Postgraduate Diploma

Ventilatory Techniques and Parameters in NIV

tech *technological university*

Postgraduate Diploma
Ventilatory Techniques and Parameters in NIV

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

Website: **www.techtitute.com/us/medicine/postgraduate-diploma/postgraduate-diploma-ventilatory-techniques-parameters-niv**

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01
Introduction

The growing use of Non-Invasive Mechanical Ventilation to address pulmonary complications has led to the refinement of respiratory support techniques and parameter adjustments. Thanks to these advancements, it is possible to optimize the oxygen delivery process to patients, improving their quality of life and supporting their recovery. Therefore, specialists should incorporate these advancements into their daily practice to stay at the forefront of medical knowledge. Due to this, TECH has created this certification, enabling neurologists to delve into the latest scientific evidence regarding the adjustment of pressure, volume, flow, Ti/Ttot parameters, or the use of CPAP and BiPAP in respiratory pathologies. Furthermore, it will be updated exclusively online without the need to travel from your home.

" *With this Postgraduate Diploma you will explore the latest scientific evidence related to the adjustment of pressure, volume, flow, and Ti/Ttot parameters"*

Non-Invasive Mechanical Ventilation has emerged as a highly utilized medical strategy to save the lives of patients with respiratory difficulties without resorting to aggressive methods that generate complications and prolong hospital stays. As a result, techniques and adjustments to ventilatory parameters have significantly evolved in recent years, aiming to effectively adapt NIV to each patient's needs and preserve their overall well-being. Consequently, neurologists who wish to stay current in their field are obligated to have an in-depth understanding of all the recent advancements in this area.

For this reason, TECH has spearheaded the development of this program, which provides specialists with a comprehensive update on Non-Invasive Mechanical Ventilation techniques and parameters. Throughout this academic period, you will explore the latest developments in adjusting various types of ventilatory parameters and ventilation strategies such as pressure support, volume-controlled, and high-frequency ventilation. You will also delve into sophisticated methods for assessing patient tolerance and adaptation to NIV.

Since this Postgraduate Diploma features a revolutionary 100% online methodology, students can manage their own time as they see fit to achieve a thoroughly effective medical update. Moreover, students will have access to a range of educational materials presented in cutting-edge formats like video, interactive summaries, or real-case simulations. This allows students to choose the study resources that best suit their individual academic needs.

This **Postgraduate Diploma in Ventilatory Techniques and Parameters in NIV** contains the most complete and up-to-date scientific program on the market. The most important features include:

- The development of case studies presented by experts in Non-Invasive Mechanical Ventilation

- 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

- Practical exercises where self-assessment can be used to improve learning.

- Its special emphasis on innovative methodologies

- 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

Learn, through this certificate, the state-of-the-art methods for assessing patient tolerance and adaptation to administered NIV"

Update yourself at your own pace of study thanks to the revolutionary Relearning system offered by TECH Universidad Tecnológica"

Delve into recent advances in the use of CPAP and BiPAP in various critical clinical settings.

Enjoy the most up-to-date educational content available in state-of-the-art multimedia formats to optimize your study.

The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading 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 education programmed to learn 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 year This will be done with the help of an innovative system of interactive videos made by renowned experts.

02
Objectives

The design of this Postgraduate Diploma has been carried out with the premise of facilitating the professional updating of specialists in Pulmonology in the field of NIV Techniques and Ventilatory Parameters. Through this program, you will delve into cutting-edge methods of non-invasive respiratory support and the indications and contraindications for different ventilatory modes according to the latest scientific evidence. All within just 6 months and with an advanced pedagogical methodology.

