

Cambridge University Press
978-1-107-02849-4 - Core Topics in Obstetric Anaesthesia
Edited by Kirsty MacLennan, Kate O'Brien and W. Ross Macnab
Frontmatter
[More information](#)

Core Topics in Obstetric Anaesthesia

Cambridge University Press
978-1-107-02849-4 - Core Topics in Obstetric Anaesthesia
Edited by Kirsty MacLennan, Kate O'Brien and W. Ross Macnab
Frontmatter
[More information](#)

Cambridge University Press
978-1-107-02849-4 - Core Topics in Obstetric Anaesthesia
Edited by Kirsty MacLennan, Kate O'Brien and W. Ross Macnab
Frontmatter
[More information](#)

Core Topics in Obstetric Anaesthesia

Edited by

Kirsty MacLennan

Consultant Obstetric Anaesthetist, St Mary's Hospital, Central Manchester University Hospitals NHS Trust, Manchester, UK

Kate O'Brien

Consultant Obstetric Anaesthetist, St Mary's Hospital, Central Manchester University Hospitals NHS Trust, Manchester, UK

W. Ross Macnab

Consultant Obstetric Anaesthetist, St Mary's Hospital, Central Manchester University Hospitals NHS Trust, Manchester, UK



CAMBRIDGE
UNIVERSITY PRESS

Cambridge University Press
978-1-107-02849-4 - Core Topics in Obstetric Anaesthesia
Edited by Kirsty MacLennan, Kate O'Brien and W. Ross Macnab
Frontmatter
[More information](#)

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org
Information on this title: www.cambridge.org/9781107028494

© Cambridge University Press 2015

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 2015

Printed in the United Kingdom by TJ International Ltd. Padstow Cornwall

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

Library of Congress Cataloguing in Publication data

Core topics in obstetric anaesthesia / edited by Kirsty MacLennan, Consultant Obstetric Anaesthetist, St Mary's Hospital, Central Manchester, University Hospitals NHS Trust, Manchester, UK, Katherine O'Brien, Consultant Obstetric Anaesthetist, St Mary's Hospital, Central Manchester, University Hospitals NHS Trust, Manchester, UK, William MacNab, Consultant Obstetric Anaesthetist, St Mary's Hospital, Central Manchester, University Hospitals NHS Trust, Manchester, UK.

pages cm
ISBN 978-1-107-02849-4 (hardback)

1. Anesthesia in obstetrics. I. MacLennan, Kirsty. II. O'Brien, Katherine, 1962– III. MacNab, William, 1969–
RG732.C68 2015
617.9'682–dc23

2015021141

ISBN 978-1-107-02849-4 Hardback

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 book 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 vii
Preface xi

Section 1 – Basic science, epidemiology and service organization

1 **Physiology of pregnancy** 1
N. J. Nirmalan and M. Nirmalan

2 **Placental physiology** 9
Carolynn Wai and W. Ross Macnab

3 **Pharmacology relevant to pregnancy** 13
Christopher Kelly and Malachy Columb

4 **Maternal morbidity and mortality** 24
Kate O’Brien

Section 2 – Obstetric aspects

5 **Maternal critical care** 29
Sarah Wheatly and Kate O’Brien

6 **Obstetrics for the anaesthetist** 35
Emma Ingram, Alex Heazell and Edward D. Johnstone

7 **Antenatal assessment** 44
Allison C. L. Howells

Section 3 – Provision of anaesthesia

8 **Incidental anaesthesia during pregnancy** 49
Desiree M. A. Choi and Kim G. Soulsby

9 **Non-regional analgesia techniques for labour** 54
Gordon Yuill

10 **Regional analgesia techniques for labour** 61
Lawrence C. Tsen

11 **Regional anaesthesia for operative delivery** 73
Cathy Armstrong and Khaled Girgirah

12 **General anaesthesia for caesarean section and transverse abdominal plane block** 83
Suraj Jayasundera and Karen Butler

13 **Anaesthesia for other obstetric indications: cervical suture, external cephalic version, controlled ARM, manual removal of placenta and perineal repair** 92
John R. Dick

