

# Postgraduate Certificate Electrocardiography in Small Animals





## Postgraduate Certificate Electrocardiography in Small Animals

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

Website: [www.techtute.com/in/veterinary-medicine/postgraduate-certificate/electrocardiography-small-animals](http://www.techtute.com/in/veterinary-medicine/postgraduate-certificate/electrocardiography-small-animals)

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# 01

# Introduction

The performance of appropriate complementary tests is crucial in the assessment of patients suffering from cardiovascular disease. Knowing the exact state of electrical activity in the cardiac muscle and its physiology allows for a more precise and personalized diagnosis and treatment, in order to minimize the occurrence of unexpected complications.

The electrocardiogram is a simple, fast and inexpensive test. Obtaining a quality tracing and a solid and specialized knowledge base in Electrophysiology is essential for its correct interpretation. Concepts such as automaticity and conduction velocity will help to make clinical decisions or risk predictions based on an electrocardiographic tracing.



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*This training is the best option you can find to specialize in veterinary cardiology and make more accurate diagnoses”*

Cardiology of Small Animals is a subspecialty of Internal Medicine with a great development in the last decades. The teachers of this Postgraduate Certificate are at the forefront of the latest diagnostic techniques and treatment of cardiovascular diseases in small animals. Thanks to their specialized training, they have developed a useful, practical program adapted to the current reality, a reality that is becoming more and more demanding.

This comprehensive program compiles the different cardiovascular diseases affecting small animals. It starts with a solid development of the basics of cardiovascular physiology, pathophysiology and pharmacology, so often forgotten and so important and useful in daily clinical practice, followed by the optimization of clinical examination and diagnostic tests, and ending with the latest therapeutic protocols and patient monitoring procedures.

This training specializes the general practitioner in an area that is increasingly in demand, partly because of its frequency, partly because of the need for specialization that this area demands.

In all the modules, a gradual exposition of knowledge at the physiological and pathophysiological level has been established, a development of the protocols for approaching patients with cardiovascular diseases with diagnostic and treatment algorithms, as well as the monitoring that should be done in these patients, since many of these diseases are chronic. It compiles the author's experience, without forgetting scientific rigor and the most important updates based on evidence. It develops the diseases, the action protocols and takes into account the integral approach to the patient, considering the disease, the patient and the owner in line with evidence-based medicine.

All topics incorporate numerous multimedia material: photos, videos and diagrams, so important in a specialty where imaging techniques are of great importance.

Finally, as it is an online program, the students are not conditioned by fixed schedules, nor do they need to move to another physical location. All of the content can be accessed at any time of the day, so you can balance your working or personal life with your academic life.

This **Postgraduate Certificate in Electrocardiography in Small Animals** contains the most complete and up-to-date educational program on the market. The most important features of the program include:

- ♦ The development of case studies presented by experts in Veterinary Cardiology
- ♦ 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
- ♦ New developments in Electrocardiography in Small Animals
- ♦ Practical exercises where self-assessment can be used to improve learning
- ♦ Special emphasis on innovative methodologies in Electrocardiography in Small Animals
- ♦ 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



*Do not miss the opportunity to take this Postgraduate Certificate with TECH. It's the perfect opportunity to advance your career and stand out in an industry with high demand for professionals"*

“ *This Postgraduate Certificate is the best investment you can make in selecting a refresher program to update your veterinary knowledge in cardiology*”

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 programmed to train in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the academic program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned experts with extensive experience in Cardiology in Small Animals.

*This training comes with the best didactic material, providing you with a contextual approach that will facilitate your learning.*

*This 100% online Postgraduate Certificate will allow you to combine your studies with your professional work while increasing your knowledge in this field.*



# 02 Objectives

The Postgraduate Certificate in Electrocardiography in Small Animals is aimed at facilitating the performance of the professional dedicated to Veterinary Medicine with the latest advances and newest treatments in the sector.





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*You will learn how to perform a correct anamnesis focused on the cardiovascular and respiratory system, with this highly scientifically rigorous program"*



## General Objectives

- Analyze the physical principles of ultrasound, which are the basis of imaging in Electrocardiography
- Establish the protocol for performing electrocardiography and analyze in detail all the parameters that can be obtained through electrocardiography
- Examine in depth the information provided by Electrocardiography in the hemodynamic assessment of patients
- Present advanced electrocardiographic techniques and new advances in the field of electrocardiography





## Specific Objectives

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- ♦ Generate specialized knowledge on tools for the unambiguous identification of P-waves
- ♦ Develop a systematic method for understanding the electrical activity illustrated by the ECG tracing
- ♦ Establish the characteristics that allow discerning the etiology of the arrhythmia
- ♦ Establish criteria to define the anatomical origin of the arrhythmia
- ♦ Specify the criteria defining the malignancy of an arrhythmia
- ♦ Clearly define patients who require a Holter study
- ♦ Develop advanced techniques in the range of therapeutic possibilities

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*Update your knowledge through the program in Electrocardiography in Small Animals”*

03

# Course Management

The program's teaching staff includes leading experts in veterinary cardiology who bring the experience of their work to this training. They are world-renowned veterinarians from different countries with proven theoretical and practical professional experience.



