

Postgraduate Diploma

Cardiotoxicity, Mechanisms and Early Detection





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Cardiotoxicity, Mechanisms and Early Detection

Course Modality: Online

Duration: 6 months.

Certificate: TECH Technological University

16 ECTS Credits

Teaching Hours: 400 hours.

Website: www.techtute.com/pk/medicine/postgraduate-diploma/postgraduate-diploma-cardiotoxicity-mechanisms-early-detection

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01

Introduction

In recent years there has been an enormous development of therapeutic options in all types of oncological processes. Although much more effective and precise, the new treatments are not without risk, and the physician must face the daily challenge of dealing with the toxicity of the therapeutic options, especially in patients with multiple pathologies. This program is oriented towards facilitating the professional's update in a practical way.



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This training will generate a sense of confidence in the performance of medical practice, which will help you grow both personally and professionally"

Cancer patients often present pathologies associated with the oncological process that require care. On the other hand, approaches to cancer patients are often aggressive and can affect other systems, which in the case of frail patients is a major problem in managing risk in therapeutic choices.

The heart is undoubtedly one of the organs most affected by systemic cancer treatments, and considering the importance of its functioning, it becomes an area of study that requires rigor, depth and timeliness.

Cardiological effects are routinely present in the side effects of most treatments for the oncology patient. The management of the medication, as well as of other therapeutic options, is fundamental in the adjustment of the appropriate dosage for medical praxis. Being up to date on the details of cardiac risk management in this type of patient is a fundamental skill for the physician to possess when dealing with the patient and his or her symptoms.

This program is designed to facilitate the specialist's updating process, so that he/she can include in the clinical practice of their patients all the innovations and the latest knowledge about oncological therapeutics.

The **Postgraduate Diploma in Cardiotoxicity, Mechanisms and Early Detection** contains the most complete and up to date scientific program on the market. The most important features of the program include:

- ♦ Development of case studies presented by experts in Cardiotoxicity, Mechanisms and Early Detection. The graphic, schematic, and eminently practical contents with which they are created provide scientific and practical information on the disciplines that are essential for professional practice.
- ♦ Developments on the cardiotoxic effect of oncologic therapies and cardiac risk assessment.
- ♦ It contains practical exercises where the self-evaluation process can be carried out to improve learning.
- ♦ With special emphasis on innovative methodologies in therapeutic risk assessment.
- ♦ 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.

“Update your knowledge with the Postgraduate Diploma program in Cardiotoxicity, Mechanisms and Early Detection”

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This Postgraduate Diploma may be the best investment you can make in the selection of a refresher program for two reasons: in addition to updating your knowledge in Cardiotoxicity, Mechanisms and Early Detection, you will obtain an Postgraduate Diploma certificate from TECH Technological University"