Section 4 – Medical conditions in pregnancy

14 **Hypertension in pregnancy, pre-eclampsia and eclampsia** 97
Suna Monaghan, Jenny Myers and Lorna A. Howie

15 **Sepsis and influenza in pregnancy** 105
Tim Holzmann and Dougal Atkinson

16 **Cardiac disease in pregnancy** 114
W. Ross Macnab, Anita Macnab and Akbar Vohra

17 **Respiratory disease in pregnancy** 123
Christopher Kelly, Simon Maguire and Craig Carroll

18 **Obesity and ultrasonography for central neuraxial blocks** 130
Sophie Bishop and Preye Zuokumor

19 **Endocrine disease in pregnancy including diabetes mellitus, thyroid and adrenal disease** 138
Jenny Myers and Dan Mallaber

Cambridge University Press
978-1-107-02849-4 - Core Topics in Obstetric Anaesthesia
Edited by Kirsty MacLennan, Kate O'Brien and W. Ross Macnab
Frontmatter
[More information](#)

Contents

20 **Renal disease** 146
Jessica Longbottom and W. Ross Macnab

21 **Haematologic disease in pregnancy** 155
Pavan Kochhar, Andrew Heck and Clare Tower

22 **Neurosurgical and neurological disease in pregnancy** 165
Kirsty MacLennan and Craig Carroll

23 **Immunology, including testing and management of allergy during pregnancy** 176
Gareth Kitchen, Tomaz Garcez and Nigel J. N. Harper

24 **HIV and infectious disease in pregnancy, including herpes, syphilis and hepatitis** 185
Jacqueline E. A. K. Bamfo, Matthew D. Phillips, M. Kingston, K. Chan and Ian Clegg

Section 5 – Postpartum complications and obstetric emergencies

25 **Maternal collapse, including massive obstetric haemorrhage, amniotic fluid embolism and cardiac arrest** 191
Kate Grady and Tracey Johnston

26 **Postpartum complications, follow-up and maternal satisfaction** 201
Richard Wadsworth and Kailash Bhatia

Section 6 – Service organization

27 **Multidisciplinary teaching and training on the delivery unit** 211
Catherine Robinson and Cathy Armstrong

28 **Clinical governance and patient safety** 219
Kate O'Brien

29 **Ethics, consent and the law** 225
Andrew Heck and Ross Clark

Index 232

Colour plate section can be found between pp. 204 and 205.

Contributors

- Cathy Armstrong**
Consultant Anaesthetist, Manchester Royal Infirmary, Manchester, UK
- Dougal Atkinson**
Consultant in Anaesthesia and Critical Care, Central Manchester University Hospitals, Manchester, UK
- Jacqueline E. A. K. Bamfo**
Subspeciality Trainee in Maternal Fetal Medicine, Fetal Medicine Unit, St Mary’s Hospital, Manchester, UK
- Kailash Bhatia**
Consultant Anaesthetist, Department of Anaesthesia, Central Manchester University Hospitals NHS Foundation Trust, Manchester, UK
- Sophie Bishop**
Consultant Anaesthetist, University Hospital of South Manchester, Wythenshawe, UK
- Karen Butler**
Consultant Anaesthetist, Anaesthetic Department, Blackburn Hospital, Blackburn, UK
- Craig Carroll**
Consultant Neuroanaesthetist, Salford Royal Hospital NHS Foundation Trust, Salford, UK
- K. Chan**
Consultant Obstetrician, Department of Obstetrics and Fetal Medicine Unit, St Mary’s Hospital, Manchester, UK
- Desiree M. A. Choi**
Consultant Obstetric Anaesthetist, Nuffield Department of Anaesthetics, John Radcliffe Hospital, Oxford, UK
- Ross Clark**
Consultant Obstetric Anaesthetist, Central Manchester University Hospitals NHS Foundation Trust, Manchester, UK

