

Professional Master's Degree

Non-Invasive Mechanical Ventilation





## Professional Master's Degree Non-Invasive Mechanical Ventilation

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/medicine/professional-master-degree/master-non-invasive-mechanical-ventilation](http://www.techtute.com/us/medicine/professional-master-degree/master-non-invasive-mechanical-ventilation)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Skills

---

*p. 14*

04

Course Management

---

*p. 18*

05

Structure and Content

---

*p. 24*

06

Methodology

---

*p. 38*

07

Certificate

---

*p. 46*

# 01

# Introduction

Technological and scientific advances have led to the development of cutting-edge techniques and modes of Non-Invasive Mechanical Ventilation that allow for the refinement of the treatment of conditions such as COPD or EAPC. In this regard, these methods contribute to improving the patient's prognosis and reducing hospitalization times. This has highlighted the need for pulmonologists to stay updated so as not to fall behind in the evolution of their field. For this reason, TECH has designed this program, which enables the specialist to explore advanced non-invasive respiratory support procedures or the latest evidence on the use of NIMV in Pediatrics, online and from the comfort of their home.





“

*This Professional Master's Degree will allow you to incorporate state-of-the-art non-invasive respiratory support procedures into your clinical practice"*

Non-Invasive Mechanical Ventilation is a method that, as a result of continuous medical research, is increasingly used to improve the breathing of patients with various pulmonary diseases. Thanks to its popularization, the scientific community has focused its efforts on designing facial or nasal masks that enhance oxygenation effectiveness, as well as advanced ventilation modes that automatically adapt to changes in an individual's respiratory function. Since these advances help optimize the patient's recovery process, pulmonologists are obliged to have an in-depth understanding of them to ensure their professional development.

This is why TECH has created this Professional Master's Degree, which offers medical professionals an excellent update on Non-Invasive Mechanical Ventilation with both adult and pediatric patients. Over 12 months of intensive study, you will delve into the latest scientific recommendations on ventilatory parameter adjustments based on each individual's characteristics and illness. You will also become familiar with the most cutting-edge technologies used in Intermediate Respiratory Care Units or explore sophisticated tools for monitoring and evaluating patients with NIMV.

All of this without the need to sacrifice your daily personal and professional responsibilities since this program is delivered in an innovative 100% online format. Likewise, it has been designed by high-caliber specialists in the field of Pulmonology who are familiar with advanced Non-Invasive Mechanical Ventilation techniques. This ensures the program's excellent academic quality and the practical applicability of the knowledge acquired in daily practice.

This **Professional Master's Degree in Non-Invasive Mechanical Ventilation** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ The development of practical cases presented by specialists in Pulmonology
- ♦ 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



*Through this certificate, you will delve into the cutting-edge tools to undertake the monitoring and evaluation of patients with Non Invasive Mechanical Ventilation"*

“

*Study from anywhere in the world and 24 hours a day thanks to the 100% online format that offers this program of updating”*

The program's teaching staff includes professionals from the field 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. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.

*Get up to date in this field of Pneumology through the professional experience of reference specialists in this medical area.*

*Throughout this certificate, you will delve into the sophisticated technologies used in Intermediate Respiratory Care Units.*

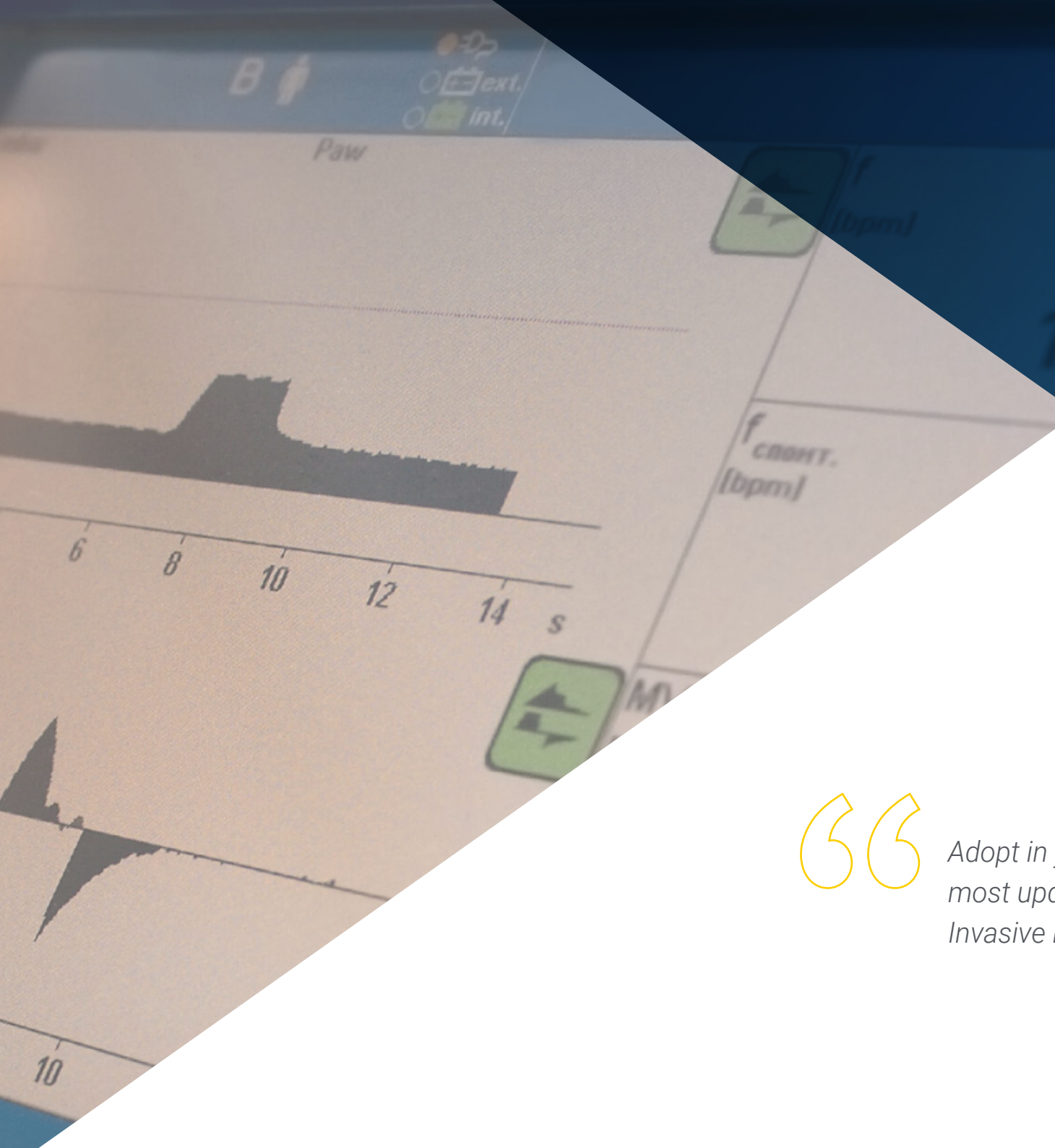


# 02 Objectives

TECH has designed this Professional Master's Degree with the idea of offering the specialist the latest scientific evidence on Non-Invasive Mechanical Ventilation. Through this program, you will delve into the cutting-edge indications and contraindications of this technique with different types of patients, as well as its peculiarities when applied to pediatric patients. This medical update will also be preserved by the following general and specific objectives.







