

# Professional Master's Degree

## Non-Invasive Mechanical Ventilation for Nursing





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

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

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

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# 01

# Introduction

The nurse plays a crucial role in the application of NIMV. Accordingly, they are responsible for the placement of the interfaces and for continuously monitoring the complications that may arise in the process, in order to act with agility and guarantee the patient's well-being. As a result, the professional must keep up to date with the procedures for handling delicate clinical situations or the care required by each individual in order to be at the forefront of healthcare. Because of this, TECH has designed this program, which allows the student to learn the leading protocols for creating individualized care plans for NIMV in diseases such as COPD, heart failure or ARDS, online and without time constraints.





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*Thanks to this degree, you will learn the state-of-the-art procedures to create an individualized care plan for patients with COPD or heart failure undergoing NIMV”*



In recent years, clinical studies have shown that Non-Invasive Mechanical Ventilation has innumerable benefits for people with a wide range of respiratory difficulties. Consequently, its use is becoming more and more common in hospital settings, leading to the improvement of procedures and nursing care before, during and after the application of NIMV, in order to improve the patient's quality of life. For this reason, nurses who wish to carry out an updated healthcare practice should be aware of these advances in order to optimize their professional update.

For this reason, TECH Technological University has designed this program, which provides students with the most cutting-edge knowledge on Non-Invasive Mechanical Ventilation for Nursing in only 1,500 hours. Throughout this academic period, students will delve into strategies to optimize the choice of the most appropriate interface for each patient or learn the techniques to prevent the appearance of pressure ulcers caused by NIMV. Likewise, students will learn about the latest methods for monitoring the patient undergoing Non-Invasive Mechanical Ventilation.

Since this Professional Master's Degree is taught in a 100% online mode, students will not be forced to give up their professional and personal obligations to complete their updating process. Likewise, this degree has been designed by physicians and nurses of reference in the field of Non-Invasive Mechanical Ventilation and the care of patients with respiratory difficulties. Therefore, the knowledge that the student will assimilate will be fully useful in daily practice.

This **Professional Master's Degree in Non-Invasive Mechanical Ventilation for Nursing** 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 VMNI experts
- ♦ 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 the self-assessment process can be carried out 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 in depth, with this program, the updated techniques to prevent the appearance of pressure ulcers caused by NIVM"*

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*Complete your update as a nurse 100% online and without leaving your home”*

The program's teaching staff includes professionals from the sector who contribute their work experience to this 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.

*Identify state-of-the-art Non-Invasive Mechanical Ventilation patient monitoring techniques.*

*Get the best didactic content in the educational environment and enjoy studying through revolutionary multimedia formats.*



# 02

# Objectives

TECH has designed this Professional Master's Degree with the intention of updating the nurse with respect to the care and attention of the patient in Non-Invasive Mechanical Ventilation. Thanks to this program, you will delve into the techniques for pre-NIMV assessment of the patient or advanced strategies for monitoring and tracking their health status. Likewise, your learning will be ensured through the following general and specific objectives.







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*Adopt in your nursing practice the most advanced knowledge on Non-Invasive Mechanical Ventilation”*



## General Objectives

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- ◆ Understand the importance and role of Non-Invasive Mechanical Ventilation in the treatment of acute and chronic respiratory pathologies
- ◆ Know the updated indications and contraindications for the use of Non-Invasive Mechanical Ventilation, as well as the different types of devices and modes of ventilation
- ◆ Acquire skills and competences in the monitoring of the patient with Non-Invasive Mechanical Ventilation, including the interpretation of the data obtained and the detection and prevention of complications
- ◆ Investigate the state-of-the-art technologies used in the telemonitoring of patients with Non-Invasive Mechanical Ventilation and the ethical and legal aspects related to their use
- ◆ Delve into the main differences in Non-Invasive Mechanical Ventilation in Pediatrics
- ◆ Delve into the ethical aspects related to the management of patients requiring NIMV



*Through this program, you will learn the sophisticated techniques to undertake the pre-NIMV evaluation of the patient"*





## Specific Objectives

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### Module 1. Ventilatory Mechanics

- ♦ Learn in depth the mechanisms of respiratory control and blood pH regulation, as well as the 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 that act on the lungs during ventilation and the relationship between respiratory mechanics and respiratory muscle effort
- ♦ Investigate the 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 the measurement and the factors that influence it, as well as the alterations in respiratory diseases
- ♦ Delve into the ventilation-perfusion relationship, state-of-the-art methods to detect alterations in respiratory diseases and therapeutic strategies to improve this relationship

### Module 2. Non-Invasive Mechanical Ventilation and Ventilatory Parameter Settings in Non-Invasive Mechanical Ventilation

- ♦ Define and clarify the terminology and basic concepts of NIMV
- ♦ Describe the different ventilatory modes used in NIMV, including spontaneous, assisted and controlled mode
- ♦ Identify the different types of interfaces used in NIMV, explaining their selection and setting
- ♦ Delve into the different alarms and patient safety measures in NIMV
- ♦ Detect patients suitable for NIMV and explain the strategies for initiation and parameter according to evolution

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

- ♦ Analyze the role of the IRCU in the care and treatment of critically ill patients
- ♦ Have an in-depth knowledge of the structure and design of the IRCU and the mechanisms of coordination and collaboration between the different services
- ♦ Identify the types of equipment and technologies available in the IRCU and their advantages and disadvantages
- ♦ Detect the latest trends and advances in the technology used in IRCUs
- ♦ Delve into the prognostic scales used in NPPV
- ♦ Delve into the respiratory, cardiovascular, neurological, gastrointestinal, dermatological and psychological complications in NIV and to know the updated protocols to manage them

### Module 4. Noninvasive Respiratory Support Techniques

- ♦ Understand the principles and mechanics of continuous positive airway pressure, positive airway pressure, pressure support ventilation, volume controlled ventilation and high-flow nasal cannula (HFNC)
- ♦ Identify the indications for the use of each of these ventilatory modalities and know how to adjust the necessary parameters
- ♦ Compare the different ventilatory modalities to choose the most appropriate one for each patient
- ♦ Know in depth the usefulness of high frequency ventilation and other new ventilatory modes

