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The rapidly growing area of nuclear medicine imaging receives only limited attention in broad-based medical dictionaries. This encyclopedic dictionary is intended to fill the gap. More than 400 entries of between one and three paragraphs are included, defining and carefully explaining terms in an appropriate degree of detail. The dictionary encompasses concepts used in planar, SPECT, and PET imaging protocols and covers both scanner operations and popular data analysis approaches. In spite of the mathematical complexities in the acquisition and analysis of images, the explanations given are easy to understand and many helpful concrete examples are provided. The book will be ideal for those who wish to obtain a rapid grasp of a concept beyond a definition of a few words but do not have the time to search the reference literature. The almost tutorial-like style accommodates the needs of students, nuclear medicine technologists, and varieties of other medical professionals. From a distinguished author comes this new edition for technologists, practitioners, residents, and students in radiology and nuclear medicine. Encompassing major topics in nuclear medicine from the basic physics of radioactive decay to instrumentation and radiobiology, it is an ideal review for Board and Registry examinations. The material is well organized and written with clarity. The book is supplemented with tables and illustrations throughout. It provides a quick reference book that is concise but comprehensive, and offers a complete discussion of topics for the nuclear medicine and radiology physician in training. "A concise review of all aspects of nuclear medicine, this fully revised second edition includes 1786 questions-and-answers (multiple choice; fill-in-the-blank; and true-or-false) designed to help those preparing for certification or re-certification exams administered by the American Board of Radiology, of which nuclear medicine is an important part. Fully updated with the progress made in the field since the first edition's publication, especially in positron emission tomography (PET)"--Provided by publisher. This pioneering book, now in its fourth edition, presents the cutting-edge developments in pediatric nuclear medicine. Thoroughly revised and updated, it retains the fundamentals that anchor the book's distinguished reputation and includes the latest advances in PET/CT, SPECT, hybrid imaging, and molecular imaging. *Pediatric Nuclear Medicine and Molecular Imaging, Fourth Edition*, is an excellent resource for nuclear medicine physicians, diagnostic radiologists, pediatricians, and residents and fellows. The Fourth Edition features: · 16 new chapters, including PET and PET/CT in Children and Young Adults; Lymphoscintigraphy; Skeletal Scintigraphy; Neuroblastoma; Lymphomas and Lymphoproliferative Disorders; Functional Imaging of Pediatric Musculoskeletal Tumors; Solid Tumors in Childhood; Pediatric Molecular Imaging; Combined PET/MRI in Childhood; Radiation Exposures; Radiation Protection in Pediatric Nuclear Medicine; and Dose Optimization in Pediatric Nuclear Medicine. · Discussion of the use of image fusion and hybrid imaging in children. · Strategies for communicating potential radiation risk to patients, families and members of the healthcare team. · Methods to optimize pediatric radiopharmaceutical administered doses and improve image quality. S. Ted Treves, MD, is Professor of Radiology at Harvard Medical School, Founder and Former Chief, Division of Nuclear Medicine and Molecular Imaging, Children's Hospital Boston (1970-2011). In 2013, he received the Society of Nuclear Medicine and Molecular Imaging's Georg Charles de Hevesy Nuclear Pioneer Award for outstanding contributions to the field of Nuclear Medicine. The Institute of Nuclear Medicine, founded in 1961, celebrates with this Festschrift, its Golden Jubilee. It has been a remarkable 50 years of progress of the radionuclide tracer methodology. From initial, physiology based experimentation, a full independent medical discipline evolved, and with it, a comprehensive clinical service. Diagnosis and Treatment with radiotracers have established the basis for Nuclear Medicine. Technological advances have permeated the field like none other, its multidisciplinary character and its translational research are embedded in the history of the Institute and its success. Recent and latest advances in the field promise a future as bright as has been witnessed and documented in the last 50 years. A tactical guide for radiologists and nuclear medicine physicians, *Diagnostic Imaging: Nuclear Medicine, Second Edition* is practical, easy-to-use, and in-touch with the realities of multimodality diagnostic imaging. This comprehensive yet accessible reference addresses the most appropriate nuclear medicine options available to answer specific clinical questions within the framework of all imaging modalities. Sweeping updates