

# Advanced Master's Degree Clinical Pulmonology



## Advanced Master's Degree Clinical Pulmonology

Course Modality: **Online**

Duration: **2 years**

Certificate: **TECH Technological University**

Official N° of hours: **3,000 h.**

Website: [www.techtute.com/us/medicine/advanced-master-degree/advanced-master-degree-clinical-pulmonology](http://www.techtute.com/us/medicine/advanced-master-degree/advanced-master-degree-clinical-pulmonology)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Skills

---

*p. 16*

04

Course Management

---

*p. 20*

05

Structure and Content

---

*p. 30*

06

Methodology

---

*p. 50*

07

Certificate

---

*p. 58*

# 01

# Introduction

The integration of new disciplines such as Big Data in pulmonology has brought about a great revolution in this area, which now has more precise methods for diagnosing and treating this type of pathology. Thus, it is necessary for the specialist to be able to incorporate these techniques into their daily work, so that they can use the most effective procedures for each patient. This program has brought together all these advances, and allows the professional to delve into issues such as the molecular biology of lung adenocarcinoma or precision medicine applied to asthma. All this, through an online learning system with which it will be easy to combine your daily work with your studies, as it adapts completely to your personal circumstances.





“

*With this program, the professional will be able to integrate the latest advances in Big Data applied to pulmonology into their daily work, while deepening their knowledge of techniques such as pulmonary nodule volumetry”*

Pulmonology is one of the clinical disciplines that has experienced the greatest advances in recent years. Areas such as Big Data have led to the emergence of new techniques in this field, making it more accurate and effective. Therefore, the specialist has the opportunity to incorporate the latest procedures into their work thanks to this Advanced Master's Degree, which also integrates specialties such as genomic precision pulmonology.

Therefore, throughout this program, the physician will be able to delve into issues such as the genetics of susceptibility to lung cancer, the genetic links of COPD, pulmonary eosinophilias associated with asthma or hypoventilation syndromes. In addition, you will learn about the latest advances in procedures such as electromagnetic navigation or medical thoracoscopy. This will give you access to the most cutting-edge innovations in this complex but exciting field.

This Advanced Master's Degree is developed through a 100% online teaching method that has been specially designed with the working professional in mind, as it adapts to their personal circumstances, adjusting to their work pace and without imposing fixed schedules. In addition, its innovative contents will be presented in multimedia format, taught by a teaching staff of great prestige in this medical area.

This **Advanced Master's Degree in Clinical Pulmonology** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ Practical cases presented by experts in medicine
- ♦ The graphic, schematic, and eminently 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
- ♦ Special emphasis is placed on innovative methodologies in the management of pneumologic pathologies
- ♦ 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



*TECH's online methodology will allow you to combine your work with your studies, since it is completely adapted to you, without imposing fixed schedules"*

“

*TECH provides you with state-of-the-art educational technology: interactive summaries, case studies, video proceedings, master classes, etc. The most varied and effective resources to get you up to date"*

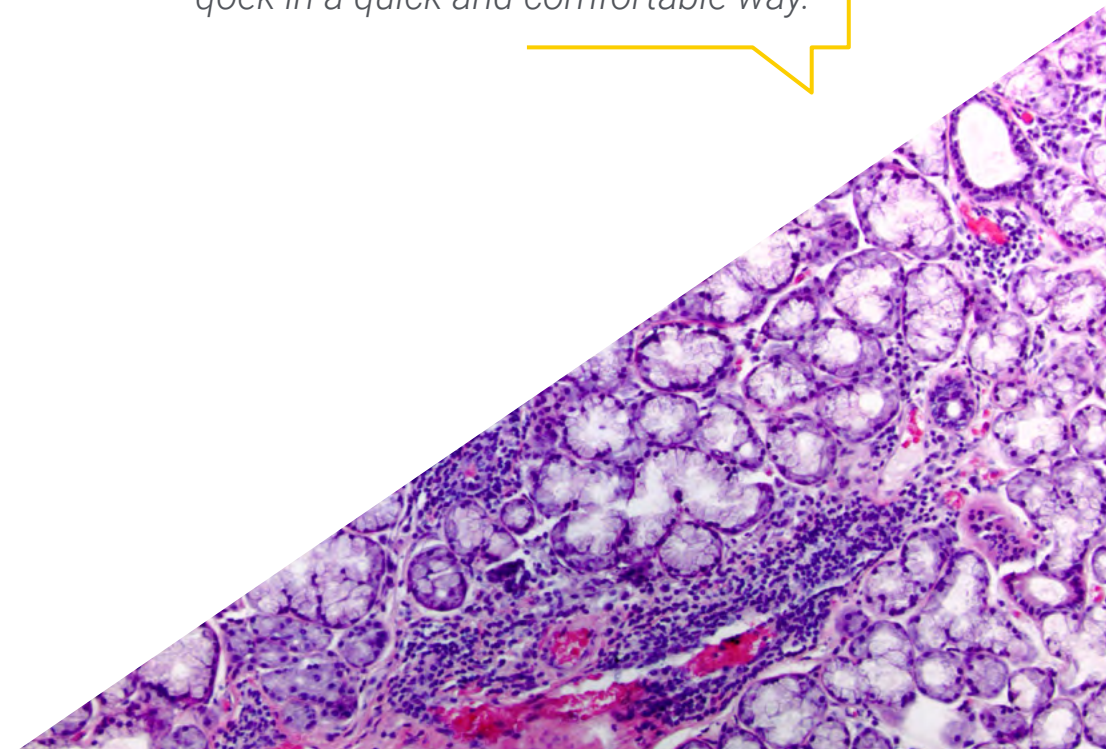
The teaching staff includes professionals from the psychology sector, who bring their experience to this training program, as well as renowned specialists from leading societies and prestigious universities.

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 an immersive training experience designed to train for real-life situations.

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

*You will deepen your knowledge in the latest advances in the genetic links of COPD and in the surgical technique for lung transplants.*

*This Advanced Master's Degree will allow you to integrate the most recent innovations in pulmonology into your daily work in a quick and comfortable way.*



# 02 Objectives

The main objective of this Advanced Master's Degree is to bring the specialist closer to the latest developments in this health area, and for this purpose it has designed an online learning itinerary that will make it easy to keep up to date. Thus, to achieve this goal, this program has a teaching system designed for practicing professionals. It provides complete and in-depth contents, first class teaching resources and a teaching staff composed of highly prestigious specialists in the field of pulmonology.







“

*Update your knowledge thanks to this TECH program which includes the latest advances in pulmonology and genomic precision”*



## General Objectives

---

- ♦ Provide an update on the latest scientific evidence available in published guidelines, scientific articles and systematic reviews
- ♦ Address the fundamental aspects for the care practice of pneumologic pathologies
- ♦ Update the knowledge of pulmonologists and other medical specialists on the most frequent pathologies in the area of pulmonology
- ♦ Provide in-depth knowledge on the genetic link of respiratory diseases
- ♦ Interpret and generate knowledge with the information provided by primary and secondary sources of Big Data
- ♦ Improve the assessment for the prognosis and prevention of respiratory diseases
- ♦ Understand the precision treatment of pulmonary pathology in the daily practice of medicine
- ♦ Acquire strong knowledge of the different pulmonary pathologies and their genetic basis







## Specific Objectives

---

### Module 1. Interstitial Lung Diseases

- ♦ Update the most relevant theoretical medical knowledge on ILD
- ♦ Deepen specific understanding of the scientific and technical aspects related to the most prevalent ILD
- ♦ Actively promote the continuing education of each professional in order to improve clinical care and their professional work

### Module 2. Chronic Obstructive Pulmonary Disease

- ♦ Develop professional competencies aimed at optimizing comprehensive patient-centered care based on the latest available evidence
- ♦ Be able to interpret the most commonly used complementary tests in the diagnosis and follow-up of COPD patients
- ♦ Know how to manage the main comorbidities associated with COPD
- ♦ Gain up-to-date knowledge on the maintenance treatment of COPD

### Module 3. Asthma

- ♦ Help the physician to improve the control and quality of life of patients with Asthma, through the knowledge they have acquired based on the latest scientific evidence available
- ♦ Know how to interpret the most commonly used complementary tests in the diagnosis and follow-up of patients with asthma
- ♦ Identify and manage the main comorbidities associated with asthma
- ♦ Gain up-to-date knowledge on the maintenance treatment of asthma
- ♦ Learn to identify the sub-group of patients with serious, uncontrolled asthma
- ♦ Know the different phenotypes and specific asthma treatment recommendations
- ♦ Know how to manage occupational asthma, pulmonary eosinophilias, as well as special circumstances such as asthma-pregnancy, exertion-induced asthma, aspirin-exacerbated respiratory disease, etc

### Module 4. Respiratory Infections and Related Diseases

- ♦ Provide specific knowledge on the advances in infectious diseases and new antimicrobials, as well as other treatments and new diagnostic tests that allow us to give a satisfactory response to the current challenges of respiratory diseases
- ♦ Gain the necessary skills for an adequate identification and correct treatment of the main infectious pathologies of the respiratory system, being able to perform a better clinical management of the different entities
- ♦ Perform a review of recently published guidelines, scientific articles and systematic reviews, making a critical reading with learning from the best available scientific evidence

### Module 5. Bronchopulmonary Neoplasms

- ♦ Provide a global and multidisciplinary perspective on the approach to lung cancer, including its epidemiology, etiology, histology, diagnostic and treatment process
- ♦ Provide up-to-date information on multidisciplinary issues important for daily clinical practice in lung cancer patients
- ♦ Delve into the latest, ever-changing advances in both the diagnosis and treatment of lung cancer

### Module 6. Diseases of the Pleura and Mediastinum

- ♦ Update knowledge on the different diseases that affect the pleura and mediastinum
- ♦ Deepen knowledge of the different diagnostic techniques for the study of these pathologies, using a practical approach
- ♦ Optimization of the therapeutic management of patients with pleural effusion, pneumothorax and mediastinal disease

### Module 7. Pulmonary Circulation

- ♦ Deepen understanding of the medical management of the most frequent pathologies affecting the pulmonary vascular tree such as venous thromboembolic disease or pulmonary hypertension
- ♦ Gain up-to-date knowledge of other less frequent pathologies such as pulmonary vasculitis or alveolar hemorrhage

### Module 8. Respiratory Disorders During Sleep

- ♦ Gain up-to-date knowledge of respiratory disorders during sleep
- ♦ Provide guidelines to enable the best decisions to be made in the care of patients with this disease based on a clinical summary of the most current literature
- ♦ Deepen specific understanding of the scientific and technical aspects related to respiratory sleep disorders



### **Module 9. Respiratory Failure. Non-Invasive Mechanical Ventilation High-flow Oxygen Therapy**

- ♦ Know the pathophysiology and classification of respiratory failure and learn the keys for the diagnosis, which allows it to be applied in clinical practice
- ♦ Provide knowledge based on the best available evidence on the various treatment options for respiratory failure, including the application and contraindications of both NIV and HFO in acute and chronic respiratory failure
- ♦ Deepen knowledge in the main ventilatory modes and asynchronies during NIV
- ♦ Delve into the main features and clinical benefits of high-flow oxygen therapy

