

# Professional Master's Degree

## Transfusion Medicine and Patient Blood Management



## Professional Master's Degree Transfusion Medicine and Patient Blood Management

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Accreditation: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/medicine/professional-master-degree/master-transfusion-medicine-patient-blood-management](http://www.techtute.com/us/medicine/professional-master-degree/master-transfusion-medicine-patient-blood-management)

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# 01

# Introduction

In the face of acute blood loss, allogeneic transfusion is the best tool for blood component replacement. However, blood is a limited and costly resource from donors, so it is necessary to optimize and economize its use. Therefore, in this program students will learn the strategies and recommendations that currently exist on restrictive therapy of hemocomponents in the management of the bleeding patient (Patient Blood Management) and the correct use of other blood derivatives. This provides a broad approach to the entire transfusion system, so that professionals delve into transfusion medicine.





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*Specialize with TECH! This Professional Master's Degree in Transfusion Medicine and Patient Blood Management is the program you were looking for to boost your academic career towards excellence"*

Allogeneic transfusion remains the most useful and rapid therapeutic tool for the replacement of blood components after acute blood loss. However, we are increasingly aware of its limitations and undesirable effects on polytransfused patients, both in terms of adverse infusion reactions and its influence on their morbidity and mortality during hospitalization. On the other hand, it is necessary to optimize the use of a limited and costly resource coming from blood donors, collaborating to maintain a sustainable health system.

Therefore, in this TECH Professional Master's Degree, students will learn the different strategies and current recommendations for restrictive therapy of hemocomponents in the management of the bleeding patient (Patient Blood Management) and the correct use of other blood derivatives, in a didactic way with examples of common practice and with a main focus on patient safety.

Therefore, a broad approach to the entire transfusion system is proposed, in its different areas, pre-transfusion - post-transfusion, patients with or without acute bleeding, medical or surgical patients in its three pillars of care (pre-, intra- and post-operative), as well as in the areas of donation and processing of blood components, according to current quality standards, the importance of pre-transfusion tests and the development of a robust hemovigilance system, together with various topics of paramount knowledge and management in transfusion medicine.

It also includes 10 exclusive Masterclasses, designed by a prestigious international expert specialized in Transfusion Medicine. Therefore, it is a 100% online Professional Master's Degree that provides students with the ease of being able to study it comfortably, wherever and whenever they want. All they need is a device with Internet access to take their career one step further. A modality in line with the current times with all the guarantees to position the medical professional in a highly demanded field.

This **Professional Master's Degree in Transfusion Medicine and Patient Blood Management** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ The development of practical cases presented by experts in transfusion medicine and Patient Blood Management
- ♦ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ♦ Practical exercises where the self-assessment process can be carried out to improve learning
- ♦ With a special emphasis on evidence-based medicine and research methodologies in the field of transfusion medicine
- ♦ 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



*Bet on TECH! Benefit from the 10 additional Masterclasses included in this program, taught by an internationally renowned expert in Transfusion Medicine"*



*Learn more about the different methods to reduce intraoperative bleeding and learn the main indications and thresholds for blood transfusion from the best professionals"*

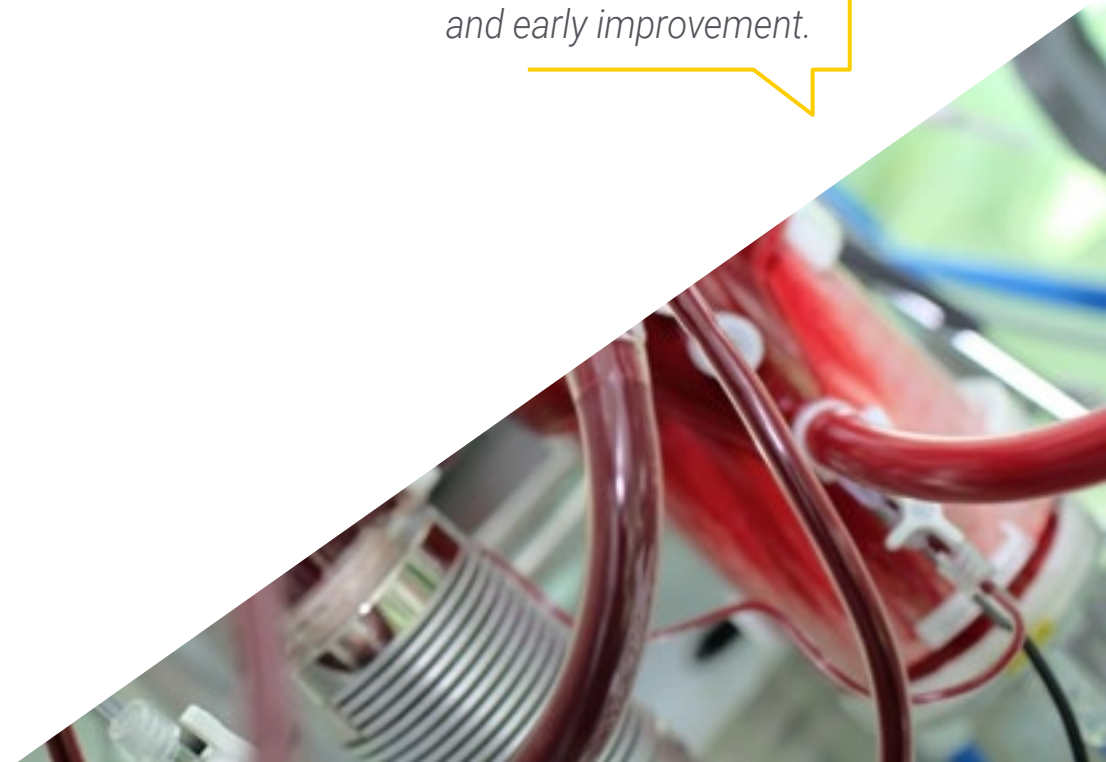
The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to learn in real situations.