include a complete reorganization, new differential diagnoses based on findings, and new chapters on physics and Nuclear Regulatory Commission guidelines. User-friendly bulleted text and a uniform chapter layout allow fast and effortless access to the crucial knowledge you need! Time-saving reference features include bulleted text, a variety of test data tables, key facts in each chapter, 2,000 full-color annotated images, and an extensive index Expanded coverage of the most important topics and trends in nuclear medicine including Recently revised radioactive iodine therapy guidelines for hyperthyroidism and thyroid cancer New bone tumor therapy radium-223 (currently indicated for treatment of painful bone metastases in prostate cancer) New I-123 ioflupane dopamine transporter imaging for diagnosis of parkinsonian syndromes F-18 PET/CT bone scan (particularly its indication for nonaccidental trauma in children) Meticulous updates throughout reflect the latest advances as well as all study guide topics listed for the new American Board of Radiology exam, including physics and Nuclear Regulatory Commission guidelines Recent advances in the field of nuclear medicine (NM) are expanding the role and responsibilities of the nuclear medicine technologist (NMT) to include more complex and detailed tasks. New technologies are making the diagnosis, management, and treatment of illnesses more sensitive, more specific, more accurate, and ultimately safer for both the patient and the technologist. *Radiation Safety in Nuclear Medicine, Second Edition* provides the latest technological advances and expanded responsibilities of today's NMT while laying a solid foundation for understanding the basic physics behind the technology. As with the original, this edition teaches the units of radioactivity, exposure, and dosimetry, along with the principles of instrumentation needed for detection and measurement. Focusing on the issues of safety, this volume devotes considerable attention to the science and practice of safety techniques and includes information on rules and regulations. In keeping with the expanding nature of the field, the second edition incorporates many updates and additions such as, Recent modifications to the U.S. Code of Federal Regulations specific to the use of radiopharmaceuticals in medicine The growing popularity of metabolic imaging with positron emissions tomography (PET) The benefits of merging two modalities, namely, the images of PET and computerized tomography (CT) into one short scanning procedure The new role of therapeutic radiopharmaceuticals that use molecular targeting as a method of localization Providing a basic understanding of nuclear medicine, its scientific basis, diagnostic and therapeutic applications, safety practices and regulations, and future directions, *Radiation Safety in Nuclear Medicine, Second Edition* is the comprehensive reference for technologists, students, researchers, and other professionals in the Nuclear Medicine. The Fourth Edition of Dr. Gopal B. Saha's *Physics and Radiobiology of Nuclear Medicine* was prompted by the need to provide up-to-date information to keep pace with the perpetual growth and improvement in the instrumentation and techniques employed in nuclear medicine since the last edition published in 2006. Like previous editions, the book is intended for radiology and nuclear medicine residents to prepare for the American Board of Nuclear Medicine, American Board of Radiology, and American Board of Science in Nuclear Medicine examinations, all of which require a strong physics background. Additionally, the book will serve as a textbook on nuclear medicine physics for nuclear medicine technologists taking the Nuclear Medicine Technology Certification Board examination. The Fourth Edition includes new or expanded sections and information for: * PET/MR, including the attenuation correction method and its quality control tests; * accreditation of nuclear medicine and PET facilities; * solid state digital cameras; * time of flight and scatter correction techniques; * CT scanners and attenuation correction in SPECT/CT; * partial volume effects; * quality control of CT scanners; * ion chamber survey meters, proportional counters, and G-M counters. This book, now in its fourth edition, aims to promote a deeper understanding of the scientific and clinical basis of nuclear medicine and the new directions in medical imaging. The new edition has been revised and updated significantly to reflect recent changes and to ensure that the contents are in line with likely future directions. In addition to that, chapters have been reorganized in order to simplify the contents and to increase the readability. The book starts by providing essential information on general pathophysiology, cell biology and biologic effects of ionizing radiation followed by the mechanisms of radiopharmaceutical localization in different tissues and cells. This is followed by a series of chapters that