Professional Master's Degree

Nuclear Medicine

tech global university

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Professional Master's Degree

Nuclear Medicine

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

Website: www.techtitute.com/us/medicine/professional-master-degree/master-nuclear-medicine

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01

Introduction

Diagnostic methods have progressed greatly in recent years. Nuclear Medicine offers more and more solutions to treat and detect different pathologies that could otherwise worsen the health of many people. Thus, a growing number of physicians are seeking to deepen their knowledge in this area in order to offer better services to their patients, thus achieving great prestige at scientific and social level. Therefore, this Professional Master's Degree is a breakthrough for all those medical professionals who wish to specialize or update their knowledge in this area, so that they can offer the best procedures to their patients and achieve success in their careers.

Specialize in Nuclear Medicine and increase your prestige by helping to detect and treat different pathologies thanks to this Professional Master's Degree"

Nuclear Medicine is one of the health areas that is currently experiencing greatest advances. This specialty makes it possible to find and treat different pathologies that, by other means, would be imperceptible or would be detected late. Moreover, its efficiency and precision make it one of the most sought-after fields by the major medical services of the best clinics in the world.

For that reason, going deeper into this subject can transform the physicians intro a prestigious professional who will enjoy great opportunities to advance in their career, in addition to updating their knowledge in a field in constant transformation. Thus, this Professional Master's Degree in Nuclear Medicine is the perfect educational program for all those who wish to deepen their knowledge in this area that will turn them into reputable doctors.

Thus, this degree offers its students highly specialized contents with which they will be able to master issues such as single photon emission applied to Nuclear Medicine, Nuclear Medicine related to pediatrics, nuclear treatments of neuroendocrine tumors or the use of radioguided surgery.

With this knowledge, physicians who complete the program will have become experts in this field and will have up-to-date their skills so that they have mastered the latest techniques in this area. Thus, they will be able to progress professionally, being able to access the Nuclear Medicine services of the major clinics in the country.

This program, moreover, is taught through an innovative 100% online teaching methodology that will allow doctors to combine their professional careers and personal lives with their studies, since it has been designed to adapt to the circumstances of each individual. In this way, the learning process is facilitated while continuing to be highly academic and guaranteeing that students will be true specialists in Nuclear Medicine when they complete this Professional Master's Degree.

This **Professional Master's Degree in Nuclear Medicine** contains the most complete and up-to-date scientific program on the market. Its most notable features are:

- The development of case studies presented by experts in Nuclear Medicine
- The graphic, schematic, and eminently practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

Nuclear Medicine offers innovative techniques to treat complex pathologies. Enroll now and offer the best services to your patients with this innovative degree"

Specialization is the key: with this degree you will enhance your reputation and progress in the exciting field of Nuclear Medicine"

Update your knowledge in Nuclear Medicine and become a prestigious specialist thanks to this Professional Master's Degree.

Nuclear Medicine services are booming. Specialize and achieve all your professional goals.

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

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

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the academic year. This will be done with the help of an innovative system of interactive videos made by renowned experts in the field of Nuclear Medicine with extensive teaching experience.

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Objectives

The main objective of this Professional Master's Degree in Nuclear Medicine is to enable students to acquire all the necessary knowledge to become prestigious specialists who can lead the Nuclear Medicine service in a large clinic in their countries. To this end, this degree offers innovative content that will enable professionals to deepen their knowledge and update their skills, so that they can provide their patients with the best possible service.

This Professional Master's Degree will make you the best specialist in Nuclear Medicine in your area"

General Objectives

- Update the specialist in Nuclear Medicine
- Perform and interpret functional tests in an integrated and sequential manner
- Achieve diagnostic guidance for patients
- Assist in deciding the best therapeutic strategy, including radiometabolic therapy, for each patient
- Apply clinical and biochemical criteria for the diagnosis of infections and inflammations
- Understand the particularities of Nuclear Medicine applied to pediatric patients
- Learn about the new therapies of Nuclear Medicine

Your goals will be much closer when you complete this degree Don't hesitate and enroll"

Specific Objectives

Module 1. Management

- Delve into the exhaustive management of the Nuclear Medicine unit with efficiency and quality oriented to the patient
- Establish a strategic plan considering the institution's environment, needs and resources
- Delve into the different organizational forms and the implementation of a quality program oriented to continuous improvement focused on the patient

Module 2. Radiomics

- Obtain diagnostic, response predictive and prognostic biomarkers offering patients personalized precision therapy

Module 3. Single Photon Emission Nuclear Medicine: “pearls and pitfalls”

- Show the characteristic imaging patterns for new pathologies, the causes of diagnostic error and the update of advances in conventional Nuclear Medicine in a practical way

Module 4. Infection/Inflammation

- Delve into the application of molecular and morphofunctional imaging techniques in the field of Nuclear Medicine in the diagnosis, assessment of the extent and response to treatment of infectious/inflammatory pathology in the different organs and systems
- Delve into the techniques applied in the specific clinical context.
- Accurate diagnosis with the least consumption of resources and radiation for the patient

Module 5. Nuclear Medicine in Pediatrics

- Delve into the specific characteristics of Nuclear Medicine studies in pediatrics
- Cover aspects of test indication, acquisition protocols with appropriate choice of radiopharmaceutical and instrumentation characteristics
- Optimization of dosimetric parameters
- Interpret images and know the different pathologies by organs and systems and differential diagnosis
- Understand the best diagnostic strategy with proper sequencing of tests while minimizing radiation
- Avoid tests that do not provide information for the management of the child

Module 6. Neuroendocrine Tumors

- Delve into the clinical, diagnostic and therapeutic aspects of NETs
- Position Nuclear Medicine both in the diagnostic and therapeutic aspects in the appropriate context

Module 7. Radioguided Surgery

- Establish the protocols for performing the techniques, as well as their indication and modifications in the management of the patient in the different locations

Module 8. PET/CT- PET/MRI in oncology clinical guidelines

- Delve into the role of PET/CT studies in tumors with the highest incidence
- Know its impact on diagnosis and staging and on response assessment and monitoring
- Analyze the positioning of the different scientific societies in the respective clinical guidelines

Module 9. Radioligand targeted therapy

- Present the diagnostic protocols, patient selection, therapeutic protocols, care of the patient treated with metabolic therapy, responses obtained, side effects, its positioning compared to other therapies and possible lines of research for each of the different pathologies in which it is used

Module 10. Nuclear Medicine

- Delve into the knowledge of the basics of Nuclear Medicine in its fundamental elements, such as radioactivity and the type of disintegrations, image detection and generation, radiopharmaceuticals and radioprotection

03

Skills

This degree develops a series of skills that will enable students to master all types of specialized Nuclear Medicine techniques. Thus, at the end of this program, they will have acquired the ability to apply complex procedures in this area to detect and treat cancers and other pathologies that require great attention. Therefore, with these new skills, medical professionals who have completed this degree will be able to face their work with the best guarantees of success.

