CONFLICT OF INTEREST

There is no conflict of interest

OBJECTIVES

• To learn about how to become a Medical Physicist and a Medical Physics Expert in Europe.
• To learn about EUTEMPE NETWORK.
• To find out more about the best centers for unique learning in diagnostic radiology physics in Europe.
• To describe the advantages of combined e-learning and interactive programs.
• To describe methods of achieving excellence in advanced medical physics training.
CURRENT FACTS

- The European Basic Safety Standards define the term Medical Physics Expert (MPE).
- The MPE is an individual that has the knowledge, training and experience to act or give advice on matters relating to radiation physics applied to medical exposure at the highest level possible (called EQF level 8).

RESPONSIBILITIES OF THE MPE (ARTICLE 85)

- Within the health care environment, the medical physics expert shall, as appropriate, act or give specialist advice on matters relating to radiation physics as applied to medical exposure.
- Depending on the medical radiological practice, the medical physics expert shall take responsibility for dosimetry, including physical measurements for evaluation of the dose delivered to the patient, give advice on medical radiological equipment, and contribute in particular to the following:
  - optimization of the radiation protection of patients and other individuals subjected to medical exposure, including the application and use of diagnostic reference levels;
  - the definition and performance of quality assurance of the medical radiological equipment;
  - the preparation of technical specifications for medical radiological equipment and installation design;
  - the surveillance of the medical radiological installations with regard to radiation protection;
  - the selection of equipment required to perform radiation protection measurements;
  - the training of practitioners and other staff in relevant aspects of radiation protection.

MPE project (tren/h4/167-2009) has distinguished between 3 levels of medical physics education and training:

1. The level of the graduate with a Master’s degree in Medical Physics or equivalent,
2. The Medical Physicist level in one Specialty area of medical physics after having followed two years of training in the particular Specialty of medical physics,
3. The Medical Physics Expert level (MPE) in a given Specialty (after two additional years of advanced training and practice) in which knowledge-skills-competences are developed to the highest level possible i.e., EQF level 8.
CHALLENGES AND GAPS FOR BECOMING AN MPE

• There was no educational platform generally available in the EC member States.
• There was no specific European initiative in this area.
• There are financial restrictions at a national level to develop MPEs.
• There is lack of specialized academic staff.
• There are financial restrictions for physicists due to their reduced budget.
• Medical physicists with young children have restrictions in becoming MPE due to time, work and financial restrictions.

It is very unlikely that a single European academic centre, or even a network of local academic centres, can deliver all required topics at EQF level 8.

THE SOLUTION IS:

EUTEMPE NETWORK

• Borderless mobility and lifelong learning:
• Gender equality
• Special attention to the assessment of the learning outcomes (at EQF level 8)
• Active involvement of future employers: industry, hospitals, regulatory authorities
• To set up a multicampus Education combining online with face-to-face learning
• To serve as a model for harmonised courses across Europe and get accredited by EBAMP (European Board for Accreditation in Medical Physics)
ACADEMIC CENTERS

- Hilde Bosmans, Nick Marzial
  Katholieke Universiteit Leuven, BELGIUM
- Carmel Caruana, Virginia Trapalis, John Damilakis
  European Federation of Organisations for Medical Physics, UK
- Eliseo Vano & Jose Miguel Fernandez,
  Servicio Madrilleno de Salud, Madrid, ITALY
- Andrea Oberto & Vas Smith & Klaus Troett,
  Universita Degli Studi Di Pavia, Pavia, ITALY
- Ingo Semmler
  Universitat Politècnica de Catalunya, Barcelona, SPAIN
- Ruben van Engen & Wouter Veldkamp
  Stichting Landelijk Referentie Centrum, HOLLAND
- John Damilakis
  University of Crete, Heraklion, GREECE
- Renato Padovani & Analisa Trianni
  Azienda Ospedaliero Universitaria S. Maria della Misericordia, Trieste, ITALY
- Mauro Gambaccini & Angelo Taibi
  Universita Degli Studi di Ferrara, Ferrara, ITALY
- Kristina Bliznakova, Zhivko Bliznakov & Ivan Buliev
  Technical University of Varna, Varna, BULGARIA

