Postgraduate Diploma
Hyperbaric Medicine. Fundamentals, Effects and Indications of HBOT

Endorsed by the NBA

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Postgraduate Diploma

Hyperbaric Medicine. Fundamentals, Effects and Indications of HBOT

- Modality: **online**
- Duration: **6 months**
- Certificate: **TECH Global University**
- Credits: **18 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/sports-science/postgraduate-diploma/postgraduate-diploma-hyperbaric-medicine-fundamentals-effects-indications-hbot**

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01

Introduction

Knowing the bases and fundamentals of Hyperbaric Oxygen Therapy in the physical field, as well as its specific indications is essential to be able to turn its application into a first level therapeutic asset in the area of Sports Sciences. In this sense, within this field of study, Hyperbaric intervention has become one of the most interesting and effective tools for its great potential to help heal injuries and / or pathologies that have originated in physical activity. Therefore, learning about this will make you a much more competent and prepared professional to work with these treatments in a variety of scenarios.

Incorporate the benefits of HBOT in sports medicine intervention: an innovative and efficient pathway to high therapeutic quality"

The creation of new generation hyperbaric chambers, which are more affordable and easier to install in public and private institutions, has led different professionals to incorporate this tool into their daily practice. Among them, one of the areas that is benefiting the most from this type of therapy is Sports Science.

The Postgraduate Diploma in Hyperbaric Medicine: Fundamentals, Effects and Indications of HBOT in Physical Activity and Sport will allow the professional to deepen in the use of these mechanisms. The program develops a solid and up-to-date training in Hyperbaric Oxygen Therapy, which will help the sports professional to obtain the necessary competences and skills to identify and adequately solve different cases of pathologies and/or injuries for which this treatment can be effective.

The training begins with a brief historical overview of the beginning of Hyperbaric Medicine, the first indications of what would become a Hyperbaric chamber and the empirical discovery of the beneficial effects of the combination of increased pressure and oxygen on human physiology. The sports professional will learn about the beginning of the scientific period of Hyperbaric Medicine and the development of Underwater Medicine, as well as the accompaniment of Diving Medicine in the understanding and development of this treatment in different countries.

The basics of HBOT will also be presented in a practical and simple way. The physical laws of Henry, Dalton, and Boyle and Mariotte will be addressed with the objective of incorporating the concept of volumetric and solumetric effect. Likewise, the mathematical model of Krogh is presented, which allows to know the effect of oxygen perfusion radius at different treatment pressures. In addition, the different types of hypoxia are detailed so that the student can understand the hypoxic bases of the different pathologies and recognize the therapeutic applications of hyperoxia.

On the other hand, the specialist will learn, through this training, the most relevant physiological effects: vasoconstriction, angiogenesis, collagen synthesis, osteogenesis, neuroprotection, peripheral axonal regeneration, bactericidal effect, anti-inflammatory and antioxidant effect.

The **Postgraduate Diploma in Hyperbaric Medicine: Fundamentals, Effects and Indications Effects of HBOT** contains the most complete and up-to-date educational program on the market. The most important features of the program include:

- Development of practical cases presented by experts in Hyperbaric Medicine and Sport
- 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
- New developments in Hyperbaric Medicine and its use in the field of sports
- Practical exercises where self-assessment can be used to improve learning
- Special emphasis on innovative methodologies in Hyperbaric Medicine
- 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

Only one click separates you from entering the best experience. Don't miss this great opportunity"

This Postgraduate Diploma is the best investment you can make in the selection of a refresher program because, in addition to providing you with the most complete contents on the market, it will offer you the opportunity to study without neglecting the rest of your daily activities"

