Foreword

Rarely before has the field of nuclear medicine grown at such a pace as today. Reimbursement in many countries has led to a growing acceptance of PET and now PET-CT in the clinical setting and its full integration into clinical practice. At the same time, many new and promising target-specific radioligands have emerged in the research laboratory and await translation into the clinical environment. Once introduced into the clinic, they are likely to further transform the scope of nuclear medicine with substantial implications for patient care, including patient diagnosis and staging of disease and risk assessment. Moreover, they are likely to enhance treatment response monitoring and, importantly, facilitate tailoring of patient-specific treatment strategies.

Advances in imaging instrumentation have further accelerated the pace of growth in clinical nuclear medicine. Greater sensitivity together with higher spatial and temporal resolution capabilities has shortened clinical imaging times and thus increased patient throughput. It has also enhanced our ability to visualize and quantify normal functional processes, or altered, even when still subtle in magnitude in developing disease or when still confined to anatomically small regions. Importantly, PET-CT allows accurate localization of functional processes including rates of metabolism, receptor expression and activity, cell–cell or cell–tissue interactions, or events occurring at the molecular level. Functional parameters can thus be assigned to disease-related structural derangements. Finally, research in molecular imaging continues to produce a stream of novel, target-specific radioligands for probing molecular and cellular processes and promising to visualize and delineate cellular and molecular events at the onset of disease or in response to therapy. Many of these novel probes hold considerable promise for defining new targets for therapeutic strategies or, conversely, to serve as therapeutic agents themselves.

These impressive advances offer new and exciting opportunities for broadening the practice of nuclear medicine. Yet they also pose tremendous challenges to the clinician, especially as to how best apply the ever-growing array of imaging capabilities to patient care. The editors, Doctors Schober and Heindel deserve credit for providing us with a comprehensive and concisely written survey of the current state of clinical PET and PET-CT imaging. They have enlisted an outstanding team of contributors, all active clinicians in nuclear medicine, radiology, oncology, radiation therapy, neurology, or cardiology. As most of the contributors practice at the same academic medical center, they present a unified and coordinated approach to diagnostic imaging.

The text covers the full range of current PET and PET-CT applications, including those in neurology and cardiology and appropriately emphasizes applications in oncology. Importantly, the chapters adhere to a consistent structure and include a brief assessment of alternative imaging approaches such as MRI and CT, listing advantages and limitations, a feature which is especially useful for selecting the most effective and appropriate imaging approach and deciding when to use PET or PET-CT for solving a clinical question. I wish to congratulate the editors and contributors alike on this superb book, which serves as a readily accessible resource to the imaging clinician and as a well-organized, easily readable, and well-illustrated introduction to PET-CT for the beginner.

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