

Postgraduate Diploma

Clinical Imaging in Respiratory
and Cardiovascular Pathology
in Emergency and Critical Care



Postgraduate Diploma

Clinical Imaging in Respiratory
and Cardiovascular Pathology
in Emergency and Critical Care

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: www.techtute.com/in/medicine/postgraduate-diploma/postgraduate-diploma-clinical-imaging-respiratory-cardiovascular-pathology-emergency-critical-care

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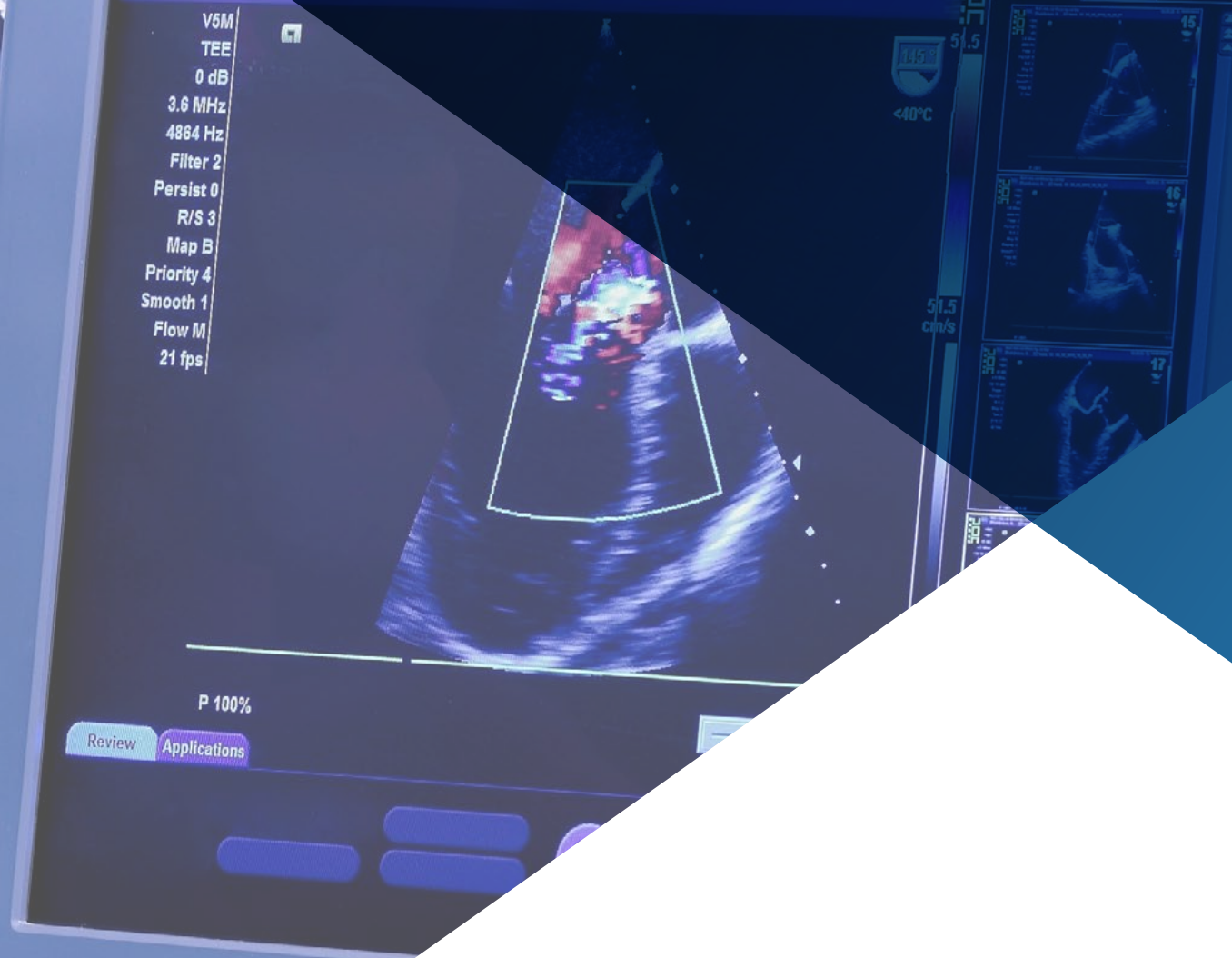
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01

Introduction

One of the main procedures in the field of emergency medicine is that of clinical imaging, since it largely defines the protocol to be followed. Similarly, when talking specifically about problems attributed to the lungs and cardiovascular system, it is vitally important to identify the problem and the most effective way to do this is through imaging. That is why, in this program, the medical professional will update their knowledge in the handling of medical equipment, techniques and procedures to be followed.





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Improve your knowledge through this program, where you will find the best didactic material with real clinical cases. Learn about the latest advances in the specialty to be able to provide excellent medical care"

Emergency and critical care clinicians and radiologists must know the indications and practical usefulness of imaging techniques, and know how to interpret the information derived from them, even more so when it is to do with a respiratory problem.