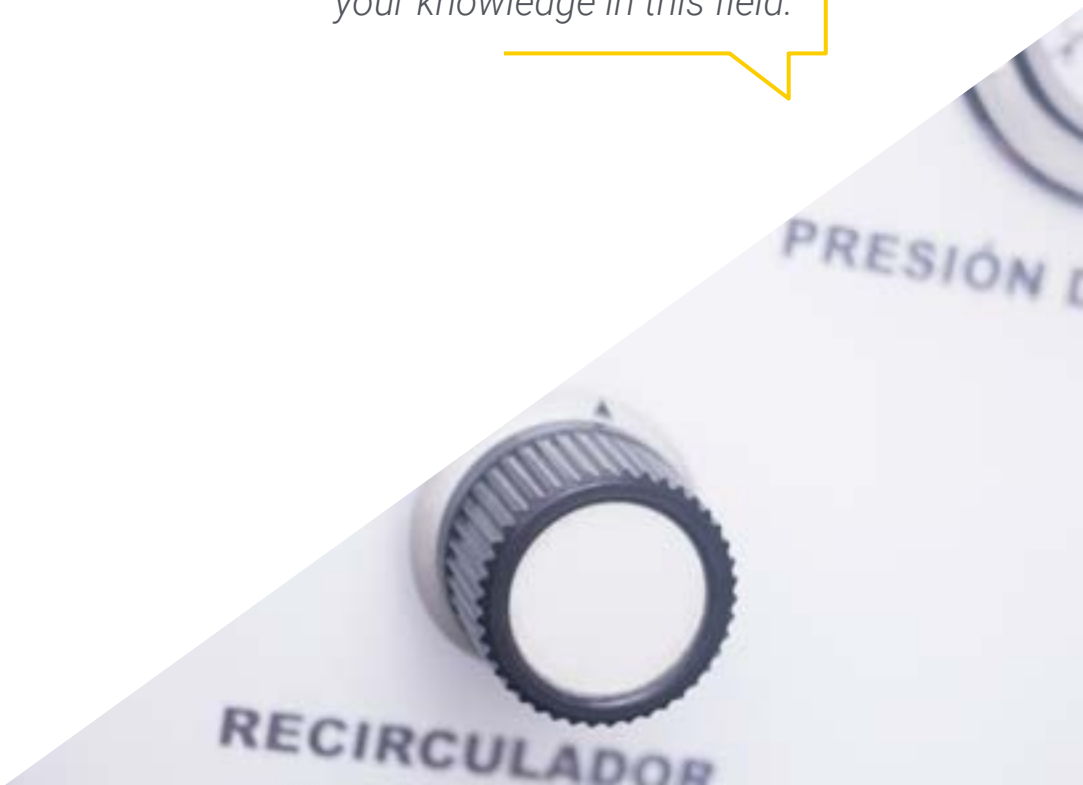
This training comes with the best didactic material, providing you with a contextual approach that will facilitate your learning.

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

The program includes, in its teaching staff, professionals belonging to the field of Hyperbaric Medicine and Sport, who pour into this training the experience of their work, in addition to recognized specialists from reference societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive training programmed to train in real situations.

