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# Pattern recognition in diagnostic imaging

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# Contents

Preface	v
Foreword	vii
Definitions	x
<hr/>	
<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
<hr/>	
<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
<hr/>	
<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

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<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

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# 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 world wide 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. It is distributed free of charge, and can be obtained by contacting.

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Geneva, 31 June 2001  
Harald Ostensen, MD

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# 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*

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# Definitions

**ALARA** keeping radiation dose 'as low as reasonably achievable'

**AP** anteroposterior means patient is facing the X-ray tube/beam (see PA)

**Atelectasis** radiographic pattern to describe (i) incomplete expansion of lungs at birth, or (ii) collapse of adult lung usually with limited re-expansion

**Baud** number of bytes transmitted in one second in telemedicine

**Bit** smallest unit of digital information

**Byte** a group of 8 bits used to transmit a value of character

**Collapse** radiographic pattern of partially or completely airless lung due to some form of obstruction

**Consolidation** a region of lung opacification following pneumonia with air bronchograms. Strictly a pathological term for lobar pneumonia.

**CTR** cardio-thoracic-ratio is the ratio of the measurement of widest transverse diameter of the heart on a chest radiograph versus the widest transverse ratio of the thoracic cage

**Decubitus view** patient lying on either left or right side and radiograph is taken using a horizontal X-ray beam at right angles to the cassette placed either behind the patient (PA decubitus) or in front of patient (AP decubitus)

**DICOM** a standard allowing interfacing of digital imaging devices with other digital devices

**Digitise** process to convert analogue data or images into digital data

**Effusion** fluid in a cavity, e.g. pleural cavity

**FFD** focal film distance, i.e. distance from source of X-ray beam to the film

**Horizontal beam/shoot-through** film taken using horizontal X-ray beam at right angles to the cassette; patient can be supine, prone, semi-erect, lateral

**ISDN** integrated system digital network

**IVU** intravenous urography

**KUB** plain-film-radiograph of abdomen; i.e. kidneys to bladder region

**Lossless compression** there is no alteration of original image after reconstruction in digital imaging

**Osteopaenia** decreased bone density on a radiograph.

**PA** posteroanterior view with X-ray beam entering from behind the patient and emerging through anterior part because patient is positioned facing cassette

**Sclerosis** increased bone density or opacity on the radiograph

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