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

*Thanks to this Professional Master's Degree, you will perfectly understand the process of blood and blood components donation.*

*You will master the strategies to increase red blood cell mass, especially in patients who will undergo high bleeding risk surgeries, contributing to their well-being and early improvement.*



# 02 Objectives

The purpose of this Professional Master's Degree program is for students to achieve the proposed objectives, in order to update their knowledge in Transfusion Medicine and delve into Patient Blood Management through the development of the different skills necessary for a good medical practice. To this end, a team of medical professionals has poured their knowledge and experience in the development of the points of this syllabus, which will drive professionals from a complete perspective and a current approach, with full specialization for the achievement of their professional goal, guiding them towards excellence in their daily medical work.







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*You will update your knowledge in Transfusion Medicine and understand the importance of hemovigilance as never before”*



## General Objectives

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- Know everything about the process of blood donation and blood components
- Understand hemovigilance as a cross-cutting process involving the entire transfusion chain, from donor to patient



*The fractionation of whole blood implies a better use of a resource that is by definition limited. Therefore, it is necessary to delve into the blood components, do it with this Professional Master's Degree from TECH!"*



## Specific Objectives

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### **Module 1. Blood Donation, Self-Donation and Pre-Transfusion Tests**

- Understand the process of blood, and blood components, donation, framing it in the context of current legislation
- Address the donation process specifically, delving into the donor selection process, and the transfusion request process, including the development of pre-transfusion compatibility testing
- Address the issue of alternatives to allogeneic blood transfusion raised in the Seville Document with special interest in self-donation. The concept of donation promotion will also be developed, understood as a necessary process to match donation and transfusion, and thus obtain a correct management of resources

### **Module 2. Immunohematology**

- In-depth study of the performance and interpretation of immunohematological tests that will lead the clinician to provide greater safety in the act of transfusion

### **Module 3. Allogeneic Transfusion and Patient Blood Management (PBM) Overview**

- Delve into the concepts of Patient Blood Management programs, recommendations for implementation in our environment and to specify transfusion thresholds in the non-bleeding patient

**Module 4. Transfusion in Pediatrics**

- ♦ Gain a deeper knowledge of the indications of hemocomponents in pediatric patients, considering it as a therapeutic measure, of which a clear and precise physiological knowledge is necessary in the pediatric age to avoid unnecessary risks and to make a good use of them
- ♦ Determine transfusion thresholds in the pediatric population
- ♦ Focus on the proper use of blood derivatives in the pediatric population

**Module 5. Transfusion and Blood Saving Strategies in Special Situations**

- ♦ Describe and identify special clinical situations in which individualized transfusion strategies are a priority

**Module 6. Processing of Blood Components**

- ♦ Delve into blood components, from their procurement to the quality criteria that must be observed in their production
- ♦ Learn in detail about each of the products, the modifications that can be made to them, such as irradiation, cryopreservation and pathogen inactivation techniques
- ♦ Influence the labeling of products that follow the standards of the International Society of Blood Transfusion (ISBT), which must be respected in order to make possible the exchange of components between countries when necessary

**Module 7. Therapeutic Apheresis**

- ♦ Know the apheresis technique, its purpose and usefulness in clinical practice, with its different clinical indications Learn to perform the procedure or at least know which patients can benefit from this procedure taking into account side effects and complications
- ♦ Be familiar with the legislation and quality standards that apply to this type of procedure

**Module 8. Strategies for Blood Saving in the Preoperative Setting**

- ♦ Acquire in-depth knowledge of the recommended preoperative evaluation of the patient, in terms of the patient's treatments and pathologies that may increase bleeding complications in surgery
- ♦ Explore strategies for increasing red blood cell mass, especially in patients who will undergo surgery with a high bleeding risk

**Module 9. Strategies for Blood Saving in the Intraoperative Setting**

- ♦ Acquire in-depth knowledge of the different methods to reduce intraoperative bleeding and the main indications and thresholds for blood transfusion