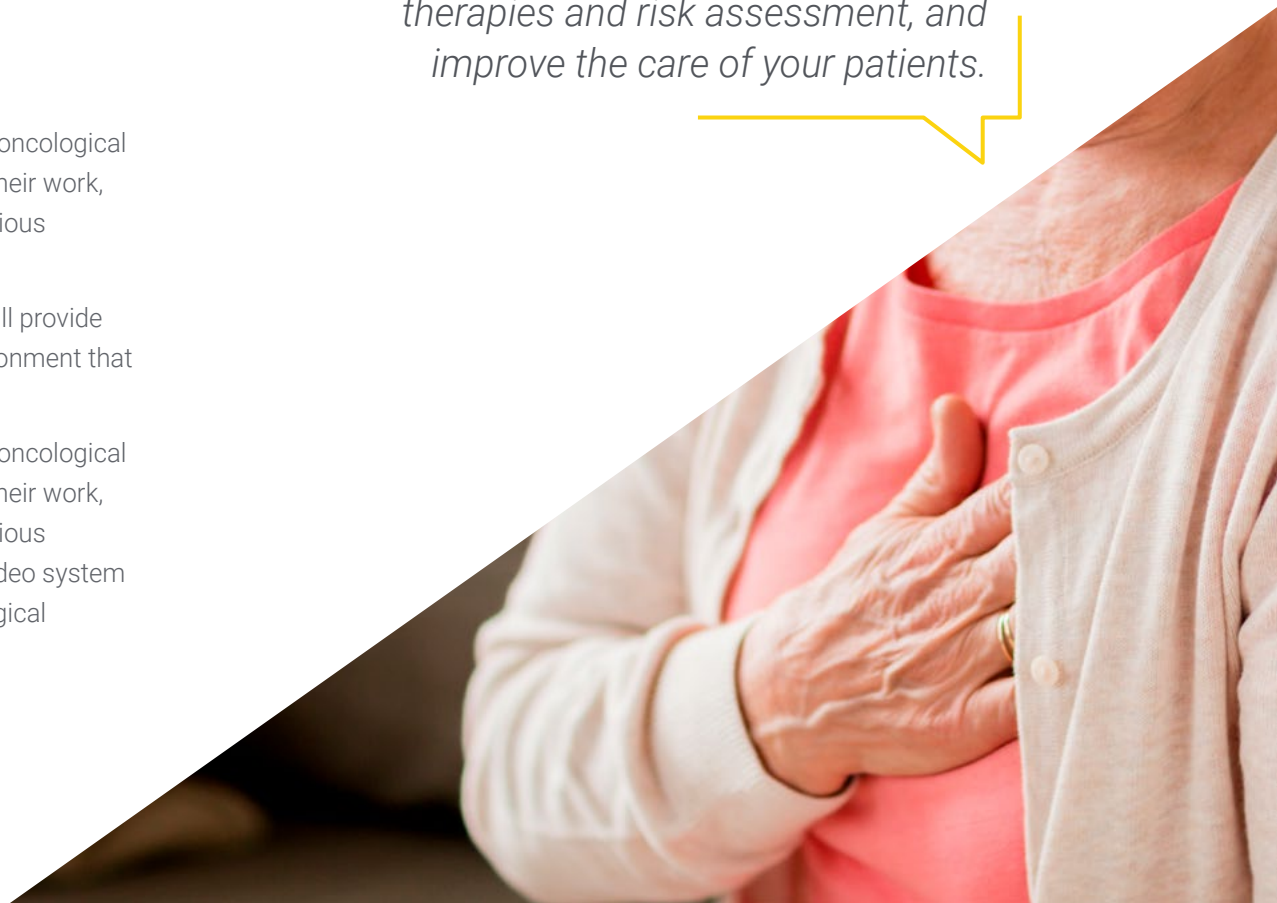
Its teaching staff includes professionals in the field of cardiotoxic effects of oncological therapies and risk assessment, who bring to this training the experience of their work, as well as renowned specialists belonging to reference societies and prestigious universities.

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 immersive training program to train in real situations.

Its teaching staff includes professionals in the field of cardiotoxic effects of oncological therapies and risk assessment, who bring to this training the experience of their work, as well as renowned specialists belonging to reference societies and prestigious universities. To this end, the student will be assisted by a novel interactive video system developed by recognized experts in the field of cardiotoxic effects of oncological therapies and risk assessment, with extensive teaching experience.

Increase your decision-making confidence by updating your knowledge through this specialist course.

Seize the opportunity to learn about the latest advances in addressing the cardiotoxic effects of oncology therapies and risk assessment, and improve the care of your patients.



02 Objectives

The Postgraduate Diploma in Cardiotoxicity, Mechanisms and Early Detection is aimed at facilitating the actions of the physician dedicated to the treatment of oncological pathology, in which it is necessary to accurately interpret the toxic effects of possible occurrence and assess the cardiological risks inherent to the disease process.





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This Postgraduate Diploma is designed for you to update your knowledge in Cardiotoxicity, Mechanisms and Early Detection, with the use of the latest educational technology, to contribute with quality and safety to decision making"



General Objective

- ♦ Update the knowledge of the specialist Cardiologist, Oncologist and Hematologist in the field of Cardio-Oncology.
- ♦ Promote work strategies based on a comprehensive approach to the patient as a standard model for achieving excellent care.
- ♦ Encourage the acquisition of technical skills and abilities, through a powerful audio-visual system, and the possibility of development through online simulation workshops and/or specific training.
- ♦ Encourage professional stimulus through continuing education and research.