“

*Adopt in your daily practice the most updated knowledge on Non-Invasive Mechanical Ventilation”*



## 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





## 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 NIMV
- ♦ Describe the different ventilation modes used in NIMV, including spontaneous, assisted, and controlled modes
- ♦ Identify the different types of interfaces used in NIMV, explaining their selection and adjustment
- ♦ Explore the various alarms and patient safety measures in NIMV
- ♦ Identify suitable patients for NIMV and explain parameter initiation and adjustment strategies based on patient progress

### **Module 3. Intermediate Respiratory Care Units (IRCU)**

- ♦ Analyze the role of IRCUs in the care and treatment of critically ill patients
- ♦ Gain in-depth knowledge of IRCU structure and design, coordination and collaboration mechanisms between different services
- ♦ Identify types of equipment and technologies available in IRCUs, along with their advantages and disadvantages
- ♦ Recognize the latest trends and advances in technology used in IRCUs
- ♦ Deepen understanding of prognostic scales used in NIMV
- ♦ Explore respiratory, cardiovascular, neurological, gastrointestinal, dermatological, and psychological complications in NIMV and learn about updated protocols for managing them

### **Module 4. 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

### **Module 5. Beyond Non-Invasive Ventilation in an IRCU Highly Specialized Concepts**

- ♦ Describe the criteria for performing tracheostomy in patients with prolonged invasive mechanical ventilation
- ♦ Identify cutting-edge techniques used in weaning from invasive mechanical ventilation through tracheostomy
- ♦ Analyze the utility of non-invasive respiratory support in the removal of orotracheal intubation
- ♦ Delve into the identification of abnormal respiratory patterns, monitoring of the effectiveness of respiratory support, and the interpretation of respiratory complications associated with NIV
- ♦ Understand the objectives and benefits of respiratory physiotherapy in IRCUs
- ♦ Deepen your knowledge of inotropes, vasodilators, and the management of hypotension with fluid therapy

### **Module 6. Non-Invasive Mechanical Ventilation in Specific Pathologies**

- ♦ Describe the indications and contraindications of Non-Invasive Mechanical Ventilation (NIV) in various pathologies such as COPD, Heart Failure, ARDS, or Epidemic Infectious Diseases, among others
- ♦ Analyze the selection and adjustment of ventilatory parameters for NIMV in each specific pathology
- ♦ Evaluate the effectiveness of NIMV in each specific pathology
- ♦ Delve into the latest scientific evidence on NIMV management in Epidemic Infectious Diseases
- ♦ Understand the complications associated with the use of NIMV in obese patients and strategies for prevention and treatment

**Module 7. Care in Non-Invasive Mechanical Ventilation**

- ♦ Monitor the patient's vital signs and adjust monitoring as needed
- ♦ Monitor patient oxygenation and ventilation and adjust mechanical ventilation according to patient needs
- ♦ Evaluate and manage respiratory secretions to prevent aspiration
- ♦ Develop an individualized care plan for patients on Non-Invasive Mechanical Ventilation

**Module 8. Non-Invasive Mechanical Ventilation in Pediatrics**

- ♦ Understand the physiological and anatomical differences between pediatric and adult patients in terms of Non-Invasive Mechanical Ventilation
- ♦ Know the indications and contraindications of Non-Invasive Mechanical Ventilation in Pediatrics
- ♦ Properly adjust Non-Invasive Mechanical Ventilation in Pediatrics based on individual patient needs
- ♦ Deepen your knowledge of updated monitoring and adjustment techniques for Non-Invasive Mechanical Ventilation in Pediatrics
- ♦ Manage the main pediatric respiratory pathologies that require Non-Invasive Mechanical Ventilation based on the latest scientific evidence

**Module 9. Ethics, Innovation, and Research**

- ♦ Understand ethical principles in the use of NIMV, as well as relevant regulations and legal considerations, and the civil and criminal liability of healthcare professionals
- ♦ Gain in-depth knowledge of ethical and legal considerations in decision-making for patients with limited decision-making capacity and patients at the end of life
- ♦ Explore new technologies in mechanical ventilation, NIMV in sleep apnea, and home NIMV
- ♦ Deepen your understanding of the latest research in NIMV management

**Module 10. Monitoring in Chronic Home NIMV**

- ♦ Understand recent indications for the use of NIMV in chronic home patients
- ♦ Explore telemonitoring as a tool for monitoring and evaluating patients on NIMV
- ♦ Identify updated strategies for the prevention and management of anxiety and depression in patients on NIMV
- ♦ Explore opportunities and challenges of teleeducation and teletraining in NIMV



*With this program, learn about the latest scientific evidence on the indications and contraindications of Non-Invasive Mechanical Ventilation in different types of patients"*

# 03 Skills

The Professional Master's Degree in Non-Invasive Mechanical Ventilation has been designed to enable specialists to update their knowledge in the management of this technique in just 1,500 hours. Through this academic experience, they will acquire medical skills in this field that will position them as cutting-edge pulmonologists. Furthermore, they will achieve this objective while benefiting from the best educational methodology in the pedagogical landscape.



“

*Position yourself as a leading-edge pulmonologist through the up-to-date medical competencies you will acquire through this certificate"*



## General Skills

- ♦ Explain the indications and contraindications of NIV, including the different clinical situations in which it is used
- ♦ Evaluate the level of ventilatory support required based on clinical indication, arterial blood gas analysis, and the patient's respiratory mechanics
- ♦ Interpret the data obtained during monitoring and applying tracking and evaluation techniques
- ♦ Make appropriate ethical decisions for patients who require NIMV at the end of their life







## Specific Skills

---

- Evaluate the effectiveness of patient safety measures in NIMV
- Analyze patient-ventilator synchronization and its different issues
- Determine criteria for good and poor clinical response to NIMV
- Develop personalized care plans for each patient in IRCU
- Monitor and manage complications that may arise in each ventilatory modality
- Perform nutritional and metabolic assessment in IRCU patients

“

*Do you want to update and enhance your skills in Non-Invasive Mechanical Ventilation in just 1,500 hours? This academic program is for you!”*

04

# Course Management

To maintain the excellent educational quality that characterizes TECH's programs, this Master's program is taught by leading specialists in the field of Pulmonology. These professionals, who actively work in top-level hospitals, have high proficiency in Non-Invasive Mechanical Ventilation. Therefore, the knowledge acquired by the student will be in line with the latest advances in this area.





“

*Update your knowledge in Non-Invasive Mechanical Ventilation with pulmonologists practicing in cutting-edge hospitals”*

## International Guest Director

With a relevant trajectory in the field of Pulmonology and Clinical Research, Dr. Maxime Patout distinguishes himself as an internationally renowned physician and scientist. As such, his involvement and contribution have led him to position himself as Clinical Director in Public Assistance in prestigious hospitals in Paris, standing out for his leadership in the management of Complex Respiratory Diseases. With this, it is worth mentioning his work as Coordinator of the Department of Functional Explorations of Breathing, Exercise and Dyspnea at the famous Hospital de la Pitié-Salpêtrière.