### **Module 10. Lung Transplant**

- ♦ Know the indications and contraindications for the possible performance of a lung transplant, as well as the criteria for referral to a Lung Transplant Unit
- ♦ Know the criteria for being included on the lung transplant waiting list
- ♦ Know how donor selection and surgical techniques for lung transplantation are performed
- ♦ Know how to detect possible complications derived from lung transplants that may be encountered during the review of these patients in their office or during admission to a hospital that does not have a Lung Transplant Unit
- ♦ Gain a deeper understanding of the use of immunosuppressive treatments and prophylaxis in lung transplant patients, as well as in the complications derived from them
- ♦ Delve into the possible long-term complications of lung transplant patients
- ♦ Know how to determine when an urgent/preferential referral to the Lung Transplant Unit is necessary

### **Module 11. Personalized Precision Medicine and Big Data in Pulmonology Prelude**

- ♦ Delve into the health care and ethical implications of precision medicine
- ♦ Deepen understanding of the sources of information on precision medicine
- ♦ Master the "omics" biomarkers of interest in pulmonology
- ♦ Determine the contribution of specific care in personalized care

### **Module 12. Interventional Pulmonology and Precision Medicine**

- ♦ Deepen in minimally invasive bronchological techniques that allow precision and genetic diagnosis
- ♦ Gain in-depth knowledge of minimally invasive pleural techniques that allow precision and genetic diagnosis
- ♦ Master endoscopic invasive treatments for specific pneumologic patients

### **Module 13. Precision Medicine, Imaging Techniques and Pulmonary Function**

- ♦ Gain in-depth knowledge of invasive diagnostic techniques that increase bronchological diagnostic accuracy
- ♦ Master the techniques of invasive diagnostic techniques that increase pleural diagnostic accuracy
- ♦ Deepen understanding of precision endobronchial treatments

#### **Module 14. Genetics and Precision Medicine and Pediatric Diseases**

- ♦ In-depth understanding of genetic links to disease in the pediatric population
- ♦ Delve into the implications of childhood congenital diseases on respiratory health during a person's lifetime
- ♦ Master the management of frequent genetic respiratory diseases.
- ♦ Precision medicine in child asthma. Use of Biologicals

#### **Module 15. Genetics, Precision Medicine and Asthma**

- ♦ Deepen understanding of the epidemiological associations of asthma that suggest a genetic basis of the disease
- ♦ Delve into the genetic complexity of asthma in light of the most current findings
- ♦ Master the biology, therapeutic targets and clinical use of precision treatments in asthma

#### **Module 16. Genetics, Precision Medicine and Lung Cancer**

- ♦ Gain deeper insight into the genetic susceptibility of lung cancer
- ♦ Gain in-depth knowledge into driver gene mutations with approved lung cancer treatments
- ♦ Know future treatments against therapeutic targets
- ♦ Master the state-of-the-art lung cancer treatment and the contribution of treatments based on genetic therapeutic targets

#### **Module 17. Genetics, Precision Medicine and COPD**

- ♦ Gain an in-depth understanding of the genetic and perinatal links of COPD
- ♦ Deepen knowledge in genetic links and smoking
- ♦ Delve into hereditary COPD due to alpha-1 antitrypsin deficiency
- ♦ Know the latest developments in the management of COPD oriented to treatable features
- ♦ Explore the genetic link with the results of physical training in COPD

#### **Module 18. Genetics, Precision Medicine and Other Respiratory Diseases**

- ♦ Delve into genetic links to pulmonary vascular diseases and interstitial diseases
- ♦ Gain in-depth understanding of genetic links and susceptibility to infection
- ♦ Deepen knowledge in telomeres as prognostic markers in respiratory diseases
- ♦ Master the mechanisms and results of new mRNA-based vaccines

#### **Module 19. Big Data and Respiratory Diseases I**

- ♦ Know the applications of Big Data in the study of the epidemiology of respiratory diseases
- ♦ Discuss the usefulness of Big Data in the evaluation of procedures used in respiratory pathology
- ♦ Explain how Big Data can help in the study of risk factors for respiratory diseases
- ♦ Describe the usefulness of Big Data in the management of obstructive diseases and sleep ventilation disorders



## Module 20. Big Data and Respiratory Diseases II

- ◆ Know the usefulness of Big Data in the study of respiratory diseases of infectious origin
- ◆ Discuss the use of Big Data to assess the impact of environmental pollution on respiratory infections
- ◆ Deepen understanding of the importance of Big Data in the evaluation of other respiratory diseases such as pleural pathology, lung cancer, interstitial diseases, pulmonary thromboembolism and pulmonary hypertension
- ◆ Describe the applications of Big Data in the field of neonatal-onset respiratory diseases

“ You will achieve your goal of getting up to date quickly and all from the comfort of you home or office”

# 03 Skills

Throughout this Advanced Master's Degree in Clinical Pulmonology, the physician will be able to develop a series of skills focused on incorporating all the latest advances in this discipline into their daily practice. Therefore, they will have the opportunity to deepen their knowledge of the diagnostic and monitoring procedures for pneumologic pathologies as well learning the most advanced surgical techniques and knowing the latest methods and protocols for lung transplants.







“

*Bring all your skills up to date thanks to this program, which brings you closer to the best diagnostic and surgical techniques in the field of pulmonology”*

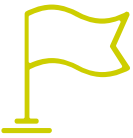


## General Skills

---

- ♦ Identify early-on any disease related to the area of pulmonology and application of the most appropriate treatments for each patient, taking into account their needs
- ♦ Adapt to the main advances in this medical area and apply the latest techniques and treatments
- ♦ Achieve better results in the recovery of patients affected by pulmonary diseases
- ♦ Apply epidemiological and clinical methods in collective or individual care to solve the main health problems related to respiratory diseases
- ♦ Perform a critical reading of the scientific literature on these diseases and at the same time have the tools to communicate research results
- ♦ Collect, process and analyze in very diverse clinical and epidemiological contexts, any scientific information for diagnostic and therapeutic decision-making in the field of Precision Pulmonology in both a specific way and for health in general
- ♦ Develop learning to learn as one of the most important skills for any professional nowadays, who is obliged to constantly train and improve his or her professional skills due to the dizzying and accelerated process of scientific knowledge production





## Specific Skills

---

- ♦ Identify pulmonary diseases, offering the most appropriate treatment for each person
- ♦ Optimize comprehensive, patient-centered care based on the latest available evidence
- ♦ Improve the quality of life of asthma patients through the most effective treatments
- ♦ Apply major advances in therapies for infectious diseases
- ♦ Apply medical and surgical treatments in patients with lung cancer
- ♦ Approximate the nature of pleural effusion, visualize solid pleural pathology and identify the existence of pneumothorax
- ♦ Diagnose and treat venous thromboembolic disease and pulmonary hypertension
- ♦ Perform early identification of respiratory disorders during sleep
- ♦ Apply conventional oxygen therapy, non-invasive mechanical ventilation and high-flow nasal cannula therapy in patients with respiratory insufficiency
- ♦ Know in depth all the processes involved in lung transplantation
- ♦ The professional will be able to identify the healthcare and ethical implications of precision medicine, understand the sources of information in this area and master the biomarkers of interest in pulmonology
- ♦ Identify endoscopic techniques that are less invasive for patients, improving their ability to perform pulmonary diagnostics
- ♦ Identify treatable traits that allow physicians to personalize the treatment or prognosis of patients with pulmonary diseases
- ♦ Gain extensive understanding of childhood diseases associated with specific genetic alterations and their possible implications for future respiratory health
- ♦ Obtain the necessary knowledge to revise the genetic aspects of asthma, as well as the biological treatments aimed at specific targets
- ♦ Gain up-to-date knowledge of current and future biomarkers and their relationship with the different phenotypes of asthma
- ♦ Acquire a complete vision of the most current knowledge on the genetic basis of lung cancer, as well as the most relevant driver mutations for their therapeutic implications
- ♦ Know the current strategies in the management of lung cancer at the center of genetic therapeutic targets
- ♦ Have a complete mastery of the genetic links of COPD, as well as the relationship between smoking and the genes
- ♦ Understand the role of telomeres in lung aging and the mechanism of operation of mRNA-based vaccines
- ♦ Be fully trained in the usefulness of Big Data in the study of respiratory diseases of infectious origin



# 04

# Course Management

This Advanced Master's Degree in Clinical Pulmonology has been designed according to very high quality standards, so each of its sections is of a high standard. The case of its teaching staff is no different, since it is made up of highly prestigious specialists in this health field, who will transfer their knowledge of the latest advances in the area to the physician, guaranteeing a direct and immediate transmission of knowledge.







“

*The best specialists in Pulmonology will accompany you throughout the course, sharing with you their knowledge of the latest advances in the discipline”*

## Management



### Dr. Jara Chinarro, Beatriz

- Head of the Pulmonology Department of the Puerta de Hierro University Hospital, Majadahonda
- Degree in Medicine and Surgery from the Complutense University of Madrid
- Pulmonology Specialist
- Specialist in sleep disorders at CEAMS (Specialized Centers for the Elderly)



### Dr. Puente Maestú, Luis

- Professor in Pulmonology in the Department of Medicine at the Complutense University of Madrid
- Head of Pulmonology Department at the Gregorio Marañón General University Hospital
- Degree in Medicine from the Complutense University of Madrid
- Specialist in Pulmonology from the Complutense University of Madrid
- PhD "Cum Laude" in Medicine from the Complutense University of Madrid
- Master's Degree in Design and Statistics in Health Sciences from Autonomous University of Barcelona
- Master's Degree in Senior Management of Health Services and Business Management from the University of Alcalá



### **Dr. De Miguel Díez, Javier**

- ♦ Head of Department and Tutor of Residents in the Pulmonology Department at the Gregorio Marañón General University Hospital
- ♦ PhD in Medicine and Surgery from the Autonomous University of Madrid
- ♦ Master's Degree in Healthcare Management and Administration
- ♦ Master's Degree in Smoking
- ♦ Master's Degree in Advances in the Diagnosis and Treatment of Diseases of the Airways
- ♦ Postgraduate Master's Degree on Advances in the Diagnosis and Treatment of Sleep Disorders
- ♦ Master's Degree in Advances in Diagnosis and Treatment of Diffuse Interstitial Lung Disease
- ♦ Master's Degree in Pulmonary Hypertension and Master's Degree in Thrombotic Disease



### **Dr. Ussetti Gil, Piedad**

- ♦ Emeritus Advisor of the Pulmonology Department of the Puerta de Hierro University Hospital in Majadahonda
- ♦ Degree in Medicine and Surgery from the Central University of Barcelona
- ♦ Specialist in Pulmonology
- ♦ Executive Master's Degree in Healthcare Leadership ESADE
- ♦ Associate Professor of the Medicine Department, Autonomous University of Madrid



