Medical Physics Certification in Europe

Cari Borrás, D.Sc., FAAPM, FACR, FIOMP

Chair, AAPM International Educational Activities Committee

Adjunct Assistant Professor (Radiology)
The George Washington University
School of Medicine and Health Sciences

Washington DC, USA

EUROPE


Finland
Norway
Sweden
Estonia
Latvia
Denmark
Lithuania
Ireland
United Kingdom
Belarus
Poland
Netherlands
Germany
Belgium
Luxembourg
Czechia
Ukraine
Slovakia
France
Austria
Liechtenstein
Switzerland
Hungary
Moldova
Slovenia
Croatia
Romania
Bosnia and Herzegovina
San Marino
Monaco
Serbia
Italy
Kosovo*
Andorra
Montenegro
Bulgaria
Vatican City
North Macedonia
Albania
Spain
Portugal
Greece
Turkey
Malta
Cyprus

EUROPEAN COUNTRIES

MEMBERS (EU)	IOMP	EFOMP
Austria	y	y
Belgium	y	y
Bosnia & Herzegovina	no	y
Bulgaria	y	y
Croatia	y	y
Cyprus	y	y
Czechia	y	y
Denmark	y	y
Estonia	y	y
Finland	y	y
France	y	y
Georgia	y	no
Germany	y	y
Greece	y	y
Hungary	y	y
Ireland	y	y
Italy	y	y
Latvia	no	y
Lithuania	y	y

MEMBERS (EU)	IOMP	EFOMP
Luxembourg	no	no
Malta	no	y
Moldova	y	y
Norway	y	y
Poland	y	y
Portugal	y	y
Republic of N. Macedonia	y	y
Romania	y	y
Russia	y	y
Serbia	no	y
Slovakia	no	y
Slovenia	y	y
Spain	y	y
Sweden	y	y
Switzerland	y	y
The Netherlands	y	y
United Kingdom	y	y
Ukraine	y	no

Bologna Declaration: 1999
(> 46 countries)

1. Adoption of a system of easily readable and comparable degrees (implementation of the Diploma Supplement)
2. Adoption of a system essentially based on two main cycles, undergraduate and graduate
3. Establishment of a system of credits, such as in the ECTS system.
4. Promotion of mobility
5. Promotion of European co-operation in quality assurance
6. Promotion of the necessary European dimensions in higher education

Medical Physics in Europe

- Unfortunately, Medical Physics is not yet regulated in some European countries.
- Education and Training of Medical Physics in Europe is not harmonized.
- The total length (basic university + post-graduate training) ranges from 2½ years to 9 years.
- EFOMP (European Federation for Medical Physics) has been promoting recommendations to harmonize this education and training.

M. Ribas, AAPM 2014

Physica Medica 30 (2014) 598–603

Contents lists available at ScienceDirect

Physica Medica

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

EFOMP policy statement

European Federation of Organisations for Medical Physics (EFOMP) Policy Statement 12.1: Recommendations on Medical Physics Education and Training in Europe 2014

C.J. Caruana [a,*], S. Christofides [b], G.H. Hartmann [c]

[a] Medical Physics Department, Faculty of Health Sciences, University of Malta, Malta
[b] Medical Physics Department, Nicosia General Hospital, Cyprus
[c] Department of Medical Physics and Radiation Therapy, German Cancer Research Centre in Heidelberg, Germany

Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom

2.1 Role of the MPE in the revised Basic Safety Standard (revised BSS)

European BSS

Medical Physics Experts are defined and their roles are specified in the revised BSS. The more pertinent articles are:

Article 4: Definitions

(49) "medical physics expert" means an individual or, if provided for in national legislation, a group of individuals[3], having the knowledge, training and experience to act or give advice on matters relating to radiation physics applied to medical exposure, whose competence in this respect is recognised by the competent authority;

Article 14: General responsibilities for the education, training and provision of information

2. Member States shall ensure that arrangements are made for the establishment of education, training and retraining to allow the recognition of radiation protection experts and medical physics experts …

[3] Authors' note: By 'group of individuals' is meant a group of Medical Physics Professionals with at least one who has reached the status of MPE in each specialised area of radiation physics applied to medical exposure e.g., Diagnostic and Interventional Radiology or Radiation Oncology or Nuclear Medicine or a sub-speciality of these e.g., Brachytherapy, Nuclear Medicine therapy, Interventional Imaging in Cardiology as owing to the rapid expansion in medical technology it is becoming increasingly difficult for any single individual to be able to act or give advice in all areas of radiation physics applied to medical exposure.