In the field of Clinical Research, Dr. Patout has made valuable contributions in leading areas such as Chronic Obstructive Pulmonary Disease, Lung Cancer and Respiratory Physiology. Accordingly, in his role as a Research Fellow at Guy's and St Thomas' NHS Foundation Trust, he has conducted groundbreaking studies that have expanded and improved the treatment options available to patients.

In this line, his versatility and leadership as a physician give him a vast experience in fields such as Biology, Physiology and Pharmacology of Circulation and Respiration. Therefore, he stands out as a renowned specialist in the Pulmonary and Systemic Diseases unit. In addition, his recognized competence in the Anti-Infectious Chemotherapy unit also places him as an outstanding reference in the field, being a regular advisor to future health professionals.

For all these reasons, his outstanding expertise in the field of Pulmonology has led him to be an active member of prestigious international organizations such as the European Respiratory Society and the French-Language Society of Pneumology, where he continues to contribute to scientific progress. So much so, that he shows an active participation in symposiums that enhance his medical excellence and constant updating in his field.



## Dr. Patout, Maxime

---

- Clinical Director in Public Care at the Salpêtrière Hospital, Paris, France
- Clinical Research Fellow at Guy's and St Thomas' NHS Foundation Trust
- Coordinator of the Breathing, Exercise and Dyspnea Functional Examination Service at the Pitié-Salpêtrière Hospital
- Doctor of Medicine, University of Rouen
- Master's Degree in Biology, Physiology and Pharmacology of the Circulation and Respiration at the University of Paris
- University Expert in Pulmonary and Systemic Diseases from the University of Lille
- University Expert in Anti-infectious Chemotherapy, University of Rouen
- Medical Specialist in Pulmonology from the University of Rouen
- Member of: European Respiratory Society, French-language Society of Pneumology



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

## Management



### Dr. Landete Rodríguez, Pedro

- Head of the Intermediate Respiratory Care Unit at Emergencias Enfermera Isabel Zenda Hospital
- 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. López Padilla, Daniel

- ♦ Pulmonologist Specialist and Researcher
- ♦ FEA in the Intermediate Respiratory Care Unit at the General University Hospital
- ♦ Teacher in undergraduate studies related to Health Sciences
- ♦ Coordinator of the Emerging Group for Mechanical Ventilation and Critical Respiratory Care of the Spanish Society of Pulmonology and Thoracic Surgery
- ♦ Member of the Integrated Research Program on Non-Invasive Ventilation and Intermediate Respiratory Care Units of the Spanish Society of Pulmonology and Thoracic Surgery
- ♦ Editor-in-Chief of the Journal of Respiratory Pathology
- ♦ Author of numerous publications in scientific journals
- ♦ Doctorate in Medicine from the Autonomous University Madrid

### Dr. Rodríguez Jerez, Francisco

- ♦ Pulmonologist at HUCSC
- ♦ 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 NIMV 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

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

### Dr. González, Elizabeth

- ♦ Specialist in Pulmonology
- ♦ Head of Ward at the Hospital Universitario Clínico San Carlos, Respiratory Intermediate Care Unit, and the Ventilation Consultation for Chronic Patients
- ♦ Specialist in Pulmonology at the University Hospital of Getafe
- ♦ FEA of Pulmonology at the Hospital Universitario Clínico San Carlos
- ♦ Teacher in university studies

### Dr. Ferrer Espinos, Santos

- ♦ Pulmonologist
- ♦ 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

**Dr. Muñoz Corroto, Cristina**

- ♦ Doctor and teaching collaborator
- ♦ Specialist in Pulmonology at the Hospital Universitario Reina Sofía
- ♦ Teaching collaborator in university studies of Medicine
- ♦ Speaker at national and international Pulmonology Congresses
- ♦ Expert in Thoracic Ultrasound from the University of Barcelona

**Ms. González González, María**

- ♦ Clinical Nurse
- ♦ Clinical Nurse in the Intermediate Respiratory Care Unit at the Hospital de La Princesa
- ♦ Clinical tutor in Nursing degree studies
- ♦ Master's Degree in Clinical Nutrition from the University of Granada
- ♦ Postgraduate Diploma in Nursing Research from the Universidad Católica de Ávila

**Ms. Nieves Fernández, Laura**

- ♦ Nurse
- ♦ Nurse at the Hospital Universitario de Tomelloso
- ♦ Clinical Nursing Teacher in university degree programs
- ♦ Collaborating member of the Protocol and Clinical Guidelines Committee at the Hospital Universitario de Tomelloso
- ♦ Master's Degree in Specialized Nursing Care in Emergencies
- ♦ Graduate in Nursing from the Complutense University of Madrid Europea Miguel de Cervantes





**Dr. Ávalos Pérez-Urrutia, Elena**

- ◆ Pulmonologist and Researcher
- ◆ Specialist in Pulmonology at the Hospital Universitario de La Princesa
- ◆ Researcher specializing in sleep-related respiratory disorders and non-invasive mechanical ventilation
- ◆ Collaborating instructor in undergraduate medical studies
- ◆ Master's Degree in Medicine, Complutense University of Madrid

**Dr. Bascuas Arribas, Marta**

- ◆ Specialist Pediatrician
- ◆ FEA of Pediatric Pneumology of the Hospital Universitario Infantil Niño Jesús
- ◆ Member of the Mucopolysaccharidosis Committee at the Hospital Universitario Infantil Niño Jesús
- ◆ Author of various scientific publications related to her specialty

**Dr. Esteban Ronda, Violeta**

- ◆ Specialist in Pulmonology
- ◆ Head of the Non-Invasive Mechanical Ventilation Clinic at the Hospital Universitario de Sant Joan
- ◆ Pulmonologist at the Hospital Universitario de Sant Joan
- ◆ Master's Degree in Advances in Diagnosis and Treatment of Sleep Disorders from the Universidad Católica San Antonio de Murcia
- ◆ Master's Degree in Biomedical Research from the University of Valencia
- ◆ Member of: SEPAR Valencian Society of Pneumology

# 05

## Structure and Content

The syllabus of this Master's Degree is made up of 10 modules through which the specialist will obtain an excellent update on the use of Non-Invasive Mechanical Ventilation in different clinical contexts. All the didactic contents that will be available during the duration of this academic program are available in cutting-edge formats such as video, interactive summary or simulation of real cases. This way, enjoying a 100% online methodology and without adhering to pre-established schedules, you will complete an enjoyable and effective academic experience.





