

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 Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: www.techtute.com/in/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. Master the different strategies and current recommendations for restrictive therapy of hemocomponents in Patient Blood Management and the correct use of other blood derivatives. A broad approach to the whole transfusion system is proposed, so that the professional learns transfusion medicine in depth.



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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 blood component replacement after acute blood loss. However, we are increasingly aware of its limitations and undesirable effects in poly-transfused patients, both in terms of infusional adverse 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 from blood donors, collaborating to maintain a sustainable health system.

Therefore, in this Professional Master's Degree from TECH, the student will learn the different strategies and current recommendations of 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.

Thus, a broad approach is proposed for the entire transfusion system, in its different areas, pre-transfusion and 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 issues of paramount knowledge and management in Transfusion Medicine.

In addition, it is a 100% online Professional Master's Degree that provides the student with the ease of being able to study it comfortably, wherever and whenever he/she wants. All you need is a device with internet access to take your 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 scientific and up-to-date program on the market. Its most notable features are:

- The development of case studies 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 development.
- Practical exercises where self-assessment can be used 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 device with an Internet connection



You will learn the latest strategies for restrictive hemocomponent therapy in the management of the bleeding patient with the best professionals in the field."

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Thanks to this Professional Master's Degree, you will perfectly understand the process of the donation of blood and blood components in the context of the current legislation in Spain”.

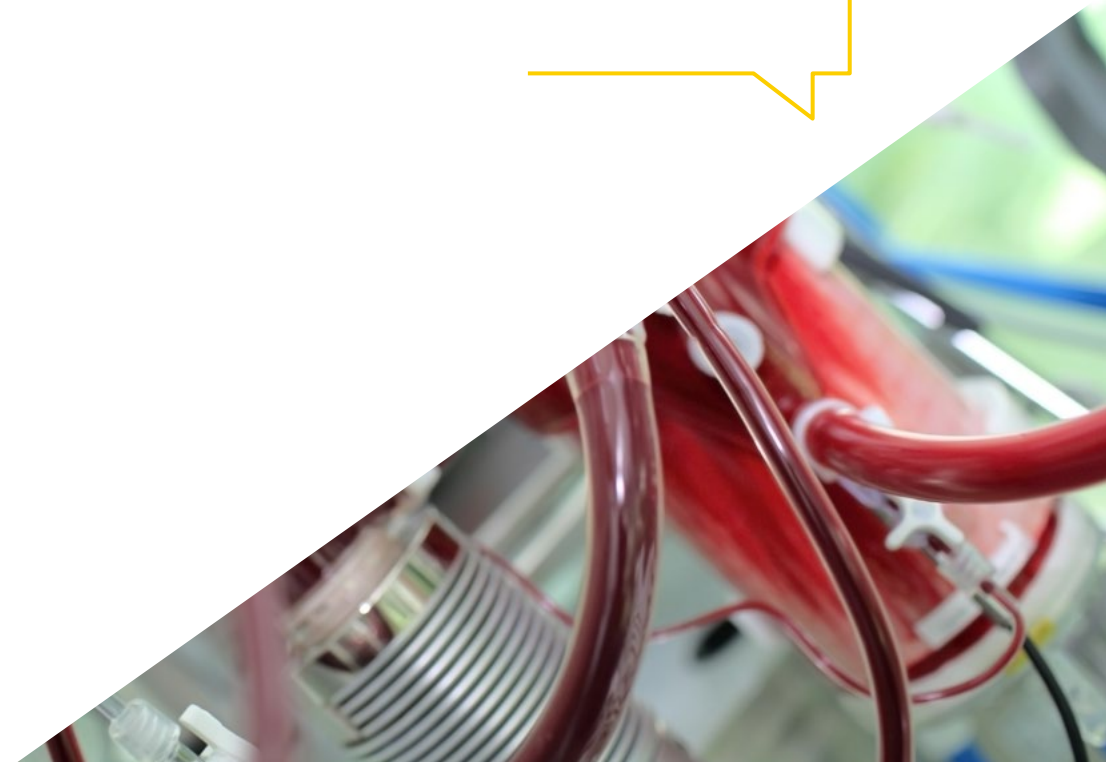
The program's teaching staff includes professionals from the sector who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

Its 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 throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts.

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

Learn more about the different methods to reduce intraoperative bleeding and the main indications and thresholds of blood transfusion from the best professionals.



02 Objectives

The purpose of this Professional Master's Degree program is for students to achieve the proposed objectives so that they can update their understanding of Transfusion Medicine and deepen their knowledge of *Patient Blood Management* through the development of the different skills necessary for good medical practice. To this end, a team of medical professionals has poured their knowledge and experience into the development of the points of this curriculum, which will drive the professional from a complete perspective and a current approach, with comprehensive preparation 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 like never before.”