"

Dive into sophisticated ventilation modalities and their adaptation to each patient's needs through this Postgraduate Diploma"

General Objectives

* Understand the importance and role of Non-Invasive Mechanical Ventilation in the treatment of acute and chronic respiratory pathologies

* Acquire knowledge of the updated indications and contraindications for the use of Non-Invasive Mechanical Ventilation, as well as the different types of devices and ventilation modes

* Develop skills and competencies in monitoring patients with Non-Invasive Mechanical Ventilation, including data interpretation and the detection and prevention of complications

* Explore cutting-edge technologies used in the telemonitoring of patients with Non-Invasive Mechanical Ventilation and the ethical and legal aspects related to its use

* Delve into the key differences in Non-Invasive Mechanical Ventilation in Pediatrics

* Delve your understanding of the ethical aspects related to the management of patients requiring NIV

In just 6 months, you will incorporate the most cutting-edge NIV techniques into your medical practice"

Specific Objectives

Module 1. Ventilatory Mechanics

- Gain in-depth knowledge of respiratory control mechanisms and blood pH regulation, as well as ventilatory responses in situations of hypoxia, hypercapnia, and acidosis, and the interaction between the respiratory system and the central nervous system

- Delve into the forces acting on the lungs during ventilation and the relationship between respiratory mechanics and respiratory muscle effort

- Explore different lung volumes and capacities, their alterations in respiratory diseases, and the interpretation of spirometric values and their limitations

- Understand the concept of *compliance* and resistance of the respiratory system, including measurement and influencing factors, as well as alterations in respiratory diseases

- Deepen your understanding of ventilation-perfusion relationships, advanced methods for detecting abnormalities in respiratory diseases, and therapeutic strategies to improve these relationships

Module 2. Non-Invasive Mechanical Ventilation and Adjustment of Ventilatory Parameters in Non-Invasive Mechanical Ventilation

- Define and clarify the terminology and basic concepts of NIV

- Describe the different ventilation modes used in NIV, including spontaneous, assisted, and controlled modes

- Identify the different types of interfaces used in NIV, explaining their selection and adjustment

- Explore the various alarms and patient safety measures in NIV

- Identify suitable patients for NIV and explain parameter initiation and adjustment strategies based on patient progress

Module 3. Non-Invasive Respiratory Support Techniques

- Understand the principles and mechanics of continuous positive pressure in the airway, positive pressure in the airway, pressure support ventilation, volume-controlled ventilation, and high-flow nasal cannula (HFNC)

- Identify the indications for using each of these ventilation modalities and know how to adjust the necessary parameters

- Compare different ventilation modalities to choose the most suitable one for each patient

- Gain in-depth knowledge of the utility of high-frequency ventilation and other innovative ventilation modes

03
Course Management

In order to achieve the highest academic standard for its programs, TECH has chosen excellent specialists in Pulmonology, who have extensive experience in the use of Non-Invasive Mechanical Ventilation. These doctors will be responsible for developing the teaching resources of this Postgraduate Diploma, so that the contents that the student will enjoy will preserve a complete professional applicability.

" *TECH has handpicked the most accomplished active specialists in Pulmonology to provide you with the latest knowledge on Techniques and Ventilatory Parameters in NIV"*

Management

Dr. Landete Rodríguez, Pedro

- Coordinator of the Basic Ventilation Unit at La Princesa University Hospital
- Pulmonologist at La Princesa University Hospital
- Pulmonologist at Blue Healthcare
- Researcher in various research groups
- Professor in undergraduate and postgraduate university studies
- Author of numerous scientific publications in international journals and contributor to several book chapters
- Speaker at international medical congresses
- Doctor Cum Laude from the Autonomous University of Madrid

Professors

Dr. Rodríguez Jerez, Francisco

* Coordinator of the Intermediate Respiratory Care Unit at the Hospital Universitario Clínico San Cecilio
* Coordinator of the Non-Invasive Mechanical Ventilation Unit at the Hospital Universitario Central de Asturias
* Senior Specialist of the Pulmonology Service at the Hospital Universitario Clínico San Cecilio
* Teacher in undergraduate studies related to Health Sciences
* Coordinator of the NIV and IRCU Skills Course at the Hospital Universitario Clínico San Cecilio
* Member of the Sleep and Ventilation Working Group of the Spanish Society of Pulmonology and Thoracic Surgery
* Reviewer for the Respiratory Care and BRNreview journals

