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The medical physics specialization system in Poland

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ABSTRACT

This paper presents the situation of the profession of medical physicists in Poland. The official recognition of the profession of medical physicist in Polish legislation was in 2002. In recent years, more and more Universities which have Physics Faculties introduce a medical physics specialty. At present, there are about 15 Universities which offer such programmes. These Universities are able to graduate about 150 medical physicists per year. In 2002, the Ministry of Health introduced a programme of postgraduate specialization in medical physics along the same rules employed in the specialization of physicians in various branches of medicine. Five institutions, mostly large oncology centres, were selected as teaching institutions, based on their experience, the quality of the medical physics professionals, staffing levels, equipment availability, lecture halls, etc. The first cycle of the specialization programme started in 2006, and the first candidates completed their training at the end of 2008, and passed their official state exams in May 2009. As of January 2016, there are 196 specialized medical physicists in Poland. Another about 120 medical physicists are undergoing specialization.

The system of training of medical physics professionals in Poland is well established. The principles of postgraduate training and specialization are well defined and the curriculum of the training is very demanding. The programme of specialization was revised in 2011 and is in accordance with EC and EFOMP recommendations.

1. Introduction

The aim of this paper is to present the situation of the profession of medical physicist in Poland. The official recognition of the profession of medical physicist in Polish legislation was in 2002. For a long period of time, physicists working in a hospital environment were called just physicists. The first Physics Laboratory in a hospital was opened in 1934 at the Radium Institute in Warsaw. It was planned and organized by Maria Skłodowska-Curie, and the first head of this laboratory was trained at her laboratory in Paris [1,2]. Until 1970, the number of physicists working in hospitals was rather limited. This number started to grow considerably with the advent of complex equipment in radiotherapy and radiodiagnostics, such as linear accelerators, computed tomography scanners, and with the introduction of new radioisotopes in brachytherapy and nuclear medicine, and also with the introduction of complex computerized treatment planning systems. The physicists were graduates from Physics Faculties at Universities and from various faculties with physics programmes at Technical Universities. These were five year MSc programmes with various specializations, but there was no medical physics programme as such at any University until 1972.

2. University programmes

In recent years, more and more Universities which have Physics Faculties introduce a medical physics specialty (the Master degree after 2–3 years) for students after three years of general physics (the Bachelor degree). Several Universities are offering two-step studies in medical physics (3 years for the Bachelor degree and 2–3 years for the Master degree). The syllabus of the studies varies between the Universities. At present, there are about 15 Universities which offer programmes of this kind in medical physics. These Universities can graduate about 150 medical physicists per year. Only a relatively small proportion of them find employment in medical institutions. A large proportion find employment outside hospitals or other medical applications.

3. The specialization programme

Thanks to longstanding efforts of the Polish Society of Medical Physics, in 2002, the Ministry of Health introduced a programme

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of postgraduate specialization in medical physics along the same rules used in the specialization of physicians in various branches of medicine. A detailed syllabus of the programme of specialization has been established (Table 1) and is in accordance with the recommendations of the European Commission and EFOMP recommendations in Policy Statement No 12 [3–5]. It includes a set of lecture programmes and a list of practical training required in departments of teleradiotherapy, brachytherapy, radiodiagnostics, nuclear medicine, etc. There are 6 obligatory courses, each of them ends with an examination. The lecture programme, in the form of 3–5 day training courses, is organized by the Polish Society of Medical Physics. Initially five institutions, mostly large oncology centres were selected as teaching institutions, based on their experience, quality of the medical physics professionals, staffing levels, equipment availability, lecture halls, etc. At present there are nine such institutions (Fig. 1). At the initial stage of the programme, a group of medical physicists was selected by the Ministry of Health; they were supposed to become the core of a teaching faculty. The requirements for the selection were: ten years working experience in a clinical environment and a PhD degree in physics. The requirements were met by 34 medical physicists. They became the tutors of the first candidates for the specialization. This initial group of students were assigned the position of provisional medical physics experts. At the end of this first three year period, this group also had to pass a state examination.