These updates will help the practitioner to respond to patients presenting upper torso complications. This is a 100% online program that will provide innovative information to medical professionals, so that they will be aware of all the latest innovations.

Compared to other programs in the education sector, this program is tailored to the needs of professionals, since it does not require travel or cumbersome procedures. Another advantage of this program is that the professional will be able to take it from the comfort of their home or from the place that best suits them, as they will only need a mobile device with an internet connection.

The **Postgraduate Diploma in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ More than 75 clinical cases presented by experts in clinical imaging
- ♦ 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
- ♦ Diagnostic and therapeutic developments in assessment, diagnosis and intervention in Clinical Imaging for Emergency and Critical Care
- ♦ Practical exercises where the self-evaluation process can be carried out to improve learning
- ♦ Clinical iconography and diagnostic image tests
- ♦ An algorithm-based interactive learning system for decision-making in the clinical situations presented throughout the course
- ♦ Special emphasis on evidence-based medicine and clinical imaging research methodologies in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care
- ♦ 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



Increase your skills in the approach to Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care through this Postgraduate Diploma"



This Postgraduate Diploma may be the best investment you can make when selecting a refresher program, for two reasons: in addition to updating your knowledge in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care, you will obtain a Postgraduate Diploma from TECH Technological University"

The teaching staff includes professionals from the field of Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care who contribute their experience to this program, as well as renowned specialists from leading scientific societies.

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 academic experience programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the physician must try to solve the different professional practice situations that arise throughout the program. For this purpose, the physician will be assisted by an innovative interactive video system created by renowned and experienced experts in the field of Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care with extensive teaching experience.

Increase your decision-making confidence by updating your knowledge with this University Expert course.

Make the most of this opportunity to learn about the latest advances in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care and improve your patient care.



02 Objectives

The program in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care is aimed at enhancing the physician's performance and ability to diagnose and treat patients in emergency or intensive care situations.





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This refresher program will generate a sense of confidence when practising medicine, which will help you grow both personally and professionally”



General Objective

- The general objective of the program in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care is to complete the process of making clinical physicians and radiologists experts in the use of imaging techniques, allowing them to deal with emergency situations and critical patients, regardless of the environment in which they find themselves.



Make the most of the opportunity and take the step to get up to date on the latest developments in the management of Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care"



Specific Objectives

Module 1. Fundamental Diagnostic Imaging Techniques

- Describe the fundamental diagnostic imaging techniques
- Explain the parameters to consider in conventional radiology
- Explain the characteristics of image quality and artifacts in conventional radiology
- Define the parameters that guarantee patient safety
- Define the parameters that guarantee safety of professionals
- Define the physical principles involved in ultrasound imaging
- Establish an appropriate ultrasound sequence for each examination
- Explain the ultrasound modes
- Define the different types of ultrasound and their applications
- Describe the different ultrasound planes
- Explain the principles of echonavigation
- Define the physical principles involved in computerized tomography
- Define the physical principles involved in magnetic resonance
- Identify artifacts in magnetic resonance imaging
- Define the physical principles involved in digital angiography
- Define the material required for digital angiography
- Define the physical principles involved in nuclear medicine
- Describe the principles of radiation protection and radiopharmaceuticals

Module 2. Imaging in Acute Pathology of the Respiratory System

- ♦ Describe the use of imaging in acute pathology related to airway infections
- ♦ Describe the use of imaging in asthma, COPD, bronchiectasis
- ♦ Describe the use of imaging in airway trauma
- ♦ Describe the use of imaging in the emergency care of patients with foreign body aspiration
- ♦ Identify the different uses of imaging in the diagnosis of pulmonary infectious pathology
- ♦ Identify the different uses of imaging in the diagnosis of pulmonary hemorrhagic pathology
- ♦ Identify the different uses of imaging in the diagnosis of barotrauma and contusion
- ♦ Identify the different uses of imaging in the diagnosis of emergency care for inhalation toxics

Module 3. Imaging in Acute Pathology of the Cardiovascular System

- ♦ Describe the use of imaging in acute mediastinal pathology
- ♦ Describe the use of imaging in acute esophageal pathology
- ♦ Describe the use of imaging in acute pathology of the pleura, chest wall and diaphragm
- ♦ Describe the use of imaging in the management of major respiratory syndromes
- ♦ Describe the use of imaging in the placement and testing of tubes, catheters and drains
- ♦ Describe the use of imaging in acute myocardial pathology
- ♦ Describe the use of imaging in acute pericardial pathology
- ♦ Describe the use of imaging in acute aortic syndrome
- ♦ Describe the use of imaging in emergency care in heart failure
- ♦ Describe the use of imaging in emergency care in thromboembolic disease
- ♦ Describe the use of imaging in shock and cardiac arrest

03

Course Management

The program's teaching staff includes leading specialists in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care who contribute their years of work experience to this program. Additionally, other recognized specialists participate in its design and preparation, which means that the program is developed in an interdisciplinary manner.