Specific Objectives

- ♦ Know the epidemiological significance of cancer.
- ♦ Know the clinical and epidemiological significance of cardiac toxicity.
- ♦ Identify the epidemiological significance of prevention and early detection of cardiotoxicity.
- ♦ Learn the objectives of the Cardio-Oncology Units.
- ♦ Know the structure and organization of the Cardio-Oncology Units.
- ♦ Define the concept of cardiotoxicity.
- ♦ Learn the types of cardiotoxicity depending on the area affected.
- ♦ Learn the types of cardiotoxicity according to the pathophysiological mechanism. Understand the molecular and tissue mechanisms leading to CT.
- ♦ Recognize the cardiotoxic effects of thoracic radiotherapy.
- ♦ Update the knowledge concerning the evolution of radiothoracic radiotherapy equipment and methods.
- ♦ Explain the factors influencing acute and chronic radioinduced cardiotoxicity.
- ♦ Recognize chemotherapeutic drugs implicated in cardiotoxicity.
- ♦ Analyze the cardiotoxic effects of anthracyclines.
- ♦ Explain the cardiotoxic effects of anti-tubulins.
- ♦ Explain the cardiotoxic effects of antimetabolites.
- ♦ Explain the cardiotoxic effects of alkylating agents and other drugs that interact with DNA.
- ♦ Analyze the cardiotoxic effects of biological agents, specifically trastuzumab-type monoclonal antibodies.
- ♦ Become familiar with other potentially cardiotoxic biological agents.
- ♦ Analyze the cardiotoxic effects of cell kinase inhibitors.
- ♦ Be aware of other potentially cardiotoxic oncological treatments, such as antiangiogenic drugs, histone deacetylase inhibitors, differentiation and/or apoptosis inducers and hormone therapy.
- ♦ Understand the individual susceptibility factors, both genetic and acquired, involved in the development of cardiac toxicity.
- ♦ Be able to perform a comprehensive risk assessment of patients undergoing oncologic treatment.
- ♦ Describe the monitoring required by patients during treatment for cardiotoxicity.
- ♦ Identify biomarkers as a method used to detect cardiotoxicity early, especially troponins and natriuretic peptides.
- ♦ Deepen the knowledge of echocardiography, with special attention to the "global longitudinal strain" technique as a marker for early detection of cardiac toxicity.
- ♦ Know the role of cardiac magnetic resonance imaging in the early detection of cardiotoxicity.

- ♦ Recognize the clinical relevance and mechanisms involved in the onset of ventricular dysfunction and heart failure secondary to cardiac toxicity.
- ♦ Deepen our knowledge of myocardial involvement caused by anthracyclines.
- ♦ Identify other chemotherapy drugs with the capacity to produce myocardial toxicity.
- ♦ Deepen our knowledge of myocardial toxicity induced by monoclonal antibodies, especially trastuzumab.
- ♦ Recognize the ability of therapies directed against new molecular targets (cellular kinase inhibitors) and proteasome inhibitors to produce ventricular dysfunction and heart failure.
- ♦ Learn the effects of thoracic radiotherapy on the myocardium.
- ♦ Improve knowledge in the clinical diagnosis of heart failure associated with cardiotoxicity.
- ♦ Acquire updated knowledge in the treatment of heart failure and ventricular dysfunction related to oncological treatments.
- ♦ Know the importance of early detection of myocardial involvement due to cardiotoxicity.
- ♦ Describe the appropriate action to be taken in the event of an increase in circulating biomarkers during oncologic treatment.
- ♦ Describe the appropriate response to the appearance of "global longitudinal strain" alteration during oncological treatment.
- ♦ Learn the monitoring strategy during treatment with anthracyclines.
- ♦ Learn the monitoring strategy during treatment with monoclonal antibodies, especially trastuzumab.
- ♦ Learn the monitoring strategy during treatment with cell kinase inhibitors.
- ♦ Understand the potential causes and mechanisms of ischemic heart disease in the context of cardiac toxicity.

- ♦ Identify patients at high risk of coronary artery disease.
- ♦ Define the role of oncological treatments such as fluoropyrimidines in the development of ischemic heart disease.
- ♦ Acquire updated knowledge on diagnostic methods for coronary artery disease related to cardiotoxic drugs.
- ♦ Get up to date on the management of acute coronary syndrome in the context of oncologic treatment.
- ♦ Learn the monitoring strategy in patients who have had coronary ischemia.
- ♦ Know the clinical relevance of thoracic radiotherapy in the development of coronary artery disease and its mechanisms.
- ♦ Recognize the risk factors for the development of ischemic heart disease in patients who have received thoracic radiotherapy.



