the need for transient or permanent cardiac pacing in a patient with bradycardia
- Identify the steps for implanting a transient pacemaker in a patient requiring urgent or temporary pacing
- Modify the programming of a pacemaker and defibrillator in preparation for an MRI or a surgical procedure
- Consult the programming of a pacemaker and defibrillator and identify if its operation is correct
- Acquire echocardiographic plans of sufficient quality for the identification of structures and possible alterations
- Master the basic functions of an echocardiograph: two-dimensional, M-mode, color, pulsed and continuous Doppler
- Detect a pericardial effusion and establish the indication for percutaneous puncture to evacuate it
- Apply a systematic order to proceed with orotracheal intubation, pericardiocentesis and intra-aortic balloon counterpulsation implantation
- Plan and indicate the appropriate treatment in patients with myocarditis and pericarditis to prevent recurrences and to support possible mechanical complications
- Observe the possible postoperative complications in an echocardiogram
- Evaluate the severity of a pericardial effusion and its hemodynamic consequences
- Establish the indication for a pericardial effusion

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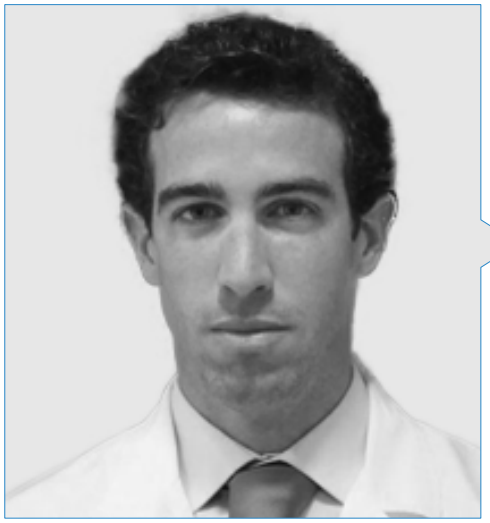
# Course Management

With the premise of offering a quality program to its students, this Hybrid Professional Master's Degree of TECH has a teaching staff made up of the best specialists in Cardiology, who have experience in dealing with the critically ill patient. These doctors are responsible for developing all the teaching resources to which the student will have access throughout the program, so that the knowledge they will provide will have been previously applied in their professional experiences.

*The best professionals in Medicine, specialized in Cardiology, are responsible for developing the didactic resources that you will access in this program"*

## Management



### Dr. Rodríguez Muñoz, Daniel

- Cardiologist, Arrhythmologist and Interventional Electrophysiologist at La Zarzuela University Hospital
- Cardiologist, Arrhythmologist and Interventional Electrophysiologist at the 12 de Octubre Hospital
- Doctorate in Health Sciences, University of Alcala
- Master's Degree in Pacemakers, Defibrillators and Cardiac Resynchronization by the University of Alcalá
- Master's Degree in Diagnostic and Therapeutic Cardiac Electrophysiology by CEU San Pablo University
- Level 2 accreditation for the practice of Interventional Electrophysiology
- Director and teaching collaborator of numerous courses and postgraduate training programs in Arrhythmias
- Member of the European Heart Arrhythmia Association (EHRA), Spanish Society of Cardiology (SEC), Section of Arrhythmias and Electrophysiology of the SEC

### Dr. Zamorano Gómez, José Luis

- Vice of the European Society of Cardiology
- Head of the Cardiology Department of the Ramón y Cajal Hospital
- Doctor of Medicine
- Executive Management and Health Resources in Esade, Madrid
- National Qualification Professor of Medicine
- Member of the First European Echocardiography Accreditation Committee of the European Association of Echocardiography
- Honorary Fellow American Society of Echocardiography
- Chairman of the Clinical Guidelines Committee of the European Society of Cardiology
- Chairman National Cardiovascular Panel FIS of the Carlos III Institute
- Associate Editor of the European Heart Journal Cardiovascular Imaging
- Author of more than 20 books, more than 500 articles in scientific journals and more than 400 communications to National and International Congresses
- Impact Factor > 1500. IH 84 and Citations > 40000
- Member of:Editorial Board of the Spanish Journal of Cardiology, Editorial Board of the European Journal of Echocardiography, Editorial Board of the American Society of Echocardiography, International Relations Task Force of the American Society of Echocardiography

## Professors

### Dr. Fernández-Golfín Lobán, Covadonga

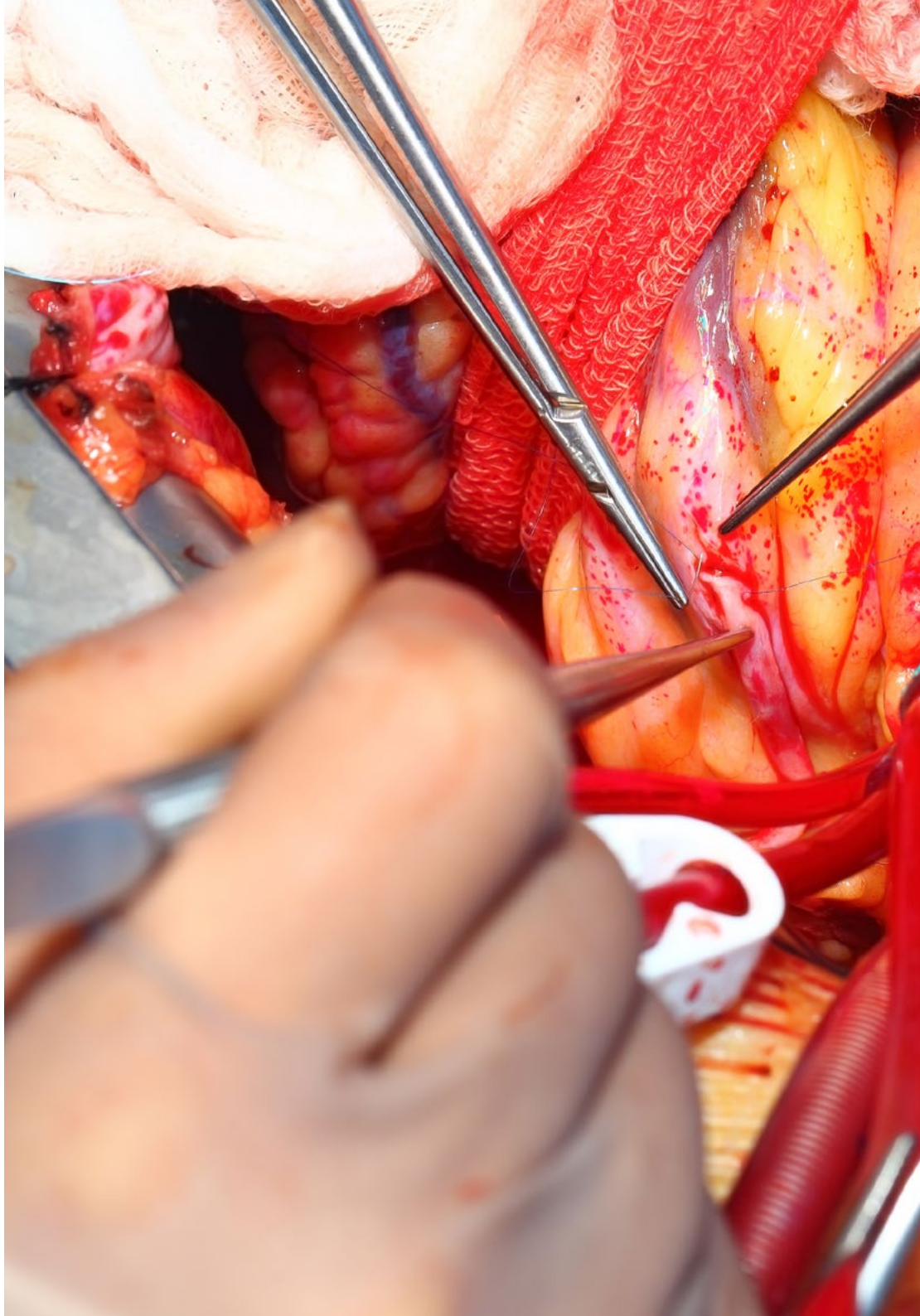
- Head of the Cardiac Imaging Section at Ramon y Cajal University Hospital
- Coordinator of the Cardiac Imaging Unit at Ramon y Cajal University Hospital
- Specialist in Cardiology at Sanitas La Zarzuela University Hospital
- Assistant Cardiology Physician in the Imaging Unit of the San Carlos Clinical Hospital
- Assistant Cardiology Physician at the Virgen de la Salud Hospital
- PhD in Health Sciences from the University of Alcalá
- Degree in Medicine from the Autonomous University Madrid
- Specialty Studies in Medicine at the Free University of Brussels
- Senior Management Program in Health Institutions at the University of Navarra

