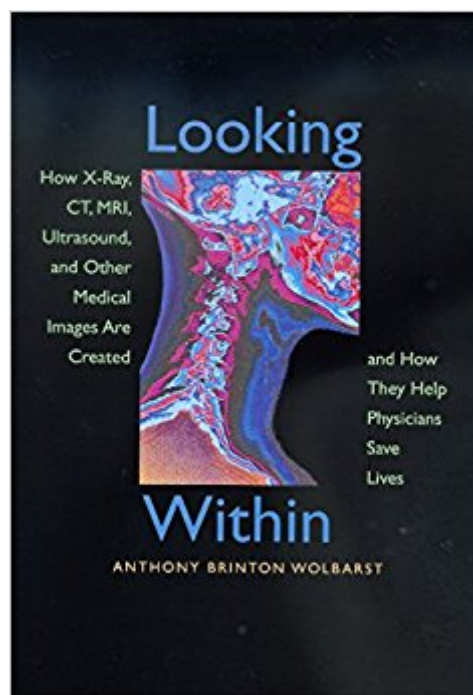




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# Looking Within: How X-Ray, CT, MRI, Ultrasound, And Other Medical Images Are Created, And How They Help Physicians Save Lives



## Synopsis

A hundred years ago, a doctor had no way to look within the body of a patient other than to slice it open. That changed radically at the turn of the century, with the discovery of X-rays. X-ray and other forms of diagnostic imaging technology developed slowly but steadily from then until the 1970s, at which point a revolution occurred. Made possible largely by the availability of powerful but inexpensive computers, the rapid and widespread adoption of computed tomography (CT) and, a decade later, of magnetic resonance imaging (MRI) greatly expanded the power of clinical imaging, and even changed the ways in which physicians view and think about the human body. This unique guide explains how the principal imaging devices work and how they help physicians save lives. It gives readers a grasp of the major medical technologies that might come to play important roles in their lives, and it provides succinct, easy-to-understand, and reliable explanations for those who wish to explore the issues of the associated benefits, costs, and risks in an informed manner. In nonspecialized language, *Looking Within* discusses how X-ray, fluoroscopic, CT, MRI, positron emission tomography (PET), ultrasound, and other medical pictures are created, and explores the essential roles they play in the diagnosis and treatment of patients. It should be of interest to patients and their friends and loved ones, and to those who are simply curious about this vitally important, exciting, and cutting-edge branch of medicine. Its brief but clear descriptions of how these essential tools work should also be of value to health care providers in supporting and educating their patients.

## Book Information

Paperback: 219 pages

Publisher: University of California Press; 1 edition (November 16, 1999)

Language: English

ISBN-10: 0520211820

ISBN-13: 978-0520211827

Product Dimensions: 7 x 0.8 x 10 inches

Shipping Weight: 1 pounds (View shipping rates and policies)

Average Customer Review: 4.0 out of 5 stars 4 customer reviews

Best Sellers Rank: #1,344,411 in Books (See Top 100 in Books) #40 in [Books > Textbooks > Medicine & Health Sciences > Reference > Instruments & Supplies](#) #284 in [Books > Textbooks > Medicine & Health Sciences > Medicine > Clinical > Radiology & Nuclear Medicine > Diagnostic Imaging](#) #612 in [Books > Textbooks > Medicine & Health Sciences > Medicine >](#)

## Customer Reviews

For most of human history, our bodies have been inscrutable, accessible only to exterior or postmortem examination. But over the past hundred years, we've found tricky ways of viewing our bones, brains, and unborn children and thus greatly enriched our health. Medical physicist Anthony Brinton Wolbarst celebrates this revolution in *Looking Within*, an intriguing survey of medical imaging from the early days of Roentgen to the latest developments in thermography and functional magnetic resonance imaging. Writing for a general, if well-educated, audience, he guides us through the century by explaining the theories underlying each imaging technique as applied to real cases: broken bones, tumors, and heart disease all make their presence known through increasingly sophisticated technology. The images, both reproductions and explanatory diagrams, are top-notch, lending a visual balance to the text that carries the reader through even when Wolbarst (rarely) gets a bit too technical. His experience with the National Cancer Institute and the Environmental Protection Agency broadens his range of understanding of the effects of radiological imaging on our lives, making his explanations more cogent and practical. Whether you want to gain insight into that ultrasound you have coming up or you simply want to marvel at the miracles of modern medicine, *Looking Within* will help you see what's really going on--just like a shoe store fluoroscope. --Rob Lightner

"Should be beneficial for patients undergoing these procedures and the physicians administering them, as well as technology buffs." --Science News

I am a X-ray Tech and I purchased this book to give me an in depth look at the Medical imaging profession because working with students and informed patients who have many question about the other modalities i.e. MRI, Ultrasound and Nuclear Medicine. This book gives me insight on the other areas of Medical imaging that I am not familiar with and can share that knowledge with those that I come across while at work...

I'm taking a course on radiology and this was the text assigned for the class. I think the book does a fine job at what the title states: how x-ray, MRI, US images are created and how they help save lives. It gives a good description of the history of the machines and again how the images are created. If you are looking for a book that shows you how to read and interpret these images, this is

not the book to get. That's what I was hoping for when this was the required text for my radiology class.

This book has a lot of information about medical imaging, and it seems to be accurate. It covers X-rays, Fluoroscopy, CT, Nuclear Medicine, Ultrasound, MRI, and others, including possible future methods that are still in the laboratory as of 1999. It covers the original invention and some of the improvements, including brief biographical information about some of the principal players. The organization is mostly historical, from X-rays to MRI, but that order seems mostly an accident. Rather, there is a building block approach, with new ideas built on concepts from earlier chapters. You can browse in this book, but you will get a lot more from it by reading it front to back. There is information about what the patient experiences with each of the imaging techniques. The risks of each are revealed. All are low risk to no risk, but the trade-offs are examined. For the physician, higher resolution is better, and higher contrast (more shades of gray) is better. These good things usually take more energy, usually meaning more risk. They also may require more money. The economics of the various technologies are also considered. The instrument designer and the physician try to provide adequate contrast and resolution, with lowest risk and as inexpensively as possible. There are human interest stories, cases, about people subject to the various methods, including why the physician selected that method. There are over 100 figures, many with several parts. Many of the earlier figures are referred to in later chapters to reveal additional insight. The author is a physicist, and it shows. There is a lot of information about how the various technologies work. It is at the "popular" level, but this physics minor of 40 years ago was impressed by how well the author expressed the physics at the popular level without introducing lies of simplification. More science writing should be this good. It took me a while to decide on 5 stars instead of 4. Here are some complaints about the book. They are trivial enough to not detract from the overall rating. There are many marginal notes and side bars. Some go on for several pages. Figure captions are long and often duplicate the information in the text. The author often does comparisons using "times less than" or "times smaller than". In the chapter on Computer Tomography, he mentions the Algebraic Reconstruction Technique (ART). You do not have to understand it. Then he claims attempts to speed it up by using the Fast Fourier Algorithm (FFA) have not been successful because of the lack of a good acronym. He means FFT, but the joke is not funny unless you know there are alternatives to ART called, SART, MART, and SMART. This reviewer is praising with faint damns.

I bought this book as part of a college program I was working on. The book was easy to read and had good information in it. It's not very detailed though - more of a skim of the topic. It's written pretty much in layman's terms - no medical background needed.

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