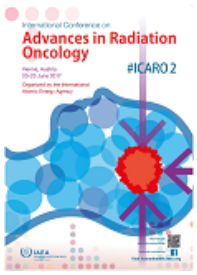

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The role of radiation therapy in the schedule of the medical physics MSc course of BME University

Friday, 23 June 2017 10:50 (5 minutes)

Introduction: The subject covering particular areas of radiation therapy is of primary importance in the curriculum of a Medical Physics MSc course. These areas include dose measurements, pertinent dosimetry and treatment planning tools. Advanced radiotherapy techniques, such as intensity-modulated radiotherapy, image-guided radiotherapy, stereotactic body radiation therapy (SBRT), 3D brachytherapy etc. have become available. However, the safe introduction of these treatment modalities requires adequately trained human resources. By increasing the complexity of radiotherapy procedures, the role of medical physicists is becoming more important.
The discipline of medical physics covers the human application of physical science and development thereof, primarily in the areas of diagnostic imaging and radiation therapy. The first gradual medical physics course in Hungary was launched six years ago at the Faculty of Natural Sciences of Budapest University of Technology and Economics (BME) managed by the Institute of Nuclear Techniques.
Methods: The course curriculum comprises fundamental physical subjects (atomic and molecular physics, nuclear physics, particle physics) as well as fundamental medical knowledge (anatomy, physiology) required for subjects of diagnostics and therapy. Students at this MSc branch may chose further subjects from the "compulsory optional"array concerning medical imaging, X-ray diagnostics, radiation therapy, magnetic resonance and its clinical applications, ultrasound diagnostics and nuclear medicine, respectively.
Radiation therapy and dosimetry form a relevant part of all interdisciplinary sciences, so they receive considerable significance in the medical physics course as well. The subject "The Physical basis of Radiotherapy" presented in the second semester of the course fosters students for both clinical and R&D activities as well. Students become familiar with radiation treatment planning, the theory and practice of radiation therapy physics measurements; in order to be prepared for their future tasks concerning accident prevention and provision for radiation therapy safety of patients and professionals of health services. The subject „Radiation therapy II"presented in the third semester gives more knowledge and experience about advanced radiotherapy techniques such as intensity-modulated radiotherapy, image-guided radiotherapy, stereotactic body radiation therapy (SBRT) and 3D brachytherapy.
Results: Student laboratory exercises of the subject "Radiation Therapy"comprise measurements of film and ionisation chamber dosimetry, radiation therapy treatment planning in addition to getting familiar with radiation protection aspects of radiation therapy centres. Measurements of the subject "Laboratory Practice in Medical Physics"are also related to radiation therapy. The National Institute of Oncology is the facilitator of all laboratory practices in the radiation therapy field. These tasks include amongst others dosimetric measurement with linear accelerators; radiation treatment planning with VARIAN Eclipse, Philips Pinnacle; QA/QC based on the IAEA-TECDOC-1583 with Cirs IMRT Thorax phantom; brachytherapy I-125 seed prostate treatment; measurement with film, ionisation chamber and diode.
Conclusion: The medical physics specialisation aims at providing high level interdisciplinary theoretical and practical knowledge and readily applicable skills that can put into practice in both the clinical and the R&D fields. Overall, the education and training of medical physicists is vital to ensure the safe and effective use of radiotherapy.

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