

Medical Physics

Guido PEDROLI, Dr.Phys

Director

STAFF Senior Deputy Director for Physics in Radiotherapy:
Mario Ciocca, Dr.Phys
Deputy Director for Physics in Radiotherapy:
Federica Cattani, Dr.Phys
Senior Assistants for Physics in Radiotherapy:
Raffaella Cambria, Dr.Phys, Cristina Garibaldi, Dr.Phys,
Elena Rondi, Dr.Phys
Deputy Director for Physics in Nuclear Medicine:
Marta Cremonesi, Dr.Phys
Senior Assistant for Physics in Nuclear Medicine:
Mahila Ferrari, Dr.Phys
Deputy Director for Physics in Diagnostic Radiology and
MR Imaging: Daniela Origgi, Dr.Phys
Fellows for Physics in Radiotherapy: Stefania Comi, Dr. Phys,
Marco Liotta, Dr.Phys, Rosa Luraschi, Dr.Phys
Fellow for Physics in Nuclear Medicine:
Amalia Di Dia, Dr.Phys
Fellow for Physics in Diagnostic Radiology and MR Imaging:
Nicola Caretto, Dr.Phys
Chief Technician: Annalisa Rossi

Activities 2007. Many diagnostic, therapeutical and research activities performed in the Institute involve the use of sealed and unsealed radioactive substances and of many types of ionising radiation producing equipments (X-ray tubes for diagnostic radiology, conventional and mobile linear accelerators for external radiotherapy, after-remote-loading equipment for brachitherapy with sealed radioactive sources). The contribution of the Medical Physics team is indispensable in order to guarantee the radiation safety of the exposed personnel and of the patients. Moreover, the team regularly and continuously cooperates with the Divisions of Diagnostic Radiology, Nuclear Medicine and Radiotherapy for setting up and optimising protocols for clinical dosimetry, for the development and the introduction into the clinical practice of new and advanced techniques involving the use of ionising and non-ionising radiation sources, for commissioning new equipments and for carrying out a constant quality control on the radiation sources and on the diagnostic imaging systems.

In 2007, apart from the radiation protection and quality control procedures, the following routine activities involving the optimisation of diagnostic and therapeutic procedures were performed:

- calculation of treatment plans for conventional external radiotherapy, stereotactical radiotherapy, multiple arcs prostate radiotherapy, IORT (Intra Operative Radiation Therapy), conventional brachitherapy and brachitherapy with permanent implant of the sources and TBI (Total Body Irradiation) treatments;
- internal dosimetry evaluations for radioimmunotherapy with avidin-biotin and peptides labelled with β -emitters, like ^{90}Y and ^{177}Lu , for selective internal radiation therapy of liver primary tumours and metastasis with colloidal microspheres labelled with ^{90}Y ;
- commissioning of a 1.5T Magnetic Resonance equipment, of a digital mammographic system and of two mobile x-ray equipments.



Research activities were directed to:

- optimisation of IMRT (Intensity-Modulated-Radiation-Therapy), IGRT (image guided radiotherapy) and extracranial stereotactical treatments with “deep inspiration breath hold”;
- IART (intraoperative avidination radionuclide therapy) and study of the effect of multi-cycle approach to radionuclide therapy;
- evaluation of patient dose in Multislice CT.

In the frame of a research project developed in cooperation with the Department of Materials Science of the Milano-Bicocca University and financed by Regione Lombardia, a new dosimeter, based on a radio luminescent crystal and an optical fibre has been developed and is being tested with the different radiation sources available in the Institute.