covers all relevant organ systems presenting the basic knowledge of anatomy, physiology, and pathology and relating them to the clinical utilization of various scintigraphic modalities. The final chapter is devoted to the basis of therapeutic applications of nuclear medicine. The book will prove invaluable to all with an interest in the pathophysiologic basis of Nuclear Medicine, including nuclear medicine professionals, radiologists, surgeons, pediatricians and internal medicine physicians. This book provides a review of image analysis techniques as they are applied in the field of diagnostic and therapeutic nuclear medicine. Driven in part by the remarkable sophistication of nuclear medicine instrumentation and - crease in computing power and its ready and inexpensive availability, this is a relatively new yet rapidly expanding field. Likewise, although the use of nuclear imaging for diagnosis and therapy has origins dating back almost to the pioneering work of Dr G. de Hevesy, quantitative imaging has only recently emerged as a promising approach for diagnosis and therapy of many diseases. An effort has, therefore, been made to place the reviews provided in this book in a broader context. The effort to do this is reflected by the inclusion of introductory chapters that address basic principles of nuclear medicine instrumentation and dual-modality imaging, followed by overview of issues that are closely related to quantitative nuclear imaging and its potential role in diagnostic and therapeutic applications. A brief overview of each chapter is provided below. Chapter 1 presents a general overview of nuclear medicine imaging physics and instrumentation including planar scintigraphy, single-photon emission computed tomography (SPECT) and positron emission tomography (PET). Nowadays, patients' diagnosis and therapy is rarely done without the use of imaging technology. As such, imaging considerations are incorporated in almost every chapter of the book. The development of dual-modality - aging systems is an emerging research field, which is addressed in chapter 2. This publication provides the basis for the education of medical physicists initiating their university studies in the field of nuclear medicine. The handbook includes 20 chapters and covers topics relevant to nuclear medicine physics, including basic physics for nuclear medicine, radionuclide production, imaging and non-imaging detectors, quantitative nuclear medicine, internal dosimetry in clinical practice and radionuclide therapy. It provides, in the form of a syllabus, a comprehensive overview of the basic medical physics knowledge required for the practice of medical physics in modern nuclear medicine. with 40 contributors This handbook will provide updated information on nuclear medicine and molecular imaging techniques as well as its clinical applications, including radionuclide therapy, to trainees and practitioners of nuclear medicine, radiology and general medicine. Updated information on nuclear medicine and molecular imaging are vitally important and useful to both trainees and existing practitioners. Imaging techniques and agents are advancing and changing so rapidly that concise and pertinent information are absolutely necessary and helpful. It is hoped that

this handbook will help readers be better equipped for the utilization of new imaging methods and treatments using radiopharmaceuticals. This work has true international scope, being a unique European/American joint venture that focuses on the state of the art in both diagnostic and therapeutic radionuclide methodology. Pertinent clinical applications are emphasized rather than attempting to cover everything included in the several large comprehensive texts available in our field. This "practical" approach should make it an essential guide to nuclear medicine physicians, technologists, students and interested clinicians alike. Nuclear Medicine is a fast growing specialty. The procedures provide quantitative parameters of organ functions required for modern practice of medicine. With the development of new machines and increased application of computer software, the procedures are under continuous change. Some procedures have become outdated or redundant, while new methods have been introduced to enhance the quality of information obtained from a particular application. Although there are a few books published abroad to inform doctors and technical staff about the procedures, a comprehensive source to give quick information about how different tests are performed, particularly the new developments and the expected outcome both in normal and abnormal cases has been a long felt need. The physician ordering a Nuclear Medicine test also needs to know what patient preparations are required for optimal results, how to satisfy the queries of the patient particularly in respect of radiation exposure which sometimes can be a major concern of the patient. This manual has been prepared not only