European Federation of Organizations for Medical Physics

EFOMP activities and priorities that have been influenced by or are in line with the 'Bonn Call for Action'

Prof. John Damilakis
EFOMP President

'Applying physics to healthcare for the benefit of patients, staff and public'

08

Strengthen radiation safety culture in health care

- Establish patient safety as a strategic priority in medical uses of ionizing radiation, and recognize leadership as a critical element of strengthening radiation safety culture;
- Foster closer co-operation between radiation regulatory authorities, health authorities and professional societies;
- Foster closer co-operation on radiation protection between different disciplines of medical radiation applications as well as between different areas of radiation protection overall, including professional societies and patient associations;
- Learn about best practices for instilling a safety culture from other areas.

- Work towards recognition of medical physics as an independent profession in health care, with radiation protection responsibilities;

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- Enhance information exchange among peers on radiation protection and safety-related issues, utilizing advances in information technology.

POLICY STATEMENTS AND GUIDELINES

Physica Medica 32 (2016) 533–540

Contents lists available at ScienceDirect

Physica Medica

journal homepage: http://www.physicamedica.com

EFOMP Policy Statement

The European Federation of Organisations for Medical Physics. Policy Statement No. 7.1: The roles, responsibilities and status of the medical physicist including the criteria for the staffing levels in a Medical Physics Department approved by EFOMP Council on 5th February 2016 ☆

Physica Medica 32 (2016) 1–6

Contents lists available at ScienceDirect

Physica Medica

journal homepage: http://www.physicamedica.com

EFOMP Policy Statement

The European Federation of Organisations for Medical Physics Policy Statement No. 6.1: Recommended Guidelines on National Registration Schemes for Medical Physicists ☆

EFOMP

European Federation of Organizations for Medical Physics

EDUCATION & TRAINING

The education of medical physicists can be divided into three stages. After a first step of training the physicist up to a basic standard (B.Sc.) in Physics, Mathematics and other relevant topics in Physical Sciences, the second stage is a postgraduate qualification (minimum a Masters degree in Medical Physics or equivalent). The third stage is in-service training in hospitals.

A minimum of two years of professional work, including on-the-job clinical training, is required.
Medical Physicists at Expert Level (Medical Physics Experts)
After completing the above steps, the physicist can be recognised as a medical physicist. To reach a senior level as a Medical Physics Expert (MPE) further education and training is required to Level 8 of the European Qualification Framework (EQF), i.e. doctoral level or equivalent in Medical Physics.

This process is detailed in the European Commission Radiation Protection report No. 174 "European Guidelines on Medical Physics Expert" (MPE Guidelines). It is important to note that the presence of Medical Physicists at Expert level in hospitals is REQUIRED by EU directive 2013-59-Euratom.

The European Federation of Organisations for Medical Physics (EFOMP) was founded in May 1980 in London to serve as an umbrella to all national Medical Physics organizations in Europe.The current membership covers 35 national organisations which together represent more than 5000 Medical Physicists.

The mission of the Federation is to harmonize and advance medical physics both in its professional clinical and scientific expression throughout Europe, to strengthen and make more effective the activities of the national organizations by bringing about and maintaining systematic exchange of professional and scientific information, by the formulation of common policies, and by promoting education and training programs.

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MEDICAL PHYSICIST

to Driving *Technology* Advance *Healthcare*

MEDICAL PHYSICIST

Medical Physics is an internationally recognised applied science in healthcare. It is concerned with the application of the principles, concepts, methods and techniques of physics to medicine. Medical physicists are post-graduate scientists, who work in many different areas of healthcare managing and delivering services and carrying out research and development.

Mission Statement of the healthcare profession "Medical Physicist"

"Medical Physicists will contribute to maintaining and improving the quality, safety and cost-effectiveness of healthcare services through patient-oriented activities requiring expert action, involvement or advice regarding the specification, selection, acceptance testing, commissioning, quality assurance/control and optimised clinical use of medical devices and regarding patient risks and protection from associated physical agents (e.g., x-rays, electromagnetic fields, laser light, radionuclides) including the prevention of unintended or accidental exposures; all activities will be based on current best evidence or own scientific research when the available evidence is not sufficient. The scope includes risks to volunteers in biomedical research, carers and comforters. The scope often includes risks to workers and public particularly when these impact patient risk."