**Module 10. Blood Saving Strategies in the Postoperative and Critically Ill Patient Setting**

- ♦ Explore the best practices in blood component transfusion and bloodsaving strategies in response to the needs of the critically ill patient
- ♦ Acquire in-depth knowledge of the recommended guidelines for the management of anticoagulation and thromboprophylaxis in these patients

# 03 Skills

After passing the evaluations of the Transfusion Medicine and Patient Blood Management program, students will have acquired the professional skills necessary for quality medical practice and updated based on the latest scientific evidence, being able to diagnose and treat patient complications. All this, thanks to a unique methodology and a rigorous teaching team in this medical field, with quality content for the future professional to achieve success in their academic career. Therefore, they will be able to perform the various functions related to this Professional Master's Degree, along with the most innovative proposals in this field of action and the latest techniques used.







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*You will be able to optimize the use of such a limited resource as blood, collaborating to maintain a sustainable health system”*



## General Skills

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- ♦ Learn how to optimize the use of a limited and costly resource from blood donors, helping to maintain a sustainable health system
- ♦ Master the different strategies and current recommendations for restrictive therapy of hemocomponents in Patient Blood Management and the correct use of other blood derivatives
- ♦ Develop the different skills and abilities required in Transfusion Medicine

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*You will learn to develop the skills required in the field of Transfusion Medicine, becoming a successful professional”*





## Specific Skills

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- ◆ Have the ability to perform fluently in all the processes related to donation, from the promotion of donation to its reception and subsequent processing
- ◆ Manage the main techniques of interpretation and study of pre-transfusion compatibility tests
- ◆ Implement Patient Blood Management (PBM) programs, taking into account restrictive therapies, cost/benefit analysis and general organization
- ◆ Attend to the characteristics of transfusion practice in Pediatrics, ranging from mechanisms of adaptation to anemia to peculiarities of the sick child
- ◆ Elaborate blood saving strategies that prioritize patient safety, their biological situation and present pathologies
- ◆ Achieve maximum utilization of blood component processing, ensuring transfusion safety
- ◆ Develop clinical indications for specific hematological procedures such as therapeutic apheresis
- ◆ Establish protocols for the early detection of anemia prior to surgical procedures, while applying strategies for the improvement of red cell mass
- ◆ Make use of the different intraoperative methods and techniques that contribute to blood saving
- ◆ Care for patients with an approach based on Patient Blood Management, reducing the need for oxygen consumption, blood loss and applying appropriate management of antithrombotic therapies



# 04

# Course Management

In its maxim of offering an elite education for all, TECH counts on renowned professionals so that medical professionals acquire a solid knowledge in the specialty of transfusion medicine. In addition, that will address everything related to Patient Blood Management guided by experts in the field. For this reason, the present Professional Master's Degree has a team of highly qualified teachers, whose extensive experience in this medical field contributes to the quality of the program, which aims to provide students with the best tools for the development of their skills during the course. In this way, students have the guarantees that they demand to specialize with the best, with the elite of transfusion medicine.





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*Boost your academic career with the best and acquire the skills you need to thrive in the field of transfusion medicine with TECH"*

## International Guest Director

Dr. Aaron Tobian is one of the great international references in the area of blood transfusion, being **director of Transfusion Medicine at the Johns Hopkins Hospital**. He is also Associate Director of Medical Affairs in the Pathology Department of the same clinical center.

In the academic field, Dr. Tobian **has published more than 250 scientific articles related to Transfusion Medicine** in the most prestigious journals, as a result of his global studies on diseases such as HIV.

In this sense, he also develops an important work as a member of several editorial boards. Therefore, he is **associate editor of the Journal of Clinical Apheresis**, as well as being the editor-in-chief and founder of the Transfusion News portal, a reference in the dissemination of news on Transfusion Medicine.

All this, combined with his teaching work, which he develops in prestigious centers, being professor of **Pathology, Oncology and Epidemiology** at the Johns Hopkins University School of Medicine and at the Bloomberg School of Public Health. Professor of Pathology, Oncology and Epidemiology at the Johns Hopkins University School of Medicine and the Bloomberg School of Public Health.



## Dr. Tobian, Aaron

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- Director of Transfusion Medicine at The Johns Hopkins Hospital
- Associate Director of Clinical Affairs in the Pathology area of The Johns Hopkins Hospital
- Doctor of Medicine by the Case Western Reserve University
- Graduate in Medicine by the Case Western Reserve University
- Professor of Pathology, Medicine, Oncology and Epidemiology at the Johns Hopkins University School of Medicine
- Associate Editor of the Journal of Clinical Apheresis
- Editor-in-Chief and founding member of the website Transfusion News
- Editorial member of the Transfusion journal

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

## Management



### Dr. Alcaraz Rubio, Jesús

- ♦ Specialist in Hematology and Expert in Regenerative Therapy
- ♦ Co-director of the Regenerative Therapy Unit of the Vithas Madrid La Milagrosa University Hospital
- ♦ Medical Specialist in Hematology and Hemotherapy at the Quirónsalud de Murcia Hospital
- ♦ Medical Specialist in Hematology and Hemotherapy at the Mesa del Castillo de Murcia Hospital
- ♦ Medical Specialist in Hematology and Hemotherapy at the Policlínico Virgen de Alcázar
- ♦ Medical Specialist in Hematology and Hemotherapy at Milenium Medical Center.
- ♦ Lecturer in university studies and Medical courses
- ♦ National XXI Century Medicine Award in Hematology.

