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Nota di contenuto	Medical Imaging: Essentials for Physicians; Contents; Preface; Acknowledgments; INTRODUCTION : Dr. Doe's Headaches An Imaging Case Study; Computed tomography; Picture archiving and communication system; T1, T2, and FLAIR MRI; MR spectroscopy and a virtual biopsy; Functional MRI; Diffusion tensor MR imaging; MR guided biopsy; Pathology; Positron emission tomography?; Treatment and follow-up; CHAPTER 1 Sketches of the Standard Imaging Modalities : Different Ways of Creating Visible Contrast Among Tissues; "Roentgen has surely gone crazy!" Different imaging probes interact with different tissues in different ways and yield different kinds of medical informationTwentieth-century (analog) radiography and fluoroscopy: contrast from differential attenuation of X-rays by tissues; X-ray film of a cracked phalange; Generating the beam at the anode of the X-ray tube; Contrast from differential attenuation of the beam within the body; Exposure of a screen-film image receptor; Image intensifier-based fluoroscopy with a CCD/CMOS electronic optical camera Twenty-first century (digital) images and digital planar imaging: computer-based images and solid-state image receptorsDigital images; Computed tomography: three-dimensional mapping of X-ray attenuation by tissues; Helical, multi-slice CT; Nuclear medicine, including SPECT and PET: contrast from the differential uptake of a radiopharmaceutical by tissues; Radiopharmaceutical = radionucleus + organ-specific agent; Creating contrast through differential uptake of photon-generating radiopharmaceuticals; SPECT and PET Diagnostic ultrasound: contrast from differences in tissue elasticity or densityB-mode anatomic imaging; Doppler imaging of blood flow; Magnetic resonance imaging: mapping the spatial distribution of spin-relaxation times of hydrogen nuclei in tissue water and lipids; Spin-relaxation times of protons in water and lipids in a strong magnetic field; Mapping the spatial distribution of proton T1 and T2; Appendix: selection of imaging modalities to assist in medical diagnosis; Cardiac versus non-cardiac chest pain; Abdominal/pelvis imaging; Head and neck imaging; Musculoskeletal imaging Vascular imagingReferences; CHAPTER 2 Image Quality and Dose : What Constitutes a "Good" Medical Image?; A brief history of magnetism; About those probes and their interactions with matter . . .; Energy; Electromagnetic waves; Photons; Atoms; Molecules and fluorescent materials; The image quality quartet: contrast, resolution, stochastic (random) noise, artifacts - and always dose; Subject contrast; Resolution; Stochastic (random, statistical) noise and the signal-to-noise ratio; Artifacts: non-stochastic noise; Quality assurance; Image quality and radiation safety programs; Image QA Known medical benefits versus potential radiation risks
Sommario/riassunto	""An excellent primer on medical imaging for all members of the medical profession . . . including non-radiological specialists. It is technically solid and filled with diagrams and clinical images illustrating important points, but it is also easily readable . . . So many outstanding chapters . . . The book uses little mathematics beyond simple algebra [and] presents complex ideas in very understandable terms.""-Melvin E. Clouse, MD, Vice Chairman Emeritus, Department of Radiology, Beth Israel Deaconess Medical Center and Deaconess Professor of Radiology, Harvard Medical School<