Dr. Corral Blanco, Marta

* Pulmonologist at the Hospital Universitario 12 de Octubre
* Author of numerous scientific articles and several book chapters
* Speaker at numerous Pulmonology Congresses
* Course on Integral Care for Chronic Obstructive Pulmonary Disease by the Complutense University of Madrid

Dr. Ferrer Espinos, Santos

* Assistant in the Pulmonology Service at the Respiratory Care Unit of the Hospital Clínico Universitario de Valencia
* Member of the Emerging Non-Invasive Mechanical Ventilation and Respiratory Care Group of SEPAR
* Master's Degree in Biomedical Research from the University of Valencia

04
Structure and Content

The syllabus of this qualification has been developed with the aim of providing the physician with the most up-to-date knowledge regarding the techniques and ventilatory parameters of Non-Invasive Mechanical Ventilation. Each of the 3 modules that make up this program offers educational materials available in formats such as readings, explanatory videos, or interactive summaries. Thanks to this, and following a 100% online format, each student will enjoy an engaging and effective learning experience.

Benefit from a comprehensive and up-to-date syllabus designed by specialists with extensive experience in NIV management"
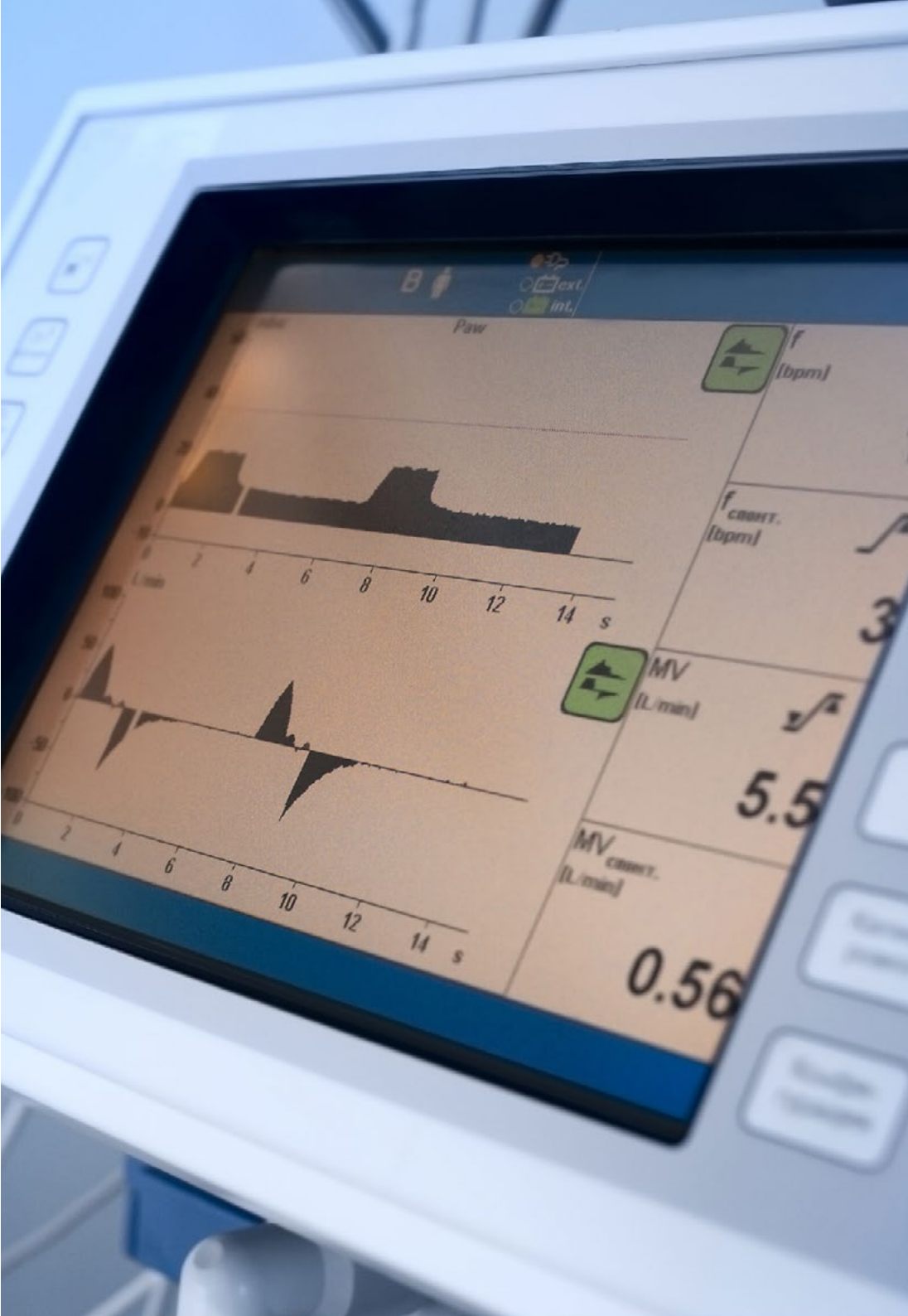
Module 1. Ventilatory Mechanics