Make the most of the opportunity and take the step to get up to date on the latest developments in Cardiotoxicity, Mechanisms and Early Detection"

03

Course Management

The program's teaching staff includes leading specialists in cardiotoxic effects in oncological therapies and risk assessment, who contribute their work experience to this training. In addition, other specialists of recognized prestige participate in its design and elaboration, completing the program in an interdisciplinary manner.



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Learn from leading professionals the latest advances in the approach to the cardiotoxic effect of oncological therapies and risk assessment"

International Guest Director

Dr. Arjun Ghosh is recognized in the healthcare field for his many efforts to improve the quality of care at the University College London Hospital (UCLH) and Barts Heart Center. Both institutions have become international references in Cardiology, an area in which this doctor is considered a true eminence.

From his position as Head of the Clinical Service at UCLH, the expert has devoted great efforts to the care of patients with cancer and to reduce the cardiac side effects that may result from aggressive treatments such as chemotherapy, radiotherapy and surgery. Thanks to his extensive experience in this field, he is a consultant specialist in the Long-Term Follow-Up Unit, created to monitor the evolution of people who have survived tumors.

Dr. Ghosh's research has been at the forefront of clinical innovation throughout his career. His PhD, for example, was defended at the Imperial College of London and subsequently presented to the British Parliament. This merit is only plausible for studies that make unquestionable contributions to society and science. The thesis has also received numerous national and international awards. It has also been endorsed by presentations at various congresses around the world.

The famous cardiologist is also a specialist in advanced Diagnostic Imaging techniques, using state-of-the-art tools: Magnetic Resonance Imaging and Echocardiography. He also has a broad academic vocation that led him to complete a Master's degree in Medical Education, obtaining accreditations from the Royal College of Physicians of the United Kingdom and University College London.

Dr. Ghosh is also the Director of the Foundation Program at St. Bartholomew's Hospital and holds various positions in local and international societies, such as the American College of Cardiology.



Dr. Arjun Ghosh

- Specialist in Cardio-Oncology and Advanced Cardiac Imaging
- Head of Clinical Service University College London Hospital (UCLH)
- Consultant Cardiologist at the Barts Heart Center
- Director of the St Bartholomew's Hospital Foundation Program
- Doctorate in Cardiology at Imperial College London
- Master's Degree in Medical Education from the Royal College of Physicians of the United Kingdom and University College London
- Member of:
 - American College of Cardiology
 - British Cardiovascular Society
 - Royal Society of Medicine
 - International Society of Cardio-Oncology



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

Management



Dr. Macía Palafox, Ester

- Clinical Manager of the Cardio-Oncology Unit of the Fundación Jiménez Díaz University Hospital in Madrid.
- Degree in Medicine from the Complutense University Madrid.
- Cardiology Specialist at La Paz University Hospital in Madrid..
- TECH Master's Degree in Clinical Arrhythmology (Complutense University of Madrid).
- Fellowship in Investigative Arrhythmology (Columbia University, New York).
- Member of the Spanish Society of Cardiology. Cardio-Oncology Work Group.

Co-Director



Dr. García-Foncillas, Jesús

- Director of the Chair of Molecular Individualized Medicine of the Autonomous University of Madrid (UAM-Merck).
- Director of the Oncology Institute "OncoHealth".
- Director of the Oncology Department of the University Hospital "Fundación Jiménez Díaz".
- Director of the Translational Oncology Division of the Health Research Institute FJD-UAM.
- Professor of Oncology, Autonomous University of Madrid.



Dr. Ibáñez Cabeza, Borja

- Head of the Fundación Jiménez Díaz Cardiology Research Unit.
- Director of the Clinical Research Department of the Carlos III National Center for Cardiovascular Research (CNIC).

Coordinators

Dr. Gómez-Talavera, Sandra

- ♦ Cardiologist at the Jiménez Díaz Foundation Hospital. Quironsalud

Dr. Pastor Planas, Ana

- ♦ Cardiologist at the Quiron University Hospital Madrid

Dr. Caramés Sánchez, Cristina

- ♦ Oncologist. Jiménez Díaz Foundation

Professors

Dr. González-Caballero, Eva

- ♦ Cardiologist at Jerez de la Frontera Hospital

Dr. Córdoba Mascuñano, Raúl

- ♦ Hematologist. Jiménez Díaz Foundation Hospital

04

Structure and Content

The structure of the contents has been designed by a team of professionals from the best hospitals and universities in Spain, aware of the relevance of current training to intervene in the toxic effects of oncological therapies at the cardiac level, and committed to quality teaching through new educational technologies.