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*Our teaching team, experts in  
Electrocardiography in Small Animals, will  
help you achieve success in your profession”*

## Management



### Dr. Martínez Delgado, Rubén

- Since 2017, he has headed the Cardiology service at the Estoril Veterinary Hospital, Móstoles
- Collaborates with the Veterinary Hospital of the UCM developing the part of minimally invasive interventional cardiology
- From 2010 to the present, he has been working as an ambulatory Cardiologist in many centers in Madrid and surrounding areas
- Graduated in Veterinary Medicine in 2008 from the Complutense University of Madrid (UCM)
- Internships in Surgery (2006) and in Cardiology (2007-2008) at UCM
- 2008 collaboration project in minimally invasive interventional cardiology in the cardiology service of the UCM
- From 2009 to 2010 he completed the Intership of the official internship of the European College of Internal Medicine (ECVIM) at the Gran Sasso Veterinary Clinic in Milan (a reference center in cardiology and ultrasound diagnosis and a center specialized in interventional cardiology)
- He is a member of AVEPA and GECAR and a regular attendee of congresses in the specialty of Cardiology and Diagnostic Imaging. He has also presented several lectures on electrocardiography and echocardiography



## Professors

### Dr. Cortés Sánchez, Pablo M

- ◆ Externship in Cardiology at the University of Glasgow, as a result of which he began a Master's Degree in Veterinary Medicine (MVM), which he is currently pursuing
- ◆ Head of the Cardiology service and co-director of the Intensive Care Unit (ICU) of the Estoril Veterinary Hospital, Móstoles, Madrid (2007 to 2017)
- ◆ Head of Cardiology service and part of the ICU team at Braid Vets, Edinburgh UK (January 2018 to July 2019)
- ◆ Graduated in veterinary medicine from the Complutense University of Madrid (UCM) in 2007, including a year of scholarship studies at the University of Southern Indiana (USA)
- ◆ Internships in Internal Medicine (2006) and Cardiology at UCM (2007)
- ◆ Master's Degree in Cardiology for generalists by ISVPS (International School of Veterinary Postgraduate Studies) in 2011
- ◆ Master's Degree in Veterinary Medicine (MVM) at present
- ◆ Internship in Cardiology at the University of Liverpool (2017), with completion of a research project in mitral disease pending publication
- ◆ Speaker in cardiology, radiology, intensive care and anesthesia, sponsored by prestigious firms, both in Spain and in the UK
- ◆ Member of GECAR (Cardiology and Respiratory System Specialists Group), and certified in echocardiography by this institution, for which he is currently developing the official echocardiographic screening guidelines for congenital heart disease
- ◆ Registered member of the Royal College of Veterinary Surgeons (RCVS), UK, which has certified him as an Advanced Veterinary Practitioner

04

# Structure and Content

The structure of the contents has been designed by the best professionals in the field of Electrocardiography in Small Animals, with extensive experience and recognized prestige in the profession, backed by the volume of cases reviewed, studied and diagnosed, and with extensive knowledge of new technologies applied to veterinary medicine.







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*This Postgraduate Certificate contains the most complete and up-to-date scientific program on the market”*

## Module 1 Complementary Tests Electrocardiogram

- 1.1. Anatomy of the Conduction System and Action Potentials
  - 1.1.1. Sinus Node and Supraventricular Conduction Pathways
  - 1.1.2. Atrioventricular Node and Ventricular Conduction Pathways
  - 1.1.3. Action Potential
    - 1.1.3.1. Pacemaker Cells
    - 1.1.3.2. Contractile Cells
- 1.2. Obtaining a High-Quality Electrocardiographic Tracing
  - 1.2.1. Limb Led System
  - 1.2.2. Precordial Lead System
  - 1.2.2. Artifact Reduction
- 1.3. Sinus Rhythm
  - 1.3.1. Typical Electrocardiographic Characteristics of Sinus Rhythm
  - 1.3.2. Respiratory Sinus Arrhythmia
  - 1.3.3. Non-respiratory Sinus Arrhythmia
  - 1.3.4. Wandering Pacemaker
  - 1.3.5. Sinus Tachycardia
  - 1.3.6. Sinus Bradycardia
  - 1.3.7. Intraventricular Conduction Blocks
- 1.4. Electrophysiological Mechanisms Causing Arrhythmias
  - 1.4.1. Stimulus Formation Disorders
    - 1.4.1.1. Altered Normal Automatism
    - 1.4.1.2. Abnormal Automatism
    - 1.4.1.3. Triggered Activity: Late Postpotentials
    - 1.4.1.4. Triggered Activity: Early Postpotentials
  - 1.4.2. Impulse Conduction Disorders
    - 1.4.2.1. Anatomical Re-entry
    - 1.4.2.2. Functional Re-entry
- 1.5. Supraventricular Arrhythmias I
  - 1.5.1. Atrial Premature Complexes
  - 1.5.2. Paroxysmal Supraventricular Tachycardia
  - 1.5.3. Atrioventricular Junctional Tachycardia
  - 1.5.4. Accessory Conduction Routes