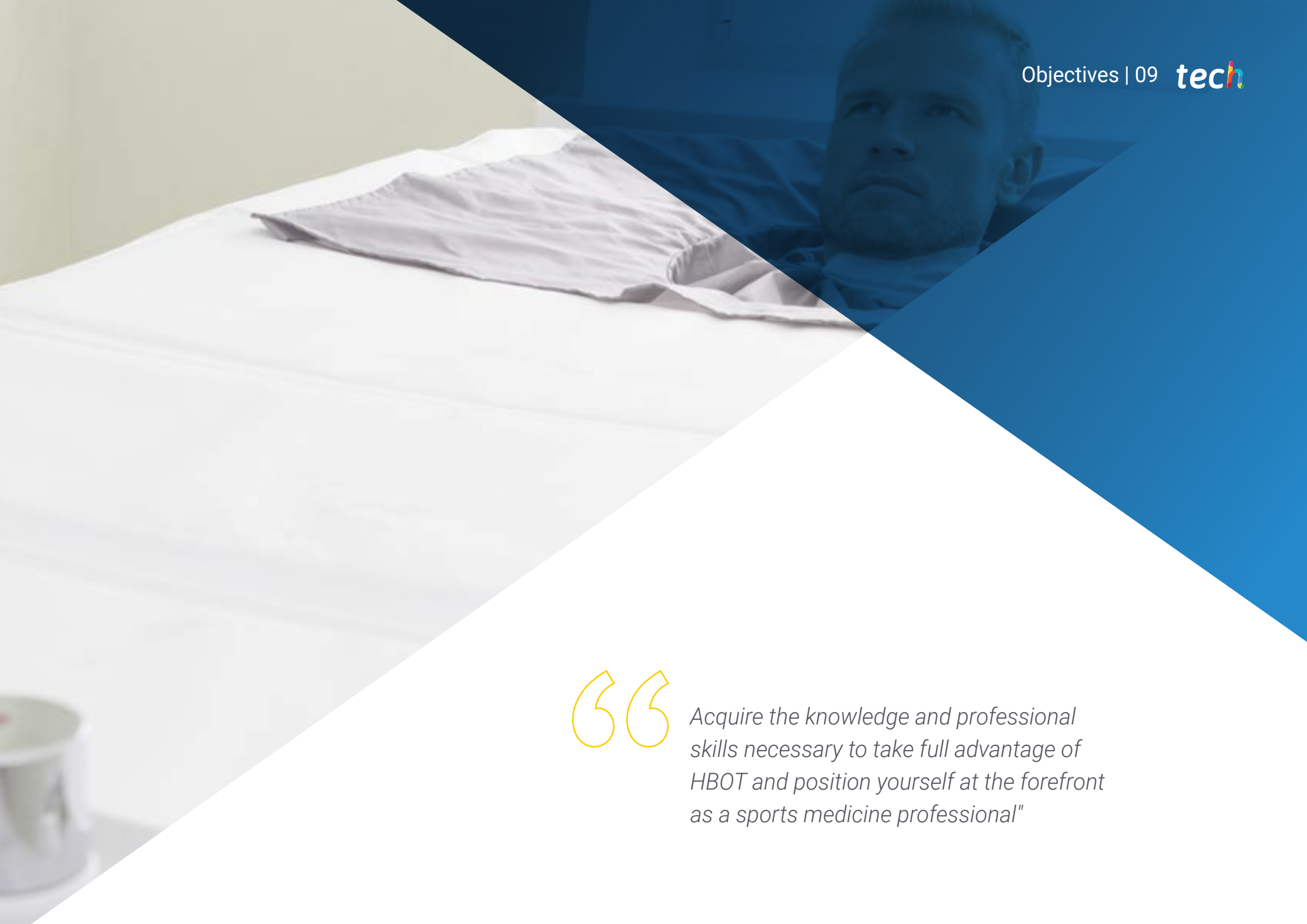
This program is designed around Problem-Based Learning, whereby the specialist must try to solve the different professional practice situations that arise during the academic year. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned experts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



02

Objectives

The Postgraduate Diploma in Hyperbaric Medicine: Fundamentals, Effects and Indications of HBOT was created with the objective of training the Sports Science professional in the fundamentals and applications of hyperbaric oxygenation treatment, especially for those cases where the injury and/or pathology has its origin in physical activity. In this way, knowing in depth its application, methodology and contraindications, the professional will have full confidence to implement this medical treatment in a safe and efficient way, thus helping to heal problems whose origin is in physical activity.



Acquire the knowledge and professional skills necessary to take full advantage of HBOT and position yourself at the forefront as a sports medicine professional"

General Objectives

- Disseminate the usefulness of hyperbaric oxygenation treatment in different specialties, especially in Sports Sciences
- Train sports professionals in the fundamentals, mechanism of action, indications, contraindications and applications of Hyperbaric Oxygen
- Study the degree of evidence published and the recommendations and indications of the different scientific societies related to Hyperbaric Medicine
- Recognize the potential applications of hyperbaric oxigen in different clinical cases and the benefits that can be achieved with the treatment, as well as performing the indication and detection of the contraindications

