



Andrei Iagaru, Thomas Hope, Patrick Veit-Haibach (Eds): PET/MRI in Oncology. Current Clinical Applications

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Luigi Mansi¹

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Although PET/MRI is an innovative and powerful hybrid technique in the diagnostic imaging toolbox, it is not yet widely available. The main reason is probably related to the performance of its main competitor, PET/CT, that has been further improved by the recent availability of new “all-digital” scanners. The popularity of PET/MRI is also negatively affected by its higher cost, and a favourable comparative cost/effectiveness is reached almost exclusively in wealthy Institutions with the possibility of acquiring a wider spectrum of technologies, and in specialized Institutions favouring its indications, particularly in paediatrics and neuropsychiatric diseases. Nevertheless, wider diffusion should be strongly encouraged since relevant clinical applications have already become evident in both oncological and nononcological diseases.

In this context, the technological and methodological background underlying PET/MRI has led to some important advantages, including the lower dosimetry and the better evaluation of soft tissues, advantages that are particularly relevant in the analysis of territories such as the pelvis, breast, brain, and head and neck. Similarly, the presence of a MR scanner creates the possibility of obtaining original information, mainly associated with data from functional MRI (fMRI). Nevertheless, there are still some technical challenges, such as those connected with quantitative evaluation that is affected by methodological difficulties, for example those related to attenuation correction measurement.

In this scenario, the book *PET/MRI in Oncology. Current Clinical Applications* is welcome. It is an updated and highly didactic text that is able to satisfy all the most important questions of people interested in the subject.

✉ Luigi Mansi
mansi.luigi@libero.it

¹ Section Health and Development, Interuniversity Research Center for Sustainability (CIRPS), Naples, Italy

The editors, who work in leading institutions and have recognized extensive experience in the field, are a guarantee of competence and of scientific value. Furthermore, they have recruited authors who are experts in the various topics. Andrei Iagaru is Professor of Radiology – Nuclear Medicine and Chief of the Division of Nuclear Medicine and Molecular Imaging at Stanford University Medical Center. Thomas Hope is an Assistant Professor in Residence in the Department of Radiology and Biomedical Imaging at the University of California, San Francisco (UCSF). Patrick Veit-Haibach is an Associate Professor of Radiology and Nuclear Medicine at University of Toronto, Canada.

The book comprises 433 pages enriched by high-quality figures, many of which are in colour, schema and tables. There is also an extensive and updated bibliography at the end of each chapter. The book presents the most important clinical topics, introduced by technical and methodological chapters. This approach makes it possible to acquire an adequate understanding of the background, and also an appreciation of the problems and solutions connected with the hybrid procedure, that allows a good understanding of PET/MRI in its current clinical applications. In particular, this book also examines oncological indications for which PET/MRI is already able to contribute to the best clinical management in many patients. All the chapters are written in a concise and clear style, and are therefore easily understandable by beginners, but still retaining the interest of experts. The bibliographies may also provide further insights.

In more detail, the book includes the following 21 chapters: (1) PET System Technology Designs for Achieving Simultaneous PET/MRI; (2) MR Pulse Sequences for PET/MRI; (3) MRI Contrast Agents; (4) PET/MRI: Attenuation Correction; (5) PET/MRI: Motion Correction; (6) PET/MRI: Reliability/Reproducibility of SUV Measurements; (7) PET/MRI: Safety Considerations; (8) Imaging of Tumour Heterogeneity: Functional MR Techniques in Oncology; (9) Workflow and Protocol Considerations; (10) Total-Body PET/

MRI in Oncological Applications; (11) PET/MRI in Brain Tumors; (12) Neuro: Head and Neck Oncology; (13) Lung Nodule Detection Using PET/MRI; (14) PET/MRI in Breast Cancer; (15) Hepatobiliary and Pancreatic Cancer PET/MRI; (16) PET/MRI in Neuroendocrine Tumours; (17) Rectal Cancer; (18) PET/MRI for Gynecological Malignancies; (19) PET/MRI in Prostate Cancer; (20) PET/MRI in Lymphoma; (21) PET/MRI for Clinical Pediatric Oncologic Imaging. The book ends with a one-page afterword, reporting future directions.

The major value of the book is the wide presentation of information achievable by the hybrid tool and by PET and

MRI (also including fMRI) alone. In this way, interesting clinical applications are identified in fields in which PET/CT is typically used, such as lymphoma and lung nodules.

In my opinion, this is a relevant book that may be of interest to experts (nuclear physicians, radiologists and oncologists), beginners and clinicians in other disciplines who want a rigorous, although not too difficult to understand, introduction to this new but already clinically important procedure.

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