1.1. Anatomy and Physiology of the Respiratory System
- 1.1.1. Structure and function of the lungs and their relationship to the rib cage
- 1.1.2. Mechanics of Pulmonary Ventilation
- 1.1.3. Gas exchange at the alveolar level

1.2. Ventilation Control and pH Regulation
- 1.2.1. Respiratory Control Mechanisms (chemoreceptors, baroreceptors, etc.)
- 1.2.2. Regulation of Blood pH and Its Relationship to Ventilation
- 1.2.3. Ventilatory Responses in Hypoxia, Hypercapnia, and Acidosis
- 1.2.4. Interaction between the Respiratory System and the Central Nervous System

1.3. Transpulmonary Pressure and Respiratory Mechanics
- 1.3.1. Forces Acting on the Lungs During Ventilation (atmospheric pressure, intrapleural pressure, etc.)
- 1.3.2. Lung Protective Mechanisms Against Overdistension and Collapse
- 1.3.3. Respiratory Mechanics in Pathological Conditions (emphysema, pulmonary fibrosis, etc.)
- 1.3.4. Relationship between Respiratory Mechanics and Respiratory Muscle Effort

1.4. Tidal Volume, Minute Volume, and Vital Capacity
- 1.4.1. Definition and Measurement of Different Lung Volumes and Capacities
- 1.4.2. Alterations in Lung Volumes and Capacities in Respiratory Diseases
- 1.4.3. Interpretation of Spirometric Values and Their Limitations

1.5. Compliance and Resistance of the Respiratory System
- 1.5.1. Concept
- 1.5.2. Measurement
- 1.5.3. Influencing Factors
- 1.5.4. Alterations in Respiratory Diseases

1.6. Types of Breathing (Spontaneous, Assisted, and Controlled)
- 1.6.1. Definition and Characteristics of Different Types of Breathing
- 1.6.2. Assessment of Patient Response to Mechanical Ventilation

1.7. Ventilation-perfusion ratio
- 1.7.1. Definition and Physiology of Ventilation-Perfusion Ratio
- 1.7.2. Alterations in Ventilation-Perfusion Ratio in Respiratory Diseases
- 1.7.3. Methods for Evaluating Ventilation-Perfusion Ratio
- 1.7.4. Therapeutic Strategies to Improve Ventilation-Perfusion Ratio

1.8. Oxygenation and Gas Transport
- 1.8.1. Alterations in Oxygenation and Gas Transport in Respiratory Diseases
- 1.8.2. Assessment in Oxygenation and Gas Transport in clinical practice
- 1.8.3. Treatment of Hypoxemia and Hypercapnia in Respiratory Patients
- 1.8.4. Complications of Hypoxemia and Hypercapnia Treatment

