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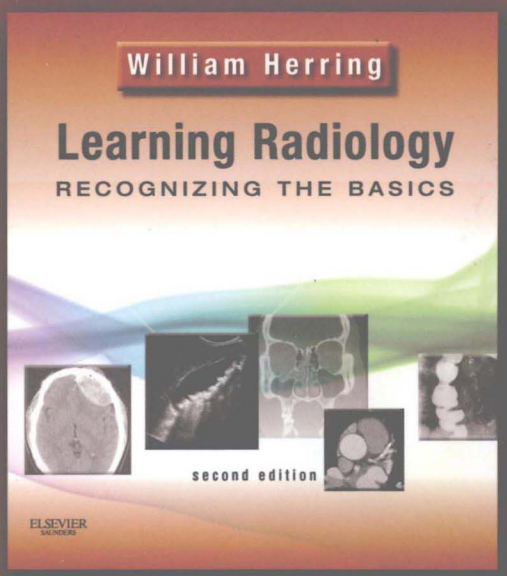
Learning Radiology

RECOGNIZING THE BASICS

影像诊断学基础教程

（第2版）

William Herring



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Recognizing the Basics

（Second Edition）

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Learning Radiology

Recognizing the Basics

（Second Edition）

To my wife, Patricia,

and our family

Contributor

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Chapter 20, Magnetic Resonance Imaging

Preface to the First Edition

If you're the kind of person, like I am, who reads the preface after you've read the book, I hope you enjoyed it. If you're the kind of person who reads the preface before reading the book, then you're in for a real treat.

Suppose for a moment that you wanted to know what kind of bird with a red beak just landed on your windowsill (don't ask why). You could get a book on birds that listed all of them alphabetically from albatross to woodpecker and spend time looking at hundreds of bird pictures. Or you could get a book that lists birds by the colors of their beaks and thumb through a much shorter list to find that it was a cardinal.

This is a red-beak book. Where possible, groups of diseases are first described by the way they *look* rather than by what they're *called*. Imaging diagnoses frequently, but not always, rest on a recognition of a reproducible visual picture of that abnormality. That is called the *pattern recognition approach* to identifying abnormalities, and the more experience you have and more proficient you become at looking at imaging studies, the more comfortable and confident you'll be with that approach.

Before diagnostic images can help you decide what disease the patient may have, you must first be able to differentiate between what is normal and what is not. That isn't as easy as it may sound. Recognizing the difference between normal and abnormal probably takes as much, if not more, practice than deciding what disease the person has.

In fact, it takes so much practice, some people—I believe they are called *radiologists*—have actually been known to spend their entire life doing it. You won't be a radiologist after you've completed this book, but you should be able to recognize abnormalities and interpret images better. By so doing, perhaps you can participate in the care of patients with more assurance and confidence.

In this text, you'll spend time in each section learning how to recognize what is normal so that you can differentiate between such things as a skin fold and a pneumothorax or so that you can recognize whether that fuzzy white stuff at the lung bases is pneumonia or the patient simply hasn't taken a deep breath.

Where pattern recognition doesn't work, we'll try whenever possible to give you a logical *approach* to reaching a diagnosis based on simple yet effective decision trees. These will be little decision trees—saplings with only a few branches—so that they are relatively easy to remember.

By learning an approach, you'll have a method you can apply to similar problems again and again. Have you ever heard the saying "Give a man a fish; you have fed him for today. Teach a man to fish, and you have fed him for a lifetime"? Learning an imaging approach is like learning how to fish, except a lot less smelly. An approach will enable you to apply a rational solution to diagnostic imaging problems.

This text was written, in part, to make complementary use of the medium for which radiologic images are ideally suited: the computer screen. The web is ideal for accessing and displaying images, but many people do not want to read large volumes of text from their computer screens. So we've joined the text in the printed book with photos, quizzes, and tutorials available online at StudentConsult.com in a series of *web enhancements* that accompany every chapter.

This text is not intended to be encyclopedic. There are many wonderful radiology reference texts available, some of which contain thousands of pages and weigh slightly less than a Volkswagen. This text is oriented more towards students, interns, and residents or residents-to-be.

Not every imaging modality is covered equally in this book, and some are not covered at all. This book emphasizes conventional radiography because that is the type of study most patients have first and because the same imaging principles that apply to recognizing the diagnosis on conventional radiographs can be applied to making the diagnosis on more complex modalities.

With a better appreciation and understanding of why images look the way they do, you'll soon be recognizing abnormalities and making diagnoses that will impress your mentors and peers and astound your friends and relatives.

Let's get started.

William Herring, MD

Preface to the Second Edition

This second edition of *Learning Radiology: Recognizing the Basics* includes numerous changes and additions. There are additional chapters, over a hundred new photos, reorganization of key material throughout the text, and an increased emphasis on the cross-sectional imaging modalities of computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound.

Two entirely new chapters have been added to help you understand the basic principles and fundamental observations of ultrasound and MRI. Trauma has moved to its own chapter, bringing together related material to provide cohesive coverage of this important subject. A new and helpful appendix has been added, which lists the most appropriate imaging study to order for each of a myriad of clinical scenarios. This information should prove indispensable on clinical rounds.

Many chapters have been reorganized. The chapter on Recognizing Adult Heart Disease has been restructured to include relevant material featuring CT and MRI. The chapters on Diseases of the Chest and Diseases of the GI and Urinary Tracts have been updated with increased emphasis on CT, ultrasound, and MRI. The chapters on Recognizing Arthritis and Common Causes of Neck and Back Pain incorporate more MRI imaging. The chapter on Recognizing Bowel Obstruction and Ileus now includes additional CT imaging.

There are enhancements to the printed text again available to registered users on the StudentConsult.com website, including access to the full text and all of its photos. Also available on the website are 24 interactive modules to help you learn radiologic anatomy. An algorithm for diagnosing adult heart disease using conventional radiography is available online. A new section on nuclear medicine has also been added to StudentConsult.com.

The first edition suggested that you'd soon be recognizing abnormalities and making diagnoses that would impress your mentors and peers and astonish your friends and relatives. With this edition, you hold the potential to be even more astounding.

Prepare to amaze.

William Herring, MD

Acknowledgments

First, I am grateful to the many thousands of you whom I have never met but who found a website called Learning Radiology helpful, and made it so popular it played a role leading to the first edition of this book, which was so popular that it led to this second edition.

For their help and suggestions, I would like to thank my colleague Mindy Horrow, MD, who read and critiqued several chapters with her usual expert eye and fine mind, and Thomas Reilly, MD, one of our radiology residents, who made invaluable suggestions about how the first edition could be changed. Daniel Kowal, MD, a radiologist who graduated from our program, did an absolutely wonderful job in simplifying the complexities of MRI for a great new chapter he wrote for this edition.

I want to thank Shuchi Rodgers, MD, Jenifer Slone, MD, Susan Summerton, MD, Mindy Horrow, MD, Morrie Kricun, MD, Huyen Tran, MD, Joanne Lee, MD, Jeffrey Weinstein, MD, and Michael Chen, MD for supplying additional photos for this edition. Thanks to Ryan Smith, MD for reviewing the StudentConsult chapter on nuclear medicine.

I certainly want to recognize and again thank Jim Merritt and Andrea Vosburgh from Elsevier for their continued support and assistance.

I also want to acknowledge the hundreds of radiology residents and medical students who, over the years, have provided me with an audience of motivated learners without whom no teacher could teach.

Finally, I want to thank my wonderful wife, Pat, who has encouraged me throughout the project, and my family.

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