The present status of Medical Physics Education and Training in Europe: An EFOMP survey∗

T. Eudaldo, Chairperson of the Education, Training and Professional matters (ETP) Committee of EFOMPa,∗, K. Olsen, Chairperson of the Standing Committee of Registration of EFOMPb

Summary
The aim of this work is to present the results of an EFOMP’s survey on the status of Education and Training of Medical Physics in Europe. This survey has been undertaken by EFOMP in 2005, to update the document “Policy Statement No. 1”, which represents the starting point of the EFOMP recommendations on Education and Training in Medical Physics. Ultimate results have been collected at the end of 2006.

To perform the survey, a questionnaire was sent to 34 National Member Organisations (NMOs) for Medical Physics, to collect information on the present state of education and training in each European country. Twenty-five countries participated in the enquiry and responded to it.

Received 24 August 2007; received in revised form 24 September 2007; accepted 27 September 2007
Available online 3 December 2007

Abbreviations: BHPA, Belgian Hospital Physicists Association; BIMEF, Society of Biomedical Engineering and Medical Physics (Serbia-Montenegro); BMGF, Ministry for Health and Women (Austria); BSc, Bachelor’s degree; CEM, Centre of Medical Examination (Poland); CMKP, Medical Centre for Postgraduate Education (Poland); CPD, Continuing Professional Development; DIPEM, Diploma of IPEM; DGMP, “Deutsche Gesellschaft für Medizinische Physik” (German Society of Medical Physics); DQPRM, “Diplôme de Qualification en Physique Radiologique et Medicale” (Radiological Physics qualifying diploma) Official French Diploma allowing to work as Medical Physicist; DSMF, Dansk Selskab for Medicinsk Fysik (Danish Society for Medical Physics); EFOMP, European Federation of Organisations for Medical Physics; EU, European Union; FANC, Federal Agency for Nuclear Control (Official Body in Belgium); HAMP, Hellenic Association of Medical Physicists (Greece); IPEM, Institute of Physics and Engineering in Medicine (United Kingdom); MED, Medical Exposure Directive: Council Directive 97/43/Euratom of 30 June 1997 on health protection of individuals against the dangers of ionising radiation in relation to medical exposure, repealing Directive 84/466/Euratom; MIPEM, Corporate membership of IPEM; MPE, Medical Physics Expert (definition given in the MED); MSc, Master’s degree; NMO, The National Organisation for Medical Physics of each country member of EFOMP; OeGMP, “Österreichische Gesellschaft für Medizinische Physik” (Austrian Society for Medical Physics); PhD, Doctor of Philosophy; PS, Policy Statement (EFOMP’s document); QMP, Qualified Medical Physicist (EFOMP definition, Policy Statement no. 10); SEFM, “Sociedad Española de Física Médica” (Spanish Society of Medical Physics); SFPM, “Societe Francaise de Physique Medicale” (French Society of Medical Physics); SPM, Specialist Medical Physicist (EFOMP definition, Policy Statement no. 10); U.K., United Kingdom.

* All EFOMP Policy Statements can be downloaded from the EFOMP web site: http://www.efomp.org.
* Corresponding author. Tel.: +34 93 291 9316/9319; fax: +34 93 291 9276.
E-mail address: teudaldo@santpau.es (T. Eudaldo).

1120-1797/$ - see front matter © 2007 Published by Elsevier Ltd on behalf of Associazione Italiana di Fisica Medica.
doi:10.1016/j.ejmp.2007.09.022
Introduction

Since its inauguration during the second conference of representatives from European organisations for Medical Physics in London in May 1980, one of the main objectives of the European Federation of Organisations for Medical Physics (EFOMP) has been to harmonise and promote the best practice of Medical Physics in Europe.

To achieve this goal, EFOMP has produced a number of unanimously adopted documents called "Policy Statements", making recommendations on the appropriate general responsibilities and roles of the Medical Physicist and proposing guidelines for Education, Training and Accreditation Programmes in Medical Physics. The most recent objectives of the EFOMP documents have been recommendations to implement Continuing Professional Development for Medical Physicists, and Guidelines on Professional Conduct. The total number of Policy Statements to date is 11.

The first of these documents, Policy Statement No. 1 [1] was published at a very early stage, in 1984. It was entitled: "Medical Physics Education and Training: The present European level and recommendations for its future development", and it represents the starting point of the EFOMP recommendations on Education and Training in Medical Physics.

To produce the document, it was necessary to be informed about the current state of development of Education and Training in Medical Physics in each European country. For this purpose, two fact-finding inquiries were conducted, as a result of which 19 national organisations for Medical Physics described the current level of education and training in their individual countries.

The results of the inquiry, summarised in the document, provide a global view of the situation on Education and Training in Medical Physics at that time in Europe.

The first EFOMP recommendations on the schemes of Education and Training in Medical Physics and on the education programmes contents were based on these.

Today, more than twenty years later, the content of this Policy Statement No. 1 is obviously obsolete. The organisation of the Medical Physics Education and Training in many countries has changed, and more recent EFOMP Policy Statements have been issued that have introduced new concepts and new recommendations that makes thorough revision of this first document necessary.

For example, reference should be made to Policy statements No. 6 [2]: "Recommended Guidelines of National Registration Schemes for Medical Physicists", and Policy Statements No. 8 [3] and No. 10 [4] on Continuing Professional Development for Medical Physicists. In addition, in 1991 EFOMP issued Policy Statement No. 4 on the numbers of qualified physicists needed in a Medical Physics Department. This document was revised in 1997 and published as Policy Statement No. 7 [5]. In 1993, the Policy Statement No. 5 [6] described the advantages, organisation and management of Departments of Medical Physics.

Furthermore, over the last two decades, the Council of the European Union has adopted new Directives on Medical Exposures and EFOMP has issued a series of relevant Policy Statements as a response to this new Legislation. In 1988 EFOMP issued Policy Statement No. 3 [7]: "Radiation Protection of the Patient in Europe: Training of the Medical Physicist as a Qualified Expert in Radiophysics" which was the EFOMP response to the Directive 84/466/Euratom[8]. In 1999, the Policy Statement No. 9 [9]: "Radiation Protection of the Patient in Europe: The Training of the Medical Physics Expert in Radiation Physics or Radiation Technology". This Policy Statement constitutes the EFOMP response to the Medical Exposure Directive, Council Directive 97/43/Euratom of 30 June 1997 on health protection of individuals against the dangers of ionising radiation in relation to medical exposure, and repealing Directive 84/466/Euratom [10].

