

# **Practical Gynaecological Ultrasound**

This user-friendly second edition provides a fully updated and practical introduction to gynaecological ultrasound. It describes and explains background anatomy and physiology, instrumentation and how to make the best use of equipment. Emphasis is placed on how to maximise image quality, and how to recognise normal and pathological features. The volume also assesses other relevant diagnostic techniques and various management strategies, and evaluates the role of ultrasound as part of patient management. It includes chapters on pathology of the uterus, ovaries and adnexae, paediatric and trauma cases, together with management of infertility and other gynaecological perspectives of patient management. Illustrated throughout with numerous high-quality ultrasound images and line drawings, many of them new for this latest edition, this is essential reading for practitioners in training, including radiologists, gynaecologists and sonographers.

With more than 20 years' experience in diagnostic ultrasound, principally as Lead Ultrasound Practitioner at St James's University Hospital, Leeds, **Jane Bates** is well qualified and well known in this field. She is also Past President of the British Medical Ultrasound Society.



# Practical Gynaecological Ultrasound

2nd edition

Edited by

Jane Bates, MPhil, DMU, DCRR

Ultrasound Department St James's University Hospital, Leeds





CAMBRIDGE UNIVERSITY PRESS

Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press

The Edinburgh Building, Cambridge CB2 2RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org

Information on this title: www.cambridge.org/9780521674508

© Cambridge University Press 2006

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published 2006

Printed in the United Kingdom at the University Press, Cambridge

A catalogue record for this book is available from the British Library

ISBN-13 978-0-521-67450-8 paperback ISBN-10 0-521-67450-6 paperback

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this publication, and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

Every effort has been made in preparing this publication to provide accurate and up-to-date information which is in accord with accepted standards and practice at the time of publication. Although case histories are drawn from actual cases, every effort has been made to disguise the identities of the individuals involved. Nevertheless, the authors, editors and publishers can make no warranties that the information contained herein is totally free from error, not least because clinical standards are constantly changing through research and regulation. The authors, editors and publishers therefore disclaim all liability for direct or consequential damages resulting from the use of material contained in this book. Readers are strongly advised to pay careful attention to information provided by the manufacturer of any drugs or equipment that they plan to use.



# **Contents**

List of contributors		page	vii
Preface			ix
1	Equipment selection and instrumentation Tony Evans		1
2	Practical equipment operation and technique Jane Bates		15
3	Anatomy, physiology and ultrasound appearances Jane Bates		32
4	Pathology of the uterus, cervix and vagi Josephine M. McHugo	ina	54
5	Pathology of the ovaries, fallopian tube and adnexae Damian J. M. Tolan and Michael J. Weston		79
6	Ultrasound in the acute pelvis Hassan Massouh	1	03
7	Ultrasound and fertility Stephen Killick	1	20
8	Paediatric gynaecological ultrasound David W. Pilling	1	26
9	Clinical management of patients: the gynaecologist's perspective Lynne Rogerson, Sean Duffy and Chris Kremer	1	42
Index		1	57

٧



# **Contributors**

### Jane Bates MPhil DMU DCRR

Ultrasound Department St James's University Hospital Beckett Street Leeds LS9 7TF

#### Sean Duffy MD FRCS (Glasg) FRCOG

Academic Department of Obstetrics and Gynaecology St James's University Hospital Beckett Street Leeds LS9 7TF

## Tony Evans BSc MSc PhD CEng CPhys

Medical Physics Department Leeds General Infirmary Great George Street Leeds LS1 3EX

#### Stephen Killick MD FFFP FRCOG

Department of Obstetrics and Gynaecology Women's and Children's Hospital Anlaby Road Hull HU3 2JZ

#### **Chris Kremer MD MRCOG**

Pinderfields General Hospital Aberford Road Wakefield WF1 4DG

#### Hassan Massouh FRCR

Department of Radiology Frimley Park Hospital Portsmouth Road Frimley Surrey

۷ij



#### viii List of contributors

#### Josephine M. McHugo FRCR FRCP FRCPCH

Ultrasound Department Birmingham Women's Hospital Edgbaston Birmingham B15 2TG

#### David W. Pilling MB ChB DCH DMRD FRCR FRCPCH

Department of Radiology Royal Liverpool Children's Hospital Eaton Road Alder Hey Liverpool L12 2AP

#### Lynne Rogerson MD MRCOG PG Cert Gynae Ultrasound

Academic Department of Obstetrics and Gynaecology St James's University Hospital Beckett Street Leeds LS9 7TF

#### Damian J. M. Tolan MBChB MRCP(UK) FRCR

Department of Radiology St James's University Hospital Beckett Street Leeds LS9 7TF

## Michael J. Weston MB ChB MRCP FRCR

Department of Radiology St James's University Hospital Beckett Street Leeds LS9 7TF



# **Preface**

Ultrasound is one of the most important and primary diagnostic tools in gynaecology. Its use continues to increase, and it is now an essential part of the diagnostic process in examining the female pelvis. The increasingly complex technology, whilst producing images of greater detail and diagnostic value, requires a more comprehensive knowledge of ultrasound scanning than ever before. Practitioners must be aware of pitfalls and diagnostic dilemmas, and must know how to produce the best images possible within the capabilities and limitations of their equipment.

Our understanding of physiology and pathological processes and the increasingly successful and minimally invasive treatment options have carved an important niche for the gynaecological ultrasound practitioner. This text aims to provide both a reference for more experienced ultrasound practitioners and a guide and teaching aid for students of ultrasound. Experts from various fields of gynaecology have contributed to the book, to achieve a comprehensive, well-informed and up-to-date project.

The book incorporates both the normal and abnormal pelvis, illustrated with diagrams and high-quality images, together with an emphasis on the role of the scan within the patient's management. It incorporates the latest thinking and practice in various fields, including the acute pelvis, infertility diagnosis and treatment and patient management. The special considerations of the paediatric pelvis merit a separate chapter. Students will find sections on how to make the most of equipment and



#### x Preface

scanning techniques, in order to maximise the diagnostic potential of their scan.

It has often been said that the greatest hazard of ultrasound is that of the untrained operator. No mere text can be a substitute for practical experience and good training, but this book aims to assist the student in understanding ultrasound and the gynaecological patient. I hope it will also provide the more experienced ultrasound practitioner with an easily accessible and comprehensive reference. The nature of medical ultrasound is such that developments rapidly outstrip publications. I hope this book will form a basic and enduring foundation which will foster best practice and encourage practitioners to develop their knowledge and skills.

#### **Acknowledgement**

My grateful thanks to all the staff of the ultrasound department at St James's Hospital, Leeds.