1. Record Nr. UNINA9910149481803321

Titolo	Basic Science of PET Imaging / / edited by Magdy M. Khalil
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2017
ISBN	3-319-40070-3
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (XIX, 619 p. 150 illus., 100 illus. in color.)
Disciplina	616.07548
Soggetti	Nuclear medicine Radiology Nuclear Medicine Diagnostic Radiology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	History -- Basics and Radiation safety of PET Imaging -- Chemistry of PET radiopharmaceuticals: labelling strategies -- PET radiopharmaceuticals in clinical and research domains -- Quality Control of PET radiopharmaceuticals -- Physiologic and Molecular basis of PET in Cancer imaging -- Basics and new developments of Cardiac PET imaging -- PET in preclinical arena: Instrumentation and applications -- Radiation Dosimetry of PET imaging -- Physics and instrumentation of PET and hybrid PET Imaging: focus on PET/CT -- Hybrid PET/MR Imaging: Technologic advances and clinical applications -- Quality control and quality assurance of PET Scanners -- Image quantification in PET Imaging -- Image processing and data analysis of PET and hybrid PET Imaging -- Partial volume correction in PET imaging -- Compartmental modeling of PET Kinetics -- Motion artefacts and correction techniques in PET/CT -- Role of PET/CT in radiotherapy treatment planning. .
Sommario/riassunto	This book offers a wide-ranging and up-to-date overview of the basic science underlying PET and its preclinical and clinical applications in modern medicine. In addition, it provides the reader with a sound understanding of the scientific principles and use of PET in routine practice and biomedical imaging research. The opening sections

address the fundamental physics, radiation safety, CT scanning dosimetry, and dosimetry of PET radiotracers, chemistry and regulation of PET radiopharmaceuticals, with information on labeling strategies, tracer quality control, and regulation of radiopharmaceutical production in Europe and the United States. PET physics and instrumentation are then discussed, covering the basic principles of PET and PET scanning systems, hybrid PET/CT and PET/MR imaging, system calibration, acceptance testing, and quality control. Subsequent sections focus on image reconstruction, processing, and quantitation in PET and hybrid PET and on imaging artifacts and correction techniques, with particular attention to partial volume correction and motion artifacts. The book closes by examining clinical applications of PET and hybrid PET and their physiological and/or molecular basis in conjunction with technical foundations in the disciplines of oncology, cardiology and neurology, PET in pediatric malignancy and its role in radiotherapy treatment planning. Basic Science of PET Imaging will meet the needs of nuclear medicine practitioners, other radiology specialists, and trainees in these fields.