

Hybrid Master's Degree Hospital Pharmacy





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Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Global University

60 + 5 ECTS Credits

Website: www.techtute.com/us/pharmacy/hybrid-master-degree/hybrid-professional-master-degree-hospital-pharmacy

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01

Introduction

Hospital Pharmacy is an essential discipline within the healthcare field, playing a fundamental role in the comprehensive care of hospitalized patients. In fact, hospital pharmacists play a key role in the selection, preparation and dispensing of medicines, ensuring correct administration and dosage. In addition, they collaborate closely with the medical team, contributing their expertise in the management of pharmacotherapy, leading to greater efficacy and safety in treatments. It is also crucial in the management of the drug supply chain, ensuring its timely and adequate availability. As such, TECH has implemented this educational program, based on the avant-garde *Relearning* methodology and complemented with innovative multimedia resources, such as videos and interactive summaries.





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Thanks to this Hybrid Master's Degree, you will contribute directly to the improvement of healthcare quality, patient safety and efficiency in the use of healthcare resources"

Hospital Pharmacy guarantees the optimization of medical treatments by ensuring the correct dispensing and administration of drugs, which contributes to improving therapeutic efficacy. It also plays an essential role in preventing medication errors and promoting patient safety. Likewise, its work extends to inventory management, resulting in a more efficient use of resources and cost reduction for healthcare institutions.

This is the origin of this Hybrid Master's Degree, which offers a comprehensive educational program, focusing on the acquisition of essential pathophysiological knowledge to design effective pharmacotherapeutic plans in pathologies. In this way, it will address the review of up-to-date scientific literature and the practical application through the analysis of real clinical cases. All this will help the pharmacist to dive into diseases such as Asthma, COPD, Rapid Intubation Sequence, Seizures, Headaches, Myasthenia Gravis, Ischemic Stroke and Withdrawal Syndromes, among others.

Likewise, the program will be extended to the approach of Hepatic, Pancreatic and Intra-abdominal Infections pathologies, allowing the professional to understand theoretically and practically their management, by means of the analysis of specific clinical cases. Similarly, the initial management of the Polytraumatized and Surgical Patient will be analyzed, as well as the attention to critical situations, such as sexual aggressions, Hypertension and Venous Thromboembolism during pregnancy.

In this context, TECH presents this Hybrid Master's Degree, which will allow the professional to develop their full potential and growth in the area of Hospital Pharmacy. Under the guidelines of the innovative *Relearning* methodology, you will easily update your daily practice through the repetition of key concepts. In addition, through the 3-week practical internship, included in the syllabus, you will deal with real patients, in an environment where you will always be accompanied by great professionals in this field.

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

- ♦ Development of more than 100 cases presented by Pharmacy professionals with expertise in intensive care and university professors with extensive experience with critical patients
- ♦ 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
- ♦ Presentation of practical workshops on Hospital Pharmacy
- ♦ Algorithm-based interactive learning system for decision making in the situations that are presented to the student
- ♦ All of this will be complemented by theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ♦ Content that is available from any fixed or portable device with an Internet connection
- ♦ Furthermore, you will be able to do an internship in one of the best hospital pharmacies



Add to your online education the realization of internships in pharmaceutical departments of prestigious hospitals, with the highest standards of quality and technological level"



You will approach the rational management of antibiotics through an extensive library full of teaching resources at the forefront of education and technology"

In this Hybrid Master's Degree, of a professionalizing nature and blended learning modality, the program is aimed at updating Pharmacy professionals who carry out their functions in hospital pharmaceutical centers, and who require a high level of qualification. The contents are based on the latest scientific evidence, and oriented in a didactic way to integrate theoretical knowledge in pharmaceutical practice, and the theoretical-practical elements will facilitate the updating of knowledge and allow decision making in Hospital Pharmacy.

Thanks to its multimedia content elaborated with the latest educational technology, they will allow the Pharmacy professional to obtain a situated and contextual learning, that is to say, a simulated environment that will provide an immersive learning programmed to specialize 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 throughout the program. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.

You will identify the initial management of oncohematologic patients and adjust therapeutic strategies according to response monitoring.

With an approach based on the most up-to-date scientific evidence, this program will become a comprehensive tool for your development of advanced competencies in Hospital Pharmacy.



02

Why Study this Hybrid Master's Degree?

In many fields of work and knowledge, theory is not enough to achieve real development or progress. In Hospital Pharmacy, it is just as important to know the latest techniques and therapeutic approaches with drugs, as it is to apply them properly to address the pathologies. For this reason, TECH has created this pioneering program, which will combine the most recent update in pathophysiological aspects and the design of effective treatment plans. In this way, the student will obtain a complete vision of the most current situation in Hospital Pharmacy, guided throughout the process by real experts in the field.





Why Study this Hybrid Professional | 09 **tech**
Master's Degree?

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Choosing this Hybrid Master's Degree in Hospital Pharmacy will equip you with the skills necessary to play a crucial role in improving pharmaceutical care within the hospital environment"

1. Updating from the latest technology available

Hospital Pharmacy is constantly evolving thanks to technological advances that have revolutionized the management and dispensing of medications. For example, dispensing robots allow efficient and accurate management, reducing errors and improving patient safety. In addition, the implementation of integrated information systems facilitates the traceability and tracking of medicines, from storage to administration, optimizing processes and ensuring more effective inventory management.

2. Gaining in-depth knowledge from the experience of top specialists

The large team of professionals that will accompany the specialist throughout the practical period is a first-class and an unprecedented guarantee of updating. With a specifically designated tutor, the student will be able to work with real patients and clients in a state-of-the-art environment, which will allow them to incorporate the most effective procedures and approaches in Hospital Pharmacy into their daily practice.

3. Entering first-class pharmaceutical environments

TECH carefully selects all available centers for Internship Programs. Thanks to this, the specialist will have guaranteed access to a prestigious environment in the area of Hospital Pharmacy. In this way, you will be able to see the day-to-day work of a demanding, rigorous and exhaustive sector, always applying the latest theses and scientific postulates in its work methodology.



4. Combining the best theory with state-of-the-art practice

The academic market is plagued by teaching programs that are poorly adapted to the daily work of the specialist and that require long teaching hours, often not very compatible with personal and professional life. TECH offers a new learning model, 100% practical, that allows you to get in front of state-of-the-art procedures in the field of Hospital Pharmacy and, best of all, to put it into professional practice in only 3 weeks.

5. Opening the door to new opportunities

Specialization in Hospital Pharmacy not only involves acquiring advanced knowledge in pathophysiology and pharmacotherapy, but also immersing oneself in the practical application of this knowledge through real clinical cases. Consequently, opening the door to new opportunities in this field not only translates into significant professional growth, but also represents the possibility of contributing to the continuous improvement of medical care in hospital settings, where quality and patient safety are a priority.

“*You will have full practical immersion
at the center of your choice*”

03 Objectives

The main objective of this university program will be to enhance the professional skills of pharmacists, enabling them to identify and address clinical situations in a precise and personalized manner. Therefore, by prioritizing the use of patient-specific information, such as age, risk factors and pre-hospital data, individual-centered pharmacy practice will be nurtured. Therapeutic and monitoring plans will also be developed, based on complex medication-related problems, patient-specific information and laboratory data, to lead effective pharmacotherapeutic interventions.



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You will acquire the ability to modify the treatment plan according to patient response monitoring, ensuring personalized and quality pharmacotherapeutic care"



General Objective

- ♦ The overall objective of this Hybrid Master's Degree in Hospital Pharmacy is to transform pharmacists into visionary leaders, capable of making a difference in the hospital setting. As such, they will be equipped with advanced skills to identify and address clinical situations, using patient-specific information. They will also develop therapeutic and monitoring plans based not only on medication, but also on patient-specific details, disease and laboratory data. In addition, this program will seek to cultivate the ability to modify treatment plans in direct response to patient progress, creating highly adaptive and skilled hospital pharmacists



You will address a wide range of pathologies and clinical situations, from cardiovascular diseases to oncohematological medical emergencies"





Specific Objectives

Module 1. Pharmacology of the Cardiovascular System

- Delve into the incidence, prehospital management, typical symptoms, assessment, rapid diagnosis and time-dependent pharmacology of Acute Coronary Syndrome (ACS)
- Assess, diagnose, and further the initial management and time-dependent therapies for Heart Failure (HF)
- Delve into Arrhythmias, initial management of Tachycardia, Stable and Unstable Tachycardia and Cardiorespiratory Arrest

Module 2. Pharmacology of the Respiratory System

- In-depth study of asthma, including its definition, prevalence, acute exacerbation, imaging and laboratory tests, emergency management and pharmacology
- Define COPD, its prevalence, acute exacerbation, imaging tests and pharmacology
- Delve into Pneumonia, its definition and incidence, types and pharmacology
- Define Anaphylaxis, its incidence, types, diagnosis and pharmacology
- Investigate Steven-Johnson Syndrome (SJS) and Toxic Epidermal Necrolysis (TEN), including their, etiology, risk factors, clinical presentation, complications and supportive therapy
- Delve into the definition, indication, pathophysiology, and pharmacology of muscle inducing and paralyzing agents of the Rapid Induction and Intubation Sequence (RIIS)
- Delve into Sedoanalgesia, its agitation, delirium and the pharmacology of Sedoanalgesia sedative agents in postintubation

Module 3. Pharmacology of Epilepsy, Migraine and Myasthenia Gravis

- Delve into seizures in the adult patient: Definition, clinical presentation and antiepileptic drugs
- Delve into seizures in the pediatric patient: Definition, diagnosis and pharmacologic management
- Update knowledge about Status Epilepticus (SE) in the adult patient
- Define SE in the pediatric patient, causes, diagnosis and treatment
- Management of Myasthenia Gravis (MG): Definition, initial management, indications for intubation and drugs to avoid
- Inquire into Headache and Migraine in the adult patient, as well as incidence, types, diagnosis, first and second line treatments, and pharmacological alternatives
- Be aware of the pharmacology in pediatric patients with Headache and Migraine
- Delve into the definition and diagnosis, initial management and patient education around Hypertensive Emergency

Module 4. Pharmacology of the Central Nervous System

- Explore the initial assessment, imaging tests, multidisciplinary team, time-dependent pharmacology, endovascular therapy, antithrombotic treatment of Ischemic Stroke
- Delve into the management of Hypertension in Acute Ischemic Stroke: Treatment selection and objectives
- Describe the incidence, clinical presentation, mechanism, risk factors management of Oropharyngeal Angioedema due to Alteplase
- Delve into the incidence, definition and clinical presentation, risk factors, initial management of Hemorrhagic Stroke - Intracerebral Hemorrhage (ICH)
- Be updated on diagnosis, initial emergency management, pharmacological and non-pharmacological measures in Cerebral Edema

- ♦ Delve into opioid overdose
- ♦ Be up to date on the management of the agitated patient: Clinical presentation, initial management, first and second line therapies
- ♦ Update knowledge of acute pain management in the substance abuse patient: General principles and multimodal analgesia
- ♦ Delve into Alcohol Withdrawal Syndrome: Incidence, pathophysiology, signs and symptoms, severity of withdrawal, pharmacology and supportive therapies