## Professors

### Dr. Alcázar Navarrete, Bernardino

- ♦ Specialist in Pulmonology at the Public Health Business Agency Hospital of Poniente
- ♦ Coordinator of the COPD department of SEPAR (Spanish Society of Pulmonology and Thoracic Surgery)
- ♦ Member of the Executive Committee of COPD at SEPAR
- ♦ Spokesperson of the SEPAR Congress Committee
- ♦ Treasurer of the Pulmonology Association of the South (Neumosur)
- ♦ Clinical pulmonologist with research activity focused mainly in the field of COPD, and more specifically in the study of biomarkers for the diagnosis, treatment and follow-up of this disease

### Dr. Aguado Ibáñez, Silvia

- ♦ Attending Physician in the Pulmonology Department. Puerto de Hierro University Hospital, Majadahonda
- ♦ Degree in Medicine and Surgery from the University of Alcalá de Henares
- ♦ Master's Degree in Diagnosis and Treatment of Airway Diseases from the Catholic University of Murcia
- ♦ Master's Degree in COPD from the Catholic University of Murcia
- ♦ International Course on Non-Invasive Mechanical Ventilation at Neumomadrid
- ♦ Journal Review Archives of Bronchopulmonology

### Dr. Aguilar Pérez, Myriam

- ♦ Attending Physician in the Pulmonology Department. La Princesa University Hospital Madrid
- ♦ Member of the Ethical Care Committee (CEAS) La Princesa University Hospital Madrid
- ♦ Degree in Medicine and Surgery from the Complutense University of Madrid
- ♦ Master's Degree in Advances in the Diagnosis and Treatment of Interstitial Lung Diseases from the Catholic University of Murcia

### Dr. Bellón Alonso, Sara

- ♦ Faculty Specialist in the Pediatric Department of the Gregorio Marañón University Hospital. Pediatric Pulmonology Unit
- ♦ Degree from the School of Medicine. University of Oviedo
- ♦ Degree in Medicine and Surgery from the Faculty of Medicine University of Oviedo

### Dr. Benedetti, Paola Antonella

- ♦ Assistant of the Bronchoscopy Department and Functional Tests, Pulmonology Department, Gregorio Marañón Hospital
- ♦ Physician and Surgeon at the Central University of Venezuela
- ♦ Resident in Pulmonology at the San Carlos Clinical Hospital, Madrid
- ♦ Currently studying a PhD in Surgical Medical Sciences Complutense University of Madrid

**Dr. Calderón Alcalá, Mariara Antonieta**

- ♦ Specialist in the Pulmonology at the Infanta Leonor University Hospital
- ♦ Degree in Medicine from the Central University of Venezuela
- ♦ Master's Degree in Chronic Obstructive Pulmonary Disease from the Catholic University of Murcia
- ♦ Postgraduate Diploma in Epidemiology and Public Health from the Esneca Business School
- ♦ Postgraduate Diploma in Diffuse Interstitial Lung Diseases in the Systemic Autoimmune Diseases from the Complutense University of Madrid

**Dr. Calles Blanco, Antonio**

- ♦ Department of Community Health in the Oncologic Medicine Department, Madrid
- ♦ Care work, teaching and research work at the Gregorio Marañón General University Hospital in Madrid
- ♦ Resident tutor and teaching collaborating physician in external medical practice teaching at the Complutense University of Madrid
- ♦ Specialist in Medical Oncology at the San Carlos Clinical Hospital, Madrid
- ♦ Degree in Medicine and Surgery from the Autonomous University of Madrid

**Dr. Calle Rubio, Myriam**

- ♦ Head of Department in San Carlos Clinical Hospital
- ♦ Care management techniques for clinical units at the San Carlos Clinical Hospital
- ♦ Specialist Degree in Bronchiectasis from the University of Alcalá de Henares
- ♦ Master's Degree in Clinical Units from the University of Murcia
- ♦ PhD in the Official Postgraduate Program in Medicine of the Complutense University of Madrid

**Dr. Choukri, Marwan Mohamed**

- ♦ Attending Faculty Specialist at the Puerta De Hierro University Hospital
- ♦ Graduate in Medicine and Surgery from the Complutense University of Madrid
- ♦ Resident Specialist at the Jiménez Díaz Foundation University Hospital

**Dr. Churruca Arróspide, María**

- ♦ Attending Physician in the Pneumology Department. La Princesa University Hospital Madrid
- ♦ Member of the Ethical Care Committee (CEAS) La Princesa University Hospital Madrid
- ♦ Degree in Medicine and Surgery from the Complutense University of Madrid
- ♦ Master's Degree in Advances in the Diagnosis and Treatment of Interstitial Lung Diseases from the Catholic University of Murcia

**Dr. De Castro Martínez, Francisco Javier**

- ♦ Physician in charge of the Difficult to Control Asthma Consultation in the Allergology Department of the Gregorio Marañón General University Hospital
- ♦ Physician in charge (in collaboration with the Pulmonology Department) of the monographic consultation of Asthma at the Gregorio Marañón General University Hospital
- ♦ Attending Physician (Allergology Specialist) at Gregorio Marañón General University Hospital
- ♦ Internal Medicine shifts as an attending physician in the emergency department of the Gregorio Marañón Hospital
- ♦ Degree in Medicine and Surgery. University of Granada
- ♦ Training in Allergology at Gregorio Marañón General University Hospital
- ♦ PhD program in Immunology as part of the Department of Medicine at the Complutense University of Madrid

**Dr. Erro Iribarren, Marta**

- ♦ Specialist in Pulmonology at the Puerta De Hierro University Hospital
- ♦ Degree in Medicine and Surgery from the University of Navarra
- ♦ Specialist in Pulmonology
- ♦ International Expert Course in the Methodology of Non-Invasive Mechanical Ventilation
- ♦ Postgraduate Degree in the Control and Treatment of Smoking from the San Antonio Catholic University of Murcia







**Dr. España Yandiola, Pedro Pablo**

- ♦ Head of the Medical/Technical Service, Pulmonology Department, Galdakao-Usánsolo Hospital, Basque Country
- ♦ Degree in Medicine and Surgery, University of the Basque Country
- ♦ Degree in Medicine and Surgery, University of the Basque Country
- ♦ Master's Degree in Clinical Unit Management

**Dr. Girón Matute, Walther Iván**

- ♦ Pulmonology specialist at Vithas La Milagrosa Hospital
- ♦ Degree in Medicine from the National Autonomous University of Honduras
- ♦ Master's Degree in Diagnosis and Treatment of Sleep Disorders San Antonio Catholic University
- ♦ Master's Degree in Infectious Diseases and Treatment Cardenal Herrera University

**Dr. González Barcala, Francisco Javier**

- ♦ Director of the specialized high complexity asthma unit. Clinical University Hospital of Santiago de Compostela
- ♦ Specialist in Pulmonology Clinical University Hospital of Santiago de Compostela
- ♦ Associate Professor at the Faculty of Health Sciences. University of Santiago de Compostela
- ♦ Member of the Editorial Committee of the International Journal of Environmental Research and Public Health

**Dr. López García Gallo, Cristin**

- ♦ Specialist in Pulmonology at the Puerta De Hierro University Hospital
- ♦ Degree in Medicine and Surgery from the Complutense University of Madrid
- ♦ Master's Degree in Pulmonary Hypertension from the Complutense University of Madrid
- ♦ Specialist in Pulmonology
- ♦ Master's Degree in "Expert in Pathology of the Pleura" from the University of Barcelona

**Dr. Izquierdo Pérez, Ainhoa**

- ♦ Specialist in Pulmonology at the Puerta De Hierro University Hospital
- ♦ Degree in Medicine and Surgery from the University of Alcalá de Henares
- ♦ Master's Degree in Clinical Medicine from the Camilo José Cela University
- ♦ Master's Degree in ILD from the Catholic University of Murcia

**Dr. Malo de Molina, Rosa**

- ♦ Specialist in Pulmonology at the Puerta De Hierro University Hospital
- ♦ Degree in Medicine from the University of Córdoba
- ♦ Doctoral Courses and Certificates of Advanced Studies at the Autonomous University of Madrid
- ♦ Professor of the Master's Degree in Airways at the University of Murcia and Collaborating Professor at the Faculty of Medicine of the Autonomous University of Madrid

**Dr. Mínguez Clemente, Patricia**

- ♦ Attending Physician in the Pulmonology Department at Puerta De Hierro University Hospital
- ♦ Degree in Medicine and Surgery from the Complutense University of Madrid
- ♦ Doctoral Courses and Certificate of Advanced Studies (Research Sufficiency: Everolimus in Lung Transplants
- ♦ Specialist Degree in Bronchiectasis from the University of Alcalá de Henares
- ♦ Master's Degree in Diagnosis and Treatment of Airway Diseases from the San Antonio Catholic University of Murcia

**Dr. Quirós Fernández, Sarai**

- ♦ Specialist in the Pulmonology at the Basurto University Hospital
- ♦ Degree in Medicine and Surgery from the University of Alcalá
- ♦ Specialist in Pulmonology at Guadalajara General University Hospital
- ♦ Postgraduate Diploma in Bronchiectasis
- ♦ Postgraduate Diploma in Clinical Management of Tuberculosis and Other Mycobacteriosis

**Dr. Trisán Alonso, Andrea**

- ♦ Area Specialist in the field of Pulmonology at the Puerta De Hierro University Hospital
- ♦ Specialist in Pulmonology at the Puerta De Hierro University Hospital
- ♦ Degree in Medicine from the University of Oviedo
- ♦ Master's Degree in Advances in the Diagnosis and Treatment of Airway Diseases from the San Antonio Catholic University of Murcia
- ♦ Postgraduate Diploma in Severe Asthma

**Dr. Zambrano Chacón, María de los Ángeles**

- ♦ Internal Medicine Resident in the Pulmonology Department at Jiménez Díaz Foundation University Hospital
- ♦ Degree in Medicine from the Central University of Venezuela
- ♦ Master's Degree in Infectious Diseases and Antimicrobial Treatment from CEU Cardenal Herrera University
- ♦ Workshop in Pulmonology Emergencies at the Jiménez Díaz Foundation

**Dr. Zambrano Ibarra, Gabriela**

- ♦ Allergology Physician at Gregorio Marañón General University Hospital
- ♦ Allergology Physician at Tajo Hospital
- ♦ Allergology Physician at Fuenlabrada Hospital
- ♦ Research activity: Retrospective observational study in routine clinical practice of the immunological follow-up of treatment with high-dose modified allergens in patients with rhinoconjunctivitis and/or asthma sensitized to Phleum pratense, Olea e, Platanus a, Cupressus arizonica and Salsola k pollens using objective biological parameters. Tajo-Aranjuez Hospital
- ♦ Research activity: Biological standardization of Cupressus arizonica allergenic extract to determine the biological activity in Histamine Equivalent Units
- ♦ Research activity: Prospective study to evaluate the quality of life with its determinants such as adherence to treatment and satisfaction with immunotherapy in patients with rhinoconjunctivitis with or without asthma, sensitized to at least one aeroallergen. Bial-Aristegui Laboratories, S.A

**Dr. Zamarrón de Lucas, Ester**

- ♦ Faculty Specialist in Pulmonology at La Paz University Hospital
- ♦ PhD in Medicine and Surgery with International Mention
- ♦ Master's Degree in Integral Care of Chronic Obstructive Pulmonary Disease from the Complutense University of Madrid
- ♦ Postgraduate Diploma in the Approach to Pulmonary Hypertension. Treatment with Prostacyclins from the Francisco de Vitoria University
- ♦ Postgraduate Diploma in Emerging and High Risk Virus Pathology, Autonomous University of Madrid



# 05

# Structure and Content

This Advanced Master's Degree in Clinical Pulmonology has been designed by leading internationally-recognised specialists who have structured the program into 20 specific modules. Throughout these modules, the professional will learn about the latest advances in issues such as late complications of lung transplantation, management of alpha-1 antitrypsin deficiency, respiratory involvement of sickle cell disease or anti-IL-9 antibodies, anti-TNF alpha, anti T-lymphocytes in asthma.