SPECIALITIES

Medical physicists most commonly work in one of four areas: diagnostic and interventional radiology, radiotherapy (radiation oncology), nuclear medicine and radiation protection. While research and teaching is also part of the role of the medical physicist.

Diagnostic and Interventional Radiology

Medical physicists typically deal with areas of testing, use optimization, and quality assurance of medical imaging devices used in radiography, fluoroscopy, mammography, angiography, and computed tomography, ultrasound, and MRI. They are heavily engaged with radiation protection issues such as radiation exposure monitoring and dosimetry. Imaging physicists are also engaged in clinical areas including for research and teaching.

Radiotherapy (Radiation Oncology)

In this area, medical physicists work as an important part of an oncology team that implements a treatment plan. Medical physicists review plans developed by dosimetrists and verify that the treatment plans are safe and effective, based on their knowledge of physics and human biology. Like medical physicists involved in imaging, those involved in treatment oversee the safe application of radiation by confirming that machinery is calibrated correctly and delivering the correct dosage of radiation to the correct position in the patient throughout the treatment.

Nuclear medicine

As part of a nuclear medical team that includes physicians and technicians, medical physicists evaluate the physical aspects of nuclear medical applications. Medical physicists use their knowledge of the possible effects of radiation on patients to develop accurate estimates for the lowest effective dosage. These physicists also have expertise in interpreting images and in analyzing data produced during administration of nuclear medical procedures.

Radiation Protection

Medical physicists understand how radiation can affect the human body and the environment, and what doses of radiation are dangerous. At hospitals and other medical facilities, they help to protect workers, patients, and visitors by ensuring that facilities using radiation sources are doing so safely. They are responsible for evaluating radiation safety procedures, monitoring possible radiation exposure, and ensuring that the facility complies with government regulations on radiation safety. Medical physicists also work as instructors or train others in radiation safety.

Other areas

Medical physicists also participate in medical research, teach or train other professionals, or work as consultants. As researchers, medical physicists work in a variety of areas relating to the application of physics to healthcare, including research related to radiation applied to medicine, physiological measurement, medical applications of computers, and developing imaging equipment and technologies. As educators, medical physicists instruct or train other medical physicists, medical doctors and students, and other healthcare workers.

04

Strengthen radiation protection education and training of health professionals

- Prioritize radiation protection education and training for health professionals globally, targeting professionals using radiation in all medical and dental areas;
- Further develop the use of newer platforms such as specific training applications on the Internet for reaching larger groups for training purposes;
- Integrate radiation protection into the curricula of medical and dental schools, ensuring theestablishment of a core competency in these areas;
- Strengthen collaboration in relation to education and training among education providers in health care settings with limited infrastructure as well as among these providers and international organizations and professional societies;
- Pay particular attention to the training of health professionals in situations of implementing new technology.

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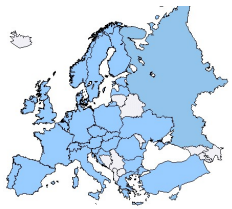
ESMPE

European School for Medical Physics Experts

EUTEMPE-RX



EBAMP

EFOMP EXAMINATION BOARD

ESMPE
European School for Medical Physics Experts

COCIR

ESMPE European School for Medical Physics Experts

Computed Tomography. Technology, Dosimetry, Optimization.

January 25 – January 27, 2018, Prague, Czech Republic

ESMPE
European School for Medical Physics Experts

ESMPE European School for Medical Physics Experts

Fundamentals of Nuclear Medicine Dosimetry

August 22, 2018
Copenhagen, Denmark

ESMPE
European School for Medical Physics Experts

Endorsed by ESTRO

ESMPE European School for Medical Physics Experts

IMRT&VMAT planning in practice

August 22, 2018
Copenhagen, Denmark

02

Enhance the implementation of the principle of optimization of protection and safety

- Ensure establishment, use of, and regular update of diagnostic reference levels for radiological procedures, including interventional procedures, in particular for children;

- Strengthen the establishment of quality assurance programmes for medical exposures, as part of the application of comprehensive quality management systems;

harmonize the dose data formats provided by imaging equipment, and increase utilization of electronic health records.