Module 5. Pharmacology of the Gastrointestinal System

- ♦ Update knowledge on Chronic Liver Disease, its definition and causes of cirrhosis, diagnosis and initial assessment, pathophysiology, severity and pharmacology
- ♦ Delve into Upper Gastrointestinal Bleeding (UGH)
- ♦ Be aware of Spontaneous Bacterial Peritonitis (SBP), its pathophysiology, incidence and management
- ♦ Delve into the Hydroelectrolytic Alterations and Hyperelectrolytemias, its physiopathology, clinical presentation and treatment
- ♦ Investigate the pathophysiology, risk factors, diagnosis, severity and pharmacological treatment of Clostridium Difficile Infection (CDI)
- ♦ Delve into the pathophysiology, microbiology, diagnosis, risk stratification, and treatment of complicated Intra-Abdominal Infection (IAI)
- ♦ Be up to date on the classification, symptoms, precipitating factors, diagnosis and treatment of Pancreatitis

Module 6. Pharmacology of Infectious Diseases and Intoxications

- ♦ Delve into the rational use of antibiotics, developing a complete analysis of their definitions and the most common infections to be treated with them
- ♦ Develop the pharmacological management of diseases, such as Skin and Soft Tissue Infections
- ♦ Define the most complex pharmacological treatments for the treatment of Pneumonia, Meningitis and Sepsis, among other infectious diseases present in the hospital context

Module 7. Hospital Pharmacology Management

- ♦ Delve into the organization and efficient management of the Hospital Pharmacy Department, including the assignment of roles and responsibilities of the pharmaceutical staff
- ♦ Delve into hospital information systems, electronic medical records and automation in the preparation and dispensing of medications
- ♦ Inquire into the concepts of pharmacoeconomics and health technology assessment to analyze the efficiency and equity in the use of resources in the healthcare setting
- ♦ Implement and evaluate protocols for the use of medications in the hospital, ensuring their safe and efficient use and their integration with the hospital information system

Module 8. Pharmacology of the Surgical and Polytraumatized Patient

- ♦ Master the pharmacological and general management of Traumatic Brain Injury, triage procedures, scales and severity classification
- ♦ Delve into the reversal of antithrombotic drugs: Coagulopathy, severity of bleeding, resuscitation, coagulopathy monitoring, reversal agents and antifibrinolytics
- ♦ Delineate the pharmacological options for the management of Acute Pain, Spinal Shock, Neurogenic Shock and Hypovolemic Shock
- ♦ Assess the different sedative agents that promote moderate sedation, their levels and recommendations

Module 9. Pharmacology of the Genitourinary, Obstetric and Gynecologic System

- ♦ Identify the microorganisms related to Sexual Aggression, recommended tests, empirical treatment, emergency contraception, vaccination and HIV prophylaxis
- ♦ Manage the precise pharmacology for sexually transmitted diseases such as Chlamydia, Gonorrhea, Syphilis, as well as their incidence
- ♦ Investigate the management of Gestational Hypertension from its pathophysiology, risk assessment, clinical presentation and pharmacological treatment
- ♦ Differentiate the pathophysiology, classification, treatment of cystitis and pharmacotherapeutic follow-up after culture

Module 10. Pharmacology of Oncohematologic Emergencies

- ♦ Delve into the incidence, diagnosis, outpatient treatment and pharmacotherapeutic arsenal against Venous Thromboembolism in oncohematological patients
- ♦ Delve into the pathophysiology, risk factors, clinical presentation, hydroelectrolytic alterations, prevention and treatment of the Tumor Lysis Syndrome
- ♦ Determine the pathophysiology, risk factors, clinical presentation, hydroelectrolytic alterations, prevention and treatment of Hypercalcemia of Tumoral origin
- ♦ Address pain management, multimodal pharmacotherapy and acute treatment of Sickle Cell Disease

04 Skills

Through this Hybrid Master's Degree, professionals will emerge with the skills to identify and manage a wide range of clinical situations, leveraging patient-specific information. They will also develop the unique ability to modify treatment plans in real time, creating highly adaptive professionals capable of leading significant advances in Hospital Pharmacy.





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Through this program, you will update your knowledge in developing therapeutic and monitoring plans, integrating medication, disease details and laboratory data”



General Skills

- ♦ Comprehensively assess clinical situations and develop therapeutic plans based on patient, disease and laboratory specific data
- ♦ Identify, select, and administer optimal and sensitive therapies for different pathologies or physical conditions
- ♦ Apply published data and reports in the field of hospital pharmacy to patient care, integrating scientific evidence into clinical decision-making
- ♦ Adjust and modify treatment plans based on patient response to initial therapy and clinical progress
- ♦ Work effectively in multidisciplinary health care teams, fostering clear and collaborative communication
- ♦ Comply with ethical and legal principles in the practice of Hospital Pharmacy





Specific Skills

- ♦ Assess and manage patients with Acute Coronary Syndrome and other cardiovascular disorders
- ♦ Address the management of Heart Failure and different Cardiac Arrhythmias, both in stable and unstable patients, using the most advanced pharmacology
- ♦ Delve into the management and pharmacology of Asthma, COPD, Pneumonia, Anaphylaxis and other respiratory disorders
- ♦ Identify and treat seizures in adult and pediatric patients, including *Status Epilepticus*
- ♦ Properly manage Steven-Johnson Syndrome and Toxic Epidermal Necrolysis, from the Hospital Pharmacy point of view, as well as Sedoanalgesia in postintubation
- ♦ Point out the most appropriate pharmacotherapeutic protocols for patients with Migraine and Myasthenia Gravis
- ♦ Assess the pharmacological approach to the Hypertensive Emergency and the management of Hypertension in Acute Ischemic Stroke
- ♦ Identify and treat Hydroelectrolytic disorders and Hyperelectrolithemia, as well as gastrointestinal infections such as *Clostridium Difficile* infection
- ♦ Develop a complete analysis of the rational use of antibiotics for the treatment of common infectious diseases
- ♦ Address specific substance intoxications and learn about the management of Acute Psychosis and Delirium
- ♦ Apply antidotes in cases of specific intoxications, such as Naloxone and N-acetylcysteine
- ♦ Master the pharmacological management of surgical and polytraumatized patients, including Acute Pain management
- ♦ Manage Gestational Hypertension and sexually transmitted diseases, such as Chlamydia, Gonorrhea and Syphilis
- ♦ Address pharmacotherapy and acute treatment of Sickle Cell Disease



You will unlock exceptional competencies, establishing yourself as an undisputed leader in the field of Hospital Pharmacy”

05

Course Management

Each faculty member is a passionate and committed expert, carefully selected by TECH for their in-depth knowledge in key areas of Hospital Pharmacy. These mentors are not only recognized in education, but also have valuable hands-on experience in prestigious hospital settings. In addition, their interactive and participatory approach will inspire graduates to face complex clinical situations with confidence. As such, the diversity of perspectives and experiences among the faculty will enrich learning, providing participants with a comprehensive and up-to-date view of the field.



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The faculty will guide you toward a thorough mastery of Hospital Pharmacy, ensuring that each lesson is an opportunity for growth and development in this vital specialty"

Management



Mr. Ramos Rodríguez, Javier

- ♦ Pharmacist at Hospital Corporación Sanitaria Parc Taulí, Sabadell, Spain
- ♦ Coordinating member of the working group of pharmacists specializing in the Emergency Department (RedFaster)
- ♦ Pharmacist specializing in Hospital Pharmacy at Hospital Mútua de Terrassa
- ♦ Pharmacist specializing in Hospital Pharmacy at Consorci Sanitari Integral
- ♦ Resident Pharmacist at Servicio Canario de la Salud (Canary Health Service)
- ♦ Assistant Pharmacist in Pharmacy María Concepción Gutiérrez
- ♦ Assistant Pharmacist in Pharmacy Marina López González
- ♦ Master in Pharmacotherapeutic Follow-up of HIV/AIDS patients by the University of Granada

Professors

Mr. De Gorostiza Frías, Carlos

- ♦ Specialist Pharmacist in Quirónsalud's Central Purchasing Office
- ♦ Resident in Hospital Pharmacy at the Fundación Jiménez Díaz Hospital
- ♦ Clinical researcher for the University of Granada
- ♦ Supervised stay at Centro Tecnológico Nacional de la Conserva y Alimentación (National Technological Center of Preserves and Food)
- ♦ Supervised stay at St Georges Hospital in London
- ♦ Double Degree in Pharmacy and Human Nutrition and Dietetics

D. Amor García, Miguel Ángel

- ♦ Hospital pharmacist at Infanta Cristina University Hospital
- ♦ Coordinator of the FarMIC Group of the Spanish Society of Hospital Pharmacy
- ♦ Member of the National Commission of Hospital Pharmacy, Ministry of Health of Spain
- ♦ Resident pharmacist at Gregorio Marañón University Hospital
- ♦ Hospital pharmacist at Salamanca Clinical Hospital
- ♦ Master's Degree in Medical Science Liaison at CESIF
- ♦ Degree in Pharmacy from the University of Salamanca

Dr. Fendián, Ángel Marcos

- ♦ Assistant Pharmacist at Hospital de la Santa Creu i Sant Joan de Déu
- ♦ Hospital Pharmacist in Intensive Care Unit at Hospital Clinic of Barcelona
- ♦ Assistant pharmacist at Hospital Universitari Joan XXIII
- ♦ Assistant pharmacist at Hospital Pius de Valls
- ♦ PhD in Pharmacy from the Université of Montpellier
- ♦ Master's Degree in Pharmaceutical Oncology by the University of Valencia

Mr. Wood, Eduardo

- ♦ Head of Hospital Pharmacy Service at ICOT Group
- ♦ Specialist in Clinical Pathology at Life Length
- ♦ Specialist in Clinical Analysis and assistant pharmacist at Pérez del Toro y Gálvez CB Laboratory Pharmacy
- ♦ Clinical Analysis Specialist in Laboratorio González Santiago SL
- ♦ Clinical Laboratory Specialist at Eurofins Megalab
- ♦ Specialist in Clinical Analysis at Dr. Negrin University Hospital
- ♦ Degree in Pharmacy from the Complutense University of Madrid

