

## **Medical Physics Profession in Georgia - problems with recognition and authority**

**N. Kobalia, K. Kotetishvili**

*Chief Medical Physicist in Georgia, Mardaleishvili Medical Centre, Lisi Lake 4, Tbilisi 0186 Georgia*

*Cell: +995592231808 E-mail: ninkobalia@gmail.com*

*Prof., Doctor of Technical Science, Georgian Technical University, Merab Kostava St. 77, Tbilisi Georgia*

*Cell: +995599504821 E-mail: k.kotetishvili@gtu.ge*

### **The abstract:**

Medical Physicist is a professional who can give you better life with increased accuracy of Diagnostic and Treatment procedures. Medical Physics professional is just recently recognized as an important staff in Georgian medical departments where treatment and diagnostic procedures are connected with radiation sources. In spite of large number of radiation units in Georgia there is nobody to take care of the QA/QC in Radiation Diagnostic units and there is a lack of Medical Physics professionals in Radiotherapy departments, what doesn't allow to be sure in accuracy of diagnostic and treatment procedures. Problems were defined long ago, but now they are recognized as important to increase quality of the medical service. This is directly addressed to qualifications of responsible people and many other minor issues which have to be solved on time, although frequent changes connected with privatization slow this process down.

**Keywords:** Medical Physicist, Lack of qualified professional, Recognition, HealthCare system.

### **Introduction**

The first Radiotherapy Department in Georgia was opened in 1958 in Radiology Scientific Institute of the National Cancer Center, where from the very beginning Radiation Protection, equipment accuracy measurements and treatment planning were done mainly by physicist. Already that time it was clearly understood that the best treatment results for cancer patients could be achieved in case of Physicist's involvement in radiation treatment procedures.

Increased number of Radiation units and lack of Medical Physics professionals provoked medical staff to Establish Association of Medical Physics in Georgia (AMPG) in 1994 and to raise the question of Medical Physics Education in Georgia at the University level, but despite of their endeavors Universities couldn't adopt new direction.

Today we have a pioneer university - Georgian Technical University, which has already 45 undergraduate students on Medical Physics module. It is a successful leap, because this field is very popular among students.

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A new law on Nuclear and Radiation protection was actuated in May 2013, according to which Medical Physicist's responsibilities are strengthened and all procedures together with dose levels and quality test performances have to be justified with well-organized protocols and guidelines.

New Georgian Law will create many job positions for Medical Physics professionals and it will help us to save lives of many patients. A lot of issues were already discussed and many problems resolved, but there are still many things to do and more serious problems to surmount.

### **Medical Physics Education and Accreditation**

Since 2005, when Georgia has joined Bologna Process, in all Georgian universities including Georgian Technical University education reform has been carried out. Nowadays, Higher Education system of Georgia consists of three cycles: Bachelor's Degree (240 credits); Master's Degree (120 credits); and Doctor's Degree (180 credits).

The Georgian Technical University (GTU) offers the qualification of Certified Specialist, as well as the Bachelor, Master and Doctoral degrees to the people who study at the faculty of Informatics and Control Systems. The University offers bachelor's degree in Engineering Physics with 240 credits, from where 120 credits are related to fundamental subjects of physics (mechanics and molecular physics, electricity and magnetism, optics and constitution of atoms, physics of solid states, physics of semiconductors and dielectrics, physics of quantum, physics of unified field theory, statistical physics, research physical methodology) and subjects in math (mathematical analysis, higher algebra, analytical geometry, differential and integral equations, vector and tensor calculations, mathematical physics). In the third year of Bachelor study student has the option to choose two desired modules (each with 60 credits). In 2012 a new module – Medical Physics and Radiation Protection of People and Environment was added to the Engineering Physics program and it is already accredited as a separate direction.

Fundamental Subjects on Medical Physics and Radiation Protection of People and Environment are:

- 1) Medical Material Sciences
- 2) Essential Medical Physics
- 3) Ionizing Radiation in Medicine
- 4) Radiation Physics
- 5) Medical Image Computer Simulation
- 6) Reception of Image in Medicine by Non-Ionized Radiation
- 7) Radiation Safety of People and Environment
- 8) Radiation Dosimeters

The new Medical Physics and Radiation Protection of People and Environment module is highly popular among students, because Georgian Technical University is the only one in Georgia where students can study this field. Currently 45 students study the Medical Physics Module. Owing to high demand, a separate Masters program in Medical Physics was created.

Master's Program in Medical Physics consists of:

- 1) Bio-Medical Nanotechnologies
- 2) Medicine Electronics
- 3) Optics in Medicine
- 4) Medical Visualization. Ionizing Radiation. Influence and Dosimetry
- 5) Biomedical Image Processing and Analysis
- 6) Medical Imaging with Non-Ionizing Radiation
- 7) Computer models of neurons and neuron networks

## 8) Parallel programming (CUDA)

Georgian Technical University has signed the contract of bilateral relations with Jülich scientific research Centre of Germany, and in autumn, 2012 two students from Georgian university were sent in Jülich Institute of Neuroscience and Medicine for their fellowship. The same fellowship will be conducted for three students in summer 2013, and the number of students will be increased from year to year. Duration of fellowship for Master students will be from 8 to 9 months. In autumn 2013 in the frames of the Program Georgian Technical University will host professors of Jülich scientific research Centre at autumn lectures on Medical and Nuclear Physics in Tbilisi.

Accreditation of Medical Physicists in Georgia has not started, yet. We still have not enough amount of Medical Physicists and the accreditation is not advisable at this point.

### **Reforms at the Ministry of Health to Help Medical Service Improvement**

One of the major projects of the Ministry of Labor, Health and Social Affairs of Georgia is to improve quality of the Medical Service in Georgia with supporting Healthcare reforms, which are to provide: rehabilitation and fitting out infrastructure and developing Human Resources with training courses in order to establish better practice in hospitals. Healthcare reforms strongly demand from universities to establish appropriate programs to educate more Medical Physicists who can help improving medical radiation service in Georgia.

Today there are four Radiotherapy Departments in Georgia (National Cancer Centre of Georgia, High Technology Medical Centre, Adjarian Oncology Centre, and My Family Clinic in Kutaisi) and three Nuclear Medicine Departments (Academician Nikoloz Kipshidze Central University Clinic, Research Institute of Clinical Medicine, and High Technology Medical Centre). In all Radiotherapy Departments there are only 6 Medical Physicists and only 2 Medical Physicists in all Nuclear Medicine Departments. Unfortunately, until now we could not convince diagnostic departments to establish QA/QC procedures under supervision of Medical Physicists.

After privatization, certain time was given to all hospital for renovations and acquiring new equipment that should change the strategy of hospital administration and improve their service to keep their license and authority. These reforms are intended for recognition of professionals responsible for the quality of medical service, and we expect the creation of additional job positions for Medical Physics Professionals.

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