“

*The most complete and up-to-date content in  
Clinical Pulmonology is now available to you"*

## Module 1. Interstitial Lung Diseases

- 1.1. ILD's
  - 1.1.1. Classification and Epidemiology of ILD's
  - 1.1.2. Diagnostic Approximation
    - 1.1.2.1. Medical History. Physical Exploration
    - 1.1.2.2. Clinical Laboratory and Pulmonary Function Laboratory
    - 1.1.2.3. Radiodiagnosis: Chest Radiography HRCT. Radiological Patterns
    - 1.1.2.4. Invasive Techniques: Bronchoalveolar Lavage (BAL), Transbronchial Biopsy (TBB) and Cryobiopsy. Surgical Biopsy. Indications and Pathologic Patterns
    - 1.1.2.5. Multidisciplinary Diagnosis
  - 1.1.3. Cellular Aging, Genetics and Biomarkers in ILD
    - 1.1.3.1. Pathogenesis of Cellular Aging
    - 1.1.3.2. Characteristics, Prognostic Value and Treatment of Telomeric Alterations
    - 1.1.3.3. Familial Pulmonary Fibrosis. Biomarkers. Diagnostic, Prognostic and Therapeutic Use
- 1.2. Idiopathic Pulmonary Fibrosis
  - 1.2.1. Epidemiology
  - 1.2.2. Risk factors
  - 1.2.3. Natural History and Prognosis
  - 1.2.4. Diagnostic Approximation
    - 1.2.4.1. Clinical Manifestations Physical Exploration
    - 1.2.4.2. Radiological Criteria
    - 1.2.4.3. Histopathological Criteria
    - 1.2.4.4. Useful Biomarkers in IPF
  - 1.2.5. Treatment
  - 1.2.6. Exacerbation of IPF
- 1.3. Idiopathic Non-specific Interstitial Pneumonia (NSIP) ILD Associated With Systemic Autoimmune Diseases (I): ILD Associated with Rheumatoid Arthritis (RA-ILD) and ILD associated with Systemic Sclerosis (SSc-IDP)
  - 1.3.1. Idiopathic NSIP
    - 1.3.1.1. Histopathological Forms
    - 1.3.1.2. Diagnostic Tests
    - 1.3.1.3. Treatment
    - 1.3.1.4. Prognosis
  - 1.3.2. ILD Associated With Systemic Autoimmune Diseases
    - 1.3.2.1. RA-ILD
    - 1.3.2.2. SSc-ILD
- 1.4. ILD Associated With Systemic Autoimmune Diseases (II)
  - 1.4.1. Dermatitis/Polymyositis
  - 1.4.2. Sjögren's Syndrome
  - 1.4.3. Mixed Connective Tissue Disease. "Overlap" Syndrome
  - 1.4.4. Interstitial Pneumonia with Autoimmune Features (IPAF)
- 1.5. Sarcoidosis
  - 1.5.1. Pathophysiology.
  - 1.5.2. Histology
  - 1.5.3. Diagnostic Approximation
  - 1.5.4. Evolution and Prognosis
  - 1.5.5. Treatment
- 1.6. Hypersensitivity Pneumonitis
  - 1.6.1. Etiology
  - 1.6.2. Pathophysiology.
  - 1.6.3. Classification. Clinical Forms
  - 1.6.4. Diagnostic Criteria. Differential Diagnosis
  - 1.6.5. Natural History and Prognosis
  - 1.6.6. Treatment



- 1.7. Cystic Pulmonary Diseases
    - 1.7.1. Lymphangioleiomyomatosis (LAM)
      - 1.7.1.1. Clinical Manifestations
      - 1.7.1.2. Diagnostic Approximation
      - 1.7.1.3. Treatment
    - 1.7.2. Langerhans Cell Histiocytosis(HPCL)
      - 1.7.2.1. Clinical Manifestations
      - 1.7.2.2. Diagnostic Approximation
      - 1.7.2.3. Treatment
    - 1.7.3. Lymphocytic Interstitial Pneumonia (LIP)
      - 1.7.3.1. Clinical Manifestations
      - 1.7.3.2. Diagnostic Approximation
      - 1.7.3.3. Treatment
  - 1.8. Cryptogenic Organizing Pneumonia (COP)
    - 1.8.1. Pathogenesis
    - 1.8.2. Clinical Manifestations
    - 1.8.3. Radiological Patterns
    - 1.8.4. Diagnostic Approximation
    - 1.8.5. Natural History
    - 1.8.6. Treatment
  - 1.9. Work and Occupational Diseases
    - 1.9.1. Diseases Related to Asbestos
      - 1.9.1.1. Varieties of Asbestos. Sources of Exposure
      - 1.9.1.2. Pleural Fibrosis. Clinical Forms and Radiological Diagnosis
      - 1.9.1.3. Asbestosis. Clinical and Radiological Findings, Diagnostic Criteria and Treatment
    - 1.9.2. Silicosis
    - 1.9.3. Coal Pneumoconiosis
  - 1.10. Pulmonary Eosinophilias. ILD Associated With Drugs. Other Rare ILDs: Pleuropulmonary Fibroelastosis. Alveolar Microlithiasis. Alveolar Proteinosis
    - 1.10.1. Acute Eosinophilic Pneumonia
      - 1.10.1.1. Epidemiology and Risk Factors
      - 1.10.1.2. Pathogenesis
      - 1.10.1.3. Clinical, Radiological, Functional and Anatomopathological Diagnosis
      - 1.10.1.4. Treatment
    - 1.10.2. ILD Associated With Drugs
      - 1.10.2.1. Epidemiology
      - 1.10.2.2. Pathogenesis and Risk Factors
      - 1.10.2.3. Diagnostic Approximation
      - 1.10.2.4. Main Causative Agents
    - 1.10.3. Differential Diagnosis of Pulmonary Eosinophilias
    - 1.10.4. Other Rare ILDs: Pleuropulmonary Fibroelastosis, Alveolar Microlithiasis and Alveolar Proteinosis: Diagnostic Approximation, Evolution and Treatment
- ## Module 2. Chronic Obstructive Pulmonary Disease
- 2.1. Etiopathogenesis
    - 2.1.1. Epidemiology
    - 2.1.2. Risk Factors
    - 2.1.3. Pathogenesis
  - 2.2. Pathophysiology of COPD and Clinical Presentation
    - 2.2.1. Pathophysiology
    - 2.2.2. Clinical Manifestations
  - 2.3. Diagnosis and Characterization
    - 2.3.1. Diagnosis: Medical History, Physical Examination, Imaging Tests, Clinical Analysis and Functional Respiratory Examination
    - 2.3.2. Characterization
      - 2.3.2.1. By Severity of the Pulmonary Obstruction
      - 2.3.2.2. By Clinical Type: Emphysema and Chronic Bronchitis
      - 2.3.2.3. By Exacerbation Risk
      - 2.3.2.4. By Symptoms

- 2.4. Pharmacological Treatment of Maintenance
  - 2.4.1. Treatment Objectives
  - 2.4.2. Drugs
    - 2.4.2.1. Inhaled Treatment
      - 2.4.2.1.1. Bronchodilators
      - 2.4.2.1.2. Inhaled Corticosteroids
    - 2.4.2.2. Oral Treatment
      - 2.4.2.2.1. Theophylline
      - 2.4.2.2.2. Roflumilast
      - 2.4.2.2.3. Azithromycin
- 2.5. Smoking Management in COPD
  - 2.5.1. Epidemiology
  - 2.5.2. Diagnosis of Smoking in COPD
  - 2.5.3. Non-Pharmacological Therapeutic Interventions
  - 2.5.4. Pharmacological Therapeutic Interventions
- 2.6. Non-Pharmacological Treatment
  - 2.6.1. Oxygen Therapy and NIMV
  - 2.6.2. Vaccines
  - 2.6.3. Nutrition
  - 2.6.4. Palliative Treatment of Dyspnea
  - 2.6.5. Reduction of Pulmonary Volume Due to Bronchoscopy
  - 2.6.6. Surgery: Reduction of Volume and Pulmonary Transplant
- 2.7. Exacerbation of COPD
  - 2.7.1. Etiology and Pathogenesis
  - 2.7.2. Classification of Severity
  - 2.7.3. Treatment





- 2.8. Comorbidities
  - 2.8.1. Prevalence
  - 2.8.2. Impact on Mortality
  - 2.8.3. Screening and Management
- 2.9. Rehabilitation and Physical Activity in COPD
  - 2.9.1. Rehabilitation in COPD
    - 2.9.1.1. Benefits
    - 2.9.1.2. Indications
    - 2.9.1.3. Structure of a Rehabilitation Project
    - 2.9.1.4. Rehabilitation After the Exacerbation of COPD
    - 2.9.1.5. Special Situations
  - 2.9.2. Physical Activity
    - 2.9.2.1. Measurement
    - 2.9.2.2. Interventions

### Module 3. Asthma

- 3.1. Etiopathogenesis
  - 3.1.1. Epidemiology
  - 3.1.2. Risk Factors
  - 3.1.3. Pathogenesis
- 3.2. Diagnosis
  - 3.2.1. Clinical Symptoms
  - 3.2.2. Spirometry and Bronchodilator Test
  - 3.2.3. Bronchial Provocation Tests
  - 3.2.4. Determination of FeNO
  - 3.2.5. Induced Sputum
  - 3.2.6. Electronic Nose
  - 3.2.7. Volatile Organic Compounds in Exhaled Air
  - 3.2.8. Diagnostic Algorithm