Ms. Marques de Llano, Marta

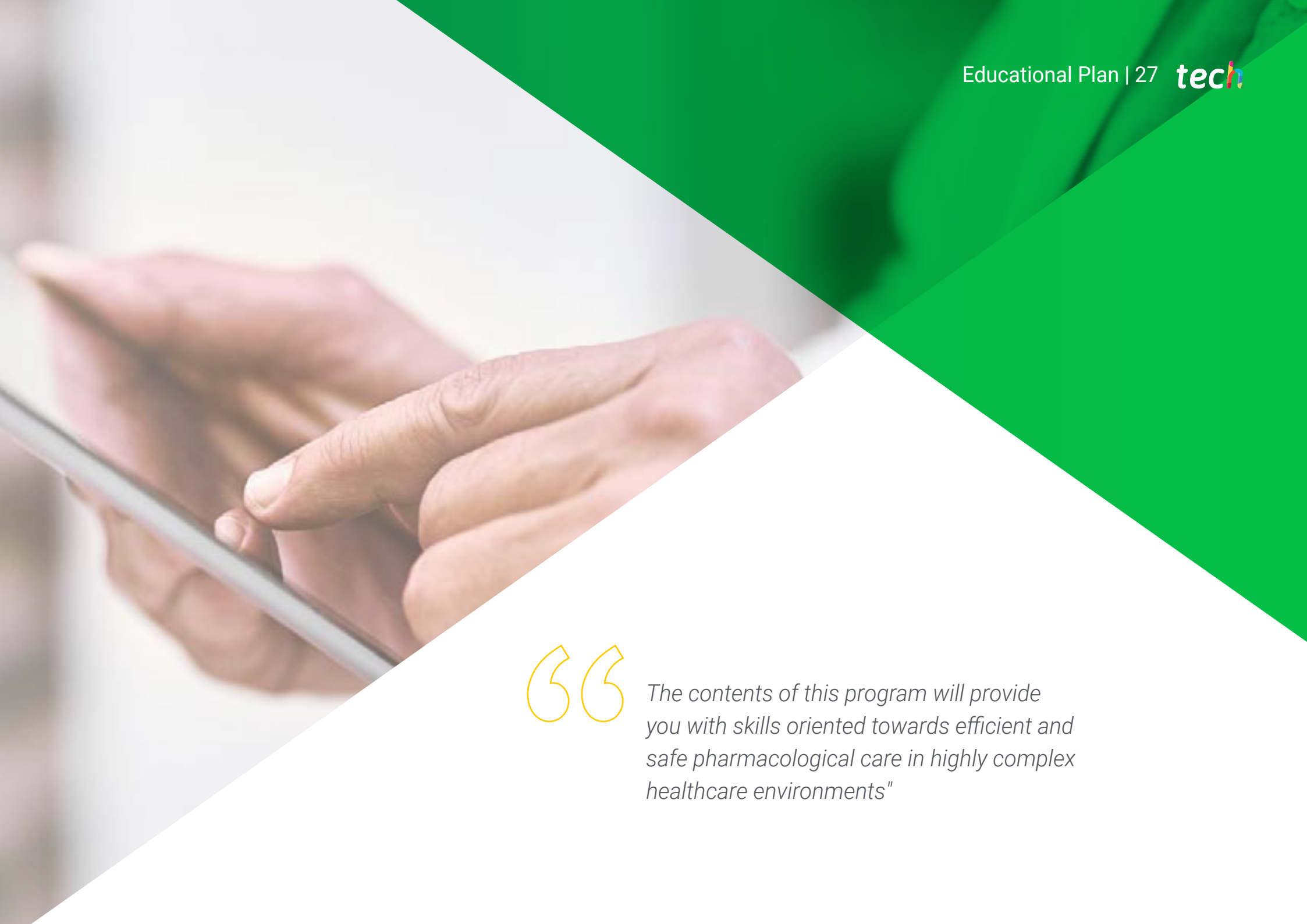
- ♦ Assistant pharmacist at the Puigvert Foundation
- ♦ Pharmacist at the Drug Information Center of the Official College of Pharmacists of Avila
- ♦ Policy Coordinator at the Spanish Federation of Pharmacy Students
- ♦ Master's Degree in Hospital Pharmaceutical Sciences, Clinical, Hospital and Primary Care Pharmacy at UDIMA University
- ♦ Degree in Pharmacy from the University of Salamanca

06

Educational Plan

The syllabus has been designed following the requirements proposed by the teaching team of this Hybrid Master's Degree. Accordingly, a syllabus has been established whose modules offer a broad perspective of Hospital Pharmacy. In this case, it will delve into various strategies and up-to-date products for the administration of drugs in cases of Cardiovascular, Respiratory or Neurological Diseases. In addition, the professional will be qualified to deal with intoxications, infectious diseases and their respective therapeutic approaches, both in specialized care units and in emergency situations.





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The contents of this program will provide you with skills oriented towards efficient and safe pharmacological care in highly complex healthcare environments"

Module 1. Pharmacology of the Cardiovascular System

- 1.1. Acute Coronary Syndrome (ACS)
 - 1.1.1. ST Segment-Elevation ACS (STE-ACS)
 - 1.1.2. Non-ST-Segment Elevation ACS (NSTEMI-ACS)
 - 1.1.3. Unstable Angina (UA)
- 1.2. Heart Failure (HF)
 - 1.2.1. Acute Exacerbation of HF
 - 1.2.2. Moderate Acute HF with Fluid Overload
 - 1.2.3. Acute Hypertensive HF: Acute Pulmonary Edema (APE)
 - 1.2.4. Acute Hypotensive HF: Cardiogenic Shock
 - 1.2.5. HF with Increased Systolic Volume
 - 1.2.6. Acute HF and Atrial Fibrillation
 - 1.2.7. Acute HF and Renal Injury
 - 1.2.8. Hyperkalemia in Acute HF
 - 1.2.9. HF of Any Type
- 1.3. Cardiac Arrhythmias
 - 1.3.1. Initial Management of the Patient with Tachycardia
 - 1.3.2. Unstable Tachycardia with a Pulse
 - 1.3.3. Stable Tachycardia
 - 1.3.4. Cardio-Respiratory Arrest (CRA)
- 1.4. Antihypertensives
 - 1.4.1. Angiotensin-Converting Enzyme Inhibitors (ACEI)
 - 1.4.2. Angiotensin Receptor Blockers (ARBs)
 - 1.4.3. Diuretics
 - 1.4.4. Beta-Blockers
- 1.5. Antiarrhythmics
 - 1.5.1. Class I
 - 1.5.2. Class II
 - 1.5.3. Class III
 - 1.5.4. Class IV
- 1.6. Drugs for the Treatment of Coronary Heart Disease
 - 1.6.1. Platelet Aggregation Inhibitors
 - 1.6.2. Beta-Blockers
 - 1.6.3. Nitrates
 - 1.6.4. Angiotensin-Converting Enzyme Inhibitors (ACEI)
- 1.7. Anticoagulants
 - 1.7.1. Oral Anticoagulants
 - 1.7.2. Vitamin K Antagonists
 - 1.7.3. Direct Thrombin Inhibitors
 - 1.7.4. Parenteral Anticoagulants
- 1.8. Drugs in the Treatment of Deep Vein Thrombosis and Pulmonary Embolism
 - 1.8.1. Pathophysiology of Deep Vein Thrombosis
 - 1.8.2. Pharmacology of Anticoagulants Used in the Treatment of DVT and PE
 - 1.8.3. Thrombolytic Drugs
 - 1.8.4. Anticoagulant Therapy in the Acute and Chronic Management of DVT and PE
- 1.9. Drugs in the Treatment of Angina Pectoris
 - 1.9.1. Pathophysiology of Angina Pectoris
 - 1.9.2. Fundamentals on Cardiovascular Pharmacology
 - 1.9.3. Classification of Drugs for the Treatment of Angina Pectoris
 - 1.9.4. Use of Beta-Blockers in the Management of Angina Pectoris: Indications and Mechanisms of Action
- 1.10. Drugs in the Treatment of Pulmonary Hypertension
 - 1.10.1. Pathophysiology of Pulmonary Hypertension
 - 1.10.2. Fundamentals on Cardiovascular Pharmacology
 - 1.10.3. Pharmacology of PDE5 inhibitors in the Treatment of Pulmonary Hypertension
 - 1.10.4. Pharmacology of Soluble Guanylate Cyclase Stimulators in the Treatment of Pulmonary Hypertension

Module 2. Pharmacology of the Respiratory System

- 2.1. Asthmatic Exacerbation
 - 2.1.1. Underlying Mechanisms
 - 2.1.2. Emerging Therapies
 - 2.1.3. Risk Factors
 - 2.1.4. Prevention Strategies
- 2.2. Acute Exacerbation of Chronic Obstructive Pulmonary Disease (COPD)
 - 2.2.1. Antibiotics
 - 2.2.2. Medical Treatment
 - 2.2.3. Oxygen Therapy
 - 2.2.4. Prevention strategies
- 2.3. Allergic Reaction
 - 2.3.1. Classification of Allergies
 - 2.3.2. Types of Allergies
 - 2.3.3. Diagnosis
 - 2.3.4. Immunotherapy
- 2.4. Anaphylaxis
 - 2.4.1. Clinical diagnosis
 - 2.4.2. Emergency Treatment
 - 2.4.3. Idiopathic Anaphylaxis
 - 2.4.4. Anaphylaxis in Pediatrics
- 2.5. Steven-Johnson Syndrome (SJS) and Toxic Epidermal Necrolysis (TEN)
 - 2.5.1. Risk Factors and Triggers for SJS and TEN
 - 2.5.2. Clinical and Differential Diagnosis of JSS and TEN
 - 2.5.3. Emergency Management and Treatment of JSS and TEN
 - 2.5.4. Role of Drugs and Infectious Agents in the Development of JSS and TEN
- 2.6. Rapid Induction and Intubation Sequence (SIIR)
 - 2.6.1. Indications and Contraindications for SIIR
 - 2.6.2. Complications and Risks Associated with SIIR and its Management
 - 2.6.3. Techniques and Approaches for Rapid and Safe Intubation in Emergency Situations
 - 2.6.4. Monitoring and Assessment during SIIR
- 2.7. Postintubation Sedoanalgesia
 - 2.7.1. Pharmacology of Sedative and Analgesic Agents
 - 2.7.2. Assessment and Monitoring of the Level of Sedation
 - 2.7.3. Strategies for Pain Control in Postintubation Patients
 - 2.7.4. Differences in Sedation and Analgesia According to the Type of Unit
- 2.8. Pharmacology of Bronchodilators
 - 2.8.1. Action Mechanisms of Bronchodilators
 - 2.8.2. Classification of Bronchodilators According to their Duration of Action and Potency
 - 2.8.3. Short-Acting versus Long-Acting Bronchodilators
 - 2.8.4. Adverse Effects and Safety of Bronchodilators
- 2.9. Principles of Pharmacokinetics and Pharmacodynamics as Applied to Respiratory Drugs
 - 2.9.1. Principles of Absorption, Distribution, Metabolism and Excretion of Respiratory Drugs
 - 2.9.2. Influence of Age, Gender and Pathological Conditions
 - 2.9.3. Assessment of the Bioavailability of Respiratory Drugs
 - 2.9.4. Optimization of Respiratory Drug Formulations for Better Absorption and Bioavailability
- 2.10. Pharmacology of Antibiotics and Antivirals in Respiratory Infections
 - 2.10.1. Classification of Antibiotics and Antivirals Used in Respiratory Infections
 - 2.10.2. Mechanisms of Action of Antibiotic and Antivirals
 - 2.10.3. Resistance to Antibiotics and Antiviral
 - 2.10.4. Rational Use of Antibiotics and Antiviral