## Professors

### Dr. Contessotto Avilés, María Cristina

- ♦ Pediatrician and Neonatology Specialist
- ♦ Pediatrician of the Pediatrics and Neonatology Unit of the Hospital Quirónsalud de Murcia.
- ♦ Co-author of scientific publications on Pediatrics.
- ♦ Speaker at several congresses related to her medical specialty.

### Dr. Burgos Alves, María Isabel

- ♦ Medical Degree from the University of Cadiz.
- ♦ Specialist in Clinical Analysis by the Virgen de la Arrixaca University Hospital

### Dr. Martínez Pelegrín, Fulgencio

- ♦ Medical Director of the Rafael Méndez University Hospital in Murcia.
- ♦ Section Chief of the Emergency Unit of the Rafael Méndez University Hospital in Murcia.
- ♦ Coordinator of La Viña Health Center
- ♦ Specialist in Otorhinolaryngology at the Lorca San Diego Health Center
- ♦ Chief Resident of the Hospital Emergency and Urgent Care Rotatory Internship for Resident Doctors in Training.
- ♦ Degree in Superior Audiology from the University College London.
- ♦ Member of the Teaching Commission of the Rafael Méndez University Hospital.



**Dr. García Zamora, Cristina**

- ♦ Specialist in General and Digestive System Surgery
- ♦ Medical Specialist in General and Digestive System Surgery at the Rafael Méndez de Murcia University Hospital
- ♦ Specialist in General and Digestive System Surgery at Virgen de la Arrixaca University Clinical Hospital
- ♦ Author and Co-author of chapters of books related to General and Digestive Surgery
- ♦ Lecturer in university studies and training sessions in Medicine.
- ♦ Doctor in Medicine and Surgery from the University of Murcia
- ♦ Master's Degree in Applied Anatomy to the Clinic from the University of Murcia
- ♦ Master's Degree in Bioethics by the Catholic University of San Antonio

**Ms. Sánchez López, Juana María**

- ♦ Nurse Expert in Anesthesia and Resuscitation
- ♦ Nurse at the Anesthesia and Resuscitation Unit of the Rafael Méndez University Hospital in Murcia
- ♦ Tutor of Nursing Students Internships
- ♦ Graduate in Nursing from the University of Murcia
- ♦ Master's Degree in Public Health
- ♦ Master's Degree in Occupational Risk Prevention.

**Dr. Reina Alcaina, Leandro**

- ♦ Specialist in Urology at the University Hospital of Rafael Méndez
- ♦ Urology Specialist at La Inmaculada Hospital
- ♦ Specialist of the Urology Service at the Morales Meseguer University General Hospital
- ♦ Doctor in Medicine from the Catholic University of San Antonio de Murcia.
- ♦ Degree in Medicine and Surgery from the University of Murcia.

**Ms. Paredes Perez, Laura**

- ♦ Responsible for the Blood Bank in the Laboratory of the Virgen de la Caridad Medical Center
- ♦ Degree in Biology from the University of Murcia.

**Dr. Rodríguez Lavado, Paula**

- ♦ Chief Medical Officer at the Virgen del Carmen Residence.
- ♦ Specialist in the Internal Medicine Service and Family Medicine Consultation in the Hospital Quirónsalud of Murcia.
- ♦ Medical Director of the Centro Polivalente IHS Centro Los Dolores.
- ♦ Manager and Coordinator in various health areas in Offshore Special Services.
- ♦ Specialist in the COVID Service of Residences of the Murcian Health Service.
- ♦ Master's Degree in Nutrition and Health by the Open University of Catalonia.
- ♦ Master's Degree in Occupational Risk Prevention by the Francisco de Vitoria University

# 05

## Structure and Content

The structure of the contents of this Professional Master's Degree has been designed based on the requirements of Transfusion Medicine, in order for professionals to deepen and update their knowledge in this medical field, with special emphasis on Patient Blood Management. Aware of the relevance of the current relevance of their specialization, the teachers of this program have developed an agenda whose content offers a broad perspective of everything involved in the procedure of blood transfusion, from pre-transfusion tests, through immunohematology to the various strategies for saving blood in the intraoperative setting, among others. Therefore, students will acquire the skills to develop professionally in this area of medicine thanks to a complete program and the best teaching methodology.