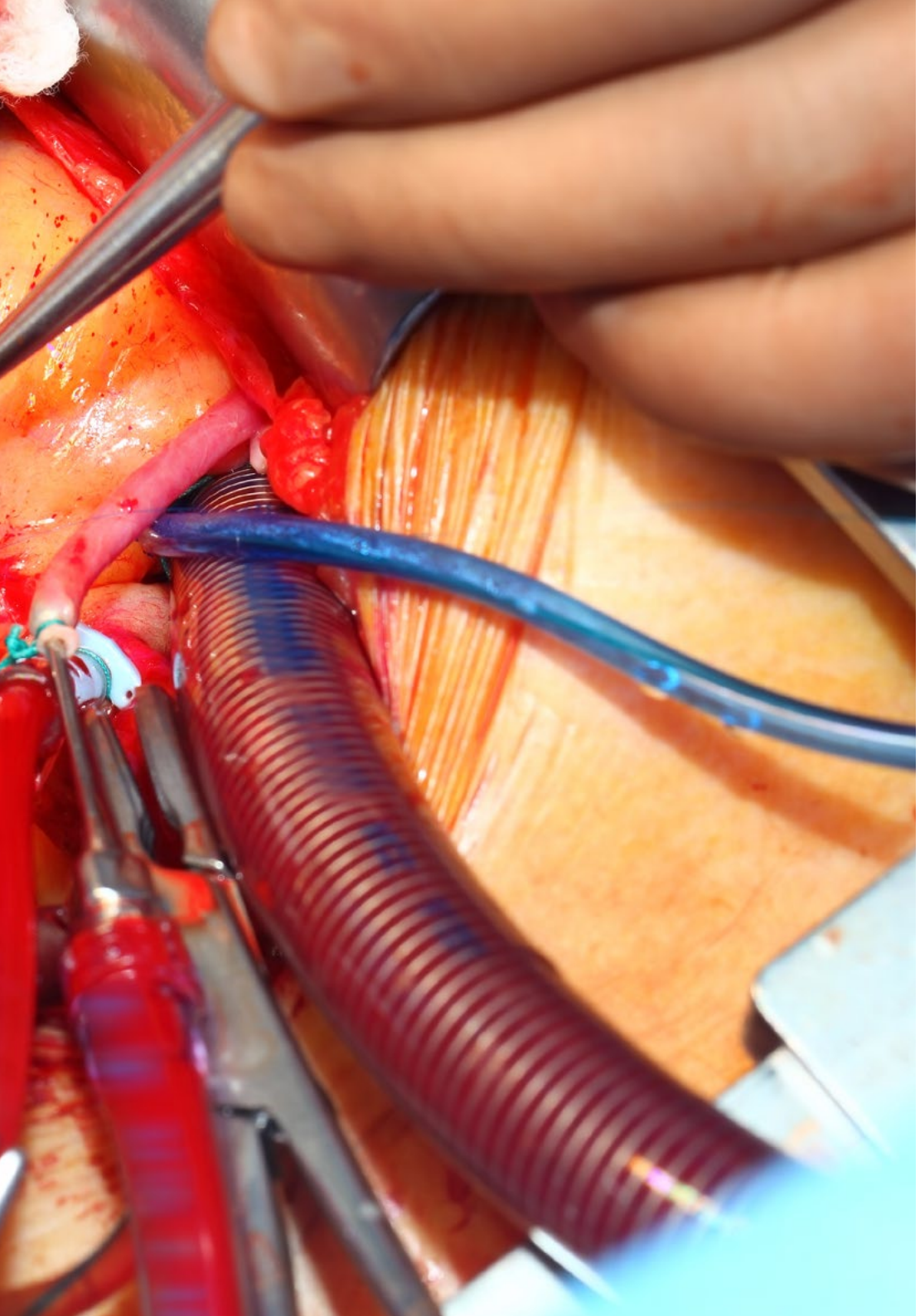
### Dr. Sionis Green, Alessandro

- Director of the Cardiac Intensive Care Unit in the Cardiology Department of La Santa Creu I Sant Pau Hospital
- Cardiology Physician
- Degree in Medicine and Surgery

### Dr. Sanmartín Fernández, Marcelo

- Head of the Acute Coronary Syndrome Section of the Ramón y Cajal University Hospital
- Cardiology Specialist
- Doctor of Medicine
- Degree in Medicine from the University of Rio de Janeiro
- Member of the Spanish Society of Cardiology







**Dr. Castillo Orive, Miguel**

- Faculty Area Specialist in Cardiology at the Ramón y Cajal Hospital
- Area Specialist in Cardiology at the San Francisco de Asís Sanatorium of Madrid
- Collaborating Professor of the University of Alcalá de Henares
- MIR Teacher
- Scientific Director of PROMIR
- Author of books: PROMIR: Cardiology, The 10 most asked topics in the MIR

*Leading cardiologists who are experts in dealing with critically ill patients will provide you with the best knowledge in this field"*

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# Educational Plan

The syllabus of this Hybrid Professional Master's Degree is composed of 10 modules through which students will expand their knowledge in the field of critical care for patients with various cardiovascular pathologies. The didactic contents to which they will have access during the duration of this program are present in a wide range of multimedia and textual formats that, added to the 100% online methodology offered, will facilitate the convenience and adaptation of learning to the needs of each student.