General Objectives

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



The fractionation of whole blood implies a greater use of a resource that is, by definition, limited. Therefore, it is necessary to learn more about blood components, do it with this Professional Master's Degree from TECH!"



Specific Objectives

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

- 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. Transfusions 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 so that the exchange of components between countries is possible 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. Strategies for blood saving in the postoperative setting and the patient.

- ♦ Explore in the best practices in blood component transfusion and blood-saving 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, the student will have acquired the professional skills necessary for quality up-to-date medical practice 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 a quality content for the future professional to achieve success in their academic career. Thus, they will be qualified to perform the various functions related to this Professional Master's Degree, together 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 a resource as limited as blood, collaborating to maintain a sustainable health system.”



General Skills

- ♦ 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, making you a successful professional.”





Specific Skills

- ♦ Have the ability to manage all the processes related to the donation with ease, from the promotion of the 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 addressing restrictive therapies, cost/benefit analysis and overall organization.
- ♦ Attend to the characteristics of transfusion practice in pediatrics, ranging from mechanisms of adaptation to anemia to the peculiarities of the sick child.
- ♦ Develop blood-saving strategies that prioritize patient safety, biological status and pathologies present.
- ♦ 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 interventions, while also applying strategies for the improvement of erythrocyte 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*, decreasing 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 the medical professional acquires a solid knowledge in the specialty of transfusion medicine. In addition, it will address everything related to *Patient Blood Management* guided by experts in the field. Therefore, this program 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 program. In this way, the student is guaranteed to become specialized with the best and most elite of transfusion medicine.





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Boost your academic career to be amongst 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 Area 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. In addition, 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, together 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 the Bloomberg School of Public Health.



Dr. Tobian, Aaron

- ♦ Director of Transfusion Medicine at The Johns Hopkins Hospital.
- ♦ Associate Director of Clinical Affairs, Pathology Area, Johns Hopkins Hospital.
- ♦ M.D. from Case Western Reserve University
- ♦ M.D., 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 journal Transfusion

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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

- ♦ Head of the Hematology Department at the 12 de Octubre Hospital (Madrid)
- ♦ Head of the Hematology Department at Mesa del Castillo Hospital, in Murcia
- ♦ Head of the Oncohematological Day Unit Hospital Viamed in Alcantarilla, Murcia.
- ♦ Emergency Specialist at the Rafael Méndez Hospital, in Lorca, Murcia.
- ♦ Head of the Hematology Department at the Hospital Virgen de la Caridad in Cartagena
- ♦ Member of Sermo's Medical Advisory Board
- ♦ Associate Professor of Emergency and Clinical Simulation at the Universidad Católica San Antonio in Murcia.
- ♦ Degree in Medicine and Surgery from the University of Murcia.
- ♦ Specialty in Hematology Hemotherapy

Professors

Dr. Contessotto Avilés, María Cristina

- ♦ Pediatrician in the Pediatrics and Neonatology Unit of Hospital Quirón Salud, in Murcia.
- ♦ Specialist in Pediatrics and Neonatology at the Hospital Universitario Virgen de la Arrixaca, in Murcia.
- ♦ Degree in Medicine and Surgery from the University of Murcia.
- ♦ Pediatrician and Neonatology Specialist

Ms. Paredes Pérez, Laura

- ♦ Blood bank manager at the Virgen de la Caridad CM laboratory.
- ♦ Degree in Biology the University of Murcia

Dr. García Zamora, Cristina

- ♦ Specialist in General and Digestive System Surgery at Hospital Universitario Rafael Méndez, in Murcia.
- ♦ Specialist in General and Digestive System Surgery at the Hospital Clínico Universitario Virgen de la Arrixaca, in Murcia.
- ♦ PhD from the University of Murcia
- ♦ Degree in Medicine from the University of Murcia
- ♦ Specialty in General and Digestive Surgery at the Hospital Clínico Universitario Virgen de la Arrixaca, in Murcia.
- ♦ Master's Degree in Anatomy applied to the Clinic by the University of Murcia.
- ♦ Master's Degree in Bioethics from the Catholic University of San Antonio, in Murcia.



Dr. Pelegrín Pelegrín, Fulgencio

- ◆ Section Chief of the Emergency Unit of the Rafael Méndez Hospital.
- ◆ Chief Resident of Hospital Emergency and Urgent Care Rotational Internships
- ◆ Degree in Medicine and Surgery from the University of Murcia.
- ◆ Specialty in Otorhinolaryngology

Dr. Sánchez López, Juana María

- ◆ Nurse of the Anesthesia and Resuscitation Unit of Hospital Rafael Méndez
- ◆ Degree in Nursing from the University of Murcia.
- ◆ Master's Degree in Public Health
- ◆ Master's Degree in Occupational Risk Prevention.