A complete revision of the document now therefore appears to be essential. The aim of this work is to provide an updated view of the present level of education and training in Medical Physics in Europe.

Materials and methods

As was done for Policy statement No. 1, the first part of the work consists of collecting the necessary information. To do this in an efficient way, the first task of the working group has been to prepare a questionnaire and send it to the National Organisation for Medical Physics of each country member of EFOMP (NMO). The questionnaire was sent to the Presidents of 34 National Organisations for Medical Physics.
The questionnaire

The questionnaire was structured on a three different parts and the questions were asked in the following subjects:

Part A: Medical Physics education

1. Education requirements to enter the Medical Physics education:
   - What degree is required? It is a university degree? How many years of studies does it represent?
2. Degree on Medical Physics:
   - Is there a nationally approved education programme? Is it official? Who has approved it?
   - Does it lead to any "official diploma/qualification"? Name of this diploma/qualification in native language and in English.
   - Is the training programme the same in all centres of education in the country?
   - Where do the education and training take place? (University, Hospital, both?)
   - How long is the programme? (Specify the total time spent in each place)
   - What is the process for assessing the training?
   - Are the centres accredited? Who gives the accreditation?
   - Does the programme include the use of EMERALD¹ material as a support?

Part B: Qualified/Specialist Medical Physicist

- Is a "diploma" or "licence" required to be allowed to act as Medical Physicist?
- Who delivers it? Is it official? (i.e. provided by the government).
- Is it the only way to be eligible for the job? Describe the other possibilities if they exist.
- Does the "diploma" or "licence" allow a person to act as a Medical Physics Expert (MED Directive) in the country?
- Is the "diploma" or "licence" equivalent to Qualified Medical Physicist² (QMP) or to Specialist Medical Physicist³ (SMP) (EFOMP definitions)?

¹ EMERALD: European MEdical Radiation Learning Development is a set of e-learning material that have been developed under the EC Leonardo da Vinci program, jointly with the EMIT (European Medical Imaging Technology Training) project. Both projects have been supported by EFOMP. Further information: http://www.emeraldz.net.
² The Qualified Medical Physicist (QMP) is competent to act independently, and has the minimum qualifications required for enrolment in an EFOMP approved National Register for Medical Physicists. Recognition as a Qualified Medical Physicist is achieved only after completion of a basic university education in physical sciences, engineering or equivalent, followed by a further 2–4 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.
³ The Specialist Medical Physicist (SMP): 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-specialty, within the first period of an EFOMP approved National CPD Scheme. The Specialist Medical Physicist is competent to give advice on all professional matters in their sub-speciality. Within the EU, as defined in the Medical Exposure Directive [10] "in relation to medical exposure", the Medical Physics Expert is equivalent to the Specialist Medical Physicist.

Part C: Registration

1. General information:
   - Is there a Register of Professionals in the country?
   - Is it officially recognised by the authorities in some way? Who is in charge of it?
   - Is the Register entrance voluntary or compulsory based?
   - How many registrants do you have? What fraction of practising Medical Physicists does it represent?
   - What fraction of applicants has been refused, on what bases? If the Register is compulsory, what is the consequence of a refused registration?
   - What proportion of your registrants has passed through a recognised training scheme and what proportion was accepted because they were already working in medical physics? What criteria were used to include the later group?
   - Does the Register identify 2 levels of registrants QMP and SMP?
   - Does the Register have a special procedure for including applicants from a foreign country, registered on a foreign approved register?

2. Registration Council:
   - Give the names and functions of the registration council members.

3. Continuing Professional Development (CPD):
   - Is there a renewal mechanism in the Register?
   - Is it based on a CPD system, as described in EFOMP Policy Statement N. 10?
   - How does it comply with EFOMP Policy Statement N. 10?

Results

The following 25 countries participated in the enquiry and responded to it: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, The Netherlands, Norway, Poland, Portugal, Russia, Serbia-Montenegro, Spain, Sweden, Turkey and United Kingdom.

The results can be summarised as follows.

Part A: Medical Physics Education

In all countries, the basic educational requirement to enter Medical Physics is a university degree, but this is not uniform. Different NMOs refers to it as: Diploma, Degree, First Degree, BSc, MSc, or other. It may be in the field of: Natural Sciences, Physics, Chemistry, Engineering, or similar. The total duration of these studies ranges from 1½ years to 5 years at a university.

Fig. 1 shows the percentage distribution for the type of basic university degree required to enter Medical Physics education in the 25 countries. The duration of the studies in most countries included in "others" is at least 4 years.

Concerning post-graduate education in Medical Physics, in 16 of the 25 countries there is a nationally approved education programme. The programme’s approval is granted solely by the Ministry of Education or by the
Committee of Universities in the following countries: Finland, Greece, Latvia and Poland, whereas in Austria, Croatia, the Czech Republic, Denmark, France, Italy, The Netherlands, Spain, Sweden and the U.K., the Ministry of Health is also involved in the approval. Germany has educational programs approved only by their own National Organisation for Medical Physics, although it is presently involved in the process of obtaining government recognition (Fig. 2).

In Austria, Denmark and the U.K. the Ministry of Health approves the educational programme, but the specific programme is run by the National Society of Medical Physics (OeGMP, DSMF and IPEM respectively). In Belgium, the programme is approved by the Federal Agency for Nuclear Control (Fig. 2).

Finally, 9 countries (Bulgaria, Cyprus, Hungary, Ireland, Norway, Portugal, Russia, Serbia-Montenegro and Turkey) do not yet have a nationally approved programme for Education and Training in Medical Physics, or have no regulated programme at all.

Post-graduate education is essentially provided in three ways. First, the university approach, leading to a Masters degree and/or Ph.D. degree in Medical Physics. This is the case for Czech Republic, Finland, Serbia-Montenegro, and Turkey. The problem in this approach is that the skills of clinical practice may not be well guaranteed because of the little time spent in hospitals: in some cases, "1 or 2 weeks" or "summer practice".

The second approach is solely within the framework of professional practice. This is the case for Denmark, Norway and Spain. In these countries, the time required is at least of 3 years. With this approach, additional courses are needed to complete the education.

Finally, the third way, the most common, combines University and Hospital training. In this approach, post-graduate education ranges from 1 year (Latvia and Bulgaria) to 5 years in Germany. Fig. 3 shows the percentage distribution of the different ways post-graduate education in Medical Physics is conducted in the different countries. In A) looking at the total group of 25 countries, and in B) looking at the 16 countries with nationally approved programme.

