
Pelvic Dysfunction in Men

Diagnosis and Treatment of Male Incontinence and Erectile Dysfunction

A textbook for physiotherapists,
nurses and doctors

Professor Grace Dorey, PhD, FCSP

Professor of Physiotherapy, University of the West of England, Bristol

Senior Research Fellow, University of Aberdeen

Extended Scope Practitioner, North Devon District NHST Hospital, Barnstaple

Consultant Physiotherapist, The Somerset Nuffield Hospital, Taunton



John Wiley & Sons, Ltd

Pelvic Dysfunction in Men

Pelvic Dysfunction in Men

Diagnosis and Treatment of Male Incontinence and Erectile Dysfunction

A textbook for physiotherapists,
nurses and doctors

Professor Grace Dorey, PhD, FCSP

Professor of Physiotherapy, University of the West of England, Bristol

Senior Research Fellow, University of Aberdeen

Extended Scope Practitioner, North Devon District NHST Hospital, Barnstaple

Consultant Physiotherapist, The Somerset Nuffield Hospital, Taunton



John Wiley & Sons, Ltd

Copyright © 2006

John Wiley & Sons Ltd
The Atrium, Southern Gate, Chichester,
West Sussex PO19 8SQ, England
Telephone (+44) 1243 779777

Email (for orders and customer service enquiries): cs-books@wiley.co.uk
Visit our Home Page on www.wiley.com

All Rights Reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except under the terms of the Copyright, Designs and Patents Act 1988 or under the terms of a licence issued by the Copyright Licensing Agency Ltd, 90 Tottenham Court Road, London W1T 4LP, UK, without the permission in writing of the Publisher. Requests to the Publisher should be addressed to the Permissions Department, John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England, or emailed to permreq@wiley.co.uk, or faxed to (+44) 1243 770620.

Designations used by companies to distinguish their products are often claimed as trademarks. All brand names and product names used in this book are trade names, service marks, trademarks or registered trademarks of their respective owners. The Publisher is not associated with any product or vendor mentioned in this book.

This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is sold on the understanding that the Publisher is not engaged in rendering professional services. If professional advice or other expert assistance is required, the services of a competent professional should be sought.

Other Wiley Editorial Offices

John Wiley & Sons Inc., 111 River Street, Hoboken, NJ 07030, USA
Jossey-Bass, 989 Market Street, San Francisco, CA 94103-1741, USA
Wiley-VCH Verlag GmbH, Boschstr. 12, D-69469 Weinheim, Germany
John Wiley & Sons Australia Ltd, 42 McDougall Street, Milton, Queensland 4064, Australia
John Wiley & Sons (Asia) Pte Ltd, 2 Clementi Loop #02-01, Jin Xing Distripark, Singapore 129809
John Wiley & Sons Canada Ltd, 6045 Freemont Blvd, Mississauga, ONT L5R

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Library of Congress Cataloging-in-Publication Data

Dorey, Grace.

Pelvic dysfunction in men : diagnosis and treatment of male incontinence and erectile dysfunction : a textbook for physiotherapists, nurses and doctors / Grace Dorey.
p. ; cm.

Includes bibliographical references and index.

ISBN-13: 978-0-470-02836-0 (alk. paper)

ISBN-10: 0-470-02836-X (alk. paper)

1. Urinary incontinence--Diagnosis. 2. Urinary incontinence--Treatment. 3. Impotence--Diagnosis. 4. Impotence--Treatment.

[DNLM: 1. Urinary Incontinence--diagnosis. 2. Impotence--diagnosis. 3. Impotence--therapy. 4. Urinary Incontinence--therapy. WJ 146 D695p 2006] I. Title.

RC921.I5D67 2006

616.6'2--dc22

2006004909

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

ISBN - 13 978-0-470-02836-0

ISBN - 10 0-470-02836-X

Typeset by SNP Best-set Typesetter Ltd., Hong Kong
Printed and bound in Great Britain by TJ International Ltd, Padstow, Cornwall

This book is printed on acid-free paper responsibly manufactured from sustainable forestry in which at least two trees are planted for each one used for paper production.