- 1.6. Supraventricular Arrhythmias II: Atrial Fibrillation
  - 1.6.1. Anatomical and Functional Substrate
  - 1.6.2. Hemodynamic Consequences
  - 1.6.3. Treatment for Frequency Control
  - 1.6.4. Treatment for Rhythm Control
- 1.7. Ventricular Arrhythmias
  - 1.7.1. Ventricular Premature Complexes
  - 1.7.2. Monomorphic Ventricular Tachycardia
  - 1.7.3. Polymorphic Ventricular Tachycardia
  - 1.7.4. Idioventricular Rhythm
- 1.8. Bradyarrhythmias
  - 1.8.1. Sick Sinus Disease
  - 1.8.2. Atrioventricular Block
  - 1.8.3. Atrial Silence
- 1.9. Holter
  - 1.9.1. Holter Monitoring Indications
  - 1.9.2. Equipment
  - 1.9.3. Interpretation
- 1.10. Advanced Treatment Techniques
  - 1.10.1. Pacemaker Implantation
  - 1.10.2. Radiofrequency Ablation



*Achieve professional success with this high-level training provided by prestigious professionals with extensive experience in the sector"*

# 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 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 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, in an attempt to recreate the actual conditions in a veterinarian'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. Veterinarians who follow this method not only manage to assimilate concepts, but also develop their mental capacity through exercises to evaluate real situations and knowledge application
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. The feeling that the effort invested is effective becomes a very important motivation for veterinarians, which translates into a greater interest in learning and an increase in the 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.



*Veterinarians 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 65,000 veterinarians have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. Our teaching method is developed in a highly demanding environment, where the students have a high socio-economic profile and an average age of 43.5 years.

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



#### Latest Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current and procedures of veterinary 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.

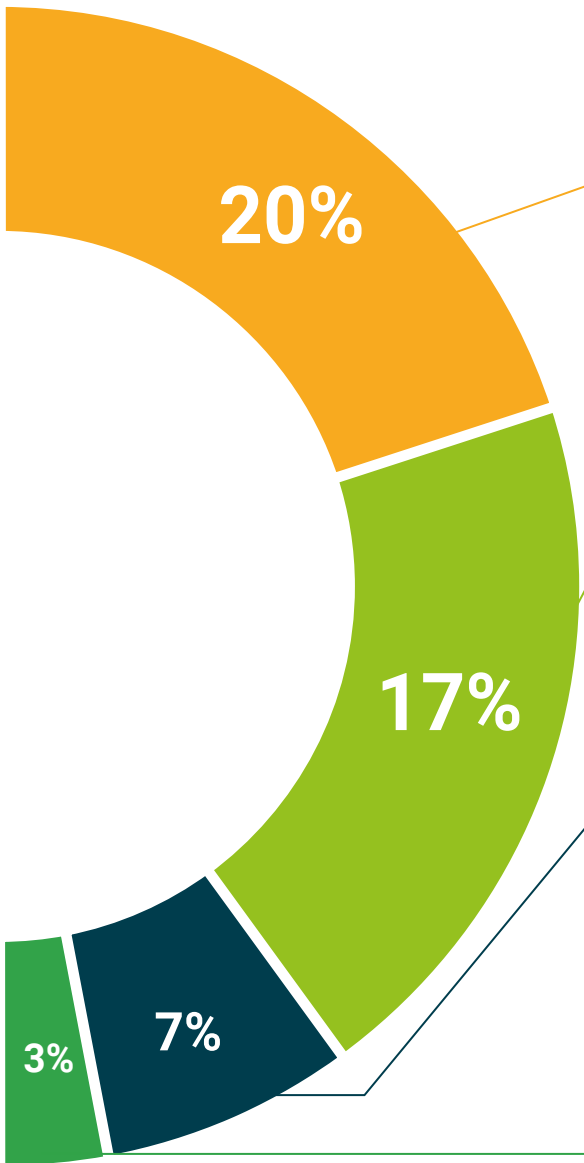
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### 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 suggesting that observing third-party experts can be useful.

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.



06

# Certificate

The Postgraduate Certificate in Electrocardiography in Small Animals guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate 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”*

This **Postgraduate Certificate in Electrocardiography in Small Animals** contains the most complete and up-to-date educational program on the market.

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

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

Title: **Postgraduate Certificate in Electrocardiography in Small Animals**

Official N° of hours: **150 h.**



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

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



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