

The Pathophysiologic Basis of Nuclear Medicine

A.H. Elgazzar, ed.

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Because nuclear medicine deals with functional and molecular changes, with development toward molecular imaging technology and radionuclide-based theranostics, it becomes crucial to understand the pathophysiologic changes of relevant disease and disease-like conditions in clinical practice. This book, a third edition, provides an in-depth systematic review of the major aspects of the pathophysiologic basis of nuclear medicine and gives the information needed to translate known pathophysiology into useful image interpretation. The editor has assembled the expertise of 30 authors who have contributed to the investigation of pathophysiology through nuclear medicine practice.

The book is well organized into 21 chapters with 215 illustrations and progresses from basic science reviews, including reviews of pathophysiology and radiopharmaceuticals, into clinical applications. Chapter 1 introduces pathology and physiology and describes the general principles of pathophysiology. Chapter 2 deals with cell and tissue biology and provides a good review of cell structure and function, DNA and gene expression, cell reproduction, normal and malignant growth, cellular metabolism, transport through the cell membrane, and cell death. Chapter 3 focuses on the basics of radiopharmaceutical localization and presents several radiopharmaceuticals that have been designed and developed over the past few decades to image the pathophysiologic function of many organs and tissues. The next set of chapters contains timely reviews of various types of clinical imaging, including inflammation; hematology; the musculoskeletal

system; the thyroid, parathyroid, and adrenal glands; the genitourinary system; oncology; the respiratory system; cardiology; the digestive system; the central nervous system; and lymphoscintigraphy. The best-written chapters are on the basics and clinical applications of oncology, cardiology, and the central nervous system. These chapters include sections not only on anatomy and pathophysiology but also on scintigraphic evaluation of these diseases. Multiple color and black-and-white illustrations are included. For those interested in therapy, the final chapters present the basics of therapeutic nuclear medicine and the biologic effects of ionizing radiation.

Overall, this is an excellent book for both residents and active practitioners of nuclear medicine. The text offers something for everyone and will help the reader understand the various patterns of disease identified in nuclear medicine studies. As Dr. Leonard M. Freeman mentions in the foreword of the book, the non-specificity of radionuclide imaging studies requires nuclear medicine physicians to have a broad, in-depth understanding of the basic pathophysiology of the disease processes they are being asked to evaluate. *The Pathophysiologic Basis of Nuclear Medicine* will surely enhance the role of nuclear medicine physicians, helping them to become well-rounded practitioners as opposed to merely “imagers.”

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Erratum

In a letter from Walrand et al. (“The impact of image reconstruction bias on PET/CT ^{90}Y dosimetry after radio-embolization.” *J Nucl Med.* 2015;56:494-495), the third author was incorrectly listed as *Lhommel Renaud*. The correct name is *Renaud Lhommel*. The authors regret the error.