EUROPEAN COMMISSION

RADIATION PROTECTION

No. 174

EUROPEAN GUIDELINES ON MEDICAL PHYSICS EXPERT

ANNEX 1

Inventory of Learning Outcomes for the MPE in Europe

30 May 2012

Qualification Framework for the Medical Physicist and Medical Physics Expert in Europe

The Qualifications Framework is based on the European Qualifications Framework (EQF). In the EQF learning outcomes are defined in terms of Knowledge, Skills, Competences (KSC) (European Parliament and Council 2008/C 111/01)

EDUCATION

EQF Level 6
(e.g., Bachelor with 180 - 240 ECTS)
(i)

Physics
or
equivalent
(ii)

EQF Level 7
(e.g., Master with 90 - 120 ECTS)
(iii)

Medical Physics*
or
equivalent
(iv)

CLINICAL TRAINING

Certification as Medical Physicist in a given specialty
(v)

Structured accredited clinical training residency in the specialty of Medical Physics for which the candidate seeks clinical certification. The duration should be typically two full-time year equivalents**
(vi)

ADVANCED EXPERIENCE and CPD

EQF Level 8 in Medical Physics specialty
(vii)

Structured advanced experience and CPD in the specialty of Medical Physics for which the candidate seeks certification as MPE. The duration would be a further minimum additional two full-time year equivalents***
(viii)

RECOGNITION

Certification as **Medical Physics Expert** in Medical Physics specialty
(ix)

RE-CERTIFICATION

5 year CPD cycle
(x)

* Should include as a minimum the educational components of the Core KSC of Medical Physics and the educational components of the KSC of the Specialty of Medical Physics (e.g., Diagnostic & Interventional Radiology, Nuclear Medicine, Radiation Oncology, Physiological Measurement) for which the candidate seeks clinical certification. When this element of specialization is not included it must be included in the residency.
** The EQF level of the residency is intermediate between EQF levels 7 and 8. The training can follow or be concurrent with the Masters.
*** In countries where the MPE is required to be certified in further specialties of Medical Physics the number of years would need to be extended such that the MPE will achieve EQF level 8 in each specialty.

EFOMP Policy Statement 12.1

Physica Medica 32 (2016) 7–11

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. 10.1: Recommended Guidelines on National Schemes for Continuing Professional Development of Medical Physicists [1]

Stelios Christofides [a,*], Jorge Isidoro [b], Csilla Pesznyak [c], Florian Cremers [d], Rita Figueira [e], Christiaan van Swol [f], Stephen Evans [g], Alberto Torresin [h]

[a] Biomedical Research Foundation, P.O. Box 24039, 1700 Nicosia, Cyprus
[b] Coimbra Hospital and Universitary Centre, 3000-075 Coimbra, Portugal
[c] Department of Technology and Economics, Budapest University, Muegyetem rkp. 3, 1111 Budapest, Hungary
[d] UKSH Lübeck, Ratzeburger Allee 160, 23538 Lübeck, Germany
[e] Centro Hospitalar de São João, Alameda Prof. Hernani Monteiro, 4200-319 Porto, Portugal
[f] St. Antonius Hospital, PO Box 2500, NL-3430 EM Nieuwegein, Netherlands
[g] EFOMP, Fairmount House, 230 Tadcaster Road, York YO24 1ES, UK
[h] Medical Physics Dep., Niguarda Ca' Granda Hospital, Milano, Italy