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Learn the latest advances in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care procedures from leading professionals”

International Guest Director

Dr. Hamid Shokoohi is one of the leading international figures in the scientific study of emergency and critical care ultrasound. His extensive career has led him to practice as an **attending physician in the Emergency Department of the Massachusetts General Hospital** and to be in charge of the direction of the **Emergency Ultrasound study areas and the Ultrasound Ultrasound division** of this same first level health space.

With more than 150 publications in high impact journals, Shokoohi has become one of the most prestigious specialists in **clinical ultrasound**. His presence at national and international congresses raises the level of competence of the rest of the attending professionals and attracts numerous experts in his field.

As a result of his excellent research work, he has been recognized by organizations such as the AEUS, which has awarded him the **Titan in Research Award or the Teaching Excellence Award** for his academic and research contribution. In addition, he directs the MGH Emergency Ultrasound Fellowship Program, which was also awarded the Stellar Clinical Ultrasound Fellowship Program Award.

The clinical use of ultrasound in the care of patients with shock and respiratory distress, the safety and efficacy of ultrasound-guided procedures are some of the fields in which he has set his study. At the same time, his interest in innovation has led him to seek innovative applications for ultrasound or the use of AI in these devices.

Likewise, in his professional career, high-level education has been part of his daily life. In this regard, Hamid Shokoohi is an Associate Professor of Emergency Medicine at Harvard University and GWU. This superb professional encourages the creation of specific training for physicians to improve their diagnostic skills and abilities.



Dr. Shokoohi, Hamid

- Médico adjunto de Urgencias del Massachusetts General Hospital
- Attending physician in the Emergency Department at Massachusetts General Hospital
- Attending Physician Wound Care and Hyperbaric Medicine Center at GWU
- Attending Physician in Emergency Medicine at GWU
- Director of the Harvard Emergency Fellowship (Ultrasound Fellowship at MGB)
- Director of Emergency Ultrasound Research at Massachusetts General Hospital
- Director of International Clinical Ultrasound at Massachusetts General Hospital
- Associate Director, Division of Ultrasound Ultrasound at Massachusetts General Hospital
- Councilor of the Executive Board of the Society of Clinical Ultrasound Fellowships (SCUF)
- Chair of the SAEM Academic Professional Development Task Force.
- Member of: SCUF Education Committee Society of Clinical Ultrasound Fellowships, American College of Emergency Physicians, American Institute of Ultrasound in Medicine, American Registry of Diagnostic Medical Sonography.



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

Management



Dr. Álvarez Fernández, Jesús Andrés

- ♦ Attending Physician of Intensive Care Medicine and Major Burns Unit. Getafe University Hospital
- ♦ Degree in Medicine and Surgery
- ♦ Specialist in Intensive Care Medicine
- ♦ Doctor of Medicine (PhD)
- ♦ Attending Physician of Intensive Care Medicine and Major Burns Unit. Getafe University Hospital. Getafe, Madrid
- ♦ Creator and Director of the Fundamentals of Ultrasonography Course Program - FUS Courses
- ♦ Founding Member of the Ecoclub of SOMIAMA
- ♦ Collaborating Professor of SOCANECO

Professors

Dr. Benito Vales, Salvador

- ♦ Head of Emeritus Service. Emergency Department. Santa Cruz and San Pablo Hospital Barcelona
- ♦ Specialist in Internal Medicine and Intensive Medicine
- ♦ Professor of Medicine Autonomous University of Barcelona – UAB

Dr. Martínez Crespo, Javier

- ♦ Radiodiagnosis Specialist at the Radiodiagnostic Department, Getafe University Hospital
- ♦ Radiodiagnostic Service
- ♦ Getafe University Hospital. Getafe, Madrid
- ♦ Associate Professor at the European University of Madrid

Dr. Costa Subias, Joaquín

- ♦ Radiodiagnosis Specialist
- ♦ Degree in Medicine (MD)
- ♦ Head of the Radiodiagnostics Department Getafe University Hospital. Madrid
- ♦ Associate Professor at the European University of Madrid

Dr. Angulo Cuesta, Javier

- ♦ Specialist in Urology
- ♦ Degree in Medicine (MD) and PhD in Medicine
- ♦ Urology Department. Getafe University Hospital. Madrid
- ♦ Professor at the European University of Madrid



Dr. Turbau Valls, Miquel

- ♦ Specialist in Internal Medicine
- ♦ Degree in Medicine (MD)
- ♦ Emergency Department. Santa Creu and Sant Pau University Hospital Barcelona