Dr. Reina Alcaina, Leandro

- ◆ Urology Specialist at Rafael Méndez University Hospital
- ◆ Urology Specialist at La Inmaculada Hospital
- ◆ Doctor of Medicine, Universidad Católica de San Antonio de Murcia.
- ◆ Degree in Medicine and Surgery from the University of Murcia.
- ◆ Specialty in Urology at Morales Meseguer University Hospital.

Dr. Burgos Alves, María Isabel

- ◆ Responsible for the technical area at Hospital Virgen de la Caridad
- ◆ Degree in Medicine from the University of Cadiz
- ◆ Specialist in Clinical Analysis by the HU Virgen de la Arrixaca

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 the professional to expand and update their knowledge in this medical field, with special emphasis on *Patient Blood Management*. Aware of the current relevance of their specialization, the teachers of this program have developed a syllabus whose content offers a broad perspective of everything involved in the blood transfusion procedure, from pre-transfusion tests, through immunohematology to the different strategies for blood saving in the intraoperative setting, among others. Thus, the student 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 curriculum developed by experts in Transfusion Medicine totally focused to help you achieve success in your professional goal, medical excellence”.

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

- 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 Total 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 Autologous Transfusion
 - 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 The Spanish Hemovigilance System and Neighboring Countries
 - 1.10.2 Incidents Related to the Donation and Processing of Blood Components
 - 1.10.3 Transfusion-related Incidents
 - 1.10.4 The *Look Back*

Module 2. Immunohematology

- 2.1. Immunohematology of the Red Series
 - 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 Spain
 - 3.4.2 Current Situation in Neighboring Countries
- 3.5. Restrictive Therapy
- 3.6. Red Blood Cell Concentrate Transfusion Thresholds
 - 3.6.1 Not Recommended
- 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. Transfusions 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. Woman 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 the Patient 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

- 6.10. Labeling 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 Pre-Surgery 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. Paediatric 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. Strategies for Blood Saving in the Postoperative Setting and the Patient

- 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 in the most prestigious medical schools in the world and has been considered one of the most effective by major publications such as the **New England Journal of Medicine**.



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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

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

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 adapted in 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 students, in addition to the most rigorous and up-to-date education, access to a Professional Master's Degree issued by TECH Technological University.



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

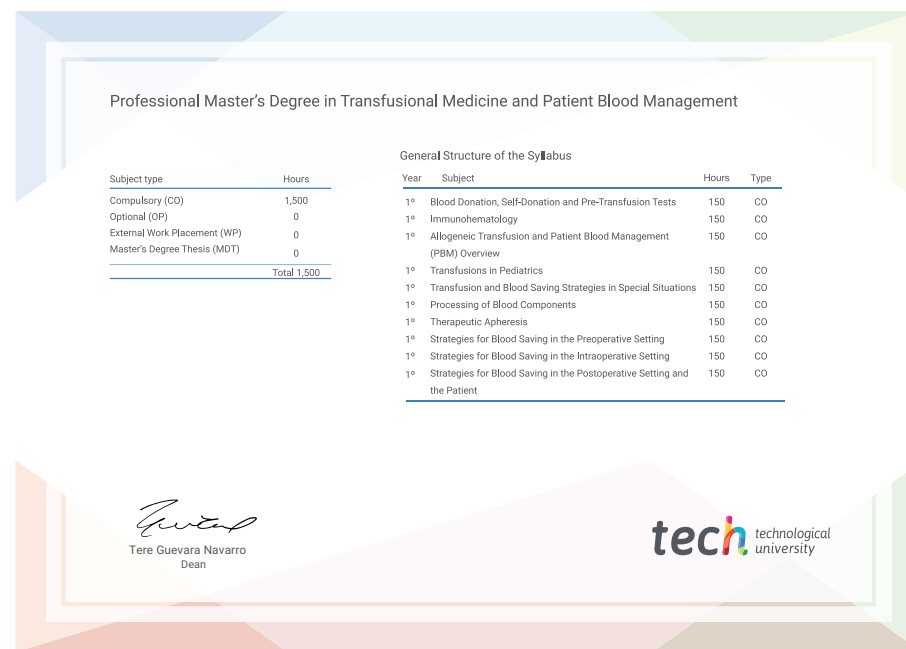
This **Professional Master's Degree in Transfusion Medicine and Patient Blood Management** contains the most complete scientific and up-to-date program on the market.

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

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

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

Official N° of Hours: **1,500 hours**.



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



Professional Master's Degree

Transfusion Medicine and Patient Blood Management

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

Professional Master's Degree

Transfusion Medicine and
Patient Blood Management