ARTICLE INFO

Article history:
Available online 2 February 2016

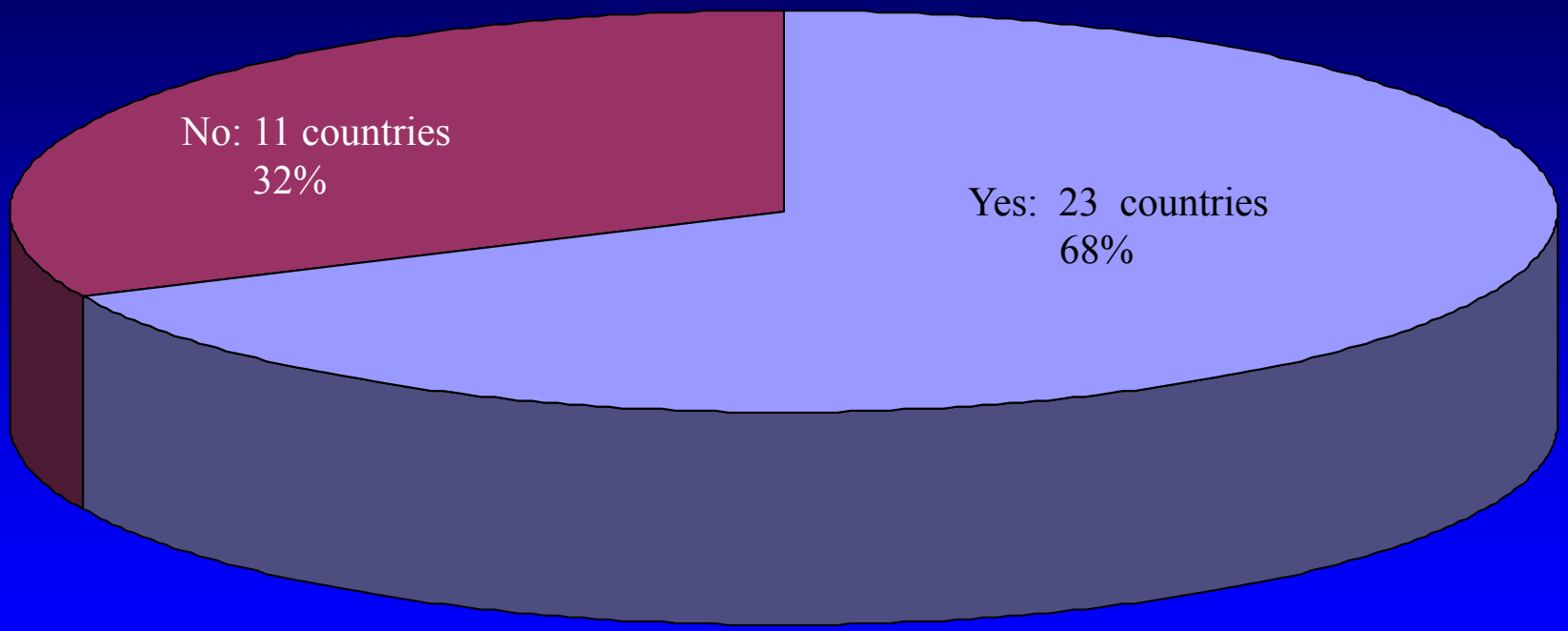
ABSTRACT

Continuing Professional Development (CPD) is vital to the medical physics profession if it is to embrace the pace of change occurring in medical practice. As CPD is the planned acquisition of knowledge, experience and skills required for professional practice throughout one's working life it promotes excellence and protects the profession and public against incompetence. Furthermore, CPD is a recommended prerequisite of registration schemes (Caruana et al. 2014 [1]; [2]) and is implied in the Council Directive 2013/59/EURATOM (EU BSS) [3] and the International Basic Safety Standards (BSS) [4]. It is to be noted that currently not all national registration schemes require CPD to maintain the registration status necessary to practise medical physics. Such schemes should consider adopting CPD as a prerequisite for renewing registration after a set period of time.

This EFOMP Policy Statement, which is an amalgamation and an update of the EFOMP Policy Statements No. 8 and No. 10, presents guidelines for the establishment of national schemes for CPD and activities that should be considered for CPD.

Professional status of Medical Physicists

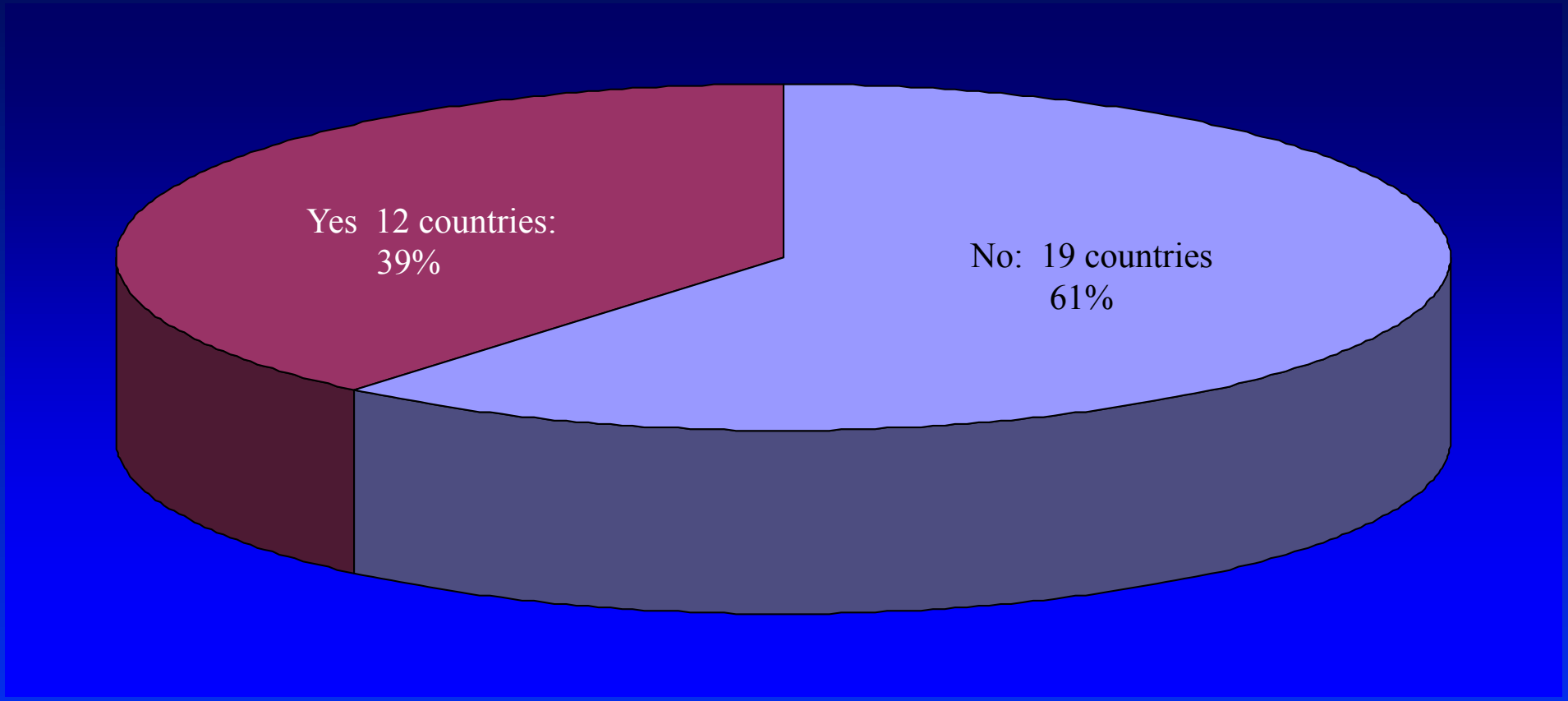
Certification - Does the qualification framework lead to certification?