Dr. Moliné Pareja, Antoni

- ♦ Degree in Medicine (MD)
- ♦ Specialist in Internal Medicine
- ♦ Emergency Department. Santa Creu and Sant Pau University Hospital Barcelona

Dr. León Ledesma, Raquel

- ♦ Degree in Medicine (MD)
- ♦ Specialist in Obstetrics and Gynecology and in General and Digestive Surgery
- ♦ General and Digestive System Surgery Department. Getafe University Hospital. Madrid

Dr. Jiménez Ruiz, Ahgiel

- ♦ Medical Surgeon
- ♦ Specialist in Medical and Surgical Emergencies and Critical Medicine
Fellow in Renal Transplants
- ♦ Emergency Department. 25 IMSS Regional General Hospital. Mexico City, Mexico

Dr. Igeño Cano, José Carlos

- ♦ Head of the Emergency and Intensive Care Unit
- ♦ San Juan de Dios Hospital. Córdoba

Mr. Soria Jerez, Juan Alfonso

- ♦ Degree in Radiology
- ♦ Specialist Technician in Radiodiagnosis
- ♦ Radiodiagnostic Service Getafe University Hospital. Madrid
- ♦ Secretary General of the Spanish Association of Radiology, Radiotherapy and Nuclear Medicine Technicians (AETR)

04

Structure and Content

The structure of the contents has been designed by a team of professionals from the best hospitals and universities in the country, who are aware of the relevance of up-to-date education to be able to intervene in clinical imaging in the diagnosis, treatment and monitoring of Respiratory and Cardiovascular Pathology in Emergency and Critical Care, and who are committed to quality teaching through new educational technologies.



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The Postgraduate Diploma in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care contains the most complete and up-to-date scientific program on the market”

Module 1. Fundamental Diagnostic Imaging Techniques

- 1.1. Conventional Radiology (CR)
 - 1.1.1. Physical Radiology
 - 1.1.2. X-ray Beam
 - 1.1.3. Analog Radiology
 - 1.1.4. Digital Radiology
 - 1.1.5. Image Quality and Artifacts
 - 1.1.6. Conventional Radiology Equipment
 - 1.1.7. Patient Safety
 - 1.1.8. Radiobiology and Radiological Protection
- 1.2. Ultrasound
 - 1.2.1. Physical Principles
 - 1.2.2. Image Formation in B Mode
 - 1.2.3. Transducers and Imaging
 - 1.2.4. Ultrasound Equipment
 - 1.2.5. Parameters Dependent on the Operator and Artifacts
 - 1.2.6. Quality and Safety for Patients in Ultrasound
- 1.3. Computed Tomography (CT)
 - 1.3.1. Physical Principles
 - 1.3.2. CT Equipment
 - 1.3.3. Image Acquisition
 - 1.3.4. Image Construction
 - 1.3.5. Quality
 - 1.3.6. Post-Process
 - 1.3.7. CT Patients Safety
 - 1.3.8. Radiological Protection in High Doses
- 1.4. Magnetic Resonance Imaging (MRI)
 - 1.4.1. Physical Principles
 - 1.4.2. Tissue Contrast
 - 1.4.3. MRI Equipment
 - 1.4.4. Obtaining an Image and its Formation
 - 1.4.5. Sequences
 - 1.4.6. Artefacts
 - 1.4.7. MRI Patients Safety
- 1.5. Digital Angiography
 - 1.5.1. Physical Principles
 - 1.5.2. Digital Angiography Equipment
 - 1.5.3. Materials and Contrast Media
 - 1.5.4. Acquisition and Construction of the Image
 - 1.5.5. Digital Subtraction, Masks and Road Map
 - 1.5.6. Radiological Protection in High Doses
- 1.6. Nuclear medicine
 - 1.6.1. Physical Principles
 - 1.6.2. Gamma Cameras
 - 1.6.3. PET and SPET Equipment
 - 1.6.4. Hybrid Equipment
 - 1.6.5. Image Quality and Acquisition
 - 1.6.6. Radiological Protections and Radiopharmacology



Module 2. Imaging in Acute Pathology of the Respiratory System

- 2.1. Upper Airway Pathology
 - 2.1.1. Upper Airway Infection
 - 2.1.2. Asthma, COPD, Bronchiectasis
 - 2.1.3. Airway Trauma: Laceration and Rupture
 - 2.1.4. Aspiration of Foreign Bodies
- 2.2. Pulmonary Pathology
 - 2.2.1. Infections
 - 2.2.2. Atelectasis and Bilateral White Hemithorax
 - 2.2.3. Embolism
 - 2.2.4. Alveolar Hemorrhage
 - 2.2.5. Barotrauma and Contusion
 - 2.2.6. Toxics and Drugs
- 2.3. Mediastinal Pathology
 - 2.3.1. Pneumomediastinum
 - 2.3.2. Mediastinal Hematoma
 - 2.3.3. Infection: Mediastinitis and Abscess
 - 2.3.4. Esophageal Pathology: Impaction, Perforation and Fistulas
- 2.4. Pathology of the Pleura, Chest Wall and Diaphragm
 - 2.4.1. Pleural Effusion, Hemothorax, Empyema and Chylothorax
 - 2.4.2. Pneumothorax
 - 2.4.3. Fractures of the Thoracic Cage
 - 2.4.4. Hernias, Diaphragmatic Paralysis and Diaphragmatic Rupture
- 2.5. Major Syndromes
 - 2.5.1. Dyspnea and Respiratory Distress
 - 2.5.2. Chest Pain
 - 2.5.3. Hemoptysis
 - 2.5.4. Persistent Cough
 - 2.5.5. Stridor