Fig. 4 shows the duration of the post-graduate training for the 16 countries with a nationally-approved programme. This figure shows that post-graduate training in two countries is given only at the university, and in two other countries, the post-graduate training is done only "on the job" at the hospital. For the remaining countries, the training consist of a combination of university study and hospital practice.

Regarding the total length of the education and training to become a Medical Physicist, it ranges from 2½ years for Bulgaria to 9 years for Italy, Croatia and The Netherlands. The time spent in the different countries is detailed in Table 1, Appendix I.

Fig. 5 shows the length of the total training to become Medical Physicist in the 16 countries with nationally approved program. From the figure, it can be seen that the total length of the education and training to become a Medical Physicist ranges from 4½ years for Sweden to 9 years for Croatia, Italy and The Netherlands. The mean value is 7 years.

More details on education and training for the 25 countries are listed in Table 1, Appendix I.

Concerning accreditation of the centres where the education takes place:

In 8 countries (Denmark, Greece, Italy, Latvia, Poland, Serbia-Montenegro, Spain and Turkey) an official body (Ministry of Education, Ministry of Health, or other governmental agency) accredits them.
For Austria, France, Germany, The Netherlands and U.K., the accreditation is granted by their own National Organisation for Medical Physics. In Ireland the accreditation is given by the IPEM (Institute of Physics and Engineering in Medicine).

Finally, there are some countries which have no type of accreditation of the educational centres. This is the case of Belgium, Bulgaria, Croatia, the Czech Republic, Finland, Hungary, Norway and Sweden.

The process for assessing training differs depending on the approach in which the post-graduate education is done. When it is based solely within the framework of professional practice, evaluation is made mainly by the assessment of the supervisor, based on periodical reports from the candidate. In the other approaches, the most common way used is a final examination.

Completion of the educational programme leads to a diploma or some qualification in 18 of the 25 countries. It should be noticed that the name of this diploma or qualification is different in each one of them:

- Austria: MSc in Medical Physics
- Belgium: Acknowledged expert in Medical Physics
- Croatia: 1. degree: Master of Medical Physics/2; degree: Specialist Medical Physicist
- Czech Republic: Professional qualification for pursuing the health profession of radiological physicist
- Denmark: Medical Physicist in Diagnostic Radiology; Medical Physicist in Radiation Therapy; Medical Physicist in Nuclear Medicine
- Finland: Phil.-Lic (or PhD) with the degree of Qualified Medical Physicist
- France: Medical and Radiological Physics qualifying diploma (DQPRM)
- Germany: Registration certificate
- Greece: Post-graduate diploma in Medical Physics (M. of Sc. In Medical Physics)
- Hungary: MSc in Biomedical Engineering (Direction Medical Physics)
- Italy: Medical Physics Specialist
- Latvia: Professional Master degree in Medical Physics
- The Netherlands: Clinical Physicist
- Poland: Specialist in Medical Physics
- Serbia-Montenegro: Specialist in Medical Physics
- Spain: Specialist in Hospital Radiation Physics
- Sweden: Hospital Physicist degree
- United Kingdom: Diploma of IPEM (DIPEM)/Corporate membership of IPEM (MIPEM)

**Figure 4** Duration (in years) of the post-graduate training for the 16 countries with a nationally approved programme. The figure shows the time spent at the university and the time spent at the hospital.

**Figure 5** Duration (in years) of total training to become a Medical Physicist in the 16 countries with a nationally-approved programme. The two parts of training: basic education and post-graduate education, are clearly identified in the figure.
The “EMERALD” material is used as a support in the educational programmes in Bulgaria, Denmark, France, Greece, Ireland, Latvia, Norway (only for Radiotherapy), Poland, Portugal (only in some hospitals) and Turkey. However, this material is still unknown in some other countries.

Table 1 in the Appendix I summarises the results of part A of the questionnaire.

Part B: Qualified/Specialist Medical Physicist

The main goal of this part of the questionnaire was to ascertain the essential requirements needed to work as a Medical Physicist in the different countries, and whether the competencies to work as such, are at the level of Qualified Medical Physicist (QMP) or at the level of Specialist Medical Physicist (SMP), both defined by EFOMP [4].

In 14 countries, it is mandatory to hold a diploma or license to work as a MP: Austria, Bulgaria, Croatia, Cyprus, the Czech Republic, Finland, France, Greece, Italy, The Netherlands, Poland, Portugal, Spain and Sweden. In some others, such as Belgium and Turkey, it is only necessary that one person holds such a diploma or license in each hospital. In Denmark, the license is only necessary to work as “the responsible MP”, not to work as an ordinary MP. In Germany, it is only compulsory to hold the diploma or license in Berlin. In the U.K. it is mandatory to be registered. In the remaining countries there is no requirement to hold a diploma or license to work as a MP.

The diploma or license is provided by a governmental body (other than the University) in 12 countries: Austria, Belgium, Bulgaria, Cyprus, Denmark, Finland, France, Greece, The Netherlands, Poland, Spain and Sweden. In Germany, this applies for Berlin only.

In most countries, this diploma is obtained after completion of the whole education and training programme described in the previous section. Nevertheless, in some others there are alternative possibilities to obtain it. Such is the case for Finland, Germany and the U.K. where a period of 3—4 years of working experience leads to the same diploma.

In answer to the question: “Does the diploma or license allow a person to act as a Medical Physics Expert (MPE) as defined in the Directive 97/43/Euratom?”, the results of the survey show this is possible in Austria, Bulgaria (it is one of the requirements), Croatia, Finland, France, Greece, Italy, The Netherlands, Poland, Portugal, Spain, Sweden and Turkey.

It should be noticed that the MPE is not defined yet in several countries. Such is the case for the Czech Republic, Denmark, Hungary and Serbia-Montenegro.

In answer to whether the diploma or licence is equivalent to QMP or to SMP (EFOMP definitions), the results showed: in Austria, Belgium, Croatia, Denmark, France and Greece, the diploma/license allows to work at the level of QMP, whereas in Bulgaria, Germany, Italy, The Netherlands, Poland, Serbia-Montenegro, and Spain it is equivalent to SMP.

Finally, the areas of competence in which this diploma or licence allows physicists to work differ considerably depending on the country. The most commonly mentioned are Radiotherapy, Diagnostic Radiology and Nuclear Medicine. In the majority of countries, this diploma/license allows Medical Physicists to work in all areas of competencies. In some other countries however, such as Belgium, Denmark, Germany and the Netherlands, the education and training are specific only for one area, so Medical Physicists are allowed to work only in one (or two) of the mentioned areas, depending on the initial choice. Fig. 6 shows these results.

