

EDUCATION, TRAINING AND CONTINUING PROFESSIONAL DEVELOPMENT FOR THE MEDICAL PHYSICIST — THE EFOMP VIEW IN RELATION TO EC COUNCIL DIRECTIVES

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Abstract

The European Federation of Organisations for Medical Physics, EFOMP, is an umbrella organisation for National Medical Physics Organisations. One of the main objectives of EFOMP is to harmonise and promote the best practice of Medical Physics within Europe. To accomplish this goal, EFOMP has presented various recommendations and guidelines in a number of Policy Statements, unanimously adopted by EFOMP Member Organisations. Policy Statement No 9, "Radiation Protection of the Patient in Europe: The Training of the Medical Physics Expert in Radiation Physics or Radiation Technology", is the EFOMP response to the Medical Exposure Directive, 97/43/Euratom. Here EFOMP presents its recommendations on the role and the competence requirements of the Medical Physics Expert, defined in this Directive, together with recommendations on education, training and Continuing Professional Development. The previous Directive 96/29/Euratom, the Basic Safety Standards Directive, defines a "Qualified Expert" in the radiation protection of workers and the general public. EFOMP has an on-going discussion on the interpretation of the competence requirements of the Qualified Expert in medical practice. The EFOMP approach to achieve harmonisation in the qualification of the Medical Physicist is to encourage the establishment of education and training schemes according to EFOMP recommendations.

1. Introduction

The European Federation of Organisations for Medical Physics was inaugurated in 1980 as an umbrella organisation for National Medical Physics Organisations. Today EFOMP has 32 National Member Organisations (NMOs), representing about 5000 medical physicists working in both clinical and research environments. The federal structure allows EFOMP to represent the medical physics profession, without constraining that diversity of national opinion, which is the essence of Europe.

To harmonise and promote the best practice of medical physics in Europe is one of the main objectives of EFOMP. Some specific aims and purposes include making recommendations on the appropriate general responsibilities and roles of the medical physicists and proposing guidelines for education, training and accreditation programmes in medical physics. EFOMP should also collaborate with international organisations and disseminate professional and scientific information. The EFOMP view on education and training has been presented at several international meetings, one of the latest being the International Conference on "Radiation Protection: What are the future training needs?" [1].

To accomplish its goals, EFOMP has over the years presented a number of policy statements, adopted unanimously by the NMOs, thus expressing the opinion of the medical physics profession in Europe. The first two policy statements, approved in 1983, presented the roles and responsibilities of the clinical medical physicist, discussed the important professional aspects of education and training, and established the basic structure of education and training. "The education of the medical physicist can be divided into three stages. After a first step bringing the physicist up to a basic standard (B.Sc.) in Physics, Mathematics, and other relevant topics in Natural Sciences, the second step is to introduce Medical Physics in postgraduate education. The third step is in-service training in hospitals. After finishing this third step, the physicist can be recognised at an appropriate level. It should also be possible to reach a senior level by further education and training, and to get a higher academic degree, i.e.

M.Sc., Ph.D. or equivalent in Medical Physics.” This structure is still relevant and has been developed in several recent policy statements.

The clinically working medical physicist is a member of a team responsible for diagnosis and treatment of patients. The qualified medical physicist has a unique competence and is responsible in his area of competence for equipment, techniques and methods used in the clinical routine, for the introduction and adaptation of new methods, for quality assurance and quality control etc., and often also for research and development. In order to acquire and maintain sufficient knowledge and a certain level of competence, both initial and continuing education and training are necessary.

2. Education and training in medical radiation physics

European legislation has challenged many professional organisations to propose harmonised professional standards of high quality. The European Union’s Directives concerning basic safety standards [2] and medical exposures [3] have given impetus to the discussions of education and training requirements in medical physics. From the EFOMP view these Directives primarily deal with medical *radiation* physics, but they also effectively set the standards for the whole medical physics profession.

The EFOMP policy statement No 9, “Radiation Protection of the Patient in Europe: The Training of the Medical Physics Expert in Radiation Physics or Radiation Technology” [4], constitutes the EFOMP response to the Medical Exposure Directive, 97/43/Euratom, [3], the MED. The Medical Physics Expert (MPE) is defined in this Directive as an expert in his own right with a well-defined professional role, requiring him to act as well as give advice on all aspects of radiation protection of the patient. The training of the MPE and his competence to act must be recognised by the competent authorities, and Member States are explicitly required to ensure that medical physicists have access to continuing education and training after qualification in addition to their basic theoretical and practical training.

The EFOMP recommendations on the role and competence requirements of the Medical Physics Expert are presented in policy statement No 9 [4], together with the recommendations on principles of education, training and continuing professional development (CPD). General criteria for structured CPD have been laid down in policy statement No 8, “Continuing Professional Development for the medical Physicist” [5]. CPD is the planned acquisition of knowledge, experience and skills, both technical and personal, required for professional practice throughout one’s working life. EFOMP recommends that all medical physicists who have completed their basic education and training should be actively involved in CPD to maintain and increase competence and expertise after qualification.

The EFOMP approach to achieve harmonisation is to encourage the establishment of national education and training schemes at all levels according to EFOMP recommendations. Guidelines for formal EFOMP recognition of National Registration Schemes for Medical Physicists were established in 1995 [6]. EFOMP approval requires inter alia clear statements of theoretical and practical competencies, as well as training programmes consistent with the EFOMP policy on training, and a regular renewal mechanism. CPD is now being recommended as the best way to meet the requirement for a renewal mechanism, and EFOMP is now finalising general guidelines for CPD Schemes [7], recommending NMOs to set up their own detailed CPD Scheme. The concept of CPD is related to the knowledge, skill and experience acquired rather than to the amount of time used to acquire them. In practice,

however, quantitative and qualitative guidelines cannot be separated. The general and very flexible guidelines proposed for CPD Schemes cover both the scheme itself and the credit point system for assessment of individual CPD activities. EFOMP approval also of the National CPD scheme will thus cover the whole structure of education and training for the medical physicist.

