

# Postgraduate Certificate Echocardiography in Small Animals





## Postgraduate Certificate Echocardiography in Small Animals

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Credits: 6 ECTS
- » Schedule: at your own pace
- » Exams: online

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

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# 01

# Introduction

This program develops the physical principles of ultrasound, which are the basis for understanding how the echocardiographic image is formed. It provides a detailed description of the equipment currently available, taking into account the characteristics that must be met in order to perform echocardiography with good guarantees. It also analyzes the artifacts that may arise from the echocardiographic technique.





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*This specialization is the best option you can find to train 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 Postgraduate Certificate 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 physiological and pathophysiological knowledge 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, since this is an online Postgraduate Certificate, 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 Echocardiography 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 on Echocardiography in Small Animals
- ♦ Practical exercises where the self assessment process can be carried out to improve learning
- ♦ Special emphasis on innovative methodologies in Echocardiography in Small Animals
- ♦ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work
- ♦ Content that is accessible from any fixed or portable device with an Internet connection



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

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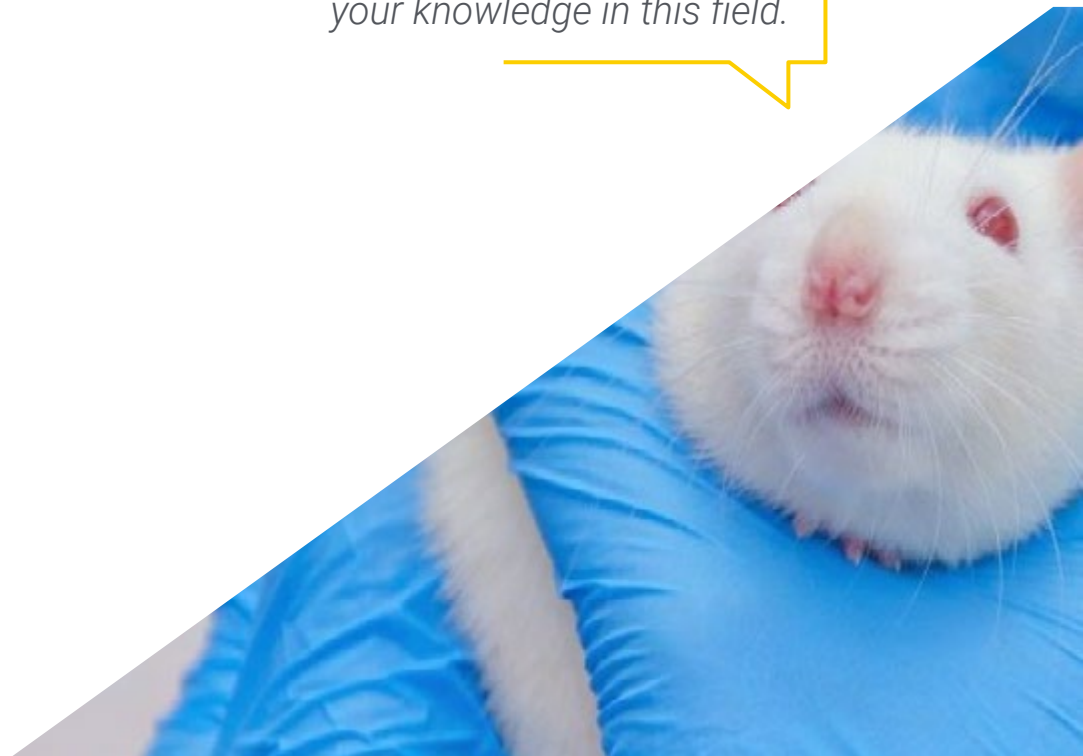
*This Postgraduate Certificate is the best investment you can make in selecting a refresher program to update your veterinary knowledge in cardiology”*

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 developed by renowned experts with extensive experience in personal training.