1.9. Effects of Mechanical Ventilation on Respiratory Physiology
- 1.9.1. Physiology of Mechanical Ventilation

1.10. Changes in Ventilatory Mechanics During Non-Invasive Mechanical Ventilation
- 1.10.1. Lung Injuries Associated with Mechanical Ventilation
- 1.10.2. Optimizing Mechanical Ventilation to Improve Respiratory Physiology

Module 2. Non-Invasive Mechanical Ventilation and Adjustment of Ventilatory Parameters in Non-Invasive Mechanical Ventilation

2.1. NIV
- 2.1.1. Terminology in NIV
- 2.1.2. What Each Parameter Used in NIV Measures

2.2. Indications and Contraindications
- 2.2.1. Indications in Acute Hypoxemic Respiratory Failure
- 2.2.2. Indications in Acute Global/Hypercapnic Respiratory Failure
- 2.2.3. Indications in Chronic Respiratory Failure
- 2.2.4. Other Indications for NIV

2.3. Ventilatory Modes
- 2.3.1. Spontaneous Mode
- 2.3.2. Assisted Mode
- 2.3.3. Controlled Mode

2.4. Interfaces: Types, Selection, and Adjustment
- 2.4.1. Face Mask
- 2.4.2. Nasal Mask
- 2.4.3. Oral Interface
- 2.4.4. Oro-Nasal Interface
- 2.4.5. Helmet

Module 3. Non-Invasive Respiratory Support Techniques

3.1. Assessment of the Required Ventilatory Support Level
- 3.1.1. Assessment of Clinical Indication
- 3.1.2. Interpretation of Arterial Blood Gas
- 3.1.3. Assessment of Respiratory Mechanics
- 3.1.4. Determination of the Required Ventilatory Support Level
- 3.1.5. Changing Ventilatory Modality

3.2. Continuous Positive Airway Pressure (CPAP)
- 3.2.1. CPAP principles and mechanics
- 3.2.2. Comparison of CPAP with Other Ventilatory Modalities
- 3.2.3. Adjustment of CPAP parameters
- 3.2.4. Monitoring and Management of CPAP Complications

3.3. Positive Airway Pressure (BiPAP)
- 3.3.1. Principles and Mechanics of BiPAP
- 3.3.2. Indications for BiPAP Use
- 3.3.3. Adjusting BiPAP Parameters
- 3.3.4. Monitoring and Management of BiPAP Complications
- 3.3.5. Comparison of BiPAP with Other Ventilatory Modalities

3.4. Pressure Support Ventilation
- 3.4.1. Conventional (PSV)
- 3.4.2. Proportional (PPSV)
- 3.4.3. Adaptive (ASV)
- 3.4.4. Intelligent Adaptive (iVAPS)

3.5. Volume-Controlled Ventilation
- 3.5.1. Principles and Mechanics of Volume NIV
- 3.5.2. Indications for Volume NIV Use
- 3.5.3. Adjusting Volume Mode Parameters
- 3.5.4. Monitoring and Management of Complications in Volume Mode
- 3.5.5. Comparison of Volume Mode with Other Ventilatory Modalities

3.6. High-Flow Nasal Cannula (HFNC)
- 3.6.1. Principles and Mechanics of HFNC
- 3.6.2. Indications for HFNC Use
- 3.6.3. Adjusting HFNC Parameters
- 3.6.4. Monitoring and Management of HFNC Complications
- 3.6.5. Comparison of HFNC with Other Ventilatory Modalities

3.7. Combined Ventilation (Positive Pressure (CPAP/BiPAP) + HFNC)
- 3.7.1. Principles and Mechanics of Combined Therapy
- 3.7.2. Indications for Combined Therapy Use
- 3.7.3. Starting Combined Therapy, Simultaneously or Staggered
- 3.7.4. Adjusting Parameters for Combined Therapy
- 3.7.5. Monitoring and Management of Complications in Combined Therapy
- 3.7.6. Comparison of Combined Therapy with Other Ventilatory Modalities

3.8. High-Frequency Ventilation
- 3.8.1. Indications for High-Frequency NIV Use
- 3.8.2. Adjusting Parameters
- 3.8.3. Utility in Acute Patients
- 3.8.4. Utility in Chronic Patients
- 3.8.5. Monitoring and Management of Complications
- 3.8.6. Comparison with Other Ventilatory Modalities

