

# Surgery: Complications, Risks and Consequences

*Series Editor*

Brendon J. Coventry

For further volumes:

<http://www.springer.com/series/11761>



Brendon J. Coventry  
Editor

# Lower Abdominal and Perineal Surgery

 Springer

*Editor*

Brendon J. Coventry, BMBS, PhD,  
FRACS, FACS, FRSM  
Discipline of Surgery  
Royal Adelaide Hospital  
University of Adelaide  
Adelaide, SA  
Australia

ISBN 978-1-4471-5468-6                      ISBN 978-1-4471-5469-3 (eBook)  
DOI 10.1007/978-1-4471-5469-3  
Springer London Heidelberg New York Dordrecht

Library of Congress Control Number: 2013957696

© Springer-Verlag London 2014

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media ([www.springer.com](http://www.springer.com))

*This book is dedicated to my wonderful wife Christine and children Charles, Cameron, Alexander and Eloise who make me so proud, having supported me through this mammoth project; my patients, past, present and future; my numerous mentors, teachers, colleagues, friends and students, who know who they are; my parents Beryl and Lawrence; and my parents-in-law Barbara and George, all of whom have taught me and encouraged me to achieve*

*“Without love and understanding we have but nothing”*

*Brendon J. Coventry*



# Foreword I

This comprehensive treatise is remarkable for its breadth and scope and its authorship by global experts. Indeed, knowledge of its content is essential if we are to achieve optimal and safe outcomes for our patients. The content embodies the details of our surgical discipline and how to incorporate facts and evidence into our surgical judgment as well as recommendations to our patients.

While acknowledging that the technical aspects of surgery are its distinguishing framework of our profession, the art and judgment of surgery requires an in depth knowledge of biology, anatomy, pathophysiology, clinical science, surgical outcomes and complications that distinguishes the theme of this book. This knowledge is essential to assure us that we are we doing the right operation, at the right time, and in the right patient. In turn, that knowledge is essential to take into account how surgical treatment interfaces with the correct sequence and combination with other treatment modalities. It is also essential to assess the extent of scientific evidence from clinical trials and surgical expertise that is the underpinning of our final treatment recommendation to our patient.

Each time I sit across from a patient to make a recommendation for a surgical treatment, I am basing my recommendation on a “benefit/risk ratio” that integrates scientific evidence, and my intuition gained through experience. That is, do the potential benefits outweigh the potential risks and complications as applied to an individual patient setting? The elements of that benefit/ risk ratio that are taken into account include: the natural history of the disease, the stage/extent of disease, scientific and empirical evidence of treatment outcomes, quality of life issues (as perceived by the patient), co-morbidity that might influence surgical outcome, risks and complications inherent to the operation (errors of commission) and the risk(s) of not proceeding with an operation (errors of omission).

Thus, if we truly want to improve our surgical outcomes, then we must understand and be able to either avoid, or execute sound management of, any complications that occur (regardless of whether they are due to co-morbidity or iatrogenic causes), to get our patient safely through the operation and its post-operative course. These subjects are nicely incorporated into the content of this book.

I highly recommend this book as a practical yet comprehensive treatise for the practicing surgeon and the surgical trainee. It is well organized, written with great clarity and nicely referenced when circumstances require further information.

Charles M. Balch, MD, FACS  
Professor of Surgery  
University of Texas, Southwestern Medical Center,  
Dallas, TX, USA  
Formerly, Professor of Surgery, Johns Hopkins Hospital,  
Baltimore, MD, USA  
Formerly, Executive Vice President and CEO,  
American Society of Clinical Oncology (ASCO)  
Past-President, Society of Surgical Oncology (USA)



## Foreword II

Throughout my clinical academic career I have aspired to improve the quality and safety of my surgical and clinical practice. It is very clear, while reading this impressive collection and synthesis of high-impact clinical evidence and international expert consensus, that in this new textbook, Brendon Coventry has the ambition to innovate and advance the quality and safety of surgical discipline.