The term medical physics specialist (a literal translation from the Polish terminology) corresponds precisely to the definition of a medical physics expert (MPE) according to the Council Directive 2013/59/EURATOM of 5 December 2013 [6]. The Medical Physics specialization system in Poland covers all fields of Medical Physics using ionizing radiation (Radiotherapy, Diagnostic and Interventional Radiology and Nuclear Medicine) in one specialization. Obviously, demand for medical physics experts is by far the largest in radiotherapy. It is envisaged that owing to the rapid expansion of technology the programme may in future offer the possibility of choice of emphasis on either radiation oncology or diagnostic and interventional radiology or nuclear medicine. This option is widely discussed in the medical physics community.

Many physicists, graduated from medical Physics Faculties at universities are very interested in a specialization in medical physics. The number of applicants is always higher than the number of places available for those who want to start a specialization in medical physics. There are two major reasons for this situation. The first, and very likely the most important, is a better chance to find employment, especially in new oncological centres. According to Polish legislation, some quality control tests of machines generating ionizing radiation, ie. accelerators, diagnostic units, equipment used in nuclear medicine can be performed solely by specialists in medical physics. These tests may also be carried out by other physicists, but under the supervision of a medical physics expert or in the frame of a laboratory accredited for the norm ISO 17025. The second most important reason is just a desire to be a better educated medical physicist. Limited access to specialized equipment makes the university education less practical than the education gained during the specialization in medical physics. These people are looking for practical training. There is also a group of physicists who want to serve the ill and they want to do their job as well as possible. They want to have contact with patients and they consider their work as a mission.

The number of places for a specialization in medical physics is limited; there are 92 places allocated to all teaching institutions altogether for the consecutive three year period (2013–2016).

The requirements for the candidates who apply for these places are as follows: a Master degree in physics, 2 years of work at a medical physics facility in a hospital environment. The specialization is also open for other master degrees, but then a recommendation from a professional society and from the national consultant in medical physics is required. Official commissions convened by the Ministry of Health select the candidates. A graphical diagram of the whole process of education and training is given in Fig. 2.

The first cycle of the specialization programme started in 2005, and the first candidates completed their training at the end of 2008. The examination commission and procedures were set up in April 2009 and the first group of candidates passed their official state exams, both theoretical and practical, according to procedures established by the Ministry of Health, in May 2009. The training of candidates and the exam procedures were supervised by the National Consultant in Medical Physics, appointed by the Minister of Health. At present, the number of medical physics experts is 196. A new round of the specialization programme started in the autumn of 2013. One has to stress the paramount role of the Polish Society of Medical Physics in organizing training courses and seminars for specializing medical physicists. The courses are at a very high level and a demand for such elements of the training events by the specializing physicists is very high.

Table 1
Syllabus of the specialization programme in medical physics in Poland.

Programme of lectures (in hours)		
Basic human anatomy and physiology		25
Principles of radiobiology		30
Selected topics of ionizing radiation physics		25
Detection methods and dosimetry		35
Principles of radiation protection		20
Teleradiotherapy, principles and practice		100
Brachytherapy, sealed and open sources, principles and practice		50
Non-ionization radiation therapy		25
Imaging diagnostics (Rtg, NM, NMR, USG, thermography)		60
Nuclear medicine		50
Bio-electricity and bio-magnetism in diagnostics; bio-cybernetics		30
Statistics		30
Selected topics of informatics in medicine		30
Legal and administrative issues		10
Total		520
Practical training (in weeks)		
Radiotherapy	2×4	8
Brachytherapy	2×3	6
Imaging techniques	2×2	4
Nuclear medicine	2×2	4
Total		22

4. Staffing requirements

Poland is a relatively large country with a population of about 38 million. In Poland, there are 35 radiotherapy centres evenly distributed all over the country (Fig. 1). These centres, equipped with about 144 megavoltage treatment units (all of them are linear accelerators; the exception being two Gamma Knifes), treat over 70 thousand new patients per year in teletherapy. In addition, there are about 12 thousand new patients per year in brachytherapy treated with about 44 afterloading units.

The number of megavoltage units is by far too small for a population of 38 million. The proportion of about 2.3 units/million is about two times lower than it is in most European countries [7].

In recent years, the number of megavoltage units has been slowly increasing, both thanks to the National Programme to Fight Cancer, which finances new equipment for public hospitals, and thanks to new private radiotherapy departments which have been set up over the last years. Therefore, the demand for medical physicists is going to increase.