

WN 180  
2001PA  
c.2

# **Pattern recognition in diagnostic imaging**



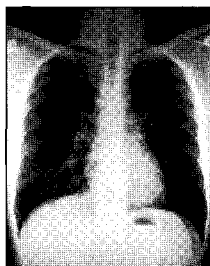
WORLD HEALTH ORGANIZATION  
GENEVA

i / 85X

# Pattern recognition in diagnostic imaging

*Peter Corr*

MBChB, FFRad (D) SA, FRCR  
Professor of Radiology  
Nelson R Mandela School of Medicine  
University of Natal,  
Durban  
South Africa



**In collaboration with**

*Wilfred Peh, Wong Siew Kune, Leonie Munro, William Rae, Fei Ling Thoo, Lai Peng Chan,  
Lesley A. Goh, Lawrence Hadley, Malai Muttarak, Swee Tian Quek.*

*Medical Artist: Merle Conway*

*Photography: NV Chetty, S Ezekiel*



Diagnostic Imaging and Laboratory Technology  
Essential Health Technologies  
Health Technology and Pharmaceuticals  
**WORLD HEALTH ORGANIZATION**  
GENEVA

## **WHO Library Cataloguing-in-Publication Data**

Pattern recognition in diagnostic imaging / Peter Corr ; in collaboration with Wilfred Peh ... [et al.]

1.Diagnostic imaging - methods 2.Pattern recognition 3.Radiography, Thoracic -methods 4.Musculoskeletal system - radiography. 5.Radiography, Abdominal-methods 6.Manuals I.Corr, Peter II.Peh, Wilfred.

ISBN 92 4 154632 8

(NLM classification: WN 180)

This publication is a reprint of material originally distributed as WHO/DIL/01.2

**© World Health Organization 2001**

Reprinted 2003 (Twice)

All rights reserved. Publications of the World Health Organization can be obtained from Marketing and Dissemination, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel: +41 22 791 2476; fax: +41 22 791 4857; email: bookorders@who.int). Requests for permission to reproduce or translate WHO publications – whether for sale or for noncommercial distribution – should be addressed to Publications, at the above address (fax: +41 22 791 4806; email: permissions@who.int).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The World Health Organization does not warrant that the information contained in this publication is complete and correct and shall not be liable for any damages incurred as a result of its use.

Designed by minimum graphics in New Zealand  
Typeset by Best-set in Hong Kong  
Printed in Malta By Interprint Ltd.

# Contents

-- JAN 2004

Preface	v
Foreword	vii
Definitions	x
<b>Part 1. Technique, quality control and radiation protection</b>	<b>1</b>
Chapter 1. Image quality optimisation and control	3
Chapter 2. Radiation protection in radiological practice	16
Chapter 3. Contrast media in imaging	21
Chapter 4. Digital imaging and telemedicine	23
<b>Part 2. Chest imaging patterns</b>	<b>27</b>
Chapter 5. The normal chest radiograph	29
Chapter 6. Pulmonary infection	34
Chapter 7. Lung cancer	40
Chapter 8. Pulmonary hypertranslucency and cystic lungs	45
Chapter 9. Pleural and extra pleural disease	51
Chapter 10. Rib lesions	56
Chapter 11. Chest trauma	59
Chapter 12. Pulmonary AIDS	65
Chapter 13. Paediatric chest	68
Chapter 14. Cardiac disease	73
Chapter 15. Mediastinal masses	77
Chapter 16. Diaphragm lesions	79
Chapter 17. Pneumoconiosis	80
<b>Part 3. Musculoskeletal patterns</b>	<b>83</b>
Chapter 18. Approach to focal bone lesions	85
Chapter 19. Periosteal reactions	91
Chapter 20. Extremities trauma	99
Chapter 21. Fractures—classification, union, complications	114
Chapter 22. Spinal trauma	124
Chapter 23. Facial and pelvic trauma	133
Chapter 24. Bone infections	141

<b>Part 4. Gastrointestinal and urinary tract patterns</b>	<b>147</b>
Chapter 25. Plain abdominal radiographs	149
Chapter 26. The acute abdomen	151
Chapter 27. Gastrointestinal contrast studies	159
Chapter 28. Paediatric abdomen	178
Chapter 29. Urinary tract imaging	183
Acknowledgements	205

---

# Preface

As modern, high technology based diagnostic imaging is moving increasingly into therapeutic medicine, and molecular imaging is becoming daily routine, it is important to remember that thousands of hospitals and medical institutions worldwide do not even have possibilities to perform the most basic examinations. Today, few other areas of medicine experience such a rapidly growing gap between what might be technically possible, e.g., what can be done in highly developed, rich countries compared to what is the reality in many less fortunate areas of the world.

As the ultimate target for the World Health Organization is to provide *Health For All*, it is with great pleasure and sincere gratitude to Professor Corr, his staff and co-authors that this book on Pattern Recognition in Diagnostic Imaging is now being published and distributed. It aims in a simple, but precise way at assisting medical professionals doing a tremendous work to save lives and reduce suffering in countries where diagnostic imaging has not yet reached the stage of molecular imaging.

We would warmly recommend that this book should not be put on a shelf or into a locker, but be used by everybody whose obligation it is to prescribe, perform, or interpret simple, but often life-saving diagnostic imaging procedures especially in locations where the presence of qualified and fully trained specialists would be a rare exception.

The book is developed and published as a WHO Document under the umbrella of the Global Steering Group for Education and Training in Diagnostic Imaging. For further information, please contact:

Team for Diagnostic Imaging and Laboratory Technology,  
World Health Organization  
20, Avenue Appia  
CH-1211 GENEVA 27, SWITZERLAND

Fax: +41 22 791 4836; e-mail: [ingolfsdotting@who.int](mailto:ingolfsdotting@who.int)

Geneva, 30 June 2001  
Harald Ostensen, MD

---



# Foreword

Imaging is currently being performed and interpreted by radiographers/technologists and primary care physicians/hospital medical officers in many developing countries. Many primary care physicians have had little or no training in the interpretation of images, both radiographic and sonographic. Radiographers are trained in producing images but often do not have the background in medicine to interpret images with confidence. This book seeks to bridge this gap by providing images of common pathologies seen in many developing countries in a pattern format. The pattern recognition format has been used successfully by both national and international radiographic societies to educate and train radiographers working in regions where radiology advice or services are unavailable.

We hope this book serves you well in your daily work which involves imaging.

**Peter Corr**  
*Durban 2001*

预览已结束，完整报告链接和二维码如下：

[https://www.yunbaogao.cn/report/index/report?reportId=5\\_30392](https://www.yunbaogao.cn/report/index/report?reportId=5_30392)