Module 3. Pharmacology of Epilepsy, Migraine and Myasthenia Gravis

- 3.1. Adult Patient Seizures
 - 3.1.1. Classification of Seizures
 - 3.1.2. Differential diagnosis and clinical evaluation
 - 3.1.3. Neuroimaging Studies in Diagnosis
 - 3.1.4. Pharmacological Treatment of Seizures in the Adult Patient
- 3.2. Seizures in the Pediatric Patient
 - 3.2.1. Classification of Seizures in the Pediatric Patient
 - 3.2.2. Differential Diagnosis and Clinical Assessment of Seizures in the Pediatric Patient
 - 3.2.3. Neuroimaging Studies in the Diagnosis of Seizures in the Pediatric Patient
 - 3.2.4. Febrile Seizures in Childhood
- 3.3. Status Epilepticus (SE) in the Adult Patient
 - 3.3.1. Diagnosis and Clinical Assessment of Status Epilepticus
 - 3.3.2. Neurophysiological Assessment and Neuroimaging in Status Epilepticus
 - 3.3.3. Causes and Trigger Factors of Status Epilepticus in Adults
 - 3.3.4. Emergency Management and Treatment of Status Epilepticus in the Adult Patient
- 3.4. SE in the Pediatric Patient
 - 3.4.1. Diagnosis and Clinical Assessment of Status Epilepticus in the Pediatric Patient
 - 3.4.2. Neurophysiological Assessment and Neuroimaging in Pediatric Status Epilepticus
 - 3.4.3. Causes and Trigger Factors of Status Epilepticus in Children
 - 3.4.4. Emergency Management and Treatment of Status Epilepticus in the Pediatric Patient
- 3.5. Management of Myasthenia Gravis (MG)
 - 3.5.1. Classification of Myasthenia Gravis
 - 3.5.2. Pharmacological Treatment of Myasthenia Gravis
 - 3.5.3. Management of Myasthenic Crisis and Acute Exacerbations of Myasthenia Gravis
 - 3.5.4. Immunomodulatory and Biological Therapies in Myasthenia Gravis
- 3.6. Headache and Migraine in the Adult Patient
 - 3.6.1. Classification of Primary and Secondary Headaches
 - 3.6.2. Clinical Assessment and Differential Diagnosis of Headache and Migraine in the Adult Patient
 - 3.6.3. Initial Therapeutic Approach and Management of Episodic Migraine
 - 3.6.4. Migraine Prophylaxis and Prevention of Chronic Headaches
- 3.7. Headache and Migraine in the Pediatric Patient
 - 3.7.1. Classification of Primary and Secondary Headaches in Children
 - 3.7.2. Clinical Assessment and Differential Diagnosis of Headache and Migraine in the Pediatric Patient
 - 3.7.3. Differences in the Presentation and Manifestation of Migraine in Children and Adults
 - 3.7.4. Acute Pharmacological Treatment of Migraine Attacks in Children
- 3.8. Hypertensive Emergencies
 - 3.8.1. Classification and Categories of Hypertensive Emergency
 - 3.8.2. Clinical Assessment and Diagnosis of the Hypertensive Emergency
 - 3.8.3. Complementary Tests and Laboratory Studies for the Assessment of Hypertensive Emergencies
 - 3.8.4. Differentiation between Hypertensive Emergency and Hypertensive Urgency
- 3.9. Principles of Pharmacokinetics and Pharmacodynamics Applied to Epilepsy Drugs
 - 3.9.1. Pharmacokinetics of Antiepileptic Drugs
 - 3.9.2. Pharmacological Interactions of Antiepileptic Drugs
 - 3.9.3. Combination Treatment Strategies
 - 3.9.4. Use of Antiepileptic Drugs in Special Populations
- 3.10. Emerging and Developing Therapies for Migraine Treatment
 - 3.10.1. Therapies Specifically Targeting the Pathophysiology of Migraine
 - 3.10.2. Monoclonal Therapies Directed Against Calcitonin Gene-Related Peptide (CGRP) in Migraine
 - 3.10.3. PDE4 Inhibitors as an Emerging Treatment for Migraine
 - 3.10.4. Use of Monoclonal Antibodies in the Prophylactic Treatment of Migraine

Module 4. Pharmacology of the Central Nervous System

- 4.1. Ischemic Stroke
 - 4.1.1. Advances in the Early Diagnosis of Ischemic Stroke
 - 4.1.2. Assessment and Classification of the Risk of Ischemic Stroke in Asymptomatic Patients
 - 4.1.3. Thrombolytic Treatment Strategies in the Acute Phase of Ischemic Stroke
 - 4.1.4. Biomarkers in Ischemic Stroke
- 4.2. Management of Hypertension in Acute Ischemic Stroke
 - 4.2.1. Current Guidelines and Protocols for the Management of Hypertension in Acute Ischemic Stroke
 - 4.2.2. Pharmacological Treatment of Hypertension in the Acute Phase of Ischemic Stroke
 - 4.2.3. Blood Pressure Control Strategies in Ischemic Stroke with Thrombolytic Therapy
 - 4.2.4. Endovascular Therapy and Blood Pressure Control in Acute Ischemic Stroke
- 4.3. Oropharyngeal Angioedema Caused by Alteplase
 - 4.3.1. Risk Factors for the Development of Oropharyngeal Angioedema after Alteplase Administration
 - 4.3.2. Clinical and Differential Diagnosis of Oropharyngeal Angioedema in Patients Treated with Alteplase
 - 4.3.3. Management and Treatment of Acute Oropharyngeal Angioedema Caused by Alteplase
 - 4.3.4. Assessment and Follow-up of Patients with a History of Oropharyngeal Angioedema prior to Alteplase Administration
- 4.4. Hemorrhagic Stroke: Intracerebral Hemorrhage (ICH)
 - 4.4.1. Diagnosis and Classification of Intracerebral Hemorrhage in Hemorrhagic Ictus
 - 4.4.2. Medical and Pharmacological Treatment of Acute Intracerebral Hemorrhage
 - 4.4.3. Neurosurgical and Endovascular Management of Intracerebral Hemorrhage
 - 4.4.4. Multidisciplinary Approach in the Care of the Patient with Intracerebral Hemorrhage
- 4.5. Cerebral Edema
 - 4.5.1. Cytotoxic versus Vasogenic Cerebral Edema
 - 4.5.2. Clinical Assessment and Diagnostic Imaging of Cerebral Edema
 - 4.5.3. Pharmacological Strategies for the Reduction of Cerebral Edema in Specific Pathologies
 - 4.5.4. Effect of Cerebral Edema
- 4.6. Opioid Overdose
 - 4.6.1. Pharmacokinetics and Pharmacodynamics of Opioids Involved in Overdose
 - 4.6.2. Role of the Hospital Pharmacist in Opioid Overdose Prevention and Education
 - 4.6.3. Management of Opioid Withdrawal in the Hospital Setting
 - 4.6.4. Naloxone and its Use as an Antidote in Opioid Overdose Reversal
- 4.7. Opioid Withdrawal Syndrome
 - 4.7.1. Epidemiology and Risk Factors for the Development of Opioid Withdrawal Syndrome
 - 4.7.2. Clinical Assessment and Diagnosis of Opioid Withdrawal Syndrome in Hospitalized Patients
 - 4.7.3. Pharmacological Management of Opioid Withdrawal Syndrome in the Hospital Setting
 - 4.7.4. Use of Opioid Agonist and Antagonist Drugs in the Treatment of Withdrawal Syndrome
- 4.8. Agitated Patient Management
 - 4.8.1. Epidemiology and Risk Factors Associated with Agitation in Hospitalized Patients
 - 4.8.2. Pharmacotherapy for the Management of Acute Agitation in Hospitalized Patients
 - 4.8.3. Use of Antipsychotics and Benzodiazepines in the Treatment of Agitation
 - 4.8.4. Safety and Prevention of Complications in the Management of the Agitated Patient
- 4.9. Acute Pain Management in the Substance Abuse Patient
 - 4.9.1. Pharmacological Interactions between Analgesics and Substances of Abuse
 - 4.9.2. Pharmacological Strategies for the Management of Acute Pain in Patients with Opioid Abuse
 - 4.9.3. Acute Pain Treatment in Alcohol Abuse Patients
 - 4.9.4. Assessment and Management of Addiction Risk in Patients with Substance Abuse Requiring Analgesia
- 4.10. Alcohol Withdrawal Syndrome
 - 4.10.1. Clinical Assessment and Diagnosis of Alcohol Withdrawal Syndrome in Hospitalized Patients
 - 4.10.2. Pharmacotherapy for the Management of Alcohol Withdrawal Syndrome in the Hospital Setting
 - 4.10.3. Use of Benzodiazepines and Other Drugs in the Treatment of Alcohol Withdrawal Syndrome
 - 4.10.4. Role of the Hospital Pharmacist in the Management of Alcohol Withdrawal Syndrome

Module 5. Pharmacology of the Gastrointestinal System

- 5.1. Chronic Hepatic Disease
 - 5.1.1. Diagnosis and Classification of Chronic Liver Diseases
 - 5.1.2. Biomarkers and Liver Function Tests in Diagnosis and Follow-up
 - 5.1.3. Strategies for Management and Prevention of Disease Progression
 - 5.1.4. Pharmacological Treatment of Chronic Liver Disease
- 5.2. Upper Gastrointestinal Bleeding (UGIB)
 - 5.2.1. Epidemiology and Risk Factors Associated to Upper Gastrointestinal Bleeding
 - 5.2.2. Classification and Etiology of Upper Gastrointestinal Bleeding
 - 5.2.3. Diagnosis and Early Detection Methods of UGIB
 - 5.2.4. Pharmacological Treatment of UGIB
- 5.3. Spontaneous Bacterial Peritonitis (SBP)
 - 5.3.1. Anatomy and Physiology of the Peritoneum and its Relationship with SBP
 - 5.3.2. Clinical Diagnosis and Detection Methods of Spontaneous Bacterial Peritonitis
 - 5.3.3. Assessment and Classification of Patients with SBP
 - 5.3.4. Pharmacological Treatment of Spontaneous Bacterial Peritonitis
- 5.4. Hydroelectrolytic Alterations
 - 5.4.1. Sodium
 - 5.4.2. Chlorine
 - 5.4.3. Potassium
 - 5.4.4. Phosphorus
- 5.5. *Clostridium Difficile* Infection (CDI)
 - 5.5.1. Epidemiology and Risk Factors Associated to CDI
 - 5.5.2. CDI Diagnosis
 - 5.5.3. Clinical Assessment of the Patient with *Clostridium Difficile* Infection
 - 5.5.4. Pharmacological Treatment of CDI
- 5.6. Complicated Intra-Abdominal Infection (CABI)
 - 5.6.1. Epidemiology and risk factors associated to complicated intra-abdominal infection
 - 5.6.2. Etiology and Pathogenesis of CABI
 - 5.6.3. Clinical Assessment of the Patient with CABI
 - 5.6.4. Pharmacological Treatment of Complicated Intra-Abdominal Infection