### **Module 5. Beyond Noninvasive Ventilation in an IRCU. Highly Skilled Concepts**

- ♦ Describe the criteria for performing tracheostomy in patients with prolonged invasive mechanical ventilation
- ♦ Identify the state-of-the-art techniques used in weaning from IMV via tracheostomy
- ♦ Analyze the usefulness of non-invasive respiratory support in the disconnection of orotracheal intubation
- ♦ Delve into the identification of abnormal respiratory patterns, monitoring of respiratory support efficacy, and interpretation of respiratory complications associated with NIMV
- ♦ Understand the goals and benefits of respiratory physiotherapy in IRCU
- ♦ Delve into the use of inotropic and 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 (NIMV) in various pathologies such as COPD, Heart Failure, ARDS or ILD, among others
- ♦ Analyze the selection and adjustment of NIMV ventilatory parameters in each specific pathology
- ♦ Analyze the effectiveness of NIMV in each specific pathology
- ♦ Delve into the latest scientific evidence on the management of NIMV in ILD
- ♦ Understand the complications associated with the use of NIMV in patients with Obesity and strategies for their prevention and treatment

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

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

### **Module 8. Non-Invasive Mechanical Ventilation In Pediatrics**

- ♦ Understand the physiologic and anatomic differences between pediatric and adult patients regarding Non-Invasive Mechanical Ventilation
- ♦ Know the indications and contraindications for Non-Invasive Mechanical Ventilation in Pediatrics
- ♦ Correctly adjust Non-Invasive Mechanical Ventilation in Pediatrics according to the patient's individual needs
- ♦ Delve into the updated techniques for monitoring and adjustment of Non-Invasive Mechanical Ventilation in Pediatrics
- ♦ Manage the main pediatric respiratory pathologies requiring Non-Invasive Mechanical Ventilation based on the latest scientific evidence



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

- ◆ Understand the ethical principles in the use of NIMV, as well as the relevant rules and regulations and the civil and criminal liability of healthcare personnel
- ◆ Have a thorough understanding of the ethical and legal considerations in decision making in patients with limited decision-making capacity and in patients at the end of life
- ◆ Investigate new technologies in mechanical ventilation, NIMV in sleep apnea and NIMV at home
- ◆ Delve into the latest research in the management of NIMV

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

- ◆ Know the recent indications for the use of NIMV in chronic patients at home
- ◆ Explore telemonitoring as a tool for the follow-up and evaluation of NIMV patients
- ◆ Identify updated strategies for the prevention and management of Anxiety and Depression in NIMV patients
- ◆ Explore the opportunities and challenges of tele-education and tele-training in NIMV



# 03 Skills

This Professional Master's Degree has been developed with the idea that the nurse can update their skills in terms of care for patients who have undergone Non-Invasive Mechanical Ventilation. To do this, you will enjoy a set of highly cutting-edge content, designed by leading experts in the field, who have accumulated extensive health care experience behind them.





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*Optimize your healthcare update  
through this innovative program”*



## General Skills

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- Explain the indications and contraindications for NIMV, including the different clinical situations in which it is used
- Assess the level of ventilatory support required according to the clinical indication, arterial blood gas and respiratory mechanics of the patient
- Interpret data obtained during monitoring and apply follow-up and evaluation techniques
- Make ethically appropriate decisions with patients requiring NIMV at the end of life







## Specific Skills

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

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*Increase your care competencies  
in only 1,500 hours of study”*

04

# Course Management

Under the premise of achieving a superlative academic level, this TECH degree has a teaching staff made up of the best physicians specializing in Pulmonology and expert nurses in the care of patients with respiratory conditions. All these professionals actively develop their careers in reference hospitals and have great skills in NIMV. Therefore, the knowledge that the student will assimilate will be fully updated.







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*Get up to date in the care of NIMV patients by benefiting from the professional experience of the best experts in this field"*

## Management



### Dr. Landete Rodríguez, Pedro

- ♦ Head of the Intermediate Respiratory Care Unit of the Hospital Emergencias Nurse Isabel Zendal
- ♦ Co-coordinator of the Basic Ventilation Unit of the Hospital Universitario de La Princesa
- ♦ Pulmonologist at the Hospital Universitario de La Princesa
- ♦ Pulmonologist at Blue Healthcare
- ♦ Researcher in several research groups
- ♦ Professor in undergraduate and postgraduate university studies
- ♦ Author of scientific numerous publications International journals and participation in book chapters
- ♦ Speaker at international medical congresses
- ♦ Doctorate *Cum Laude* by the Autonomous University of Madrid

## Professors

### Dr. Corral Blanco, Marta

- ♦ Pulmonology Specialist and researcher
- ♦ Pulmonologist at 12 de Octubre University Hospital
- ♦ Author of numerous scientific articles and book chapters
- ♦ Speaker at numerous Pulmonology Congresses
- ♦ Course on Integral Care of Chronic Obstructive Pulmonary Disease from the Complutense University of Madrid

### Dr. Ferrer Espinos, Santos

- ♦ Pulmonologist
- ♦ Adjunct of the Pulmonology Service at the Respiratory Care Unit of the Hospital Clínico Universitario de Valencia
- ♦ Member of the Emerging Group of Noninvasive Mechanical Ventilation and Respiratory Care of SEPAR
- ♦ Master's Degree in Biomedical Research at the University of Valencia

**Dr. López Padilla, Daniel**

- ♦ Pulmonology Specialist and researcher
- ♦ FEA in the Intermediate Respiratory Care Unit of the Hospital General Universitario Gregorio Marañón
- ♦ Lecturer in undergraduate university studies related to Health Sciences
- ♦ Coordinator of the Emerging Group of Diagnostic and Therapeutic Techniques and Lung Transplantation of the Spanish Society of Pulmonology and Thoracic Surgery
- ♦ Member of the Integrated Non-Invasive Ventilation and Intermediate Respiratory Care Units Research Program of the Spanish Society of Pulmonology and Thoracic Surgery
- ♦ Editor-in-Chief of the Revista de Patología Respiratoria (Journal of Respiratory Pathology)
- ♦ Author of various publications in scientific journals
- ♦ Doctorate in Medicine from the Autonomous University Madrid