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*A syllabus developed by experts in Transfusion Medicine totally focused to achieve success in your professional goal, medical excellence”*

## Module 1. Blood Donation, Self-Donation and Pre-Transfusion Testing

- 1.1. Donation of Blood and Blood Components
  - 1.1.1. Technical Requirements and Minimum Conditions for Hemodonation and Transfusion Centers and Transfusion Services
  - 1.1.2. The Principle of Altruism
  - 1.1.3. Data Protection and Confidentiality
- 1.2. The Whole Blood and Component Donation Process
  - 1.2.1. Donor Selection
  - 1.2.2. Donor Recognition and Donation Verification
  - 1.2.3. Donation of Components by Apheresis
- 1.3. Adverse Effects of Donation
  - 1.3.1. Incidents Related to Whole Blood Donation and Apheresis
  - 1.3.2. Effects Related to the Administration of Citrate
- 1.4. The Analysis of Blood Donation
  - 1.4.1. Immunohematological and Complementary Analysis
  - 1.4.2. Microbiological Analysis
- 1.5. Prescription and Administration of Blood and Blood Components
  - 1.5.1. Guide to the Transfusion of Blood Components and Plasma Derivatives of the Spanish Society of Blood Transfusion, 5th edition.
  - 1.5.2. Request for Transfusion and Pre-Transfusion Samples
- 1.6. Pre-Transfusion Testing
  - 1.6.1. Plate, Tube and Gel Techniques
- 1.7. Alternatives to Allogeneic Blood Transfusion
  - 1.7.1. Autotransfusion: Autologous Donation and Autotransfusion
  - 1.7.2. Exclusion Criteria for Autologous Donations
  - 1.7.3. The Utility of Autotransfusion
- 1.8. Directed Blood Component Donation
  - 1.8.1. Indications for Directed Donation
- 1.9. Encouraging Donation
- 1.10. Hemovigilance
  - 1.10.1. Incidents Related to the Donation and Processing of Blood Components
  - 1.10.2. Transfusion-related Incidents
  - 1.10.3. The Look Back

## Module 2. Immunohematology

- 2.1. Red Blood Cell Immunohematology
  - 2.1.1. ABO, Rh and Other Blood Grouping Systems
  - 2.1.2. Classification of Blood Grouping Systems
- 2.2. Platelet Immunohematology
  - 2.2.1. Antigens and Platelet Antibodies
  - 2.2.2. Study Techniques and Clinical Significance
  - 2.2.3. Study of Alloimmune Neonatal Thrombopenia
- 2.3. Leukocyte Immunohematology
  - 2.3.1. The HLA System Antigens and Leukocyte Antibodies
  - 2.3.2. Study Techniques and Clinical Significance
- 2.4. Autoimmune Hemolytic Anemia
  - 2.4.1. Immunohematological Tests
- 2.5. Hemolytic Disease of the Fetus and Newborn
  - 2.5.1. HDN due to Anti-D and Other Erythrocyte Groups
- 2.6. Platelet Refractoriness
  - 2.6.1. Diagnosis and Management
- 2.7. Rare Phenotypes
  - 2.7.1. Diagnosis of Rare Phenotypes
- 2.8. The Panagglutination Problem in Pretransfusion Compatibility Tests
  - 2.8.1. Diagnostic Approach
- 2.9. TRALI or Transfusion-Related Acute Lung Injury
  - 2.9.1. Vlaar's Classification of Pulmonary Complications of Transfusion
- 2.10. The Indication for Transfusion of Phenotype-Matched Blood



### Module 3. Allogeneic Transfusion and *Patient Blood Management* (PBM) Overview

- 3.1. Patient Blood Management (PBM)
  - 3.1.1. The Fundamentals of Patient Blood Management
- 3.2. Current Legislation
  - 3.2.1. The World Health Organization
  - 3.2.2. The European Commission
- 3.3. Recommendations for Implementing a Patient Blood Management Program
  - 3.3.1. Organization and Role of Each Member
- 3.4. Cost/Benefit Analysis
  - 3.4.1. Current Situation in Neighboring Countries
- 3.5. Restrictive Therapy
- 3.6. Red Blood Cell Concentrate Transfusion Thresholds
  - 3.6.1. Recommendations Not to Do
- 3.7. Therapeutic and Prophylactic Use of Platelet Transfusion
  - 3.7.1. Factors Affecting Platelet Yield
  - 3.7.2. Contraindications
- 3.8. Damage from Storage
- 3.9. Other Blood Derivatives and Prohemostats
  - 3.9.1. Fibrinogen
  - 3.9.2. Antithrombin
  - 3.9.3. Tranexamic Acid
  - 3.9.4. Desmopressin
  - 3.9.5. Prothrombin Complexes and rFVIIa