In these modern times, where we find an abundance of information that is available through the internet, and of often doubtful authenticity, it is vital that we retain a professional responsibility for the collection, analysis and dissemination of evidenced-based and accurate knowledge and guidance to benefit both clinicians and our patients.

This practical and broad-scoped compendium, which contains over 250 procedures and their related complications and associated risks, will undoubtedly become a benchmark to raise the safety and quality of surgical practice for all that read it. It also manages to succeed in providing a portal for all surgeons, at any stage of their careers, to reflect on the authors' own combined experiences and the collective insights of a strong and influential network of peers.

This text emphasizes the need to understand and appreciate our patients and the intimate relationship that their physiology, co-morbidities and underlying diagnosis can have upon their unique surgical risk with special regard to complications and adverse events.

I recognize that universally across clinical practice and our profession, the evidence base and guidance to justify our decision-making is growing, but there is also a widening gap between what we know and what we do. The variation that we see in the quality of practice throughout the world should not be tolerated.

This text makes an assertive contribution to promote quality by outlining the prerequisite foundational knowledge of surgery, science and anatomy and their complex interactions with clinical outcome that is needed for all in the field of surgery.

I thoroughly recommend this expertly constructed collection. Its breadth and quality is a testament to its authors and editor.

Professor the Lord Ara Darzi, PC, KBE, FRCS, FRS  
Paul Hamlyn Chair of Surgery  
Imperial College London, London, UK  
Formerly Undersecretary of State for Health,  
Her Majesty's Government, UK

## Conditions of Use and Disclaimer

Information is provided *for improved medical education and potential improvement in clinical practice only*. The information is based on composite material from research studies and professional personal opinion and does not guarantee accuracy for any specific clinical situation or procedure. There is also *no express or implied guarantee to accuracy or that surgical complications will be prevented, minimized, or reduced* in any way. The advice is *intended for use by individuals with suitable professional qualifications* and education in medical practice and the ability to apply the knowledge in a suitable manner for a specific condition or disease, and in an appropriate clinical context. The data is complex by nature and open to some interpretation. The purpose is to assist medical practitioners to improve awareness of possible complications, risks or consequences associated with surgical procedures for the benefit of those practitioners in the improved care of their patients. The application of the information contained herein for a specific patient or problem must be performed with care to ensure that the situation and advice is appropriate and correct for that patient and situation. The material is expressly *not for medico-legal purposes*.

The information contained in *Surgery: Complications, Risks and Consequences* is provided for the purpose of improving consent processes in healthcare and in no way guarantees prevention, early detection, risk reduction, economic benefit or improved practice of surgical treatment of any disease or condition.

The information provided in *Surgery: Complications, Risks and Consequences* is of a general nature and is not a substitute for independent medical advice or research in the management of particular diseases or patient situations by health care professionals. It should not be taken as replacing or overriding medical advice.

The Publisher or *Copyright* holder does not accept any liability for any injury, loss, delay or damage incurred arising from use, misuse, interpretation, omissions or reliance on the information provided in *Surgery: Complications, Risks and Consequences* directly or indirectly.

## **Currency and Accuracy of Information**

The user should always check that any information acted upon is up-to-date and accurate. Information is provided in good faith and is **subject to change and alteration without notice**. Every effort is made with *Surgery: Complications, Risks and Consequences* to provide current information, but no warranty, guarantee or legal responsibility is given that information provided or referred to has not changed without the knowledge of the publisher, editor or authors. Always check the quality of information provided or referred to for accuracy for the situation where it is intended to be used, or applied. We do, however, attempt to provide useful and valid information. Because of the broad nature of the information provided incompleteness or omissions of specific or general complications may have occurred and users must take this into account when using the text. No responsibility is taken for delayed, missed or inaccurate diagnosis of any illness, disease or health state at any time.