2015 IAEA Questionnaire on Medical Physics Status in Europe

Professional status of Medical Physicists

Certification - If yes, is there a recertification system in place?



2015 IAEA Questionnaire on Medical Physics Status in Europe

Poland

- Medical physics profession recognized in 2002
- The Ministry of Health introduced a specialization in medical physics (with same rules as physicians')
- First cycle started in 2007
  - Training ended in 2008
  - Official State Exams were held in 2009
- As of 2016:
  - 196 specialized medical physicists
  - 120 undergoing specialization
- Program was revised in 2011 to meet EC and EFOMP recommendations

Phys Med. 2016 Jul;32(7):914-7. doi: 10.1016/j.ejmp.2016.06.011. Epub 2016 Jul 1

THE EDUCATION AND TRAINING SCHEME FOR SPECIALISTS IN MEDICAL PHYSICS IN SPAIN

Bologna process, from 2011

University (4 y. new degree) and (5 y. old degree "licenciatura")

→ **Physics degree**
Other scientific and/or technological degrees with a high physics and mathematics content

↓ Followed by

National exam
Limited places
(about 30 per year)

→ Only candidates with the highest marks enter the special training as a Medical Physics Specialist in the medical physics departments of accredited teaching hospitals, called ***"Unidades Docentes"***.

↓ Followed by

Theoretical and practical training in Medical Physics departments of accredited teaching hospitals *(Unidades Docentes)* (3 years)

Italy
"Specializzazione in Fisica Medica"

- 3 year program: University Faculty of Medicine
  - Academic courses
  - Exams
  - Supervised clinical training in DX, NM and RT
  - Defense of a research project
- The Degree represents
  - "Certification" as a clinical medical physicist
  - "Registration" in the University directory
- 150 CPD credits to be acquired every 3 years
  - To maintain competences & employment

Greece

- BSc in Physics
- MSc in Medical Physics or equivalent
- 1 year clinical training
- Certification exams at the Ministry of Health
  a) Ionizing radiation
  b) Non ionizing radiation (MRI, antennas, laser…)
- If passing → License to work
  a) in Medical Radiation Physics
  b) ONLY in non ionizing radiation

This scheme will change as medical physics has now become a medical specialty

Russian Federation

- MS in Medical Physics or MS in Nuclear Physics with additional courses in Medical Physics
- A new Professional Standard which will require a verification process by the Ministry of Health is being developed

Yuri Kurpichev, 2019

Physica Medica 48 (2018) 162–168

Contents lists available at ScienceDirect

Physica Medica

journal homepage: www.elsevier.com/locate/ejmp

EFOMP Policy Statement

EFOMP policy statement 16: The role and competences of medical physicists and medical physics experts under 2013/59/EURATOM

Carmel J. Caruana[1], Virginia Tsapaki, John Damilakis, Marco Brambilla, Guadalupe Martín Martín, Asen Dimov, Hilde Bosmans, Gillian Egan, Klaus Bacher, Brendan McClean