An intensive training that will allow you to obtain a Postgraduate Diploma in Hyperbaric Medicine. Fundamentals, Effects and Indications of HBOT in a short time frame and with the greatest flexibility"

Specific Objectives

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. Fundamentals of the Hyperbaric Oxygenation Treatment (HBOT)

- Training on the basis of Hyperbaric Oxygenation Treatment (HBOT) and mechanisms used to achieve hyperoxia
- Present the intervening physical laws and the Krogh mathematical model which substantiates the effect of the 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

- Training on 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 these physiological effects with different indications of HBOT
- Training in the analysis of different clinical cases which can benefit from the therapeutic effects of HBOT

Module 4. 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

03

Course Management

The management and faculty of this program is composed of a number of personalities in the field of Hyperbaric Medicine and Sports Sciences. These professionals, pour into this Postgraduate Diploma the experience of their work with the aim that students learn to use Hyperbaric Therapy as a means to provide solutions to pathologies and injuries arising from sport and physical activity. In the same way, a number of leading specialists participate in the design of the content, providing the training with a complete and interdisciplinary vision. This will allow the students to enter into this field with the certainty that they will be learning from the best international experts in the field of Hyperbaric Medicine.

Leading experts in the field have joined forces to teach you the latest advances in Hyperbaric Medicine so that you can apply them in your daily work as a sports professional"

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 Gurneee 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

- 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

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

Management

Dr. Cannellotto, Mariana

- Medical Director of the network of Hyperbaric Medicine centers BioBarica Argentina
- Vice President of AAMHEI
- Specialist in Clinical Medicine. 2006
- Specialist in Hyperbaric Medicine, School of Medicine. 2009
- Vice President of AAMHEI

Dr. Jordá Vargas, Liliana

- Scientific Director of the Argentine-Spanish Association of Hyperbaric Medicine and Research (AAMHEI and AEMHEI).
- Scientific Director-Biobarica Clinical Research. International Network of BioBaric Hyperbaric Medicine Centers
- Degree in Biochemistry. National University of Córdoba, Argentina. (1992-1997)
- Microbiology Specialist
- Head of Microbiology, CRAI North, Cucaiba, Argentina

Professors

Dr. Verdini, Fabrizio

- Institutional Relations AAMHEI
- Clinical Doctor
- Diploma in Public Health Management
- Master's Degree in Healthcare Management

Dr. Ramallo, Rubén Leonardo

- Director of the AAMHEI Medical Clinic Commission
- Specialist in Internal Medicine. Residency in Internal Medicine, Córdoba Hospital
- Medical Surgeon Faculty of Medical Sciences. National University of Córdoba. Argentina
- Master's Degree in Psychoimmunoneuroendocrinology. Favaloro University

Dr. Emilia Fraga, Pilar María

- FINES Teacher
- AAMHE Pedagogical Assistant

04

Structure and Content

During the course of this Postgraduate Diploma, the student will have access to a very complete bank of contents designed by a cabinet of experts in the area of Hyperbaric Medicine, with a wide trajectory and recognized prestige in the profession, guaranteed by the volume of cases reviewed, studied and diagnosed, and with a wide domain of the new technologies applied to the use of Oxygenation Therapy for those cases whose origin is in physical activity. In addition to the quality of the content, TECH offers the student a multimedia academic immersion perfectly adapted to the current challenges of the profession and whose sole purpose is to train and catapult the professional towards success in their daily practice.

This Postgraduate Diploma contains the most complete and up-to-date scientific program on the market"

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 Fundamentals of the Hyperbaric O xygenation 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 Indications and Contraindications - Integration Module

4.1. Absolute and Relative Contraindications of HBOT
4.2. Adverse Effects of Hyperoxia
4.3. Neuronal and Pulmonary Oxygen Toxicity
4.4. Neurotoxicity/Neuroexcitability
4.5. Objective and Subjective Barotrauma
4.6. Special Care for Patients who Receive HBOT at Different Pressures
4.7. Indications by Consensus of the European Committee of Hyperbaric Medicine
4.8. Emerging Medical Applications Off Label and Medicare Indications
4.9. Management in Hyperbaric Medicine Centers. HBOT in Public and Private Health
4.10. Cost- Benefit Relationship of the Application of HBOT HBOT Cost Efficiency

If you are wondering where to study, the answer is simple, at the university that offers you the best content and the most complete teaching staff. That University is undoubtedly TECH"

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.

