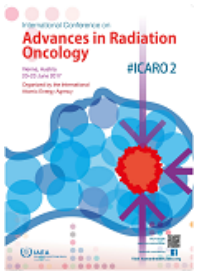

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Medical physics education and training in Bangladesh - An overview

Friday 23 June 2017 10:45 (5 minutes)

Introduction:
In the present day Medical physics is one of the most demanding and rewarding applications of physics in society. As a professional, Medical Physicist who works in the hospital environment is a member of a wide clinical team which is responsible for the accurate diagnosis and the therapeutic methods applied using radiation.

Medical physics activities in country:
The Medical physics activities originated in Bangladesh at 1954 where the first X-Ray machine was established in Kumudini hospital. The first Radiotherapy department was set up at 1957 in the same hospital and in 1960 the first Nuclear Medicine Centre was established in Dhaka Medical College Hospital (DMCH). At present, there are 20 Nuclear Medicine facilities in different part of the country. Under these facilities, 45 Gamma Camera/SPECTs and 5 PET/CT were installed. There are 28 Radiotherapy centres in our country where 19 linear accelerators, 8 CT-Simulators, 9 Tele-Cobalt machines and 13 Brachytherapy units have been equipped. Around 5000 X-ray unit and 150 CT have been installed in our country so far.

Medical physicist in Bangladesh:
Around 60 Medical Physicists are working in all radiation oncology establishments and 19 Medical Physicists are working in all Nuclear Medicine departments. 150 millions people's country of Bangladesh, we need around 300 radiotherapy centres and 600 medical physicists in oncology but we have achieved very little.

Medical Physics education in the country:
In Bangladesh there are 37 public and 92 private universities, however, they offer limited courses on medical physics. A few courses offered by the public universities cover some aspects of medical physics, while only one private university, Gono Bishwabidyalay (University) has a B.Sc and M.Sc degree program under the full faced Medical Physics and Biomedical Engineering Department. Research work in Medical physics was started in Department of Physics, University of Dhaka at 1978 and first M.Sc. student started thesis work in Medical Physics in the same department in 1981. Inception of Medical Physics courses in M.Phil. and Ph.D levels started in Bangladesh University of Engineering & Technology (BUET) under the division of Health & Medical Physics in 1982. In 2008 University of Dhaka (DU) opened a new Department of Biomedical Physics and Technology offering M.Phil. and Ph.D program. In 2014, DU has started MS program in Medical physics.

Clinical training in hospital:
The university programs are however not coupled with appropriate clinical training, making these curricula inadequate for practical clinical application. Under the MS program in DU, students are going for only 3 months internship in radiotherapy and nuclear medicine. Structured clinical in-service training program for medical physicists are also not sufficient. Hands-on-job training or training at home and abroad are the main sources of clinical medical physics learning.

Clinical training supported by IAEA:
International Atomic Energy Agency (IAEA) has developed three clinical training program guide books for medical physicist in the fields of Radiation Oncology, Diagnostic Radiology and Nuclear Medicine. This was done under a Regional Cooperative Agreement (RCA) program on strengthening of medical physics through education and training. In 2011, Bangladesh commenced the first pilot clinical training program of medical physics in nuclear medicine based on the IAEA's training course. Under this program 4 medical physicists successfully completed the clinical training.

AMPLE e-learning training program in Bangladesh:
Recently Bangladesh has joined the Advanced Medical Physics Learning Environment (AMPLE) e learning program which was run by IAEA under a RCA project named "Strengthening the effectiveness and extent of medical physics education and training". AMPLE e learning program is an online base clinical training program for medical physicists of radiotherapy, nuclear medicine and diagnostic radiology. 13 medical physicists from different hospital are involved as students (resident) in this project and 7 senior medical physicists are performing as their supervisors.

Certification/Accreditation for medical physicist:
Still now there is no accreditation program for medical physicist in Bangladesh. Bangladesh Medical Physics Association (BMPA) which is the National Organizational Member of International Organization for Medical Physics (IOMP), is trying to establish a recognition procedure for clinically qualified medical physicist with collaboration through the government of Bangladesh. BMPA has taken necessary steps for this certification procedure of medical physicist. BMPA is also working for creation of medical physicist post in all radiotherapy centre. BMPA also plays an important role in creating awareness and proper communications with higher authorities.

Conclusions:
The role of a Medical Physicist is multifold and consists of the measurement of the dose received by the patients and personnel, quality control of radiological equipment, shielding requirements study, ensure radiation safety in the department and the training of several health professionals. Education and training are the important part for adopting, using and supporting medical physics activities. Education of medical physicists should be adapted towards the requirements of healthcare institutions.

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