- 3.3. Classification of the Control and Severity
  - 3.3.1. Control
  - 3.3.2. Severity
- 3.4. Treatment of Maintenance
  - 3.4.1. Treatment Objectives
  - 3.4.2. Drugs:
  - 3.4.3. Step Treatment
  - 3.4.4. Allergen and Environmental Avoidance
  - 3.4.5. Education and Written Action Plans
- 3.5. Treatment of Asthma Attacks
  - 3.5.1. Risk Factors
  - 3.5.2. Severity Assessment
  - 3.5.3. Treatment According to Severity
  - 3.5.4. High Emergency Criteria
  - 3.5.5. Criteria for Hospitalization
  - 3.5.6. Criteria for Discharge After Hospitalization
  - 3.5.7. Outpatient Monitoring After the Attack
- 3.6. Uncontrolled Severe Asthma
  - 3.6.1. Epidemiology
  - 3.6.2. Diagnostic Procedure
  - 3.6.3. Phenotypes of Severe Asthma
  - 3.6.4. Treatment Algorithm
- 3.7. Occupational Asthma
  - 3.7.1. Causative Agents
  - 3.7.2. Classification
  - 3.7.3. Diagnosis
  - 3.7.4. Treatment
  - 3.7.5. Asthma Worsened by Work
- 3.8. Nasal Pathology Associated with Asthma
  - 3.8.1. Rhinitis
    - 3.8.1.1. Diagnosis
    - 3.8.1.2. Classification
    - 3.8.1.3. Treatment
  - 3.8.2. Rhinosinusitis and Nasal Polyposis
    - 3.8.2.1. Diagnosis
    - 3.8.2.2. Treatment
- 3.9. Pulmonary Eosinophilias Associated With Asthma
  - 3.9.1. Acute Eosinophilic Pneumonia
  - 3.9.2. Allergic Bronchopulmonary Aspergillosis
  - 3.9.3. Eosinophilic Granulomatosis with Polyangiitis
- 3.10. Special Situations
  - 3.10.1. Asthma and COPD Overlap (ACOS)
  - 3.10.2. Respiratory Disease Exacerbated by Acetylsalicylic Acid
  - 3.10.3. Asthma and Pregnancy
  - 3.10.4. Exercise-Induced Asthma
  - 3.10.5. Pseudo Asthmas

## Module 4. Respiratory Infections and Related Diseases

- 4.1. Community-Acquired Pneumonia (CAP)
  - 4.1.1. Epidemiology
  - 4.1.2. Risk Factors
  - 4.1.3. Comorbidities and Risk of CAP
  - 4.1.4. Etiology
  - 4.1.5. Clinical manifestations
  - 4.1.6. Diagnosis
  - 4.1.7. Assessment of the Severity of the CAP
  - 4.1.8. Treatment
  - 4.1.9. Clinical Response
  - 4.1.10. Complications
  - 4.1.11. Prevention: Vaccination



- 4.2. Nosocomial Pneumonia (Hospital-Acquired Pneumonia and Ventilator-Associated Pneumonia)
  - 4.2.1. Pathogenesis.
  - 4.2.2. Risk factors
  - 4.2.3. Intrahospital Pneumonia
  - 4.2.4. Pneumonia Associated with Mechanical Ventilation
  - 4.2.5. Etiology
  - 4.2.6. Diagnosis
  - 4.2.7. Treatment
  - 4.2.8. Preventive Measures
- 4.3. Pulmonary Abscess
  - 4.3.1. Pathogenesis
  - 4.3.2. Differences with Necrotizing Pneumonia
  - 4.3.3. Microbiology
  - 4.3.4. Clinical manifestations
  - 4.3.5. Diagnosis
  - 4.3.6. Differential Diagnosis
  - 4.3.7. Treatment
- 4.4. Coronavirus: COVID-19
  - 4.4.1. The 2019 Pandemic
  - 4.4.2. Epidemiology
  - 4.4.3. Pathogenesis
  - 4.4.4. Clinical Symptoms
  - 4.4.5. Diagnosis
  - 4.4.6. Treatment
  - 4.4.7. Complications
  - 4.4.8. Prevention
    - 4.4.8.1. Hygienic Measures and Social Distancing
    - 4.4.8.2. Vaccines
- 4.5. Non-Cystic Fibrosis Bronchiectasis
  - 4.5.1. Epidemiology and Costs
  - 4.5.2. Pathophysiology
  - 4.5.3. Etiology
  - 4.5.4. Diagnosis
  - 4.5.5. Differential Diagnosis
  - 4.5.6. Microbiology
  - 4.5.7. Severity and Prognostic Factors
  - 4.5.8. Treatment
  - 4.5.9. Monitoring
  - 4.5.10. Consensus Treatment of CBI in COPD and Bronchiectasis
- 4.6. Cystic fibrosis
  - 4.6.1. Aetiopathogenesis.
  - 4.6.2. Epidemiology
  - 4.6.3. Clinical manifestations
  - 4.6.4. Diagnosis
  - 4.6.5. Quality of Life Related to Health
  - 4.6.6. Treatment
    - 4.6.6.1. Of Exacerbation
    - 4.6.6.2. Of Chronic Bronchial Infection
    - 4.6.6.3. Of Bronchial Inflammation
    - 4.6.6.4. Of Mucociliary Clearance
    - 4.6.6.5. New Drugs (CFRT Protein Repairers)
  - 4.6.7. Rehabilitation
  - 4.6.8. Nutritional Treatment
  - 4.6.9. Treating Complications

- 4.7. Pulmonary Tuberculosis: Epidemiology, Clinical Symptoms, Diagnosis, Complications and Prognosis
  - 4.7.1. Epidemiology
  - 4.7.2. Etiology
  - 4.7.3. Pathogenesis and Pathophysiology
  - 4.7.4. Clinical Manifestations
  - 4.7.5. Diagnosis. Concept of Infection and Tuberculous Disease
    - 4.7.5.1. Tuberculous Infection
    - 4.7.5.2. Tuberculous Disease
      - 4.7.5.2.1. Clinical and Radiological Diagnosis
      - 4.7.5.2.2. Anatomical and Pathological Diagnosis
      - 4.7.5.2.3. Microbiological Diagnosis
  - 4.7.6. Complications and Prognosis
- 4.8. Pulmonary Tuberculosis: Treatment. Chemoprophylaxis
  - 4.8.1. Types of Bacillary Populations
  - 4.8.2. Standard Treatment. Appropriate Selection of Drug Combinations
  - 4.8.3. Treatment in Special Situations
    - 4.8.3.1. Immunodeficiencies
    - 4.8.3.2. Pregnancy and Breastfeeding
    - 4.8.3.3. Advanced Chronic Liver Failure
    - 4.8.3.4. Advanced Chronic Kidney Disease
  - 4.8.4. Adverse Effects
  - 4.8.5. Interrupting the Treatment
  - 4.8.6. Resistance
  - 4.8.7. Chemoprophylaxis. Treatment of Latent Tuberculous Infection
  - 4.8.8. Therapeutic Schemes for the Treatment of Multidrug-Resistant or Extensively Resistant Pulmonary TB
- 4.9. Atypical Mycobacteria
  - 4.9.1. Taxonomy and Epidemiology
  - 4.9.2. Pathogenesis and Susceptibility of the Host
  - 4.9.3. Clinical Forms
  - 4.9.4. Diagnostic Criteria for Atypical Mycobacterial Disease
  - 4.9.5. Treatment

- 4.10. Pulmonary Aspergillosis and Other Mycoses
  - 4.10.1. Pulmonary Aspergillosis
  - 4.10.2. Candidiasis Broncopulmonar
  - 4.10.3. Cryptococcosis
  - 4.10.4. Mucormycosis
  - 4.10.5. Pneumocystis

## Module 5. Bronchopulmonary Neoplasms

- 5.1. Epidemiology
  - 5.1.1. Incidence and Prognosis of Lung Cancer
  - 5.1.2. Risk Factors: Tabacco, Jobs, Other Carcinogens
  - 5.1.3. Screening
- 5.2. Solitary Pulmonary Nodule
  - 5.2.1. Etiology
  - 5.2.2. Factors Associated With Malignancy
    - 5.2.2.1. Estimation of Malignancy
    - 5.2.2.2. Sequential Evaluation. Management Algorithm
- 5.3. Classification
  - 5.3.1. Histological Subtypes
    - 5.3.1.1. Non-Small Cell: Adenocarcinoma, Epidermoid, Large Cell
    - 5.3.1.2. Small Cell
  - 5.3.2. Biomarkers with Diagnostic and Therapeutic Value
- 5.4. Diagnosis
  - 5.4.1. Symptoms and Signs
    - 5.4.1.1. Paraneoplastic Syndromes
  - 5.4.2. Radiodiagnostics
  - 5.4.3. Invasive Diagnostic Methods
- 5.5. Staging
  - 5.5.1. General Aspects
  - 5.5.2. TNM 8th Edition Classification

- 5.6. Multidisciplinary Evaluation in the Therapeutic Approach
  - 5.6.1. Operability Criteria
  - 5.6.2. Resectability Criteria
    - 5.6.2.1. Resectable
    - 5.6.2.2. Unresectable
    - 5.6.2.3. Potentially Resectable
- 5.7. Treatment in Initial Stages
  - 5.7.1. Surgical Management
    - 5.7.1.1. Lobectomy and Lymphadenectomy
    - 5.7.1.2. Pneumonectomy
    - 5.7.1.3. Atypical Resections
  - 5.7.2. Adjuvants
- 5.8. Locally Advanced Disease Treatment
  - 5.8.1. Neoadjuvant
  - 5.8.2. Radical Treatment with Chemoradiotherapy
- 5.9. Advanced Disease
  - 5.9.1. Oligometastatic Disease
  - 5.9.2. Chemotherapy
  - 5.9.3. Immunotherapy
  - 5.9.4. Directed Treatment
- 5.10. Support Treatments
  - 5.10.1. Radiotherapy
  - 5.10.2. Management of Complications Related to the Airway: Dyspnea, Superior Vena Cava Syndrome, Hemoptysis, Endobronchial Resection
  - 5.10.3. Other Complications