**Dr. Rodríguez Jerez, Francisco**

- ♦ Pulmonologist at HUCSC
- ♦ Intermediate Respiratory Care Unit Coordinator, San Cecilio University Clinical Hospital
- ♦ Head of the Non-Invasive Mechanical Ventilation Unit at the Central University Hospital of Asturias
- ♦ FEA of the Pulmonology Department at San Cecilio University Clinical Hospital
- ♦ Lecturer in undergraduate university studies related to Health Sciences
- ♦ Coordinator of the NIMV and IRCU skills course at the San Cecilio University Clinical Hospital
- ♦ Member of the Tuberculosis and Respiratory Infections Area (TIR) in the Spanish Society of Pulmonology and Thoracic Surgery
- ♦ Reviewer for the journals Respiratory Care and BRNreview

**Dr. González, Elizabeth**

- ♦ Specialist in Pulmonology
- ♦ Responsible for Hospitalization, Intermediate Respiratory Care Unit and Mechanical Ventilation Consultation for chronic patients at the San Carlos University Clinical Hospital
- ♦ Specialist in Pulmonology at the University Hospital of Getafe
- ♦ FEA in Pulmonology at the San Carlos University Clinical Hospital
- ♦ Teacher in university studies

**Dr. Muñoz Archidona, Cristina**

- ♦ Doctor and teaching collaborator
- ♦ Specialist in Pulmonology at Reina Sofia University Hospital
- ♦ Teaching collaborator in university studies of Medicine
- ♦ Lecturer in national and international conferences of Pulmonology
- ♦ Expert in Thoracic Musculoskeletal by the University of Barcelona

**Ms. González González, María**

- ♦ Assistant Nurse
- ♦ Assistant Nurse in the Intermediate Respiratory Care Unit of La Princesa Hospital
- ♦ Clinical tutor in undergraduate studies in Nursing
- ♦ Master's Degree in Clinical Nutrition from the University of Granada
- ♦ Postgraduate Diploma in Nursing Research by the Catholic University of Avila

**Dr. Ávalos Pérez-Urrutia, Elena**

- ♦ Pulmonologist and researcher
- ♦ Specialist in Pneumology at the La Princesa University Hospital
- ♦ Researcher specialized in Respiratory Sleep Disorders and Non-invasive Mechanical Ventilation
- ♦ Teaching collaborator in undergraduate studies in Medicine
- ♦ Master's Degree in Medicine, Complutense University of Madrid

**Dr. Bascuas Arribas, Marta**

- ♦ Specialist Pediatrician
- ♦ FEA of Pediatric Pulmonology at the University Children's Hospital Niño Jesús
- ♦ Member of the Mucopolysaccharadosis Committee of the University Children's Hospital Niño Jesús
- ♦ Author of several scientific publications linked to her specialty

**Dr. Esteban Ronda, Violeta**

- ♦ Specialist in Pulmonology
- ♦ Responsible for the Non Invasive Mechanical Ventilation consultation at the University Hospital of Sant Joan
- ♦ Pulmonologist at the University Hospital of Sant Joan
- ♦ Master's Degree in Advances in Diagnosis and Treatment of sleep disorders San Antonio Catholic University of Murcia
- ♦ Master's Degree in Biomedical Research at the University of Valencia
- ♦ Member of: SEPAR and the Valencian Society of Pulmonology







**Ms. Fernández Fernández, Alba**

- ◆ Nurse at the Ramón y Cajal University Hospital
- ◆ Nurse at Bone Marrow Unit of Transplantation at Ramón y Cajal University Hospital
- ◆ Nurse in Intermediate Respiratory Care Unit/Pulmonology of La Princesa Hospital
- ◆ Medical Oncology Nurse in the 12 de Octubre University Hospital
- ◆ Nurse at Pulmonology Unit at Ramón y Cajal University Hospital
- ◆ Degree in Nursing from Alcalá de Henares University
- ◆ Master's Degree in Social and Health Sciences Research in the University of Alcalá of León

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*A unique, key, and decisive educational experience to boost your professional development”*



# 05

# Structure and Content

The syllabus of this program is made up of 10 extensive modules with which the Nurse will delve into the most relevant aspects of Non-Invasive Mechanical Ventilation. All of them are available in a wide range of textual and multimedia formats, allowing students to select those that optimize their learning. In addition, the 100% online methodology of the Professional Master's Degree will allow you to adapt your study schedules to your timetable needs.



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*It has a curriculum designed by leading experts in the use of Non-Invasive Mechanical Ventilation to acquire the most updated knowledge in this field"*



## Module 1. Ventilatory Mechanics

- 1.1. Anatomy and Physiology of the Respiratory System
  - 1.1.1. Structure and Function of the Lungs and their Relation to the Ribcage
  - 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. Mechanisms of Respiratory Control (Chemoreceptors, Baroreceptors, etc.)
  - 1.2.2. Regulation of Blood pH and its Relation to Ventilation
  - 1.2.3. Ventilatory Responses in Situations of 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. Mechanisms of Protection of the Lungs against Overdistension and Collapse
  - 1.3.3. Mechanics of Respiration in Pathological Situations (Emphysema, Pulmonary Fibrosis, etc.)
  - 1.3.4. Relationship between Respiratory Mechanics and Respiratory Muscular Effort
- 1.4. Flow Volume, Minute Volume and Vital Capacity
  - 1.4.1. Definition and Measurement of Different Lung Volumes and Capacities
  - 1.4.2. Alterations of 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. Abnormalities in Respiratory Diseases
- 1.6. Types of Breathing (Spontaneous, Assisted and Controlled)
  - 1.6.1. Definition and Characteristics of the Different Types of Breathing
  - 1.6.2. Evaluation of the Patient's Response to Mechanical Ventilation
- 1.7. Ventilation-Perfusion Ratio
  - 1.7.1. Definition and Physiology of the Ventilation-Perfusion Ratio
  - 1.7.2. Alterations of the Ventilation-Perfusion Ratio in Respiratory Diseases
  - 1.7.3. Evaluation Methods of the Ventilation-Perfusion Ratio
  - 1.7.4. Therapeutic Strategies to Improve the 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 of 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. Pulmonary Lesions Associated with Mechanical Ventilation
  - 1.10.2. Optimization of Mechanical Ventilation to Improve Respiratory Physiology

## Module 2. Non-Invasive Mechanical Ventilation and Ventilatory Parameter Settings in Non-Invasive Mechanical Ventilation