EFOMP, United Kingdom

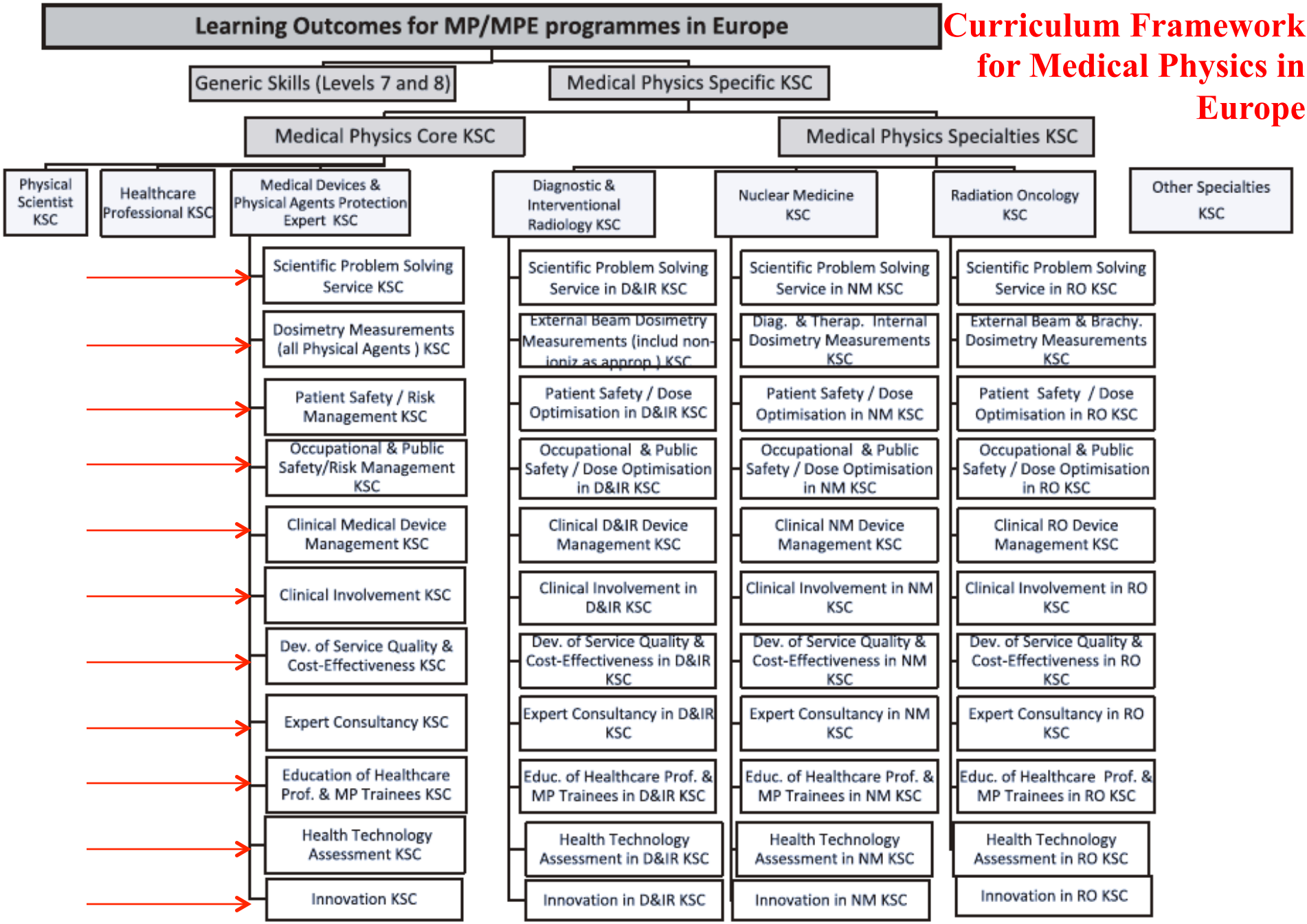
ARTICLE INFO

Keywords:
EFOMP
Medical physicist
Medical physics expert
Role development
Competence profile
European directive

ABSTRACT

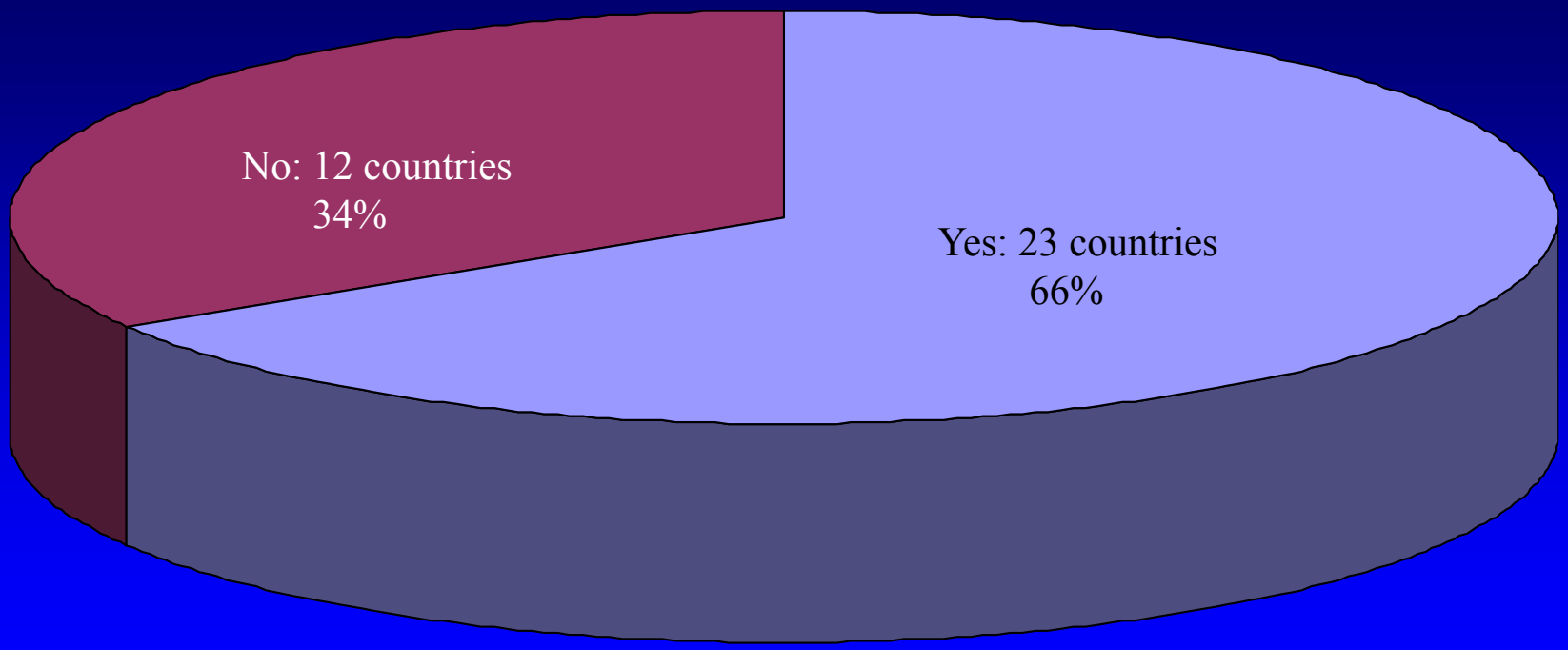
On 5 December 2013 the European Council promulgated Directive 2013/59/EURATOM. This Directive is important for Medical Physicists and Medical Physics Experts as it puts the profession on solid foundations and describes it more comprehensively. Much commentary regarding the role and competences has been developed in the context of the European Commission project "European Guidelines on the Medical Physics Expert" published as Radiation Protection Report RP174. The guidelines elaborate on the role and responsibilities under 2013/59/EURATOM in terms of a mission statement and competence profile in the specialty areas of Medical Physics relating to medical radiological services, namely Diagnostic and Interventional Radiology, Radiation Oncology and Nuclear Medicine. The present policy statement summarises the provisions of Directive 2013/59/EURATOM regarding the role and competences, reiterates the results of the European Guidelines on the Medical Physics Expert document relating to role and competences of the profession and provides additional commentary regarding further issues arising following the publication of the RP174 guidelines.