to describe technical details of various procedures that are currently practiced in Nuclear Medicine but also to provide quick information for the doctors and health care personnel on how to inform the patients about the investigation for which they are being referred and how to interpret the results. Since there is no such comprehensive book published yet in Asia, including South-East Asia, it is likely to be in great demand in the region. All students of master's degree, M.D., DRM, DMRIT, M.Sc. (Nuclear Medicine) and technologists already working in various diagnostic centers will likely buy this book. General practitioners and specialists who refer patients for different radio isotope investigations may find this book useful for quick reference. This book provides comprehensive and detailed information on the scientific bases of nuclear medicine, addressing a wide variety of topics and explaining the concepts that underlie many of the investigations and procedures performed in the field. The book is divided into six sections that cover the physics and chemistry of nuclear medicine besides associated quality assurance/quality control procedures; dosimetry and radiation biology; SPECT and PET imaging instrumentation plus CT imaging technology in hybrid modalities; data analysis including image processing, reconstruction, radiomics, image degrading correction techniques, along with image quantitation and kinetic modeling. Within these sections, particular attention is paid to recent developments and the advances in knowledge that have taken place since release of the first edition in 2011. Several entirely new chapters have been included and the remaining chapters, thoroughly updated. Innovations in the ever-expanding field of nuclear medicine are predominantly due to integration of the basic sciences with complex technological advances. This excellently illustrated book on the subject will be of interest to not only nuclear medicine physicists and physicians but also clinical scientists, radiologists, radiopharmacists, medical students and technologists. In Zurich at the 7th International Annual Meeting of the Society of Nuclear Medicine in Europe, held in 1969, a group of young scientists from eleven countries dedicated some papers to the memory of Georg von Hevesy. The papers were published in a book entitled "Frontiers of Nuclear Medicine" (Springer-verlag Berlin, Heidelberg, New York). On the occasion of the Second International World Congress of Nuclear Medicine and Biology held in 1978 in Washington D.C., under the presidency of Henry N.Wagner, Jr., a group of young scientists again dedicated important papers from the Congress to the memory of Georg von Hevesy. This book consists of these papers, which present new results in the field of Nuclear Medicine reported by physicians, physicists, chemists, engineers, and computer scientists. The Georg von Hevesy Foundation of Nuclear Medicine in Zurich, Switzerland together with the president of the Second World Congress of Nuclear Medicine, Henry N.Wagner, Jr., have been the major forces in arranging publication of this book. The Georg von Hevesy Foundation is sponsoring the Hevesy Prize for Nuclear Medicine, the Hevesy Medal, and the Hevesy Memorial Lecture. The various patterns of accumulation of radiotracers are related to specific pathophysiologic changes - the volume takes this principle as a starting point. The book provides a new approach to understanding diagnostic and therapeutic nuclear medicine by linking the pathophysiologic changes of relevant disease processes to scintigraphy. This permits accurate identification of various imaging patterns with more meaningful interpretation. Through the use of illustrations, charts and tables, this link is presented simply and clearly. The book is intended not only for nuclear physicians and technologists, but also for the referring physicians, who will understand the effective utilization of nuclear medicine and its impact on patient management. Physics in Nuclear Medicine - by Drs. Simon R. Cherry, James A. Sorenson, and Michael E. Phelps - provides current, comprehensive guidance on the physics underlying modern nuclear medicine and imaging using radioactively labeled tracers. This revised and updated fourth edition features a new full-color layout, as well as the latest information on instrumentation and technology. Stay current on crucial developments in hybrid imaging (PET/CT and SPECT/CT), and small animal imaging, and benefit from the new section on tracer kinetic modeling in neuroreceptor imaging. What's more, you can reinforce your understanding with graphical animations online at www.expertconsult.com, along with the fully searchable text and calculation tools. Master the physics of nuclear medicine with thorough explanations of analytic equations and illustrative graphs to make them accessible. Discover the technologies used in state-of-the-art nuclear medicine imaging systems Fully grasp the process