Medical Physics for Medical Imaging:

50 Years of Progress, Current Trends, Related Education and the Global Role of ICTP

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The application of physics and engineering in medicine is considered one of the most effective inter-professional scientific collaborations of XX century. In fact this application triggered the beginning of the Nobel Prizes - the first one being awarded to W.K. Roentgen primarily for the medical implementation of the new rays discovered by him – an invention which gave birth to a new profession: medical physics. In the past 50 years medical physics delivered 3 Nobel Prizes.

The rapid development of medical imaging technology in the past 50 years led to significant changes in contemporary medical diagnostics. The presentation gives an overview of the invention of the novel medical imaging methods and their implementation in clinical practice from 1960s to present. Special place is dedicated to the medical physicists, engineers and other specialists, who invented various imaging modalities in the field of X-ray imaging, CT scanning, Nuclear Medicine, Magnetic Resonance, Ultrasound Imaging, etc. Their pioneering work is given in chronological order, showing the development of ideas and their evolution as knowledge transfer from one field to another.

The digitalisation of medical imaging is described as contributor to both - the increased image quality and the introduction of quantitative imaging. Methods based on extraction of new information from medical imaging, as well as mathematical modelling, based on imaging, are shown as some of the future trends in the progress of medical imaging.

The need of new type of medical physics education, related to this revolutionary equipment development, is underlined. This includes the introduction of e-learning in the profession, the pioneering of the first e-Encyclopaedia and Dictionary of Medical Physics and other innovative educational development. Their role is highlighted as some of the main supporters for the double professional growth in the past 20 years. The presentation underlines the special place of ICTP for the global development of medical physics in Low-and-Middle-Income countries, as well as its role for the pioneering of e-learning in the profession, awarded with the first EU Prize for Education – The Leonardo Da Vinci Award.

The presentation emphasizes medical physics as an important pillar of contemporary healthcare. In this connection the recent WHO-commissioned report is cited, showing the need of tripling the medical physicists globally by 2035.

https://en.wikipedia.org/wiki/Slavik_Tabakov