- 5.7. Pancreatitis
 - 5.7.1. Epidemiology and Risk Factors Associated to Pancreatitis
 - 5.7.2. Etiology and Classification of Pancreatitis
 - 5.7.3. Clinical Diagnosis and Detection Methods of Pancreatitis
 - 5.7.4. Pharmacological Treatment of Acute and Chronic Pancreatitis
- 5.8. Irritable Bowel Syndrome
 - 5.8.1. Anatomy and Physiology of the Gastrointestinal System related to Irritable Bowel Syndrome
 - 5.8.2. Etiology and Pathogenesis of Irritable Bowel Syndrome
 - 5.8.3. Classification and Subtypes of IBS
 - 5.8.4. Pharmacological Treatment of Irritable Bowel Syndrome
- 5.9. Prokinetics and Antiemetics
 - 5.9.1. Anatomy and Physiology of the Gastrointestinal System and of Motility Control
 - 5.9.2. Classification and Mechanisms of Action of Prokinetics and Antiemetics
 - 5.9.3. Indications and Contraindications for the Use of Prokinetics and Antiemetics
 - 5.9.4. Pharmacological Treatment of Nausea and Vomiting Induced by Opioids and Other Drugs
- 5.10. Pharmacology of Drugs Used in Nutritional Therapy
 - 5.10.1. Classification and Types of Nutritional Therapy
 - 5.10.2. Drug Administration and Enteral Nutrition: Interactions and Special Considerations
 - 5.10.3. Medications Used for the Management of Malnutrition and Nutritional Support in Critically Ill Patients
 - 5.10.4. Antibiotics and Antifungals in Enteral and Parenteral Nutrition Patients

Module 6. Pharmacology of Infectious Diseases and Intoxications

- 6.1. Responsible Antibiotic Use
 - 6.1.1. Classification
 - 6.1.2. Mechanisms of Action
 - 6.1.3. Spectrum of Activity
 - 6.1.4. Principles of Antibiotic Pharmacokinetics and Pharmacodynamics
- 6.2. Urinary Tract Infections (UTIs)
 - 6.2.1. Anatomy and Physiology of the Urinary Tract Related to Urinary Tract Infection
 - 6.2.2. Etiology and Pathogenesis of UTIs
 - 6.2.3. Classification of Urinary Tract Infections
 - 6.2.4. Pharmacological Treatment of Urinary Tract Infection

- 6.3. Skin and Soft Tissue Infections (SSTIs)
 - 6.3.1. Anatomy and Physiology of Skin and Soft Tissues Related to SSTIs
 - 6.3.2. Classification and Types of Skin and Soft Tissue Infections
 - 6.3.3. Assessment of the Patient with SSTIs in the Hospital Setting
 - 6.3.4. Pharmacological Treatment of Skin and Soft Tissue Infections
- 6.4. Pneumonia
 - 6.4.1. Anatomy and Physiology of the Respiratory System in Relation to Pneumonia
 - 6.4.2. Etiology and Pathogenesis of Pneumonia
 - 6.4.3. Pneumonia Classification According to Etiology and Severity
 - 6.4.4. Pharmacological Treatment of Pneumonia
- 6.5. Meningitis
 - 6.5.1. Anatomy and Physiology of the Nervous System in Relation to Meningitis
 - 6.5.2. Classification of Meningitis by Causative Agent and Clinical Presentation
 - 6.5.3. Assessment and Classification of the Patient with Meningitis
 - 6.5.4. Pharmacological Treatment of Meningitis
- 6.6. Sepsis
 - 6.6.1. Anatomy and Physiology of the Immune System in Relation to Sepsis
 - 6.6.2. Etiology and Pathogenesis of Sepsis
 - 6.6.3. Classification and Stages of Sepsis
 - 6.6.4. Pharmacological Treatment of Sepsis
- 6.7. Acute Psychosis and Delirium
 - 6.7.1. Etiology and Pathogenesis of Acute Psychosis and Delirium
 - 6.7.2. Classification and Subtypes of Acute Psychosis and Delirium
 - 6.7.3. Assessment and Classification of Patients with Acute Psychosis and Delirium in the Hospital Setting
 - 6.7.4. Pharmacological Treatment of Acute Psychosis and Delirium

- 6.8. Acetylsalicylic Acid (ASA) Poisoning
 - 6.8.1. Toxicokinetics of Acetylsalicylic Acid in Poisoning
 - 6.8.2. Toxic Effects and Clinical Symptoms Associated with Acetylsalicylic Acid Poisoning
 - 6.8.3. Clinical Diagnosis and Detection Methods of ASA Poisoning
 - 6.8.4. Treatment and Pharmacotherapeutic Management of ASA Poisoning
- 6.9. Paracetamol Poisoning
 - 6.9.1. Toxicokinetics of Paracetamol in Poisoning
 - 6.9.2. Toxic Effects and Clinical Symptoms Associated with Paracetamol Poisoning
 - 6.9.3. Clinical Diagnosis and Detection Methods of Paracetamol Poisoning
 - 6.9.4. Treatment and Pharmacotherapeutic Management of Paracetamol Poisoning
- 6.10. Antidotes
 - 6.10.1. General Principles of Poisoning Management in the Hospital Setting
 - 6.10.2. Identification and Diagnosis of Poisonings and Intoxications
 - 6.10.3. Pharmacotherapeutic Management of Poisonings
 - 6.10.4. Use and Administration of Antidotes in Specific Poisonings

Module 7. Hospital Pharmacy Management

- 7.1. Human Resource Management in the Hospital Pharmacy Department
 - 7.1.1. Organization of the Hospital Pharmacy Department
 - 7.1.2. Roles of the Pharmaceutical Staff
 - 7.1.3. Performance Evaluation and Professional Development of the Pharmaceutical Staff
 - 7.1.4. Design of Education and Training Programs for Pharmaceutical Staff
- 7.2. Information Technologies Applied to Hospital Pharmacy Management
 - 7.2.1. Hospital Information Systems and their Integration with the Pharmacy Department
 - 7.2.2. Electronic Medical Records and Pharmacotherapeutic Registries in the Hospital Setting
 - 7.2.3. Automation and Robotics in the Preparation and Dispensing of Drugs
 - 7.2.4. Inventory Management and Stock Control Systems in the Pharmacy Department

- 7.3. Inventory Management and Pharmaceutical Logistics in Hospitals
 - 7.3.1. Organization and Structure of the Pharmacy Department in the Context of Hospital Logistics
 - 7.3.2. Selection and Assessment of Pharmaceutical Suppliers
 - 7.3.3. Receipt, Storage and Distribution of Drugs and Pharmaceuticals
 - 7.3.4. Rotation and Expiration of Inventory in the Hospital Setting
- 7.4. Pharmacoeconomics and Health Technology Assessment
 - 7.4.1. Methods and Techniques of Health Economic Analysis
 - 7.4.2. Analysis of Efficiency and Equity in the Use of Resources in the Health Sector
 - 7.4.3. Assessment of Health Outcomes and Health-Related Quality of Life
 - 7.4.4. Use of Health and Economic Indicators in Clinical and Administrative Decision-Making
- 7.5. Development and Monitoring of Protocols for the Use of Drugs in Hospitals
 - 7.5.1. The Role of the Hospital Pharmacist in the Development of Protocols
 - 7.5.2. Design and Development of Protocols for the Safe and Efficient Use of Drugs
 - 7.5.3. Implementation and Dissemination of Protocols in the Healthcare Team
 - 7.5.4. Integration of Medication Use Protocols with the Hospital Information System
- 7.6. Pharmacovigilance and Patient Safety in the Administration of Drugs
 - 7.6.1. Pharmacovigilance Systems and Databases in the Hospital Setting
 - 7.6.2. Reporting and Recording of Adverse Drug-Related Events
 - 7.6.3. Methods for the Early Detection of Adverse Drug Reactions
 - 7.6.4. Active and Passive Pharmacovigilance in the Hospital Pharmacy
- 7.7. Outpatient Clinical Pharmacy and Outpatient Care
 - 7.7.1. Models of Outpatient Pharmaceutical Care in the Hospital Setting
 - 7.7.2. Pharmaceutical Assessment of Outpatients: Collection and Analysis of Clinical and Pharmacotherapeutic Data
 - 7.7.3. Elaboration of Pharmacological Treatment Plans and Outpatient Monitoring
 - 7.7.4. Use of Information Technologies in Outpatient Pharmaceutical Care
- 7.8. Quality Management and Ongoing Improvement in the Hospital Pharmacy
 - 7.8.1. Quality Standards Applicable to the Hospital Pharmacy
 - 7.8.2. Implementation of Quality Management Systems
 - 7.8.3. Assessment and Improvement of Processes in the Hospital Pharmacy Area
 - 7.8.4. Internal and External Audits in Quality Management in the Hospital Pharmacy

- 7.9. Integration of Hospital Pharmacy in Multidisciplinary Healthcare Teams
 - 7.9.1. Models of Interprofessional and Multidisciplinary Care in the Hospital Setting
 - 7.9.2. Roles and Responsibilities of the Pharmacist in Multidisciplinary Healthcare Teams
 - 7.9.3. Effective Communication and Collaboration Among Healthcare Professionals in the Hospital Setting
 - 7.9.4. Clinical Cases and Case Discussion in Multidisciplinary Teams
- 7.10. Project Management and Strategic Planning in the Hospital Pharmacy
 - 7.10.1. Processes and Methodologies for Project Management in the Field of Hospital Pharmacy
 - 7.10.2. Identification and Development of Pharmaceutical Projects in the Hospital
 - 7.10.3. Planning and Organization of Resources for the Implementation of Projects
 - 7.10.4. Implementation and Follow-up of Pharmaceutical Projects

Module 8. Pharmacology of Surgical and Polytraumatized Patients

- 8.1. Triage
 - 8.1.1. Triage in Emergency and Disaster Situations
 - 8.1.2. Triage Systems Used in the Hospital Setting and Their Characteristics
 - 8.1.3. Role of the Pharmacist in the Triage Process and Emergency Care
 - 8.1.4. Pharmaceutical Triage Protocols in Different Clinical Scenarios
- 8.2. Resuscitation in the Polytrauma Patient (PTP)
 - 8.2.1. Hospital Pharmacy in the PTP Resuscitation Team
 - 8.2.2. Pharmacology of Resuscitation: Drugs and Therapies Used in PTP
 - 8.2.3. Fluid Therapy in the Polytrauma Patient: Types of Solutions and Considerations
 - 8.2.4. Analgesia and Sedation in the Polytrauma Patient
- 8.3. Cranioencephalic Trauma (CET)
 - 8.3.1. Classification and Severity of CET
 - 8.3.2. Pain Management and Sedation in Patients with CET
 - 8.3.3. Treatment of Intracranial Hypertension
 - 8.3.4. Use of Neuroprotective Agents in CET
- 8.4. Reversal of Anticoagulants
 - 8.4.1. Importance of Anticoagulant Reversal in Specific Clinical Situations
 - 8.4.2. Risk-benefit Assessment in Anticoagulant Reversal
 - 8.4.3. Reversal of Unfractionated Heparin (UFH) and Low Molecular Weight Heparin (LMWH)
 - 8.4.4. Antidotes and Reversal Agents for Direct Oral Anticoagulants (DOACs)

