

# Hybrid Professional Master's Degree

## Hyperbaric Medicine





## Hybrid Professional Master's Degree Hyperbaric Medicine

Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Global University

60 + 5 créditos ECTS

Website: [www.techtute.com/us/medicine/hybrid-professional-master-degree/hybrid-professional-master-degree-hyperbaric-medicine](http://www.techtute.com/us/medicine/hybrid-professional-master-degree/hybrid-professional-master-degree-hyperbaric-medicine)

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# 01

# Introduction

Hyperbaric medicine has gained greater relevance in recent years, driven by technological advances, cost reduction and its proliferation in both the public and private sectors. Following this growth, there is a need for specialists to keep up to date with all the latest developments, ranging from its use in wound healing and infectious pathologies to other areas such as toxicology or oncology. This complete program provides access to the latest scientific postulates on the subject, in addition to offering an important practical part in which all the developments presented are consolidated.





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*Access the latest developments in the field of hyperbaric medicine with a qualification that will bring you up-to-date both in theory and practice”*

Since the discovery of oxygen in 1775 by Priestley, numerous advances have been made over the centuries that have allowed the application of oxygen therapy to address a multitude of complications. Among the most common treatments, hyperbaric medicine is used for carbon monoxide poisoning, decompression sickness, air embolism or asphyxia.

Its benefits for the patient are multiple, especially when it comes to revitalization and neovascularization of tissues, antimicrobial action and can even be applied in preventive medicine to prolong the quality of life and keep healthier. Its recent proliferation has also led to explore its use in other areas of special interest for specialists in various areas.

Therefore, this Hybrid Professional Master's Degree in Hyperbaric Medicine from TECH was created with the aim of providing access to the most important research and scientific developments in this field, with special emphasis on the analysis and assessment of hyperbaric oxygenation treatment in physical and neurological rehabilitation, oncology, toxicology, and dysbaric pathology, among other areas of action.

The theoretical content of this degree is written by a team of professionals with great knowledge in the area of hyperbaric medicine, so the specialist will find an up-to-date teaching material adapted to the most current medical requirements. The support in work guides, real clinical cases, interactive summaries and additional readings will make the study process much more agile for the specialist, as they will have a multitude of help to do so.

On the other hand, the internship program of this degree provides a unique opportunity to apply and study all the recent advances in situ, in a highly prestigious center that has the most advanced technology in the application of hyperbaric oxygenation treatments. Thanks to this, the updating work will be total and complete, accessing first hand to the most innovative practical applications.

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

- ♦ Development of more than 100 clinical cases presented by professionals of hyperbaric medicine and its multiple uses
- ♦ 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
- ♦ Analysis of the physiological and therapeutic effects of hyperbaric oxygenation treatment through multiple assessments and scientific studies
- ♦ Assessment of HBOT in chronic ulcers, diabetic foot, vasculitis and other infectious pathologies
- ♦ An algorithm-based interactive learning system for decision-making in the clinical situations presented throughout the course
- ♦ Practical clinical guides on approaching different pathologies
- ♦ With a special emphasis on evidence-based medicine and research methodologies in intensive care nursing
- ♦ All this will be complemented by theoretical lessons, questions to the expert and individual reflection assignments
- ♦ Content that is accessible from any fixed or portable device with an Internet connection
- ♦ Additionally, students will be able to carry out a clinical internship in one of the best hospitals in Spain

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*You will have the opportunity to learn first-hand about the latest generation of treatments and machinery, guided by a team of highly qualified professionals in hyperbaric medicine”*

This Hybrid Professional Master's Degree program, which has a professionalizing nature and a hybrid learning modality, is aimed at updating professionals specialized in hyperbaric medicine who wish to access the latest developments in this field. The contents are based on the latest scientific evidence, and oriented in a didactic way to integrate the most modern theoretical knowledge in the use of hyperbaric oxygenation with the most current clinical practice.

Thanks to the multimedia content, developed with the latest educational technology, will allow the hyperbaric medicine professional a situated and contextual learning, i.e., a simulated environment that will provide immersive learning programmed to train 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 during the course. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

*You will be able to update your knowledge in a modern and versatile environment, where you will appreciate the most current uses of TOBH.*

*Get up-to-date with a program that respects your needs and adapts to your highest demands.*



# 02

## Why Study this Hybrid Professional Master's Degree?

In a modern world, where immediacy and the need for effectiveness in all processes leads the reality of society, training and updating of health knowledge is essential. For this reason, TECH at the forefront of education composes the most useful and complete programs for the qualification of medical professionals of national and international reference. Therefore, this program introduces the most advanced techniques, procedures and applications related to Hyperbaric Medicine. For this reason, in just 12 months of study, from the theoretical part and 100% online, to the internship period in a prestigious clinical center, you will be able to demonstrate the advantages of this treatment.



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*Stand out with a unique professional background thanks to the update you will get from cutting-edge professionals chosen by TECH for your theoretical and practical education”*

### 1. Updating from the latest technology available

Among the latest technologies for the treatment of ailments and pathologies in patients is Hyperbaric Medicine, which is also advancing by leaps and bounds. Therefore, as a health professional it is essential to be up-to-date in order to provide effective and innovative solutions to patients. With this program the student will have the latest technology from the virtual platform to the practice center that will be equipped with the most up-to-date in clinical practice.

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

TECH allows the student to be accompanied at all times by high-level professionals. From the design of the syllabus and support in the virtual platform, to the choice of the clinical internship center, the tutoring of the best specialists in the area of study is already taken into account. In this way, the learning process will flow smoothly and the student will have all the necessary technical resources to perform well in clinical internships and, therefore, to configure the desired professional background.

### 3. Entering First-Class Clinical Environments

TECH carefully selects all available centers for Internship Programs. Thanks to this, the specialist will have guaranteed access to a prestigious clinical environment in the field of Hyperbaric Medicine. In this way, you will be able to see the day-to-day work of a demanding, rigorous and exhaustive sector, always applying the latest theses and scientific postulates in its work methodology.





