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BOOK REVIEW

D. Volterrani, P.A. Erba, I. Carrió, H.W. Strauss, G. Mariani: Nuclear Medicine Textbook - Methodology and Clinical Applications

Springer Nature Switzerland AG 2019. ISBN 978-3-319-95563-6; ISBN 978-3-319-95564-3 (eBook)

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Nuclear medicine is a small specialty, but it has been and continues to be one of the most innovative and exciting branches of medicine. Nuclear medicine combines biology, chemistry, physics, and mathematics with the art and science of clinical medicine. Radiopharmaceutical therapy and diagnosis based on the tracer principle, which may be targeted and integrated systematically in form of theranostics, may be applied to all major organ systems and disease processes. Theranostics was born about 80 years ago with the use of radioiodine in the imaging and treatment of thyroid diseases. Therefore, while the concept is not new, it has undergone a renaissance with the development of novel agents for imaging and targeted radionuclide therapy of cancer (e.g., neuroendocrine tumors, prostate cancer, pheochromocytoma/paraganglioma). Other agents are anticipated in the relatively near future that are targeted to chemokine receptors and fibroblast activation protein with the list expanding as further biological insights and biomarker developments emerge. Nuclear medicine and theranostics is also anticipated to cultivate a rational link between precision health and precision medicine.

There have been many comprehensive textbooks published on the science and clinical practice of nuclear medicine. However, nuclear medicine is a fast-advancing field that demands new textbooks or relatively frequent updates to the ones previously published. Here, I review a book that was recently published by the Springer Nature Switzerland AG in 2019. The book is entitled “Nuclear Medicine Textbook - Methodology and Clinical Applications” and is edited by 5 renowned academic experts in nuclear medicine, 3 from the University of Pisa, Pisa, Italy, 1 from the Autonomous University of Barcelona, Barcelona, Spain (past editor of the European Journal of Nuclear Medicine and Molecular Imaging), and 1 from Cornell University Weill, New York, USA (past editor of the Journal of Nuclear Medicine and past president of the Society of Nuclear Medicine and Molecular Imaging). The editors also contributed as coauthors to several chapters along with a remarkable 122 invited international contributors, most from around Italy, but also several from Austria, Germany, Japan, Jordan, Spain, Sweden, The Netherlands, and the United States.

This comprehensive book is structured in 51 chapters, organized in 3 parts, and encompasses 1331 pages, with numerous tables, graphs, diagrams and high-quality images, many in color. Part

I on basic science includes 16 chapters that include information on a brief history of radiation and radioactivity, radiation physics and radiation protection, radiopharmaceuticals (categorized conveniently under single-photon emitting, positron emitting, and therapy), instrumentation including camera systems, image data acquisition, processing and quantification techniques, principles and interpretation of computed tomography and magmatic resonance imaging as an introduction to hybrid imaging, and finally culminating with an expedient summary of radioguided biopsy and surgery in the relevant clinical scenarios. Part II on clinical applications has 22 chapters covering all major organ system diseases in both adult and pediatric population with emphasis on hybrid imaging including a chapter on the expanding utility of PET/CT in dose painting and radiation treatment planning in several malignancies. Part III on practice and procedures contains 13 chapters and provides useful ancillary information on radiochemistry of single-photon emitting and positron-emitting radiopharmaceutical, their quality assurance procedures, and the regulatory processes in both Europe and the United States, quality control of instrumentation and camera systems, practice guidelines for major nuclear medicine procedures, dual-energy X-ray absorptiometry for assessment of bone mineral density, and finally closing with 36 nononcologic and 42 oncologic (mostly PET with FDG, and few PET cases with FDOPA and fluorocholine) illustrative teaching cases and techniques for optimal image interpretation and concise and informative results reporting including sample reports for 56 different clinical scenarios and nuclear medicine procedures. Each chapter includes learning objectives and key learning points with cited references and/or additional suggested readings. The book ends with a convenient section of glossary of abbreviated terms and a detailed index. This practical book is particularly useful for trainees but is also of considerable value to the seasoned physicians in nuclear medicine, radiology, and practitioners in other branches of medicine and surgery interested in the applicability of nuclear medicine procedures in their disciplines. Other professionals including technologists, medical physicists, and radiation safety officers can also benefit from this textbook. This book will be a great resource in the libraries of any clinical department and medical schools.

In the end, I paraphrase the frequent quote made by the Californian public TV personality, Huell Howser (1945-2013), in his “California’s Gold” program that explored the natural, cultural, and historical features of California. He always ended this program by saying “…and this is truly a fine example of California’s Gold”. In that same spirit, I must say that the textbook “Nuclear Medicine Textbook - Methodology and Clinical Applications” is a fine example of Nuclear Medicine’s Gold.