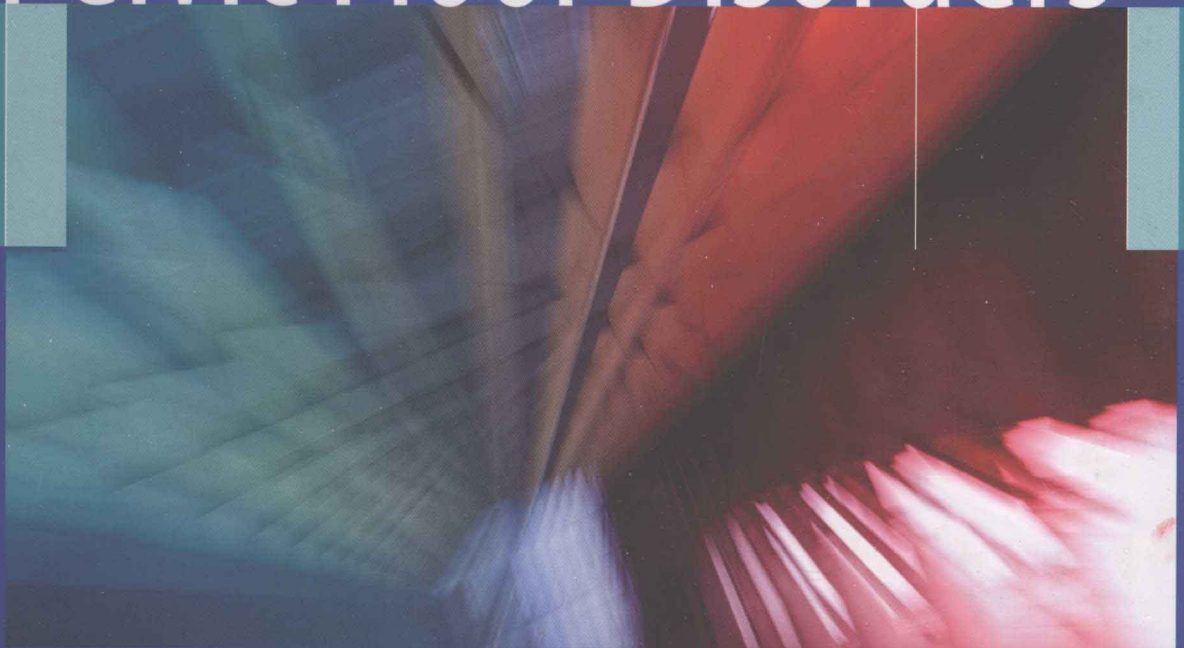


Giulio A. Santoro  
Andrzej P. Wiczorek  
Clive I. Bartram  
*Editors*

# Pelvic Floor Disorders



Imaging and Multidisciplinary Approach to Management

*Forewords by*

Jim Fleshman • András Palkó • Peter K. Sand

 Springer

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# Pelvic Floor Disorders

Imaging and Multidisciplinary Approach  
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Peter K. Sand



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*The glory of medicine is that it is constantly moving forward,  
that there is always more to learn.*

William J. Mayo (1861-1939)

*To the most important people in my life – my wife Anna and my children  
Giuseppe, Paolo, and Marco for their love and support*

*To my mother and my father, to whom I will be eternally grateful*

*To the memory of my friend Bjorn Fortling*

G.A. Santoro

*To my family*

C.I. Bartram

*To my family*

A.P. Wieczorek

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## Foreword

Drs. Santoro, Wieczorek, and Bartram have honored me by asking me to write the foreword for this comprehensive text about pelvic floor disorders. The editors have raised the bar for the rest of us with this new publication. In the past, rectal and anal issues with pelvic disorders have been evaluated separately, away from urologic and gynecologic issues. Other books have addressed these issues in more isolated format. In this comprehensive text, the anterior and posterior pelvis are evaluated and managed as a unit, with obvious improvement in our approach to both areas.

*Pelvic Floor Disorders* provides us with the theory behind disorders, the normal and abnormal functional issues, as well as testing and imaging methodology. Not since the classic *Coloproctology and the Pelvic Floor* by Henry and Swash, has there been a textbook that dealt so thoroughly with the specifics of pelvic floor diseases or disorders. The book contains everything that any starting colon and rectal surgeon will need to develop a practice in pelvic floor disorders, as well as being a reference book for those of us who have been experts in the pelvic floor for many years.

The book is extremely thorough, with comprehensive coverage of all approaches, new technology, and practical guides to performance of specific procedures. The step-by-step description of operations, with excellent intraoperative photographs, make this almost an atlas of techniques. The outstanding quality of reproduced images from ultrasonography and magnetic resonance imaging allows us to compare the imaging modalities to the illustration models, which use different colors to make anatomic relationships easy to comprehend.