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

TECH presents an innovative proposal, which combines theoretical preparation with a 100% practical stage, where the professional in 12 months will be able to expand their knowledge with ease and quality they deserve. They will enjoy an on-site internship for 3 weeks, in a real clinical space, which will allow them to work directly with multidisciplinary professionals and with the technical resources available for the treatment of patients in Hyperbaric Medicine.

#### 5. Expanding the Boundaries of Knowledge

TECH offers the possibility of taking this Hybrid Professional Master's Degree from the comfort of their favorite device because the theoretical learning is 100% online, with dynamic and differentiating multimedia resources. In addition, for the internship program, it chooses the most prestigious centers in national and international environments. This way, the specialist will be able to expand their frontiers and catch up with the best professionals from different continents. A unique opportunity that only TECH could offer.



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

# 03 Objectives

Being a field of medicine where many advances have been made in recent years, the objective of this degree is to provide the specialist with all the latest knowledge and research on hyperbaric medicine. All this in a comfortable and practical format, which integrates the latest scientific developments with the most advanced technology currently available.





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*You will incorporate all the analyses, assessments and evaluations related to HBOT into your daily practice in a natural and progressive way, even before completing the degree”*



## General Objective

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- On one hand, this Hybrid Professional Master's Degree seeks to provide the specialist with the most important studies and analysis on hyperbaric medicine, divided into areas such as pain, rheumatic pathology, physical rehabilitation or wound healing, among other areas of great interest. On the other hand, during the internship program, the specialist themselves will have the opportunity to attend and witness all the treatments given, accompanied by highly qualified professionals who are 100% committed in their updating

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*Continue your constant improvement in the field of hyperbaric medicine with the best academic offer on the market, specifically designed to meet your most demanding needs”*





## Specific Objectives

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### Module 1. Introduction to Hyperbaric Medicine

- ◆ Introduce the world history of Hyperbaric Medicine and the operation and differences in the types of hyperbaric chambers that exist today
- ◆ Describe the current state of new indications and applications based on the development of evidence, the evolution of the different models and types of hyperbaric chambers, and the origin of scientific societies related to the specialty
- ◆ Develop the concept of oxygen toxicity, contraindications and adverse effects related to the discoveries of its mechanism of action (e.g. Bert effect)
- ◆ Present the new concept of Hyperbaric Medicine which includes treatment with lower pressure, its indications, limitations and potential future applications

### Module 2. Basis of Hyperbaric Oxygenation Treatment (HBOT)

- ◆ Study the fundamentals of Hyperbaric Oxygenation Treatment (HBOT) and the mechanisms to achieve hyperoxia
- ◆ Present the physical laws involved and Krogh's mathematical model that supports the effect of treatment at different pressures
- ◆ Describe the differences between the volumetric and solumetric effect of HBOT and its limitations in the treatment of different diseases
- ◆ Present the types of hypoxia described and the scenarios of hypoxia-related disorders in different pathologies

### Module 3. Physiological Therapeutic Effects of HBOT

- ♦ Studying the effects of hyperoxia on a mitochondrial level and the physiological benefits it triggers
- ♦ Describe the importance of mitochondrial reactivation with HBOT and its potential effect on different related pathologies with mitochondrial dysfunction
- ♦ Present the physiological effects that are triggered with HBOT and the production of reactive oxygen species
- ♦ Relate this physiological effects with different indications of HBOT
- ♦ Learning the analysis of different clinical cases which can benefit from the therapeutic effects of HBOT

### Module 4. HBOT in Wound Healing Process and Infectious Pathology

- ♦ Present the scientific evidence of HBOT on different types of complex wounds and burns
- ♦ Training in the role of HBOT in wound healing process
- ♦ Up-to-date information on the evidence of the physiological therapeutic effects of HBOT on wound healing and medium pressure
- ♦ Demonstrate the experience in these applications with a presentation of clinical cases

### Module 5. HBOT in Pain, Rheumatic Diseases and the Medical Clinic

- ♦ Describe the effect and scientific evidence of HBOT on altitude sickness
- ♦ Demonstrate the mechanism of hyperbaric oxygen on analgesia and experimental evidence
- ♦ Training on the application of HBOT in rheumatic diseases and neurosensitive syndromes
- ♦ Discuss the probable application in the prevention of metabolic pathologies with inflammatory component or ischemia - reperfusion injury
- ♦ Present the experience of HBOT in clinical cases of chronic pain, intoxications and clinical medicine



**Module 6. HBOT in Physical and Neurological Rehabilitation**

- ♦ Present the scientific evidence on the neurological indications of HBOT
- ♦ Describe the effect of HBOT on physical rehabilitation
- ♦ Training on the indications of HBOT in sporting injuries and trauma pathologies
- ♦ Describe the effect of HBOT on recovery and performance in sport
- ♦ Discuss the role of hypoxia in the development of neurodegenerative diseases and present the evidence of HBOT on Parkinsons and Alzheimers
- ♦ Present the experience of clinical cases treated with HBOT

**Module 7. HBOT in Oncology**

- ♦ Describe the applications and experience in cases of clinical oncology
- ♦ Present the scientific evidence on the use of HBOT as a coadjuvant of oncological treatment
- ♦ Describe the effects of HBOT on the different radiotoxicities
- ♦ Training in the oncological safety of HBOT (angiogenesis and tumor growth)
- ♦ Present the experimental evidence of the safety and efficiency of HBOT in oncologic pathology

**Module 8. HBOT in Toxicology**

- ♦ Present the evidence and the application of HBOT in intoxication from gases
- ♦ Discuss the indication of HBOT in pressures lower than those described in the literature, considering the importance of speed in establishing HBOT in the case of carbon monoxide poisoning
- ♦ Present evidence on intoxication and injuries from venomous animal bites (Loxoscelism, snake bites)