The EFOMP efforts, resulting in recommendations on a structured system for education training, CPD and registration schemes as outlined above, have been recognised by the EC in the recent publication “Guidelines on education and training in radiation protection for medical exposures” [8].

3. Training of the medical physics expert – the specialist medical physicist

The Medical Physics Expert was introduced and defined in the Medical Exposure Directive. The duties of the MPE, specified in the Directive, suggest that the appropriate competence level should correspond to an advanced practical experience. The competence level required to start working independently is the level required to register as a Qualified Medical Physicist, according to the EFOMP recommendations [4, 6]. CPD activities should start immediately after qualification, ensuring increasing competence and leading to a higher level of qualification, e.g. the level where the medical physicist may act as a Medical Physics Expert. The EFOMP approach to structured education, training and CPD, as recommended in the proposed guidelines on CPD schemes [7], is summarised below.

3.1. The qualified medical physicist

- There is a significant divergence across European in the length and style of the academic component of physics qualifications. However, most countries will be able to recognise the Qualified Medical Physicist defined in the guidelines below.
- The entry criterion to Medical Physics education and training is a basic university education in physical sciences, engineering or equivalent.
- Recognition as a Qualified Medical Physicist is achieved by a further 2 to 4 years theoretical education and practical training in Medical Physics (depending on the national education system) under supervision of a Qualified Medical Physicist, preferably a Specialist Medical Physicist. At least half of the time should be spent in a clinical environment. The education and training should follow current EFOMP policies. (The total time for the basic education and the Medical Physics education and training would be around 7 years.)
- The Qualified Medical Physicist is competent to act independently.
- The Qualified Medical Physicist has the minimum qualifications required for enrolment in an EFOMP approved National Register for Medical Physicists.
- The Qualified Medical Physicist should have a formal recognition from a National Competent Authority, and should be enrolled in an EFOMP approved National Register for Medical Physicists [6].

3.2. The specialist medical physicist, the medical physics expert

- Within the EU, as defined in the Medical Exposure Directive [3] “in relation to medical exposure”, the Medical Physics Expert is equivalent to the Specialist Medical Physicist. In other disciplines, the term Medical Physics Expert is not relevant.
- The Qualified Medical Physicist qualifies to become a Specialist Medical Physicist by gaining advanced clinical experience and undergoing specialist training of at least two

further years duration, mostly in one sub-speciality, within the first period of an EFOMP approved National CPD Scheme. (i.e. total education & training at least 9 years)

- The Specialist Medical Physicist is competent to give advice on all professional matters in his sub-speciality.
- The Specialist Medical Physicist may have a formal recognition from a National Competent Authority and should continue to be enrolled in an EFOMP approved National Register for Medical Physicists.

4. The medical physics expert and the qualified expert in medical applications

The MED “supplements Directive 96/29/Euratom and lays down the general principles of the radiation protection of individuals in relation to the exposure referred to in paragraphs 2 and 3.” [3, Art 1.1]. The MPE is defined as “an expert in radiation physics acts or gives advice on patient dosimetry, on the development and use of complex techniques and equipment, on optimization, on quality assurance, including quality control, and on other matters relating to radiation protection, concerning exposure within the scope of this Directive” [3, Art 2]. The Basic Safety Standards Directive 96/29/Euratom (BSS) “establishes the basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation with the aim of their uniform implementation by Member States” [2, Art 54]. The BSS defines Qualified Experts (QEs), as “Persons having the knowledge and training needed to carry out physical, technical or radiochemical tests enabling doses to be assessed, and to give advice in order to ensure effective protection of individuals and the correct operation of protective equipment, and whose capacity to act as a qualified expert is recognised by the competent authorities” [2, Art 1]. The BSS also states, that Member States shall ensure that training of the QEs is arranged. Both the BSS and the MED should have been transposed into national law no later than 13 May 2000.

The EC “Guidelines on education and training for medical exposures” [8] were written to facilitate implementation of the MED. “Adequate theoretical and practical training for the purpose of radiological practices, as well as relevant competence in radiation protection” is required in the MED, [3, Art 7.1], and the training programmes in the guidelines thus include both general principles of radiation protection and particular staff aspects; “MPEs should know all the training areas at the highest level in addition to physics and all relevant aspects of quality assurance programmes.”, according to the Guidelines [8, 1.(24)]. In the “Communication from the Commission concerning the implementation of Council Directive 96/29/Euratom” [9], advice on basic and additional training for QEs is given in Annex I. The requirements on education and training, as well as on the appropriate practical experience, will depend on the complexity of the field of work and on the level and complexity of advice required from the QE; medical applications is one of the five specific areas, where additional topics have been identified. The MPE acts within the scope of the MED, the QE within the scope of the BSS. EFOMP has an on-going discussion on the interpretation of these recommendations relative to medical practice, concerning the role and responsibilities of the MPE. The MPE should be prepared to assume the responsibilities of the QE, but, in health care centres with MPEs available should the MPE and no one else take the responsibilities of the QE, and further, should the QE be required to have the competence of the MPE? The present situation in Europe shows a wide variation in the qualification requirements of the QE in medical practice.

5. Summary

The responsibilities of the Medical Physics Expert defines his competence, and EFOMP wants to emphasise that the term MPE should apply only to suitably experienced medical physicists, with a competence based on a structured education and training programme including CPD. EFOMP has presented policy statements related to all parts of this programme, in order to accomplish one of its main objectives; to harmonise and promote the best practice in medical physics in Europe.

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