

Stefano Fanti – Mohsen Farsad – Luigi Mansi

[Atlas of SPECT-CT](#)

Stefano Fanti – Mohsen Farsad – Luigi Mansi

Atlas of SPECT-CT

 Springer

Stefano Fanti, Prof. Dr.

University of Bologna
Policlinico S.Orsola-Malpighi
Dipto. Medicina Nucleare
Via Massarenti
40100 Bologna
Italy
fanti@orsola-malpighi.med.unibo.it

Luigi Mansi, Prof. Dr.

University of Naples
Ist. Scienze Radiologiche
Piazza Miraglia 2
80138 Napoli
Italy
luigi.mansi@unina2.it

Mohsen Farsad, MD.

Central Hospital Bozen
Nuclear Medicine
Via Pöhler
39100 Bolzano
Italy
mohsen.farsad@asbz.it

ISBN: 978-3-642-15725-7

e-ISBN: 978-3-642-15726-4

DOI: 10.1007/978-3-642-15726-4

Library of Congress Control Number: 2011928411

© 2011 Springer-Verlag Berlin Heidelberg

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilm or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Product liability: The publishers cannot guarantee the accuracy of any information about dosage and application contained in this book. In every individual case the user must check such information by consulting the relevant literature.

Cover design: eStudioCalamar, Spain

Printed on acid-free paper

Springer is part & Springer Science + Business Media (www.springer.com)

Acknowledgement

We would like to dedicate this book to all people who are tired of being told that nuclear medicine is the future: Nuclear Medicine is the present.

Contents

Chapter 1	SPECT-CT: Importance for Clinical Practice	1
Chapter 2	SPECT-CT: Technology and Physics	9
Chapter 3	SPECT-CT for Tumor Imaging	15
Chapter 4	Bone Imaging with SPECT-CT	105
Chapter 5	Brain Imaging with SPECT-CT	121
Chapter 6	Cardiac Imaging with SPECT-CT	133
Chapter 7	Parathyroid Imaging with SPECT-CT	143
Chapter 8	Sentinel Node Imaging with SPECT-CT	151
Chapter 9	Infection Imaging Using SPECT-CT	167
Chapter 10	Red Blood Cell Imaging with SPECT-CT	187
Chapter 11	Ventilation/Perfusion Imaging with SPECT-CT	195
Chapter 12	Radiation Therapy Planning Using SPECT-CT	203
Chapter 13	Dosimetry Using SPECT-CT	213
Index	217

Contributors

Monica Agostini U. O. Medicina Nucleare, Azienda Sanitaria di Cesena, Cesena, Italy

Carina Mari Aparici Department of Radiology and Biomedical Imaging,
University of California, San Francisco, CA, USA

Anca M. Avram Division of Nuclear Medicine/Radiology, University of Michigan Medical
Center, Ann Arbor, MI, USA

Mirco Bartolomei U. O. Medicina Nucleare, Azienda Sanitaria di Cesena, Cesena, Italy

Chiara Basile Medical Physics, Servizio di Fisica Sanitaria, Azienda Ospedaliera
S. Camillo Forlanini, Roma, Italy

Ambros J. Beer Department of Nuclear Medicine, Klinikum rechts der Isar der
Technischen Universität München, Munich, Germany

Francesca Botta Unità di Fisica Sanitaria, Istituto Europeo di Oncologia, Milano, Italy
Medical Physics and Nuclear Medicine, European Institute of Oncology, Milano, Italy

Andreas K. Buck Department of Nuclear Medicine, Klinikum rechts der Isar der
Technischen Universität München, Munich, Germany

Michela Casi U. O. Medicina Nucleare, Azienda Sanitaria di Cesena, Cesena, Italy

Angel Soriano Castrejón Department of Nuclear Medicine, University General Hospital
of Ciudad Real, Ciudad Real, Spain

Marta Cremonesi Unità di Fisica Sanitaria, Istituto Europeo di Oncologia, Milano, Italy
Medical Physics and Nuclear Medicine, European Institute of Oncology, Milano, Italy
Medical Physics Department, Istituto Europeo di Oncologia, Milano, Italy

Vincenzo Cuccurullo U.O. Medicina Nucleare, Seconda Università di Napoli, Napoli, Italy

Concetta De Cicco Divisione di Medicina Nucleare, Istituto Europeo di Oncologia,
Milano, Italy
Medical Physics and Nuclear Medicine, European Institute of Oncology, Milano, Italy

Francesco De Lauro U. O. Medicina Nucleare, Azienda Sanitaria di Cesena, Cesena, Italy

Amalia Di Dia Unità di Fisica Sanitaria, Istituto Europeo di Oncologia, Milano, Italy
Medical Physics and Nuclear Medicine, European Institute of Oncology, Milano, Italy

Fernando Di Gregorio U.O. Medicina Nucleare, Azienda Ospedaliera Santa Maria della
Misericordia di Udine, Udine, Italy
Nuclear Medicine, University Hospital, Udine, Italy