**Module 9. HBOT in Dysbaric Pathology**

- ♦ Present the scientific evidence on decompression sickness in divers
- ♦ Introduce the concept of dysbaric pathologies and Underwater Medicine
- ♦ Discuss the need for the volumetric effect of HBOT and the use of high-pressure chambers
- ♦ Describe the evidence of the effect of HBOT in iatrogenic embolism
- ♦ Introduce the concepts of work safety with high pressure chambers
- ♦ Present the requirements and regulations for the installation of the different hyperbaric chambers

**Module 10. Indications and Contraindications Integration Module**

- ♦ Training on the valid indications of HBOT for the different societies of Hyperbaric Medicine and the emerging indications based on the physiological therapeutic effects of HBOT
- ♦ Describe the adverse events that are expected from HBOT with different treatment pressures
- ♦ Present the contraindications of HBOT
- ♦ Discuss different clinical cases based on the integration of validated applications and the potential future applications of HBOT

# 04 Skills

Given the importance of modernizing and delving into all recent knowledge in this area, the competencies acquired by the specialist after completing this degree are varied. All of them are focused on the professional continuing to offer the best possible professional praxis, adapted to the demands and progress of recent times. The specialist will find very specific guidelines that guarantee their complete updating in the most relevant areas of hyperbaric medicine.



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*You will have the opportunity to be fully up-to-date and discover advances in burns, fibromyalgia and smoking, with a corresponding TOBH application to address them”*



## General Skills

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- ♦ Identify and resolve cases of pathologies in which hyperbaric oxygenation treatments can reduce the risk of morbidity and mortality, or considerably improve the patient's quality of life
- ♦ Recognize the benefits of hyperbaric chamber treatment on pathologies of diverse origins
- ♦ Actively participate in the use and expansion of the specialty in the field of public and private health





## Specific Skills

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- ♦ Recognize the different hyperbaric chambers which have existed throughout history
- ♦ Know how to apply Hyperbaric Oxygenation Treatment (HBOT)
- ♦ Know in detail the physiological therapeutic effects caused by the generation of hyperoxia
- ♦ Be able to identify the effects of HBOT that intervene in wound healing
- ♦ Know the new treatment alternatives in the different types of wounds
- ♦ Know the fundamentals of the driving mechanism of hyperbaric oxygen in pain
- ♦ Know how to apply hyperbaric oxygen in different pathologies which come with chronic pain and therefore improve the patient's quality of life
- ♦ Know the principles of the contribution of hyperbaric oxygen in the improvement of neuroplasticity in different cases of neurological rehabilitation
- ♦ Be capable of using hyperbaric oxygen for injury recovery and for improving performance in sport, following the optimal conditions for establishing the treatment
- ♦ Know the evidence, experience and future indications of the application of HBOT in clinical oncology
- ♦ Understand the role of HBOT in improving the oncology patient's quality of life and in managing radio induced lesions
- ♦ Know how to apply the driving mechanism of hyperbaric oxygen in the intoxication of gases
- ♦ Know the treatment options currently available on the market and their applications and limitations in the rapid onset of acute intoxication
- ♦ Use hyperbaric oxygen for the recovery of neurological lesions post intoxication
- ♦ Know in depth about Underwater Medicine and the need for high pressure chamber treatment in dysbaric pathologies
- ♦ Understand work safety in hyperbaric chamber procedures
- ♦ Integrate the concepts related to Hyperbaric Medicine
- ♦ Be capable of applying the concepts of the physiological effects of HBOT on different pathologies
- ♦ Perform indications in different clinical cases, assess the contraindications and make decisions in response to the different adverse effects that can occur during treatment



*At the end of this Hybrid Professional Master's Degree you will have lived a unique and enriching experience for your daily clinical practice"*

# 05

# Course Management

TECH has assembled a complete teaching team with renowned expertise in the area of hyperbaric medicine. The conjunction of their practical capacity with the latest scientific theory makes the program of outstanding quality. The specialist will be accompanied at all times by professionals who know what their needs are and what they currently require to continue to be at the forefront of the medical vanguard.





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*Leading professionals in the field of hyperbaric medicine will provide you with the most relevant technological and scientific developments in this field"*

## International Guest Director

Dr. Peter Lindholm is an eminence in Hyperbaric Medicine and the approach to Respiratory Disorders. His research has been focused on the Pathophysiology of Lung Diving, exploring topics such as Hypoxia and loss of consciousness.

Specifically, this expert has analyzed in depth the effects of the medical condition known as Lungsqueeze, frequent in divers. Among his most important contributions in this area is a detailed review of how glossopharyngeal breathing can extend lung capacity beyond normal limits. In addition, he described the first case series linking glossopharyngeal insufflation with cerebral gas embolism.

At the same time, he has been a pioneer in proposing the term Tracheal Squeeze as an alternative to pulmonary edema in divers who bleed after deep dives. On the other hand, the specialist has shown that exercise and fasting before diving increase the risk of loss of consciousness, similar to hyperventilation. In this way, he has developed an innovative method to use Magnetic Resonance Imaging in the diagnosis of Pulmonary Embolism. In the same way, he has delved into new techniques for measuring hyperbaric oxygen therapy.

Dr. Lindholm also serves as Director of the Endowed Gurnee Chair of Diving and Hyperbaric Medicine Research in the Department of Emergency Medicine at the University of California, San Diego, United States. Likewise, this renowned expert spent several years at Karolinska University Hospital. In that institution he worked as Director of Thoracic Radiology. He also has vast experience in diagnosis by means of clinical imaging based on radiation, and has even given lectures on the subject at the prestigious Karolinska Institute in Sweden. He is also a regular speaker at international conferences and has numerous scientific publications.