Curriculum Framework for Medical Physics in Europe



Professional status of Medical Physicists

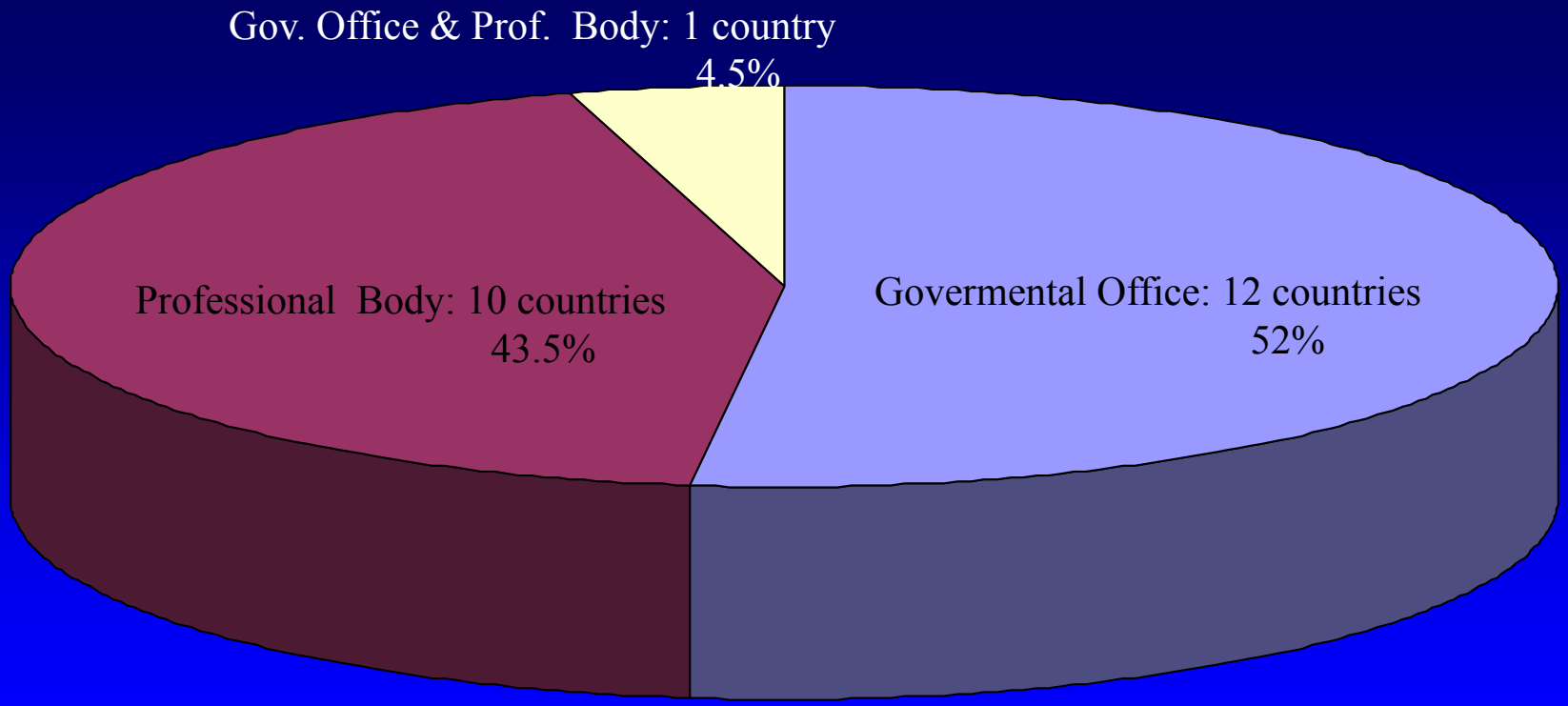
Registration - Is there a national registry for medical physicist?