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The Postgraduate Diploma in Cardiotoxicity, Mechanisms and Early Detection contains the most complete and up to date scientific program on the market"

Module 1. Epidemiology of Cancer

- 1.1. Epidemiological Significance of Cancer.
- 1.2. Epidemiological Significance of Cardiotoxicity in Oncology.
- 1.3. Epidemiological Significance of Cardiotoxicity in Hematology.

Module 2. Oncologic Treatments with Cardiotoxic Effect

- 2.1. Definition of Cardiotoxicity. Affected Cardiac Chambers. Pathophysiological Mechanisms of Cardiotoxicity.
- 2.2. Radiotherapy as a Cause of Cardiotoxicity.
 - 2.2.1. Evolution of Radiotherapy Equipment and Methods.
 - 2.2.2. Factors that Influence Radiation-Induced Cardiotoxicity.
 - 2.2.3. Acute Toxicity.
 - 2.2.4. Chronic Toxicity.
- 2.3. Chemotherapy as a Cause of Cardiotoxicity.
 - 2.3.1. Anthracyclines.
 - 2.3.2. Antitubulin Drugs.
 - 2.3.3. Antimetabolites.
 - 2.3.4. Alkylating Agents and Other Drugs that Interact with DNA.
- 2.4. Biological Agents as a Cause of Cardiotoxicity: Monoclonal Antibodies.
 - 2.4.1. Trastuzumab.
 - 2.4.2. Other Monoclonal Antibodies.
- 2.5. Other Potentially Cardiotoxic Biological Agents.
 - 2.5.1. Cytokines.
 - 2.5.2. Interferons.
- 2.6. Therapies Aimed at New Molecular Targets and Cardiotoxicity: Inhibitors of Cellular Kinases.
- 2.7. Immune Checkpoint Inhibitors and Cardiotoxicity.
- 2.8. Other Potentially Cardiotoxic Oncologic Treatments.
 - 2.8.1. Histone Deacetylase Inhibitors.
 - 2.8.2. Oral Antiangiogenics.
 - 2.8.3. Differentiation and/or Apoptosis Inducers.
 - 2.8.4. Hormonal Agents.





Module 3. Comprehensive Assessment of the Risk of Cardiotoxicity Development

- 3.1. Individual Susceptibility to Cardiotoxicity: Genetic Factors.
- 3.2. Individual Susceptibility to Cardiotoxicity: Non-Genetic Factors.
 - 3.2.1. Cardiovascular Risk Factors.
 - 3.2.2. Comorbidities.
 - 3.2.3. Combination of Oncologic Treatments.
- 3.3. Cardiological Assessment before Treatment in Patients without Known Heart Disease.
 - 3.3.1. Clinical Assessment.
 - 3.3.2. Complementary Tests.
- 3.4. Cardiological Assessment before Treatment in Patients with Known Heart Disease.
 - 3.4.1. Clinical Assessment.
 - 3.4.2. Complementary Tests.
- 3.5. Monitoring during Treatment of Patients Subjected to Cardiotoxic Treatments.
 - 3.5.1. Clinical Assessment.
 - 3.5.2. Complementary Tests.

Module 4. Early Detection of Cardiotoxicity

- 4.1. Circulating Biomarkers: Troponins.
- 4.2. Circulating Biomarkers: Natriuretic Peptides.
- 4.3. Other Circulating Biomarkers for Early Detection of Cardiotoxicity.
- 4.4. Echocardiography.
- 4.5. Cardiovascular Magnetic Resonance Imaging.
- 4.6. Computerised Axial Tomography.

“*A unique, key, and decisive
Training experience to boost your
professional development*”

05

Methodology

This training program provides you with a different way of learning. Our methodology uses a cyclical learning approach: ***Re-learning***.

This teaching system is used 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.