## Dr. Lindholm, Peter

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- Chair of Hyperpathic Medicine and Diving at the University of California, San Diego, United States
- Director of Thoracic Radiology at the Karolinska University Hospital
- Professor of Physiology and Pharmacology at Karolinska Institute in Sweden
- Reviewer for international scientific journals such as American Journal of Physiology and JAMA
- Medical Residency in Radiology at the Karolinska University Hospital
- Doctor of Science and Physiology, Karolinska Institute, Sweden

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

## Management



### **Dr. López Jiménez, Elías**

- Oncology Expert in Hyperbaric Medicine
- Oncologist at the Moncloa University Hospital
- Oncologist at Clínica Oncología Román
- Speaker at Oncology and Hyperbaric Medicine Conferences



### **Ms. Jordá Vargas, Liliana**

- Clinical Biochemistry and Microbiology Expert
- Scientific Director from BioBarica - Hyperbaric Systems
- Microbiologist at CRAI Norte
- Bacteriologist at Vélez Sarsfield Hospital
- Scientific Director of AAMHEI and AEMHEI
- Degree in Biochemistry from the National University of Córdoba
- Biochemistry and Clinical Microbiology, University Institute CEMIC

## Professors

### Dr. Cannellotto, Mariana

- ◆ Specialist in Hyperbaric Medicine
- ◆ Medical Director from BioBarica - Hyperbaric Systems
- ◆ Clinical Physician at CES SRL
- ◆ President of Argentina Association of Hyperbaric Medicine and Research
- ◆ President of Ihmera

### Dr. Verdini, Fabrizio

- ◆ Clinical Doctor at BioBarica Hyperbaric Systems
- ◆ Director of Health Programs at Camp La Llanada
- ◆ General Practitioner at Doctor Armando Mata Sanchez Hospital
- ◆ Doctor of Medicine from the University of Carabobo
- ◆ Master's Degree in Hyperbaric Medicine from the CEU Cardenal Herrera University
- ◆ Master's Degree of Business Administration Healthcare, Polytechnic University of Puerto Rico

### Dr. Ramallo, Rubén Leonardo

- ◆ Attending Physician Specialist in Medical Clinic at the General Hospital of Acute Diseases
- ◆ Physician in Hyperbaric Medicine. BioBarica Hyperbaric Systems
- ◆ Medical Surgeon Faculty of Medical Sciences. National University of Córdoba
- ◆ Specialist in Internal Medicine. Residency in Internal Medicine, Córdoba Hospital
- ◆ Master's Degree in Psychoimmunoneuroendocrinology. Favaloro University
- ◆ Director of the AAMHEI Medical Clinic Commission

### Dr. Romero Feris, María Delfina

- ◆ President AEMHEI Spanish Association of Hyperbaric Medicine and Research
- ◆ Medical Director at BioBarica Hyperbaric Medicine
- ◆ Medical Director at Sagrado Corazon Clinic
- ◆ Medical Director BioBarica, La Milagrosa Clinic
- ◆ Doctor at the Northwest National University

### Dr. Emilia Fraga, Pilar María

- ◆ Director of the Scientific and Clinical Research Division at BioBarica
- ◆ Food evaluator at the National Food Institute
- ◆ Professor of Anatomy and Physiology at ADEF
- ◆ Degree in Biochemistry from Arturo Jauretche National University



*The professionals who have participated in the design of this program are highly recognized in the area of reference”*

# 06

## Educational Plan

Knowing that this is a recent field of research, with multiple advances in recent years, this syllabus has brought together the most relevant research, postulates and scientific theses. Thanks to TECH's state-of-the-art educational technology, the specialist has easy access to all the contents whenever and wherever they want. From day one, the entire syllabus is available for downloading from any device with an Internet connection, providing the degree with the necessary flexibility to be combined with other professional or personal activities of the highest demand.



A close-up, low-angle shot of a white printer or copier. The printer is the central focus, with its various components like the paper tray and rollers visible. The lighting is soft and even, highlighting the clean, modern design of the machine. The letters 'RL' are printed in a dark, bold font on a white surface, likely a part of the printer's housing. The background is a solid, deep blue, which contrasts sharply with the white of the printer, creating a clean and professional aesthetic. The overall composition is simple and focused, emphasizing the technology and the quality of the educational environment.

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*You will learn at your own pace  
and with the organizational skills  
you need on a day-to-day basis”*

### Module 1. Introduction to Hyperbaric Medicine

- 1.1. History of Hyperbaric Medicine
- 1.2. First Hyperbaric Chambers
- 1.3. Discovery of Oxygen
- 1.4. Scientific Period of Hyperbaric Medicine
- 1.5. Types of Hyperbaric Chambers Revitalair Technology Chambers
- 1.6. Technical and Therapeutic Safety of the New Generation Hyperbaric Chambers
- 1.7. Hyperbaric Medicine Societies in the World and the Evolution of the Indications
- 1.8. Introduction to the Basis of Hyperbaric Oxygenation
- 1.9. Introduction to the Adverse Effects and Contraindications
- 1.10. Current Concept of Hyperbaric Oxygenation Treatment Medium Pressure, Micro pressure and Hyperbaria

### Module 2. Basis of Hyperbaric Oxygenation Treatment (HBOT)

- 2.1. Physiological Bases of HBOT
- 2.2. Dalton, Henry, Boyle and Mariotte Physical Laws
- 2.3. Physical and Mathematical Bases of the Diffusion of Oxygen within Tissue in the Different Treatment Pressures. Krogh Model
- 2.4. Physiology of Oxygen
- 2.5. Physiology of Respiration
- 2.6. Volumetric and Solumetric Effect
- 2.7. Hypoxia Types of Hypoxia
- 2.8. Hyperoxia and Treatment Pressure
- 2.9. Hyperoxia Effective in Wound Healing
- 2.10. Bases of the Intermittent Hyperoxia Model