- 2.1. NIMV
  - 2.1.1. Terminology in NIMV
  - 2.1.2. What Does Each Parameter Used in NIMV Measure?
- 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 Setting
  - 2.4.1. Face Mask
  - 2.4.2. Nasal Mask
  - 2.4.3. Mouth Interface
  - 2.4.4. Oronasal Interface
  - 2.4.5. Helmet
- 2.5. Ventilatory Parameters: Pressure, Volume, Flow and  $T_i/T_{tot}$ 
  - 2.5.1. Inspiratory and Expiratory Pressure Setting
  - 2.5.2. Adjustment of the Respiratory Frequency
  - 2.5.3. Adjustment of  $T_i/T_{tot}$
  - 2.5.4. PEEP Setting
  - 2.5.5.  $F_iO_2$  Setting
- 2.6. Breathing Cycles and Trigger
  - 2.6.1. Trigger Setting and Ventilator Sensitivity
  - 2.6.2. Current Volume and Inspiratory Time Setting
  - 2.6.3. Inspiratory and Expiratory Flow Setting
- 2.7. Patient-Ventilator Synchronization
  - 2.7.1. Delayed Triggering
  - 2.7.2. Self-trigger
  - 2.7.3. Ineffective Inspiratory Efforts
  - 2.7.4. Mismatch in Inspiratory Time between the Patient and the Ventilator
  - 2.7.5. Double Triggering
- 2.8. Alarms and Patient Safety
  - 2.8.1. Types of Alarms
  - 2.8.2. Handling Alarms
  - 2.8.3. Patient Safety
  - 2.8.4. Evaluation of the Effectiveness of NIMV
- 2.9. Patient Selection and Initiation Strategies
  - 2.9.1. Patient Profile
  - 2.9.2. NIMV Initiation Parameters in Acute Patients
  - 2.9.3. Initiation Parameters in Chronic Patients
  - 2.9.4. Adjustment of Parameters according to Evolution
- 2.10. Evaluation of the Patient's tolerance and Adaptation to Non-Invasive Mechanical Ventilation
  - 2.10.1. Criteria for Good Clinical Response
  - 2.10.2. Criteria for Bad Clinical Response
  - 2.10.3. Adjustments for Tolerance Improvement
  - 2.10.4. Tips to Improve Adaptation

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

- 3.1. Fundamentals and Objectives of the IRCU
  - 3.1.1. Evolution Over Time
  - 3.1.2. Importance and Benefits
  - 3.1.3. Role of IRCUs in Public Health Management
- 3.2. Characteristics and Organisation of IRCUs
  - 3.2.1. Structure and Design
  - 3.2.2. Coordination and Collaboration Mechanisms between the Different Services
  - 3.2.3. Development of Personalized Care Plans for Each Patient
  - 3.2.4. Evaluation and Follow-up of Treatment Results
- 3.3. Equipment and Technology in IRCUs
  - 3.3.1. Types of Equipment and Technology Available in the IRCUs
  - 3.3.2. Advantages and Disadvantages of the Different Technologies Available
  - 3.3.3. New Trends and Advances in the Technology Used in IRCUs
- 3.4. Health Care Personnel in IRCUs: Functions and Competencies
  - 3.4.1. Professional Profile and Training Requirements of Health Care Professionals Working in IRCUs
  - 3.4.2. Competencies and Responsibilities of the Different Members of the Health Care Personnel
  - 3.4.3. Teamwork and Coordination among the Different Health Care Professionals in the IRCUs
  - 3.4.4. Continuous Training and Professional Updating of Health Care Personnel in the IRCUs
- 3.5. Indications and Criteria in IRCUs
  - 3.5.1. Criteria for Selecting Patients for Admission to the IRCUs
  - 3.5.2. Admission Process and Evaluation of the Patients' Health Status
- 3.6. Monitoring of the Patient in the IRCU
  - 3.6.1. Capnography
  - 3.6.2. Continuous Pulse Oximetry
  - 3.6.3. Respiratory Softwares
- 3.7. NIVM Success and Failure Criteria
  - 3.7.1. Prognosis Scales
  - 3.7.2. Factors that Affect NIVM Success

- 3.7.3. Early Identification of NIVM Failure
- 3.8. Complications and Management of NIVM
  - 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 the NIVM Patient
  - 3.9.3. Others Drugs in IRCUs
- 3.10. Criteria for Discharge and Follow-up of Patients after their Stay in the IRCU
  - 3.10.1. Evaluation of the Patient's Clinical Stability Prior to Discharge from the IRCU
  - 3.10.2. Discharge Planning and Patient Follow-up
  - 3.10.3. Discharge Criteria for NIVM
  - 3.10.4. Outpatient Follow-up after Discharge from the IRCU
  - 3.10.5. Assessment of Quality of Life after Discharge from the IRCU

### Module 4. Non-Invasive Respiratory Support Techniques

- 4.1. Evaluation of the Level of Ventilatory Support Needed
  - 4.1.1. Evaluation of the Clinical Indications
  - 4.1.2. Interpretation of Arterial Blood Gas Analysis
  - 4.1.3. Evaluation of Respiratory Mechanics
  - 4.1.4. Determination of the Level of Ventilatory Support Needed
  - 4.1.5. Change of Ventilatory Modality
- 4.2. Continuous Positive Airway Pressure (CPAP)
  - 4.2.1. Principles and Mechanics of CPAP
  - 4.2.2. Indications for the Use of CPAP





- 4.2.3. Adjustment of CPAP Parameters
- 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 the Use of BiPAP
  - 4.3.3. Adjustment of BiPAP Parameters
  - 4.3.4. Monitoring and Management of BiPAP Complications
  - 4.3.5. Comparison of BiPAP with Other Ventilatory Modalities
- 4.4. Pressure Supporting 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 Controlled NIV
  - 4.5.2. Indications for the Use of NIMV by Volume
  - 4.5.3. How to Adjust the Volume 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 HFNCs
  - 4.6.2. Indications for the Use of HFNCs
  - 4.6.3. Adjustment of 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 Combination Therapy
  - 4.7.2. Indications for the Use of Combined Therapies