2.6. Tubes and Catheters

- 2.6.1. Central Vascular Catheters
- 2.6.2. Swan-Ganz Catheter
- 2.6.3. Endotracheal Tubes
- 2.6.4. Pleural Drain
- 2.6.5. Nasogastric Tubes
- 2.6.6. Other Devices

Module 3. Imaging in Acute Pathology of the Cardiovascular System

3.1. Myocardial Pathology

- 3.1.1. Acute Coronary Syndrome
- 3.1.2. Myocardial Laceration and Contusion
- 3.1.3. Myocarditis

3.2. Pericardial Pathology

- 3.2.1. Acute Pericarditis
- 3.2.2. Pericardial Effusion
- 3.2.3. Cardiac Tamponade

3.3. Acute Aortic Syndrome

- 3.3.1. Aortic Trauma
- 3.3.2. Aortic Dissection
- 3.3.3. Aortic Aneurysm

3.4. Heart Failure

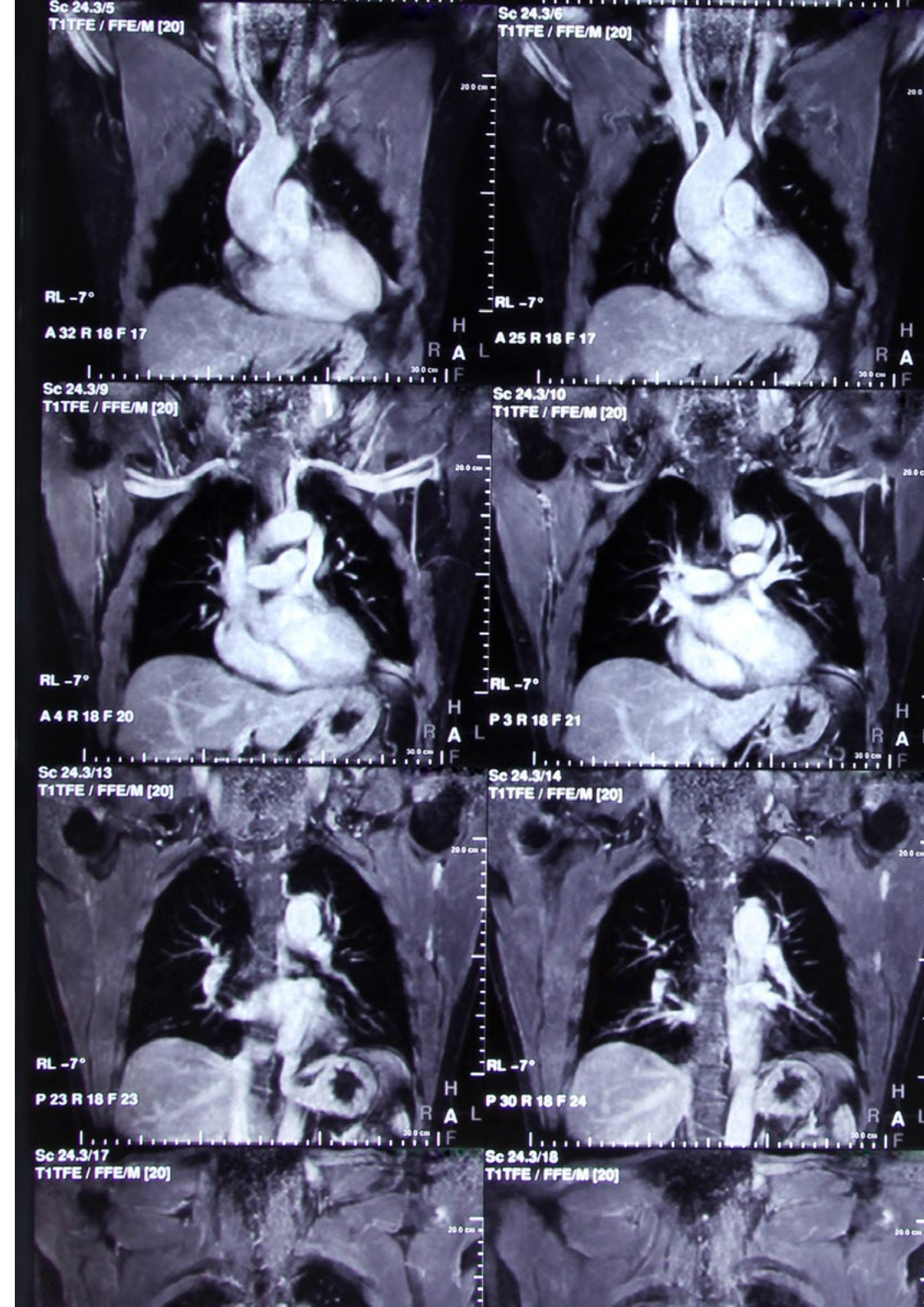
- 3.4.1. Congestive Heart Failure
- 3.4.2. Pulmonary Edema