of emission computed tomography with advanced mathematical concepts presented in the appendices. Utilize the extensive data in the day-to-day practice of nuclear medicine practice and research. Tap into the expertise of Dr. Simon Cherry, who contributes his cutting-edge knowledge in nuclear medicine instrumentation. Stay current on the latest developments in nuclear medicine technology and methods New sections to learn about hybrid imaging (PET/CT and SPECT/CT) and small animal imaging. View graphical animations online at www.expertconsult.com, where you can also access the fully searchable text and calculation tools. Get a better view of images and line art and find information more easily thanks to a brand-new, full-color layout. The perfect reference or textbook to comprehensively review physics principles in nuclear medicine. An excellent introduction to the basic concepts of nuclear medicine physics This Third Edition of Essentials of Nuclear Medicine Physics and Instrumentation expands the finely developed illustrated review and introductory guide to nuclear medicine physics and instrumentation. Along with simple, progressive, highly illustrated topics, the authors present nuclear medicine-related physics and engineering concepts clearly and concisely. Included in the text are introductory chapters on relevant atomic structure, methods of radionuclide production, and the interaction of radiation with matter. Further, the text discusses the basic function of the components of scintillation and non-scintillation detector systems. An information technology section discusses PACs and DICOM. There is extensive coverage of quality control procedures, followed by updated chapters on radiation safety practices, radiation biology, and management of radiation accident victims. Clear and concise, this new edition of Essentials of Nuclear Medicine Physics and Instrumentation offers readers: Four new chapters Updated coverage of CT and hybrid scanning systems: PET/CT and SPECT/CT Fresh discussions of the latest technology based on solid state detectors and new scanner designs optimized for dedicated cardiac imaging New coverage of PACs and DICOM systems Expanded coverage of image reconstruction and processing techniques New material on methods of image display Logically structured and clearly written, this is the book of choice for anyone entering the field of nuclear medicine, including nuclear medicine residents and fellows, cardiac nuclear medicine fellows, and nuclear medicine technology students. It is also a handy quick-reference guide for those already working in the field of nuclear physics. This book is an essential guide for all practitioners. The emphasis throughout is on the practice of nuclear medicine. Primarily aimed at the radiologist, physician, physicist or technologist starting in nuclear medicine, it will also appeal to more experienced practitioners who are keen to stay up-to-date. The practical approach with tables as "recipes" for acquisition protocols means it is essential for any departmental shelf. 3rd edition expanded - now covering areas of development in nuclear medicine, such as PET and other methods of tumour imaging, data processing. All illustrations are up-to-date to reflect current standards of image quality. Focusing on the fundamentals of PET imaging in oncology, cardiology and neurology, the new PET Study Guide has been designed to serve as an indispensable reference and review tool to assist technologists preparing for the Nuclear Medicine Technology Review Board (NMTCB) PET Specialty exam. Essential Nuclear Medicine Physics provides an excellent introduction to the basic concepts of the daunting area of nuclear physics. Logically structured and clearly written, this is the book of choice for anyone entering the field of nuclear medicine, including nuclear medicine residents and fellows, cardiac nuclear medicine fellows and nuclear medicine technology students. The text is also a handy quick-reference guide for those already working in the field of nuclear physics. This new edition provides a basic introduction to nuclear physics and the interactions of radiation and matter. The authors also provide comprehensive coverage of instrumentation and imaging, with separate chapters devoted to SPECT, PET, and PET/CT. Discussion of radiation biology, radiation safety and care of victims of radiation accidents completes the text, with an appendix containing the latest NRC rules and regulations. Essential Nuclear Medicine Physics presents difficult concepts clearly and concisely, defines all terminology for the reader, and facilitates learning through extensive illustrations and self-assessment questions. Nearly 20 million nuclear medicine procedures are carried out each year in the United States alone to diagnose and treat cancers, cardiovascular disease, and certain neurological disorders. Many of the advancements in nuclear medicine have been the result of research investments made