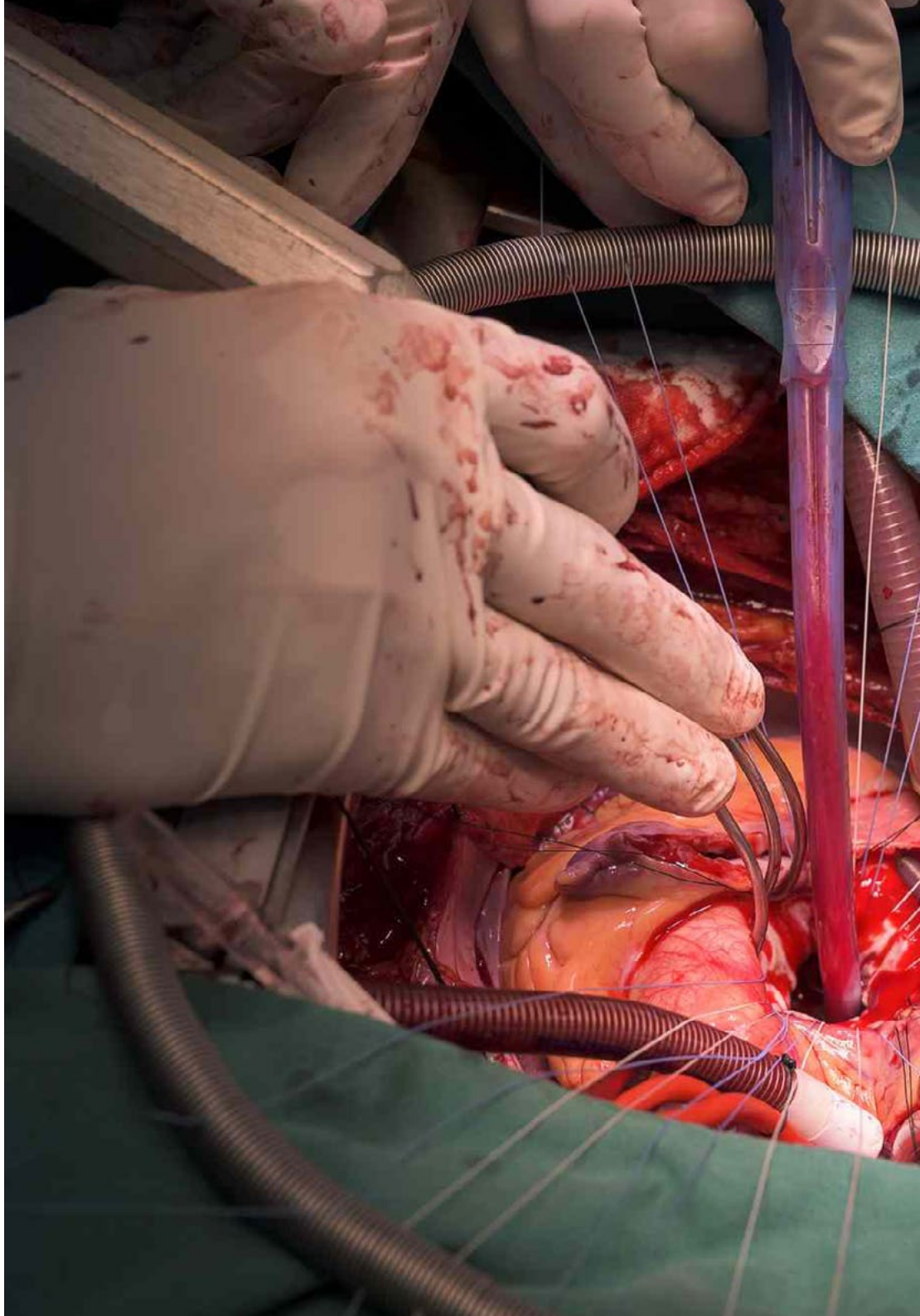
*The Relearning system characteristic of this program will allow you to adapt your learning to your own pace of study and your didactic needs"*

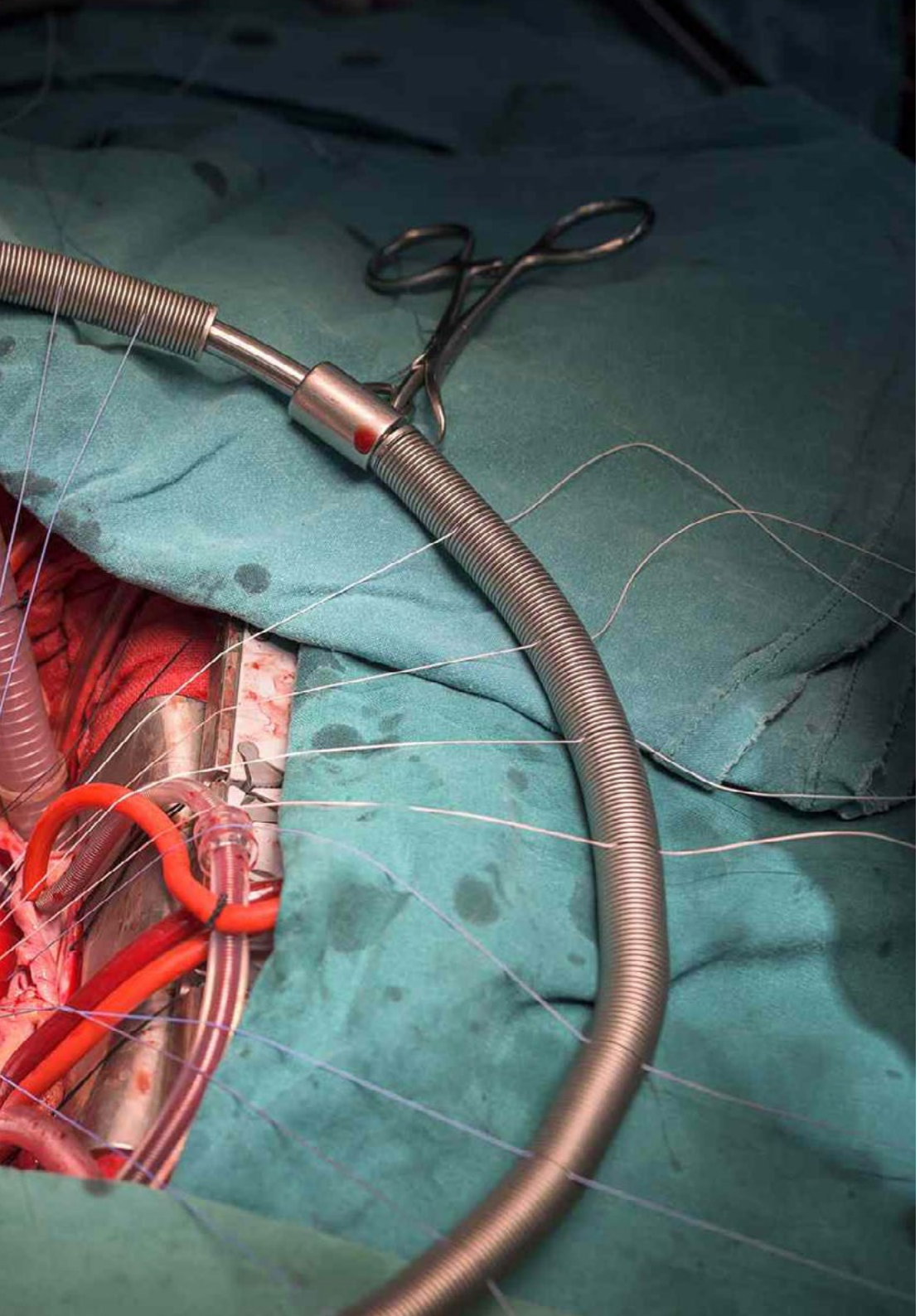
## **Module 1.** Heart Failure and Cardiogenic Shock

1.1. Underlying Pathology in Heart Failure
  1.1.1. Structural Alterations
    1.1.1.1. From Anatomy to Echocardiography
1.2. Physiological Alterations
  1.2.1. The Reason for Chronic Treatment and its Effect on Prognosis
1.3. Acute Pulmonary Edema
  1.3.1. Diagnostic and Prognostic Tools
  1.3.2. Acute Treatment and Adjustment of Chronic Treatment
1.4. Cardiogenic Shock
  1.4.1. Diagnostic and Prognostic Tools
    1.4.1.1. Differential Diagnosis of Shock
  1.4.2. Indication and Management of Vasoactive Drugs
  1.4.3. Indication and Management of Circulatory Assistances

## **Module 2.** Acute Coronary Syndrome (ACS) in Emergencies

2.1. The Underlying Pathology in Acute Coronary Syndrome
  2.1.1. Structural Alterations
    2.1.1.1. Ischemic Heart Disease
  2.1.2. Acute Coronary Syndrome without Evidence of Coronary Lesions
    2.1.2.1. The Reason for Chronic Treatment and its Effect on Prognosis
2.2. Non-ST-Segment-Elevation in ACS
  2.2.1. Acute Management
    2.2.1.1. Diagnosis
    2.2.1.2. Treatment in the First 24 Hours
2.3. Expected Complications and Chronic Treatment in NSTEACS
2.4. ST-Segment-Elevation ACS
  2.4.1. Acute Management
    2.4.1.1. Diagnosis
    2.4.1.2. Treatment in the First 24 Hours
  2.4.2. Expected Complications and Chronic Treatment







## **Module 3.** Arrhythmias and Cardiac Pacing Devices: Diagnosis and Management in the Acute Phase

3.1. Supraventricular Tachyarrhythmias
- 3.1.1. Common and Atypical Atrial Flutter
- 3.1.2. Atrial Fibrillation
- 3.1.3. Paroxysmal Supraventricular Tachycardias