### Module 4. Transfusion in Pediatrics

- 4.1. Transfusion Medicine in Pediatrics
  - 4.1.1. Optimal Transfusion Volumes
  - 4.1.2. Indication of Irradiated Components in Pediatrics
- 4.2. Transfusion of Intrauterine Hemocomponents
  - 4.2.1. Current Indications for Intrauterine Transfusion
- 4.3. Red Blood Cells Transfusion in Children Younger than 4 Months of Age
  - 4.3.1. Preterm Anemia
  - 4.3.2. Red Blood Cell Concentrate Transfusion Thresholds
- 4.4. Platelet Transfusion in Children Younger than 4 Months of Age
  - 4.4.1. Prophylactic Platelet Transfusion
  - 4.4.2. Alloimmune Neonatal Thrombopenia
- 4.5. Plasma Transfusion in Children Younger 4 Months of Age
  - 4.5.1. Indications for Fresh Frozen Plasma in the Neonatal Period
- 4.6. Exchange Transfusion
  - 4.6.1. Indications
  - 4.6.2. Complications of Exchange Transfusion
- 4.7. Red Blood Cells Transfusion in Children Older than 4 Months of Age
  - 4.7.1. Anemia in Hemato-Oncology Patients
  - 4.7.2. Management of Massive Hemorrhage in Pediatrics
- 4.8. Platelet Transfusion in Children Older than 4 Months of Age
  - 4.8.1. Therapeutic Platelet Transfusion Thresholds
- 4.9. Plasma Transfusion in Children Older than 4 Months of Age
  - 4.9.1. Acute Hemorrhage in Hemophilic Patients
- 4.10. Immunoglobulin Administration
  - 4.10.1. Update on ITP Treatment in Pediatrics

## Module 5. Transfusion and Blood Saving Strategies in Special Situations

- 5.1. Women of Childbearing Age
  - 5.1.1. Transfusion Considerations
  - 5.1.2. Alloantibodies with Gestational Significance
- 5.2. Pregnant Woman
  - 5.2.1. Anemia and Pregnancy
  - 5.2.2. Use of Erythropoietin in Pregnancy
- 5.3. Tolerance of Anemia in Elderly Patients
  - 5.3.1. Most Frequent Causes
  - 5.3.2. Factors that Lead to Hemorrhage in Elderly Patients
- 5.4. Transfusion in Elderly Patients
  - 5.4.1. Transfusion Thresholds
  - 5.4.2. Risk of Water Overload and Acute Pulmonary Edema
- 5.5. Anemia in Patients With Ischemic Heart Disease and Heart Failure
  - 5.5.1. Mechanisms of Anemia in Patients with Cardiomyopathy
  - 5.5.2. Use of Erythropoietic Agents
  - 5.5.3. Transfusion Thresholds
- 5.6. Anemia in Chronic Kidney Disease Patients
  - 5.6.1. Mechanisms of Anemia in Chronic Kidney Disease Patients
  - 5.6.2. Use of Erythropoietic Agents
- 5.7. Anemia in the Emergency Department
  - 5.7.1. Diagnosis of Anemia in the Emergency Department
  - 5.7.2. Management of Anemia in the Emergency Department
- 5.8. Massive and/or Life-Threatening Hemorrhage in the Emergency Department
  - 5.8.1. Resuscitation and Stabilization
  - 5.8.2. Hemorrhage Control
- 5.9. Immune Thrombocytopenic Purpura in Adults
  - 5.9.1. Management in the Emergency Department
- 5.10. Acute Complications in Sickle Cell Anemia Patients
  - 5.10.1. Management of Acute Complications
  - 5.10.2. Recommendations for Blood Transfusion



## Module 6. Processing of Blood Components

- 6.1. Obtaining Blood Components by Whole Blood Fractionation
  - 6.1.1. Fractionation of Whole Blood and Apheresis Procedures
  - 6.1.2. Anticoagulant and Preservative Solutions
  - 6.1.3. Leukodepletion of Blood Components
  - 6.1.4. Cryoprecipitate
- 6.2. Apheresis Procedures in Blood Component Donation
  - 6.2.1. Mono and Multicomponent Apheresis
  - 6.2.2. Apheresis Machines
- 6.3. Quality Requirements for Blood and Blood Components
  - 6.3.1. The Transfusion Accreditation Committee's Hemotherapy Standards
- 6.4. Whole Blood and Red Blood Cell Concentrates
  - 6.4.1. Indications for Whole Blood and Red Blood Cell Concentrate
  - 6.4.2. Modifications of Red Blood Cell Components: Washing, Aliquoting, Irradiation and Inactivation of Pathogens
- 6.5. Therapeutic Platelet Units
  - 6.5.1. Indications for Platelet Transfusion
  - 6.5.2. Modifications of Platelet Components: Washing, Aliquoting, Irradiation and Inactivation of Pathogens, Reconstituted Whole Blood
- 6.6. Plasma as a Blood Component
  - 6.6.1. Transfusion and Industrial Use
  - 6.6.2. The Production of Plasma Derivatives
  - 6.6.3. The Case of Hyperimmune Plasma and its Use in the SARS-CoV-2 Pandemic
- 6.7. Cryopreservation of Blood Components
  - 6.7.1. Cryopreservation Techniques Applied to Blood Components
  - 6.7.2. The Use of Cryopreserved Blood Components
- 6.8. Irradiation of Blood Components
  - 6.8.1. Sources Used for Irradiation
  - 6.8.2. Blood Components that Can Be Irradiated
  - 6.8.3. Indications for Irradiated Blood Components
- 6.9. Pathogen Inactivation Techniques in Blood Components
  - 6.9.1. Utility of Blood Components