during the past 50 years where these procedures are now a routine part of clinical care. Although nuclear medicine plays an important role in biomedical research and disease management, its promise is only beginning to be realized. Advancing Nuclear Medicine Through Innovation highlights the exciting emerging opportunities in nuclear medicine, which include assessing the efficacy of new drugs in development, individualizing treatment to the patient, and understanding the biology of human diseases. Health care and pharmaceutical professionals will be most interested in this book's examination of the challenges the field faces and its recommendations for ways to reduce these impediments. Coming of Age of Nuclear Medicine is a comprehensive and informative text which covers all significant areas of nuclear medicine and provides a personalized account of its development during the last half century. Nuclear medicine is now a well-accepted part of medicine, and the public and physicians outside of nuclear medicine are eager to learn more about what nuclear medicine is and what it can do for them and the persons under their care. Coming of Age of Nuclear Medicine is an important text for nuclear medicine specialists, radiologists, trainees in the field as well as general physicians. This book, now in its third edition, aims to promote a deeper understanding of the scientific and clinical basis of nuclear medicine and the new directions in medical imaging. The new edition has been revised and updated to reflect recent changes and to ensure that the contents are in line with likely future directions. The book starts by providing essential information on general pathophysiology, cell structure and cell biology as well as the mechanisms of radiopharmaceutical localization in different tissues and cells. The clinical applications of nuclear medicine are then presented in a series of chapters that cover every major organ system and relate the basic knowledge of anatomy, physiology and pathology to the clinical utilization of various scintigraphic modalities. The therapeutic applications of nuclear medicine are discussed in a separate chapter, and the final chapter is devoted to the biologic effects of ionizing radiations, including radiation from medical procedures. Nuclear medicine is an important component of modern medicine. This easy-to-use book is designed to acquaint readers with the basic principles of nuclear medicine, the instrumentation used, the gamut of procedures available, and the basis for selecting specific diagnostic or therapeutic procedures and interpreting results. After an introductory chapter on the history, technical basis, and scope of nuclear medicine, a series of chapters are devoted to the application of nuclear medicine techniques in the different body systems. In addition, the use of nuclear medicine methods within oncology is carefully examined, covering diagnosis, staging, assessment of treatment response, radiotherapy planning, and the sentinel node technique. The book concludes with a chapter devoted to nuclear medicine therapy. This practical and up-to-date guide to nuclear medicine is ideal for beginners and will also help professionals who need to retrieve useful information rapidly. Covering both the fundamentals and recent developments in this fast-changing field, Essentials of Nuclear Medicine and Molecular Imaging, 7th Edition, is a must-have resource for radiology residents, nuclear medicine residents and fellows, nuclear medicine specialists, and nuclear medicine technicians. Known for its clear and easily understood writing style, superb illustrations, and self-assessment features, this updated classic is an ideal reference for all diagnostic imaging and therapeutic patient care related to nuclear medicine, as well as an excellent review tool for certification or MOC preparation. Provides comprehensive, clear explanations of everything from principles of human physiology, pathology, physics, radioactivity, radiopharmaceuticals, radiation safety, and legal requirements to hot topics such as new brain and neuroendocrine tumor agents and hybrid imaging, including PET/MR and PET/CT. Covers the imaging of every body system, as well as inflammation, infection and tumor imaging; pearls and pitfalls for every chapter; and pediatric doses and guidelines in compliance with the Image Gently and Image Wisely programs. Features a separate self-assessment section on differential diagnoses, imaging procedures and artifacts, and safety issues with unknown cases, questions, answers, and explanations. Includes new images and illustrations, for a total of 430