Learn the most innovative techniques in Nuclear Medicine with this Professional Master's Degree"

General Skills

- Apply the most appropriate nuclear treatments, according to the pathology and circumstances of each patient
- Manage a Nuclear Medicine service
- Know the main advances in Nuclear Medicine to be able to respond appropriately to each situation
- Combine traditional nuclear medicine techniques with the latest advances in Nuclear Medicine

Thanks to this Professional Master's Degree you will be able to offer your patients the best Nuclear Medicine treatments"

Specific Skills

- Optimize resources and offer quality assistance in a Nuclear Medicine service
- Efficiently and equitably manage all available resources in order to provide excellent quality care
- Master computational medical imaging using imaging biomarkers
- Learn about technological advances in conventional Nuclear Medicine, such as SEPECT/CT and new radiopharmaceuticals
- Manage molecular and morphofunctional imaging techniques in the field of Nuclear Medicine in the diagnosis
- Apply Nuclear Medicine to the pediatric setting safely
- Treat neuroendocrine tumors with radiopharmaceuticals
- Perform radioguided surgeries applied to breast cancer
- Appropriate use of 18F-FDG PET/CT in different tumors
- Capture, accumulate and dispose of a chemical substance labeled with a radioactive isotope

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Course Management

In order to transmit innovative and top knowledge such as that offered by this Professional Master's Degree in Nuclear Medicine, the best faculty is needed. And this degree has an experienced and specialized teaching staff, who know the new techniques of the discipline perfectly and will share with the students all the keys to successfully apply the procedures this subject. Thus, students in this program will be able to put their new skills into practice in their professional environment immediately.

The best specialists in Nuclear Medicine teach you the latest techniques so that you can apply them in your own practice"

International Guest Director

Dr. Stefano Fanti's prominent career has been entirely devoted to **Nuclear Medicine.** For almost 3 decades he has been professionally linked to the **PET Unit** at the **Polyclinic S. Orsola.** His exhaustive management as **Medical Director** of that hospital service allowed an exponential growth of the same, both its facilities and equipment. As a result, in recent years the institution has performed more than **12,000 radiodiagnostic examinations,** making it one of the **most active** in **Europe.**

Based on these results, the expert was selected to **reorganize** the **functions** of all the metropolitan centers with Nuclear Medicine tools in the region of Bologna, Italy. After this intensive professional task, he has held the position of **Referent of the Maggiore Hospital Division.** Also, still in charge of the PET Unit, Dr. Fanti has coordinated several grant applications for this center, receiving important funding from national institutions such as the Italian **Ministry of Universities** and the **Regional Health Agency,** Ministry of Universities.

On the other hand, this specialist has participated in many research projects on the clinical application of **PET** and **PET/CT technologies** in **Oncology.** In particular, he has investigated the approach to Lymphoma and **Prostate Cancer.** In turn, he has integrated the teams of many clinical trials with BCP requirements. In addition, he personally leads experimental analyses in the field of new PET tracers, including C-Choline, F-DOPA and Ga-DOTA-NOC, among others.

Also, Dr. Fanti is a collaborator of the **International Atomic Energy Organization (IAEA),** participating in initiatives such as the consensus for the introduction of **radiopharmaceuticals for clinical use** and other advisory missions. He is also the author of more than 600 articles published in international journals and is a reviewer for The Lancet Oncology, The American Journal of Cancer, BMC Cancer, among others.

Dr. Fanti, Stefano

- Director of the Specialized School of Nuclear Medicine of the University of Bologna, Italy
- Director of the Division of Nuclear Medicine and of the PET Unit of Polyclinic S. Orsola
- Referent of the Division of Nuclear Medicine, Maggiore Hospital
- Associate Editor of Clinical and Translational Imaging, the European Journal of Nuclear Medicine and the Spanish Journal of Nuclear Medicine
- Reviewer for The Lancet Oncology, The American Journal of Cancer, BMC Cancer, European Urology, The European Journal of Hematology, Clinical Cancer Research, and other international journals
- Advisor to the International Atomic Energy Organization (IAEA)
- Member of: European Association of Nuclear Medicine

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

Management

Dr. Mitjavila, Mercedes

- Head of Nuclear Medicine Service Puerta de Hierro University Hospital Majadahonda, Madrid
- Project Manager of the Nuclear Medicine Unit in the Diagnostic Imaging Department of the Alcorcón Foundation University Hospital
- Head of Service of Nuclear Medicine of the Puerta de Hierro Hospital Majadahonda. Competitive examination BOCM
- Degree in Medicine and General Surgery from the University of Alcalá de Henares
- MIR in Nuclear Medicine Specialist by the MIR System
- PhD in Medicine and General Surgery from the University of Alcalá de Henares
- Interim Physician of the Nuclear Medicine Service of the Ramón y Cajal Hospital
- Interim Physician in the Nuclear Medicine Unit at Getafe University Hospital

Professors

Dr. Cardona, Jorge

- Specialist Physician in the Nuclear Medicine Service of the University Hospital Responsible for the areas of Endocrinology, metabolic treatments, radioguided surgery, PET-CT in endocrinology (FDG, DOPA) and PET/CT in prostate cancer (Choline and PSMA)
- Degree in Medicine and Surgery. Complutense University of Madrid
- Diploma of Advanced Studies at the Complutense University of Madrid, obtained with the work "Use of intraoperative portable gamma camera in breast sentinel"
- Doctor of Medicine. Doctoral thesis at the Department of Radiology and Physical Medicine of the Complutense University of Madrid
- Professor of the Nuclear Medicine module at the Professional Training Center Puerta de Hierro
- Coordinator of the course "Clinical Sessions on Nuclear Medicine" at the Puerta de Hierro Hospital in Majadahonda

Dr. García Cañamaque, Lina

- Head of Service, Sanchinarro Hospital
- Start-up of three Nuclear Medicine services (Nuestra Señora de América Hospital, Sanchinarro Hospital and Puerta del Sur Hospital).
- Specialist in Nuclear Medicine
- Official Doctoral Program in Biomedicine and Pharmacy San Pablo CEU University
- Supervisor of 2nd category radioactive facilities Nuclear Safety Council

Dr. Goñi Gironés, Elena

- Head of Nuclear Medicine Service Member of the Breast and Melanoma Unit of the Navarra Hospital Complex-CHN
- Area Specialist of the Nuclear Medicine Service of the Infanta Cristina Hospital in Badajoz
- Member of the Nuclear Medicine Quality Assurance Committee of the CHN
- Degree in Medicine and Surgery
- Doctor from the Public University of Navarra
- Nuclear Medicine Specialist
- Radioactive Facilities Supervisor

Dr. Herrero González, Antonio

- Data Analytics Manager (Big Data and Advanced Analytics Area)
- Director of Information Systems (IT) at General Hospital of Villalba
- Director of Information Systems (IT) in Rey Juan Carlos University Hospital
- Technical Engineering in Computer Systems. University of Salamanca
- Master's Degree in Management of Health Information and Communication Systems and Technologies. Carlos III Health Institute
- Master's Degree in Big Data Analysis. MB European University of Madrid

Dr. Martí Climent, Josep M.