“

*TECH's Relearning methodology will allow you to enjoy the didactic contents based on your own study pace in order to optimize your updating process"*

## 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 NIMV 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 NIMV
  - 2.2.5. Contraindications for NIMV
- 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

- 2.5. Ventilatory Parameters: Pressure, Volume, Flow, and  $T_i/T_{tot}$ 
  - 2.5.1. Adjustment of Inspiratory and Expiratory Pressure
  - 2.5.2. Adjustment of Respiratory Rate
  - 2.5.3. Adjustment of  $T_i/T_{tot}$
  - 2.5.4. Adjustment of PEEP
  - 2.5.5. Adjustment of  $FiO_2$
- 2.6. Respiratory Cycles and Trigger
  - 2.6.1. Adjustment of Trigger and Ventilator Sensitivity
  - 2.6.2. Adjustment of Tidal Volume and Inspiratory Time
  - 2.6.3. Adjustment of Inspiratory and Expiratory Flow
- 2.7. Patient-Ventilator Synchronization
  - 2.7.1. Trigger Delay
  - 2.7.2. Auto-Trigger
  - 2.7.3. Ineffective Inspiratory Efforts
  - 2.7.4. Inspiratory Time Mismatch Between Patient and Ventilator
  - 2.7.5. Double Trigger
- 2.8. Alarms and Patient Safety
  - 2.8.1. Types of Alarms
  - 2.8.2. Alarm Management
  - 2.8.3. Patient Safety
  - 2.8.4. Evaluation of NIMV Effectiveness
- 2.9. Patient Selection and Initiation Strategies
  - 2.9.1. Patient Profile
  - 2.9.2. Initial Parameters for Acute Patients on NIMV
  - 2.9.3. Initial Parameters for Chronic Patients
  - 2.9.4. Parameter Adjustment Based on Progress
- 2.10. Evaluation of Patient Tolerance and Adaptation to Non-Invasive Mechanical Ventilation
  - 2.10.1. Criteria for a Good Clinical Response
  - 2.10.2. Criteria for a Poor Clinical Response
  - 2.10.3. Adjustments to Improve Tolerance
  - 2.10.4. Tips for Enhancing Adaptation

### Module 3. Intermediate Respiratory Care Units (IRCU)

- 3.1. Fundamentals and Objectives of the IRCUs
  - 3.1.1. Evolution Over Time
  - 3.1.2. Importance and Benefits
  - 3.1.3. Role of IRCUs in Public Health Management
- 3.2. Features and Organization of IRCUs
  - 3.2.1. Structure and Design
  - 3.2.2. Mechanisms of Coordination and Collaboration Among Various Services
  - 3.2.3. Development of Personalized Care Plans for Each Patient
  - 3.2.4. Assessment and Monitoring of Treatment Outcomes
- 3.3. Equipment and Technology in IRCUs
  - 3.3.1. Types of Equipment and Technologies Available in IRCUs
  - 3.3.2. Advantages and Disadvantages of Different Available Technologies
  - 3.3.3. New Trends and Advances in Technology Used in IRCUs
- 3.4. Healthcare Personnel in IRCUs: Functions and Competencies
  - 3.4.1. Professional Profile and Training Requirements for Health Professionals Working in IRCUs
  - 3.4.2. Competencies and Responsibilities of Various Members of Health Personnel
  - 3.4.3. Teamwork and Coordination Among Different Healthcare Professionals in IRCUs
  - 3.4.4. Continuing Education and Professional Development of Healthcare Personnel in IRCUs
- 3.5. Indications and Criteria in IRCUs
  - 3.5.1. Criteria for Patient Selection for Admission to IRCUs
  - 3.5.2. Admission Process and Assessment of Patient's Health Status
- 3.6. Monitoring and Follow-Up of Patients in IRCUs
  - 3.6.1. Capnography
  - 3.6.2. Continuous Pulse Oximetry
  - 3.6.3. Respiratory Software
- 3.7. Success and Failure Criteria in NIMV
  - 3.7.1. Prognosis Scales
  - 3.7.2. Factors Influencing the Success or Failure of NIMV
  - 3.7.3. Early Identification of NIMV Failures

- 3.8. Complications and Their Management in NIMV
    - 3.8.1. Respiratory Complications
    - 3.8.2. Cardiovascular Complications
    - 3.8.3. Neurological Complications
    - 3.8.4. Gastrointestinal Complications
    - 3.8.5. Dermatological Complications
    - 3.8.6. Psychological Complications
  - 3.9. Pharmacological Treatments in IRCUs
    - 3.9.1. Nutrition and Nutritional Support
    - 3.9.2. Sedation and Analgesia in Patients with NIMV
    - 3.9.3. Other Medications in IRCUs
  - 3.10. Discharge Criteria and Patient Follow-Up After Their Stay in IRCUs
    - 3.10.1. Assessment of Patient's Clinical Stability Before IRCU Discharge
    - 3.10.2. Discharge Planning and Patient Follow-Up
    - 3.10.3. Discharge Criteria for NIMV
    - 3.10.4. Outpatient Follow-Up After IRCU Discharge
    - 3.10.5. Assessment of Quality of Life After IRCU Stay
- Module 4. Non-Invasive Respiratory Support Techniques**
- 4.1. Assessment of the Required Ventilatory Support Level
    - 4.1.1. Assessment of Clinical Indication
    - 4.1.2. Interpretation of Arterial Blood Gas
    - 4.1.3. Assessment of Respiratory Mechanics
    - 4.1.4. Determination of the Required Ventilatory Support Level
    - 4.1.5. Changing Ventilatory Modality
  - 4.2. Continuous Positive Airway Pressure (CPAP)
    - 4.2.1. Monitoring and Management of CPAP Complications
    - 4.2.2. Comparison of CPAP with Other Ventilatory Modalities
    - 4.2.3. Positive Airway Pressure (BiPAP)
    - 4.2.4. Monitoring and Management of CPAP Complications
    - 4.2.5. Comparison of CPAP with Other Ventilatory Modalities
  - 4.3. Positive Airway Pressure (BiPAP)
    - 4.3.1. Principles and Mechanics of BiPAP
    - 4.3.2. Indications for BiPAP Use
    - 4.3.3. Adjusting BiPAP Parameters
    - 4.3.4. Monitoring and Management of BiPAP Complications
    - 4.3.5. Comparison of BiPAP with Other Ventilatory Modalities
  - 4.4. Pressure Support Ventilation
    - 4.4.1. Conventional (PSV)
    - 4.4.2. Proportional (PPSV)
    - 4.4.3. Adaptive (ASV)
    - 4.4.4. Intelligent Adaptive (iVAPS)
  - 4.5. Volume-Controlled Ventilation
    - 4.5.1. Principles and Mechanics of Volume NIV
    - 4.5.2. Indications for Volume NIMV Use
    - 4.5.3. Adjusting Volume Mode Parameters
    - 4.5.4. Monitoring and Management of Complications in Volume Mode
    - 4.5.5. Comparison of Volume Mode with Other Ventilatory Modalities
  - 4.6. High-Flow Nasal Cannula (HFNC)
    - 4.6.1. Principles and Mechanics of HFNC
    - 4.6.2. Indications for HFNC Use
    - 4.6.3. Adjusting HFNC Parameters
    - 4.6.4. Monitoring and Management of HFNC Complications
    - 4.6.5. Comparison of HFNC with Other Ventilatory Modalities
  - 4.7. Combined Ventilation (Positive Pressure (CPAP/BiPAP) + HFNC)
    - 4.7.1. Principles and Mechanics of Combined Therapy
    - 4.7.2. Indications for Combined Therapy Use
    - 4.7.3. Starting Combined Therapy, Simultaneously or Staggered
    - 4.7.4. Adjusting Parameters for Combined Therapy
    - 4.7.5. Monitoring and Management of Complications in Combined Therapy
    - 4.7.6. Comparison of Combined Therapy with Other Ventilatory Modalities