high-quality, multi-modality examples throughout the text. Reflects recent advances in the field, including updated nuclear medicine imaging and therapy guidelines • Updated dosimetry values and effective doses for all radiopharmaceuticals with new values from the 2015 International Commission on Radiological Protection • Updated information regarding advances in brain imaging, including amyloid, dopamine transporter and dementia imaging • Inclusion of Ga-68 DOTA PET/CT for neuroendocrine tumors • Expanded information on correlative and hybrid imaging with SPECT/CT • New myocardial agents • and more. Contains extensive appendices including updated comprehensive imaging protocols for routine and hybrid imaging, pregnancy and breastfeeding guidelines, pediatric dosages, non-radioactive pharmaceuticals used in interventional and cardiac stress imaging, and radioactivity conversion tables. Get the essential tools you need to make an accurate diagnosis with Nuclear Medicine: The Requisites! The newest edition of his bestselling volume by Drs. Harvey Ziessman, Janis O'Malley, and James Thrall delivers the conceptual, factual, and interpretive information you need for effective clinical practice in nuclear medicine imaging, as well as for certification and recertification review. Prepare for the written board exam and for clinical practice with critical information on nuclear medicine physics, detection and instrumentation, SPECT and PET imaging, and clinical nuclear medicine imaging. Get the best results from today's most technologically advanced approaches, including hybrid imaging, PET/CT, and SPECT/CT, as well as recent developments in instrumentation, radiopharmaceuticals, and molecular imaging. Clearly visualize the findings you're likely to see in practice and on exams with nearly 200 vibrant new full-color images. Access the fully searchable text and downloadable images online at www.expertconsult.com. Now in its 5th Edition, this outstanding volume in the popular Requisites series thoroughly covers the fast-changing field of nuclear medicine and molecular imaging. Ideal for residency, clinical rotations, and board review, this compact and authoritative volume by Drs. Janis O'Malley and Harvey Ziessman covers the conceptual, factual, and interpretive information you need to know for success on exams and in clinical practice. NEW to this edition: More content on molecular imaging and the latest advances in clinical applications, including positron emission tomography (PET), SPECT/CT, PET/CT, and PET/MRI hybrid imaging. Inclusion of newly approved tracers such as Ga68 DOTA, F-18 amyloid, and F-18 PSMA. Expanded and integrated content on physics and non-interpretive aspects, including regulatory issues, radiation safety, and quality control. Up-to-date applications of nuclear medicine in the endocrine, skeletal, hepatobiliary, genitourinary, pulmonary, gastrointestinal, central nervous, and cardiac systems, as well as PET applications for oncology. In the outstanding Requisites tradition, the 5th Edition also: Summarizes key information with numerous outlines, tables, pearls, pitfalls, and frequently asked questions. Focuses on essentials to pass the certifying board exam and ensure accurate diagnoses in clinical practice. Helps you clearly visualize the findings you're likely to see in practice and on exams with nearly 200 full-color images. This volume addresses a wide range of issues in the field of nuclear medicine imaging, with an emphasis on the latest research findings. Initial chapters set the scene by considering the role of imaging in nuclear medicine from the medical perspective and discussing the implications of novel agents and applications for imaging. The physics at the basis of the most modern imaging systems is described, and the reader is introduced to the latest advances in image reconstruction and noise correction. Various novel concepts are then discussed, including those developed within the framework of the EURATOM FP7 MADEIRA research project on the optimization of imaging procedures in order to permit a reduction in the radiation dose to healthy tissues. Advances in quality control and quality assurance are covered, and the book concludes by listing rules of thumb for imaging that will be of use to both beginners and experienced researchers. This state-of-the-art handbook, the third and final in a series that provides medical physicists with a comprehensive overview into the field of nuclear medicine, focuses on highlighting the production and application of radiopharmaceuticals. With this, the book also describes the chemical composition of these compounds, as well as some of the main clinical applications where radiopharmaceuticals may be used. Following an introduction to the field of radiopharmacy, three chapters in this book are dedicated towards in-depth descriptions of common radionuclides and radiopharmaceuticals used during diagnostic studies utilizing planar/Single Photon Emission Computed Tomography (SPECT) imaging, in addition to during Positron Emission Tomography (PET) imaging, and, finally, radiotherapy. These chapters are followed by those describing procedures relating to quality control and manufacturing (good manufacturing practices) also encompassing aspects such as environmental compliance. Furthermore, this