ACADEMIC CENTERS

- Kenneth Young & Allistair Mackenzie
  Royal Surrey County Hospital NHS Foundation Trust, Guildford, UK
- Francis Verdun & Pascal Moren
  Hospices Cantonaux CHUV, SWITZERLAND
- Ruben van Engen & Wouter Veldkamp
  Stichting Landelijk Referentie Centrum, HOLLAND
- John Damilakis
  University of Crete, Heraklion, GREECE
- Renato Padovani & Analisa Trianni
  Azienda Ospedaliero Universitaria S. Maria della Misericordia, Trieste, ITALY
- Markus Borowski & Martin Fiebich
  Klinikum Braunschweig & Technische Hochschule Mittelhessen, GERMANY
EUTEMPE MODULE MPE01
LEADERSHIP IN MEDICAL PHYSICS: DEVELOPMENT OF THE PROFESSION AND THE CHALLENGES FOR THE MPE (D&IR)

MEDICAL PHYSICS EXPERTS
Driving Technology to Advance Healthcare
Proactively Protecting Patients

SERVICE  RESEARCH  LEADERSHIP  MISSION  VISION

A comprehensive yet concise mini-MBA for future lead Medical Physicists in Diagnostic and Interventional Radiology
MODULE 3: MONTE CARLO SIMULATIONS OF X-RAY IMAGING AND DOSIMETRY

The course aims at providing MPE with the theoretical and especially, practical abilities required to efficiently use the general purpose Monte Carlo code PENELLOPE/penEasy to simulate x-ray imaging problems and their dosimetry. The coupling between ionizing radiation and light, or electron-hole pairs, in conventional x-ray digital detectors will also be addressed in the context of the MANTIS code.

ON LINE VERSUS ON SITE PHASE

- The online phase is split in 2 parts, one before face to face phase and another after.
- The pre-f2f phase, available online at the platform provided by EUTEMPE, will be based on preparatory reading material and on the installation of and familiarization with auxiliary software used during the f2f part. The post-f2f phase will be based on forums to discuss advanced exercises and further issues on the use of the simulation codes.

MODULE 5 PHYSICAL AND VIRTUAL ANTHROPOMORPHIC PHANTOMS FOR IMAGE QUALITY AND PATIENT DOSE OPTIMIZATION

The module aims to familiarize participants with the role of the physical and virtual anthropomorphic phantoms and the possibility of performing virtual (phantom based) clinical trials using existing and new Diagnostic and Interventional Radiology (D&IR) technologies.
MODULE 5
PHYSICAL AND VIRTUAL ANTHROPOMORPHIC PHANTOMS FOR IMAGE QUALITY AND PATIENT DOSE OPTIMIZATION

• Participants are introduced to different existing types of anthropomorphic phantoms, used in clinical trials and will be encouraged to develop skills for the design and evaluation of anthropomorphic phantoms, as well as design, manage, implement and evaluate virtual clinical studies with such phantoms and discuss and interpret the results of the virtual studies.

MPE06
(still receiving applications, on site November 2017)
THE DEVELOPMENT OF ADVANCED QA PROTOCOLS FOR TESTING RADIOLOGICAL DEVICES
BENEFITS OF EUTEMPE COURSES TOWARDS MEDICAL PHYSICISTS

- Online courses enable professionals with family lives to participate
- Official, harmonized certification
- Students can benefit from the best resources in Europe
- All operating staff, users, patients and peripheral public benefit from increased safety levels and controlled applications doses.

CONCLUSIONS

- Scientific and academic, state of the art knowledge base.
- Continuously improved through ongoing research and "teach and learn" approach across Europe.
- No in-kind competition.
- Web-based, on line availability.
- Towards a European standard.
- Certification protocol reflects level of education for students and trainees.
- Focuses in on safety of users, operating staff as well as patients and peripheral subjects.
- Combines and leverages medical and industrial experiences and knowledge.
THE PATH OF SPIRITUAL GROWTH IS A PATH OF LIFelong LEARNING

THANK YOU FOR YOUR ATTENTION