- 4.7.3. How to Initiate Combination Therapy, at the Same Time or in a Staggered Manner
- 4.7.4. Adjustment of Combined Therapies Parameters
- 4.7.5. Monitoring and Management of Combined Therapies Complications
- 4.7.6. Comparison of Combined Therapies with Other Ventilatory Modalities
- 4.8. High Frequency Ventilation
  - 4.8.1. Indications for the Use of NIMV with High Frequency
  - 4.8.2. Parameter Adjustment
  - 4.8.3. Usefulness in the Acute Patient
  - 4.8.4. Usefulness in the Chronic Patient
  - 4.8.5. Monitoring and Management of Complications
  - 4.8.6. Comparison with Other Ventilatory Modalities
- 4.9. Other Ventilatory Modes
  - 4.9.1. Pressure Support Ventilation with Mandatory Flow Control (MFC)
  - 4.9.2. High Velocity Ventilation with Nasal Cannula
  - 4.9.3. Other Innovative Ventilatory Modes
- 4.10. Humidification and Temperature Adjustment in NIMV
  - 4.10.1. Importance of Adequate Humidification and Temperature in NIMV
  - 4.10.2. Types of NIMV Humidification Systems
  - 4.10.3. Indications for Adding Humidifier in Acutely Ill Patients
  - 4.10.4. Indications for Humidifier in Chronic Patients
  - 4.10.5. Methods of NIMV Humidification Monitoring
  - 4.10.6. Temperature Adjustment in NIMV
  - 4.10.7. Monitoring and Management of Complications Related to Humidity and Temperature in NIMV

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

- 5.1. Weaning from Invasive Mechanical Ventilation via Tracheostomy in an IRCU
  - 5.1.1. Criteria for the Performance of Tracheostomy in Patients with Prolonged IMV
  - 5.1.2. Preparation of the Patient for Weaning from IMV
  - 5.1.3. Techniques for Weaning IMV through Tracheostomy
  - 5.1.4. Assessment of Tolerance to IMV Weaning via Tracheostomy
  - 5.1.5. Management of Complications during Weaning
- 5.2. Management of Tracheostomy in the IRCU
  - 5.2.1. Selection of the Adequate Tracheostomy Technique for the Patient
  - 5.2.2. Initial Tracheostomy Care in the IRCU
  - 5.2.3. Cannulae Maintenance and Change
  - 5.2.4. Monitoring Complications
  - 5.2.5. Evaluation of the Appropriate Timing of Tracheostomy Withdrawal
  - 5.2.6. Decanulation Protocol
- 5.3. Utility of Non-Invasive Respiratory Support in the Disconnection of Orotracheal Intubation
  - 5.3.1. Selection of Patient Candidates for Disconnection
  - 5.3.2. Techniques for Disconnection of Orotracheal Intubation
  - 5.3.3. Evaluation of Tolerance to Non-Invasive Respiratory Support During Disconnection
  - 5.3.4. Monitoring and Management of Disconnecting Complications
  - 5.3.5. Evaluation of the Success of Non-Invasive Respiratory Support at Disconnection of Orotracheal Intubation and Patient Follow-up
- 5.4. Management of Secretions and Cough Assistants
  - 5.4.1. Indications
  - 5.4.2. How to Measure Them
  - 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 of Polygraph in Patients with NIMV
  - 5.5.2. Interpretation of Polygraphy Results in NIMV Patients
  - 5.5.3. Identification of Abnormal Breathing Patterns on Polygraphy During NIMV
  - 5.5.4. Monitoring the Effectiveness of Respiratory Support During Polygraphy
  - 5.5.5. Interpretation of the Respiratory Complications Associated with NIMV in Polygraphy

- 5.6. Physiotherapy in an ICU
  - 5.6.1. Objectives and Benefits of Respiratory Physiotherapy in the ICU
  - 5.6.2. Respiratory Physiotherapy Techniques used in the ICU
  - 5.6.3. Physiotherapy in the Prevention and Treatment of Respiratory Complications in the ICU
  - 5.6.4. Evaluation and Monitoring of Patient Progress with Respiratory Physiotherapy in the ICU
  - 5.6.5. Multidisciplinary Collaboration in the Implementation of Respiratory Physical Therapy in the ICU
- 5.7. Management of Shock and Other Commonly Used Drugs in ICU
  - 5.7.1. Types of Shock and their management in ICUs
  - 5.7.2. Indications and Dosage of Vasopressors in the Management of Shock in ICU
  - 5.7.3. Use of Inotropics and Vasodilators in the management of Shock in ICUs
  - 5.7.4. Management of Hypotension in the ICU with Fluid Therapy
  - 5.7.5. Monitoring of Hemodynamic and Patient Response to Drugs Used in the Management of Shock in the ICU
- 5.8. Study of Swallowing Alterations
  - 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 ICU
  - 5.9.1. Nutritional Assessment in ICU Patients
  - 5.9.2. Assessing Nutritional Status and Energy Needs
  - 5.9.3. Nutritional Strategies in Patients with Prolonged Admission to the ICU
  - 5.9.4. Monitoring of Nutritional Support and Necessary Adjustments in ICU Patients
  - 5.9.5. Prevention and Management of Nutritional Complications in Patients with Prolonged Admission to the ICU
- 5.10. Unstable Patient Management
  - 5.10.1. Management of Rapid Atrial Fibrillation
  - 5.10.2. Management of Supraventricular Tachycardia
  - 5.10.3. Management of Cardiorespiratory Arrest
  - 5.10.4. Orotracheal Intubation
  - 5.10.5. Sedation in NIMV