The non-ionising radiation field is also considered competence of Medical Physicists in Bulgaria (for Specialists in Medical Health Physics only), Croatia, Italy, Poland, Sweden and the U.K.

Radiation Protection is a field of competence only in Croatia, Greece, Italy, Latvia, Spain and, in some institutions only, Sweden. In Bulgaria it is competence of Medical Physicists only in the field of Radiotherapy.

On that issue, the EFOMP Council has approved very recently the document “Malaga Declaration” [11] on EFOMP’s position on the Medical Physics in Europe. Point 3 of this document, which is dealing with Medical Physics in Radiation Protection in the Medical Area, clearly states that Radiation Protection in hospitals, involving patients, working staff and members of the public, must be performed by Medical Physics Experts.

In Finland, Medical Physicists also have competencies in Clinical Physiology and in Clinical Neurophysiology, and in the Netherlands in the area of Audiology.

Table 2, Appendix I, summarises the results of part B of the questionnaire.

Part C: Registration

At present, 17 countries have a Register of Professionals working as Medical Physicists: Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Latvia, Netherlands, Poland, Spain, Sweden and the U.K.

The Register is “official”, in the sense that it is recognised and managed by a governmental body (Ministry of Health, National Board of Health, etc.) in 10 countries: Austria, Belgium, Bulgaria, the Czech Republic, Finland, The Netherlands, Poland, Spain, Sweden and the U.K. For the remaining, it is the National Organisation for Medical Physics who manages the Register by means of their own Registration Board.

Austria, Belgium, Bulgaria, Spain and Sweden have two different kinds of Registers: in addition to the “official” register managed by the authorities, the National Society
for Medical Physics also has its own register, voluntary-based, whose aim is to better accomplish the EFOMP requirements.

The Register is compulsory in Belgium (the official one), the Czech Republic, Finland, the Netherlands, Sweden and the U.K. In Austria, Bulgaria (the official register), Denmark and Spain (the official register), registration is “automatic” in the sense that Medical Physicists are automatically registered when they obtain their diploma. For the remaining countries, the Register is a voluntary one.

The Register identifies two levels (QMP and SMP) only in Bulgaria, Denmark, France and Spain (only for the register managed by the SEFM).

In general, there is no special procedure to include applicants from a foreign country in the National Registers. The most common way consists of an individual assessment of the applicant.

A Continuing Professional Development (CPD) system operates in 13 countries: Austria, Belgium, Croatia, Czech Republic, Denmark, France, Germany, Greece, Ireland, The Netherlands, Spain, Sweden and the U.K.

CPD is used as a renewal mechanism for the Register in all of them, either partially or fully.

The CPD system fully complies with EFOMP recommendations stated in Policy statement No. 10 [4] only in 10 countries (Austria, Belgium, Croatia, Denmark, France, Germany, Greece, Ireland, Spain and the U.K). It is presently in the process of adaptation in the Czech Republic and Sweden.

CPD is based on a 5- or 6-years-cycle time in most countries.

Table 3, Appendix I, summarises the results of part C of the questionnaire.

Conclusions

The most relevant conclusions can be summarised as follows:

- Basic education:
  - In all countries, the basic requirement to enter Medical Physics is a university degree. Master’s degree 36%, BSc 28% and the remainder refer to a diploma, a license, first degree, etc.
  - The length of the basic university education ranges from 1½ to 5 years.
- Post-graduate education in Medical Physics:
  - Unfortunately, Medical Physics education is not yet regulated in some countries.
  - A nationally approved educational programme is in operation in 64% of the countries. The university gives approval in 16% of them, whereas in 40% the ministry of health is also involved in the approval. National Societies for Medical Physics having played an important role in setting-up the educational programmes in most countries.
  - There are basically 3 different approaches to post-graduate education:
    a) University studies only, leading to a Master’s Degree or PhD in Medical Physics (12% of the overall countries).
    b) Hospital only: on-the-job training (12% of the overall countries).
    c) Combining University + Hospital (68%). In this approach the time spent in the hospital ranges from 1 month to 3 years.
- The total length of Medical Physics education and training (basic university + post-graduate training) ranges from 2½ years to 9 years.
- Completion of the educational programme leads to a diploma/license named very differently in each country.
  - Diploma or license to work as a Medical Physicist:
    - In 56% of the countries, it is mandatory to hold a diploma or license to work as a Medical Physicist. In 4 countries this is only mandatory for 1 physicist per centre, or only to act as responsible Medical Physicist.
    - This diploma or licence is “official” in the sense that it is delivered by a governmental body in 48% of the countries.
    - Holding this diploma/license is the only way to be eligible for the job in 56% of the countries. Other possibilities such as: “hold a Master’s degree” or “3 years’ work experience”, are also possible for the remaining countries.
  - It allows one to work as a Medical Physics Expert (MPE) in 52% of the countries.
  - It is equivalent to Qualified Medical Physicist (QMP), EFOMP definition, in 24% of the countries.
  - It is equivalent to Specialist Medical Physicist (SMP), EFOMP definition, in 24% of the countries.
  - It allows one to work in all areas of competence in 56% of the countries, whereas in 4 countries (16%) it depends on the areas selected by the Medical Physicist in their education and training programme (only one or two areas per training programme are possible).
  - Register of professionals:
    - 68% of the countries have a register for Medical Physicists. In 59% of them, an official body manages the register, whereas in 41% the Board of their own National Society for Medical Physics exclusively does so.
    - The register is compulsory in 35% of the cases and voluntary based in 53%. For the remainder it can be considered “automatic”.
  - A renewal mechanism is in operation in 65% of the registers.
- Continuous Professional Development (CPD):
  - A formal CPD programme is in operation in 52% of the countries, fully or partially complying with the EFOMP recommendations.
  - CPD is used as a renewal mechanism in the Register in all of them.
  - The CPD cycle time, credit-point based ranges from 5 to 6 years.