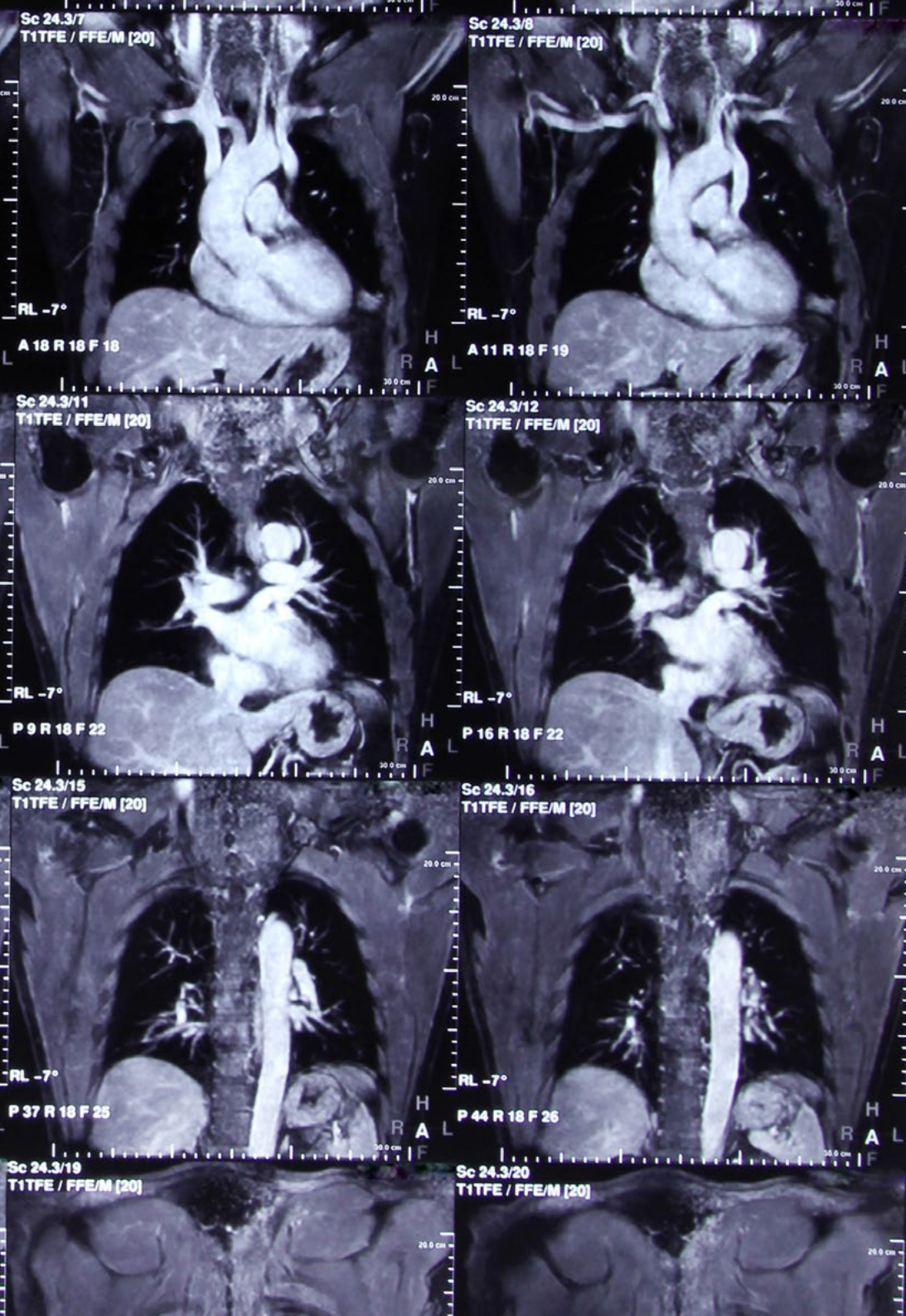
3.5. Thromboembolic Disease

- 3.5.1. Deep Vein Thrombosis
- 3.5.2. Pulmonary Embolism

3.6. Shock and Cardiac Arrest

- 3.6.1. Types of Shock
- 3.6.2. Pulseless Electrical Activity
- 3.6.3. Cardiorespiratory Arrest





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A unique, key, and decisive educational experience to boost your professional development”

05 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.