- 4.8. High-Frequency Ventilation
  - 4.8.1. Indications for High-Frequency NIMV Use
  - 4.8.2. Adjusting Parameters
  - 4.8.3. Utility in Acute Patients
  - 4.8.4. Utility in Chronic Patients
  - 4.8.5. Monitoring and Management of Complications
  - 4.8.6. Comparison with Other Ventilatory Modalities
- 4.9. Others Ventilatory Modes
  - 4.9.1. Pressure Support Ventilation with Mandatory Flow Control (MFC)
  - 4.9.2. High-Velocity Nasal Cannula Ventilation
  - 4.9.3. Other Innovative Ventilatory Modes
- 4.10. Humidification and Temperature Adjustment in NIV
  - 4.10.1. Importance of Adequate Humidification and Temperature in NIV
  - 4.10.2. Types of Humidification Systems in NIV
  - 4.10.3. Indications for Adding a Humidifier in Acute Patients
  - 4.10.4. Indications for Humidifier Use in Chronic Patients
  - 4.10.5. Methods for Monitoring Humidification in NIV
  - 4.10.6. Temperature Adjustment in NIV
  - 4.10.7. Monitoring and Management of Complications Related to Humidification and Temperature in NIV

## Module 5. Beyond Non-Invasive Ventilation in an IRCU Highly Specialized Concepts

- 5.1. Ventilator Weaning with Tracheostomy in an Intermediate Respiratory Care Unit
  - 5.1.1. Criteria for Performing Tracheostomy in Patients with Prolonged IMV
  - 5.1.2. Patient Preparation for Weaning from IMV
  - 5.1.3. Weaning Techniques from IMV via Tracheostomy
  - 5.1.4. Assessment of Tolerance during Weaning from IMV via Tracheostomy
  - 5.1.5. Management of Complications during Weaning
- 5.2. Tracheostomy Management in the Intermediate Respiratory Care Unit
  - 5.2.1. Selecting the Appropriate Tracheostomy Technique for the Patient
  - 5.2.2. Initial Tracheostomy Care in the Intermediate Respiratory Care Unit
  - 5.2.3. Tracheostomy Tube Replacement and Maintenance
  - 5.2.4. Monitoring Complications
  - 5.2.5. Assessing the Appropriate Time of Tracheostomy Removal
  - 5.2.6. Decannulation Protocol
- 5.3. Utilizing Non-Invasive Respiratory Support in the disconnection of orotracheal intubation
  - 5.3.1. Selection of patients who are candidates for disconnection
  - 5.3.2. Techniques for disconnection of orotracheal intubation
  - 5.3.3. Evaluation of tolerance to noninvasive respiratory support during disconnection
  - 5.3.4. Monitoring and management of complications during disconnection
  - 5.3.5. Evaluation of the success of noninvasive respiratory support in the disconnection of orotracheal intubation and patient follow-up
- 5.4. Secretion Management and Cough Assistance
  - 5.4.1. Indications
  - 5.4.2. How to measure it
  - 5.4.3. Different devices
  - 5.4.4. Pressure configuration
  - 5.4.5. How to use it
- 5.5. NIMV and polygraphy, indications and interpretation
  - 5.5.1. Indications for polygraphy in the NIMV patient
  - 5.5.2. Interpretation of polygraphy results in patients with NIMV
  - 5.5.3. Identification of abnormal respiratory patterns on polygraph during the use of NIMV
  - 5.5.4. Monitoring the efficacy of respiratory support during polygraphy
  - 5.5.5. Interpretation of respiratory complications associated with NIMV on polygraphy
- 5.6. Physiotherapy in an IRCU
  - 5.6.1. Objectives and benefits of respiratory physiotherapy in the IRCU
  - 5.6.2. Respiratory physiotherapy techniques used in the IRCU
  - 5.6.3. Physiotherapy in the prevention and treatment of respiratory complications in the IRCU



- 5.6.4. Evaluation and follow-up of patient progress with respiratory physiotherapy in the IRCU
- 5.6.5. Multidisciplinary collaboration in the implementation of respiratory physiotherapy in the IRCU
- 5.7. Management of shock and other frequently used drugs in IRCU
  - 5.7.1. Types of shock and its management in the IRCU
  - 5.7.2. Indications and dosage of vasopressors in the management of shock in the IRCU
  - 5.7.3. Use of inotropics and vasodilators in the management of shock in the IRCU
  - 5.7.4. Management of hypotension in the IRCU with fluid therapy
  - 5.7.5. Monitoring hemodynamic and patient response to drugs used in the management of shock in IRCU
- 5.8. Swallowing Disorders Evaluation
  - 5.8.1. Prolonged Orotracheal Intubation
  - 5.8.2. Tracheostomy
  - 5.8.3. Ineffective Swallowing
- 5.9. Nutritional study in patients with prolonged admission to the IRCU
  - 5.9.1. Nutritional and metabolic assessment in patients in the IRCU
  - 5.9.2. Evaluating Nutritional Status and Energy Needs
  - 5.9.3. Nutritional strategies for patients with prolonged admission to the IRCU
  - 5.9.4. Monitoring of nutritional support and necessary adjustments in IRCU patients
  - 5.9.5. Prevention and management of nutritional complications in patients with prolonged admission to the IRCU
- 5.10. Management of Unstable Patients
  - 5.10.1. Management of Rapid Atrial Fibrillation
  - 5.10.2. Management of Supraventricular Tachycardia
  - 5.10.3. Management of Cardiopulmonary Arrest
  - 5.10.4. Orotracheal Intubation
  - 5.10.5. Sedation in NIV

