

Medical Physicists (Revised definition provided by International Organisation for Medical Physicists)

Medical Physicists apply knowledge and methodology of science of physics to all aspects of medicine, to conduct research, develop or improve theories and address problems related to diagnosis, treatment, and rehabilitation of human disease. They are directly involved with patients and people with disabilities.

Tasks include –

- (a) Conducting research into human disorders, illnesses and disabilities; investigating biophysical techniques associated with any branch of medicine.
- (b) Conducting specialised examinations of patients and the disabled, improving patient care and clinical services, developing innovative imaging and non-imaging diagnostic procedures for specific medical applications.
- (c) Developing novel instrumentation and physiological measurement techniques, mathematical analysis and applications of computers in medicine in response to clinical need for patients, and aids to everyday living for the disabled;
- (d) Ensuring the quality, safety testing and correct maintenance and operation of treatment machines, x-ray equipment, radiation treatment planning computers; medical uses of ultrasound, MRI, and infrared; and the correct delivery of prescribed radiation doses to patients in radiation therapy;
- (e) Ensuring the accuracy of treatment unit parameters and settings used for a patient's treatment, including correct transfer of parameters between the simulator, treatment plan and the treatment unit, and periodic review of each patient's chart.
- (f) Calculating dose distributions and machine settings; design and fabrication of treatment aids and treatment-beam modifiers for individual patient treatments.
- (g) *In-vivo* measurement to verify the dose delivered to a patient; participation at patient-discussion conferences.
- (h) Advising and consulting with physicians on the physical and radiobiological aspects of patients' treatments, and the development of treatment plans in such applications as use of ionising radiation in diagnosis, therapy, treatment planning with externally delivered radiation as well as use of internally implanted radioactive sources given the state of technology
- (i) Planning, directing, conducting, and participating in supporting programs and remedial procedures to ensure effective and safe use of ionising and non-ionizing radiation and radio nuclides in human beings by physician specialist
- (j) Formulating radiation protection guides and procedures specific to hospital environment and other professional groups and organizations; conducting specialised measurements and producing protocols to minimise radiation exposure of patients, staff and the general public;
- (k) Participating in and contributing to the development and implementation of national and international standards, laws and regulations relating to patient safety, particularly to radiation and radioactive materials;
- (l) Teaching principles of medical physics to physicians, residents, graduate students, medical students, technologists, and other health care professionals by means of lectures, problem solving, and laboratory sessions
- (m) Preparing, publishing and presenting scientific papers and reports;
- (n) Supervising and managing radiation workers and other health professional workers.

Examples of the occupations classified here:

Clinical medical physicists, Clinical scientist