3.2. Ventricular Tachyarrhythmias
- 3.2.1. Ventricular Tachycardia in Ischemic Patients
- 3.2.2. Ventricular Tachycardias in Non-Ischemic Patients
- 3.2.3. Idiopathic Ventricular Tachycardia
- 3.2.4. Polymorphic Ventricular Tachycardia and Ventricular Fibrillation

3.3. Bradyarrhythmias
- 3.3.1. Sinus Dysfunction
- 3.3.2. Atrioventricular Conduction Disorders

3.4. ST-Segment-Elevation ACS

## **Module 4.** Echocardiography in the Cardiovascular Critical Patient in the Emergency Department

4.1. Basic Skills in Echocardiography
- 4.1.1. Echocardiographic Planes
- 4.1.2. Limitations in the Acute Context
- 4.1.3. Hemodynamic Calculations

4.2. Special Situations
- 4.2.1. Echocardiograms in the Initial Evaluation of the Patient
  - 4.2.1.1. The Patient in Shock and the Echocardiogram as a Diagnostic Tool
- 4.2.2. Echocardiogram in the Hemodynamic Laboratory
- 4.2.3. Echocardiogram in Cardiac Surgery Operating Room
- 4.2.4. Acute Complications in Myocardio Infarction

## **Module 5.** Procedures and Techniques in a Patient in Cardiovascular Critical Care

5.1. Intubation and Invasive Mechanical Ventilation
- 5.1.1. Orotracheal Intubation
  - 5.1.1.1. Available Tools and Technique
- 5.1.2. Mechanical Ventilation
  - 5.1.2.1. Forms of Ventilation
  - 5.1.2.2. Adjustment Depending on the Hemodynamic and Respiratory Situation of the Patient

5.2. Pericardiocentesis
- 5.2.1. Indications
- 5.2.2. Technique
- 5.2.3. Alternatives to Pericardial Drainage

5.3. Arterial and Central Venous Cannulation
- 5.3.1. Indications
- 5.3.2. Technique

5.4. Counterpulsation Balloon
- 5.4.1. Indications
- 5.4.2. Implantation Technique

5.5. Transient Pacemaker
- 5.5.1. Indications
- 5.5.2. Implantation Technique

## **Module 6.** Special Situations in a Patient in Cardiovascular Critical Care

6.1. The Patient Before, During and After Cardiac Surgery
- 6.1.1. Aspects to Look Out For
- 6.1.2. Evolution
- 6.1.3. Expected Complications
- 6.1.4. Vascular Surgery Indications
- 6.1.5. Emergency Coronary Surgery Indications

6.2. Acute Valvular Disease
- 6.2.1. Endocarditis
- 6.2.2. Other Indications of Emergency Surgery

6.3. Myocarditis
- 6.3.1. Certainties and Controversies in Acute Management

6.4. Percarditis, Pericardial Effusion and Cardiac Tamponade
- 6.4.1. Acute and Chronic Treatment Options in Pericarditis

## **Module 7.** Action Guides in Acute Cardiac Pathology

7.1. ST-Segment-Elevation ACS

7.2. Non-ST-Segment-Elevation ACS

7.3. Revascularization and DAPT

7.4. Heart Failure

7.5. Ventricular Arrhythmias and SCD - ICD Implantation Criteria

7.6. Syncope

## **Module 8.** Non-Invasive Cardiac Imaging and Functional Tests

8.1. General Basis of an Echocardiography Equipment

8.2. Transthoracic and Transesophageal Echocardiography

8.3. Cardiac CAT Scan

8.4. Magnetic Resonance

8.5. Functional Tests



## **Module 9.** Pulmonary Hypertension

9.1. Pediatric Pulmonary Hypertension: Epidemiology, Classification and Clinical Process
9.2. Diagnostic Protocol for Pediatric PHT Assessment of Functional Grade
9.3. Cardiac Catheterization in Pulmonary Hypertension Percutaneous Treatment
9.4. Specific Conventional Pharmacological Treatment of Pharmacological Treatment
9.5. Surgical Treatment of PHT Potts Shunt Lung Transplant

## **Module 10.** General Basis of Arrhythmias in Fetal and Pediatric Age Group

10.1. General Bases: Cellular and Cardiac Electrophysiology Anatomy and Embryology of the Conduction System Normal and Pathological ECG Changes During Development The Normal Patient With a Structurally Abnormal Heart
10.2. Canalopathies
10.3. Genetics of Arrhythmic Disorders
10.4. Preexcitation Clinical Management
10.5. Supraventricular Tachycardias I (AV reentry and intranodal)
10.6. Supraventricular Tachycardias II (focal atrial, reentrant and atrial fibrillation)
10.7. Ventricular Tachycardias
10.8. Bradycardias and Blockages
10.9. Invasive EPS, Endocavitary Recordings Equipment: Electroanatomical Mapping, RF Ablation, Cryoablation
10.10. Syncope and Sudden Death
10.11. Antiarrhythmic Pharmacology
10.12. Perioperative Arrhythmias
10.13. Temporary and Definitive Stimulation
10.14. IAD Defibrillation Test

07

# Clinical Internship

After the completion of the theoretical training, the student will have access to a 120-hour internship program in a prestigious hospital center where, surrounded by the best doctors, they will assimilate skills that will enrich their daily medical practice.

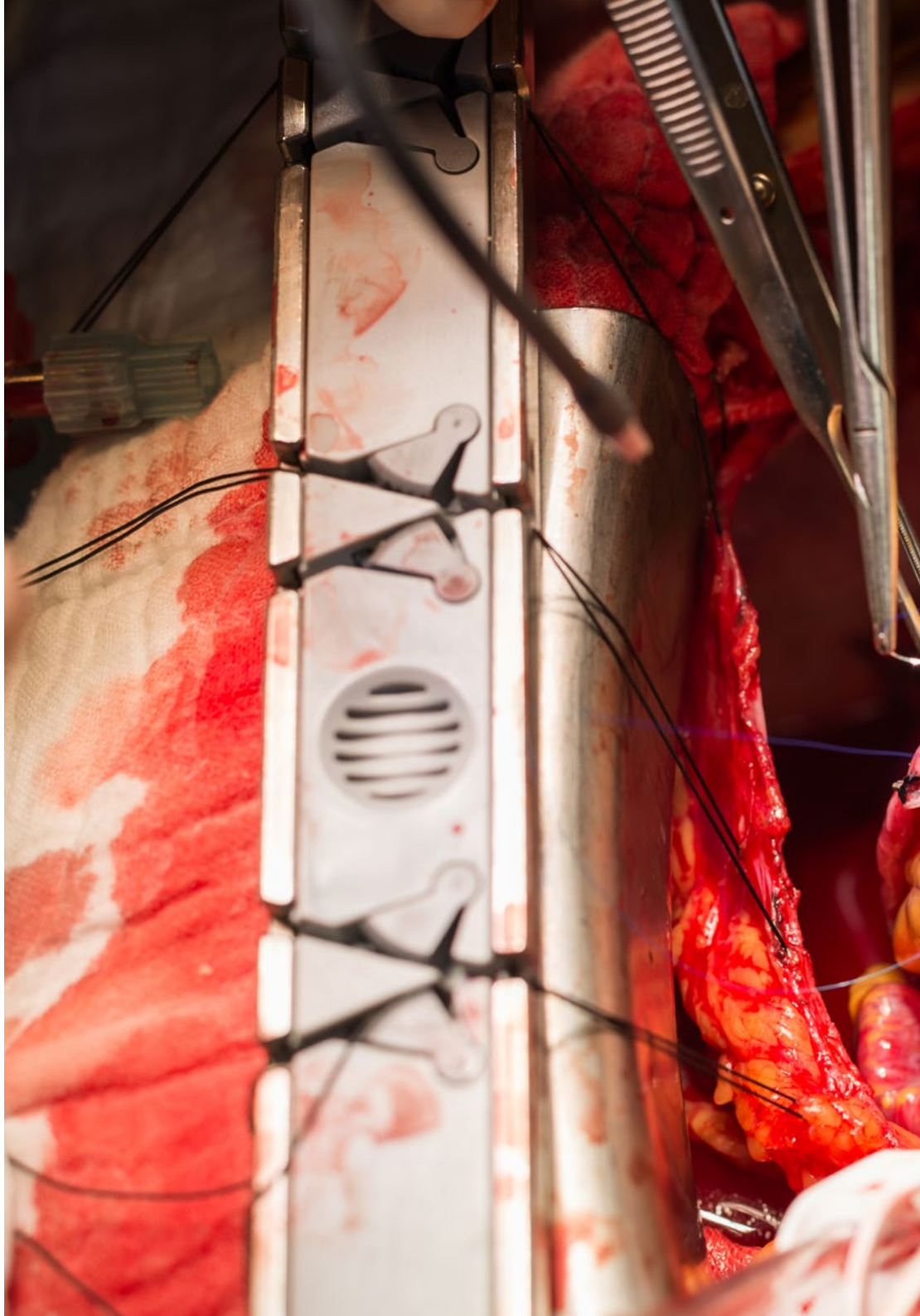
*Undertake your hospital internship in one of the best centers specialized in the treatment of cardiovascular patients"*