## Module 6. Non-Invasive Mechanical Ventilation in Specific Pathologies

- 6.1. Non-Invasive Mechanical Ventilation in Acute Chronic Obstructive Pulmonary Disease (COPD)
  - 6.1.1. Indications and Contraindications in Patients with COPD
  - 6.1.2. Selection and Adjustment of Ventilatory Parameters in COPD
  - 6.1.3. Assessment of Efficacy
  - 6.1.4. Weaning Strategies from NIMV in COPD Patients
  - 6.1.5. Criteria for NIMV at Hospital Discharge
- 6.2. Non-Invasive Mechanical Ventilation in Heart Failure
  - 6.2.1. Effects of Non-Invasive Mechanical Ventilation on the Hemodynamics of Heart Failure Patients
  - 6.2.2. Monitoring Heart Failure Patients during Non-Invasive Mechanical Ventilation
  - 6.2.3. Non-Invasive Mechanical Ventilation in Patients with Acutely Decompensated Heart Failure
  - 6.2.4. Non-Invasive Mechanical Ventilation in Patients with Chronic Heart Failure and Its Impact on Patient Quality of Life
- 6.3. Non-Invasive Mechanical Ventilation in Acute Respiratory Distress Syndrome (ARDS)
  - 6.3.1. Definition and Diagnostic Criteria for ARDS
  - 6.3.2. Indications and Contraindications of NIMV in ARDS Patients
  - 6.3.3. Selection and Adjustment of Ventilatory Parameters in ARDS Patients on NIMV
  - 6.3.4. Monitoring and Evaluation of Response to NIMV in ARDS Patients
  - 6.3.5. Comparison of NIMV with IMV in ARDS Patients
- 6.4. Non-Invasive Mechanical Ventilation in Diffuse Interstitial Lung Diseases (DILD)
  - 6.4.1. Pathophysiology of Diffuse Interstitial Lung Diseases (DILD)
  - 6.4.2. Scientific Evidence in the Management of NIMV in DILD
  - 6.4.3. Indications for NIMV in Patients with DILD
  - 6.4.4. Assessment of the Efficacy of NIMV in Patients with DILD

- 6.5. Non-Invasive Mechanical Ventilation in Obesity
  - 6.5.1. Obesity Pathophysiology and Its Relationship with NIMV
  - 6.5.2. Indications and Contraindications in Obese Patients
  - 6.5.3. Specific NIMV Adjustments in Obese Patients
  - 6.5.4. Strategies for Prevention and Treatment of Complications
  - 6.5.5. NIMV in Patients with Obstructive Sleep Apnea
  - 6.5.6. Obesity Hypoventilation Syndrome
- 6.6. Non-Invasive Mechanical Ventilation in Neuromuscular and Rib Cage
  - 6.6.1. Indications
  - 6.6.2. Main Neuromuscular and Rib Cage Diseases
  - 6.6.3. Selection of Ventilatory Modes
  - 6.6.4. Adjustment of Ventilatory Parameters
  - 6.6.5. Assessment of Efficacy and Tolerance of NIMV
  - 6.6.6. Tracheostomy Indications
  - 6.6.7. Management of Complications
- 6.7. Non-Invasive Mechanical Ventilation in COVID-19 Patients
  - 6.7.1. Indications for NIMV in COVID-19 Patients
  - 6.7.2. Adjustment of Ventilatory Parameters
  - 6.7.3. Safety Considerations in NIMV for COVID-19
  - 6.7.4. Assessment of Efficacy
  - 6.7.5. Disconnection Strategies
- 6.8. Non-Invasive Mechanical Ventilation in Acute Hypoxemic Respiratory Failure
  - 6.8.1. Definition of De Novo Respiratory Failure
  - 6.8.2. Indications and Contraindications for NIMV in Acute Hypoxemic Respiratory Failure
  - 6.8.3. Parameters and Adjustments in NIMV for Patients with Acute Hypoxemic Respiratory Failure
  - 6.8.4. Complications Associated with NIMV Use in Acute Hypoxemic Respiratory Failure
  - 6.8.5. Assessment of NIMV Efficacy in Improving Oxygenation and Reducing Respiratory Work in Acute Hypoxemic Respiratory Failure
  - 6.8.6. Comparison of NIMV with Invasive Mechanical Ventilation in Patients with Acute Hypoxemic Respiratory Failure

- 6.9. Non-Invasive Mechanical Ventilation in the asthmatic patient in exacerbation
  - 6.9.1. Indications for NIMV in Asthma Attacks
  - 6.9.2. Ventilatory Parameters to Adjust
  - 6.9.3. Monitoring of the acutely ill asthmatic patient during NIMV
  - 6.9.4. Alarm Criteria for Poor Response to NIMV
- 6.10. Non-Invasive Mechanical Ventilation in Pre-Intubation Preparation
  - 6.10.1. Benefits, Risks, and Limitations
  - 6.10.2. Management of NIMV in Transition to Invasive Mechanical Ventilation

## Module 7. Care in Non-Invasive Mechanical Ventilation

- 7.1. Monitoring of the Patient's Vital Signs
  - 7.1.1. Importance of Monitoring Vital Signs
  - 7.1.2. Types of Vital Signs to Monitor
  - 7.1.3. Analysis and Interpretation of Obtained Values
  - 7.1.4. Adjusting Monitoring According to the Patient's Needs
- 7.2. Monitoring Oxygenation and Ventilation of the Patient
  - 7.2.1. Techniques for Monitoring Oxygenation and Ventilation
  - 7.2.2. Interpreting Pulse Oximetry and Capnography Values
  - 7.2.3. Early Detection of Hypoxia and Hypercapnia
  - 7.2.4. Adjusting Mechanical Ventilation According to the Patient's Needs
- 7.3. Monitoring of Interface and Ventilation Circuit
  - 7.3.1. Identification and Prevention of Leaks in the Interface and Circuit
  - 7.3.2. Cleaning and Maintenance of the Interface and Circuit
  - 7.3.3. Changing and Selecting the Interface According to the Patient's Needs
- 7.4. Management of Respiratory Secretions
  - 7.4.1. Assessment Techniques for Respiratory Secretions
  - 7.4.2. Methods for Mobilizing and Removing Secretions
  - 7.4.3. Precautions and Measures to Avoid Aspiration of Secretions
  - 7.4.4. Selection and Adjustment of Secretion Suction Devices

- 7.5. Skin Care at the Interface Site
  - 7.5.1. Assessment and Prevention of Skin Lesions at the Interface Site
  - 7.5.2. Skin Cleaning and Care Techniques at the Interface Site
  - 7.5.3. Dressings and Wound Care for Skin Lesions
- 7.6. Prevention of Gastric Content Aspiration
  - 7.6.1. Assessment of Aspiration Risk
  - 7.6.2. Prevention Measures for Aspiration in Non-Invasive Mechanical Ventilation Patients
  - 7.6.3. Types of Tubes and Devices Used for Patient Nutrition and Feeding
- 7.7. Patient and Family Education on Non-Invasive Mechanical Ventilation
  - 7.7.1. Importance of Patient and Family Education
  - 7.7.2. Information to Be Provided to the Patient and Their Family About the Use of Non-Invasive Mechanical Ventilation
  - 7.7.3. Management of Emergencies and Unexpected Situations by the Patient and Their Family
  - 7.7.4. Strategies to Promote Adherence to Non-Invasive Mechanical Ventilation
- 7.8. Individualized Care Plan for Patients on Non-Invasive Mechanical Ventilation
  - 7.8.1. General Considerations in Developing the Care Plan
  - 7.8.2. Nursing Assessment of Patients on NIMV
  - 7.8.3. NANDA Diagnosis
  - 7.8.4. Nursing Outcomes and Interventions
- 7.9. Tracheostomy care and treatment
  - 7.9.1. Tracheostomy cleaning and healing techniques
  - 7.9.2. Selection and adjustment of the tracheostomy device
  - 7.9.3. Prevention and treatment of complications associated with tracheostomy
- 7.10. Infection transmission prevention measures
  - 7.10.1. Standard Precautions
  - 7.10.2. Types of hospital isolation
  - 7.10.3. NIMV patient specifications