Ryan A. Dvorak Division of Nuclear Medicine/Radiology, University of Michigan Medical Center, Ann Arbor, MI, USA

Paola Erba U.O. Medicina Nucleare, Azienda Ospedaliero-Universitaria Pisana, Pisa, Italy

Jure Fettich Department of Nuclear Medicine, University Medical Centre of Ljubljana, Ljubljana, Slovenia

Albert Flotats Department of Nuclear Medicine, Universitat Autònoma de Barcelona, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain

José Manuel Cordero Garcia Department of Nuclear Medicine, University General Hospital of Ciudad Real, Ciudad Real, Spain

Victor Manuel Poblete García Department of Nuclear Medicine, University General Hospital of Ciudad Real, Ciudad Real, Spain

Onelio Geatti U.O. Medicina Nucleare, Azienda Ospedaliera Santa Maria della Misericordia di Udine, Udine, Italy
Nuclear Medicine, University Hospital, Udine, Italy

Andor W. J. M. Glaudemans Department of Nuclear Medicine and Molecular Imaging, University Medical Center Groningen, Groningen, The Netherlands

Henrik Gutte Department of Clinical Physiology, Nuclear Medicine and PET, Copenhagen University Hospital, Copenhagen, Denmark

Randall Hawkins Department of Radiology and Biomedical Imaging, University of California, San Francisco, CA, USA

Ken Herrmann Department of Nuclear Medicine, Klinikum rechts der Isar der Technischen Universität München, Munich, Germany

Marina Hodolic Department of Nuclear Medicine, University Medical Centre of Ljubljana, Ljubljana, Slovenia

Cornelis A. Hoefnagel Department of Nuclear Medicine, The Netherlands Cancer Institute and Academic Medical Center, Amsterdam, The Netherlands

Eugenio Inglese U. O. Medicina Nucleare, Ospedale Maggiore della Carità di Novara, Novara, Italy

Andreas Kjær Department of Clinical Physiology, Nuclear Medicine and PET, Copenhagen University Hospital, Copenhagen, Denmark

Marco Krengli U. O. Medicina Nucleare, Ospedale Maggiore della Carità di Novara, Novara, Italy

Torsten Kuwert Clinic of Nuclear Medicine, University of Erlangen-Nuremberg, Erlangen, Germany

Elena Lazzeri U.O. Medicina Nucleare, Azienda Ospedaliero-Universitaria Pisana, Pisa, Italy

Gianfranco Loi U. O. Medicina Nucleare, Ospedale Maggiore della Carità di Novara, Novara, Italy

Lucio Mango Servizio di Fisica Sanitaria, Azienda Ospedaliera S. Camillo Forlanini, Roma, Italy
Medical Physics, Azienda Ospedaliera S. Camillo Forlanini, Roma, Italy

Luigi Mansi University of Naples, Ist. Scienze Radiologiche, Piazza Miraglia 2, Napoli, Italy

Agustín Ruiz Martínez Department of Nuclear Medicine, Universitat Autònoma de Barcelona, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain

Vincenzo Mattone U. O. Medicina Nucleare, Azienda Sanitaria di Cesena, Cesena, Italy

Jann Mortensen Department of Clinical Physiology, Nuclear Medicine and PET, Copenhagen University Hospital, Copenhagen, Denmark

Massimiliano Pacilio Servizio di Fisica Sanitaria, Azienda Ospedaliera S. Camillo Forlanini, Roma, Italy
Medical Physics Department, Azienda Ospedaliera S. Camillo Forlanini, Rome, Italy

Giovanni Paganelli Divisione di Medicina Nucleare, Istituto Europeo di Oncologia, Milano, Italy
Medical Physics and Nuclear Medicine, European Institute of Oncology, Milano, Italy

Pier Francesco Rambaldi U.O. Medicina Nucleare, Seconda Università di Napoli, Napoli, Italy

Prado Talavera Rubio Department of Nuclear Medicine, University General Hospital of Ciudad Real, Ciudad Real, Spain

Ivan Santi U. O. Medicina Nucleare, Policlinico S. Orsola-Malpighi, Bologna, Italy

Youngho Seo Department of Radiology and Biomedical Imaging, University of California, San Francisco, CA, USA

Alberto Signore Nuclear Medicine, 2nd Faculty of Medicine, Università Sapienza di Roma, Roma, Italy
Department of Nuclear Medicine and Molecular Imaging, University Medical Center Groningen, University of Groningen, Groningen, The Netherlands

Ana María García Vicente Department of Nuclear Medicine, University General Hospital of Ciudad Real, Ciudad Real, Spain

John Patrick Pilkington Woll Department of Nuclear Medicine, University General Hospital of Ciudad Real, Ciudad Real, Spain

Ka Kit Wong Division of Nuclear Medicine/Radiology, University of Michigan Medical Center, Ann Arbor, MI, USA
Department of Nuclear Medicine, VA Ann Arbor Healthcare System, Ann Arbor, MI, USA