European Federation of Organizations for Medical Physics

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Mammo Protocol

EFOMP

Mammo Working Group Protocol,March 2015

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European Federation of Organisations for Medical Physics

NEW

ESTRO

European Society for RADIOTHERAPY & ONCOLOGY

IAEA

International Atomic Energy Agency

Quality control in cone-beam computed tomography (CBCT)

EFOMP-ESTRO-IAEA protocol

EFOMP

Final version 2nd of June 2017

EFOMP

03

Strengthen manufacturers' role in contributing to the overall safety regime

- Ensure improved safety of medical devices by enhancing the radiation protection features in the design of both physical equipment and software and to make these available as default features rather than optional extra features;
- Support development of technical solutions for reduction of radiation exposure of patients, while maintaining clinical outcome, as well as of health workers;

- Strengthen cooperation and communication between manufacturers and other stakeholders, such as health professionals and professional societies;

- Address the special needs of health care settings with limited infrastructure, such as sustainability and performance of equipment, whether new or refurbished;
- Strengthen cooperation and communication between manufacturers and other stakeholders, such as health professionals and professional societies;
- Support usage of platforms for interaction between manufacturers and health and radiation regulatory authorities and their representative organizations.

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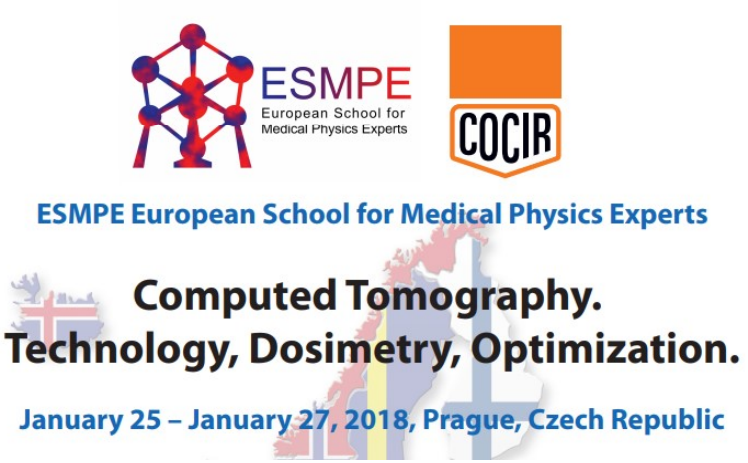
European Federation of Organizations for Medical Physics

Relationship with other societies

We have signed Memoranda of Understanding:

EANM
ESTRO
ESMRMB
MELODI (2014)
EFRS (2015)
ESR (2015)
AAPM (2015)
COCIR (2017)



We are in contact with other organizations to sign MoUs

(MEFOMP)

05

Shape and promote a strategic research agenda for radiation protection in medicine

- Explore the re-balancing of radiation research budgets in recognition of the fact that an overwhelming percentage of human exposure to man-made sources is medical;
- Strengthen investigations in low-dose health effects and radiological risks from external and internal exposures, especially in children and pregnant women, with an aim to reduce uncertainties in risk estimates at low doses;
- Study the occurrence of and mechanisms for individual differences in radiosensitivity and hyper-sensitivity to ionizing radiation, and their potential impact on the radiation protection system and practices;
- Explore the possibilities of identifying biological markers specific to ionizing radiation;
- Advance research in specialized areas of radiation effects, such as characterization of deterministic health effects, cardiovascular effects, and post-accident treatment of overexposed individuals;
- Promote research to improve methods for organ dose assessment, including patient dosimetry when using unsealed radioactive sources, as well as external beam small-field dosimetry.

European Federation of Organizations for Medical Physics

Insights Imaging (2017) 8:183–197
DOI 10.1007/s13244-016-0538-x

STATEMENT

Common strategic research agenda for radiation protection in medicine

European Association of Nuclear Medicine (EANM)[1] · European Federation of Organizations for Medical Physics (EFOMP)[2] · European Federation of Radiographer Societies (EFRS)[3] · European Society of Radiology (ESR)[4] · European Society for Radiotherapy and Oncology (ESTRO)[5]

06

Increase availability of improved global information on medical exposures and occupational exposures in medicine

- Improve collection of dose data and trends on medical exposures globally, and especially in low- and middle-income countries, by fostering international co-operation;
- Improve data collection on occupational exposures in medicine globally, also focussing on corresponding radiation protection measures taken in practice;
- Make the data available as a tool for quality management and for trend analysis, decision making and resource allocation.

European Federation of Organizations for Medical Physics

EFOMP involvement in EU projects

PiDRL

EUTEMPE-RX

ENETRAP III

BSS Transposition

ENEN+

MEDIRAD

10

Strengthen the implementation of safety requirements globally

- Develop practical guidance to provide for the implementation of the International Basic Safety Standards in health care globally;
- Further the establishment of sufficient legislative and administrative framework for the protection of patients, workers and the public at national level, including enforcing requirements for radiation protection education and training of health professionals, and performing on-site inspections to identify deficits in the application of the requirements of this framework.