## Module 8. Non-Invasive Mechanical Ventilation in Pediatrics

- 8.1. Differences Between Non-Invasive Mechanical Ventilation in Adults and Pediatrics
  - 8.1.1. Lung Physiology in Pediatric Patients
  - 8.1.2. Key Differences in Managing the Pediatric Airway
  - 8.1.3. Common Respiratory Pathologies in Pediatrics Requiring NIMV
  - 8.1.4. Managing Patient Collaboration in Pediatric NIMV
- 8.2. Indications and Contraindications of Non-Invasive Mechanical Ventilation in Pediatrics
  - 8.2.1. Indications for NIMV in Pediatrics
  - 8.2.2. Absolute Contraindications for NIMV in Pediatrics
  - 8.2.3. Relative Contraindications for NIMV in Pediatrics
- 8.3. Equipment and Modes of Non-Invasive Mechanical Ventilation in Pediatrics
  - 8.3.1. NIMV Modes in Pediatrics
  - 8.3.2. Ventilatory Support Equipment in Pediatrics
  - 8.3.3. Accessories and Circuits for Non-Invasive Mechanical Ventilation in Pediatrics
  - 8.3.4. Monitoring and Ventilation Adjustment in Pediatrics
- 8.4. Adjusting Non-Invasive Mechanical Ventilation in Pediatrics
  - 8.4.1. Setting Support Pressures and PEEP
  - 8.4.2. Adjusting Airflow
  - 8.4.3. Adjustment of Respiratory Rate
  - 8.4.4. Setting Inspiratory Time
- 8.5. Monitoring and Adjustment of Non-Invasive Mechanical Ventilation in Pediatrics
  - 8.5.1. Clinical Assessment
  - 8.5.2. Arterial Blood Gas Assessment
  - 8.5.3. Pulse Oximetry Assessment
  - 8.5.4. Capnography Assessment

- 8.6. Non-Invasive Mechanical Ventilation in Pediatric Respiratory Pathologies
  - 8.6.1. Prematurity
  - 8.6.2. Bronchiolitis
  - 8.6.3. Cystic fibrosis
  - 8.6.4. Bronchopulmonary Dysplasia
  - 8.6.5. Neonatal respiratory failure
  - 8.6.6. Tracheostomy
  - 8.6.7. Neuromuscular Diseases
  - 8.6.8. Disconnections for Orotracheal Intubation
- 8.7. Interfaces in NIMV in Pediatric Patients
  - 8.7.1. Nasal Mask
  - 8.7.2. Oro-Nasal Mask
  - 8.7.3. Face Mask
  - 8.7.4. Helmet
  - 8.7.5. Special Considerations in the Use of NIMV Interfaces in Pediatrics
- 8.8. Complications of Non-Invasive Mechanical Ventilation in Pediatrics
  - 8.8.1. Pneumothorax
  - 8.8.2. Hypotension
  - 8.8.3. Hypoxemia
  - 8.8.4. Desaturation during support removal
- 8.9. Home NIMV in Pediatrics
  - 8.9.1. Indications for Home NIMV
  - 8.9.2. Selection of Suitable Patients
  - 8.9.3. Caregiver Training
  - 8.9.4. Home Monitoring
- 8.10. Weaning Techniques in Pediatrics
  - 8.10.1. Gradual withdrawal of NIMV
  - 8.10.2. Assessment of tolerance to NIMV withdrawal
  - 8.10.3. Use of oxygen therapy after withdrawal of NIMV
  - 8.10.4. Assessment of the patient after withdrawal of NIMV

## Module 9. Ethics, Innovation, and Research

- 9.1. Ethics and Legality in Non-Invasive Mechanical Ventilation
  - 9.1.1. Ethical Principles in Non-Invasive Mechanical Ventilation
  - 9.1.2. Patient Confidentiality and Privacy
  - 9.1.3. Professional and Legal Responsibility of Healthcare Personnel
  - 9.1.4. Regulations and Guidelines for Non-Invasive Mechanical Ventilation
  - 9.1.5. Civil and Criminal Liability in Non-Invasive Mechanical Ventilation
- 9.2. Use of NIMV in Emergency Situations
  - 9.2.1. NIMV in Emergency Situations: Assessing Risks and Benefits in the Context of a Pandemic
  - 9.2.2. Selecting Patients for NIMV in Emergency Situations: How to Choose the Most Suitable Patients?
  - 9.2.3. NIMV in Emergency Situations: Practical and Logistical Aspects in a High-Demand Environment
  - 9.2.4. The Role of Nursing Staff in the Application and Monitoring of NIMV in Emergency Situations
  - 9.2.5. Ethical and Legal Considerations in the Application of NIMV in Emergency Situations During and After the Pandemic
- 9.3. Use of NIMV in Patients with Limited Decision-Making Capacity
  - 9.3.1. Ethical Considerations in Decision-Making for Patients with Limited Decision-Making Capacity in NIV
  - 9.3.2. Role of the Multidisciplinary Team in Assessment and Decision-Making
  - 9.3.3. Importance of Effective Communication with Family or Caregivers in Decision-Making
  - 9.3.4. Assessment of the Patient's Quality of Life and Capacity to Tolerate NIMV
  - 9.3.5. Analysis of the Potential Consequences of NIMV in Patients with Limited Decision-Making Capacity and Its Impact on Medical Decision-Making
- 9.4. Use of Non-Invasive Mechanical Ventilation in End-of-Life Patients
  - 9.4.1. The Role of the Palliative Care Team in the Decision to Use NIMV at the End of Life
  - 9.4.2. Ethical Considerations in the Use of NIMV in End-of-Life Patients
  - 9.4.3. Psychological Impact on Patients and Families when Using NIMV at the End of Life
  - 9.4.4. Identifying Candidates for NIMV at the End of Life
  - 9.4.5. Alternatives to NIMV in Palliative Care