- 8.5. Acute Pain Management
 - 8.5.1. Classification and Assessment Scales of Acute Pain
 - 8.5.2. Principles and Guidelines for Pharmacological Management of Acute Pain
 - 8.5.3. Multimodal Analgesia
 - 8.5.4. Intravenous, Oral and Transdermal Analgesia
- 8.6. Spinal Shock
 - 8.6.1. Assessment and Classification of Spinal Shock
 - 8.6.2. Medications to Stabilize Blood Pressure in Spinal Shock
 - 8.6.3. Pain Management in Patients with Spinal Shock
 - 8.6.4. Neuroprotective Agents in Spinal Shock
- 8.7. Hypovolemic Shock
 - 8.7.1. Assessment and Classification of Hypovolemic Shock
 - 8.7.2. Fluid Therapy and Fluid Volume Replacement in Hypovolemic Shock
 - 8.7.3. Types of Solutions and Electrolytes used in Fluid Volume Replacement
 - 8.7.4. Use of Vasoactive Agents in the Management of Hypovolemic Shock
- 8.8. Penetrating Trauma
 - 8.8.1. Assessment and Classification of Patients with Penetrating Trauma
 - 8.8.2. Initial Management and Pharmacologic Stabilization of the Trauma Patient
 - 8.8.3. Use of Hemostatic Agents and Pharmacologic Hemostasis
 - 8.8.4. Antibiotherapy in Patients with Penetrating Trauma
- 8.9. Open Fractures
 - 8.9.1. Initial Assessment and Emergency Management of Patients with Open Fractures
 - 8.9.2. Use of Analgesia and Sedation in Patients with Open Fractures
 - 8.9.3. Adjuvant Therapies in the Acceleration of Bone Healing
 - 8.9.4. Use of Analgesics and Anti-inflammatory Drugs in the Management of Pain in Open Fractures
- 8.10. Moderate Sedation
 - 8.10.1. Indications and Contraindications of Moderate Sedation
 - 8.10.2. Assessment and Selection of the Appropriate Level of Sedation for Each Patient
 - 8.10.3. Management of Anxiety and Pain in Procedures with Moderate Sedation
 - 8.10.4. Monitoring and Patient Safety during Moderate Sedation

Module 9. Pharmacology of the Genitourinary, Obstetric and Gynecologic System

- 9.1. Sexual Assault
 - 9.1.1. Medical and Pharmacological Considerations in the Immediate Care of Victims of Sexual Assault
 - 9.1.2. Pharmacotherapy for the Prevention and Treatment of Sexually Transmitted Infections (STIs)
 - 9.1.3. Post-Exposure Prophylaxis (PEP) for HIV and other STIs in Victims of Sexual Assault
 - 9.1.4. Pharmacologic Therapy to Prevent and Treat Physical Injuries and Psychological Complications
- 9.2. Sexually Transmitted Diseases
 - 9.2.1. Epidemiology of Sexually Transmitted Diseases
 - 9.2.2. Prevention and Promotion of Sexual Health in At-risk Populations
 - 9.2.3. Pharmacotherapy for the Prevention and Treatment of Sexually Transmitted Diseases (STDs)
 - 9.2.4. Post-Exposure Prophylaxis (PEP) for HIV and other STIs
- 9.3. Gestational Hypertension
 - 9.3.1. Classification and Diagnosis of Gestational Hypertension
 - 9.3.2. Pharmacology of Drugs Used in the Management of Gestational Hypertension
 - 9.3.3. Monitoring and Control of Blood Pressure in Pregnant Women
 - 9.3.4. Pharmacological Management of Mild and Severe Gestational Hypertension
- 9.4. Venous Thromboembolism
 - 9.4.1. Classification and Diagnosis of Venous Thromboembolism
 - 9.4.2. Pharmacology of Anticoagulants Used in the Treatment of VTE
 - 9.4.3. Use of Parenteral and Oral Anticoagulants in the Management of VTE
 - 9.4.4. VTE Prophylaxis in Hospitalized and Surgical Patients
- 9.5. Acute Uncomplicated Cystitis
 - 9.5.1. Classification and Diagnosis of Acute Cystitis
 - 9.5.2. Pharmacology of Antibiotics Used in the Treatment of Acute Cystitis
 - 9.5.3. Use of Analgesic Drugs in the Relief of Pain in Acute Cystitis
 - 9.5.4. Alternatives to Antibiotics in the Treatment of Acute Cystitis
- 9.6. Urinary Tract Infections
 - 9.6.1. Classification and Diagnosis of Urinary Tract Infections
 - 9.6.2. Pharmacology of Antibiotics Used in the Treatment of the UTIs
 - 9.6.3. Use of Analgesic Drugs in Pain Relief in the UTIs
 - 9.6.4. Treatment of Complicated and Recurrent Urinary Tract Infections

- 9.7. Principles of Pharmacokinetics and Pharmacodynamics Applied to Gynecologic Drug Medications
 - 9.7.1. Principles of Absorption
 - 9.7.2. Principles of Metabolism
 - 9.7.3. Principles of Excretion
 - 9.7.4. Relevant Drug Interactions in the Area of Gynecology
- 9.8. Pharmacology of Drugs Used in the Genitourinary System
 - 9.8.1. Drugs Used in the Treatment of Urinary Tract Infections (UTIs)
 - 9.8.2. Drugs for the Treatment of Erectile Dysfunction and Other Sexual Disorders
 - 9.8.3. Pharmacotherapy in the Management of Benign Prostatic Hyperplasia (BPH)
 - 9.8.4. Drugs for the Management of Kidney Diseases, such as Nephritis and Chronic Kidney Disease (CKD)
- 9.9. Pharmacology of the Obstetric System
 - 9.9.1. Pharmacology of Prenatal Supplements and Micronutrients Used in Pregnancy
 - 9.9.2. Drugs Used in the Treatment of Nausea and Vomiting During Pregnancy
 - 9.9.3. Drugs for the Management of Hypertensive Disorders in Pregnancy (Preeclampsia and Eclampsia)
 - 9.9.4. Use of Drugs in the Prevention and Treatment of Infections During Pregnancy
- 9.10. Pathophysiology of Menstrual Disorders
 - 9.10.1. Menstrual Bleeding Disorders: Menorrhagia, Metrorrhagia and Hypomenorrhea
 - 9.10.2. Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD)
 - 9.10.3. Endometriosis: Pathological Mechanisms and Clinical Manifestations
 - 9.10.4. Polycystic Ovary Syndrome (PCOS): Characteristics and Consequences

Module 10. Pharmacology of Oncohematologic Emergencies

- 10.1. Venous Thromboembolism in the Oncohematologic Patient
 - 10.1.1. Epidemiology and Risk Factors of VTE in Oncohematologic Patients
 - 10.1.2. Diagnosis and Classification of Venous Thromboembolism in Patients With Hematologic Cancers
 - 10.1.3. Pharmacology of Anticoagulants Used in the Treatment and Prevention of VTE in Oncohematologic Patients
 - 10.1.4. Use of Thrombolytics in Severe Cases of VTE in Oncohematological Patients
- 10.2. Tumor Lysis Syndrome
 - 10.2.1. Classification and Diagnosis of Tumor Lysis Syndrome
 - 10.2.2. Use of Allopurinol and Rasburicase in the Prevention and Management of Hyperuricemia in TLS
 - 10.2.3. Treatment of Electrolyte Disturbances in the Tumor Lysis Syndrome
 - 10.2.4. Pharmacologic Management of Hyperkalemia in Patients with TLS
- 10.3. Tumor-Related Hypercalcemia
 - 10.3.1. Mechanisms of Action of Tumors to Provoke Hypercalcemia
 - 10.3.2. Types of Tumors Associated with Hypercalcemia
 - 10.3.3. Diagnosis and Classification of Tumor-Related Hypercalcemia
 - 10.3.4. Risk Assessment and Prognostic Factors in Patients with Tumor-Related Hypercalcemia
- 10.4. Febrile Neutropenia
 - 10.4.1. Mechanisms of Action of Tumors to Provoke Hypercalcemia
 - 10.4.2. Types of Tumors Associated with Hypercalcemia
 - 10.4.3. Diagnosis and Classification of Tumor-Related Hypercalcemia
 - 10.4.4. Risk Assessment and Prognostic Factors in Patients with Tumor-Related Hypercalcemia
- 10.5. Sickle Cell Disease
 - 10.5.1. Genetics and Inheritance of Sickle Cell Disease
 - 10.5.2. Diagnosis and Classification of Sickle Cell Disease
 - 10.5.3. Pharmacology of Drugs Used in the Treatment and Management of SCD
 - 10.5.4. Use of Hydroxyurea in the Treatment and Prevention of Vaso-Occlusive Crises

- 10.6. Mechanisms of Development and Progression of Oncohematological Diseases
 - 10.6.1. Genetics and Molecular Biology of Normal and Cancerous Hematopoietic Cells
 - 10.6.2. Mechanisms of Malignant Transformation of Hematopoietic Cells
 - 10.6.3. Role of Genetic Mutations in Hematologic Oncogenesis
 - 10.6.4. Tumor Microenvironment and its Influence on the Progression of Oncohematological Diseases
- 10.7. Pharmacology of Drugs Used in Oncohematological Emergencies
 - 10.7.1. Pharmacology of Drugs Used in the Stabilization and Life Support of Oncohematological Patients
 - 10.7.2. Pharmacological Management of Acute Hematological Complications, such as Severe Anemia and Thrombocytopenia
 - 10.7.3. Pharmacotherapy in Cases of Febrile Neutropenia in Patients With Blood Cancers
 - 10.7.4. Use of Drugs for Acute Pain Control in Oncohematologic Patients
- 10.8. Treatment of Febrile Neutropenia
 - 10.8.1. Etiology and Risk Factors of Febrile Neutropenia in Oncologic and Hematologic Patients
 - 10.8.2. Diagnosis and Classification of Febrile Neutropenia
 - 10.8.3. Pharmacology of Antibiotics used in the Empirical Treatment of Febrile Neutropenia
 - 10.8.4. Use of Colony Stimulating Factors (G-CSF) in the Management of Febrile Neutropenia
- 10.9. Treatment of Tumor Lysis Syndrome
 - 10.9.1. Risk Factors and Prediction of the Risk of Developing Tumor Lysis Syndrome
 - 10.9.2. Diagnosis and Classification of Tumor Lysis Syndrome
 - 10.9.3. Pharmacology of Drugs used in the Prophylaxis and Treatment of Tumor Lysis Syndrome
 - 10.9.4. Use of Allopurinol and Rasburicase in the Prevention and Management of Hyperuricemia in TLS
- 10.10. Leukemia and Lymphoma Emergencies
 - 10.10.1. Oncohematological Emergencies
 - 10.10.2. Leukemia Acute Emergencies
 - 10.10.3. Pharmacology of Induction and Consolidation Treatments in Acute Leukemias
 - 10.10.4. Treatment of Infectious Complications in Patients with Leukemia and Lymphoma



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This program will allow you to advance in your career in a comfortable and flexible way, thanks to the state-of-the-art Relearning methodology"

07

Clinical Internship

After passing the online theoretical period, the program includes a practical internship in a reference hospital pharmacy department. There, the graduates will have at their disposal the support of a personal tutor, who will accompany them throughout the process, both in the preparation and in the development of the internship.