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"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"

You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

> *Our program prepares you to face new challenges in uncertain environments and achieve success in your career"*

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question we face in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

Relearning Methodology

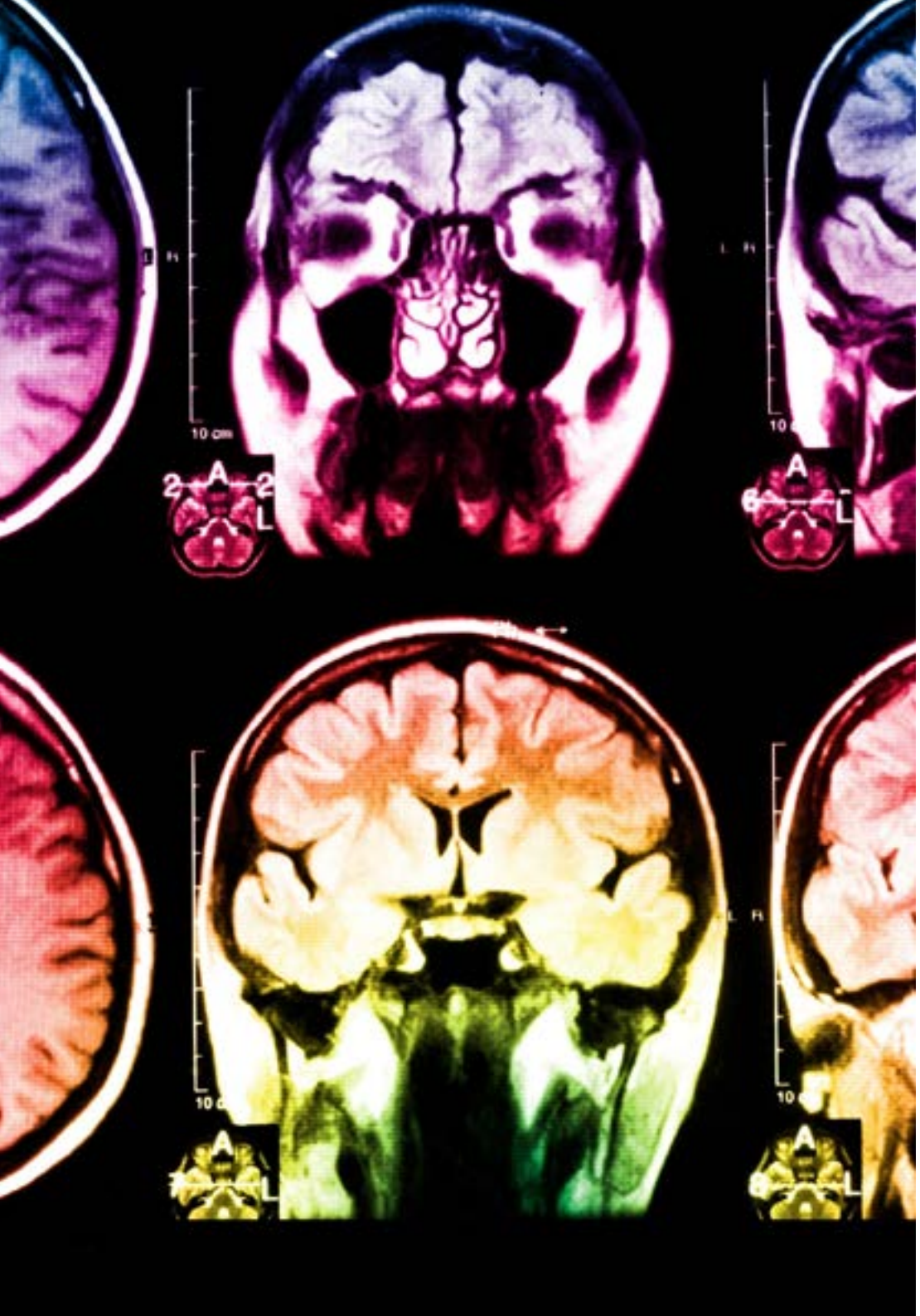
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