Acknowledgments

The authors acknowledge all those that have been made possible this work: The NMO’s who has responded to the questionnaire; The EFOMP’s Officers who have always supported the initiative and have contributed to the final version of this document with comments, suggestions and even grammar corrections. Finally, a special acknowledgement to Helene Bouscayrol, core member of the EFOMP Standing Committee on Registration, for her valuable contribution in setting up the questionnaire.
## Table 1
Summary of the part A of the questionnaire: Medical Physics education and training

<table>
<thead>
<tr>
<th>Country</th>
<th>Basic education</th>
<th>Post-graduate education on Medical Physics</th>
<th>Total years</th>
<th>By: Assessment of the training</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>University degree</td>
<td>No. years</td>
<td>National approv. Progr.?</td>
<td>Where the Education take place?</td>
</tr>
<tr>
<td>Austria</td>
<td>MSc or PhD in Physics, Technical Physics or Electrotechnics</td>
<td>5</td>
<td>Yes</td>
<td>BMGF</td>
</tr>
<tr>
<td>Belgium</td>
<td>License in Physical Science, Chemistry, Engineer or equiv.</td>
<td>4–5</td>
<td>Yes</td>
<td>FANC</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>BSc. in Physics or Engineering</td>
<td>1½–2</td>
<td>No</td>
<td>3 Universities + Hospitals</td>
</tr>
<tr>
<td>Croatia</td>
<td>Past: Diploma. Engineer Prof. of Physics Now: Master of Physics</td>
<td>5</td>
<td>Yes</td>
<td>University of Zagreb + Ministry of Health</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Master degree in Medical Physics</td>
<td>4–5</td>
<td>No</td>
<td>Abroad</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>BSc. Mathematics and Physics</td>
<td>3</td>
<td>Yes</td>
<td>Ministry Education Ministry of Health</td>
</tr>
<tr>
<td>Denmark</td>
<td>MSc in Physics, Engineer or equiv.</td>
<td>5</td>
<td>Yes</td>
<td>Ministry of Health. Hospital only</td>
</tr>
<tr>
<td>Finland</td>
<td>BSc or MSc in Physics, Engineer or equiv.</td>
<td>5</td>
<td>Yes</td>
<td>Ministry Education Ministry of Health (DQPRM diploma)</td>
</tr>
<tr>
<td>Germany</td>
<td>Diploma/Master Physics or Engineering</td>
<td>3–5</td>
<td>Yes</td>
<td>DGMP only</td>
</tr>
<tr>
<td>Greece</td>
<td>First degree in Physics</td>
<td>4</td>
<td>Yes</td>
<td>Ministry Education Ministry of Health</td>
</tr>
<tr>
<td>Hungary</td>
<td>BSc Physical Science or equiv.</td>
<td>3–3½</td>
<td>Not yet</td>
<td>Ministry Education (only: Master 2 year)</td>
</tr>
<tr>
<td>Ireland</td>
<td>B. Sc. (Hons) Physics or equiv.</td>
<td>4</td>
<td>No</td>
<td>University + Hospital</td>
</tr>
<tr>
<td>Country</td>
<td>Programme Type</td>
<td>Duration</td>
<td>Years</td>
<td>Minimum qualifications</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------</td>
<td>----------</td>
<td>-------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Italy</td>
<td>&quot;Laurea Specialistica: Fisica&quot;</td>
<td>5</td>
<td>Yes</td>
<td>University Minister + Ministry of Health</td>
</tr>
<tr>
<td>Latvia</td>
<td>Professional BSc in MP Professional BSc or 5th level professional qualifications MSc in Physics</td>
<td>4½</td>
<td>Yes</td>
<td>Accredit. Commit. of the Minister of Science and Educat.</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Master</td>
<td>5</td>
<td>No</td>
<td>Hospital only (working under supervision)</td>
</tr>
<tr>
<td>Portugal</td>
<td>Degree on Physics or Physics Engineering</td>
<td>4–5</td>
<td>No</td>
<td>Hospital only</td>
</tr>
<tr>
<td>Poland</td>
<td>Licence in Physics or BSc. in Techn. Physics</td>
<td>3–3½</td>
<td>Yes</td>
<td>University + Ministry of Science</td>
</tr>
<tr>
<td>Russia</td>
<td>High degree (Natural Science, Electr. Eng, Nuclear Physics)</td>
<td>4</td>
<td>Not yet</td>
<td>Only University</td>
</tr>
<tr>
<td>Norway</td>
<td>&quot;Licenciatura&quot; in Physics, Engineering or equiv.</td>
<td>4–5</td>
<td>Yes</td>
<td>Ministry of Health and Ministry of Education</td>
</tr>
<tr>
<td>Sweden</td>
<td>2 years University Maths + Physics</td>
<td>2</td>
<td>Yes</td>
<td>National Body of Health and Welfare</td>
</tr>
<tr>
<td>Turkey</td>
<td>Basic Degree Physical Science or Engineering</td>
<td>4</td>
<td>No</td>
<td>Only University</td>
</tr>
<tr>
<td>U.K.</td>
<td>BSc (Honours level) in Physics, engineering or allied Science</td>
<td>3–4</td>
<td>Yes</td>
<td>Departm. of Health. Run by IPEM</td>
</tr>
</tbody>
</table>

(*) For Portugal, the data shown in this table refers to the training scheme as it was organised until 2003. Since then, the status of public hospitals (who delivered the training) has changed (from public to privat managed organizations). The new management-status does not promote the traditional established professional careers (e.g. hospital physics career) implementing, as an alternative, individual work contracts with the employees. Various education programmes in medical physics related areas are currently available in Portugal and a proposal for an education program (MSc), to complement the official training, was prepared by two public high education institutions and proposed as a suitable alternative to the established scheme.