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

- 6.1. Non-Invasive Mechanical Ventilation in Chronic Obstructive Pulmonary Disease (COPD)
  - 6.1.1. Indications and Contraindications in COPD Patients
  - 6.1.2. Selection and Adjustment of Ventilatory Parameters in COPD
  - 6.1.3. Evaluation of the Efficacy
  - 6.1.4. NIMV Weaning Strategies 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 the Heart Failure Patient
  - 6.2.2. Monitoring of the Patient with Heart Failure during Non-Invasive Mechanical Ventilation
  - 6.2.3. Non-Invasive Mechanical Ventilation in Patients with Acute Decompensated Heart Failure
  - 6.2.4. Non-Invasive Mechanical Ventilation in Patients with Chronic Heart Failure and its Impact on the Patient's 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 for NIMV in Patients with ARDS
  - 6.3.3. Selection and Adjustment of Ventilatory Parameters in Patients with ARDS in NIMV
  - 6.3.4. Monitoring and Assessment of Response to NIMV in Patients with ARDS
  - 6.3.5. Comparison of NIMV with IMV in Patients with ARDS
- 6.4. Non-Invasive Mechanical Ventilation in Diffuse Interstitial Lung Diseases (ILD)
  - 6.4.1. Pathophysiology Between Interstitial Lung Diseases (ILD)
  - 6.4.2. Scientific Evidence in the Management of NIMV in ILD
  - 6.4.3. Indications for NIMV in Patients with ILD
  - 6.4.4. NIMV Efficiency Assessment in ILD Patients
- 6.5. Non-Invasive Mechanical Ventilation In Obesity
  - 6.5.1. Pathophysiology of Obesity and its Relation to NIMV
  - 6.5.2. Indications and Contraindications in Obese Patients
  - 6.5.3. Specific NIMV settings in Obese Patients
  - 6.5.4. Strategies for the 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 Disease and Ribcage
  - 6.6.1. Indications
  - 6.6.2. Main Neuromuscular and Ribcage Diseases
  - 6.6.3. Selection of Ventilatory Modes
  - 6.6.4. Ventilatory Parameter Adjustment
  - 6.6.5. NIMV Efficacy and Tolerance Assessment
  - 6.6.6. Indications for Tracheostomy
  - 6.6.7. Addressing Complications
- 6.7. Non-Invasive Mechanical Ventilation in COVID-19 Patients
  - 6.7.1. Indications for NIMV in Patients with COVID-19
  - 6.7.2. Ventilatory Parameter Adjustment
  - 6.7.3. Safety Considerations in NIMV in COVID-19
  - 6.7.4. Evaluation of the 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 the Use of NIMV in Acute Hypoxemic Respiratory Failure
  - 6.8.3. NIMV Parameters and Settings in Patients with Acute Hypoxemic Respiratory Failure
  - 6.8.4. Complications Associated with the Use of NIMV in Acute Hypoxemic Respiratory Failure
  - 6.8.5. Evaluation of the Effectiveness of NIMV in Improving Oxygenation and Reducing Work of Breathing in Hypoxemic Acute Respiratory Failure
  - 6.8.6. Comparison of NIMV with Invasive Mechanical Ventilation in Patients with Hypoxemic Acute Respiratory Failure
- 6.9. Non-Invasive Mechanical Ventilation in the Asthmatic Patient in Acute Asthma
  - 6.9.1. Indications for NIMV in Asthmatic Crisis
  - 6.9.2. Ventilatory Parameters to be Adjusted
  - 6.9.3. Monitoring of the Acute Asthmatic Patient During NIMV
  - 6.9.4. Alarm Data for Poor NIMV Response
- 6.10. Non-Invasive Mechanical Ventilation in Pre-intubation Preparation
  - 6.10.1. Benefits, Risks and Limitations
  - 6.10.2. Management of NIMV in the Transition to Invasive Mechanical Ventilation

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

- 7.1. Monitoring the Patient's Vital Signs
  - 7.1.1. Importance of Monitoring Vital Signs
  - 7.1.2. Types of Vital Signs to be Monitored
  - 7.1.3. Analyzing and Interpreting the Value Obtained
  - 7.1.4. Adjustment of the Monitoring according to the Patient's Needs
- 7.2. Patient Ventilation and Oxygenation Monitoring
  - 7.2.1. Oxygenation and Ventilation Monitoring Techniques
  - 7.2.2. Interpretation of Pulse Oximetry and Capnography Values
  - 7.2.3. Early Detection of Hypoxia and Hypercapnia
  - 7.2.4. Adjustment of the Mechanical Ventilation according to the Patient's Needs
- 7.3. Monitoring of the Interface and the Ventilation Circuit
  - 7.3.1. Identification and Prevention of Interface and Circuit Leakage
  - 7.3.2. Cleaning and Maintenance of Interface and Circuit
  - 7.3.3. Change and Selection of the Interface according to the Patient's Needs
- 7.4. Management of Respiratory Secretions
  - 7.4.1. Techniques for Evaluation of Respiratory Secretions
  - 7.4.2. Methods of Mobilization and Elimination of Secretions
  - 7.4.3. Precautions and Measures to Prevent Aspiration of Secretions
  - 7.4.4. Selection and Adjustment of Secretion Aspiration Devices
- 7.5. Care of the Skin in the Interface Area
  - 7.5.1. Evaluation and Prevention of Skin Lesions in the Interface Area
  - 7.5.2. Cleaning and Care Techniques of the Skin in the Interface Area
  - 7.5.3. Dressings and Treatment of Skin Lesions
- 7.6. Prevention of Aspiration of Gastric Contents
  - 7.6.1. Aspiration Risk Assessment
  - 7.6.2. Aspiration Prevention Measures in Non-Invasive Mechanical Ventilation Patients
  - 7.6.3. Types of Probes 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 Family on the Use of Non Invasive Mechanical Ventilation
  - 7.7.3. Management of Emergencies and Unforeseen Situations by the Patient and Family
  - 7.7.4. Strategies to Promote Adherence to Non-Invasive Mechanical Ventilation
- 7.8. Individualized Care Plan for the Non-Invasive Mechanical Ventilation Patient
  - 7.8.1. General Considerations in the Elaboration of the Care Plan
  - 7.8.2. Nursing Assessment of the NIMV Patient
  - 7.8.3. NANDA Diagnosis
  - 7.8.4. Nursing Outcomes and Interventions
- 7.9. Tracheostomy Care and Treatment
  - 7.9.1. Tracheostomy Cleaning and Treatment Techniques
  - 7.9.2. Tracheostomy Device Selection and Adjustment
  - 7.9.3. Prevention and Treatment of Complications associated with Tracheostomy
- 7.10. Measures to Prevent Transmission of Infections
  - 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 Adult and Pediatric Patients
  - 8.1.1. Pulmonary Physiology in Pediatric Patients
  - 8.1.2. Main Differences in the Management of the Pediatric Airway
  - 8.1.3. Common Respiratory Pathologies in Pediatrics requiring NIMV
  - 8.1.4. Management of 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. Modes for NIMV 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 Adjustment of Ventilation in Pediatrics
- 8.4. Adjustments of Non-Invasive Mechanical Ventilation In Pediatrics
  - 8.4.1. Adjustment of Support Pressures and PEEP
  - 8.4.2. Adjustment of Airflow
  - 8.4.3. Adjustment of the Respiratory Frequency
  - 8.4.4. Inspiratory Time Setting
- 8.5. Monitoring and Adjustments of Non-Invasive Mechanical Ventilation In Pediatrics
  - 8.5.1. Clinical Assessment
  - 8.5.2. Assessment of Arterial Blood Gas Analysis
  - 8.5.3. Pulse Oximetry Evaluation
  - 8.5.4. Assessment of Capnography
- 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 Insufficiency
  - 8.6.6. Tracheostomy
  - 8.6.7. Neuromuscular Diseases
  - 8.6.8. Disconnections for Orotracheal Intubation
- 8.7. Interfaces in Pediatric Patient NIMV
  - 8.7.1. Nasal Mask
  - 8.7.2. Oronasal 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 Removal of the Support