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Through this program, you will be able to do your internship in a prestigious hospital center, alongside renowned professionals in the pharmaceutical field. Enroll now!”

Paragraphs before table modules. The Internship Program of this Hybrid Master's Degree in Hospital Pharmacy consists of an intensive internship in a hospital pharmacy department, lasting 3 weeks, from Monday to Friday, with 8 consecutive hours of work, alongside an associate specialist. This internship will allow the graduate to work with real patients alongside a team of reference pharmacists, planning a state-of-the-art therapy for each pathology.

In this practical internship program, the activities will be directed towards the development and improvement of the competencies necessary for the pharmaceutical care of patients, which will require a high level of qualification. In addition, it will be oriented towards specific qualification for the practice of the activity, in an environment of safety for the patient and high professional performance for the student.

It is, without a doubt, a unique opportunity to learn by working, treating in real time patients who require specific medication for their treatments. This is a new way of understanding and integrating pharmaceutical processes, in an ideal teaching scenario, designed to develop this innovative experience.

The practical part will be carried out with the active participation of the student performing the activities and procedures of each area of competence (learning to learn and learning to do), with the accompaniment and guidance of professors and other learning partners that facilitate teamwork and multidisciplinary integration as transversal skills for the practice of Hospital Pharmacy (learning to be and learning to relate).



The procedures described below will form the basis of the practical part of the internship, and its implementation is subject to both the suitability of the patients and the availability of the center and its workload, with the proposed activities being as follows:

Module	Practical Activity
Research work	Observe and become familiar with the daily operations of the hospital pharmacological center
	Participate in the review and update of the department's Standard Operating Procedures (SOP)
	Collaborate in the performance of pharmacoeconomics studies and cost analyses
	Cooperate in ethics committees and clinical research protocols
Education and innovation projects	Participate in the continuous development and updating of the pharmacological department staff
	Collaborate in the research and development of new pharmacological protocols
	Assistance in the implementation of information systems and health technologies in the pharmacological field
	Cooperate in the review and updating of continuing education for pharmaceutical staff
Pharmaceutical inventory management	Manage drug inventories and ensure their proper storage
	Assist in the receipt, classification and distribution of medicines and pharmaceutical products
	Assist in the management of waste and expired pharmaceuticals in a safe and environmentally responsible manner
	Monitor temperature and environmental conditions for proper storage of medications
	Coordinate contracts with pharmaceutical suppliers

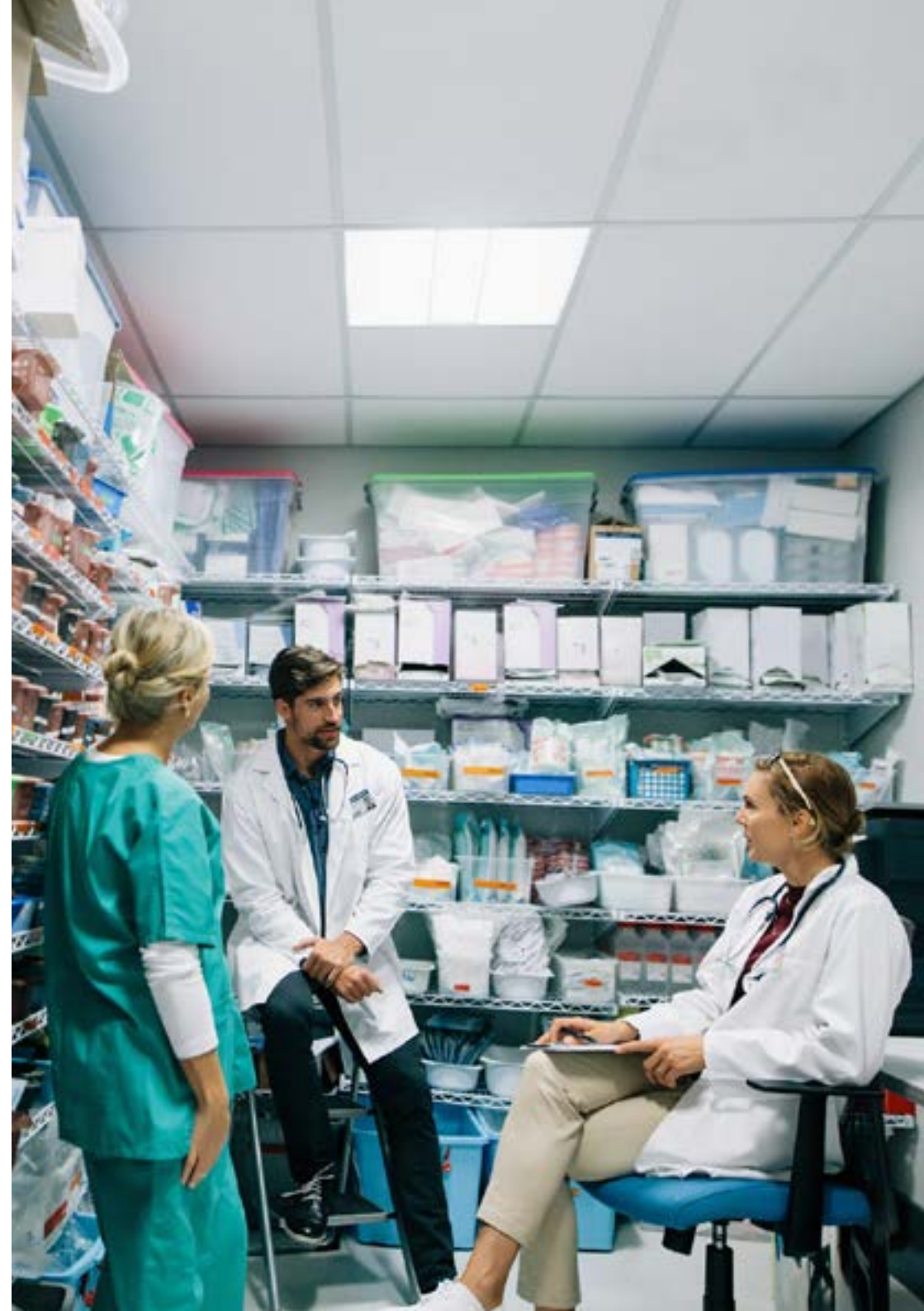
Preparation and dispensing of medications	Prepare and dispense medications under the supervision of professional pharmacists
	Contribute to the verification of prescriptions and ensure compliance with legal and ethical regulations
	Collaborate in the identification and management of adverse drug-related events
	Manage clinical and pharmaceutical information in electronic systems
	Assist in the elaboration of monitoring and evaluation reports of pharmacological department activities
Patient care	Cooperate in patient care, providing information on medications and possible interactions
	Collaborate in the organization and implementation of patient education programs on the proper use of medications
	Participate in the promotion of pharmacovigilance and adverse reaction reporting
	Intervene in the implementation of measures for the prevention of medication errors

Civil Liability Insurance

This institution's main concern is to guarantee the safety of the learners and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this entity commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical learning period. That way professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.



General Conditions of the Internship Program

The general terms and conditions of the internship agreement for the program are as follows:

1. TUTOR: During the Hybrid Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

2. DURATION: The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

3. ABSENCE: If the students does not show up on the start date of the Hybrid Master's Degree, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

4. CERTIFICATION: Professionals who pass the Hybrid Master's Degree will receive a certificate accrediting their stay at the center.

5. EMPLOYMENT RELATIONSHIP: the Hybrid Master's Degree shall not constitute an employment relationship of any kind.

6. PRIOR EDUCATION: Some centers may require a certificate of prior education for the Hybrid Master's Degree. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

7. DOES NOT INCLUDE: The Hybrid Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed.

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

08

Where Can I Do the Clinical Internship?

This Hybrid Master's Degree includes in its itinerary a practical internship in a prestigious hospital pharmacy department, where students will put into practice everything they have learned in the field of Hospital Pharmacy. In this sense, and in order to bring this program closer to more professionals, TECH will offer the opportunity to take it in different hospitals around your country. In this way, the institution strengthens its commitment to quality and affordable education for all.





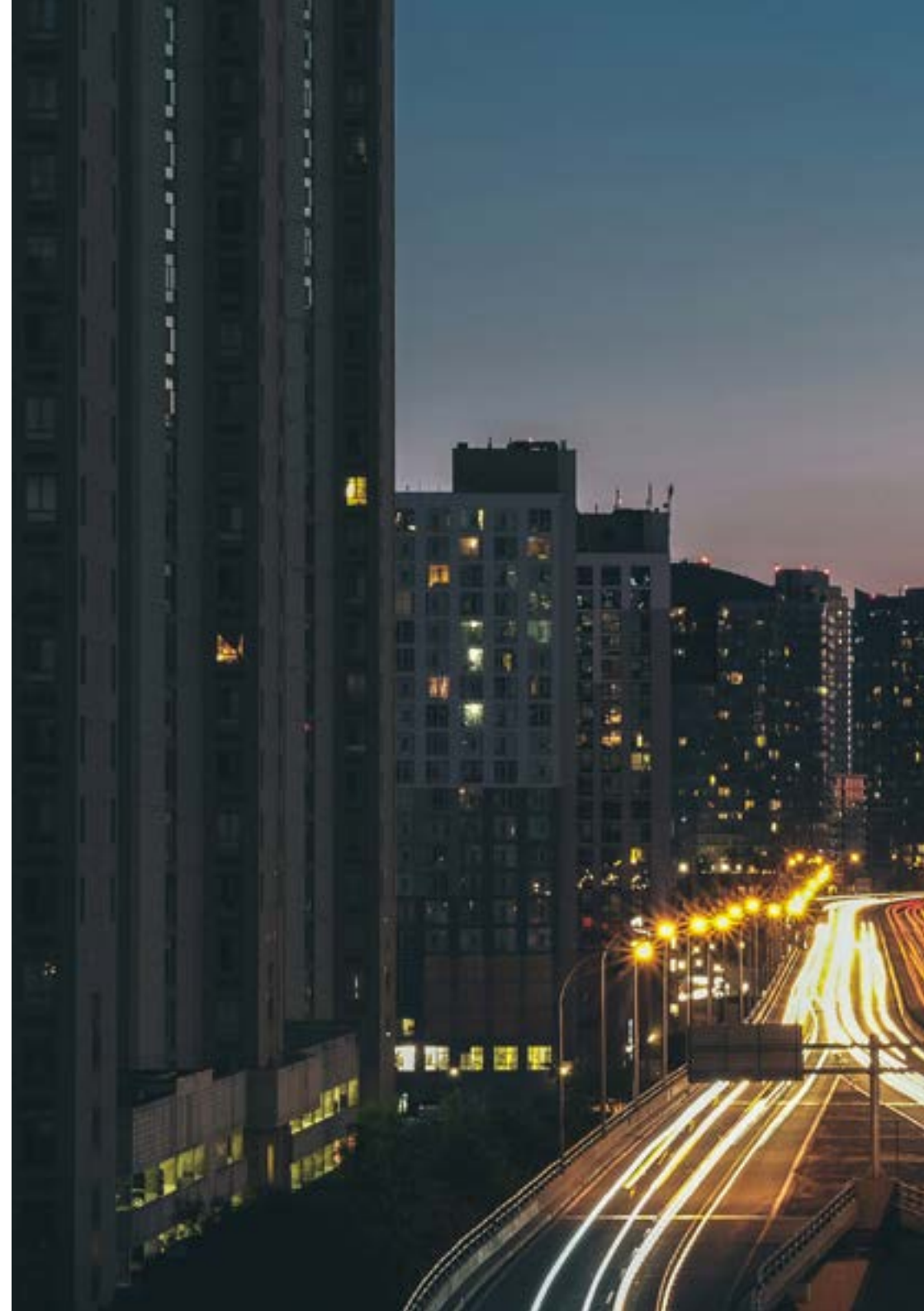
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You will complete your theoretical education with the best practical internship in the market. Achieve success thanks to this TECH program!"

tech 48 | Where Can I Do the Clinical Internship?