List of abbreviations used in this Table: BSc: Bachelor’s degree; DSMF: Danish Society for Medical Physics; MSc: Master’s degree; SFPM: French Society for Medical Physics; PhD: Philosophical Doctor (Thesis); DQPRM: Official French Diploma allowing to work as Medical Physicist; MP: Medical Physicist; IPEM: Institute of Physics and Engineering in Medicine (United Kingdom); OeGMP: Austrian Society for Medical Physics; DIPEM: Diploma of IPEM (after 2 years training); BMGF: Ministry for Health and Women (Austria); MIPEM: Corporate Membership of IPEM (after 4 years training); FANC: Federal Agency for Nuclear Control (Belgium); DGMP: German Society of Medical Physics.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Yes: Licence</td>
<td>Yes</td>
<td>BMGF</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td>QMP (SMP not defined)</td>
<td>Radiotherapy; Nuclear M; Radiology</td>
</tr>
<tr>
<td>Belgium</td>
<td>Only 1 per Hosp. (Radiotherapy)</td>
<td>Yes</td>
<td>FANC</td>
<td>Yes</td>
<td></td>
<td>N/A</td>
<td>QMP</td>
<td>Radiotherapy; Nuclear M; Radiology Only in 1 or 2 areas Spec. in Medical Radiation Physics: Radiotherapy, Nuclear M., Radiology Specialist in Medical Health Physics: Non-Ionizing-rad.</td>
</tr>
<tr>
<td>Croatia</td>
<td>Yes</td>
<td>No, Only University</td>
<td>University</td>
<td>Will be</td>
<td></td>
<td>Yes</td>
<td>QMP</td>
<td>All areas of Medical Physics</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Yes</td>
<td>YES</td>
<td>Ministry of Labour</td>
<td>No</td>
<td></td>
<td></td>
<td>Depending of the years of experience</td>
<td>All qualified MP can be employed</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Yes</td>
<td>No, Only University</td>
<td>University</td>
<td>No</td>
<td>Any MSc + courses</td>
<td>MPE not yet defined</td>
<td>N/A</td>
<td>Radiotherapy; Nuclear M; Radiology</td>
</tr>
<tr>
<td>Denmark</td>
<td>Only for the: Responsible MP</td>
<td>No, Only for Responsible MP</td>
<td>National Body of Health</td>
<td>No</td>
<td>To work as an ordinary MP</td>
<td>MPE not yet defined</td>
<td>QMP</td>
<td>Only in 1 or 2 areas of specialization: Radiotherapy; Nuclear M; Radiology</td>
</tr>
<tr>
<td>Finland</td>
<td>Yes</td>
<td>Yes</td>
<td>University + National Authority Medicolegal</td>
<td>Yes</td>
<td></td>
<td></td>
<td>N/A</td>
<td>Radiotherapy; Nuclear M; Radiology Clinical Physiol; Clinical Neurophys.</td>
</tr>
<tr>
<td>France</td>
<td>Yes (DQPRM)</td>
<td>Yes</td>
<td>INSTIN (University)</td>
<td>DQPRM defined by low education</td>
<td>Yes</td>
<td>DQPRM = QMP SMP = after 5 years experience</td>
<td></td>
<td>Radiotherapy; Nuclear M; Radiology</td>
</tr>
<tr>
<td>Germany</td>
<td>Only in Berlin</td>
<td>Yes (Berlin only)</td>
<td>The Senat (Berlin only)</td>
<td>No</td>
<td>Personal initiat. or advertising</td>
<td>N/A</td>
<td>SMP</td>
<td>Depend on the areas selected by the MP during his Education &amp; Training</td>
</tr>
<tr>
<td>Greece</td>
<td>Yes</td>
<td>Yes</td>
<td>Ministry of Health</td>
<td>Yes</td>
<td></td>
<td></td>
<td>QMP</td>
<td>Radiotherapy; Nuclear M; Radiology</td>
</tr>
<tr>
<td>Hungary</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
<td>Radiation Protection N/A</td>
</tr>
<tr>
<td>Ireland</td>
<td>Not yet (2008)?</td>
<td>Will be</td>
<td>Will be: State appointed Registration Council</td>
<td>Will be</td>
<td></td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Country</td>
<td>Education Required</td>
<td>Only Master's Degree</td>
<td>University Level</td>
<td>University Required</td>
<td>Only QMP</td>
<td>Qualification Type</td>
<td>Remarks</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------</td>
<td>----------------------</td>
<td>------------------</td>
<td>---------------------</td>
<td>----------</td>
<td>-------------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>Yes</td>
<td>No</td>
<td>University</td>
<td>Yes</td>
<td>Yes</td>
<td>SMP</td>
<td>Radiotherapy; Nuclear Medicine; Radiology; Radiation Protection; Non-Ionizing Radiation</td>
<td></td>
</tr>
<tr>
<td>Latvia</td>
<td>No</td>
<td>No</td>
<td>University</td>
<td>No But No in Practice</td>
<td>N/A</td>
<td>SMP</td>
<td>Only 1 area per training programme: General Clinical Physics; Radiotherapy; Nuclear Medicine; Audiology; Radiology</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>Yes</td>
<td>Yes (2005)</td>
<td>Executive Committ. for Board registration of the Dutch Society (on behalf of the Ministry of Health)</td>
<td>Yes But No in Practice</td>
<td>N/A</td>
<td>SMP</td>
<td>Mainly Radiotherapy From 2005: QA in Nuclear Medicine and Radiology</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>No</td>
<td>No</td>
<td>University</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>Radiation Physics; Nuclear Medicine; Radiology</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>Yes</td>
<td>Yes</td>
<td>Head of the Centre of Medical Examination</td>
<td>No</td>
<td>Master degree on Physics</td>
<td>SMP</td>
<td>Radiotherapy; Nuclear Medicine; Radiology</td>
<td></td>
</tr>
<tr>
<td>Portugal (*)</td>
<td>Yes</td>
<td>Yes</td>
<td>Ministry of Health</td>
<td>No</td>
<td>Yes</td>
<td>N/A</td>
<td>Radiation Physics; Nuclear Medicine; Radiology</td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>N/A</td>
<td>Not yet (in progress)</td>
<td>Ministry of Health (will be)</td>
<td>No</td>
<td>Appropriate Univ. Diploma</td>
<td>SMP</td>
<td>Radiotherapy (primarily)</td>
<td></td>
</tr>
<tr>
<td>Serbia-Montenegro</td>
<td>No</td>
<td>No</td>
<td>Ministry of Education</td>
<td>Yes</td>
<td>Work under supervision</td>
<td>SMP</td>
<td>Radiation Physics; Nuclear Medicine; Radiology</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>Yes</td>
<td>Yes</td>
<td>National Body of Health and Welfare</td>
<td>Yes</td>
<td>Yes</td>
<td>Below QMP</td>
<td>Radiation Physics; Nuclear Medicine; Non-Ionizing Radiation</td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>At least 1 per Centre</td>
<td>No</td>
<td>Council of Higher Education</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Radiation Oncology</td>
<td></td>
</tr>
<tr>
<td>U.K.</td>
<td>No</td>
<td>Yes (in any way)</td>
<td>IPEM</td>
<td>No</td>
<td>3 years of work</td>
<td>No</td>
<td>QMP All areas</td>
<td></td>
</tr>
</tbody>
</table>

(*) For Portugal, the data showed in this table are only available until 2003.