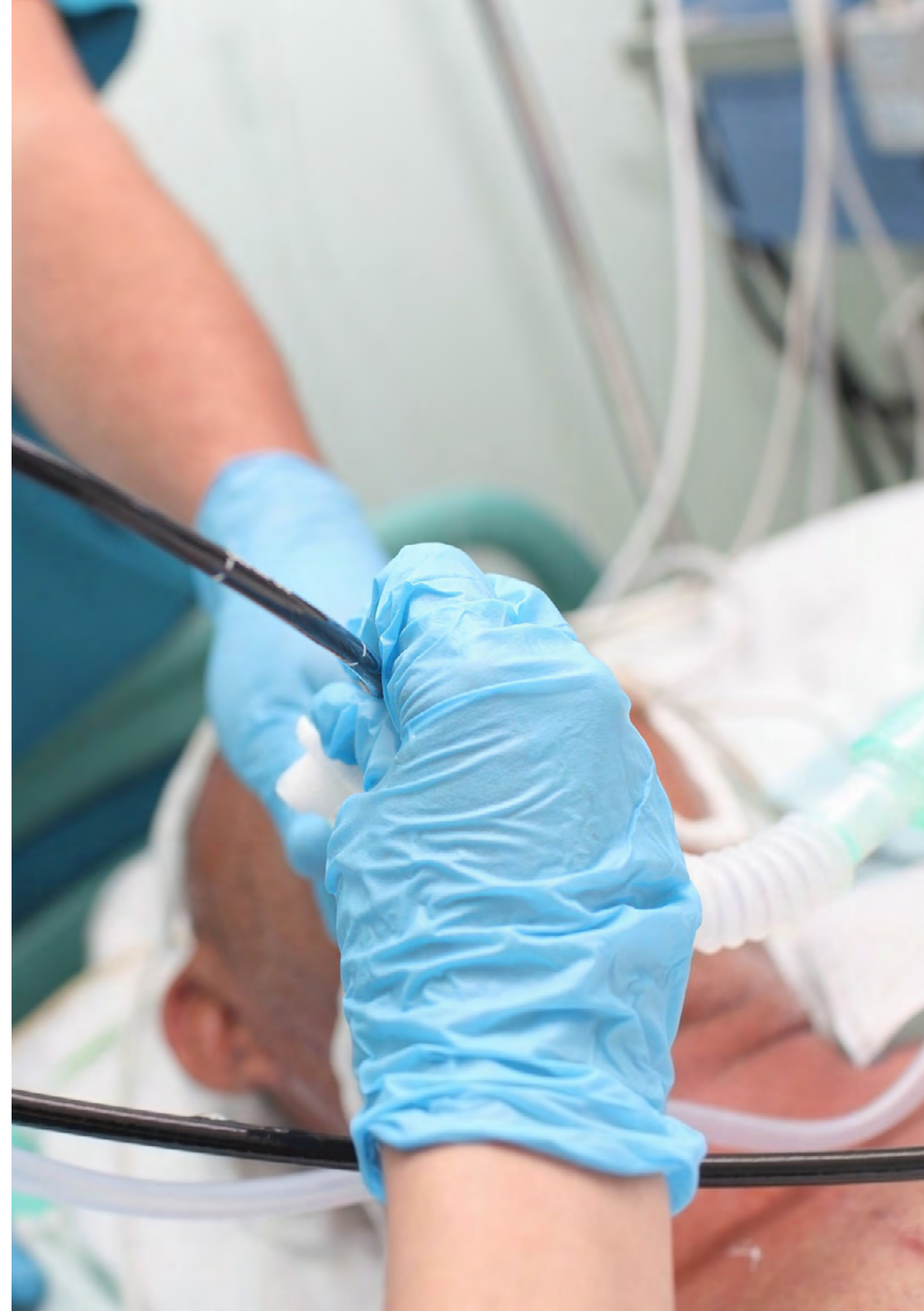
## Module 6. Diseases of the Pleura and Mediastinum

- 6.1. Pleura
  - 6.1.1. Anatomy
  - 6.1.2. Histology
- 6.2. Pathophysiology of the Pleura
  - 6.2.1. Pleural Pressure
  - 6.2.2. Formation of Pleural Fluid
  - 6.2.3. Absorption of Pleural Fluid
- 6.3. Definition and Epidemiology of Pleural Diseases
  - 6.3.1. Pleural Effusion
  - 6.3.2. Hemothorax
  - 6.3.3. Chylothorax
  - 6.3.4. Pneumothorax
  - 6.3.5. Solid Pleural Pathology
- 6.4. Clinical Diagnosis of Pleural Pathology
  - 6.4.1. Symptoms
  - 6.4.2. Physical Exploration
- 6.5. Imaging Diagnosis of Pleural Pathology
  - 6.5.1. Chest X-ray
  - 6.5.2. Chest CAT Scan
  - 6.5.3. Thoracic Ultrasound Scan
- 6.6. Invasive Techniques for the Diagnosis of Pleural Effusion
  - 6.6.1. Diagnostic Thoracentesis
  - 6.6.2. Closed Pleural Biopsy
  - 6.6.3. Medical Thoracoscopy
- 6.7. Solid Pleural Pathology
  - 6.7.1. Pleural Fibrous Tumor
  - 6.7.2. Pleural Pathology Due to Asbestos
  - 6.7.3. Mesothelioma
  - 6.7.4. Metastatic Cancer

- 6.8. Management of the Patient with Pleural Effusion
  - 6.8.1. Diagnostic Approximation
  - 6.8.2. Etiological Diagnosis
  - 6.8.3. Treatment
- 6.9. Caring for a Patient with Pneumothorax
  - 6.9.1. Classification
  - 6.9.2. Diagnosis
  - 6.9.3. Treatment
- 6.10. Mediastinal Diseases
  - 6.10.1. Anatomy
  - 6.10.2. Epidemiology
  - 6.10.3. Mediastinitis
  - 6.10.4. Mediastinal Tumors
  - 6.10.5. Diagnostic Approximation of a Mediastinal Mass

## Module 7. Pulmonary Circulation

- 7.1. Pathophysiology of Pulmonary Circulation
  - 7.1.1. Anatomical-Functional Review
  - 7.1.2. Physiological Changes with Age and Exercise
  - 7.1.3. Pathophysiology
- 7.2. Acute Pulmonary Thromboembolism
  - 7.2.1. Epidemiology and Etiopathogenesis of an Acute Pulmonary Thromboembolism
  - 7.2.2. Clinical Presentation and Probability
  - 7.2.3. Diagnosis of a Pulmonary Embolism
  - 7.2.4. Prognostic Stratification





- 7.3. Therapeutic Management of Acute Pulmonary Thromboembolism
  - 7.3.1. Treatment of Acute Pulmonary Thromboembolism
  - 7.3.2. Prophylaxis of Venous Thromboembolic Disease
  - 7.3.3. Pulmonary Embolism in Special Situations
    - 7.3.3.1. Pulmonary Embolism in Oncologic Patients
    - 7.3.3.2. Pulmonary Embolism in Pregnant Women
- 7.4. Pulmonary Arterial Hypertension
  - 7.4.1. Epidemiology
  - 7.4.2. Diagnosis and Clinical Assessment of Pulmonary Hypertension
- 7.5. Classification and Types of Pulmonary Hypertension
  - 7.5.1. ERS/ESC Classification of Pulmonary Hypertension
  - 7.5.2. Group 1- Pulmonary Arterial Hypertension
    - 7.5.2.1. Pulmonary Veno-Occlusive Disease/Pulmonary Capillary Hemangiomatosis
    - 7.5.2.2. Persistent Pulmonary Hypertension of a Newborn
  - 7.5.3. Group 2 - Pulmonary Hypertension Secondary to Left Ventricle Cardiomyopathy
  - 7.5.4. Group 3 - Pulmonary Hypertension Secondary to Lung Diseases and Hypoxia
  - 7.5.5. Group 4 - Chronic Thromboembolic Pulmonary Hypertension and Other Pulmonary Artery Obstructions
  - 7.5.6. Group 5 - Pulmonary Hypertension of Unestablished and/or Multifactorial Mechanism
- 7.6. Therapeutic Management of Pulmonary Arterial Hypertension
  - 7.6.1. PHT Group 1
  - 7.6.2. PHT Group 2
  - 7.6.3. PHT Group 3
  - 7.6.4. PHT Group 4
  - 7.6.5. PHT Group 5
- 7.7. Hemoptysis.
  - 7.7.1. Epidemiology, Etiology
  - 7.7.2. Differential Diagnosis
  - 7.7.3. Diagnostic Management
  - 7.7.4. Treatment
  - 7.7.5. Prognosis
- 7.8. Pulmonary Vasculitis
  - 7.8.1. Epidemiology and Etiopathogenesis
  - 7.8.2. Classification. Specific Vasculitis According to the CHCC 2012 Classification
  - 7.8.3. Diagnosis
  - 7.8.4. Treatment
  - 7.8.5. Prophylaxis
  - 7.8.6. Prognosis
- 7.9. Alveolar Hemorrhage
  - 7.9.1. Diagnosis of an Alveolar Hemorrhage
    - 7.9.1.1. Pathologic Anatomy/Pathogenesis
    - 7.9.1.2. Differential Diagnosis
  - 7.9.2. Treatment
- 7.10. Intrapulmonary Shunts
  - 7.10.1. Hepatopulmonary Syndrome
  - 7.10.2. Arteriovenous Fistulae

## Module 8. Respiratory Disorders During Sleep

- 8.1. Physiology and Epidemiology
  - 8.1.1. Sleep Disorders Classification
  - 8.1.2. Obstructive Sleep Apnea (OSA)
  - 8.1.3. Pathophysiology.
  - 8.1.4. Epidemiology
  - 8.1.5. OSA as a Public Health Problem
- 8.2. Risk Factors for OAS
  - 8.2.1. Age and Sex
  - 8.2.2. Obesity
  - 8.2.3. Menopause
  - 8.2.4. Craniofacial Anatomy and Heredity
  - 8.2.5. Tobacco, Alcohol and Drugs
  - 8.2.6. Supine Position
- 8.3. OAS and Comorbidities
  - 8.3.1. OAS and Respiratory Diseases
  - 8.3.2. AHT and Cardiovascular Risk
  - 8.3.3. Endocrine Alterations
  - 8.3.4. Neurological Alterations
  - 8.3.5. Cancer
- 8.4. Clinical Manifestations of OSA
  - 8.4.1. Symptoms and Signs
  - 8.4.2. Physical Exploration
  - 8.4.3. Complementary Evaluations
  - 8.4.4. Criteria for Referral to the Sleep Unit
- 8.5. Diagnosis
  - 8.5.1. Medical History
  - 8.5.2. Polysomnography
  - 8.5.3. Respiratory Polygraphy
  - 8.5.4. Simplified Methods
  - 8.5.5. Other Complementary Tests
- 8.6. Treatment
  - 8.6.1. General Measures
  - 8.6.2. Continuous Positive Airway Pressure (CPAP) Treatment
  - 8.6.3. Other Modes of Positive Pressure: BPAP and Servoventilator
  - 8.6.4. Different Positive Pressure Options
- 8.7. OSA in Special Population Groups
  - 8.7.1. Children and Adults
  - 8.7.2. Elderly People
  - 8.7.3. Women
  - 8.7.4. OSA and Pregnancy
- 8.8. Central Apnea syndrome
  - 8.8.1. Clinical manifestations
  - 8.8.2. Diagnosis
  - 8.8.3. Treatment
- 8.9. Hypoventilation Syndrome.
  - 8.9.1. Classification of Alveolar Hypoventilation Syndromes
  - 8.9.2. Obesity Hypoventilation Syndrome
  - 8.9.3. Idiopathic Central Alveolar Hypoventilation
  - 8.9.4. Congenital Central Alveolar Hypoventilation Syndrome
  - 8.9.5. Hypoventilation During Sleep Related to Medication or Substances
  - 8.9.6. Hypoventilation During Sleep Related to Medical Disorders
- 8.10. Other Sleep Disorders
  - 8.10.1. Hypersomnias
  - 8.10.2. Parasomnias and Restless Leg Syndrome
  - 8.10.3. Insomnia and Drowsiness