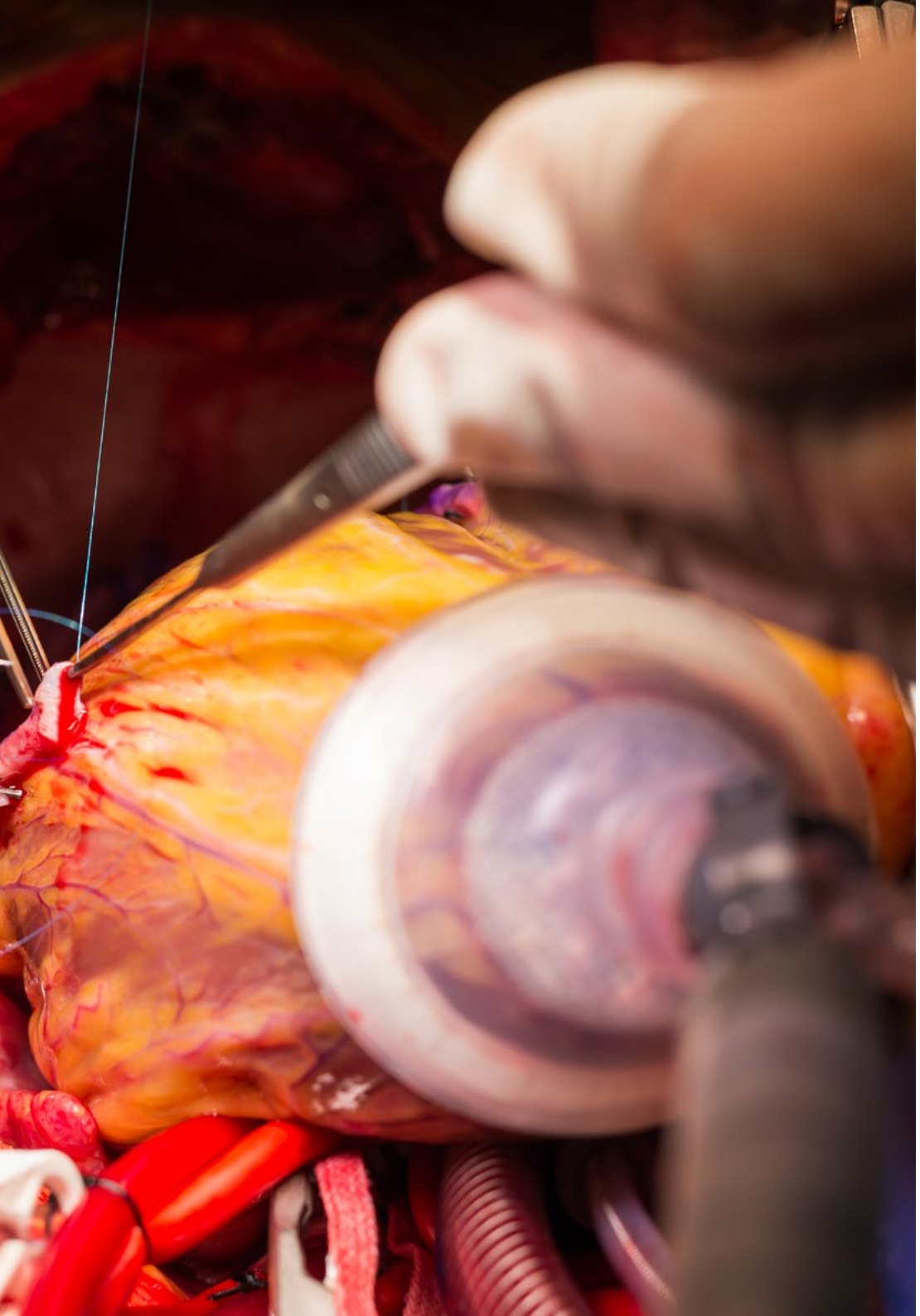
The internship program of the Hybrid Professional Master's Degree's Degree in Cardiovascular Critical Care in the Emergency Department includes a 3-week stay in a referral hospital center, from Monday to Friday, with 8-hour working days under the guidance of a specialist. Integrated in a multidisciplinary medical team, the student will deal with patients in need of cardiovascular critical care and will apply the most innovative therapy to ensure their well-being and preserve their life.

In this practical part, the activities are aimed at developing and perfecting the skills necessary for the provision of health care in areas and conditions that require a high level of qualification, and which are oriented towards specific training for the exercise of the activity, in an environment of patient safety and high professional performance.

It is, therefore, an excellent opportunity to develop high medical skills by working in a hospital, where the use of advanced diagnostic and therapeutic methods are essential to ensure the health of patients. Through this experience, the physician will enhance their health care skills to become a cutting-edge professional.

The practical part will be carried out with the active participation of the student performing the activities and procedures of each area of skill (learning to learn and learning to do), with the accompaniment and guidance of professors and other fellow trainees who facilitate teamwork and multidisciplinary integration as transversal skills for medical practice (learning to be and learning to relate)







The procedures described below will be the basis of the practical part of the training, and their implementation is subject to both the suitability of the patients and the availability of the center and its volume of work, the proposed activities being the following:

