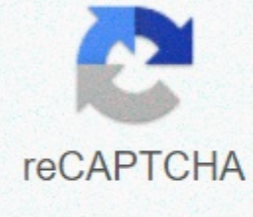




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The essential physics of medical imaging 3rd edition pdf

@article{Mahesh2013TheEP, title={The Essential Physics of Medical Imaging, Third Edition.}, author={M. Mahesh}, journal={Medical physics}, year={2013}, volume={40 7}}The Essential Physics of Medical Imaging, Third Edition., Bushberg J. T., Seibert J. A., Leidholdt E. M. Jr., Boone J. M., Lippincott Williams & Wilkins, Philadelphia, PA, USA, 2012. 1048 pp. Price: \$199.99. ISBN 9780781780575 (hardcover). © 2013 Doody's Review Service. Doody's Review Service. A guide to the fundamental principles of medical imaging physics, radiation protection and radiation biology, with complex topics presented in the clear and concise manner and style for which these authors are known. It is suitable for medical imaging professionals, and teachers and students in medical physics and biomedical engineering. This renowned work is derived from the authors' acclaimed national review course ("Physics of Medical Imaging") at the University of California-Davis for radiology residents. The text is a guide to the fundamental principles of medical imaging physics, radiation protection and radiation biology, with complex topics presented in the clear and concise manner and style for which these authors are known. Coverage includes the production, characteristics and interactions of ionizing radiation used in medical imaging and the imaging modalities in which they are used, including radiography, mammography, fluoroscopy, computed tomography and nuclear medicine. Special attention is paid to optimizing patient dose in each of these modalities. Sections of the book address topics common to all forms of diagnostic imaging, including image quality and medical informatics as well as the non-ionizing medical imaging modalities of MRI and ultrasound. The basic science important to nuclear imaging, including the nature and production of radioactivity, internal dosimetry and radiation detection and measurement, are presented clearly and concisely. Current concepts in the fields of radiation biology and radiation protection relevant to medical imaging, and a number of helpful appendices complete this comprehensive textbook. The text is enhanced by numerous full color charts, tables, images and superb illustrations that reinforce central concepts. The book is ideal for medical imaging professionals, and teachers and students in medical physics and biomedical engineering. Radiology residents will find this text especially useful in bolstering their understanding of imaging physics and related topics prior to board exams. Preface to the Third Edition Foreword Acknowledgements Section I: Basic Concepts 1 Introduction to Medical Imaging 1.1 The Modalities 1.2 Image Properties 2 Radiation and the Atom 2.1 Radiation 2.2 Structure of the Atom 3 Interaction of Radiation with Matter 3.1 Particle Interactions 3.2 X-ray and Gamma-Ray Interactions 3.3 Attenuation of x-rays and Gamma Rays 3.4 Absorption of Energy from X-rays and Gamma Rays 3.5 Imparted Energy, Equivalent Dose, and Effective Dose 4 Image Quality 4.1 Spatial Resolution 4.2 Convolution 4.3 Physical Mechanisms of Blurring 4.4 The Frequency Domain 4.5 Contrast Resolution 4.6 Noise Texture: The Noise Power Spectrum 4.7 Contrast 4.8 Contrast-to-Noise Ratio 4.9 Signal-to-Noise Ratio 4.10 Contrast-Detail Diagrams 4.11 Detective Quantum Efficiency 4.12 Receiver Operating Characteristic Curves 5 Medical Imaging Informatics 5.1 Analog and Digital Representation of Data 5.2 Digital Radiological Images 5.3 Digital Computers 5.4 Information Storage Devices 5.5 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Radionuclide Therapy Home Care Guidelines Index Author Jerrold T. Bushberg, John Boone Short Title ESSENTIAL PHYSICS OF MEDICAL I Publisher Lippincott Williams & Wilkins USA Publication Date 2012-01-09 Audience Professional and Scholarly Country of Publication United States

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