Preface

All is flux, nothing stays still.
Nothing endures but change.
Heraclitus, 540–480 B.C.

Medical imaging has grown exponentially in the last three decades with the development of many promising and often noninvasive diagnostic studies and therapeutic modalities. The corresponding medical literature has also exploded in volume and can be overwhelming to physicians. In addition, the literature varies in scientific rigor and clinical applicability. The purpose of this book is to employ stringent evidence-based medicine criteria to systematically review the evidence defining the appropriate use of medical imaging and to present to the reader a concise summary of the best medical imaging choices for patient care.

Since our prior version, we have added ten new chapters that cover radiation risk in medical imaging, economic and regulatory impact of evidence-based imaging in the new health care reform environment, and new topics on common disorders. The 40 chapters cover the most prevalent diseases in developed countries, including the four major causes of mortality and morbidity: injury, coronary artery disease, cancer, and cerebrovascular disease. Most of the chapters have been written by radiologists and imagers in close collaboration with clinical physicians and surgeons to provide a balanced and fair analysis of the different medical topics. In addition, we address in detail both the adult and pediatric sides of the issues. We cannot answer all questions – medical imaging is a delicate balance of science and art, often without data for guidance – but we can empower the reader with the current evidence behind medical imaging.

To make the book user-friendly and to enable fast access to pertinent information, we have organized all of the chapters in the same format. The chapters are framed around important and provocative clinical questions relevant to the daily physician's practice. A short listing of issues at the beginning of each chapter helps three different tiers of users: (1) the busy physician searching for quick guidance, (2) the meticulous physician seeking deeper understanding, and (3) the medical-imaging researcher requiring a comprehensive resource. Key points and summarized answers to the important clinical issues are at the beginning of the chapters, so the busy clinician can understand the most important evidence-based imaging data in seconds. Each important question and summary is followed by a detailed discussion of the supporting evidence so that the meticulous physician can have a clear understanding of the science behind the evidence.

In each chapter, the evidence discussed is presented in tables and figures that provide an easy review in the form of summary tables and flow charts. The imaging case series highlights the strengths and limitations of the different imaging studies with vivid examples. Toward the end of the chapters, the best imaging protocols are described to ensure that the imaging studies are well standardized and done with the highest available quality. The final section of the chapters is Future Research, in which provocative questions are raised for physicians and nonphysicians interested in advancing medical imaging.

Not all research and not all evidence are created equal. Accordingly, throughout the book, we use a four-level classification detailing the strength of the evidence and based on the Oxford-criteria: level I (strong evidence), level II (moderate evidence), level III (limited evidence), and level IV (insufficient evidence). The strength of the evidence is presented in parenthesis throughout the chapter so the reader gets immediate feedback on the weight of the evidence behind each topic.

Finally, we had the privilege of working with a group of outstanding contributors from major medical centers and universities in North America and Europe. We believe that the authors' expertise, breadth of knowledge, and thoroughness in writing the chapters provide a valuable source of information and can guide decision-making for physicians and patients. In addition to guiding practice, the evidence summarized in the chapters may have policy-making and public health implications. We hope that the book highlights key points and generates discussion, promoting new ideas for future research. Finally, regardless of the endless hours spent researching the multiple topics in-depth, evidence-based imaging remains a work in progress. We value your suggestions and comments on how to improve this book. Please email them to us, so we can bring you the best of the evidence over the years.

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