## Module 7. Therapeutic Apheresis

- 7.1. Apheresis Techniques
  - 7.1.1. Techniques and Types of Replacement
  - 7.1.2. Apheresis in Pediatrics
- 7.2. Complications and Adverse Effects
  - 7.2.1. Complications Related to the Technique
  - 7.2.2. Adverse Effects Related to the Anticoagulant Used and Venous Accesses
  - 7.2.3. Adverse Effects Related to the Replenishment Volume
- 7.3. General Apheresis Procedure
  - 7.3.1. Types of Venous Access
- 7.4. Patient Assessment for Apheresis
  - 7.4.1. Donor/Patient Assessment
  - 7.4.2. Informed Consent
- 7.5. Therapeutic Apheresis in Hematology: Progenitor Transplantation
  - 7.5.1. Apheresis for Hematopoietic Progenitor Donation, for Autologous and Allogeneic Transplantation
  - 7.5.2. Donor Lymphocyte Apheresis
- 7.6. Therapeutic Apheresis in Hematology: Plasma Exchange
  - 7.6.1. Thrombotic Thrombocytopenic Purpura
- 7.7. Therapeutic Apheresis in Hematology: Other Situations
  - 7.7.1. Erythroapheresis
  - 7.7.2. Leukoapheresis
  - 7.7.3. Platelet Apheresis
- 7.8. Therapeutic Apheresis in Solid Organ Rejection
  - 7.8.1. Indications for Solid Organ Transplants
- 7.9. Therapeutic Apheresis in Neurological Pathology:
  - 7.9.1. Indications in Neurological Pathology
- 7.10. Therapeutic Apheresis in Renal Pathology
  - 7.10.1. Indications in Neurological Pathology

## Module 8. Strategies for Blood Saving in the Preoperative Setting

- 8.1. Preoperative Anemia
  - 8.1.1. Diagnostic Algorithm
- 8.2. Iron Deficiency Anemia
  - 8.2.1. Use of Intravenous Iron
- 8.3. Anemia in Oncology Patients
  - 8.3.1. Anemia Mechanisms
- 8.4. Erythropoietin
  - 8.4.1. Erythropoietin Indications
- 8.5. Hemorrhagic Risk Assessment
  - 8.5.1. Patient Factors
  - 8.5.2. Procedural Factors
- 8.6. Thrombotic Risk Assessment
  - 8.6.1. Patient Factors
  - 8.6.2. Procedural Factors
- 8.7. Bridge Therapy and Preoperative Recommendations
  - 8.7.1. Dicoumarinics
  - 8.7.2. Direct Acting Anticoagulants
- 8.8. Preoperative Recommendations for Antiplatelet Therapy
  - 8.8.1. Low Hemorrhagic Risk Surgery
  - 8.8.2. High Hemorrhagic Risk Surgery
- 8.9. Preoperative Recommendations in Patients with Congenital Coagulopathies
  - 8.9.1. Low Hemorrhagic Risk Surgeries
  - 8.9.2. High Hemorrhagic Risk Surgeries
- 8.10. The Jehovah's Witness Patient
  - 8.10.1. Basics of Transfusion Rejection
  - 8.10.2. Conclusions

## Module 9. Strategies for Blood Saving in the Intraoperative Setting

- 9.1. Identification and Monitoring of Intraoperative Hemostasis Disorders
- 9.2. Anesthetic and Surgical Techniques to Reduce Intraoperative Bleeding
  - 9.2.1. Intraoperative Fluid Therapy
- 9.3. Administration of Prohemostats
  - 9.3.1. Plasma and Platelet Administration
  - 9.3.2. Administration of Antifibrinolytics
  - 9.3.3. Fibrinogen and Cryoprecipitates
  - 9.3.4. Prothrombin Complex Concentrate
- 9.4. Autologous Transfusion Methods
  - 9.4.1. Acute Normovolemic Hemodilution
  - 9.4.2. Autologous Blood Transfusion
- 9.5. Intraoperative Blood Component Transfusion
  - 9.5.1. Transfusion Thresholds
- 9.6. Cardiac Surgery
  - 9.6.1. Fluid Therapy in Cardiac Surgery
  - 9.6.2. Transfusion Algorithms and Transfusion Thresholds
- 9.7. Pediatric and Obstetric Surgery
  - 9.7.1. Obstetric Hemorrhage
  - 9.7.2. Transfusion Recommendations for Neonates in the Intraoperative Setting
- 9.8. Orthopedic Surgery and Traumatology
  - 9.8.1. Risks for Transfusion in Orthopedic Surgery Patient
- 9.9. Refusal of Allogeneic Blood Transfusion
  - 9.9.1. Alternatives to Allogeneic Blood Transfusion in Patients Refusing Transfusion
- 9.10. Acute Hemorrhage and Massive Transfusion
  - 9.10.1. Main Intraoperative Causes
  - 9.10.2. Strategies in Antiplatelet/Anticoagulated Patients and Emergency Surgery