## **External Web Site Links or References**

The decisions about the accuracy, currency, reliability and correctness of information made by individuals using the *Surgery: Complications, Risks and Consequences* information or from external Internet links remain the individuals own concern and responsibility. Such external links or reference materials or other information should not be taken as an endorsement, agreement or recommendation of any third party products, services, material, information, views or content offered by these sites or publications. Users should check the sources and validity of information obtained for themselves prior to use.

## **Privacy and Confidentiality**

We maintain confidentiality and privacy of personal information but do not guarantee any confidentiality or privacy.

## **Errors or Suggested Changes**

If you or any colleagues note any errors or wish to suggest changes please notify us directly as they would be gratefully received.

# How to Use This Book

This book provides a resource for better understanding of surgical procedures and potential complications in general terms. The application of this material will depend on the individual patient and clinical context. It is not intended to be absolutely comprehensive for all situations or for all patients, but act as a ‘guide’ for understanding and prediction of complications, to assist in risk management and improvement of patient outcomes.

The design of the book is aimed at:

- Reducing Risk and better Managing Risks associated with surgery
- Providing information about ‘general complications’ associated with surgery
- Providing information about ‘specific complications’ associated with surgery
- Providing comprehensive information in one location, to assist surgeons in their explanation to the patient during the consent process

For each specific surgical procedure the text provides:

- Description and some background of the surgical procedure
- Anatomical points and possible variations
- Estimated Frequencies
- Perspective
- Major Complications

From this, a better understanding of the risks, complications and consequences associated with surgical procedures can hopefully be gained by the clinician for explanation of relevant and appropriate aspects to the patient.

The *Estimated frequency lists are not mean’t to be totally comprehensive* or to contain all of the information that needs to be explained in obtaining informed consent from the patient for a surgical procedure. Indeed, *most of the information is for the surgeon* or reader only, *not designed for the patient*, however, parts should be selected by the surgeon at their discretion for appropriate explanation to the individual patient in the consent process.

Many patients would not understand or would be confused by the number of potential complications that may be associated with a specific surgical procedure, so *some degree of selective discussion of the risks, complications and consequences would be necessary and advisable*, as would usually occur in clinical practice. This judgement should necessarily be left to the surgeon, surgeon-in-training or other practitioner.

# Preface

Over the last decade or so we have witnessed a rapid change in the consumer demand for information by patients preparing for a surgical procedure. This is fuelled by multiple factors including the ‘internet revolution’, altered public consumer attitudes, professional patient advocacy, freedom of information laws, insurance issues, risk management, and medicolegal claims made through the legal system throughout the western world, so that the need has arisen for a higher, fairer and clearer standard of ‘*informed consent*’.

One of the my main difficulties encountered as a young intern, and later as a surgical resident, registrar and consultant surgeon, was obtaining information for use for the pre-operative consenting of patients, and for managing patients on the ward after surgical operations. I watched others struggle with the same problem too. The literature contained many useful facts and clinical studies, but it was unwieldy and very time-consuming to access, and the information that was obtained seemed specific to well-defined studies of highly specific groups of patients. These patient studies, while useful, often did not address my particular patient under treatment in the clinic, operating theatre or ward. Often the studies came from centres with vast experience of a particular condition treated with one type of surgical procedure, constituting a series or trial.

What I wanted to know was:

- The **main complications** associated with a surgical procedure;
- **Information that could be provided** during the consent process, and
- How to **reduce the relative risks** of a complication, where possible

This information was difficult to find in one place!

As a young surgeon, on a very long flight from Adelaide to London, with much time to think and fuelled by some very pleasant champagne, I started making some notes about how I might tackle this problem. My first draft was idle scribble, as I listed the ways surgical complications could be classified. After finding over 10 different classification systems for listing complications, the task became much larger and more complex. I then realized why someone had not taken on this job before!

After a brief in-flight sleep and another glass, the task became far less daunting and suddenly much clearer – the champagne was very good, and there was little else to do in any case!