*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 Echocardiography in Small Animals is designed to facilitate the performance of the veterinary professional with the latest advances and most innovative procedures in the sector.





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*Learn about the latest advances in the field from the comfort of your home, thanks to the online mode on which this program is based"*



## General Objectives

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



*A path to achieve training and professional growth that will propel you towards a greater level of competitiveness in the employment market"*





## Specific Objectives

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- ◆ Establish the basic principles of image formation in echocardiography
- ◆ Identify the main artifacts that may appear during the echocardiographic technique
- ◆ Determine patient preparation and positioning guidelines for echocardiography
- ◆ Determine the common echocardiographic slices and develop the information that can be obtained from them in the M-mode and two-dimensional modes
- ◆ Review Doppler measurements and assessment and highlight its importance in hemodynamic assessment
- ◆ Develop in depth hemodynamic assessment in terms of systolic, diastolic, spectral and color Doppler function
- ◆ Determine the use of thoracic ultrasound in other diseases that may be a consequence of cardiac disease
- ◆ Develop expertise in the performance and assessment of echocardiography in small mammals



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 cardiology 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. Ortiz Díez, Gustavo

- ♦ Associate Professor, Department of Animal Medicine and Surgery, Faculty of Veterinary Medicine, Complutense University of Madrid
- ♦ Head of Small Animal Unit at Complutense Clinical Veterinary Hospital
- ♦ Head of the Department of Soft Tissue Surgery and Minimally Invasive Procedures at the Veterinary Specialties Hospital 4 Octubre (Arteixo, La Coruña, Spain)
- ♦ PhD and Undergraduate Degree in Veterinary Medicine from the UCM
- ♦ AVEPA Accredited Soft Tissue Surgery
- ♦ Member of the scientific committee and current president of GECIRA (AVEPA's Soft Tissue Surgery Specialty Group)
- ♦ Master's Degree in Research Methodology in Health Sciences from the UAB
- ♦ ICT competencies course for teachers by UNED
- ♦ Specialist in Traumatology and Orthopedic Surgery in Companion Animals by the UCM. Degree in Small Animal Cardiology from the UCM
- ♦ Courses of laparoscopic and thoracoscopic surgery at the Minimally Invasive Center Jesús Usón. Accredited in functions B, C, D and E of Experimentation Animals by the Community of Madrid
- ♦ Degree in Emotional Intelligence by UR. Completed training in Gestalt psychology

### Dr. Gómez Trujillo, Blanca

- ♦ Head of the Cardiology Service of the Madrid Este Veterinary Hospital
- ♦ Veterinarian, member of the Cardiology and Echocardiography Service of the VETSIA Veterinary Hospital
- ♦ Veterinary Degree. Complutense University of Madrid
- ♦ General Certificate in Small Animal Medicine. ISVPS
- ♦ Postgraduate course in Small Animal Internal Medicine. Improve International. Madrid
- ♦ Small Animal Cardiology Course. FORVET. Madrid
- ♦ Course of Echocardiography in Small Animals. FORVET. Madrid

# 04

# Structure and Content

The structure of the content has been designed by the best professionals in the Echocardiography in Small Animals sector, 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 Echocardiography

