The medical physics specialization system in Poland

W. Bulski, B. Gwiazdowska

Department of Medical Physics, M. Skłodowska-Curie Memorial Cancer Center and Institute of Oncology, Warsaw, Poland

***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 done in 2002. In recent years, more and more Universities which have Physics Faculties introduce the medical physics specialty. At present there are about 15 Universities which offer such programs in medical physics. These Universities can graduate about 150 medical physicists per year. In 2002, the Ministry of Health introduced a program of postgraduate specialization in medical physics along the same rules used in specialization of physicians in various branches of medicine. Seven 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. The first cycle of specialization programme started in 2005 and the first candidates completed their training at the end of 2008 and passed their official state exams in May 2009. The formation of medical physics professionals in Poland is well established. The principles of postgraduate training and specialization are well established and the curriculum of the training is very demanding. However, the system of specialization should be strengthened and supported financially to meet the requirements established by the Ministry of Health.**

***Keywords*— medical physics; education; specialization**

INTRODUCTION

The aim of this paper is to present the situation of the profession of medical physicists in Poland. The official recognition of the profession of medical physicist in Polish legislation was done in 2002. For a long period of time the physicists working in the 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 Sklodowska-Curie, and the first head of this laboratory was trained at her laboratory in Paris. Until the 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. These physicists were graduates from physics faculties at the Universities and from various faculties with the physics programmes at the Technical Universities. These were five year MSc programmes with various specializations, but there was no medical physics programme at any University until 1972.

UNIVERSITY PROGRAMMES

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

SPECIALIZATION PROGRAMME

Thanks to longstanding efforts of the Polish Society of Medical Physics, , the Ministry of Health introduced in 2002 the program of postgraduate specialization in medical physics along the same rules used in specialization of physicians in various branches of medicine. A detailed syllabus of the programme of specialization has been established (Table 1). It includes a set of lecture programmes and a list of practical trainings required in departments of teleradiotherapy, brachytherapy, radiodiagnostics, nuclear medicine, etc. Seven 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. The number of specializing physicist is limited, there are 92 places allocated to all teaching institutions altogether for the next three years period (2009-2012).

The requirements for the candidates who apply for these places are as follows: Master degree in physics, 2 years of work at a medical physics facility in hospital environment, and the recommendation from a professional society. Official commissions convened by Ministry of Health select the candidates.

The first cycle of 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 specialized medical physicists or medical physics experts is 56. The new round of specialization programme starts in autumn 2009.

Staffing requirements

Poland is a relatively large country with population of about 39 million. In Poland there are 25 radiotherapy centres evenly distributed over the country. These centres, equipped with about 90 megavoltage treatment units (about 83 accelerators and 7 Co-60 units), treat about 50 thousand new patients per year in teletherapy. On top of that there are about 8 thousand new patients per year in brachytherapy treated with about 40 afterloading units.

The number of megavoltage units is by far too small for the population of 39 million. The number of about 2.3 units/ million is 2-3 lower than it is in most European countries.

In recent years the number of megavoltage has been slowly increasing, both due to the National Programme to Fight Cancer which finances new equipment for public hospitals and due to the new private radiotherapy departments which are being set up since a couple of years. Therefore the demand for medical physicists is going to increase.

In 2006 the Ministry of Health issued a regulation specifying the required number of physicists employed in various radiotherapy and radiodiagnostics departments. According to the regulations of the ministry of Health every megavoltage radiotherapy facility has to have a Medical Physics Department or Laboratory. In radiotherapy every department has to employ 3 physicists (including 2 medical physics experts) per 1000 new patients treated per year. This regulation is supposed to enter into force by the end of 2010. At present, there are about 220 medical physicists employed in radiotherapy facilities (2007). So far the overall number of medical physicist is sufficient, but the number of medical physics experts is too small. For the number of radiotherapy patients treated presently per year (about 58,000) the required number of medical physics experts is 116. Every nuclear medicine department (about 50 in Poland) has to employ a medical physics expert. A number of medical physics experts are required to supervise (part-time) the radiodiagnostics departments.

Conclusions

The formation of medical physics professionals in Poland is well established. About 15 Universities offer the MSc studies in medical physics and graduate sufficient number of them every year. The principles of postgraduate training and specialization are well established and the curriculum of the training is very demanding. However, the system of specialization should be strengthened and supported financially to meet the requirements established by the Ministry of Health.

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

Programme of lectures	hours
Basic human anatomy and physiology	40
Principles of radiobiology	50
Selected topics of ionizing radiation physics	40
Principles of radiation protection	30
Teleradiotherapy, principles and practice	120
Brachytherapy, sealed and open sources, principles and practice	70
Non-ionization radiation therapy	50
Imaging diagnostics (Rtg, NM, NMR, USG, Thermography)	90
Bio-electricity and Bio-magnetism in diagnostics; biocybernetics	40
Statistical analysis of data	30
Legal and administrative issues	30
Total	600
Practical training	**weeks**
Radiotherapy	8
Imaging techniques	8
Non-radiation diagnostics	4

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Author: Wojciech Bulski

Institute: Department of Medical Physics, M. Skłodowska.-Curie Memorial Cancer Center and Institute of Oncology
Street: Roentgena 5
City: Warsaw
Country: Poland
Email: W.Bulski@rth.coi.waw.pl