- 9.5. Effective Communication in Non-Invasive Mechanical Ventilation
  - 9.5.1. Importance of Effective Communication in Healthcare
  - 9.5.2. Techniques for Effective Communication with Patients and Their Families
  - 9.5.3. Non-Verbal Communication in Non-Invasive Mechanical Ventilation
  - 9.5.4. Effective Communication in Planning the Discharge of Patients with Chronic NIMV
- 9.6. Education and Training of Healthcare Personnel, Patients, and Families in Home NIMV Management
- 9.7. Conflict Situations in the Management of Non-Invasive Mechanical Ventilation
  - 9.7.1. Challenges in the Application of NIMV in Morbidly Obese Patients
  - 9.7.2. Intolerance to Non-Invasive Mechanical Ventilation: Causes and Alternatives
  - 9.7.3. Approach to NIMV in Patients with Advanced Neuromuscular Disorders
- 9.8. NIMV in Patient Care in the Context of Palliative Care
  - 9.8.1. Indications and Ethical Considerations
  - 9.8.2. NIMV in Patients with Terminal Illness: When to Initiate and Discontinue
- 9.9. Innovation in Non-Invasive Mechanical Ventilation
  - 9.9.1. New Technologies in NIMV: Advanced Ventilators and Ventilation Modes
  - 9.9.2. NIMV in Sleep Apnea: Advances and Challenges
  - 9.9.3. NIMV at Home: Implications and Self-Care Recommendations
- 9.10. Research in Non-Invasive Mechanical Ventilation Management
  - 9.10.1. Study Design in Non-Invasive Mechanical Ventilation Management
  - 9.10.2. Research
    - 9.10.2.1. Efficacy and Safety of NIMV
    - 9.10.2.2. Patient Quality of Life and Satisfaction
    - 9.10.2.3. Implementation and Dissemination of Guidelines and Recommendations for NIMV Management
- 10.2. Monitoring Patients with Chronic Home Ventilation
  - 10.2.1. Parameters to Monitor
  - 10.2.2. Monitoring Methods
  - 10.2.3. Interpretation of Data Obtained During Monitoring
  - 10.2.4. Follow-Up and Evaluation Techniques
- 10.3. Telemonitoring in Patients with Chronic Home Ventilation
  - 10.3.1. Definition
  - 10.3.2. Advantages and Disadvantages
  - 10.3.3. Technologies Used
  - 10.3.4. Ethical and Legal Aspects
- 10.4. Organization of Consultations for Patients with Chronic Home Ventilation
  - 10.4.1. Definition of the Organization of Consultations for Patients with Chronic Home Ventilation
  - 10.4.2. Methods of Organizing Consultations
  - 10.4.3. Assessment of the Effectiveness of Consultation Organization
- 10.5. Nursing Care for Patients with Chronic Home Ventilation
  - 10.5.1. Role of Nursing in Management
  - 10.5.2. Nursing Care
  - 10.5.3. Patient and Caregiver Education
  - 10.5.4. Prevention and Management of Complications
- 10.6. Management of Psychiatric Issues in Patients with Chronic Home Ventilation
  - 10.6.1. Prevalence of Anxiety and Depression
  - 10.6.2. Clinical Manifestations of Anxiety and Depression
  - 10.6.3. Strategies for Managing Anxiety and Depression
  - 10.6.4. Prevention of Anxiety and Depression
- 10.7. Teleconsultation in Non-Invasive Mechanical Ventilation: Benefits and Limitations
  - 10.7.1. Advantages and Limitations of Teleconsultation in NIMV
  - 10.7.2. Use of Information Technologies in NIMV During the Pandemic
  - 10.7.3. Impact of Teleconsultation on the Quality of NIMV Care
  - 10.7.4. Factors Influencing the Effectiveness of Teleconsultation in NIMV
  - 10.7.5. Need for Protocols and Guidelines for Teleconsultation in NIMV

## Module 10. Monitoring in Chronic Home NIMV

- 10.1. Chronic Home Ventilation
  - 10.1.1. Definition of Chronic Home Ventilation
  - 10.1.2. Indications for Chronic Home Ventilation
  - 10.1.3. Types of Chronic Home Ventilation
  - 10.1.4. Benefits of Chronic Home Ventilation

- 10.8. Telehealth in NIMV
  - 10.8.1. Teleeducation and Teletraining: Opportunities and Challenges
  - 10.8.2. Legal and Ethical Aspects
- 10.9. Telemedicine and NIMV in Various Contexts
  - 10.9.1. The COVID-19 Pandemic
  - 10.9.2. Rural and Hard-to-Access Areas: Strategies and Solutions
  - 10.9.3. In Developing Countries: Challenges and Opportunities
- 10.10. Economic and Financial Evaluation of Telemedicine in Non-Invasive Mechanical Ventilation: Cost-Effectiveness and Sustainability
  - 10.10.1. Basic Concepts of Economic Evaluation in Telemedicine
  - 10.10.2. Cost-Effectiveness of Telemedicine in NIMV
  - 10.10.3. Cost Analysis of Teleconsultation in NIMV
  - 10.10.4. Financial Sustainability of Telemedicine in NIMV
  - 10.10.5. Limitations and Challenges in the Economic Evaluation of Telemedicine in NIMV





“ Take this Professional Master's Degree and obtain the most updated knowledge of the educational panorama on Non-Invasive Mechanical Ventilation”

06

# 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.*



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.



07

# Certificate

The Professional Master's Degree in Non-Invasive Mechanical Ventilation guarantees students, in addition to the most rigorous and up-to-date education, access to a Professional Master's Degree diploma issued by TECH Global University.





The image features three black graduation caps (mortarboards) against a bright blue sky with light, wispy clouds. The caps are positioned at different angles, creating a sense of depth and movement. The bottom right corner of the image is a white diagonal shape that contains the quote.

“

*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 **Professional Master's Degree diploma in Non-Invasive Mechanical Ventilation** 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.

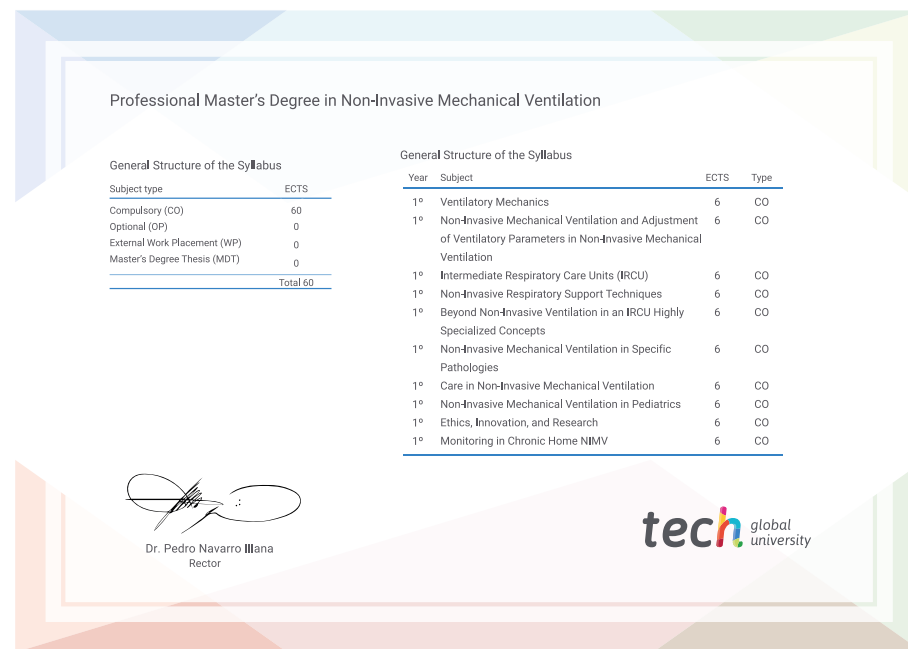
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Professional Master's Degree in Non-Invasive Mechanical Ventilation**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**



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

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



**Professional Master's  
Degree**  
Non-Invasive Mechanical  
Ventilation

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Schedule: at your own pace
- » Exams: online

# Professional Master's Degree

## Non-Invasive Mechanical Ventilation