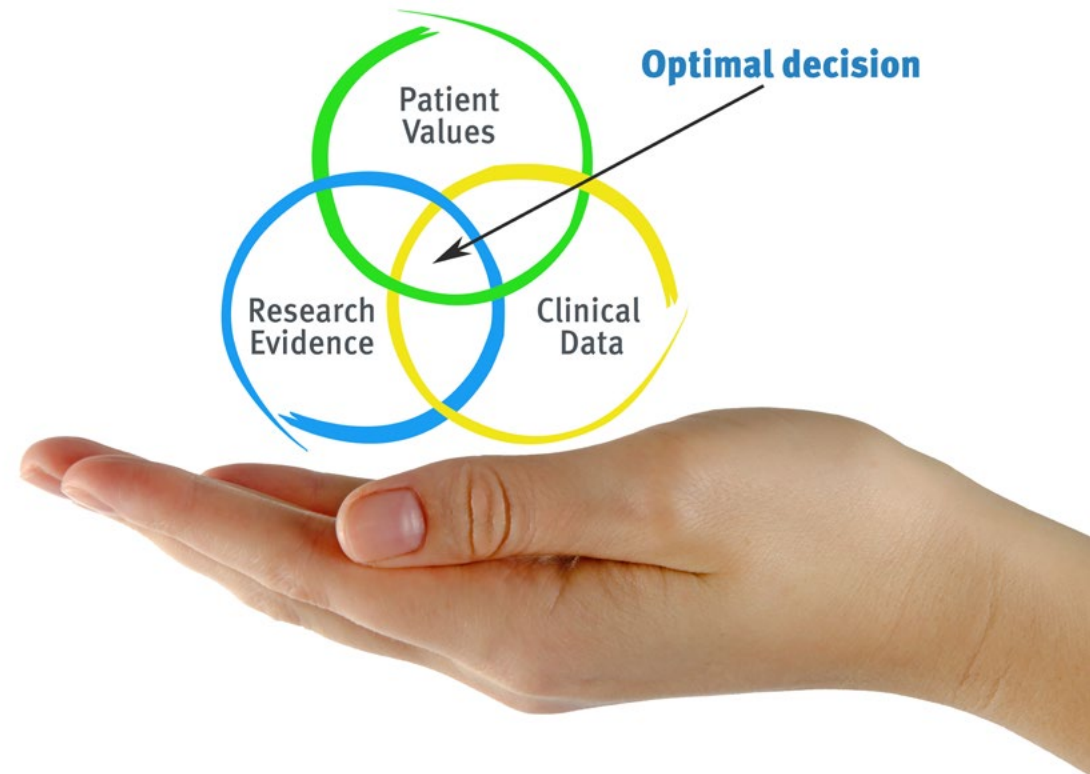
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Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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. Gervas, 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.

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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.

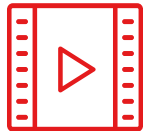
Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.

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

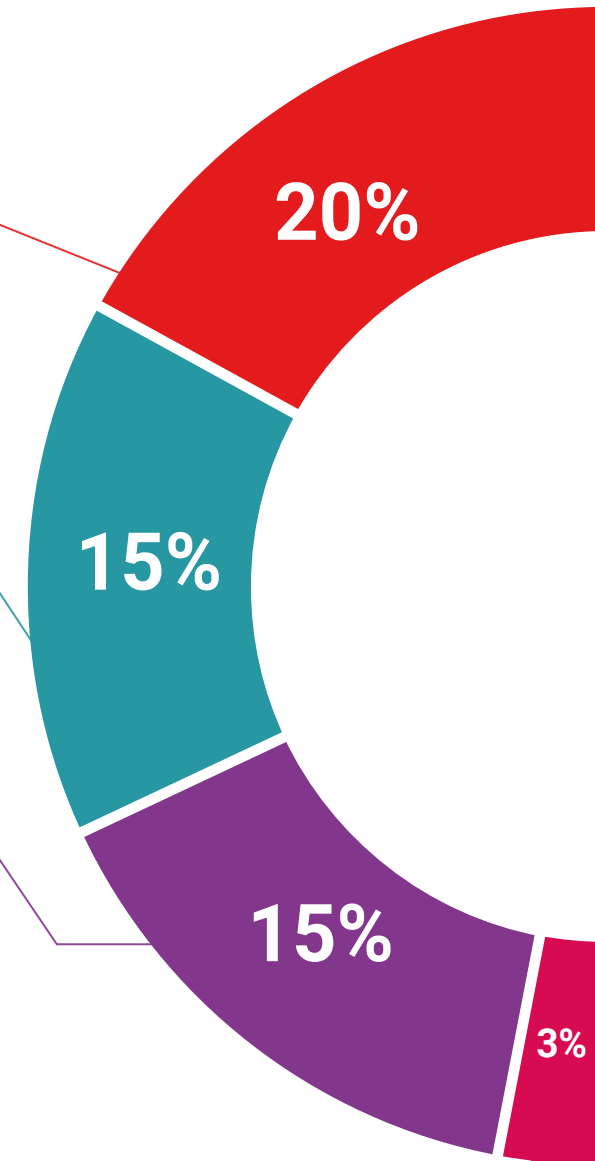
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