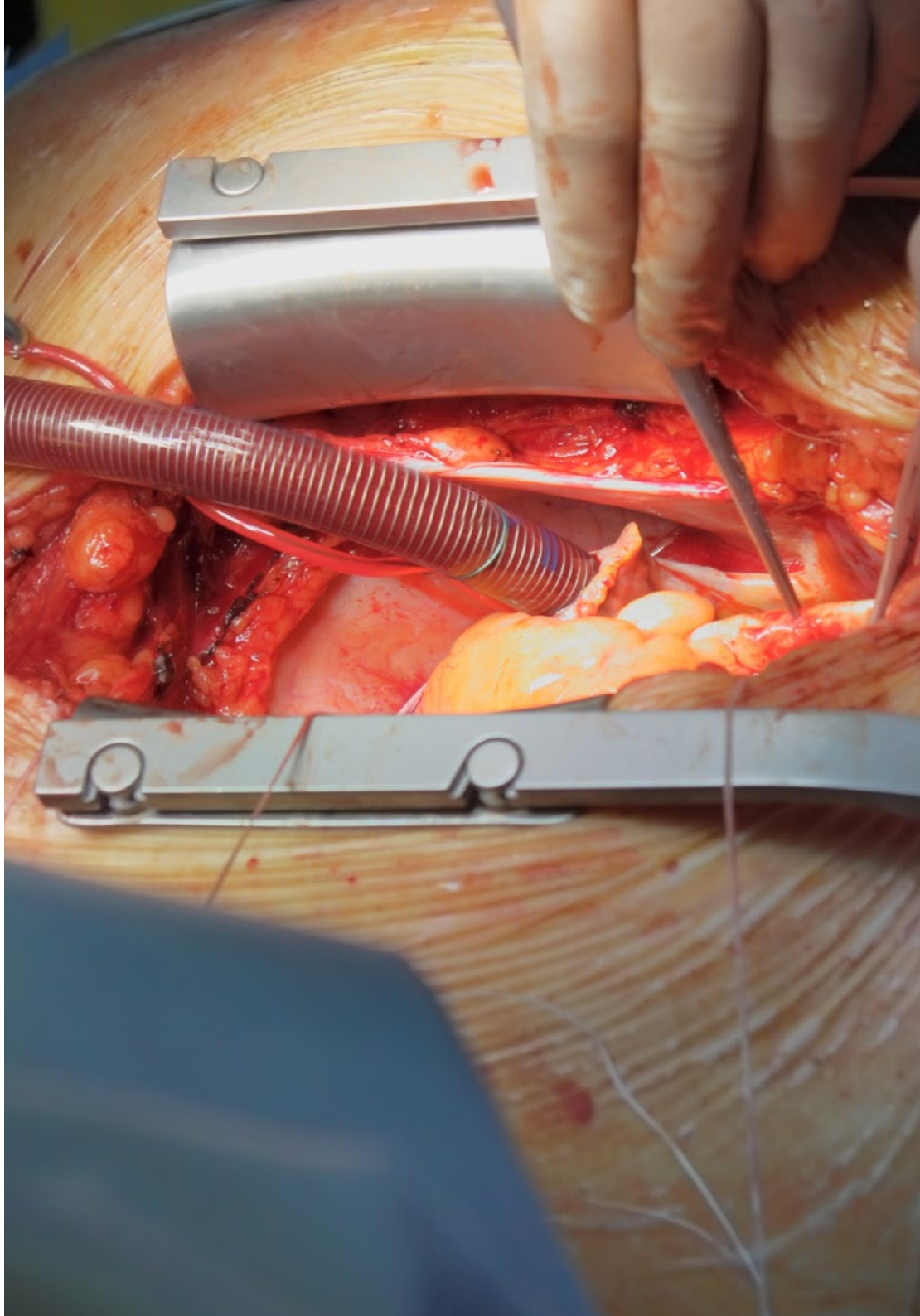
| Module | Practical Activity |
|---|---|
| Heart Failure, Cardiogenic Shock and Acute Coronary Syndrome | Prescribe a specific treatment for the patient presenting with acute pulmonary edema and evaluate their response to it in order to tailor decision making accordingly |
| | Administer vasoactive substances for the critical care patient who requires them |
| | Carry out the treatment strategy adapted to each type of coronary syndrome the patient experiences |
| Arrhythmias in adulthood, fetal and pediatric age | Diagnose, based on electrocardiographic findings, the type of arrhythmia in an adult patient |
| | Monitor a patient with arrhythmia who has a possibility of progression to a more severe disorder |
| | Perform an evaluation of the youngest patient to detect a possible arrhythmia and establish the appropriate treatment for it |
| Procedures andtechniques in a Patient in cardiovascular critical care | Consult the programming of a pacemaker and defibrillator to detect if its operation is appropriate |
| | Modify the programming of a pacemaker and defibrillator in preparation of an MRI or a surgical procedure |
| | Undertake mechanical ventilation of the patient to ensure adequate oxygen delivery |
| Pulmonary Hypertension | Diagnose possible pulmonary Hypertension in pediatric patients |
| | Pharmacological treatment of pulmonary Hypertension in the adult patient |
| | Carry out the health care and care for the patient who has undergone pulmonary transplantation |

## Civil Liability Insurance

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this entity commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical training period. That way professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.



## General Conditions for Practical Training

The general terms and conditions of the internship agreement for the program are as follows:

1. TUTOR: During the Hybrid Professional Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

2. DURATION: The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

3. ABSENCE: If the students does not show up on the start date of the Hybrid Professional Master's Degree, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

4. CERTIFICATION: Professionals who pass the Hybrid Professional Master's Degree will receive a certificate accrediting their stay at the center.

5. EMPLOYMENT RELATIONSHIP: The Hybrid Professional Master's Degree shall not constitute an employment relationship of any kind.

6. PRIOR EDUCATION: Some centers may require a certificate of prior education for the Hybrid Professional Master's Degree. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

7. DOES NOT INCLUDE: The Hybrid Professional Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

08

# Where Can I Do the Clinical Internship?

TECH has the utmost priority to ensure that the destination in which the student performs the internship is completely adapted to their needs, therefore it has chosen a large number of hospitals that have the latest technology and the best equipment for the treatment of patients requiring cardiovascular critical care.

*In order to preserve your comfort, TECH provides you with several hospital centers located in many different geographical locations to carry out your internship"*

The student will be able to complete the practical part of this Hybrid Professional Master's Degree at the following centers:

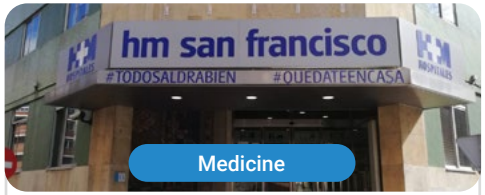

### Hospital HM Modelo

Country: Spain
City: La Coruña

Address: Rúa Virrey Osorio, 30, 15011, A Coruña

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Anaesthesiology and Resuscitation
- Palliative Care




### Hospital HM San Francisco

Country: Spain
City: León

Address: C. Marqueses de San Isidro, 11, 24004, León

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Update in Anesthesiology and Resuscitation
Trauma Nursing


### Hospital HM Regla

Country: Spain
City: León

Address: Calle Cardenal Landázuri, 2, 24003, León

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Update on Psychiatric Treatment in Minor Patients


### Hospital HM Nou Delfos

Country: Spain
City: Barcelona

Address: Avinguda de Vallcarca, 151, 08023 Barcelona

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Aesthetic Medicine
- Clinical Nutrition in Medicine


### Hospital HM Madrid

Country: Spain
City: Madrid

Address: Pl. del Conde del Valle de Súchil, 16, 28015, Madrid

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Palliative Care
- Anaesthesiology and Resuscitation


### Hospital HM Montepríncipe

Country: Spain
City: Madrid

Address: Av. de Montepríncipe, 25, 28660, Boadilla del Monte, Madrid

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Palliative Care
- Aesthetic Medicine


### Hospital HM Torrelodones

Country: Spain
City: Madrid

Address: Av. Castillo Olivares, s/n, 28250, Torrelodones, Madrid

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Anaesthesiology and Resuscitation
- Palliative Care


### Hospital HM Sanchinarro

Country: Spain
City: Madrid

Address: Calle de Oña, 10, 28050, Madrid

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Anaesthesiology and Resuscitation
- Palliative Care



Medicine

## Hospital HM Puerta del Sur

Country
Spain

City
Madrid

Address: Av. Carlos V, 70, 28938, Móstoles, Madrid

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Palliative Care
- Clinical Ophthalmology

Medicine

## Hospital HM Vallés

Country
Spain

City
Madrid

Address: Calle Santiago, 14, 28801, Alcalá de Henares, Madrid

Network of private clinics, hospitals and private specialized centers distributed throughout Spain