- Director of the Radiophysics and Radiological Protection Service of the University Clinic of Navarra
- Deputy Director of the Nuclear Medicine Service of the University Clinic of Navarra
- Graduate in Sciences (Autonomous University of Barcelona)
- D. in Sciences (Autonomous University of Barcelona)
- Specialist in Hospital Radiophysics (Ministry of Education and Science)

Dr. Muros de Fuentes, María Angustias

- Nuclear Medicine in the Andalusian Health Service
- Degree in Medicine and Surgery. University of Granada
- Doctor of Medicine and Surgery. University of Granada
- Research: Galenic development and biodistribution study of the radiopharmaceutical99mtc-dextran for isotopic ventriculography studies
- Research: Utility of lymphogrammagraphy and SLNB in the treatment of thyroid cancer

Dr. Mucientes, Jorge

- Nuclear Medicine Area Specialist at the Puerta de Hierro Majadahonda University Hospital
- Nuclear Medicine Resident Tutor at Puerta de Hierro University Hospital
- Coordinator of Quality of the Nuclear Medicine Service of the University Hospital
- Puerta De Hierro
- Degree in Medicine and Surgery. University of Alcalá
- PhD in Medicine Cum Laude, at the Complutense University of Madrid

Dr. Paniagua Correa, Cándida

- Medical Specialist in Nuclear Medicine with practice at Getafe Hospital
- Professional practice as a Nuclear Medicine Specialist in the Nuclear Medicine Department of the Quirón Madrid University Hospital
- Collaborating professor in the training of residents in the specialty of Nuclear Medicine at the Getafe Hospital
- Degree in Medicine and Surgery from the Complutense University
- Specialist in Nuclear Medicine. MIR at the University Hospital of Getafe
- PhD in Dermatology Complutense University of Madrid
- Radioactive Facilities Supervisor License issued by the Nuclear Safety Council
- Member of Spanish Society of Nuclear Medicine

Dr. Rayo Madrid, Juan Ignacio

- Head of the Nuclear Medicine Service of the University Hospital Complex of Badajoz
- Specialist in Nuclear Medicine and head of the Nuclear Medicine Service of the University Hospital Complex of Badajoz
- Area Specialist in Nuclear Medicine Clinical Hospital of Salamanca
- Degree in Medicine and Surgery. University of Extremadura
- PhD in Medicine and Surgery from the University of Salamanca. Outstanding Award
- Specialist in Nuclear Medicine. Clinical Hospital of Salamanca
- Master's Degree in Quality Management in Health and Social Health Services. Complutense University of Madrid
- European Expert in Quality Management in the Healthcare Sector
- Expert in Clinical Management

Dr. Rodríguez Alfonso, Begoña

- Elective Puerta de Hierro University Hospital
- Elective La Paz University Hospital
- Elective Ciudad Real General Hospital
- Degree in Medicine and Surgery from the Complutense University of Madrid
- Official Doctoral Program in Medicine and Surgery Autonomous University of Madrid

05

Structure and Content

The contents of this Professional Master's Degree in Nuclear Medicine have been designed by the best experts in the field, and have been designed to offer students the latest techniques and treatments in this exciting field that can save many lives. Thus, at the end of this program, students will have become great specialists in Nuclear Medicine thanks to the knowledge they will have learned throughout its development.

The most innovative and specialized contents in Nuclear Medicine can be found in this Professional Master's Degree"

Module 1. Management

1.1. Strategic Planning
- 1.1.1. Benefits
- 1.1.2. Vision, Mission and Values of the Health Institution and the Nuclear Medicine Unit
- 1.1.3. Models: SWOT Analysis

1.2. Organization and Management
- 1.2.1. Organizational and Functional Structure
- 1.2.2. Technical Equipment
- 1.2.3. Human Resources

1.3. IT Systems
- 1.3.1. Indicators and Indexes

1.4. Knowledge Management

1.5. Quality Program
- 1.5.1. ISO Standards
- 1.5.2. Clinical Audits
- 1.5.3. Objectives of Clinical Audits
- 1.5.4. The Audit Cycle
- 1.5.5. Evidence-Based Medicine
- 1.5.6. Elements of Quality: Structure, Process and Results

1.6. Economic Assessment of Nuclear Medicine Processes

1.7. Adequacy of Imaging Tests
- 1.7.1. What Should Be Done?
- 1.7.2. What Not to Do?

1.8. Risk Management
- 1.8.1. Levels of Responsibility
- 1.8.2. Patient Security

1.9. Nuclear Medicine Teleworking
- 1.9.1. Technical Requirements

Module 2. Radiomics

2.1. Artificial Intelligence, Machine Learning, Deep Learning

2.2. Radiomics Today

2.3. Imaging Biomarkers

2.4. Multidimensionality in Imaging

2.5. Applications: Diagnosis, Prognosis and Prediction of Response

2.6. Evidence Levels

2.7. Combination with Other "omics": Radiogenomics

Module 3. Single Photon Emission Nuclear Medicine: “pearls and pitfalls”

3.1. Pneumology
- 3.1.1. Perfusion/Ventilation
- 3.1.2. Pulmonary Thromboembolism
- 3.1.3. Pulmonary Hypertension
- 3.1.4. Lung Transplant
- 3.1.5. Pleuroperitoneal Fistula: Cirrhotic Patient, Peritoneal Dialysis

3.2. Cardiology
- 3.2.1. Perfusion: Ischemic Heart Disease, Cellular Viability, Contribution
- 3.2.2. GATED, Myocarditis
- 3.2.3. Shunt: Left-Right, Right-Left
- 3.2.4. Ventricular Function: Ischemic Cardiopathy, Cardiotoxicity
- 3.2.5. Cardiac Innervation: Cardiac Pathology, Neurological Pathology

3.3. Vascular and Lymphatic System
- 3.3.1. Peripheral Endothelial Function
- 3.3.2. Lower Limb Perfusion
- 3.3.3. Lymphogrammagraphy

3.4. Osteoarticular
- 3.4.1. Primary Benign and Malignant Tumor Pathology: Planar Imaging
- 3.4.2. Hybrid Image Contribution
- 3.4.3. Bone Metastasis: Contributions of SPECT and SPECT/CT, Usefulness in Diagnosis and Monitoring
- 3.4.4. Benign Pathology: Metabolic Disease, Sports Pathology

3.5. Nephrourology
- 3.5.1. Assessment of Renal Malformations
- 3.5.2. Obstructive Pathology: Hydronephrosis in Pediatric Age: Diagnosis and Monitoring, Adult Hydronephrosis, Urinary Diversion Study
- 3.5.3. Pyelonephritis: Initial Diagnosis, Evolution
- 3.5.4. Renal Transplantation: Rejection, Tubular Necrosis, Nephrotoxicity, Urinary Leakage
- 3.5.5. Vasculorenal Hypertension: Diagnosis and Monitoring
- 3.5.6. Glomerular Filtration and Effective Renal Plasma Flow
- 3.5.7. Cystogammagraphy: Direct and Indirect in the Diagnosis and Monitoring of Vesicoureteral Reflux