It was then that I decided to speak with as many of my respected colleagues as I could from around the globe, to get their opinions and advice. The perspectives that emerged were remarkable, as many of them had faced the same dilemmas in their own practices and hospitals, also without a satisfactory solution.

What developed was a composite documentation of information (i) from the published literature and (ii) from the opinions of many experienced surgical practitioners in the field – to provide a text to supply information on **Complications, Risks and Consequences of Surgery** for surgical and other clinical practitioners to use at the bedside and in the clinic.

This work represents the culmination of more than 10 years work with the support and help of colleagues from around the world, for the benefit of their students, junior surgical colleagues, peers, and patients. To them, I owe much gratitude for their cooperation, advice, intellect, experience, wise counsel, friendship and help, for their time, and for their continued encouragement in this rather long-term and complex project. I have already used the text material myself with good effect and it has helped me enormously in my surgical practice.

The text aims to provide health professionals with useful information, which can be selectively used to better inform patients of the potential surgical complications, risks and consequences. I sincerely hope it fulfils this role.

Adelaide, SA, Australia

Brendon J. Coventry, BMBS, PhD,  
FRACS, FACS, FRSM



# Acknowledgments

I wish to thank:

The many learned friends and experienced colleagues who have contributed in innumerable ways along the way in the writing of this text.

Professor Sir Peter Morris, formerly Professor of Surgery at Oxford University, and also Past-President of the College of Surgeons of England, for allowing me to base my initial work at the Nuffield Department of Surgery (NDS) and John Radcliffe Hospital in the University of Oxford, for the UK sector of the studies. He and his colleagues have provided encouragement and valuable discussion time over the course of the project.

The (late) Professor John Farndon, Professor of Surgery at the University of Bristol, Bristol Royal Infirmary, UK; and Professor Robert Mansel, Professor of Surgery at the University of Wales, Cardiff, UK for discussions and valued advice.

Professor Charles Balch, then Professor of Surgery at the Johns Hopkins University, Baltimore, Maryland, USA, and Professor Clifford Ko, from UCLA and American College of Surgeons NSQIP Program, USA, for helpful discussions.

Professor Armando Guiliano, formerly of the John Wayne Cancer Institute, Santa Monica, California, USA for his contributions and valuable discussions.

Professor Jonathan Meakins, then Professor of Surgery at McGill University, Quebec, Canada, who provided helpful discussions and encouragement, during our respective sabbatical periods, which coincided in Oxford; and later as Professor of Surgery at Oxford University.

Over the last decade, numerous clinicians have discussed and generously contributed their experience to the validation of the range and relative frequency of complications associated with the wide spectrum of surgical procedures. These clinicians include:

Los Angeles, USA: Professor Carmack Holmes, Cardiothoracic Surgeon, Los Angeles (UCLA); Professor Donald Morton, Melanoma Surgeon, Los Angeles; Dr R Essner, Melanoma Surgeon, Los Angeles.

New York, USA: Professor Murray Brennan; Dr David Jacques; Prof L Blumgart; Dr Dan Coit; Dr Mary Sue Brady (Surgeons, Department of Surgery, Memorial Sloan-Kettering Cancer Centre, New York);

Oxford, UK: Dr Linda Hands, Vascular Surgeon; Dr Jack Collin, Vascular Surgeon; Professor Peter Friend, Transplant and Vascular Surgeon; Dr Nick Maynard, Upper Gastrointestinal Surgeon; Dr Mike Greenall, Breast Surgeon; Dr Jane Clark, Breast Surgeon; Professor Derek Gray, Vascular/Pancreatic Surgeon; Dr Julian Britton, Hepato-Biliary Surgeon; Dr Greg Sadler, Endocrine Surgeon; Dr Christopher Cunningham, Colorectal Surgeon; Professor Neil Mortensen, Colorectal Surgeon; Dr Bruce George, Colorectal Surgeon; Dr Chris Glynn, Anaesthetist (National Health Service (NHS), Oxford, UK).