**Module 10.** Blood Saving Strategies in the Postoperative and Critically Ill Patient Setting.

- 10.1. Mechanisms of Anemia in Critical Patients
  - 10.1.1. Etiopathogenesis
- 10.2. Mechanisms of Coagulopathy in Critical Patients
  - 10.2.1. Disseminated Intravascular Coagulation
- 10.3. Management of Anticoagulation and Antithrombotic Prophylaxis
  - 10.3.1. Thromboprophylaxis
  - 10.3.2. Anticoagulation
- 10.4. Early Diagnosis and Treatment of Infections
  - 10.4.1. Strategies for Early Diagnosis of Infections and Prevention of Sepsis
- 10.5. Optimization of Anemia Tolerance
  - 10.5.1. Use of Erythropoietic Agents in Critically Ill Patients
- 10.6. Transfusion Thresholds in Critically Ill Patients
  - 10.6.1. "Do/Not-Do" Practices in the Use of Blood Components
- 10.7. Controlled Hypotension
  - 10.7.1. Indications
  - 10.7.2. Physiological Response of the Organism
- 10.8. Gastrointestinal Bleeding
  - 10.8.1. Managing Hepatopathic Patients
  - 10.8.2. Gastrointestinal Bleeding Prophylaxis
- 10.9. Intracranial Hemorrhage Management
  - 10.9.1. Use of Prohemostatic Agents
- 10.10. Management and Indications of the Extracorporeal Membrane Oxygenation System (ECMO)
  - 10.10.1. Venoarterial ECMO
  - 10.10.2. Venovenous ECMO
  - 10.10.3. Transfusion Thresholds



06

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.



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

## At TECH 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.



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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. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.



## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

*Professionals will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*





At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

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

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.



This program offers the best educational material, prepared with professionals in mind:



#### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



#### Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.



#### Interactive Summaries

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

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



#### Additional Reading

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





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

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



#### Testing & Retesting

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



#### Classes

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



#### Quick Action Guides

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



07

# Certificate

The Professional Master's Degree in Transfusion Medicine and Patient Blood Management guarantees, in addition to the most rigorous and updated education, access to a Professional Master's Degree 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 private qualification will allow you to obtain a **Professional Master's Degree diploma in Transfusion Medicine and Patient Blood Management** endorsed by **TECH Global University**, the world's largest online university.

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

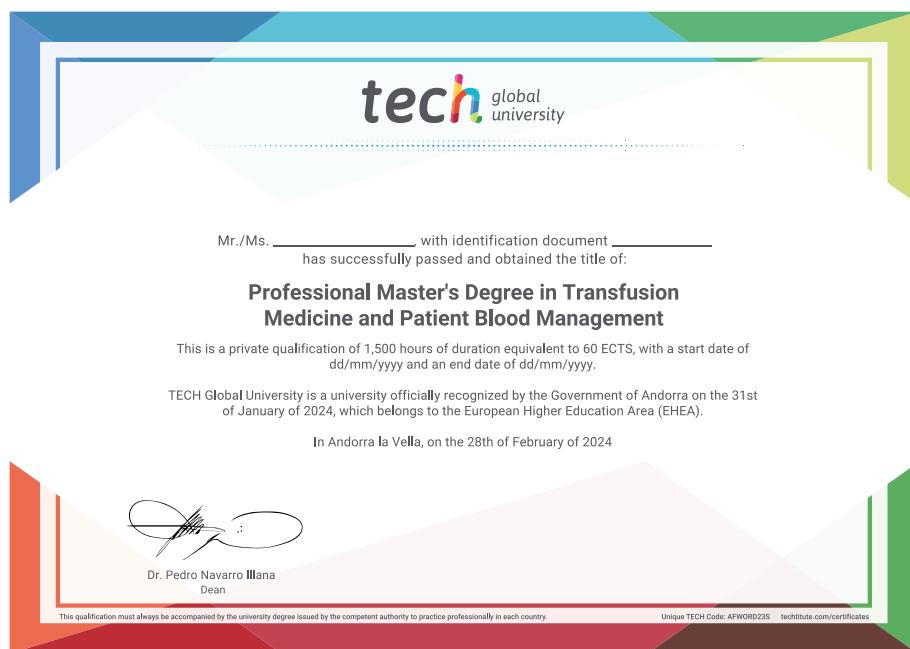
This **TECH Global University title**, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Professional Master's Degree in Transfusion Medicine and Patient Blood Management**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**



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



**Professional Master's  
Degree**  
Transfusion Medicine and  
Patient Blood Management

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Accreditation: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

# Professional Master's Degree

Transfusion Medicine and  
Patient Blood Management