3.6. Gastroenterology
- 3.6.1. Salivary Glands: Autoimmune Pathology, Post-radiation Damage, Salivary Gland Tumors
- 3.6.2. Digestive Transit: Esophageal Transit, Gastroesophageal Reflux, Pulmonary Aspiration, Gastric Emptying
- 3.6.3. Gastrointestinal Bleeding: Study with Labeled Red Blood Cells, Study with Radiocolloids
- 3.6.4. Hepatobiliary Pathology: Aliasic Cholecystitis, Hepatic Functional Reserve Assessment, Hepatic Transplantation (Rejection, Biliary Leakage), Biliary Tract Atresia
- 3.6.5. Bile Acid Malabsorption
- 3.6.6. Inflammatory Bowel Disease: Diagnosis, Monitoring and Complications
- 3.6.7. Hepatic Space-Occupying Lesion: Hepatic Hemangioma, Focal Nodular Hyperplasia vs. Adenoma
- 3.6.8. Cell Labeling: Method and Indications
- 3.6.9. Red Blood Cells: In Vivo, In Vitro, In Vivitro
- 3.6.10. Leukocytes

3.7. Splenic Pathology
- 3.7.1. Hepatic Space-Occupying Lesions: Hemangioma, Hamartoma
- 3.7.2. Splenosis: Study with Denatured Labeled Red Cells
- 3.7.3. Cell Hijacking

3.8. Endocrinology
- 3.8.1. Thyroid: Hyperfunctioning Thyroid (Autoimmune, Thyroiditis), Thyroid Nodule, Differentiated Thyroid Carcinoma
- 3.8.2. Parathyroid: Hyperfunctioning Gland Location
- 3.8.3. Adrenal Glands: Adrenal Cortex Pathology (Hypercortisolism, Hyperaldosteronism), Adrenal Medulla Pathology (Hyperplasia, Pheochromocytoma), Adrenal Incidentaloma

3.9. Neurology SPECT vs. PET:
- 3.9.1. Cognitive Impairment: Characteristic Patterns and Differential Diagnosis
- 3.9.2. Movement Disorders: Parkinson's Disease, Parkinson Plus and Differential Diagnosis
- 3.9.3. Epilepsy: Preoperative Assessment, Acquisition Protocols

3.10. Oncology: Tumor Viability, Radionecrosis vs. Progression
- 3.10.1. Brain Death
- 3.10.2. Cerebrospinal Fluid (CSF)-Cysternogammography Kinetics: Hydrocephalus, CSF Leakage

Module 4. Infection/Inflammation: Gammagraphic Studies and PET Tracers

4.1. Osteoarticular
- 4.1.1. Osteomyelitis: Previously Healthy Bone, Diabetic Patient, Spine Surgery
- 4.1.2. Prosthesis: Septic vs. Aseptic Mobilization

4.2. Cardiac
- 4.2.1. Endocarditis: Native Valve, Prosthetic Valve
- 4.2.2. Myocarditis: Infectious vs. Inflammatory
- 4.2.3. Intracardiac Devices

4.3. Vascular
- 4.3.1. Inflammatory Vasculitis
- 4.3.2. Prosthetic Graft Infection

4.4. Encephalitis: PET-FDG Study
- 4.4.1. Paraneoplastic
- 4.4.2. Infectious: Patterns and Differential Diagnosis

4.5. Fever of Unknown Origin
- 4.5.1. Immunosuppressed Patients
- 4.5.2. Postoperative Fever and Recurrent Sepsis

4.6. Systemic Disease
- 4.6.1. Sarcoidosis: Diagnosis, Extent and Response to Treatment
- 4.6.2. IgG4-related Disease

4.7. Other Locations
- 4.7.1. Hepatorenal Polycystic Kidney Disease: Localization of the Infectious Focus
- 4.7.2. Hepatobiliary: Post-surgical Patient

4.8. Covid-19
- 4.8.1. Nuclear Medicine Studies in Acute Phase: Pulmonary Inflammation, Pulmonary Thromboembolism, Oncology Patient and Covid-19
- 4.8.2. Utility of Nuclear Medicine in Post-covid Pathology: Pulmonary, Systemic
- 4.8.3. Organizational Changes in a Pandemic Situation

Module 5. Nuclear Medicine in Pediatrics

5.1. Pediatric Nuclear Medicine
- 5.1.1. Management of the Child in Nuclear Medicine: Information to Parents and/or Guardians, Preparation and Scheduling, Appropriate Environments
- 5.1.2. Dose Optimization
- 5.1.3. Sedation and Anaesthesia
- 5.1.4. Physical Aspects in Pediatric Patients: Image Acquisition and Processing

5.2. PET/PET-CT/PET-MRI in Pediatric and Young Adult Patients
- 5.2.1. Protocol Optimization
- 5.2.2. Indications
- 5.2.3. Non-FDG Tracers

5.3. Central Nervous System/LCR
- 5.3.1. Brain Maturation Patterns
- 5.3.2. Epilepsy and Vascular Disorders
- 5.3.3. Brain Tumors
- 5.3.4. Hydrocephalus and Cerebrospinal Fluid Fistula

5.4. Endocrine
- 5.4.1. Thyroid Pathology: Hypothyroidism, Hyperthyroidism, Thyroid Nodule
- 5.4.2. Hyperinsulinism

5.5. Cardiopulmonary
- 5.5.1. Congenital Heart Disease: Shunt Right-Left, Shunt Left-Right
- 5.5.2. Bronchopulmonary Pathology: Congenital and Acquired

5.6. Gastrointestinal System
- 5.6.1. Dynamic Esophagogastric Studies
- 5.6.2. Gastroesophageal Reflux, Bronchopulmonary Aspiration
- 5.6.3. Hepatobiliary Gammagraphy: Biliary Tract Atresia
- 5.6.4. Intestinal Bleeding: Mekel's Diverticulum, Intestinal Duplication

5.7. Nephrourology
- 5.7.1. Hydronephrosis Assessment
- 5.7.2. Renal Cortical Assessment: in Infections, Ectopy
- 5.7.3. Vesicoureteral Reflux: Diagnosis and Monitoring
- 5.7.4. Others: Renal Malformations, Renal Transplantation, Kidney Transplantation

5.8. Osteoarticular System
- 5.8.1. Benign Lesions in Pediatric Patients: Fractures, Tumors
- 5.8.2. Avascular Necrosis: Perthes' Disease and Others
- 5.8.3. Sympathetic - Reflex Dystrophy
- 5.8.4. Low Back Pain
- 5.8.5. Infection: Osteomyelitis, Spondylodiscitis

5.9. Neuroblastoma
- 5.9.1. Diagnostic Studies: Bone Scintigraphy, MIBG and other PET Radiotracers
- 5.9.2. Radiometabolic Treatment: MIBG, 177Lu-DOTATATE

5.10. Other Tumours
- 5.10.1. Osteosarcoma: Diagnosis, Response Assessment and Monitoring
- 5.10.2. Bone Tracers and 18F-FDG-PET/CT PET/CT Study
- 5.10.3. Ewing's Disease: Diagnosis, Response Assessment and Monitoring
- 5.10.4. Bone Tracers and 18F-FDG-PET/CT Study
- 5.10.5. Lymphoma: 18F-FDG PET/CT in Diagnosis, Response Assessment, Monitoring
- 5.10.6. Rhabdomyosarcoma and Soft Tissue Sarcomas: 18F-FDG PET/CT in Diagnosis, Response Assessment and Monitoring