The book is well referenced, with an extensive up-to-date bibliography for each chapter. The editors have gathered a spectacular collection of expert international authors. The table of contents is clear and well organized, and the chapters are of manageable length with the latest of techniques and references. This will be a must-have and must-read text for all of us who deal with pelvic floor abnormalities. I want to congratulate the editors on a job well done and look forward to this as a beginning of a longstanding educational effort on their behalf as we see edition after edition in the future.

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Professor of Surgery, Chief of Colon and Rectal Surgery  
Washington University in St Louis, MO, USA  
Past-President of American Society of Colon and Rectal Surgeons*

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## Foreword

The pelvic floor is a rather complex system, comprising active and passive components, bestowing mechanical support but at the same time preserving continence and managing coordinated relaxation during bladder and bowel voiding. Its malfunction may manifest in the form of pain, constipation, incontinence, and prolapse.

As a result of increasing awareness of clinical conditions resulting from dysfunction and anatomical disorders of the pelvic floor, with respect to the rather high, although frequently hidden, prevalence of these changes that compromise the quality of life of many patients, together with the rapidly developing and increasingly widely available technical-technological solutions, pelvic floor imaging has become an extensively required segment of imaging diagnostics. However, some of the techniques are available at relatively few centers only, and members of the community of radiologists, including even specialists of abdominal and urogenital imaging, are far less aware of the therapeutic and diagnostic implications of these conditions than their significance deserves.

A group of renowned experts, as editors and authors, with the assistance of many professionals from different fields of medicine, have thus chosen the optimal time and format to present most diagnostic and therapeutic aspects of pelvic floor disorders. The decision to discuss the subject in such a comprehensive structure, compiling not only the traditional radiological but also the clinical approach, has been highly fruitful; as a result, the content of the volume covers not only the imaging but also the clinical management of this condition and, beyond this, it presents the topic in a “multicompartmental”, integrated fashion. The conventional “setting the ground” chapters (anatomy, ultrasonographic and magnetic resonance anatomy of the pelvic floor) are followed by those describing not only the multimodality imaging (with special emphasis on multiplanar visualization), but also the multidisciplinary management of pathologic conditions affecting one or more of the pelvic compartments (damage caused by childbirth, urinary incontinence and voiding dysfunctions, fecal incontinence, pelvic organ prolapse, pelvic pain, fistulae and the diagnostics and management of complications of surgery).

The target group of this volume therefore includes interested radiologists, but the book reaches beyond this expert group and encourages clinicians to better understand not only the reports but also the images resulting from ultrasonographic and/or magnetic resonance imaging of the pelvic structures, which is necessary to fully understand the diagnostic capacity (and of course the limitations) of these modalities. While these examinations may today be considered as “exotic” by many radiologists and clinicians, proper training, standardized imaging and evaluation technique, and well-established diagnostic and therapeutic protocols will shift their

performance from the art of a few talented experts to the routine of many abdominal and urogenital imaging specialists.

The need for detailed anatomical and functional imaging of the pelvic floor structures is likely to increase, on the one hand because of the growing patient and physician consciousness, on the other hand because of the improvement in available therapeutic solutions. Since this book fills a void in the current literature, giving those interested in the topic the opportunity to have an up-to-date source of knowledge, it may be offered for thorough reading not only to radiologists and other experts deeply immersed in this special segment of their profession, but also to all those interested in new developments of their discipline.

*Prof. Dr. András Palkó PhD*  
*Head and Chairman of the Department of Radiology,*  
*University of Szeged, Hungary*  
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## Foreword

This new book *Pelvic Floor Disorders*, is an exciting, novel contribution by Drs. Giulio Aniello Santoro, Andrzej Paweł Wieczorek, and Clive Bartram that should greatly add to our understanding of diagnosing and treating women with pelvic floor dysfunction. This is a unique contribution that has brought together experts from around the world from multiple disciplines (urogynecology, urology, colorectal surgery, radiology, physical therapy, gynecology, and oncology), to give their opinions on how to diagnose urinary and fecal incontinence, fistulae, pelvic pain, and prolapse. This multidisciplinary approach and commentary from subspecialists in different fields offers the reader a different perspective than textbooks that just present the opinion of one specialty. This is further enhanced by the integration of imaging chapters covering all aspects of pelvic floor dysfunction.

This multidisciplinary approach, with authors recruited from all around the world, is particularly attractive to me. As a member of the International Urogynecological Association for the last 25 years, and the current president of this organization, I have learned the importance of soliciting opinions and knowledge from specialists throughout the world. The tendency of editors to publish work that just represents singular provincial views from one nation or continent often cheats readers of knowledge and different perspectives from different parts of the world. While subspecialists often share many common approaches to the diagnosis and treatment of pelvic floor dysfunction around the world, the subtle differences to the approach to these problems can improve the care of women being treated for pelvic floor dysfunction around the globe. However, without books like *Pelvic Floor Disorders* or participation in international organizations, like the International Urogynecological Association, many clinicians would never be exposed to the diversity of opinions and approaches to all of these disorders. These three editors from different countries and backgrounds are to be complimented for their foresight in preparing an excellent book and soliciting contributions from experts from around the world with diverse perspectives. It is an excellent book that sets a new standard for diversity.