### Module 3. Physiological Therapeutic Effects of HBOT

- 3.1. Introduction to the Physiological Therapeutic Effects
- 3.2. Vasoconstriction
  - 3.2.1. Robin Hood Effect
  - 3.2.2. Effect of HBOT on Blood Pressure and Heart Rate
- 3.3. Stem Cells and Oxygen
  - 3.3.1. Liberation of Stem Cells with HBOT
  - 3.3.2. Importance of Stem Cells on Wound Healing
  - 3.3.3. Oxygen in the Differentiation of Stem Cells
- 3.4. Oxygen in the Synthesis of Collagen
  - 3.4.1. Synthesis and Types of Collagen
  - 3.4.2. Oxygen in the Synthesis and Maturing of Collagen
  - 3.4.3. HBOT and Collagen in Healing
- 3.5. Angiogenesis and Vasculogenesis
  - 3.5.1. Degenerative Angiogenesis and Hyperbaric Oxygen
- 3.6. Osteogenesis
  - 3.6.1. HBOT and Osteogenesis and Bone Resorption
- 3.7. Mitochondrial Function, Inflammation and Oxidative Stress
  - 3.7.1. Mitochondrial Dysfunction in the Pathogenesis of Different Pathologies
  - 3.7.2. HBOT and Mitochondrial Function
- 3.8. Oxidative Stress and Hyperbaric Oxygen
  - 3.8.1. Oxidative Stress in Different Pathologies
  - 3.8.2. Oxidative Stress in Hyperbaric Oxygen
- 3.9. Anti-inflammatory Effect in Hyperbaric Oxygen
  - 3.9.1. Hyperbaric Oxygen and Inflammation
- 3.10. Antimicrobial Effect in Hyperbaric Oxygen
  - 3.10.1. Bacterial Effect of Oxygen
  - 3.10.2. Hyperbaric Oxygen and Biofilm
  - 3.10.3. Hyperbaric Oxygen and the Immune Response
- 3.11. Oxygen and Neurone Function
  - 3.11.1. Oxygen and Peripheral Axonal Regeneration
  - 3.11.2. Oxygen and Neuroplasticity

**Module 4. HBOT in Wound Healing Process and Infectious Pathology**

- 4.1. HBOT in Healing Physiology
- 4.2. Medium Pressure and Wound Healing
  - 4.2.1. Effective Angiogenesis
  - 4.2.2. Equivalent Osteogenesis
  - 4.2.3. Anti-inflammatory Effect in Medium Pressure
- 4.3. Necrotizing Infections
- 4.4. HBOT in Chronic Ulcers and Diabetic Foot
- 4.5. Burns
- 4.6. Injuries from Radiofrequency Lesions and Hyperbaric Oxygen
- 4.7. HBOT in Crush Syndrome
- 4.8. Vasculitis and HBOT
- 4.9. HBOT in Pyoderma Gangrenosum
- 4.10. Evidence of HBOT in Other Injuries and Dermatological Conditions

**Module 5. HBOT in Pain, Rheumatic Diseases and the Medical Clinic**

- 5.1. HBOT in Altitude Sickness
- 5.2. Mechanisms of Action in Analgesia Neuropathic Pain and Hyperbaric Oxygen
- 5.3. Arthropathies and Collagenopathies
- 5.4. HBOT in Dysfunctional Neurosensitive Syndromes
- 5.5. Fibromyalgia and Hyperbaric Oxygen
- 5.6. HBOT in Ischemia Reperfusion Injury
- 5.7. Tinnitus and Sudden Onset Deafness
- 5.8. Inflammatory Bowel Diseases and Hyperbaric Oxygen
- 5.9. HBOT in Fertility
- 5.10. Hyperbaric Oxygen in the Metabolism of Diabetes and Severe Anemia

**Module 6. HBOT in Physical and Neurological Rehabilitation**

- 6.1. HBOT in Recovery and Performance in Sport
- 6.2. Hyperbaric Oxygen and Sporting Injuries
- 6.3. Brain Trauma and Post-Concussion Syndrome
- 6.4. Stroke Recovery and Hyperbaric Oxygen
- 6.5. Brain Paralysis and HBOT
- 6.6. Autism
- 6.7. Ischemic Encephalopathies
- 6.8. HBOT in Parkinson's
- 6.9. HBOT in Alzheimer's
- 6.10. HBOT in Trauma (Avascular Necrosis, Bone Edema, Fractures and Osteomyelitis)

**Module 7. HBOT in Oncology**

- 7.1. Hypoxia and Tumors
- 7.2. Tumoral Angiogenesis
- 7.3. Oncologic Safety of HBOT
- 7.4. HBOT and Radiosensitivity
- 7.5. HBOT and Chemotherapy
- 7.6. Osteoradionecrosis and Hyperbaric Oxygen
- 7.7. Radical Cystitis and Proctitis
- 7.8. Radio induced Skin Syndrome and HBOT
- 7.9. HBOT in Other Radio lesions
- 7.10. HBOT in Oncology Pain and Quality of Life

### Module 8. HBOT in Toxicology

- 8.1. Bibliographical Evidence in Relation to Dosage/ Speed of Using Hyperbaric Oxygen in Carbon Monoxide Poisoning
- 8.2. Inflammation in Carbon Monoxide Poisoning
- 8.3. Delayed Neurological Syndrome
- 8.4. Smoke Inhalation and Hyperbaric Oxygen
- 8.5. HBOT in Hydrogen Cyanide Poisoning
- 8.6. HBOT in Other Gases Poisoning
- 8.7. Hyperbaric Oxygen in Pollution and Tobacco
- 8.8. Hyperbaric Oxygen in Addiction Recovery
- 8.9. HBOT in Corner Spider Bite Injuries and Poisoning
- 8.10. HBOT in Snake Bite Injuries and Poisoning

### Module 9. HBOT in Dysbaric Pathology

- 9.1. Diving and Diving Medicine Physiological Reactions to Diving Conditions Deep Neurological Syndrome
- 9.2. Changes in Environmental Pressure Decompression Sickness Air Embolism Pathophysiology. Symptoms and Signs
- 9.3. Treatment of Decompression Sickness Prevention of Dysbaric Accidents Decompression Table
- 9.4. Dysbaric Pathology and Evidence-Based Medicine
- 9.5. Dysbaric Osteonecrosis
- 9.6. HBOT in Postoperative Gas Embolism Iatrogenic Embolism
- 9.7. Hyperbaric Medicine in the Workplace Work in Compressed Air Medical Documents and Immersion Records Health Risks
- 9.8. Work Accidents in Operating High Pressure Chambers Medical Support and Treatment for Compressed Air Jobs
- 9.9. Fire Evaluation and Prevention with Hyperbaric Chamber with Combustion Risk
- 9.10. Regulations and Requirements for the Installation of Different Types of Hyperbaric Chambers