Module 6. Neuroendocrine Tumors

6.1. Causes and Risk Factors
- 6.1.1. Hereditary Syndromes

6.2. Clinical presentation
- 6.2.1. Signs
- 6.2.2. Symptoms: Endocrine Syndromes

6.3. Anatomopathological Diagnosis
- 6.3.1. Degrees of Cellular Differentiation
- 6.3.2. Classification

6.4. Subtypes and Locations
- 6.4.1. Extrapancreatic
- 6.4.2. Pancreatic

6.5. Staging
- 6.5.1. Endoscopic Technique
- 6.5.2. Imaging Techniques
- 6.5.3. Echo, CT, MRI

6.6. Molecular Techniques
- 6.6.1. 111In, 99mTc, 8Ga-labeled Somatostatin Analogs
- 6.6.2. Advantages and Disadvantages of Each of Them Best Choice Based on Availability
- 6.6.3. 18F-FDG: Contributions to Patient Management
- 6.6.4. Combined FDG-Somatostatin Analogues Studies
- 6.6.5. Other Targets

6.7. Treatment
- 6.7.1. Treatments Available
- 6.7.2. Radiometabolic Therapy: When and How?

6.8. Assessment of Response to Treatment
- 6.8.1. Clinical-Biochemistry
- 6.8.2. Morphological
- 6.8.3. Functional Criteria

6.9. Monitoring
- 6.9.1. Clinical-Biochemistry
- 6.9.2. Image: Morphological and Functional Best Sequence

6.10. Clinical Trials
- 6.10.1. Therapy Sequencing
- 6.10.2. Association: Combined Treatments

Module 7. Radioguided Surgery

7.1. Selective Biopsy of the Sentinel Ganglion (SBSG)
- 7.1.1. Detection with Radiopharmaceutical and Combined Techniques
  - 7.1.1.1. Radiocolloids, Dyes
  - 7.1.1.2. BSGC Breast Cancer
- 7.1.2. Initial Staging
- 7.1.3. In Neoadjuvant

7.2. BSGC Gynecologic Tumors
- 7.2.1. Vulva
- 7.2.2. Cervix
- 7.2.3. Endometrium
- 7.2.4. Ovaries

7.3. BSGC Skin Cancer
- 7.3.1. Melanoma
- 7.3.2. Non-Melanoma

7.4. BSGC Head and Neck Tumors
- 7.4.1. Thyroid Cancer
- 7.4.2. Oral Cavity

7.5. BSGC Gastrointestinal Tumors
- 7.5.1. Oesophageal Cancer
- 7.5.2. Stomach Cancer
- 7.5.3. Colorectal Carcinoma

7.6. BSGC Urological Cancers
- 7.6.1. Penis
- 7.6.2. Prostate

7.7. Combined Technique of BSGC and Radioguided Occult Lesion Localization (ROLL)
- 7.7.1. Breast
- 7.7.2. Other Locations

7.8. ROLL
- 7.8.1. Radiopharmaceuticals 99mTc, Seeds 125-I
- 7.8.2. Indications: Tumor Pathology and Other Applications

7.9. Radioguided Surgery in Primary Hyperparathyroidism
- 7.9.1. Indications
- 7.9.2. Protocols According to Radiopharmaceuticals

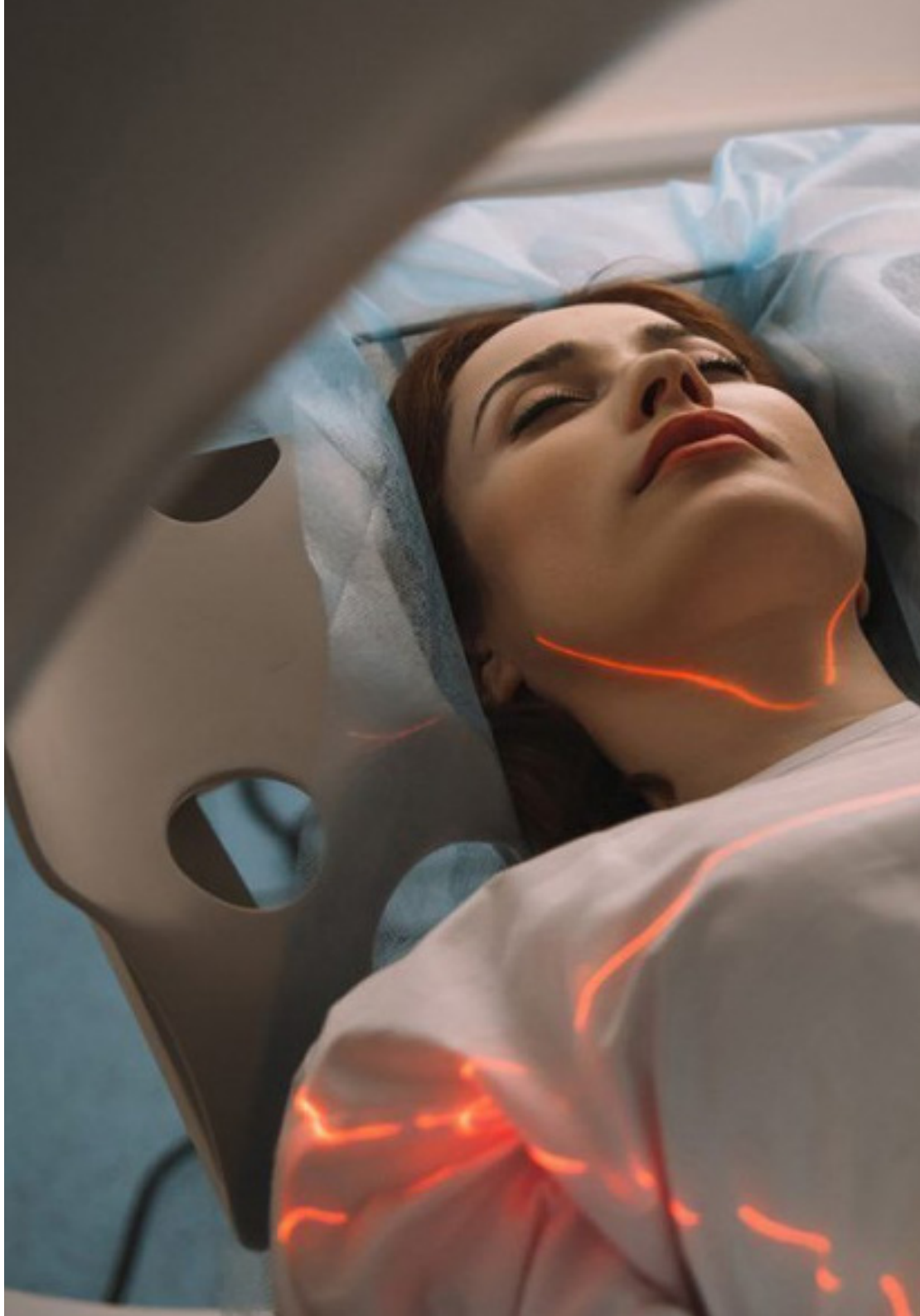
Module 8. PET/CT- PET/MRI in Oncology Clinical Guidelines

8.1. Nuclear Medicine in Different Tumors
- 8.1.1. Staging and Prognosis
- 8.1.2. Response to Treatment
- 8.1.3. Monitoring and Diagnosis of Recurrence

