Combined Scintigraphic and Radiographic Diagnosis of Bone and Joint Diseases

Y.-W. Bahk

New York, NY: Springer, 2017, $259

Ever since burgeoning in 1940 with ^{131}I-sodium iodide thyroid scanning and a prototypal Geiger–Muller tube, nuclear medicine has ceaselessly, vigorously, and extensively advanced much beyond our initial modest hopes and expectations. Valuable progress has also been achieved using the hybridization of imaging modalities such as PET/CT and PET/MRI, with image resolution of a few millimeters in humans. In addition, the recent advent of γ-correction pinhole bone scans can efficiently and economically diagnose submillimetric fractures of bony trabecula that are actively engaged with osteoneogenesis in the form of seed-pearl callus formation. The smallest size currently capable of being imaged is a 0.23-mm fracture of human bone and a 0.03-mm fracture of the rat femur, well deserving of the term *microscanning*. Bone marrow edema, hemorrhage, and trabecular microfracture are the basic pathologic triad of most bone and joint diseases, and their visualization has become possible through γ-correction pinhole bone scanning.

Professor Bahk's successful book, *Combined Scintigraphic and Radiographic Diagnosis of Bone and Joint Diseases,* has contributed to the practical recognition of nuclear medicine imaging as an everlasting "seeing is believing" type of science. Furthermore, this fifth edition not only expertly discusses the depiction and quantification of small bony trabecular fractures for high-level biochemical and anatomic diagnoses but also predicts the feasibility of the extended application of γ-correction to CT and MRI and even to conventional radiography to far more clearly depict small changes that occur in the bones, joints, and soft-tissue structures, significantly contributing to personalized medicine. The author again aims in this fifth edition to equip the reader with updated information that will facilitate accurate diagnosis of bone and joint diseases by means of combined scintigraphy and radiography. This edition has 26 chapters, including two that are entirely new: one on the use of ^{18}F-NaF PET/CT and the other on γ-correction scan diagnosis of bony trabecular microfractures and microcontusions as well as bone edema and hemorrhage. Further topics covered for the first time include enthesopathies, myositis, soft-tissue diseases, cryptic bones, and differential diagnosis. Individual chapters dealing with traumatic, inflammatory, degenerative, vascular, metabolic, and neoplastic bony diseases, as well as soft-tissue infection and tumors, have been updated and rearranged to reflect the latest advances in imaging diagnosis. As before, a vast number of state-of-the-art γ-correction pinhole bone scans and corroborative conventional radiographs, as well as CT, MRI, and ultrasound images, are presented side by side, with arrows highlighting findings. The images are clear and impressive, and the references are up to date. In addition, extension of γ-correction to other imaging methods, such as MRI and CT, and the solution of the halation problem are necessarily addressed. The first chapter discusses the fundamentals of pinhole scintigraphy, an appendix summarizes the basic physics of pinhole scintigraphy, and the index is accurate.

This fifth edition of *Combined Scintigraphic and Radiographic Diagnosis of Bone and Joint Diseases* will be helpful and useful to practitioners and researchers in nuclear medicine, radiology, orthopedic surgery, pathology, anatomy, and the imaging sciences for the improved diagnosis of variable bone and joint diseases.

E. Edmund Kim
University of California at Irvine
101 The City Dr. S.
Orange, CA 92868
E-mail: edmundek@uci.edu

Published online Dec. 21, 2017.
DOI: 10.2967/jnumed.117.206698