## Module 9. Respiratory Failure. Non-Invasive Mechanical Ventilation. High-Flow Oxygen Therapy

- 9.1. Respiratory Failure
  - 9.1.1. According to Pathophysiology (Partial, Global, Postoperative or Hypoperfusion/ Shock)
    - 9.1.1.1. According to Time of Onset (Acute, Chronic and Acute Chronic)
    - 9.1.1.2. According to Alveolar-Arterial Gradient (Normal or Elevated)
    - 9.1.1.3. Pathophysiological Mechanisms
  - 9.1.2. Decrease in Oxygen Partial Pressure
    - 9.1.2.1. Presence of a Circuit Breaker or Shunt
    - 9.1.2.2. Ventilation/Perfusion imbalance (V/Q)
    - 9.1.2.3. Alveolar Hypoventilation
    - 9.1.2.4. Diffusion Alteration
- 9.2. Diagnosis
  - 9.2.1. Clinical Symptoms
  - 9.2.2. Arterial Blood Gas Analysis. Interpretation
  - 9.2.3. Pulse Oximetry
  - 9.2.4. Imaging Tests
  - 9.2.5. Others: Respiratory Function Tests, ECG, Blood Analysis, etc.
  - 9.2.6. Etiology of Respiratory Failure
  - 9.2.7. Treatment of Respiratory Failure
    - 9.2.7.1. General Measures
    - 9.2.7.2. Oxygen Therapy, NIMV and HFO (See Next Sections)
- 9.3. Conventional Oxygen Therapy
  - 9.3.1. Indications of Acute Oxygen Therapy
  - 9.3.2. Indications for Chronic Home Oxygen Therapy
  - 9.3.3. Systems and Sources of Administration
  - 9.3.4. Oxygen Sources
  - 9.3.5. Special Situations: Flights
- 9.4. Non-Invasive Mechanical Ventilation (NIMV)
  - 9.4.1. Pathophysiological Effects
    - 9.4.1.1. On the Respiratory System
    - 9.4.1.2. On the Cardiovascular System
  - 9.4.2. Components
    - 9.4.2.1. Interfaces
    - 9.4.2.2. Complications of the Interface: Skin Lesions, Leaks
    - 9.4.2.3. Accessories
  - 9.4.3. Monitoring
- 9.5. Indications and Contraindications NIMV
  - 9.5.1. In the Acute Phase
    - 9.5.1.1. In Emergency Situations Prior to Concrete Diagnosis
    - 9.5.1.2. Acute Hypercapnic Respiratory Failure (Acute COPD, Decompensation of OHS Patient, Respiratory Center Depression, etc.)
    - 9.5.1.3. Hypoxemic ARF de Novo/ARDS/Immunosuppressed
    - 9.5.1.4. Neuromuscular Diseases
    - 9.5.1.5. Post-Surgery
    - 9.5.1.6. *Weaning* and Extubation
    - 9.5.1.7. Patients Ordered Not to Intubate
  - 9.5.2. In the Chronic Phase
    - 9.5.2.1. COPD
    - 9.5.2.2. Restrictive Diseases (Thoracic Wall, Diaphragm, Neuromuscular, etc)
    - 9.5.2.3. Palliative Situation
  - 9.5.3. Contraindications
  - 9.5.4. NIMV Failure

- 9.6. Basic Concepts of NIMV
  - 9.6.1. Respiratory Parameters of the Ventilator
    - 9.6.1.1. Trigger
    - 9.6.1.2. Cycling
    - 9.6.1.3. Ramp
    - 9.6.1.4. IPAP
    - 9.6.1.5. EPAP
    - 9.6.1.6. Pressure Support
    - 9.6.1.7. PEEP
    - 9.6.1.8. I/E Relationship
  - 9.6.2. Interpretation of Respiratory Curves
- 9.7. Main Ventilatory Modes
  - 9.7.1. Pressure-Limited
    - 9.7.1.1. Continuous Positive Airway Pressure (CPAP)
    - 9.7.1.2. Bilevel Positive Airway Pressure (BIPAP)
  - 9.7.2. Volume-Limited
  - 9.7.3. New Modes: AVAPS, IVAPS, NAVA, Autotrack
- 9.8. Main Asynchronies
  - 9.8.1. Due to Leakage
    - 9.8.1.1. Autocycled
    - 9.8.1.2. Prolonged Inspiration
  - 9.8.2. Due to Ventilator
    - 9.8.2.1. Short Cycle
    - 9.8.2.2. Double Trigger
    - 9.8.2.3. Ineffective Effort
  - 9.8.3. Due to the Patient
    - 9.8.3.1. AutoPEEP
    - 9.8.3.2. Reverse Trigger







- 9.9. High-Flow Nasal Cannula Therapy (HFNCT)
  - 9.9.1. Components
  - 9.9.2. Clinical Effects and Mechanism of Action
    - 9.9.2.1. Improvement in Oxygenation
    - 9.9.2.2. Dead Space Lavage
    - 9.9.2.3. PEEP Effect
    - 9.9.2.4. Reduction in Respiratory Work
    - 9.9.2.5. Hemodynamic Effects
    - 9.9.2.6. Comfort
- 9.10. Clinical Applications and Contradictions of TAF
  - 9.10.1. Clinical Applications
    - 9.10.1.1. Acute Hypoxemic Respiratory Failure/ ARDS/ Immunosuppressed
    - 9.10.1.2. Hypercapnic Respiratory Failure in COPD
    - 9.10.1.3. Acute Heart Failure and Acute Pulmonary Edema
    - 9.10.1.4. Invasive (Fibrobronchoscopy) and Post-Surgery Procedures
    - 9.10.1.5. Pre-Oxygenation Prior to Intubation and Prevention of Post-Extubation Respiratory Failure
    - 9.10.1.6. Patients in a Palliative Situation
  - 9.10.2. Contraindications
  - 9.10.3. Complications

## Module 10. Lung Transplant

- 10.1. Lung Transplant
  - 10.1.1. Historical Recollection
  - 10.1.2. Evolution in Recent Years: Demographic Revision, Analysis by Pathologies and Survival
- 10.2. Selection of Receptors
  - 10.2.1. Absolute Contra-indications
  - 10.2.2. Relative Contra-indications
  - 10.2.3. Indications for Referral to a Lung Transplant Unit Due to Pathologies
    - 10.2.3.1. Usual Interstitial Pneumonia/ Non-Specific Interstitial Pneumonia
    - 10.2.3.2. Chronic Obstructive Pulmonary Disease
    - 10.2.3.3. Cystic Fibrosis
    - 10.2.3.4. Pulmonary Hypertension
  - 10.2.4. Indications for Referral to a Lung Transplant Unit Due to Pathologies
    - 10.2.4.1. Usual Interstitial Pneumonia/ Non-Specific Interstitial Pneumonia
    - 10.2.4.2. Chronic Obstructive Pulmonary Disease
    - 10.2.4.3. Cystic fibrosis
    - 10.2.4.4. Pulmonary Hypertension
- 10.3. Selection of Donor
  - 10.3.1. Brain-Dead Donor
  - 10.3.2. Donor in Asystole
  - 10.3.3. Exvivo Evaluation System
- 10.4. Surgical Technique
  - 10.4.1. Removal of the Affected Lung
  - 10.4.2. Bench Surgery
  - 10.4.3. Graft Implantation
- 10.5. Cardio-Respiratory Care
  - 10.5.1. ECMO as a Bridge to a Transplant
  - 10.5.2. Intra-Operative ECMO
  - 10.5.3. Post-Operative Radiotherapy
- 10.6. Early Complications of Lung Transplants
  - 10.6.1. Hyperacute Rejection
  - 10.6.2. Primary Dysfunction of the Graft
  - 10.6.3. Complications from Surgery
  - 10.6.4. Peri-Operative Infections
- 10.7. Post-Operative Care
  - 10.7.1. Immunosuppressive Treatments
  - 10.7.2. Infectious Prophylaxis
  - 10.7.3. Monitoring
- 10.8. Delayed Complications of Lung Transplants
  - 10.8.1. Acute Cellular Rejection (Early or Delayed)
  - 10.8.2. Chronic Dysfunction of the Graft. *Chronic Lung Allograft Dysfunction (CLAD)*
    - 10.8.2.1. Types
    - 10.8.2.2. Treatment
  - 10.8.3. Tumours
    - 10.8.3.1. Cutaneous Tumors
    - 10.8.3.2. Post-Transplant Lymphoproliferative Syndrome
    - 10.8.3.3. Solid Tumors
    - 10.8.3.4. Kaposi's Sarcoma
  - 10.8.4. Infections
  - 10.8.5. Other Frequent Complications
    - 10.8.5.1. Diabetes Mellitus
    - 10.8.5.2. Hyperlipidemia
    - 10.8.5.3. High Blood Pressure
    - 10.8.5.4. Acute and Chronic Kidney Failure
- 10.9. Quality of Life and Suffering
  - 10.9.1. Quality of Life Analysis
  - 10.9.2. Survival Rate; Evaluation of Subgroups
- 10.10. Re-Transplant
  - 10.10.1. Indications and Limitations
  - 10.10.2. Survival and Quality of Life

## Module 11. Personalized Precision Medicine and Big Data in Pulmonology Prelude

- 11.1. Ethics in Precision Medicine
- 11.2. Advantages
  - 11.2.1. Disadvantages of Precision Medicine
- 11.3. Precision Medicine as a Strategy
- 11.4. The Revolution of Precision Medicine
- 11.5. Studies in Real Life
  - 11.5.1. Advantages
  - 11.5.2. Inconveniences
- 11.6. Pharmacogenomics
- 11.7. Proteomics
- 11.8. Chronicity
  - 11.8.1. Personalization of Care
- 11.9. Telemedicine
- 11.10. Personalized Care for Dependents
  - 11.10.1. The Role of Nursing Staff

## Module 12. Interventional Pulmonology and Precision Medicine

- 12.1. EBUS-(Endobronchial Ultrasound)
  - 12.1.1. Its Role in the Genetic Diagnosis and Most Precise Stadification of Lung Cancer
- 12.2. Radial Endobronchial Ultrasound (r-EBUS)
  - 12.2.1. Its Role in the Diagnosis or Peripheral Lesions and the Genetic Typification of Lung Cancer
- 12.3. Electromagnetic Navigation
  - 12.3.1. Its Role in the Diagnosis and Treatment of Peripheral Lesions
- 12.4. Narrow Band Imaging in Bronchoscopic Examination with Suspected Bronchial Neoplastic Disease
- 12.5. Endobronchial Therapy of Treatable Features
  - 12.5.1. Homogeneous Emphysema with Intact Cysura
- 12.6. Endobronchial Therapy of Treatable Features Homogeneous Emphysema with Interlobar Communication