8.2. Lymphomas
- 8.2.1. Hodgkin's Lymphoma
- 8.2.2. Diffuse Large B-cell Lymphoma
- 8.2.3. Other Lymphomas

8.3. Breast Cancer
- 8.3.1. Initial Staging
- 8.3.2. Response to Neoadjuvant
- 8.3.3. Monitoring

8.4. Gynecologic Tumors
- 8.4.1. Vagina Cervix: Staging, Response to Treatment and Monitoring
- 8.4.2. Endometrium: Staging, Response to Treatment and Monitoring
- 8.4.3. Ovaries: Staging, Response to Treatment and Monitoring



8.5. Lung Cancer
- 8.5.1. Non-small Cell Lung Carcinoma
- 8.5.2. Small Cell Lung Carcinoma
- 8.5.3. Response Assessment: Radiotherapy, Immunotherapy

8.6. Digestive System Tumors
- 8.6.1. Esophago-Gastric
- 8.6.2. Colorectal
- 8.6.3. Pancreas
- 8.6.4. Hepatobiliary: Hepatocarcinoma, Cholangiocarcinoma

8.7. Sarcomas
- 8.7.1. Bones
- 8.7.2. Soft Parts

8.8. Urogenitals
- 8.8.1. Prostate
- 8.8.2. Renal
- 8.8.3. Bladder
- 8.8.4. Testicle

8.9. Endocrine
- 8.9.1. Thyroid
- 8.9.2. Adrenal Gland

8.10. Radiotherapy Planning
- 8.10.1. Acquisition of Exploration
- 8.10.2. Volume Delimitation

Module 9. Radioligand Targeted Therapy

9.1. Theragnosis
- 9.1.1. Clinical and Therapeutic Implications

9.2. Thyroid
- 9.2.1. Hyperthyroidism
- 9.2.2. Differentiated Thyroid Carcinoma
- 9.2.3. Goiter

9.3. Neuroendocrine, Gastroenteropancreatic and Other Tumors: Radiolabeled Peptides
- 9.3.1. Indications
- 9.3.2. Administration

9.4. Pheochromocytoma and Paragangliomas: 131I-MIBG
- 9.4.1. Indications and Patient Selection
- 9.4.2. Administration Protocols
- 9.4.3. Results

9.5. Bone Metastases
- 9.5.1. Pathophysiology of Bone Metastases
- 9.5.2. Basis of Metabolic Radiotherapy
- 9.5.3. Radiopharmaceuticals Used: Indications and Results

9.6. Selective Internal Radiation Therapy (SIRT): Labeled Microspheres
- 9.6.1. Basis of Therapy with Radiolabeled Microspheres
- 9.6.2. Available Devices: Differential Characteristics
- 9.6.3. Calculation of the Activity to be Administered and Dosimetric Assessment according to the Device
- 9.6.4. Hepatocarcinoma: Application and Results
- 9.6.5. Liver Metastases: Application and Results in Colorectal Carcinoma, Neuroendocrine and Other Tumors
- 9.6.6. Contributions of SIRT to Liver Surgery
- 9.6.7. Potentially Resectable Patient
- 9.6.8. Hepatic Lobe Hypertrophy

9.7. Synoviorthesis
- 9.7.1. Pathophysiological Basis of Treatment
- 9.7.2. Radiopharmaceuticals Used
- 9.7.3. Indications and Clinical Experience in Different Locations and Pathologies: Rheumatoid Arthritis, Other Arthritis, Vellonodular Synovitis
- 9.7.4. Applications in Pediatrics: Hemophilic Patient

9.8. Metastatic Prostate Cancer: 177Lu-PSMA
- 9.8.1. Pathophysiological Bases
- 9.8.2. Patient Selection
- 9.8.3. Management Protocols and Results

9.9. Lymphomas: Radioimmunotherapy
- 9.9.1. Pathophysiological Bases
- 9.9.2. Indications
- 9.9.3. Administration Protocols

9.10. Future
- 9.10.1. Search for New Ligands and Radioisotopes
- 9.10.2. Translational Research
- 9.10.3. Research Lines

Module 10. The Nuclear Medicine

10.1. Physical Bases of Ionizing Radiations
- 10.1.1. Ionizing Radiation and Radioactive Isotopes
- 10.1.2. Types of Radiation

10.2. Biological Effects of Ionizing Radiations
- 10.2.1. Classification of Effects according to: Time of Occurrence
- 10.2.2. Biological and Dose Dependent Effect
- 10.2.3. Interaction of Ionizing Radiation with Matter
- 10.2.4. Ionizing Radiation-Cell Interaction: Characteristics, Direct and Non-Direct Effects
- 10.2.5. Radiosensitivity
- 10.2.6. Adaptive Response

10.3. Radiopharmaceuticals
- 10.3.1. The Radiopharmaceutical
- 10.3.2. Conventional Diagnostic Radiopharmaceuticals

10.3.3. Radionuclide Generators
10.3.4. Localization Mechanisms
10.3.5. Positron Emission Tomography Radiopharmaceuticals
10.3.6. Synthesis Scheme
10.3.7. Metabolic Pathway Substrates
10.3.8. Radiopharmaceuticals with Therapeutic Effect
10.3.8.1. Characteristics that Must be Met
10.3.8.2. Design and Approval
10.4. Radiopharmacy
10.4.1. Operation
10.4.2. Quality Control
10.5. Image Acquisition and Processing
10.5.1. Planar Image
10.5.2. Components
10.5.3. Performance: Resolution and Sensitivity
10.5.4. Acquisition Modes: Static, Dynamic, Synchronized
10.5.5. Reconstruction
10.5.6. Single Photon Tomography (SPECT)
10.5.7. Acquisition
10.5.8. Reconstruction
10.5.9. Positron Emission Tomography (PET)
10.5.10. Components
10.5.11. Acquisition of Data
10.5.12. Operating Parameters
10.6. Quantification Techniques: Basis
10.6.1. In Cardiology
10.6.2. In Neurology
10.6.3. Metabolic Parameters
10.6.4. The Image of TC
10.7. Image Generation
10.7.1. Acquisition and Reconstruction Parameters
10.7.2. Protocols and Contrast Media
10.7.3. Head and Neck
10.7.4. Thorax: Cardiology and Lung
10.7.5. Abdomen: General, Liver, Renal
10.8. The Image of RM
10.8.1. Resonance Phenomenon
10.8.2. Tissue Contrast: Sequence Knowledge
10.8.3. Diffusion
10.8.4. Paramagnetic Contrasts
10.9. The Multimodality Image
10.9.1. SPECT/TC
10.9.2. PET/TC
10.9.3. PET/RM
10.10. Radioprotection
10.10.1. The Radioprotection
10.10.2. Special Situations: Pediatrics, Pregnancy and Lactation
10.10.3. Dosimetry

These contents will help you to become a renowned expert in Nuclear Medicine”

06

Methodology

This training program provides you with a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