- Ian Clegg**
Consultant Anaesthetist, East Lancashire Hospitals NHS Trust, UK
- Malachy Columb**
Consultant in Anaesthesia and Intensive Care Medicine, University Hospital of South Manchester, Wythenshawe, UK
- John R. Dick**
Consultant Anaesthetist, University College London Hospital, London, UK
- Tomaz Garcez**
Consultant Clinical Immunologist, Central Manchester University Hospitals NHS Foundation Trust, Manchester, UK
- Khaled Girgirah**
Specialty Trainee in Anaesthesia, North West Deanery, Central Manchester Children’s Hospital, Manchester, UK
- Kate Grady**
Consultant Anaesthetist, University Hospital of South Manchester, Manchester, UK
- Nigel J. N. Harper**
Consultant Anaesthetist, Department of Anaesthesia, Central Manchester University Hospitals NHS Foundation Trust, Manchester, UK
- Alex Heazell**
Senior Clinical Lecturer and Honorary Consultant in Obstetrics, St Mary’s Hospital, Manchester, UK
- Andrew Heck**
Specialty Trainee in Anaesthesia, North West Deanery, Department of Anaesthesia, St Mary’s Hospital, Manchester, UK
- Tim Holzmann**
North Western Deanery, Manchester, UK

Cambridge University Press
978-1-107-02849-4 - Core Topics in Obstetric Anaesthesia
Edited by Kirsty MacLennan, Kate O’Brien and W. Ross Macnab
Frontmatter
[More information](#)

List of contributors

Allison C. L. Howells

Consultant Anaesthetist, Central Manchester
University Hospitals NHS Foundation Trust,
Manchester, UK

Lorna A. Howie

Specialist Trainee in Anaesthesia, North West
Deanery, St Mary’s Hospital, Manchester, UK

Emma Ingram

Academic Health Science Centre,
Manchester, UK

Suraj Jayasundera

Specialty Trainee in Anaesthesia, North West
Deanery, Royal Manchester Children’s Hospital,
Manchester, UK

Tracey Johnston

Consultant Obstetrician, Birmingham
Women’s NHS Foundation Trust,
Birmingham, UK

Edward D. Johnstone

Senior Clinical Lecturer, St Mary’s Hospital and
Central Manchester University Hospitals NHS
Foundation Trust, Manchester, UK

Christopher Kelly

Specialty Trainee, in Anaesthesia, North West
Deanery, University Hospital of South Manchester,
Wythenshawe, UK

M. Kingston

Consultant Physician in Genitourinang Medicine,
Manchester Royal Infirmary,
Manchester, UK

Gareth Kitchen

Specialty Trainee in Anaesthesia, North Western
Deanery, Manchester, UK

Pavan Kochhar

Consultant Obstetric Anaesthetist,
St Mary’s Hospital, Manchester, UK

Jessica Longbottom

Specialty Trainee in Anaesthesia, North West
Deanery, Manchester, UK

Kirsty MacLennan

Consultant Obstetric Anaesthetist, St Mary’s
Hospital, Manchester, UK

Anita Macnab

Consultant Cardiologist, University Hospital of South
Manchester, Manchester, UK

W. Ross Macnab

Consultant Obstetric Anaesthetist, St Mary’s
Hospital, Manchester, UK

Simon Maguire

Consultant Anaesthetist, South Manchester
University Hospital Trust, Manchester, UK

Dan Mallaber

Consultant Anaesthetist, Central Manchester
University Hospitals NHS Foundation Trust,
Manchester, UK

Suna Monaghan

Consultant Anaesthetist, Central Manchester
University Hospitals NHS Foundation Trust,
Manchester, UK

Jenny Myers

Senior Clinical Lecturer, Maternal and Fetal Health
Research Centre, St Mary’s Hospital,
Manchester, UK

M. Nirmalan

Professor of Medical Education and Honorary
Consultant in Anaesthesia, Manchester Royal
Infirmary, Manchester, UK

N. J. Nirmalan

Senior Lecturer, Programme Leader, Biomedical
Sciences, University of Salford,
Manchester, UK

