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## The essential physics of medical imaging second edition pdf

This website uses cookies. By continuing to use this website you are giving consent to cookies being used. For information on cookies and how you can disable them visit our Privacy and Cookie Policy. Got it, thanks! Over recent years there has been a vast expansion in the variety of imaging techniques available, and developments in machine specifications continue apace. If radiologists and radiographers are to obtain optimal image quality while minimising exposure times, a good understanding of the fundamentals of the radiological science underpinning diagnostic imaging is essential. The second edition of this well-received textbook continues to cover all technical aspects of diagnostic radiology, and remains an ideal companion during examination preparation and beyond. The content includes a review of basic science aspects of imaging, followed by a detailed explanation of radiological sciences, conventional x-ray image formation and other imaging techniques. The enormous technical advances in computed tomography, including multislice acquisition and 3D image reconstruction, digital imaging in the form of image plate and direct radiography, magnetic resonance imaging, colour flow imaging in ultrasound and positron radiopharmaceuticals in nuclear medicine, are all considered here. A chapter devoted to computers in radiology considers advances in radiology information systems and computer applications in image storage and communication systems. The text concludes with a series of general topics relating to diagnostic imaging. The content has been revised and updated throughout to ensure it remains in line with the Fellowship of the Royal College of Radiologists (FRCR) examination, while European and American perspectives on technology, guidelines and regulations ensure international relevance. 1. Basic mathematics for radiology 2. Basic physics for radiology 3. X-ray production and properties: the fundamentals 4. X-ray production and properties: specific machine design 5. Interaction of X and gamma-radiation with matter 6. Interaction of radiation with matter: detectors 7. Photography and the film image 8. The analog image: film and video 9. Basic projection X-ray imaging systems 10. Fluoroscopy 11. Computers in radiology 12. The digital image 13. Digital fluorography 14. Computed tomography 15. Nuclear medicine: basic principles 16. Nuclear medicine: radiopharmaceuticals and imaging equipment 17. Principles of ultrasound 18. Ultrasound imaging 19. Magnetic resonance: principles 20. Magnetic resonance: imaging 21. Radiation protection: radiobiology and risk estimation 22. Radiation protection: legislation and clinical practice A unique feature of this book is its international flavour ... European and American perspectives on technology, guidelines and regulation are discussed ... This book is highly recommended Physics in Medicine and Biology very much a teaching book aimed at a student audience ... Comprehensively covers the various areas of medical imaging The British Journal of Radiology Developed from the authors' highly successful annual imaging physics review course, this new Second Edition gives readers a clear, fundamental understanding of the theory and applications of physics in radiology, nuclear medicine, and radiobiology. The Essential Physics of Medical Imaging, Second Edition provides key coverage of the clinical implications of technical principles—making this book great for board review. Highlights of this new edition include completely updated and expanded chapters and more than 960 illustrations. Major sections cover basic concepts, diagnostic radiology, nuclear medicine, and radiation protection, dosimetry, and biology. A Brandon-Hill recommended title. Essential Physics of Medical Imaging Textbooks | Buy Textbooks | Math & Science Textbooks | Applied Physics Textbooks Summary Author bio Table of contents Digital rights Physics: Equations and Answers - 5th edition 1. 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PREFACE TO THE SECOND EDITION The first edition of this text was developed from the extensive syllabus we had created for a radiology resident board review course that has been taught annually at the University of California Davis since 1984. Although the topics were, in broad terms, the same as in the course syllabus, the book itself was written de novo. Since the first edition of this book was completed in 1993, there have been many important advances in medical imaging technology. Consequently, in this second edition, most of the chapters have been completely rewritten, although the organization of the text into four main sections remains unchanged. In addition, new chapters have been added. An Introduction to Medical Imaging begins this new edition as Chapter 1. In the Diagnostic Radiology section, chapters on Film Processing, Digital Radiography, and Computer Networks, PACS, and Teleradiography have been added. In recognition of the increased sophistication and complexity in some modalities, the chapters on MRI and nuclear imaging have been split into two chapters each, in an attempt to break the material into smaller and more digestible parts. Considerable effort was also spent on integrating the discussion and assuring consistent terminology between the different chapters. The Image Quality chapter was expanded to provide additional details on this important topic. In addition, a more extensive set of reference data is provided in this edition. The appendices have been expanded to include the fundamental principles of physics, physical constants and conversion factors, elemental data, mass attenuation coefficients, x-ray spectra, and radiopharmaceutical characteristics and dosimetry. Web sites of professional societies, governmental organizations and other entities that may be of interest to the medical imaging community are also provided. The field of radiology is in a protracted state of transition regarding the usage of units. Although the SI

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