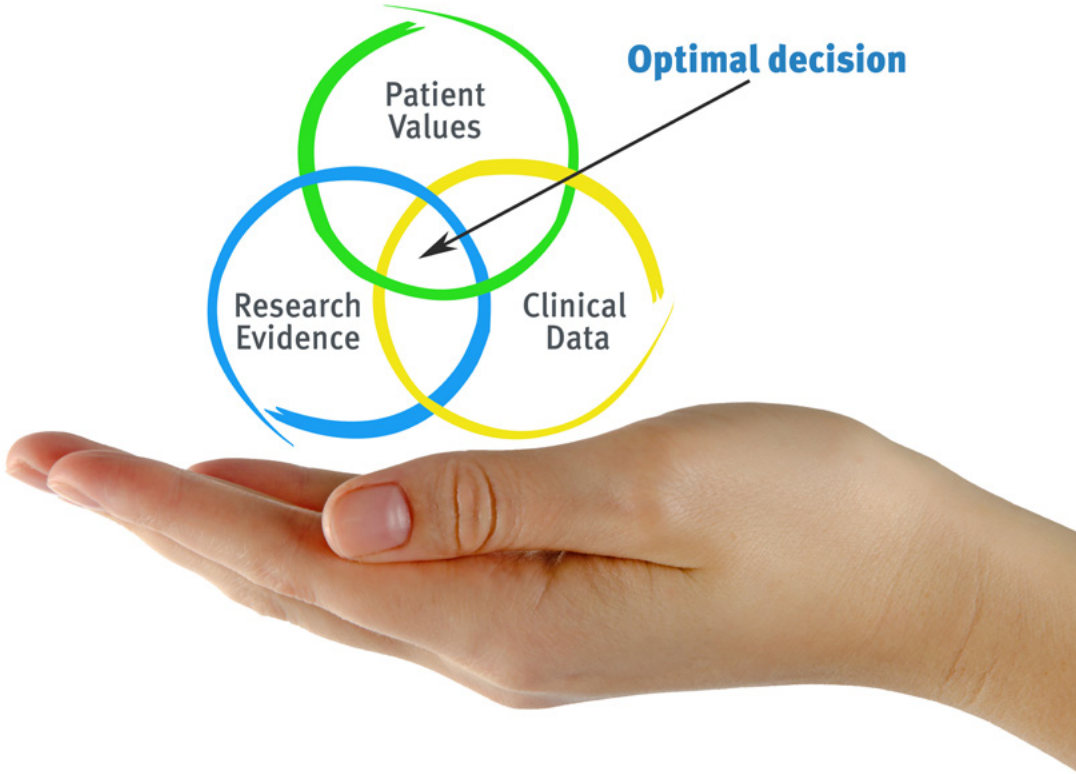
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

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

At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician's professional practice.

Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"

The effectiveness of the method is justified by four fundamental achievements:

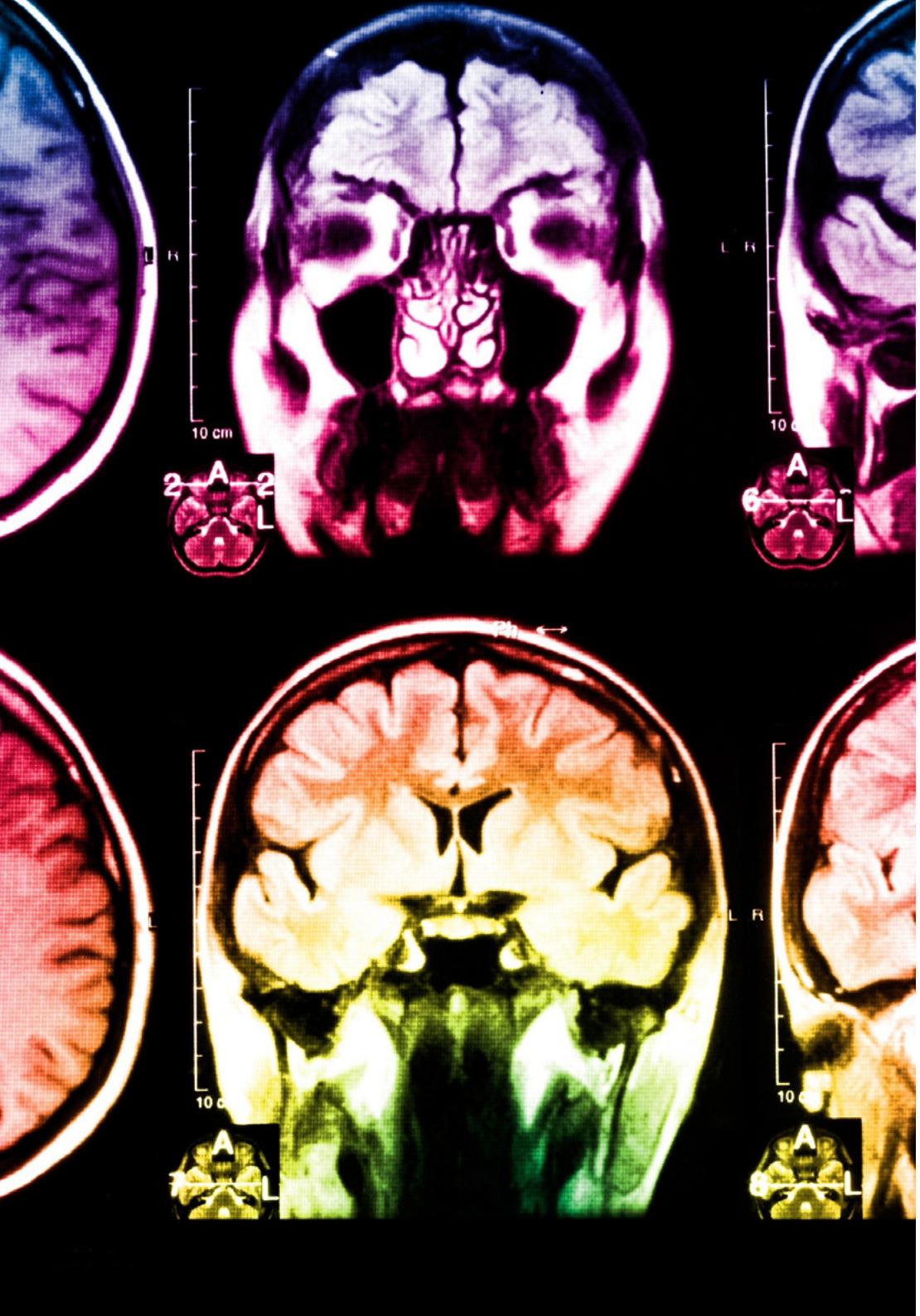
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better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

Relearning Methodology

At TECH we enhance the Harvard 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.