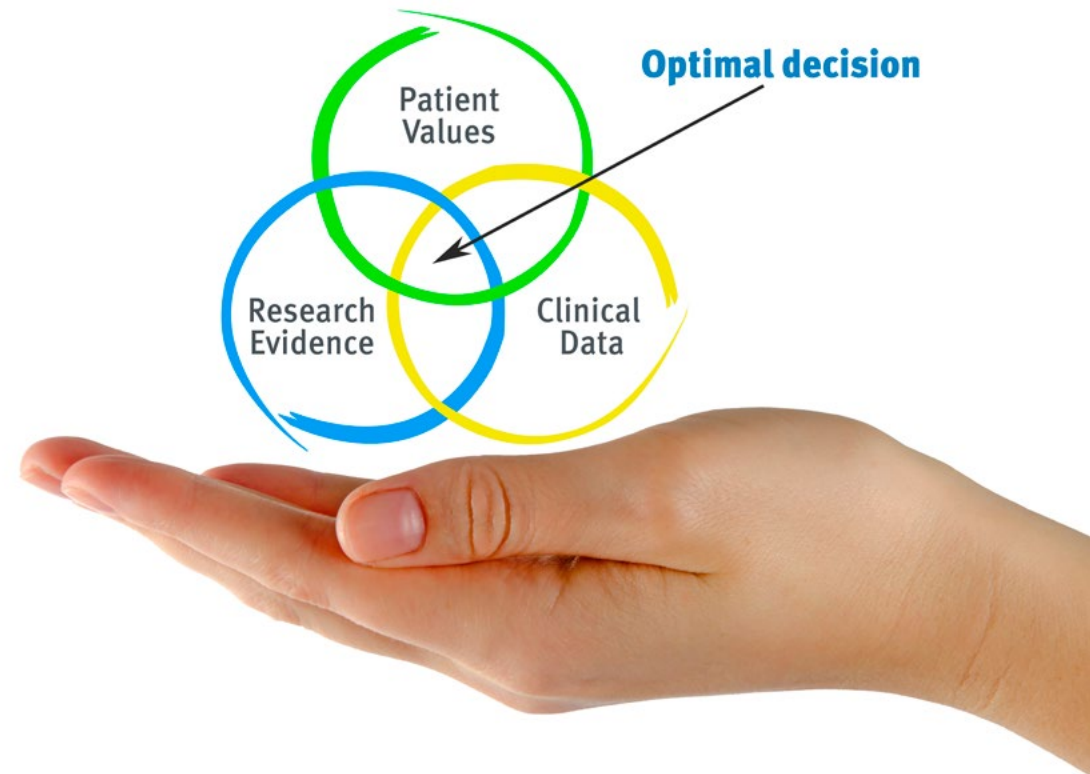
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Discover Re-learning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

At TECH we use the Case Method

In a given situation, what would you do? Throughout the program, you will be presented with multiple simulated clinical cases based on real patients, where you will have to investigate, establish hypotheses and, finally, resolve the situation. There is abundant scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

With TECH you can 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 potential 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 professional medical 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 grasp concepts, but also develop their mental capacity by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on 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.



Re-Learning Methodology

At TECH we enhance the Harvard case method with the best 100% online teaching methodology available: Re-learning.

Our 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, which represent a real revolution with respect to simply studying and analyzing cases.

The physician will learn through real cases and by solving 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 Re-learning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best Spanish-speaking online university (Columbia University).

With this methodology we have trained more than 250,000 physicians with unprecedented success, in all clinical specialties regardless of the surgical load. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

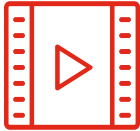
Re-learning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.

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

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



In this program you will have access to the best educational material, prepared with you 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.

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.



Latest Techniques and Procedures on Video

We introduce you to the latest techniques, to the latest educational advances, to the forefront of current medical techniques. All this, in first person, with the maximum rigor, explained and detailed for your assimilation and understanding. And best of all, you can watch them as many times as you want.