List of abbreviations used in this Table: MP: Medical Physicist; BMGF, Ministry for Health and Women (Austria); MPE: Medical Physics Expert (Directive 97/43 Euratom); FANC, Federal Agency for Nuclear Control (Belgium); QMP, Qualified Medical Physicist (EFOMP definition); INSTIN, National Institute for Nuclear Science and Technology (France); SMP, Specialist Medical Physicist (EFOMP definition); DQPRM, Official French Diploma allowing to work as Medical Physicist; MSc, Master’s degree; IPEM, Institute of Physics and Engineering in Medicine (United Kingdom); QA, Quality Assurance.
<table>
<thead>
<tr>
<th>Country</th>
<th>General Information</th>
<th>Register?</th>
<th>Officially recognised?</th>
<th>Who is in charge of it?</th>
<th>Voluntary/Compulsory</th>
<th>How many registrants?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Yes (2 differ.)</td>
<td>Yes</td>
<td>OeGMP</td>
<td>Automatic</td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Belgium</td>
<td>Yes (2 differ.)</td>
<td>FANC: Yes</td>
<td>FANC</td>
<td>Compulsory</td>
<td></td>
<td>No data</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Yes (2 differ.)</td>
<td>Yes</td>
<td>Ministry of Health</td>
<td>Automatic</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Croatia</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Yes</td>
<td>Yes</td>
<td>Ministry of Health</td>
<td>Compulsory (in 2006)</td>
<td></td>
<td>No data</td>
</tr>
<tr>
<td>Denmark</td>
<td>Yes</td>
<td>No</td>
<td>National Authority</td>
<td>Compulsory</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>Finland</td>
<td>Yes</td>
<td>Yes</td>
<td>National Authority</td>
<td>Voluntary</td>
<td></td>
<td>147</td>
</tr>
<tr>
<td>France</td>
<td>Yes</td>
<td>No</td>
<td>Registrat. Committ of SFPM</td>
<td>Voluntary</td>
<td></td>
<td>550</td>
</tr>
<tr>
<td>Greece</td>
<td>Yes</td>
<td>No</td>
<td>DGMP</td>
<td>Voluntary</td>
<td></td>
<td>203</td>
</tr>
<tr>
<td>Hungary</td>
<td>No</td>
<td>Yes</td>
<td>Registered Members</td>
<td>Voluntary</td>
<td></td>
<td>39</td>
</tr>
<tr>
<td>Ireland</td>
<td>Yes</td>
<td>No</td>
<td>Latvian Med Engin and</td>
<td>Voluntary</td>
<td></td>
<td>30 (only 7 MP)</td>
</tr>
<tr>
<td>Latvia</td>
<td>No</td>
<td>Yes</td>
<td>Latvian Med Engin and</td>
<td>Voluntary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>Yes</td>
<td>Yes</td>
<td>Executive Commit for</td>
<td>Compulsory</td>
<td></td>
<td>245</td>
</tr>
<tr>
<td>Norway</td>
<td>No</td>
<td>Yes</td>
<td>CMKP and CEM + Ministry of Health</td>
<td>Voluntary</td>
<td></td>
<td>20 + 48 (in process)</td>
</tr>
<tr>
<td>Poland</td>
<td>No</td>
<td>Yes</td>
<td>CMKP and CEM + Ministry of Health</td>
<td>Voluntary</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Portugal</td>
<td>No</td>
<td>No</td>
<td>Not yet</td>
<td>Voluntary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>N/A</td>
<td>Yes</td>
<td>BIMEF + Ministry of Health and Labour</td>
<td>Compulsory (will be)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serbia-</td>
<td>Yes</td>
<td>1: Yes</td>
<td>1: Ministry of Health</td>
<td>Automatic</td>
<td></td>
<td>1: 480</td>
</tr>
<tr>
<td>Montenegro</td>
<td>(2 differ.)</td>
<td>2: No</td>
<td>2: SEFM</td>
<td>Voluntary</td>
<td></td>
<td>2: 160</td>
</tr>
<tr>
<td>Spain</td>
<td>Yes</td>
<td>Yes</td>
<td>National Body of Health and welfare</td>
<td>Compulsory</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>Sweden</td>
<td>(2 differ.)</td>
<td>Yes</td>
<td>National Body of Health and welfare</td>
<td>Compulsory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>Health Professions Council</td>
<td>Compulsory</td>
<td>1260</td>
</tr>
<tr>
<td>U.K.</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Health Professions Council</td>
<td>Compulsory</td>
<td>1260</td>
</tr>
</tbody>
</table>

List of abbreviations used in this Table: CPD: Continuous Professional Development; SFPM: French Society for Medical Physics; MP: Medical Physicist; BHPA: Belgian Hospital Physicists Association; QMP: Qualified Medical Physicist (EFOMP definition); DGMP: German Society of Medical Physics; SMP: Specialist Medical Physicist (EFOMP definition); HAMP: Hellenic Association of Medical Physicists; PS: Policy Statement (EFOMP’s document); CMKP: Medical Centre for Postgraduate Education (Poland); FANC: Federal Agency for Nuclear Control (Belgium); CEM: Centre of Medical Examination (Poland); OeGMP: Austrian Society for Medical Physics; BIMEF: Society of Biomedical Engineering and Medical Physics (Serbia-Montenegro); BMGF: Ministry for Health and Women (Austria); SEFM: Spanish Society of Medical Physics; DSMF: Danish Society for Medical Physics.
Table 3 (continued)

<table>
<thead>
<tr>
<th>General Information</th>
<th>Continuing Professional Development (CPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fraction of practising MP?</strong></td>
<td><strong>Proportion: Recognized scheme/not</strong></td>
</tr>
<tr>
<td>100%</td>
<td>20/30</td>
</tr>
<tr>
<td>No data</td>
<td>No data</td>
</tr>
<tr>
<td>50%</td>
<td>No data</td>
</tr>
<tr>
<td>No data</td>
<td>27/30</td>
</tr>
<tr>
<td>100% in RT and NM</td>
<td>100%</td>
</tr>
<tr>
<td>60%</td>
<td>90%/10%</td>
</tr>
<tr>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>Majority</td>
<td>Nearly all</td>
</tr>
<tr>
<td>20–30%</td>
<td>No data</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>1: 100%</td>
<td>40%/60%</td>
</tr>
<tr>
<td>2: 33%</td>
<td>2: Yes</td>
</tr>
<tr>
<td>100%</td>
<td>10%/90%</td>
</tr>
<tr>
<td>100%</td>
<td>4:1</td>
</tr>
</tbody>
</table>

Medical Physics Education and training in Europe
Appendix II: NMO’s Education and Training Schemes

AUSTRIA (OeGMP)

**University**
- Basic Education: Physical Science, Engineering or equivalent minimum 5 years

**Hospital (On-the-job training)**
- Postgraduate Training: Theor. Part: 360 hours + Master Thesis at Postgraduate course Prac. Part: min 3 years at a hospital

Registration as Qualified Medical Physicist [eq. Medical Physics Expert]