- 1.1. Introduction Ultrasound and Equipment
  - 1.1.1. Ultrasound Physics
  - 1.1.2. Equipment and Transducers
  - 1.1.3. Doppler
  - 1.1.4. Artefacts
- 1.2. Echocardiographic Examination
  - 1.2.1. Patient Preparation and Positioning
  - 1.2.2. 2D Two-dimensional Echocardiography
    - 1.2.2.1. Echocardiographic Slicing
    - 1.2.2.2. Two-dimensional Image Controls
  - 1.2.3. M-Mode
  - 1.2.4. Spectral Doppler
  - 1.2.5. Color Doppler
  - 1.2.6. Tissue Doppler
- 1.3. Measurements and Assessment of 2-D and M-mode Images
  - 1.3.1. General aspects
  - 1.3.2. Left Ventricle and Mitral Valve
  - 1.3.3. Left Atrium
  - 1.3.4. Aorta
  - 1.3.5. Right Ventricle and Tricuspid Valve
  - 1.3.6. Right Atrium and Caval Veins
  - 1.3.7. Pulmonary Trunk and Arteries
  - 1.3.8. Pericardium
- 1.4. Doppler Measurements and Assessment
  - 1.4.1. General Aspects
    - 1.4.1.1. Alignment
    - 1.4.1.2. Laminar and Turbulent Flow
    - 1.4.1.3. Hemodynamic Information
  - 1.4.2. Spectral Doppler: Aortic and Pulmonary Flow
  - 1.4.3. Spectral Doppler: Mitral and Tricuspid Flow
  - 1.4.4. Spectral Doppler: Flow of the Pulmonary and Left Atrial Veins
  - 1.4.5. Colour Doppler Assessment
  - 1.4.6. Tissue Doppler Measurement and Assessment



- 1.5. Advanced Echocardiography
  - 1.5.1. Tissue Doppler-Derived Techniques
  - 1.5.2. Transesophageal Echocardiogram
  - 1.5.3. 3-D Echocardiography
- 1.6. Hemodynamic Assessment I
  - 1.6.1. Left Ventricular Systolic Function
    - 1.6.1.1. M-Mode Analysis
    - 1.6.1.2. Two-Dimensional Analysis
    - 1.6.1.3. Spectral Doppler Analysis
    - 1.6.1.4. Tissue Doppler Analysis
- 1.7. Hemodynamic Assessment II
  - 1.7.1. Left Ventricular Diastolic Function
    - 1.7.1.1. Types of Diastolic Dysfunction
  - 1.7.2. Left Ventricular Filling Pressures
  - 1.7.3. Right Ventricular Function
    - 1.7.3.1. Radial Systolic Function
    - 1.7.3.2. Longitudinal Systolic Function
    - 1.7.3.3. Tissue Doppler
- 1.8. Hemodynamic Assessment III
  - 1.8.1. Spectral Doppler
    - 1.8.1.1. Pressure Gradients
    - 1.8.1.2. *Pressure Half Time*
    - 1.8.1.3. Regurgitation Volume and Fraction
    - 1.8.1.4. *Shunt Quota*
  - 1.8.2. M-Mode
    - 1.8.2.1. Aorta
    - 1.8.2.2. Mitral
    - 1.8.2.3. Septum
    - 1.8.2.4. Left Ventricular Free Wall
- 1.9. Hemodynamic Assessment IV
  - 1.9.1. Color Doppler
    - 1.9.1.1. Jet Size
    - 1.9.1.2. PISA
    - 1.9.1.3. Contracted Vein
  - 1.9.2. Assessment of Mitral Regurgitation
  - 1.9.3. Assessment of Tricuspid Regurgitation
  - 1.9.4. Assessment of Aortic Regurgitation
  - 1.9.5. Assessment of Pulmonary Regurgitation
- 1.10. Thoracic Ultrasound
  - 1.10.1. Thoracic Ultrasound
    - 1.10.1.1. Spills
    - 1.10.1.2. Masses
    - 1.10.1.3. Pulmonary Parenchyma
  - 1.10.2. Echocardiography in Exotic Animals
    - 1.10.2.1. Rabbits
    - 1.10.2.2. Ferrets
    - 1.10.2.3. Rodents
  - 1.10.3. Others



*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. 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, 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 Echocardiography in Small Animals guarantees students, in addition to the most rigorous and up to date education, access to a Postgraduate Certificate issued by TECH Global University.





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

This program will allow you to obtain your **Postgraduate Certificate in Echocardiography in Small Animals** endorsed by **TECH Global University**, the world's largest online university.

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

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

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

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



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



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# Postgraduate Certificate

## Echocardiography in Small Animals