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. With this methodology, we have trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, markets, and financial instruments. All this in a highly demanding environment, where the students have a strong 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.

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

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.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

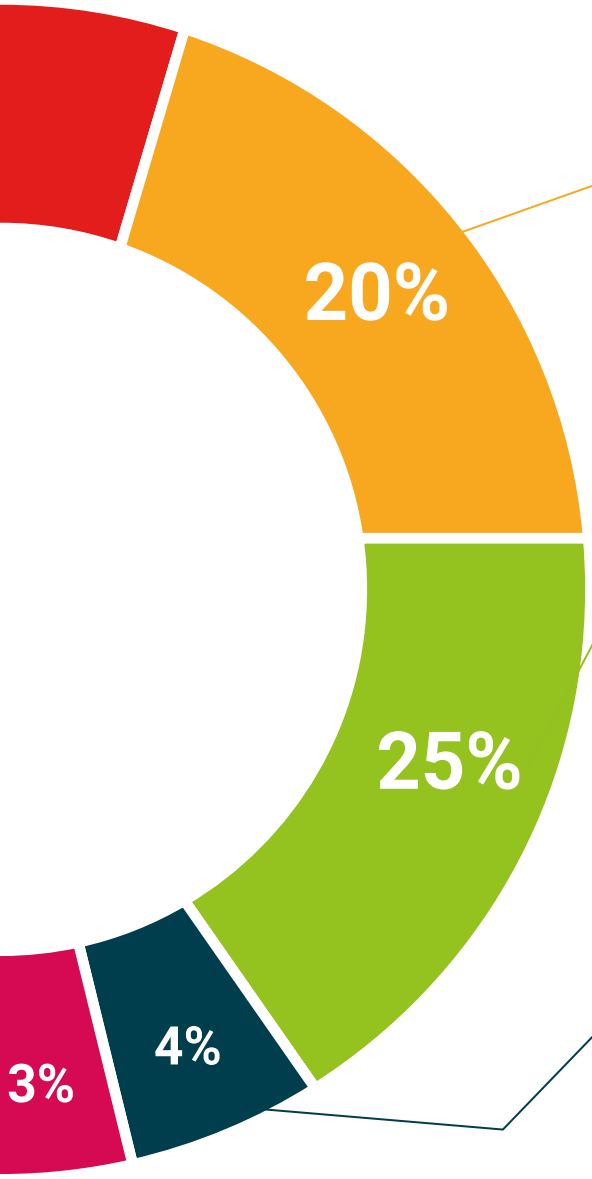
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

Practising Skills and Abilities

They will carry out activities to develop specific competencies and skills in each thematic area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

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.



Case Studies

Students will complete a selection of the best case studies chosen specifically for this situation. Cases that are presented, analyzed, and supervised by the best specialists in the world.

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".

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.

06

Certificate

The Postgraduate Diploma in Hyperbaric Medicine: Fundamentals, Effects and Indications of HBOT guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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 Diploma in Hyperbaric Medicine. Fundamentals, Effects and Indications of HBOT**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 Diploma in Hyperbaric Medicine. Fundamentals, Effects and Indications of HBOT**

Modality: **online**

Duration: **6 months**

Accreditation: **18 ECTS**


tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Diploma in Hyperbaric Medicine. Fundamentals, Effects and Indications of HBOT

This is a program of 450 hours of duration equivalent to 18 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

The Official Online University of the NBA

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

Unique TECH Code: AFWORD23S techtitute.com/certificates

*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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