volume illustrates how facilities handling these chemicals should be designed to comply with set regulations. Like many pharmaceuticals, the development of radiopharmaceuticals relies heavily on the use of mouse models. Thus, the translation of radiopharmaceuticals (i.e., the process undertaken to assure that the functionality and safety of a newly developed drug is maintained also in a human context), is covered in a later chapter. This is followed by a chapter emphasising the importance of safe waste disposal and how to assure that these procedures meet the requirements set for the disposal of hazardous waste. Several chapters have also been dedicated towards describing various medical procedures utilizing clinical nuclear medicine as a tool for diagnostics and therapeutics. As physicists may be involved in clinical trials, a chapter describing the procedures and regulations associated with these types of studies is included. This is followed by a chapter focusing on patient safety and another on an imaging modality not based on ionizing radiation – ultrasound. Finally, the last chapter of this book discusses future perspectives of the field of nuclear medicine. This text will be an invaluable resource for libraries, institutions, and clinical and academic medical physicists searching for a complete account of what defines nuclear medicine. The most comprehensive reference available providing a state-of-the-art overview of the field of nuclear medicine Edited by a leader in the field, with contributions from a team of experienced medical physicists, chemists, engineers, scientists, and clinical medical personnel Includes the latest practical research in the field, in addition to explaining fundamental theory and the field's history Prepare for success on the nuclear medicine component of the radiology Core Exam! Nuclear Medicine: A Core Review, 2nd Edition, by Drs. Chirayu Shah, Marques Bradshaw, and Ishani Dalal is an up-to-date, practical review tool written specifically for the Core Exam. This helpful resource contains 300 image-rich, multiple-choice questions with detailed explanations of right and wrong answers. Fully revised content, high-yield tables for easy review, and additional eBook questions ensure you're ready for the Core Exam or recertification exam. This revised edition includes one hundred new questions with a dedicated physics chapter. Questions removed from the previous edition are still available for review in the eBook. The gold standard text-reference Diagnostic Nuclear Medicine is now in its Fourth Edition--with a sharp clinical focus, a streamlined new single-volume format, and a very attractive price. Written by the top authorities in the specialty, this brand-new edition offers encyclopedic coverage of clinically relevant developments in nuclear medicine--including instrumentation, radiopharmaceuticals, and applications. Readers will find the latest on PET, molecular imaging, SPECT myocardial perfusion imaging, monoclonal antibody therapy, and the use of functional imaging studies in oncology. This edition has been trimmed from two volumes to one, so that readers can find exactly what they need quickly, without cross-checking between volumes. Building on the traditional concept of nuclear medicine, this textbook presents cutting-edge concepts of hybrid imaging and discusses the close interactions between nuclear medicine and other clinical specialties, in order to achieve the best possible outcomes for patients. Today the diagnostic applications of nuclear medicine are no longer stand-alone procedures, separate from other diagnostic imaging modalities. This is especially true for hybrid imaging guided interventional radiology or surgical procedures. Accordingly, today's nuclear medicine specialists are actually specialists in multimodality imaging (in addition to their expertise in the diagnostic and therapeutic uses of radionuclides). This new role requires a new core curriculum for training nuclear medicine specialists. This textbook is designed to meet these new educational needs, and to prepare nuclear physicians and technologists for careers in this exciting specialty. The 3rd edition of this classic – considered the standard in the field - reflects the latest advances in PET, SPECT, and oncology. Updated to incorporate cutting-edge diagnostic techniques, it serves as a bedrock resource for physicians whose nuclear medicine practices include children and provides a vast amount of background material for residents in training. The new edition retains the fundamental standard of excellence that earned its predecessors such a distinguished reputation. It has been thoroughly updated to incorporate cutting-edge diagnostic techniques. Pediatric Nuclear Medicine/PET, Third Edition is an indispensable resource for physicians whose practices include children and provides a vast amount of background material for residents in training.

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