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## Preface

Major developments in medicine over last few years have resulted in more reliable and accessible diagnostics and treatment of pelvic floor disorders. A unique aspect of the pelvic floor is the number of specialties involved (urology, gynecology, gastroenterology, colorectal surgery, radiology, rehabilitation medicine) and how often patients have problems that transgress the boundaries of any single specialty. Given the complex multicompartamental physiopathology of pelvic floor disorders, we felt that the approach in this volume should not be limited to the assessment of one compartment but should involve the three compartments (anterior, central, and posterior) in an integrated fashion. The subtitle of this book “Imaging and Multidisciplinary Approach to Management” encompasses this concept of cutting across boundaries to expand our knowledge base with regard to both imaging and the clinical management of incontinence, prolapse, pelvic pain, and fistula. We have endeavored, with the help of an international group of contributors, to provide an up-to-date and authoritative account of the imaging and clinical issues involved in the expert management of pelvic floor disorders.

Our starting point (Section I) is the anatomy of the pelvic floor, and this section addresses not only what it is in anatomical terms, but also how it works throughout life, with chapters on its musculo-elastic and neurophysiological control, and the changes associated with ageing and the menopause.

Imaging, particularly ultrasonography and magnetic resonography, knows no bounds and will take the specialist into regions of the pelvis that may be unfamiliar territory. Many clinicians undertake their own ultrasonography, and the whole of Section II is devoted to the various techniques (conventional two-dimensional, and three/four-dimensional endovaginal, endoanal, and transperineal ultrasonography) that may be employed to image the pelvic floor, in the hope that more clinicians will be encouraged to expand their repertoire of these more specialized examinations. Standardization of these techniques, fundamental for reliability and repeatability, the development of new software options, and increasing availability of training, will take pelvic floor ultrasonography from a niche application and lead to more general acceptance of this modality as a standard diagnostic option in pelvic floor disorders. Considerable space has been dedicated to drawings illustrating anatomy and techniques and to two-dimensional and three-dimensional echographic images, in order to help the reader to learn how to see and interpret ultrasound images, and provide more experienced examiners with an opportunity to review and reassess their techniques.

Childbirth represents the single most important cause of damage to the female pelvic floor, and in recognition of this, Section III is devoted to the mechanisms

involved and preventative measures. The next three sections (Sections IV, V, and VI) focus on urinary incontinence and voiding dysfunction, fecal incontinence, and pelvic organ prolapse, considered as a global entity. Surgical principles of reconstructive surgery are aimed at either restoring anatomy with a presumed restoration of function, or creating compensatory anatomical mechanisms. Thus far, decision making in relation to operative treatment has been based mainly on clinical assessment. The purpose of these sections is to describe how pelvic floor imaging, providing an extensive understanding of the pathomorphologic changes leading to these disorders, influences the selection of different forms of treatment. An important feature throughout is that every section, or group of chapters, is accompanied by an invited commentary. We hope that these expert overviews may highlight and balance the individual contributions, to add to the reader's depth of understanding.

Two issues that often cause undue concern in management and tend to be overlooked in the literature are pelvic pain and what to do when it all goes wrong surgically. These are dealt with in detail in Sections VII and Section IX, to complete what the editors trust is an interesting and very practical work to further our knowledge and care of these disorders.

We wish to express our deep appreciation to Springer-Verlag for supporting the idea of publishing a book in such an innovative form. Special thanks are due to Dr. Alessandra Born, a representative of the publisher, for her constant assistance throughout the development of the project, organizing every stage of the editorial work. Special acknowledgements must be given to the authors, who are among the foremost experts with outstanding qualifications in this complex field, and who have contributed to the many diverse chapters and provided critical commentaries of the individual sections of this volume. Without their experience and cooperation, this book would not have been possible. Further, thanks must go to our hospitals, whose advanced technological support made it possible to accomplish this new project, to the medical illustrators Mrs. Nadia Simeoni, Lisa Belhange, and Primal Pictures, who have created the numerous artistic drawings, and to Mr. Steffen Jorgensen, Mr. Gert Karlsson, and Mrs. Anne Mitchell of B-K Medical, for gathering much of the data and photographic material showing the technological equipment as well as for their contribution to organizing meetings of the editors' team.

We are confident that this textbook will be met with great interest from all clinicians involved in the care of patients suffering from pelvic floor disorders.

*London, May 2010*

*Giulio Aniello Santoro  
Andrzej Paweł Wieczorek  
Clive I. Bartram*

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