3.9. Others Ventilatory Modes
- 3.9.1. Pressure Support Ventilation with Mandatory Flow Control (MFC)
- 3.9.2. High-Velocity Nasal Cannula Ventilation
- 3.9.3. Other Innovative Ventilatory Modes

3.10. Humidification and Temperature Adjustment in NIV
- 3.10.1. Importance of Adequate Humidification and Temperature in NIV
- 3.10.2. Types of Humidification Systems in NIV
- 3.10.3. Indications for Adding a Humidifier in Acute Patients
- 3.10.4. Indications for Humidifier Use in Chronic Patients
- 3.10.5. Methods for Monitoring Humidification in NIV
- 3.10.6. Temperature Adjustment in NIV
- 3.10.7. Monitoring and Management of Complications Related to Humidification and Temperature in NIV

" Update your professional profile in a dynamic and highly effective manner through educational resources such as interactive summaries or real-life case simulations"

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.

> " *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.

01 learning from evidence

02 relearning from evidence

08 competencies testing (retesting)

03 testing

07 case based learning through storytelling

04 learning from an expert

06 Von-Restorff effect

05 neurocognitive context dependent 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.

20%

15%

15%

3%

20%

17%

7%

3%

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.

06
Certificate

The Postgraduate Diploma in Ventilatory Techniques and Parameters in NIV guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.

"

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"
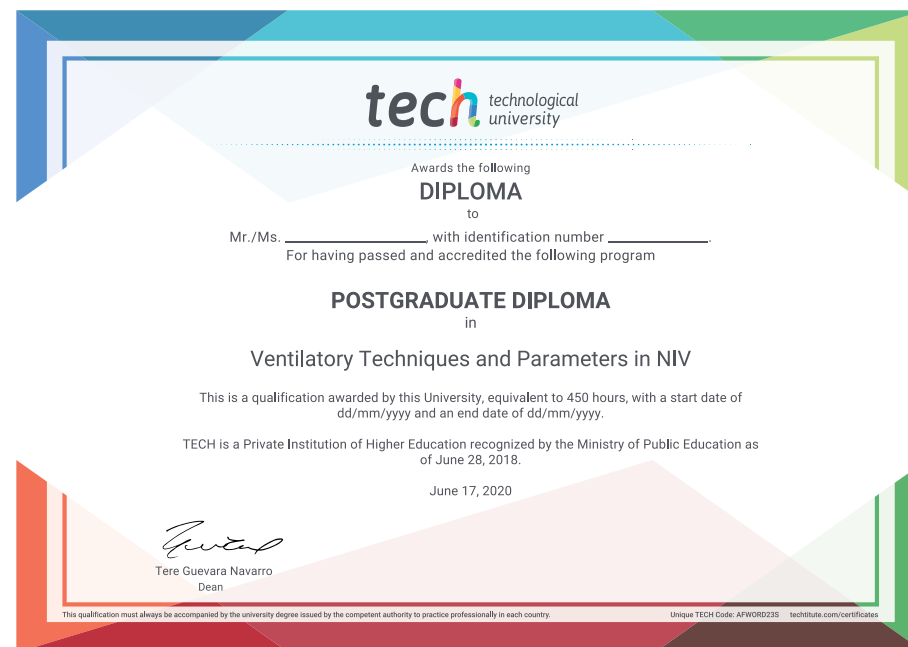
This **Postgraduate Diploma in Ventilatory Techniques and Parameters in NIV** contains the most complete and up-to-date scientific on the market.

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

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

Title: **Postgraduate Diploma in Ventilatory Techniques and Parameters in NIV**

Official Nº of Hours: **450 h.**

tech technological university

Awards the following

DIPLOMA

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE DIPLOMA

in

Ventilatory Techniques and Parameters in NIV

This is a qualification awarded by this University, equivalent to 450 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

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 EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

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tech *technological university*