

The Role of the Medical Physicist in Relation to Medical Devices

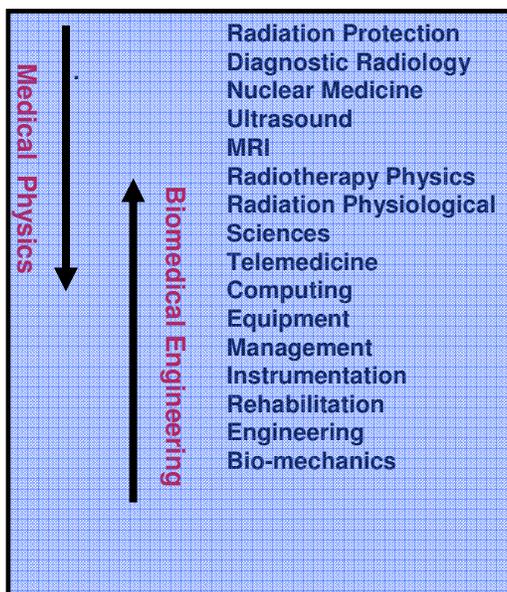
Peter H S Smith

Immediate Past Secretary-General, IOMP

Medical Physics is a branch of Applied Physics, pursued by medical physicists, which uses physics principles, methods and techniques in practice and research for the prevention, diagnosis and treatment of human diseases with a specific goal of improving human health and well-being.

Medical physicists (MPs) working in clinical environment are health professionals, with education and specialist training in the concepts and techniques of applying physics in medicine, competent to practice independently in one or more of the subfields (specialties) of medical physics.

In some countries the term 'medical physics' is often used as synonymous with 'clinical radiation physics' whilst in others the interpretation is much broader, with considerable overlap with biomedical (or clinical) engineering, as illustrated in the diagram below:



MPs are mainly involved in medical devices that emit or detect radiation (ionising and non-ionising) such as:

- Devices for radiotherapy – including
 - ❖ Linear Accelerators and Cobalt- 60 Units
 - ❖ Treatment planning computers
- Imaging Devices – including:
 - ❖ X-ray sets
 - ❖ MRI Scanners
 - ❖ CT scanners
 - ❖ Nuclear Medicine gamma cameras
- Lasers
- Physiotherapy equipment involving optical and other forms of electromagnetic radiation

However some medical physicists may also involved in areas such as physiological measurement, computing, medical instrumentation and telemedicine.

Roles of MPs in relation to Medical Devices

- Establishment, implementation, and supervision of radiation protection and safety programs for medical devices
- Measurement (Calibration) of radiation emitted or detected by medical devices
- Establishment, implementation, and supervision of quality assurance programs for medical devices.
- Optimization of physical aspects of diagnostic and therapeutic procedures and this will normally involve the medical devices involved.
- Commissioning and supervising the delivery of complex or new clinical medical devices
- Technical specification of equipment and design of installations
- Acceptance and commissioning of equipment
- Management of equipment – particularly in radiotherapy departments
- Technical supervision of maintenance
- Research and innovation of new medical device
- Teaching – radiation protection and users of equipment