- 12.7. Endobronchial Therapy of Treatable Features
  - 12.7.1. Non-Eosnophilic Asthma
- 12.8. Detection of Diagnostic Markers in the Malignant Pleural Pathology With Minimally Invasive Techniques
- 12.9. Medical Thoracoscopy
  - 12.9.1. Contribution to the Diagnostic Precision of Pleural Effusion
  - 12.9.2. Alveoloscopy: "In Vivo" Analysis of the Peripheral Airways

## Module 13. Precision Medicine, Imaging Techniques and Pulmonary Function

- 13.1. Quantification of Obstructive Pulmonary Impairment by Chest Computed Tomography Applied as a Tool for Increasing Diagnostic Accuracy
- 13.2. Lung Nodule Volumetry Applied as a Tool for Increasing Diagnostic Accuracy
- 13.3. Elastography of Lung Lesions
  - 13.3.1. Pleurals as a Tool for Increasing Diagnostic Accuracy
- 13.4. Pleural Ultrasound Applied as a Tool to Increase Diagnostic Accuracy
- 13.5. Detection of Treatable Feature in Respiratory Diseases
  - 13.5.1. Hyperinflation (Lung Volumes, Dynamic Hyperinflation)
- 13.6. Detection of Treatable Feature in Respiratory Diseases
  - 13.6.1. Pulmonary Resistances
  - 13.6.2. Peripheral Tract Involvement
- 13.7. Detection of Treatable Feature in Respiratory Diseases
  - 13.7.1. Measurement of Physical Activity in the Personalization of Care and the Prognosis of Patients
- 13.8. Detection of Treatable Feature in Respiratory Diseases
  - 13.8.1. Adherence to Treatment
- 13.9. Detection of Treatable Feature in Respiratory Diseases
  - 13.9.1. Non-Invasive Detection of Bronchial Inflammation by Exhaled Nitric Oxide Fraction
- 13.10. Detection of Treatable Feature in Respiratory Diseases
  - 13.10.1. Non-Invasive Detection of Bronchial Inflammation With Induced Sputum

## Module 14. Genetics and Precision Medicine and Pediatric Diseases

- 14.1. Cystic Fibrosis Epidemiology
  - 14.1.1. Genetic Basis
- 14.2. Cystic Fibrosis in Children
  - 14.2.1. Manifestations
- 14.3. Cystic Fibrosis in Children
  - 14.3.1. Screening and Treatment. Primary Ciliary Dyskinesia
- 14.4. Genetic Links of Respiratory Distress of the New Born
  - 14.4.1. Bronchopulmonary Dysplasia
- 14.5. Duchenne and Becker Muscular Dystrophy
  - 14.5.1. Genetic Basis
- 14.6. Duchenne and Becker Muscular Dystrophy
  - 14.6.1. Management and Prognosis
- 14.7. Respiratory Involvement of Sickle Cell Disease
- 14.8. Underweight at Birth and Respiratory Disease
- 14.9. Treatments Oriented to Specific Therapeutic Targets in Childhood Asthma
  - 14.9.1. Use of Biological Treatment in the Pediatric Population

## Module 15. Genetics, Precision Medicine and Asthma

- 15.1. Epidemiology of Asthma
  - 15.1.1. Familial, Racial or Generational Associations
  - 15.1.2. Twin Studies
- 15.2. Genes Related to Asthma
  - 15.2.1. Localization 1
- 15.3. Genes Related to Asthma
  - 15.3.1. Localization 2
- 15.4. Inflammatory Pathways of Asthma
- 15.5. Precision Medicine in Asthma
  - 15.5.1. Anti IgE Antibodies

- 15.6. Precision Medicine in Asthma
  - 15.6.1. Anti IL-5 Antibodies or IL5 Receptor
- 15.7. Precision Medicine in Asthma
  - 15.7.1. IL-4/IL-13 Antibodies
- 15.8. Precision Medicine and Other Biological Treatments in Asthma
  - 15.8.1. Anti-IL-9, Anti-TNF Alpha, Anti-T-Lymphocyte Antibodies
- 15.9. Precision Medicine
  - 15.9.1. Current and Future Biomarkers
- 15.10. Precision Medicine in Asthma
  - 15.10.1. Linking Phenotypes to Specific Treatments

## Module 16. Genetics, Precision Medicine and Lung Cancer

- 16.1. The Genetics of Lung Cancer Susceptibility
  - 16.1.1. Implications for Treatment
- 16.2. Molecular Biology of Adenocarcinoma of the Lung
  - 16.2.1. Driver Mutations
- 16.3. Molecular Biology of Squamous Cell Carcinoma of the Lung
  - 16.3.1. Sarcomatoid Carcinoma of the Lung
- 16.4. Molecular Biology of Microcytic Carcinoma of the Lung
- 16.5. Genomic Platforms for Lung Cancer Molecular Diagnostics and Fluid Biopsy
- 16.6. Driver Mutations as Therapeutic Targets
  - 16.6.1. EGFR Mutation
- 16.7. Driver Mutations as Therapeutic Targets
  - 16.7.1. ALK Translocation
- 16.8. Driver Mutations as Therapeutic Targets
  - 16.8.1. Others (ROS1, MET, RET, BRAF, NTRK)
- 16.9. Treatment Against Therapeutic Targets in Research
  - 16.9.1. HER2, NRG1 y KRAS
- 16.10. Precision Medicine in Lung Cancer
  - 16.10.1. Global Strategy for the Management of Lung Cancer Linked to Therapeutic Targets



## Module 17. Genetics, Precision Medicine and COPD

- 17.1. Genetic Links of COPD
- 17.2. Genetic Alpha-1 Deficiency
  - 17.2.1. Antitrypsins
- 17.3. Epidemiology of Alpha-1 Antitrypsin Deficiency
- 17.4. Management of Alpha-1 Antitrypsin Deficiency
  - 17.4.1. Genetic Counselling Treatment
- 17.5. COPD and Underweight at Birth
  - 17.5.1. COPD Trajectories
- 17.6. Genetics of Smoking
- 17.7. COPD Phenotypes
  - 17.7.1. Bio Markers
- 17.8. Personalized Medicine
  - 17.8.1. Treatment Oriented to Phenotypes
- 17.9. Sarcopenia
  - 17.9.1. Intolerance to Exercise
  - 17.9.2. Lack of Physical Activity
  - 17.9.3. Sedentary Behavior
- 17.10. Association of Polymorphisms in ACTN3 Genes
  - 17.10.1. ACE and PPARGC1A with the Effectiveness of Physical Training

## Module 18. Genetics, Precision Medicine and Other Respiratory Diseases

- 18.1. Link Between Interstitial Lung Diseases and Genetics
- 18.2. Link Between Pulmonary Hypertension and Genetics
- 18.3. Genetic Basis of the Susceptibility of Hypoxemia in COPD
- 18.4. Genetic Disorders that Increase Susceptibility to Venous Thromboembolic Disease and Pulmonary Thromboembolism
- 18.5. Cystic Fibrosis in Adults
  - 18.5.1. Suspected and Diagnosis
- 18.6. Genetic Aspects of Obstructive Sleep Apnea Syndromes

- 18.7. Telomeres and Respiratory Diseases
- 18.8. Genetic Variability in Susceptibility and Severity of Pneumonia
- 18.9. Genetic Variability in Susceptibility and Severity of Pneumonia
- 18.10. Vaccines Based on mRNA
  - 18.10.1. Results and Secondary Effects in SARS-COVID-19 For Example

## Module 19. Big Data and Respiratory Diseases I

- 19.1. Big Data and Epidemiology of Respiratory Diseases
- 19.2. Big Data and Bronchoscopy
- 19.3. Big Data and Non-invasive Mechanical Ventilation
- 19.4. Big Data and Invasive Mechanical Ventilation
- 19.5. Big Data and Smoking
- 19.6. Big Data and Air Pollution
- 19.7. Big Data and Asthma
- 19.8. Big Data and COPD
- 19.9. Big Data and Sleep Apnea-Hypopnea Syndrome
- 19.10. Big Data and Obesity-Hypoventilation Syndrome

## Module 20. Big Data and Respiratory Diseases II

- 20.1. Big Data and Community-Acquired Pneumonia
- 20.2. Big Data and Nosocomial Infection
- 20.3. Big Data and Tuberculosis
- 20.4. Big Data, Environmental Pollution and Respiratory Infections
- 20.5. Big Data and COVID-19 Infection
- 20.6. Big Data, Pleural Diseases and Lung Cancer
- 20.7. Big Data and Interstitial Lung Diseases
- 20.8. Big Data and Thromboembolic Disease
- 20.9. Big Data and Pulmonary Hypertension
- 20.10. Big Data and Respiratory Diseases Starting in the Neonatal Period

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.





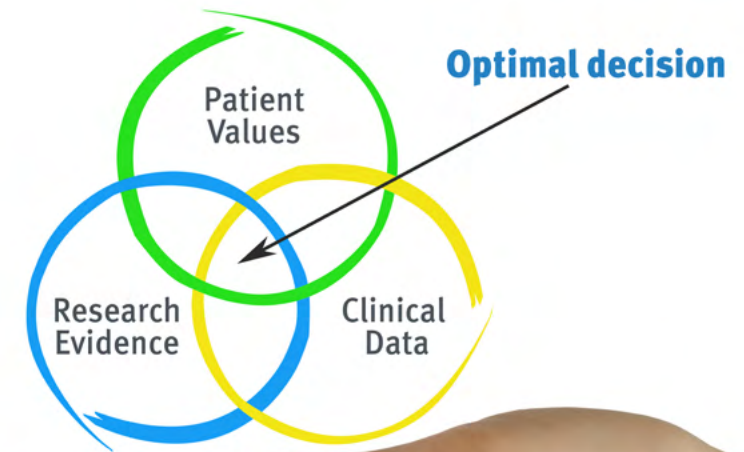
“

*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

This Advanced Master's Degree in Clinical Pulmonology guarantees, in addition to the most rigorous and update training, access to a Advanced Master's Degree issued by TECH Technological University.



“

*Successfully complete this training  
and receive your university degree  
without travel or laborious paperwork”*

This **Advanced Master's Degree in Clinical Pulmonology** contains the scientific most complete and update program on the market.

After the student has passed the assessments, they will receive their corresponding **Advanced 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 Advanced Master's Degree, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional from career evaluation committees.

Title: **Advanced Master's Degree in Clinical Pulmonology**

Official N° of hours: **3,000 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.



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



Advanced Master's  
Degree  
Clinical Pulmonology

Course Modality: Online

Duration: 2 years

Certificate: TECH Technological University

Official N° of hours: 3,000 h.

# Advanced Master's Degree Clinical Pulmonology