Kate O’Brien

Consultant Obstetric Anaesthetist, St Mary’s
Hospital, Manchester, UK

Matthew D. Phillips

Manchester Royal Infirmary,
Manchester, UK

Catherine Robinson

Consultant Anaesthetist, Manchester Royal
Infirmary, Manchester, UK

Kim G. Soulsby

Specialist Registrar in Anaesthesia,
Oxford University Hospitals,
Oxford, UK

Cambridge University Press
978-1-107-02849-4 - Core Topics in Obstetric Anaesthesia
Edited by Kirsty MacLennan, Kate O’Brien and W. Ross Macnab
Frontmatter
[More information](#)

List of contributors

Clare Tower
Consultant in Obstetrics and Maternal
and Fetal Medicine, Central Manchester University
Hospitals NHS Foundation Trust, Manchester, UK

Lawrence C. Tsen
Associate Professor, Harvard Medical School,
Department of Anesthesiology, Perioperative and
Pain Medicine, Brigham and Women’s Hospital,
Boston, MA

Akbar Vohra
Consultant Anaesthetist Central Manchester
University Hospitals NHS Foundation Trust,
Manchester, UK

Richard Wadsworth
Consultant Anaesthetist, Department of Anaesthesia,
Central Manchester University Hospitals NHS
Foundation Trust, Manchester, UK

Carolynn Wai
Specialty Trainee in Anaesthesia, North West
Deanery, Manchester, UK

Sarah Wheatly
Consultant Anaesthetist, University Hospital of South
Manchester, Manchester, UK

Gordon Yuill
Consultant Anaesthetist, Department of Anaesthesia,
Stepping Hill Hospital, Stockport, UK

Preye Zuokumor
Consultant Anaesthetist, Central Manchester
University Hospitals NHS Foundation Trust,
Manchester, UK

Cambridge University Press
978-1-107-02849-4 - Core Topics in Obstetric Anaesthesia
Edited by Kirsty MacLennan, Kate O’Brien and W. Ross Macnab
Frontmatter
[More information](#)

Preface

Navigating through the minefields of obstetric anaesthesia is becoming more and more challenging. Obstetric anaesthetists are encountering a much broader range of pathologies owing to the ever increasing morbidity affecting women of childbearing age. This book aims to provide healthcare professionals caring for parturients with a wealth of up-to-date information on a broad range of aspects affecting obstetric care.

The book is divided into six sections. Section 1 addresses the basic sciences, including expected physiological and pharmacological alterations associated with pregnancy, and epidemiology. Section 2, entitled obstetric aspects, includes maternal critical care, antenatal assessment and a chapter authored by an obstetrician, dedicated to obstetrics for the anaesthetist.

Section 3 covers all aspects of provision of anaesthesia, including incidental anaesthesia (for those parturients requiring non-obstetric surgery whilst pregnant), regional and non-regional analgesia for labour, regional and general anaesthesia for operative delivery and anaesthesia for specific obstetric indications. Section 4 is divided into easily navigable chapters that cover the common conditions encountered during pregnancy, ranging from obesity and pre-eclampsia to allergy, sepsis and HIV. Dedicated chapters for individual systems detail commonly encountered conditions, how these conditions can

be affected by pregnancy and suggested peripartum management plans.

Section 5 focuses on postpartum complications and maternal collapse. Section 6 changes the direction away from clinical practice and addresses ethics and consent, clinical governance and multidisciplinary training for members of the delivery suite.

By combining obstetric and anaesthetic authorship on many chapters, we aspire to give the reader a well-founded knowledge base with which to approach situations on the delivery suite. This book is a must have for current, easily accessible opinion, making it valuable for anaesthetic trainees sitting examinations, occasional dabblers in obstetric anaesthesia and full-time obstetric anaesthetic consultants alike. Most up-to-date literature and initiatives, including National Audit Project 5, Cochrane reviews, guidelines and enhanced recovery after surgery are discussed.

We hope that this addition to the core topic range will assist healthcare professionals in the rapidly changing complex field of obstetric anaesthesia.

**Kirsty MacLennan, Kate O'Brien and
W. Ross Macnab**