Interactive Summaries

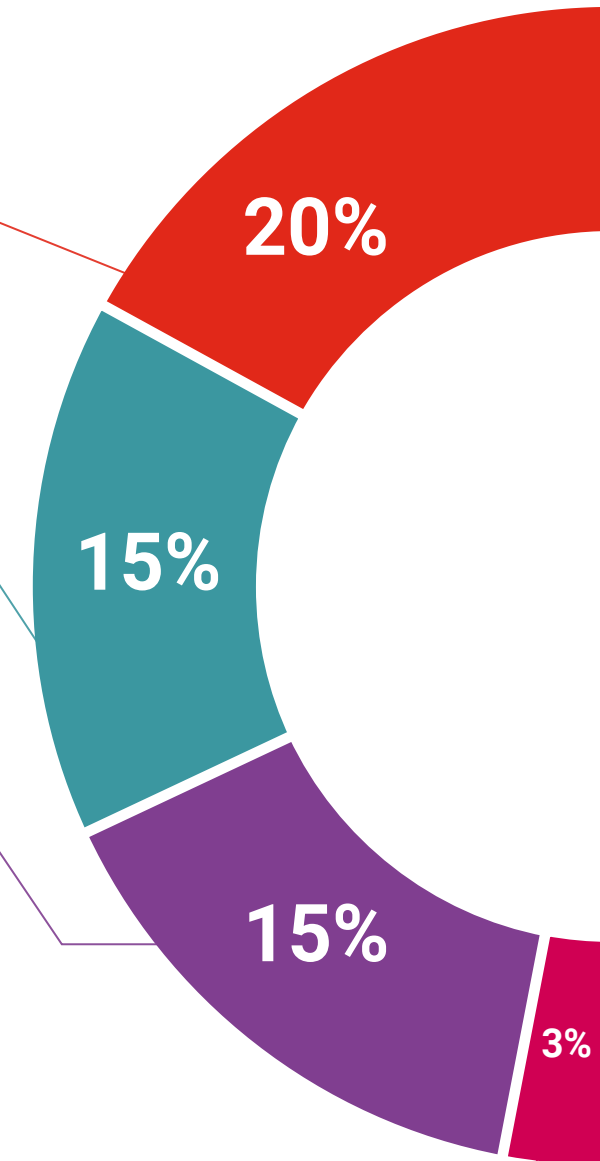
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

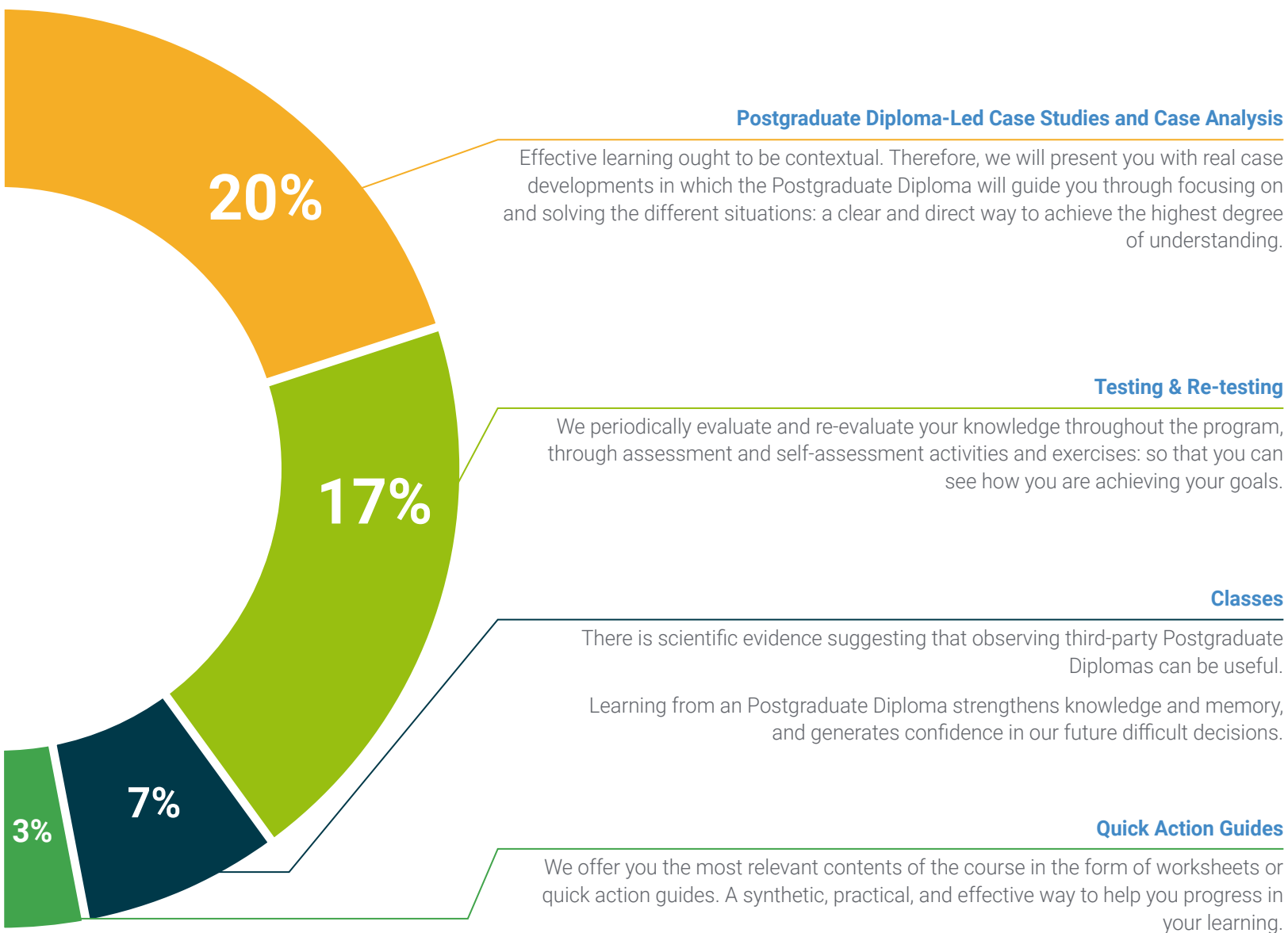
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