The student will be able to complete the practical part of this Hybrid Master's Degree at the following centers:





“

Boost your career path with holistic teaching, allowing you to advance both theoretically and practically”

09

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 be confronted with multiple simulated clinical cases based on real patients, in which they will have to investigate, establish hypotheses and ultimately, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Pharmacists learn better, more quickly 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. Gervas, 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, attempting to recreate the actual conditions in a pharmacist's professional practice.

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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. Pharmacists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their 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.

Our 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, which represent a real revolution with respect to simply studying and analyzing cases.

Pharmacists 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, more than 115,000 pharmacists have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. This pedagogical methodology is developed in a highly demanding environment, with a university student body with a high socioeconomic profile and an average age of 43.5 years.

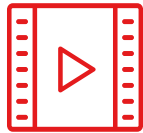
Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.

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 created specifically for the course by specialist pharmacists who will be teaching the course, so that the didactic development is highly specific and accurate.

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.



Video Techniques and Procedures

TECH introduces students to the latest techniques, to the latest educational advances, to the forefront of current pharmaceutical care procedures. All of this, first hand, and explained and detailed with precision to contribute to assimilation and a better understanding. And best of all, you can watch them as many times as you want.



Interactive Summaries

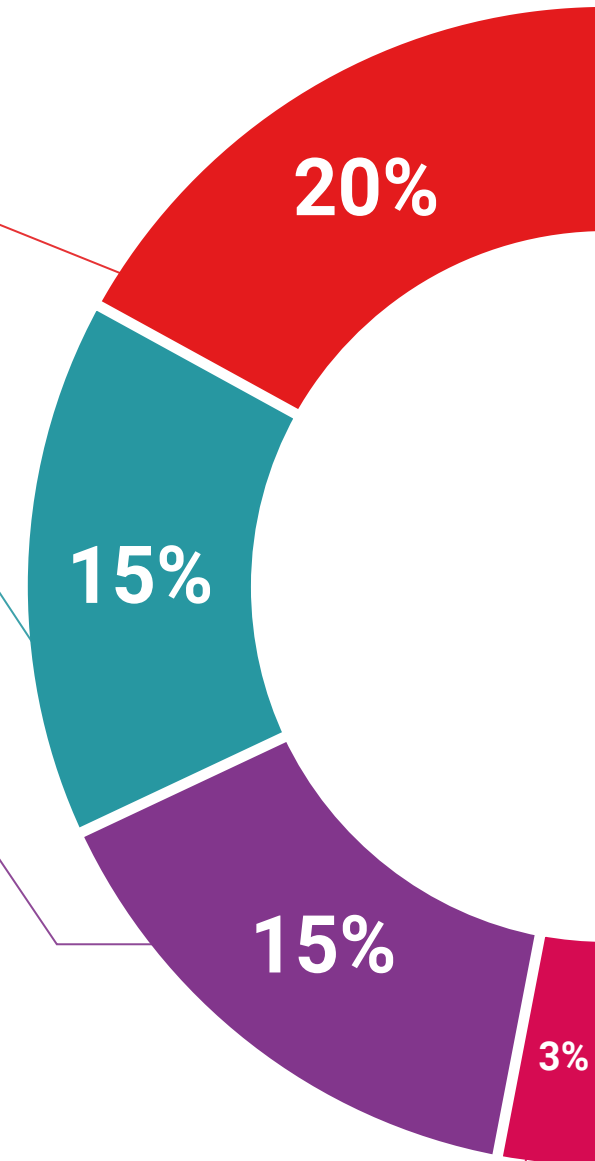
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

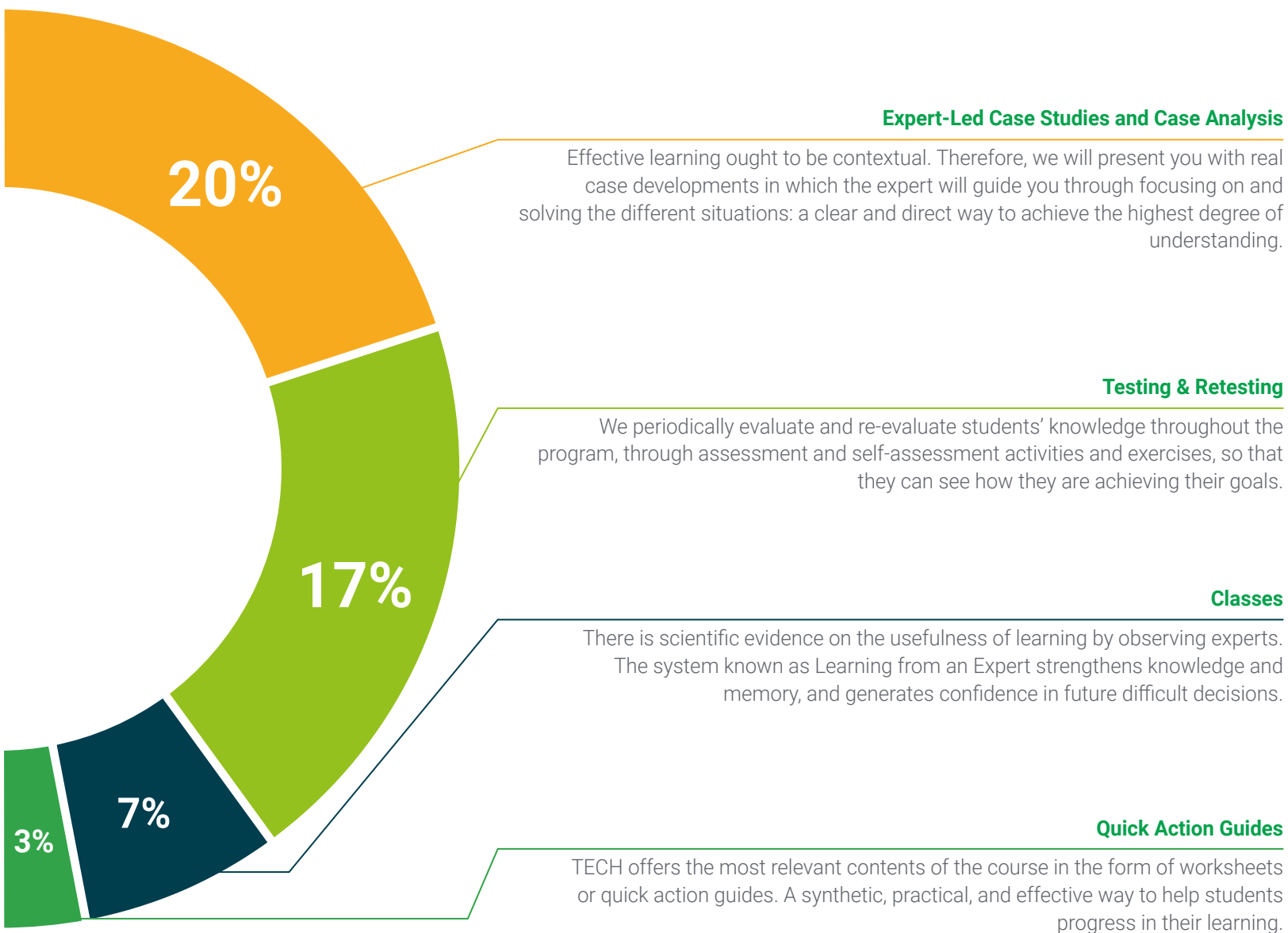
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



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.





10 Certificate

The Hybrid Master's Degree in Hospital Pharmacy guarantees students, in addition to the most rigorous and up-to-date education, access to a Hybrid Master's Degree diploma issued by TECH Global University.



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

This program will allow you to obtain your **Hybrid Master's Degree diploma in Hospital Pharmacy** endorsed by **TECH Global University**, the world's largest online university.

TECH Global University is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

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

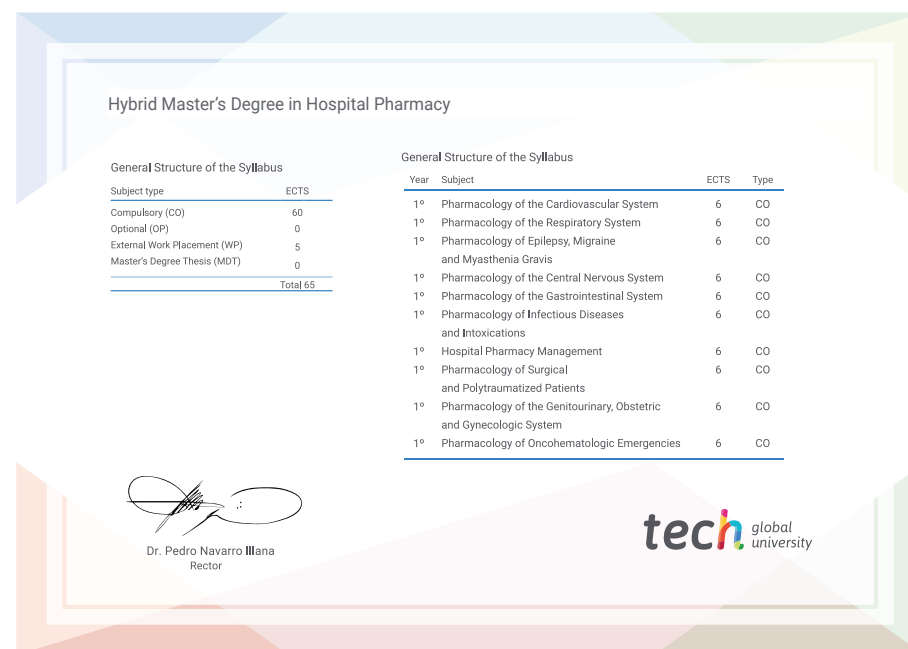
Title: **Hybrid Master's Degree in Hospital Pharmacy**

Course Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Certificate: **TECH Global University**

Recognition: **60 + 5 ECTS Credits**





Hybrid Master's Degree Hospital Pharmacy

Modality: Hybrid (Online + Clinical Internship)

Duration: 12 months

Certificate: TECH Global University

60 + 5 ECTS Credits

Hybrid Master's Degree

Hospital Pharmacy