2015 IAEA Questionnaire on Medical Physics Status in Europe

Professional status of Medical Physicists

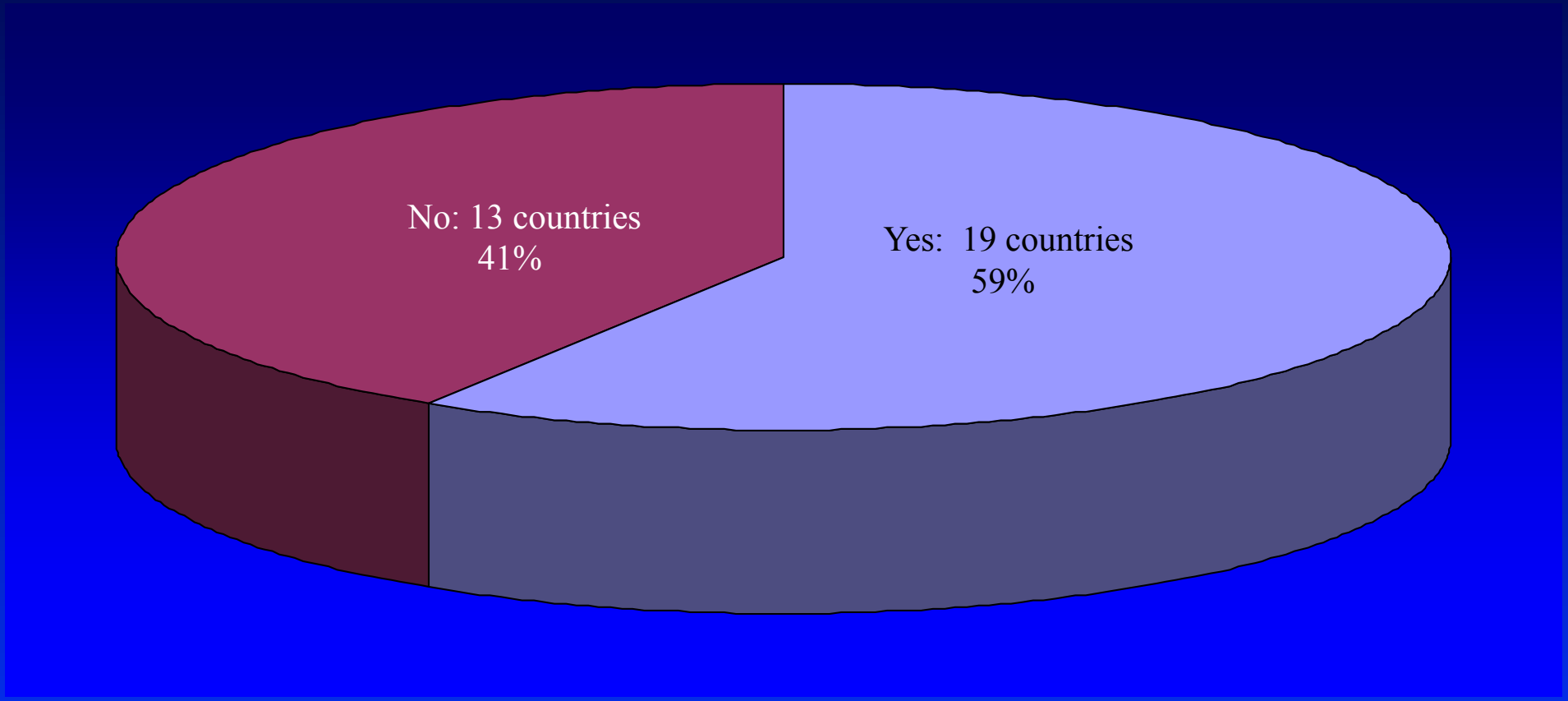
Registration - Who runs it?



2015 IAEA Questionnaire on Medical Physics Status in Europe

Professional status of Medical Physicists

Recognition - Is there a designated competent authority for MP recognition?



2015 IAEA Questionnaire on Medical Physics Status in Europe

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 ☆

Stelios Christofides [a,*], Jorge Isidoro [b], Csilla Pesznyak [c], Lada Bumbure [d], Florian Cremers [e], Werner F.O. Schmidt [f]

[a] Biomedical Research Foundation, P.O. Box 24039, Nicosia 1700, Cyprus
[b] Coimbra Hospital and University Centre, Praceta Prof Mota Pinto, Coimbra 3000-075, Portugal
[c] Budapest University of Technology and Economics, Muegyetem rkp., Budapest 1111, Hungary
[d] Riga Technical University, Kalku street 1, Riga LV-1658, Latvia
[e] Department of Radiotherapy, UKSH Lübeck, Ratzeburger Allee 160, Lübeck 23538, Germany
[f] Institute for Radio-Oncology, Donauspital Vienna, Langobardenstrasse 122, Vienna A-1220, Austria