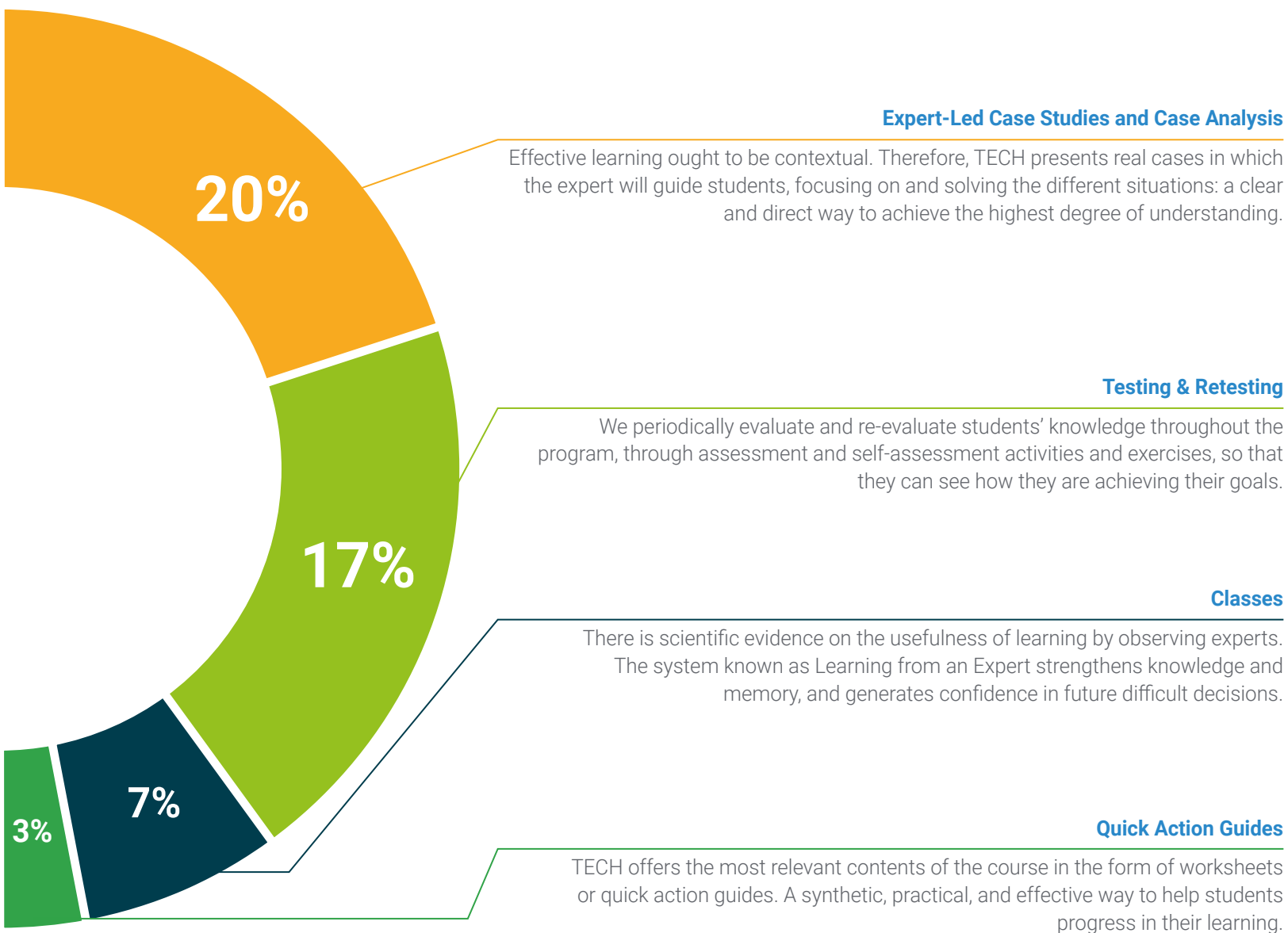
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



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.





06 Certificate

The Postgraduate Diploma in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.



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

The **Postgraduate Diploma in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care** contains the most complete and up-to-date scientific program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma**, issued by **TECH Technological University** via tracked delivery*.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Clinical Imaging in Respiratory and Cardiovascular Pathology in Emergency and Critical Care**

Official N° of Hours: **450 h.**



*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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