**Related internship programs:**
- Gynecologic Oncology
- Clinical Ophthalmology

09

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

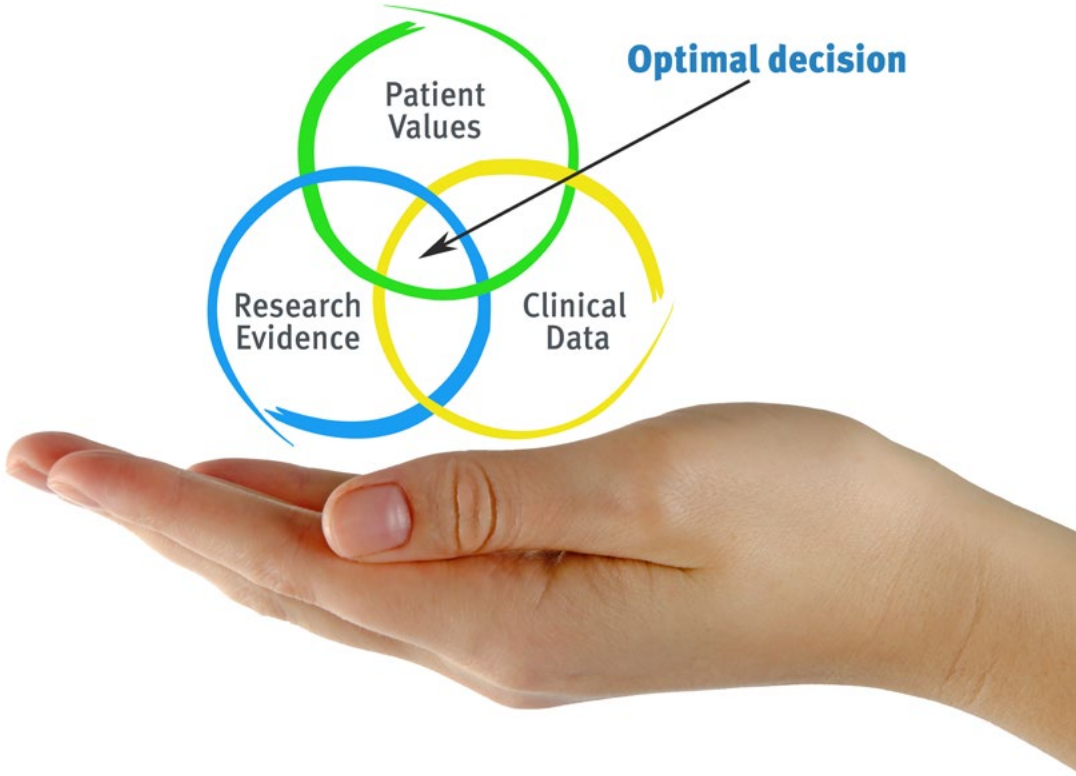
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.*




According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician's professional practice.

*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"*

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

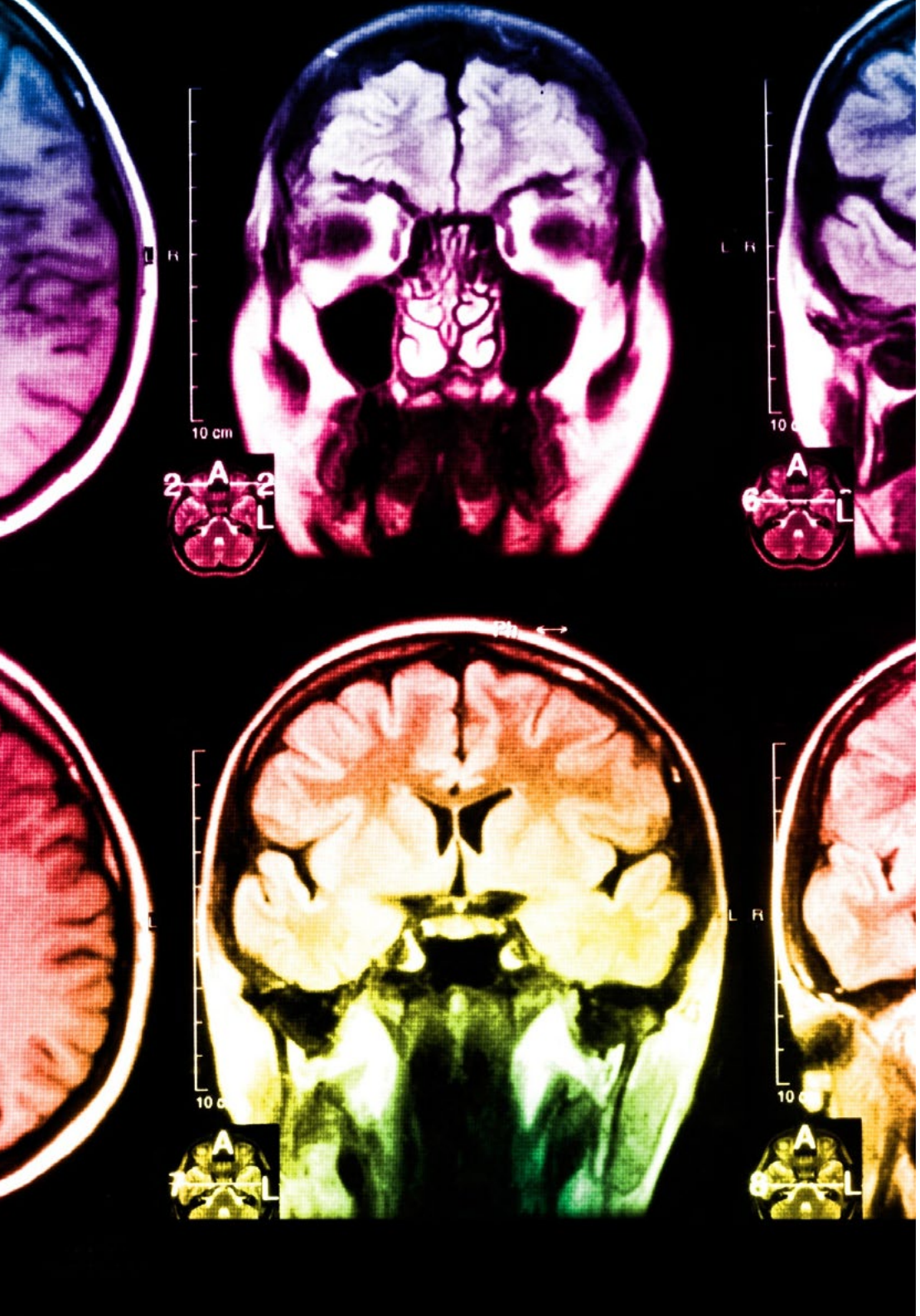
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better 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.

## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

*Professionals will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

*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.*

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.

**This program offers the best educational material, prepared with professionals in mind:**

### 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.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

### Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.