### Module 10. Indications and Contraindications Integration Module

- 10.1. Absolute and Relative Contraindications of HBOT
- 10.2. Adverse Effects of Hyperoxia
- 10.3. Neuronal and Pulmonary Oxygen Toxicity
- 10.4. Neurotoxicity/Neuro excitability
- 10.5. Objective and Subjective Barotrauma
- 10.6. Special Care for Patients who Receive HBOT at Different Pressures
- 10.7. Indications by Consensus of the European Committee of Hyperbaric Medicine
- 10.8. Emerging Medical Applications Off label and Medicare Indications
- 10.9. Management in Hyperbaric Medicine Centers HBOT in Public and Private Health
- 10.10. Cost- Benefit Relationship of the Application of HBOT HBOT Cost Efficiency

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*This content will be available to you 24 hours a day from the most convenient and advanced virtual platform”*

07

# Clinical Internship

After the online update period, this program includes clinical internship in a prestigious hyperbaric medicine center, with access to multiple treatments and state-of-the-art equipment. The tutor assigned to the specialist will serve as a guide throughout the internship, which lasts 3 weeks and 30 hours per week. During the internship, they will have access to treatments for radiated patients, diabetic foot ulcers, recovery of sports injuries and other services of great relevance in the current panorama of hyperbaric medicine.





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*Learn in a direct way, accompanied by professionals with great expertise in the use of hyperbaric medicine for various clinical pictures”*

The internship period of this hyperbaric medicine program includes 3 weeks of practical training in a prestigious health center, 30 hours per week. This internship will allow to treat real patients alongside a team of professionals of reference in the field of application of TOBH in the face of different pathologies and complications.

The activities that the specialist will develop throughout the internship are aimed at delving deeper and continuing to improve their skills in the field of hyperbaric medicine and its multiple applications. As it is a medical area that requires a high level of specialization and knowledge, the specialist will be accompanied at all times by professionals who will guide them throughout the process.

It is, therefore, an unbeatable opportunity to get up-to-date in a practical format, knowing first-hand the advances made in this field and its most practical and successful application in patients with various pathologies. All this in a prestigious center that has the latest machinery and technological devices available.

The practical part will be carried out with the active participation of the student performing the activities and procedures of each area of knowledge (learning to learn and learning to do), with the accompaniment and guidance of teachers and other fellow trainees that facilitate teamwork and multidisciplinary integration as transversal competencies for the practice of Hyperbaric Medicine (learning to be and learning to relate).

The procedures described below will form the basis of the practical part of the training, and their implementation is subject to both the suitability of the patients and the availability of the center and its workload, with the proposed activities being as follows:





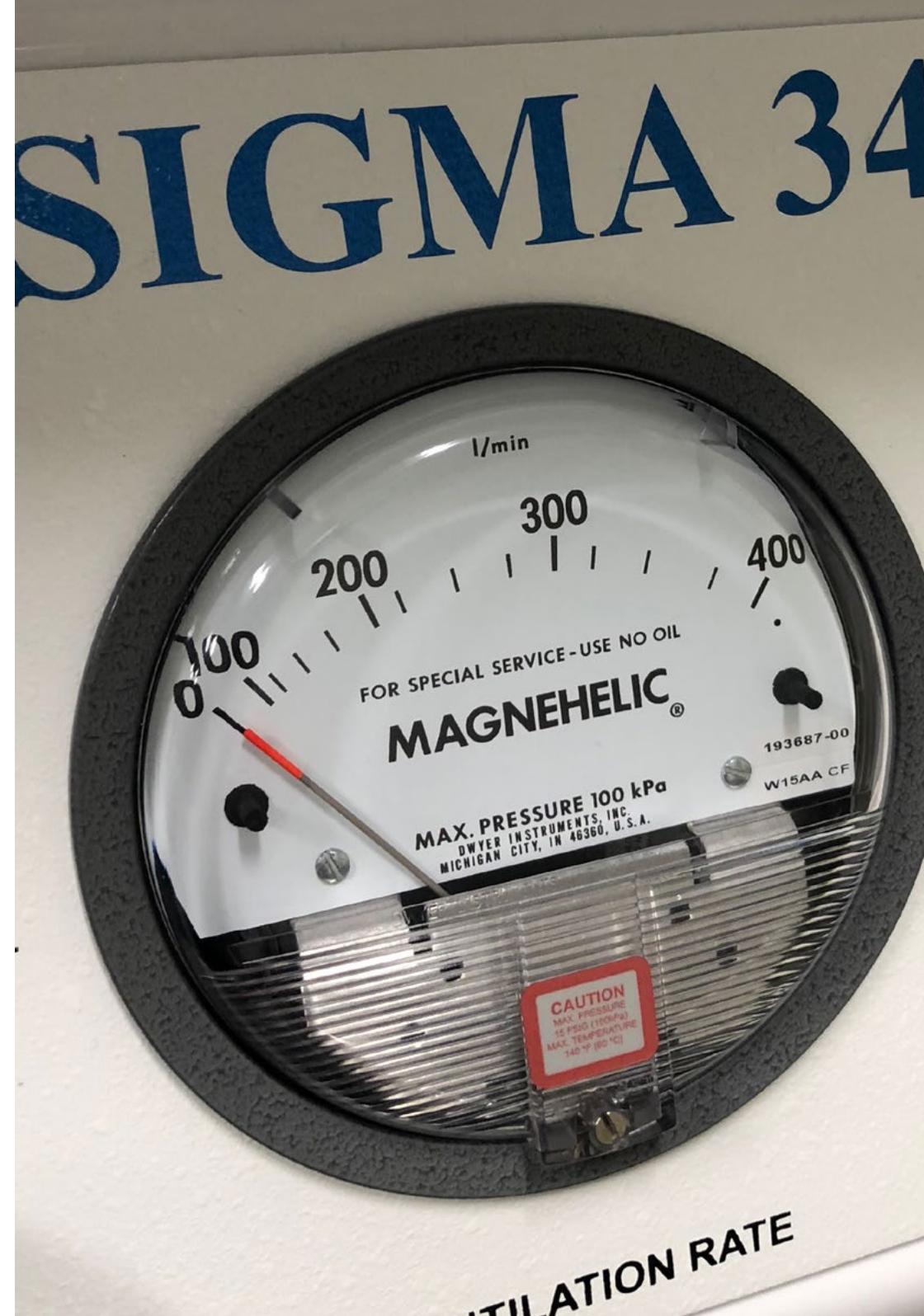
Module	Practical Activity
<b>Hyperbaric Chamber Configuration</b>	Apply the strictest protocols of technical and therapeutic safety in new generation hyperbaric chambers
	Regulate the indicated pressure of each session according to the intended treatment
	Analyze the patient's ability to compensate the pressure in their ears, regulating the pressurization speed accordingly
	Perform average pressures, micropressure and hyperbaric pressure test
<b>Verification of Physiological Therapeutic Effects of HBOT</b>	Perform vasoconstriction analysis and other types of assessments in various conditions
	Analyzing oxidative stress and hyperbaric oxygen
	Test the anti-inflammatory effect of hyperbaric oxygen and the antimicrobial effect of hyperbaric oxygen
<b>Indications of Level 1 Hyperbaric Medicine</b>	Assess the use of Hyperbaric Medicine in patients with serious disorders such as Limb Crush Syndrome, Compromised Grafts and Flaps, Sudden Deafness, Chronic Osteomyelitis
	Assess patients with ulcers, gangrene or situations of Chronic Critical Ischemia where the use of Hyperbaric Medicine may be beneficial
	Follow up the patient's evolution based on vascular permeability
<b>Indications of Level 2 Hyperbaric Medicine</b>	Participate in therapeutic processes where Hyperbaric Medicine serves as a reinforcement in patients with limb reimplantation surgeries, cerebral anoxia or burns of more than 20% and second degree
	Examine cases of diabetic foot, cerebral vascular insufficiency, peripheral ischemic syndromes or sports injuries where Hyperbaric Medicine can intervene
	Assess the benefits of Hyperbaric Medicine in patients undergoing neurological and orthopedic rehabilitation, as well as in recovery from plastic or reconstructive surgeries
<b>Indications and Contraindications of Hyperbaric Medicine</b>	Analyze absolute and relative contraindications of Hyperbaric Medicine according to the clinical history of patients
	Assess patients with absolute contraindications such as untreated pneumothorax, proven oxygen toxicity or claustrophobia
	Study the use of Hyperbaric Medicine in patients with relative contraindications such as congenital anomalies of the nose and throat, narcolepsy or acute nephritis