- 8.9. Home NIMV in Pediatrics
  - 8.9.1. Indications for Home NIMV
  - 8.9.2. Selection of Suitable Patients
  - 8.9.3. Training of Caregivers
  - 8.9.4. Home Monitoring
- 8.10. NIMV Withdrawal Techniques in Pediatrics
  - 8.10.1. Gradual withdrawal of NIMV
  - 8.10.2. Evaluation of Tolerance to the Withdrawal of NIMV
  - 8.10.3. Use of Oxygen Therapy After Withdrawal of NIMV
  - 8.10.4. Patient Evaluation after the 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 Health Care Personnel
  - 9.1.4. Standards and Regulations on Non-Invasive Mechanical Ventilation
  - 9.1.5. Civil and Criminal Liability in Non-Invasive Mechanical Ventilation
- 9.2. NIMV Use in Emergency Situations
  - 9.2.1. NIMV in Emergency Settings: Assessing the Risks and Benefits in the Pandemic Context
  - 9.2.2. Patient Selection 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 Setting
  - 9.2.4. Role of Nurses 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 Ability
  - 9.3.1. Ethical Considerations in Decision Making in Patients with Limited Decision Making Capacity in NIMV
  - 9.3.2. Role of the Multidisciplinary Team in the Evaluation 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 Ability to Tolerate NIMV
  - 9.3.5. Analysis of the Possible Consequences of NIMV in Patients with Limited Decision Making Capacity and its Impact on Medical Decision Making
- 9.4. Use of Noninvasive Mechanical Ventilation in Patients at the End of Life
  - 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 Patients at the End of Life
  - 9.4.3. Psychological Impact on Patients and Families when using NIMV at the End of Life
  - 9.4.4. Identification of Patients who are 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 Health Care
  - 9.5.2. Techniques for Effective Communication with the Patient and their Family
  - 9.5.3. Non-verbal Communication in Non-Invasive Mechanical Ventilation
  - 9.5.4. Effective Communication in Chronic NIMV Patient Discharge Planning
- 9.6. Education and Training of Healthcare Personnel for Patients and Family Members in the Management of Home NIMV
- 9.7. Conflicting Situations in the Management of Non-Invasive Mechanical Ventilation
  - 9.7.1. Difficulties in the Application of NIMV in Morbidly Obese Patients
  - 9.7.2. Situations of Intolerance to Non-Invasive Mechanical Ventilation: Causes and Alternatives
  - 9.7.3. Approach to NIMV in Patients with Advanced Neuromuscular Pathology
- 9.8. NIMV in the Care of the Patient in the Palliative Care Context
  - 9.8.1. Indications and Ethical Considerations
  - 9.8.2. NIMV in Terminally Ill Patients: When to Initiate and When to 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 in the Home: Implications and Recommendations for Self-Care
- 9.10. Research in Non-Invasive Mechanical Ventilation Management
  - 9.10.1. Design of Studies in Non-Invasive Mechanical Ventilation Management
  - 9.10.2. Research
    - 9.10.2.1. Efficacy and Safety of NIMV
    - 9.10.2.2. Quality of Life and Patient Satisfaction
    - 9.10.2.3. Implementation and Dissemination of Guidelines and Recommendations for the Management of NIMV

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

- 10.1. Chronic Home Ventilation Therapy
  - 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
- 10.2. Monitoring Patients with Chronic Home Ventilation Therapy
  - 10.2.1. Parameters to Monitoring
  - 10.2.2. Monitoring Methods
  - 10.2.3. Interpretation of Data Obtained During Monitoring
  - 10.2.4. Monitoring and Evaluation Techniques
- 10.3. Monitoring Patients with Chronic Home Ventilation Therapy
  - 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 in the Patient with Chronic Ventilation at Home
  - 10.4.1. Definition of the Organization of Consultations in the Patient with Chronic Ventilation at Home
  - 10.4.2. Methods of Organizing Consultations
  - 10.4.3. Evaluation of the Effectiveness of the Organization of the Consultations
- 10.5. Nursing Care in the Patient with Chronic Ventilation at Home
  - 10.5.1. Role of Nursing in Management
  - 10.5.2. Nursing Care
  - 10.5.3. Education of the Patient and the Patient's Carer
  - 10.5.4. Prevention and Management of Complications
- 10.6. Management of the Psychiatric Sphere in the Patient with Chronic Ventilation at Home
  - 10.6.1. Prevalence of Anxiety and Depression
  - 10.6.2. Clinical Manifestations of Anxiety and Depression
  - 10.6.3. Management Strategies for of 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 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. The Need for NIMV Teleconsultation Protocols and Guidelines
- 10.8. Telehealth in NIMV
  - 10.8.1. Tele-education and Tele-training: Opportunities and Challenges
  - 10.8.2. Legal and Ethics Aspects
- 10.9. Telemedicine and NIMV in Different Contexts
  - 10.9.1. The COVID-19 Pandemic
  - 10.9.2. Rural and Hard-to-Reach 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 Teleconsultations in NIMV
  - 10.10.4. Financial Sustainability of Telemedicine in NIMV
  - 10.10.5. Limitations and Challenges in the Economic Evaluation of NIMV Telemedicine

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.