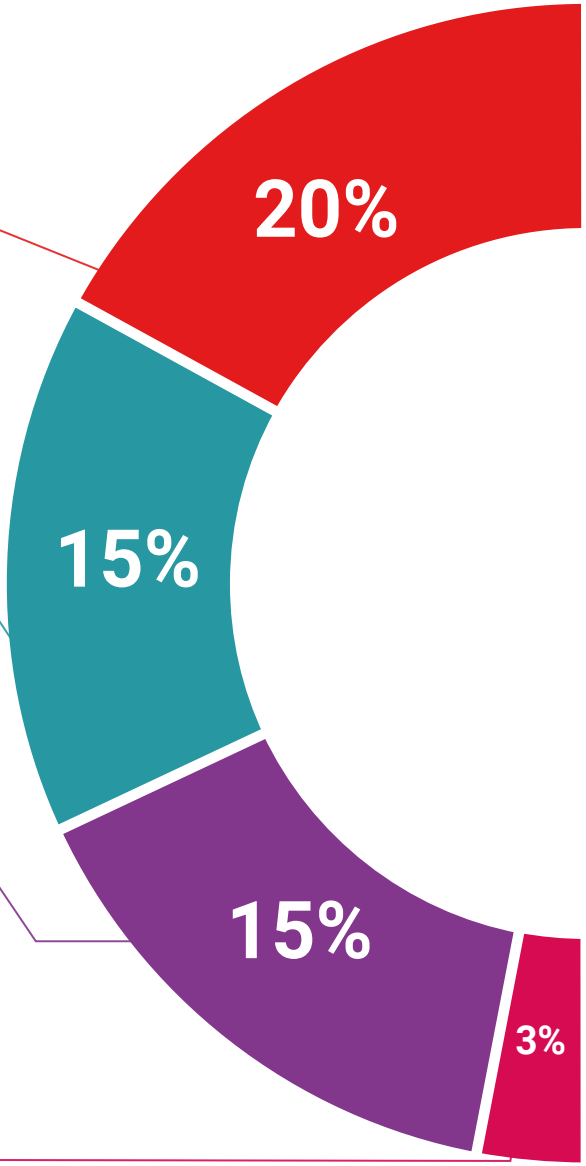
Interactive Summaries

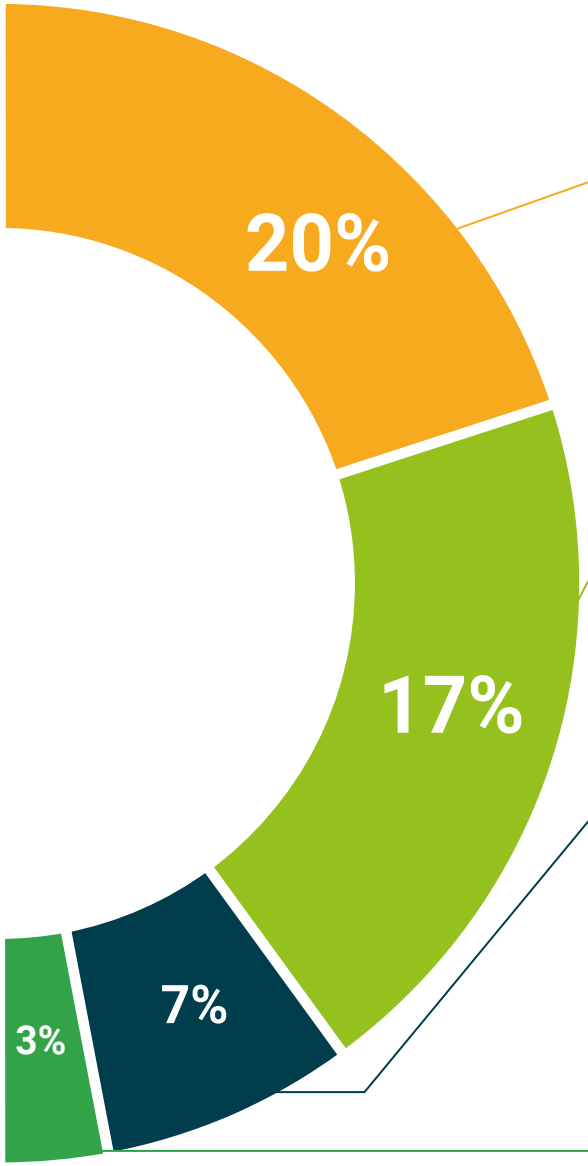
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive multimedia content presentation training Exclusive 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.





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 your goals.

Classes

There is scientific evidence on the usefulness of learning by observing experts: The system termed Learning from an Expert strengthens knowledge and recall capacity, and generates confidence in the face of difficult decisions in the future.

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 Nuclear Medicine guarantees you, in addition to the most rigorous and up-to-dated training, access to a Professional Master's Degree issued by TECH Global University.

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

This program will allow you to obtain your **Professional Master's Degree diploma in Nuclear Medicine** 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 Nuclear Medicine**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**


tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Professional Master's Degree in Nuclear Medicine

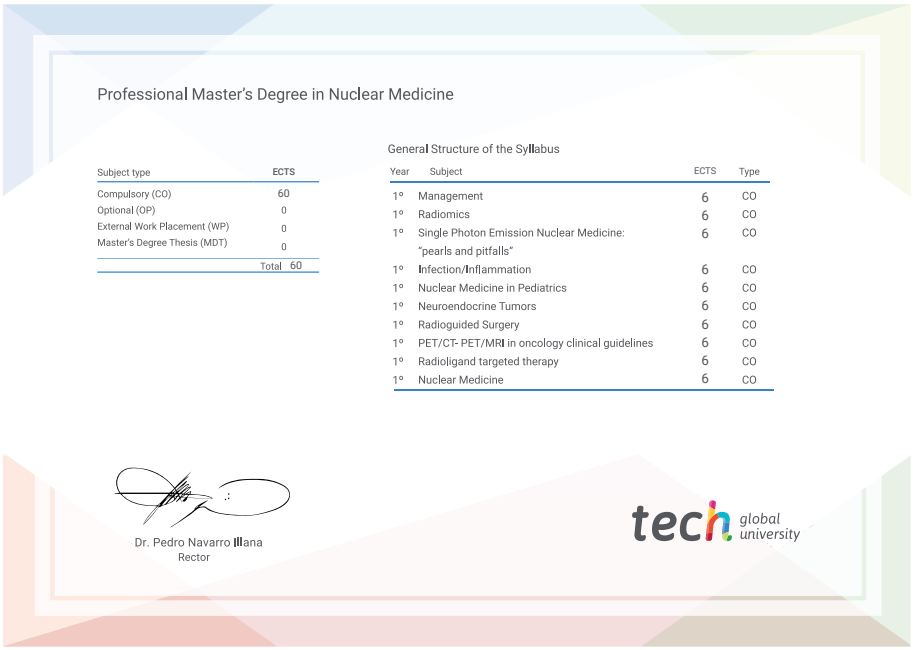
This is a program of 1,500 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates


Professional Master's Degree in Nuclear Medicine

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
Total	60

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Management	6	CO
1º	Radiomics	6	CO
1º	Single Photon Emission Nuclear Medicine: "pearls and pitfalls"	6	CO
1º	Infection/Inflammation	6	CO
1º	Nuclear Medicine in Pediatrics	6	CO
1º	Neuroendocrine Tumors	6	CO
1º	Radioguided Surgery	6	CO
1º	PET/CT- PET/MRI in oncology clinical guidelines	6	CO
1º	Radioligand targeted therapy	6	CO
1º	Nuclear Medicine	6	CO

Dr. Pedro Navarro Illana
Rector

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*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.

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Professional Master's Degree

Nuclear Medicine

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

Professional Master's Degree

Nuclear Medicine

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