## Civil Liability Insurance

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

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

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



## General Conditions of the Internship Program

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

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

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

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

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

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

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

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

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

08

# Where Can I Do the Clinical Internship?

With this Hybrid Professional Master's Degree in Hyperbaric Medicine the specialist complements their theoretical update with an internship in a high prestige clinic, with the capacity to integrate the latest advances given. In this way, the specialist obtains a much more comprehensive and effective up-to-date, as they will see the direct application of all the treatments and developments previously presented in a theoretical way.



“

*Complement theory and practice in a unique program that will help you continue your professional development in the field of hyperbaric medicine”*



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



Medicine

### Oxiclínico - Centro Odontoclínico Integral

Country	City
Spain	Madrid

Address: Calle Puerto de los Leones, 2 Planta primera, oficina 10, 28220 Majadahonda, Madrid

Specialized Clinic in General Dentistry and Hyperbaric Medicine

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**Related internship programs:**

- Hyperbaric Medicine



Medicine

### CornerSalud

Country	City
Spain	Madrid

Address: Av. de la Coruña, 68, 28231 Las Rozas de Madrid, Madrid

Hyperbaric Medicine Clinical Center with oxygen therapy

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**Related internship programs:**

- Hyperbaric Medicine



Medicine

### Hospital HM Montepíncipe

Country	City
Spain	Madrid

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

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

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**Related internship programs:**

- Palliative Care
- Aesthetic Medicine



Medicine

### Pilares del Rosario

Country  
Argentina

City  
Santa Fe

Address: Paraguay 2041 Rosario, Santa Fe

Clinic of integral neurorehabilitation for adults  
and children

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**Related internship programs:**

- Physiotherapy in Early Care
- Hyperbaric Medicine

09

# Methodology

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

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



“

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

## At TECH we use the Case Method

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

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



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

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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.

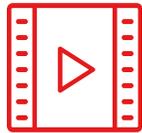
*Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.*

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

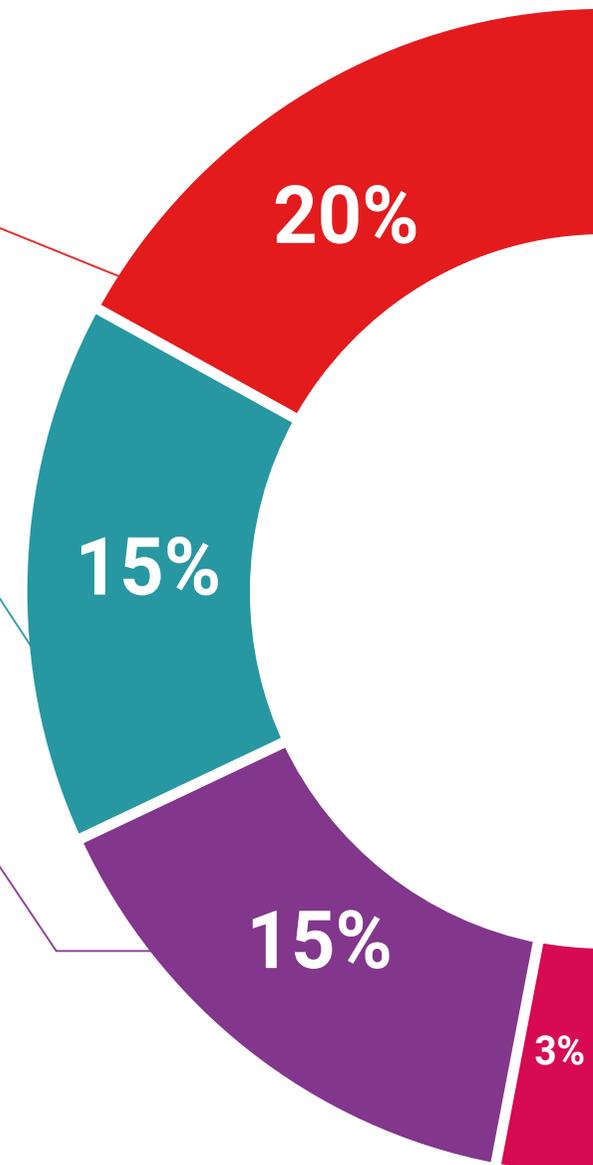
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