Additional Reading

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





06

Certificate

The **Postgraduate Diploma in Cardiotoxicity, Mechanisms and Early Detection** guarantees you, in addition to the most rigorous and up to date training, access to a Postgraduate Diploma issued by **TECH Technological University**.



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Successfully complete this training and receive your university degree without travel or laborious paperwork”

This **Postgraduate Diploma in Cardiotoxicity, Mechanisms and Early Detection** contains the most complete and up to date scientific program on the market.

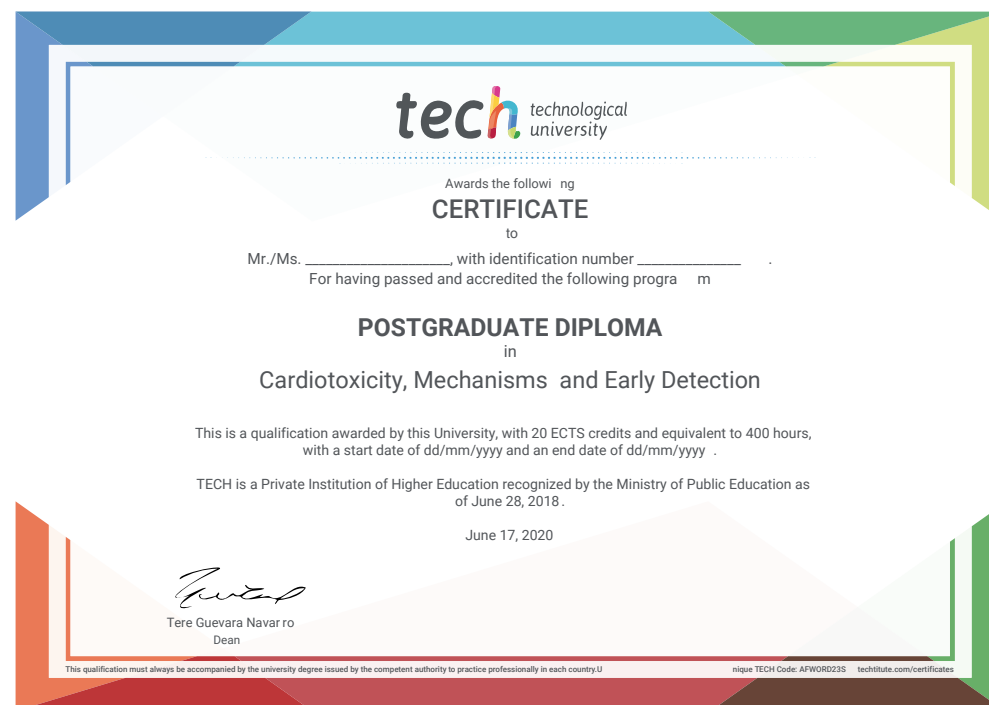
After the student has passed the evaluations, he/she will receive by mail with acknowledgment of receipt their corresponding **Postgraduate Diploma Certificate** issued by **TECH Technological University**.

The **Postgraduate Diploma** issued by **TECH Technological University** will express 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 Cardiotoxicity, Mechanisms and Early Detection**

ECTS: **16**

Official Number of Hours: **400**



future

health

confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation

knowledge present quality

online training

development languages

virtual classroom

tech technological
university

Postgraduate Diploma

Cardiotoxicity, Mechanisms
and Early Detection