Continuing Professional Development:
- 6 year cycle time
- Credit point system

Special Courses, Workshops, Congresses etc., Self directed learning

No “Specialist Medical Physicist” defined in Austria

BELGIUM

**University**
- Basic Education: Physical science, Chemistry, Engineering or equivalent

**Hospital**
- Postgraduate Training: Theor + pract. part: 600 hrs
- Practical clinical training: 1 yr prof. work (radiotherapy) .5 yr prof. work (radiology) .5 yr prof work (nucl. Medicine)

Registration as Qualifed Medical Physicist by the Federal Agency for Nuclear Control (FANC) (expert agrée en radiophysique médicale – erkend deskundige in de medische stralingsfysica) in one or more fields (radiotherapy-radiology-nucl. medicine)

Activity reports + continuing professional development (8 yr cycle time)

CROATIA

**University**
- Basic Education: Physical Science (Master of Physics), Engineering (Master of electrotechnics, electronic and informatics or equivalent) 5 years

**Hospital (On-the-job training)**
- 1. Postgraduate Training + University Theor. Part (lectures + exercises) + Hospital training: approx. 400 hours + Hosp.training (30% of all Hosp. yr.) After 2 years: Master of medical physics
- 2. Additional 2 years (altogether 4 years) Only Hospital training (70% of all Hosp. training time) Exam: Specialist Medical Physicist

Continuing Professional Development: workshops, congresses, publ. articles.....
- Credit point system, 5 year cycle time, 250 points, 50 points at year
**FINLAND**

**University**
- Basic Education: Physical Science, Engineering or equivalent
- 5 years

**Hospital (On-the-job training)**
- Postgraduate Training:
  - Theor. Part: 40 weeks = 800 hours, licentiateship work, hospital physicist examination

**Registration as Qualified Medical Physicist**
- Special Courses, Workshops, Congresses etc., Self directed learning
- Continuing Professional Development:
  - 5 year cycle time
  - Credit point system

**FRANCE**

Prerequisite: L1L2L3 + M1 (4 years university) in physics or related areas
- 180 ECTS + 60 ECTS

M2 in medical physics (5th year university)
- 60 ECTS composed of a theoretical part and a research part

**Diploma of Qualification in Radiological and Medical Physics (DQPRM)**
- 7 weeks theoretical part and 32 weeks in accredited centers
- MP Specialist
  - (as defined in the official text of 19/11/2004)
- Doctorate in Medical Physics or related fields (Ph. D)

**Registration on the SFPM Register (voluntary based)**
- as a Qualified MP
  - if less than:
    - 5 years experience
    - 3 years when holding a PhD
- as an Expert in Medical Physics

**GERMANY**

**DGMP Scheme E & T Medical Physics**

**Registration Qualified MP**

**CPD**

**Oral Examination**
- 3 year guided clinical practice (Mentor)
- Theory & Practicing (360 h) in:
  - Basic (A), Special (B) and Optional Selected Fields (C)

**1 suppl. year clin. practice**
- 2 suppl. years clin. practice

**Dipl.-Ing. (FH)**

**5 year university study of physics or related field**

**Dipl.-Ing. (BA)**

**3 year techn.Acad.**

**Dipl.-Ing. (FH)**

**4 year applied university**
GREECE

University

Basic Education:
First degree in Physics (4 years)

Hospital
(On-the-job training)

Postgraduate Training:
Theor. Part: 600 hours
Practical Part: 1 1/2 years professional work

Registration as Qualified Medical Physicist

Special Courses, Workshops, Congresses etc.,
Self directed learning

Continuing Professional Development:
5 year cycle time
Credit point system

Registration as Specialist Medical Physicist [eq. Medical Physics Expert]

POLAND

University course
(physics, medical physics
technical physics
computer science)
3 years (Lic.), 2 years (Mgr)

Clinical employment
(minimum 2 years,
under supervision of a
specialist in medical physics)

Specialist Training
(3 years, in accredited hospital)
(following state-approved theoretical and
practical training programme)

State Exam (Medical Examination Centre)

Present situation (Sept. 2006):
28 Approved Specialists
48 in Training (until 2008) in
5 Accredited Centres

SPAIN

University

Basic Education:
Physical Science, Engineering or equivalent
4 - 5 years

Hospital
(On-the-job training)

Postgraduate Training:
Theoretical and practical training in Medical Physics
departments of accredited teaching hospitals (3 years)
Theor. Part: This is done by reading a basic bibliography,
attendance at specific courses, seminars, lectures, etc., in the
hospital itself or organised by the SEFM (The Spanish Society
of Medical Physics) or other recognised scientific organisations.
Practical Part: 3 years professional work

Registration as Qualified Medical Physicist

Special Courses, Workshops, Congresses etc.,
Self directed learning

Continuing Professional Development:
5 year cycle time
Credit point system: 250 credit-points/5 years

Registration as Specialist Medical Physicist [eq. Medical Physics Expert]
SWEDEN

M2 years basic physics+maths, Medical physics 4,5 years including 0.5 years on-the-job training

- Formal registration as Medical Physicist by The National Board of Health and Welfare, MPE?
- 2 years professional work and voluntary cdp or equivalent
- Registration as Resident Medical Physicist by Swedish CPD Board, equivalent with Qualified Medical Physicist, MPE
- 5 years professional work and voluntary cdp or equivalent
- Registration as Specialist Medical Physicist by the Swedish CPD Board, equivalent with Specialist Medical Physicist, MPE

TURKEY

University

- Basic Education: Physical Science, Engineering or equivalent (4 years)

Hospital

- Postgraduate Training:
  - Theor. Part: 250 hours (plus 200 hours practical training)
  - Practical Part: Minimum 2 years professional work (at the same time thesis study)

- Registration as Qualified Medical Physicist
- Continuing Professional Development: Special courses, workshops, congress
- Registration as Specialist Medical Physicist [eq. Medical Physics Expert]
- Self directed learning

UNITED KINGDOM

University

- Basic education to BSc honors level in physics, engineering or allied subjects, 4 years in Scotland, 3 years in rest of the UK

Part 1 Training

- IPEM approved MSc in medical physics/bioengineering (1 year. Competency based training for 1 year in 3 specialist areas.)
- Submission of portfolio of work done in competency training period and interview by IPEM. Award of DipIPEM

Part 2 Training

- 2 years training in usually one specialty area. This is for advanced experience and knowledge. Competencies required during this time specified by IPEM but are consistent with those required for registration. Must also do CPD.
- Submission of portfolio of work demonstrating competencies required for entry to the register and award of MIPEM. Interview by two assessors appointed jointly by IPEM and the Association of Clinical Scientists*. Award of MIPEM and entry to register

CPD
References