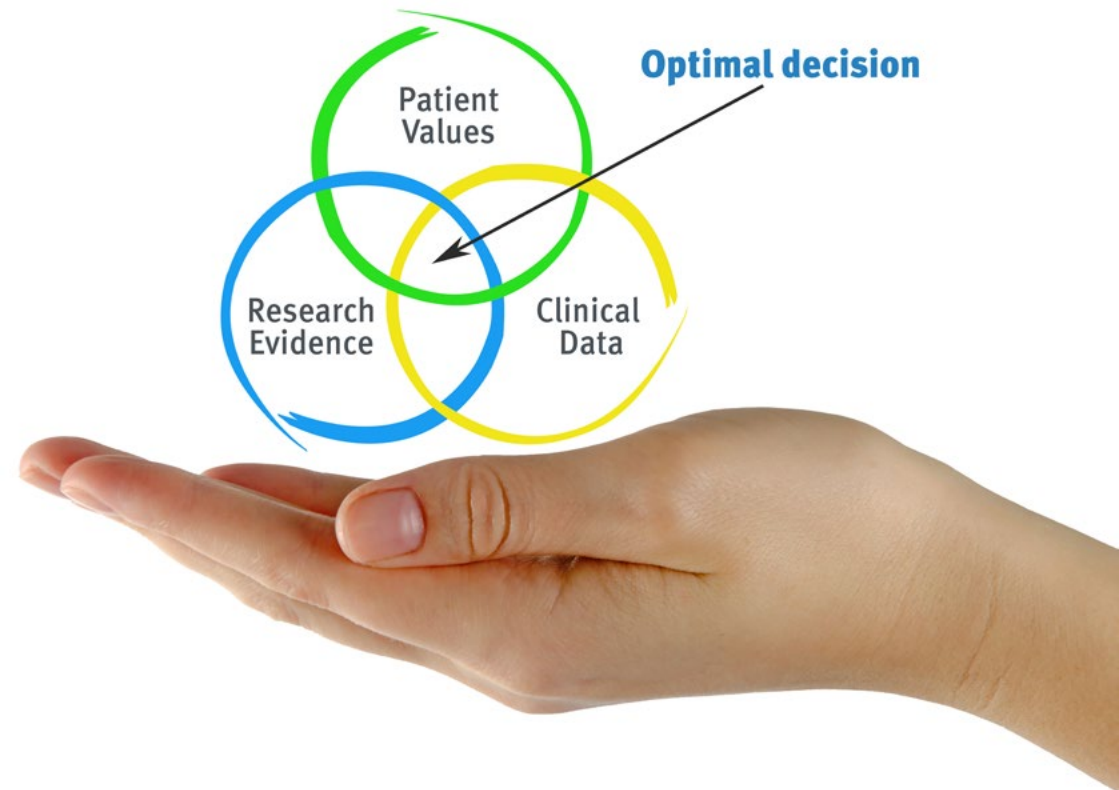
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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH Nursing School we use the Case Method

In a given situation, what should a professional do? 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. Nurses learn better, faster, and more sustainably over time.

*With TECH, nurses can experience a learning methodology that is shaking the foundations of traditional universities around the world.*



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, in an attempt to recreate the real conditions in professional nursing 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. Nurses who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the nursing professional to better integrate knowledge acquisition into the hospital setting or primary care.
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 case studies with a 100% online learning system based on repetition combining a minimum of 8 different elements in each lesson, which is a real revolution compared to the simple study and analysis of cases.



*The nurse will learn through real cases and by solving 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 we have trained more than 175,000 nurses with unprecedented success in all specialities regardless of practical workload. 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 really 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.



### Nursing Techniques and Procedures on Video

We introduce you to the latest techniques, to the latest educational advances, 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 them as many times as you want.



### Interactive Summaries

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

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



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.







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

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



#### Testing & Retesting

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



#### Classes

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

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



#### Quick Action Guides

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



07

# Certificate

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



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

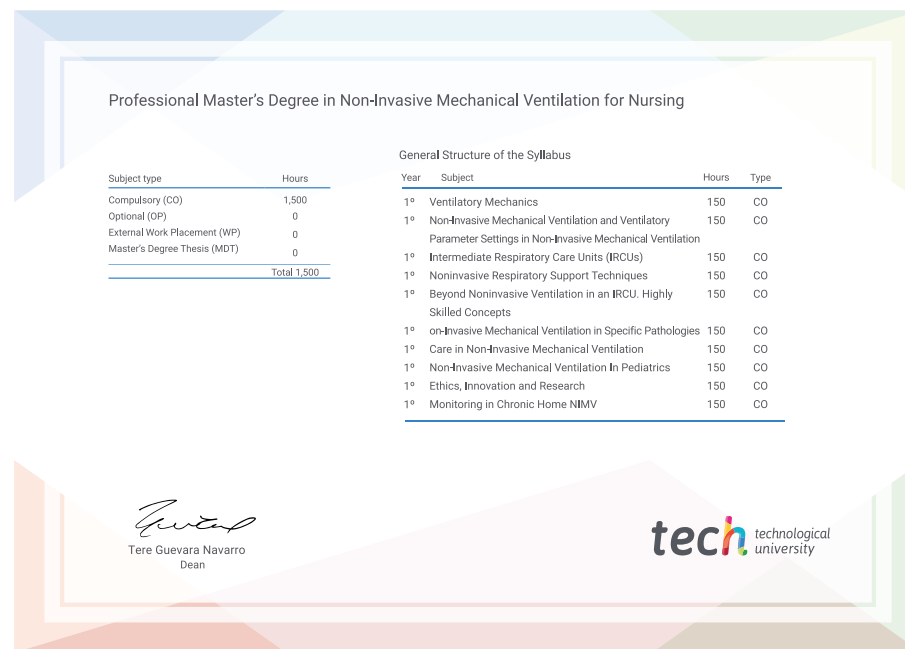
This **Professional Master's Degree in Non-Invasive Mechanical Ventilation for Nursing** contains the most complete and up-to-date scientific on the market.

After the student has passed the assessments, they will receive their corresponding **Professional Master's Degree** issued by **TECH Technological University** via tracked delivery\*.

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

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

Official N° of Hours: **1,500 h.**



\*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.





## Professional Master's Degree

### Non-Invasive Mechanical Ventilation for Nursing

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Professional Master's Degree

Non-Invasive Mechanical  
Ventilation for Nursing