ARTICLE INFO

Article history:
Available online 2 February 2016

Keywords:
Medical physics
Medical physicist
Policy statement
National registration scheme

ABSTRACT

This EFOMP Policy Statement is an update of Policy Statement No. 6 first published in 1994. The present version takes into account the European Union Parliament and Council Directive 2013/55/EU that amends Directive 2005/36/EU on the recognition of professional qualifications and the European Union Council Directive 2013/59/EURATOM laying down the basic safety standards for protection against the dangers arising from exposure to ionising radiation. The European Commission Radiation Protection Report No. 174, Guidelines on Medical Physics Expert and the EFOMP Policy Statement No. 12.1, Recommendations on Medical Physics Education and Training in Europe 2014, are also taken into consideration.

The European Federation of Organisations for Medical Physics
Fairmount House, 230 Tadcaster Road, York, YO24, 1ES, UK
Telephone: (+44) 1904 610821 Fax: (+44) 1904 612279

NATIONAL REGISTRATION SCHEME EVALUATION FORM					
Country		NMO			
Contact person		NMO president			
E-mail address		E-mail address		Date	
Medical Physics subspecialties for which the registration applies [1])					

	Criterion	yes/no	Remarks by the NMO	Note by PMC member
1.	A clear statement of the aims of the scheme including the levels of recognition is available.	☐/☐		
2.	A properly constituted Registration Council is installed and functioning.	☐/☐		
3.	A complete set of criteria concerning scientific knowledge and practical competencies is defined and used for registration. [2])	☐/☐		
4.	An education & training programme can be provided that is consistent with the EFOMP policy statement on education and training (EFOMP PS 6.1) and the EU guideline (RP 174).	☐/☐		

The European Federation of Organisations for Medical Physics
Fairmount House, 230 Tadcaster Road, York, YO24, 1ES, UK
Telephone: (+44) 1904 610821 Fax: (+44) 1904 612279

NATIONAL REGISTRATION SCHEME EVALUATION FORM

Cont.

5.	The Registration Council maintains a list of registered MPE's.	☐/☐		
6.	Registration is renewed at least every five years based on evidence of continuing activity in relevant areas (EFOMP PS 10.1).	☐/☐		
7.	Rules of Professional Conduct are devised and enforced by the NMO (EFOMP PS 11).	☐/☐		
8.	The NMO has drafted regulations for Professional Misconduct, which includes a procedure for notification and disciplinary action.	☐/☐		

[1]) Examples of expert areas are radiotherapy, diagnostic and Interventional radiology, nuclear medicine, hospital physics etc.).

[2]) It is recommended that these are in line with the learning outcomes prescribed in RP174 at the appropriate level in order to meet the requirements of paragraph 2 of article 49a of Directive 2013/55/EU)

Member of Professional Matters Committee				NMO	
Judgment	Approved or rejected			Date	
Explanation					
Recommendation					

Countries with MPE Registration requesting approval from EFOMP about their National Registration Scheme

Austria	Denmark
Finland	Ireland
Germany	Italy
Greece	Malta
Netherlands	Portugal
United Kingdom	Spain
	Sweden

To harmonize Medical Physics education & training standards, thus facilitating the mobility of medical physicists in Europe

EFOMP

EFOMP ▾ Science ▾ Education ▾ Publications ▾ Professional Matters ▾ EU & International Matters ▾ Contact Us

About EFOMP's Examination Board

Dear colleagues,

EFOMP's Examination Board (EEB) has been established to facilitate the harmonization of Medical Physics education and training standards throughout Europe. EEB introduces the European Diploma of Medical Physics (EDMP) and the European Attestation Certificate to those Medical Physicists that have reached the Medical Physics Expert level (EACMPE). EEB examinations are tests of excellence in Medical Physics. They are designed to assess the knowledge, skills and competences requisite for the delivery of high standard Medical Physics services.

Currently medical physicists in European countries face difficulties in providing the necessary qualification evidence when they seek employment in other EU Member States or other countries. The EDMP will facilitate mobility of medical physicists in Europe and beyond. Furthermore, EEB provides an attestation certificate to those medical physicists that have reached the Medical Physics Expert level to be recognized by the relevant competent authorities of the EU according to the EU Directive 2013/59/EURATOM laying down the basic safety standards for protection against the dangers arising from exposure to ionising radiation (EU BSS). Information about EDMP and EACMPE, examination dates, venue, application forms and other documents can be found in this webpage.

The EEB examinations are voluntary. EEB diplomas will not replace any national certificates. However, they will be a common European qualification for medical physicists and will help to standardise training and expertise in Medical Physics across Europe.

Professor John Damilakis
EEB Chair

EFOMP's Examination Board Statistics
(The EEB was established in 2016)

Date	Location	Applicants	Passed
6 & 7 July 2017	Prague, Checkia	18	12
21 & 22 August 2018	Copenhagen, Denmark	18	9
8 & 9 October 2019	Warsaw, Poland		

Data provided by John Damilakis, 2019