EFOMP

This project was awarded to a consortium headed by the EFOMP. Other participating organizations were the ESR and the EFRS

07

Improve prevention of medical radiation incidents and accidents

- Implement and support voluntary educational safety reporting systems for the purpose of learning from the return of experience of safety related events in medical uses of radiation;
- Harmonize taxonomy in relation to medical radiation incidents and accidents, as well as related communication tools such as severity scales, and consider harmonization with safety taxonomy in other medical areas;
- Work towards inclusion of all modalities of medical usage of ionizing radiation in voluntary safety reporting, with an emphasis on brachytherapy, interventional radiology, and therapeutic nuclear medicine in addition to external beam radiotherapy;
- Implement prospective risk analysis methods to enhance safety in clinical practice;
- Ensure prioritization of independent verification of safety at critical steps, as an essential component of safety measures in medical uses of radiation.

European Federation of Organizations for Medical Physics

ECR 2017

08:30 - 10:00 Room G

EFOMP Workshop: Radiation incidents and accidents in medical imaging: can we prevent them?

EF 1
Radiation incidents and accidents in medical imaging and their management (part I)

Moderators:
J. Damilakis; Iraklion/GR
A. Torresin; Milan/IT

A-414 08:30
Chairman's introduction
J. Damilakis; *Iraklion/GR*

Session Objectives:
1. To learn about the common reasons for radiation incidents and accidents in CT and interventional suites.
2. To learn about the common reasons for accidental exposure during pregnancy.
3. To be informed about the EU BSS requirements on radiation incidents and accidents in medical imaging and their management.

A-415 08:35
Radiation incidents and accidents in CT
M. Mahesh; *Baltimore, MD/US*

Learning Objectives:
1. To give an overview of radiation incidents and accidents in CT.
2. To discuss the lessons learnt from these incidents and accidents.
3. To learn how to manage incidents and accidents in CT.

A-416 09:05
Radiation incidents and accidents in interventional suites
R.W.R. Loose; *Nürnberg/DE*

Learning Objectives:
1. To give an overview of radiation incidents and accidents in interventional radiology.
2. To discuss the lessons learnt from these incidents and accidents.
3. To learn how to manage incidents and accidents in interventional radiology.

A-417 09:35
Accidental exposure during pregnancy
J. Damilakis; *Iraklion/GR*

Learning Objectives:
1. To provide information about the frequency of accidental exposure of pregnant patients in imaging departments.
2. To learn how cases of accidental exposure of pregnant patients in imaging departments can be reduced.
3. To learn how to manage pregnant patients in case of accidental exposure to x-rays.

10:30 - 12:00 Room G

EFOMP Workshop: Radiation incidents and accidents in medical imaging: can we prevent them?

EF 2
Radiation incidents and accidents in medical imaging and their management (part II)

Moderators:
M. Brambilla; Novara/IT
D.J. Lurie; Aberdeen/UK

A-446 10:30
Chairman's introduction
M. Brambilla; *Novara/IT*

Session Objectives:
1. To learn about the common reasons for radiation incidents and accidents in MRI and nuclear medicine departments.
2. To appreciate why we need to manage radiation incidents and accidents properly.

A-447 10:35
Incidents and accidents in MRI
D.J. Lurie; *Aberdeen/UK*

Learning Objectives:
1. To give an overview of radiation incidents and accidents in MRI.
2. To discuss the lessons learnt from these incidents and accidents.
3. To learn how to manage incidents and accidents in MRI.

A-448 11:05
Radiation incidents and accidents in nuclear medicine
M. Brambilla; *Novara/IT*

Learning Objectives:
1. To give an overview of radiation incidents and accidents in nuclear medicine.
2. To discuss the lessons learnt from these incidents and accidents.
3. To learn how to manage incidents and accidents in nuclear medicine.

A-449 11:35
Management of incidents and accidents in imaging departments: the role and responsibilities of medical physicists
V. Tsapaki; *Athens/GR*

Learning Objectives:
1. To provide information about the role of medical physicists in managing incidents and accidents in imaging departments.
2. To identify the duties and responsibilities of medical physicists associated with the management of radiation incidents and accidents.

Thank You!