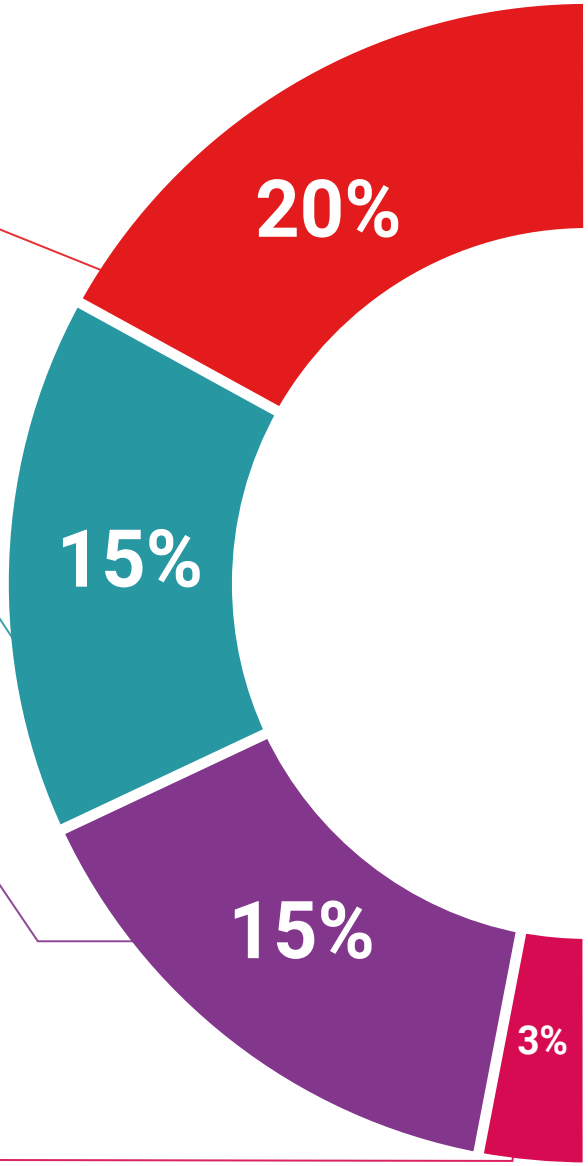
### Interactive Summaries

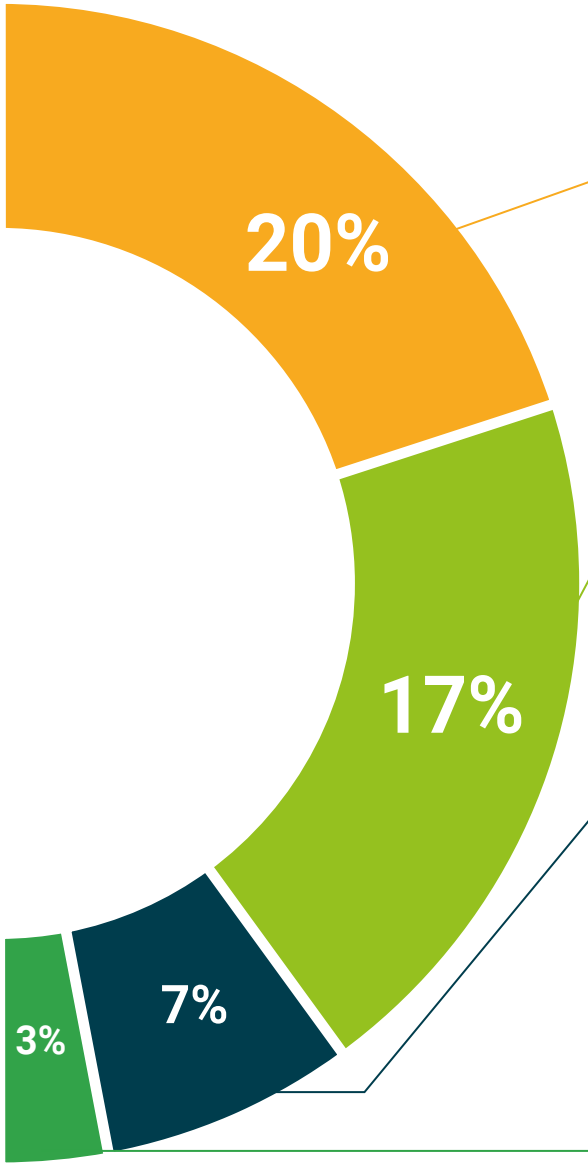
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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

### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.






### Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.

### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

### Classes

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in 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.

10

# Certificate

The Hybrid Professional Master's Degree in Cardiovascular Critical Care in the Emergency Department guarantees, in addition to the most rigorous and up-to-date qualification, access to a Hybrid Professional Master's Degree issued by TECH Technological University.

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

This **Hybrid Professional Master's Degree in Critical Care in the Emergency Department** contains the most complete and up-to-date program on the professional and academic field.

After the student has passed the assessments, they will receive their corresponding Hybrid Professional Master's Degree diploma issued by TECH Technological University via tracked delivery*.

In addition to the diploma, students will be able to obtain an academic transcript, as well as a certificate outlining the contents of the program. In order to do so, students should contact their academic advisor, who will provide them with all the necessary information.

Title: **Hybrid Professional Master's Degree in ACritical Care in the Emergency Department**

Course Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Certificate: **TECH Technological University**

Teaching Hours: **1,620 hours.**

tech technological university

Awards the following

DIPLOMA

to

Mr./Ms. _____, with identification number _____.

For having successfully passed and accredited the following program

HYBRID PROFESSIONAL MASTER'S DEGREE

in

Cardiovascular Critical Care in the Emergency Department

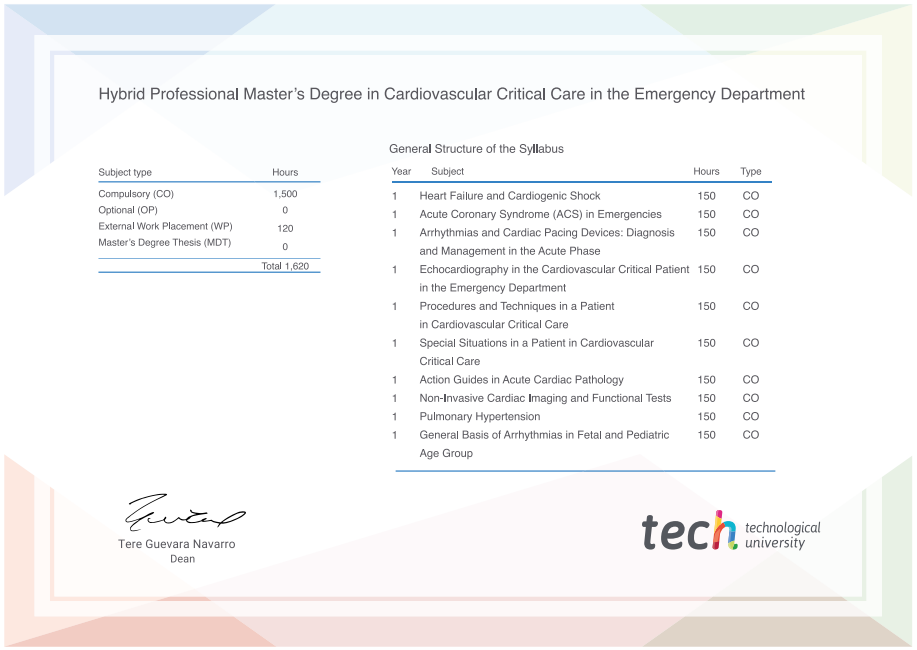
This is a qualification awarded by this University, with a duration of 1,620 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates



Hybrid Professional Master's Degree in Cardiovascular Critical Care in the Emergency Department

| Subject type | Hours |
|---|---|
| Compulsory (CO) | 1,500 |
| Optional (OP) | 0 |
| External Work Placement (WP) | 120 |
| Master's Degree Thesis (MDT) | 0 |
| | Total 1,620 |

General Structure of the Syllabus

| Year | Subject | Hours | Type |
|---|---|---|---|
| 1 | Heart Failure and Cardiogenic Shock | 150 | CO |
| 1 | Acute Coronary Syndrome (ACS) in Emergencies | 150 | CO |
| 1 | Arrhythmias and Cardiac Pacing Devices: Diagnosis and Management in the Acute Phase | 150 | CO |
| 1 | Echocardiography in the Cardiovascular Critical Patient in the Emergency Department | 150 | CO |
| 1 | Procedures and Techniques in a Patient in Cardiovascular Critical Care | 150 | CO |
| 1 | Special Situations in a Patient in Cardiovascular Critical Care | 150 | CO |
| 1 | Action Guides in Acute Cardiac Pathology | 150 | CO |
| 1 | Non-Invasive Cardiac Imaging and Functional Tests | 150 | CO |
| 1 | Pulmonary Hypertension | 150 | CO |
| 1 | General Basis of Arrhythmias in Fetal and Pediatric Age Group | 150 | CO |

Tere Guevara Navarro
Dean

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

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# Hybrid Professional Master's Degree

## Cardiovascular Critical Care in the Emergency Department

Course Modality: **Hybrid (Online + Clinical Internship)**
Duration: **12 months**
Certificate: **TECH Technological University**
Teaching Hours: **1,620 h.**

# Hybrid Professional Master's Degree

## Cardiovascular Critical Care in the Emergency Department

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