Bristol, UK: Professor Derek Alderson.

Adelaide, Australia: Professor Guy Ludbrook, Anesthetist; Dr Elizabeth Tam, Anesthetist.

A number of senior medical students at the University of Adelaide, including Hwee Sim Tan, Adelaine S Lam, Ramon Pathi, Mohd Azizan Ghzali, William Cheng, Sue Min Ooi, Teena Silakong, and Balaji Rajacopalin, who assisted during their student projects in the preliminary feasibility studies and research, and their participation is much appreciated. Thanks also to numerous sixth year students, residents and surgeons at Hospitals in Adelaide who participated in questionnaires and surveys.

The support of the University of Adelaide, especially the Department of Surgery, and Royal Adelaide Hospital has been invaluable in allowing the sabbatical time to engineer the collaborations necessary for this project to progress. I thank Professors Glyn Jamieson and Guy Maddern for their support in this regard.

I especially thank the Royal Australasian College of Surgeons for part-support through the Marjorie Hooper Fellowship.

I thank my clinical colleagues on the Breast, Endocrine and Surgical Oncology Unit at the Royal Adelaide Hospital, especially Grantley Gill, James Kollias and Melissa Bochner, for caring for my patients and assuming greater clinical load when I have been away.

Professor Bill Runciman, Australian Patient Safety Foundation, for all of his advice and support; Professors Cliff Hughes and Bruce Barraclough, from the Royal Australasian College of Surgeons, the Clinical Excellence Commission, New South Wales, and the Australian Commission (Council) on Safety and Quality in Healthcare.

Thanks too to Kai Holt, Anne-Marie Bennett and Carrie Cooper who assisted and helped to organise my work. I also acknowledge my collaborator Martin Ashdown for being so patient during distractions from our scientific research work. Also to Graeme Cogdell, Imagart Design Ltd, Adelaide, for his expertise and helpful discussions.

I particularly thank Melissa Morton and her global team at Springer-Verlag for their work in preparing the manuscript for publication.

Importantly, I truly appreciate and thank my wife Christine, my four children and our parents/ wider family for their support in every way towards seeing this project through to its completion, and in believing so much in me, and in my work.

Adelaide, SA, Australia

Brendon J. Coventry, BMBS, PhD,  
FRACS, FACS, FRSM

# Contents

<b>1 Introduction</b> .....	1
Brendon J. Coventry	
<b>2 Colorectal Surgery</b> .....	3
Bruce Waxman, Brendon J. Coventry, David Wattachow, and Clifford Ko	
<b>3 Anal Surgery</b> .....	71
Bruce Waxman and Brendon J. Coventry	
<b>4 Pilonidal Sinus Surgery</b> .....	99
Bruce Waxman and Brendon J. Coventry	
<b>5 Penile, Scrotal, and Testicular Surgery</b> .....	109
Brendon J. Coventry and Villis Marshall	
<b>Index</b> .....	133



# Contributors

**Brendon J. Coventry, BMBS, PhD, FRACS, FACS, FRSM** Discipline of Surgery, Royal Adelaide Hospital, University of Adelaide, Adelaide, SA, Australia

**Clifford Y. Ko, MD, MS, MSHS** Division of Research and Optimal Patient Care, American College of Surgeons, Chicago, IL, USA

**Villis Marshall, MD, FRACS** Department of Surgery, The University of Adelaide, Royal Adelaide Hospital, Adelaide, Australia

**David Wattoo, BM, BS, PhD, FRACS** Department of Surgery, Flinders Medical Centre, Bedford Park, Australia

**Bruce Waxman, BMedSc, MBBS, FRACS, FRCS(Eng), FACS** Academic Surgical Unit, Monash University, Monash Health and Southern Clinical School, Dandenong, VIC, Australia