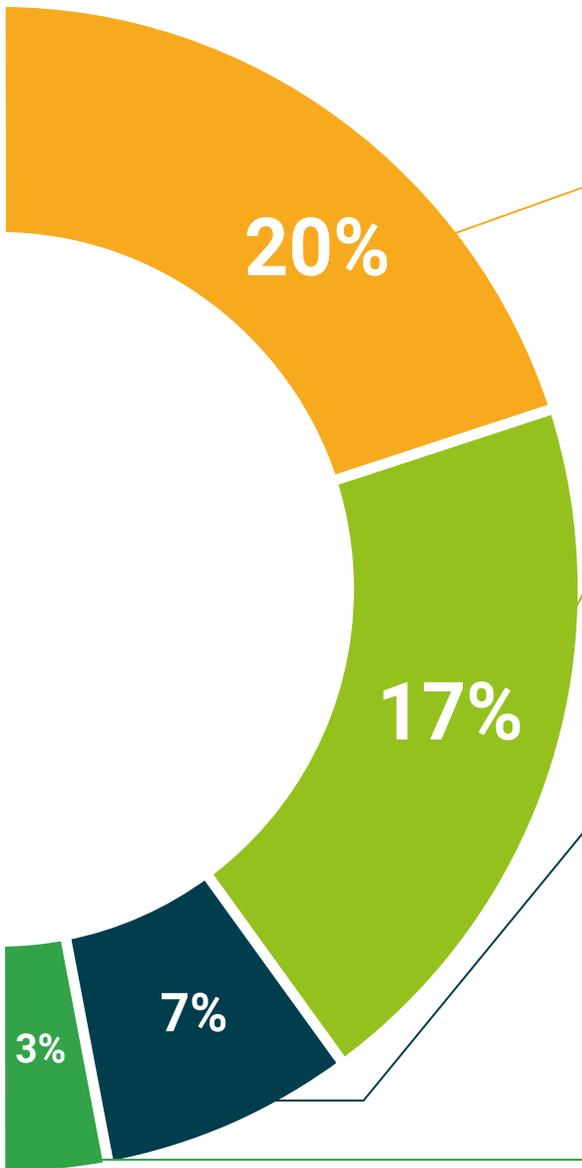
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### 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.





#### Expert-Led Case Studies and Case Analysis

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



#### Testing & Retesting

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



#### Classes

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



#### Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.



# 10 Certificate

The Hybrid Professional Master's Degree in Hyperbaric Medicine guarantees students, in addition to the most rigorous and up-to-date education, access to a Hybrid Professional Master's Degree diploma 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 **Hybrid Professional Master's Degree diploma in Hyperbaric Medicine** 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.

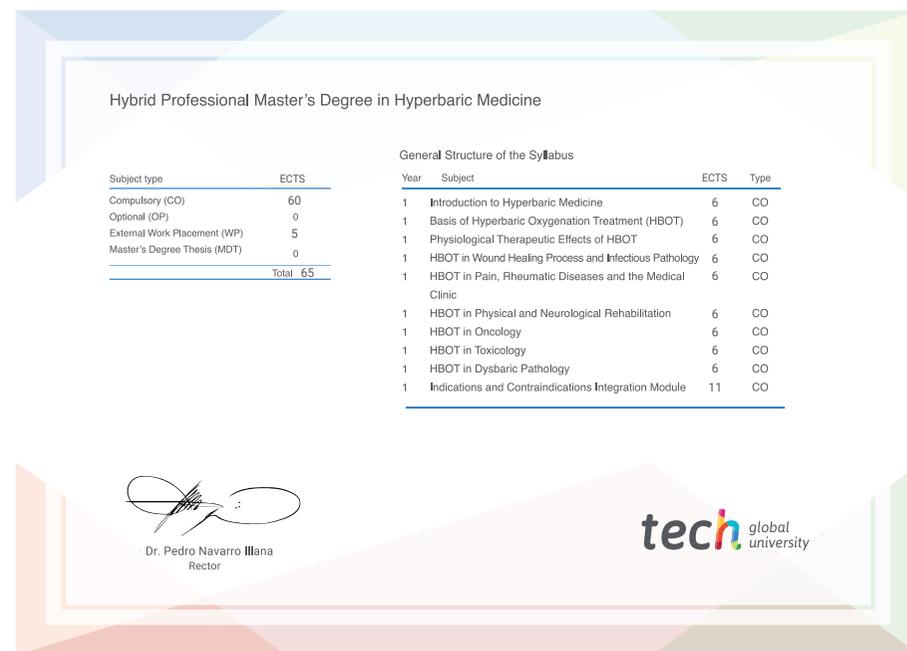
Title: **Hybrid Professional Master's Degree in Hyperbaric Medicine**

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

Duration: **12 months**

Certificate: **TECH Global University**

Recognition: **60 + 5 ECTS Credits**



\*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.

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



## Hybrid Professional Master's Degree

### Hyperbaric Medicine

Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Global University

60 + 5 créditos ECTS

# Hybrid Professional Master's Degree Hyperbaric Medicine