Dedication

To my friend and physiotherapy colleague Claire Oldroyd, who referred my first male urology patient to me in 1996.

To Dr John Oldroyd, my first male urology patient, a delightful man who inspired me to research the subject in greater depth.

Contents

List of Figures xiii

List of Tables xvii

Preface xix

Acknowledgements xxi

1 History of the Male Pelvic Floor 1

- Introduction 1
- Physiotherapy development 1
- Assessment of the male pelvic floor 2
- Pelvic floor exercises 3
- Posture 3
- Detrusor underactivity 3
- Detrusor overactivity 4
- Nocturnal enuresis 5
- Post-prostatectomy incontinence 5
- Post-micturition dribble 6
- Constipation 6
- Faecal incontinence 7
- Erectile dysfunction 7
- Conclusion 8

2 Lower Urinary Tract Symptoms 9

- Male lower urinary tract symptoms 9
- Male questionnaires 10
- Prevalence of lower urinary tract symptoms 12
- Summary 13

3 Anatomy and Physiology of the Lower Urinary Tract 15

- Male lower urinary tract 15
- Prostate gland 17
- Pelvic floor muscles 18
- Penis 22
- Nerve supply to the urinary system 22
- Congenital abnormalities 24
- Summary 27

- 4 Nervous Control of Lower Urinary Tract Function 29**
Introduction 29
Urinary continence 29
Micturition cycle 29
Neurological control of the bladder 31
Integral bladder storage and voiding reflexes 33
Summary 35
- 5 Prostate Conditions and their Treatment 37**
Investigations for prostate conditions 37
Benign prostatic hyperplasia 38
Prostate cancer 40
Prostatitis 41
Summary 41
- 6 Urinary Incontinence 43**
Definition of urinary incontinence 43
Prevalence of urinary incontinence in men 43
Incidence of urinary incontinence following transurethral resection of the prostate 44
Incidence of urinary incontinence following radical prostatectomy 44
Classification of lower urinary tract symptoms 45
Storage symptoms 45
Voiding symptoms 47
Post-micturition symptoms 47
Signs suggestive of lower urinary tract dysfunction 47
Urodynamic terminology 50
Summary 51
- 7 Pelvic Pain in Men 53**
Introduction 53
Definitions of pelvic pain 53
Acute pelvic pain 54
Chronic pelvic pain syndromes 54
Penile pain 54
Prostatitis 55
Sexual pain 55
Incidence of pelvic pain 55
Aetiology of acute pelvic pain 56
Aetiology of chronic pelvic pain 57
Assessment of pelvic pain 58
Treatment of acute pelvic pain 58
Treatment of chronic pelvic pain 58
Summary 61

- 8 Patient Assessment 63**
 - Introduction 63
 - Subjective assessment 63
 - Bowel activity 65
 - Objective assessment 69
 - Urodynamics 70
 - Summary 74
- 9 Conservative Treatment 75**
 - Conservative treatment for men with lower urinary tract symptoms 75
 - Stress urinary incontinence 77
 - Urge urinary incontinence 87
 - Post-prostatectomy incontinence 90
 - Post-micturition dribble 91
 - Chronic retention of urine 91
 - Extra-urethral urinary incontinence 93
 - Functional incontinence 94
 - Follow-up treatment 94
 - Treatment outcomes 94
 - Prevention of urinary incontinence 94
 - Pads 94
 - Appliances 96
 - Skin care 96
 - Research opportunities 97
 - Case studies: Questions and answers 98
 - Summary 100
- 10 Literature Review of Treatment before and after Prostatectomy 101**
 - Introduction 101
 - Literature search 102
 - Results 103
 - Conclusions 111
- 11 Treatment of Post-prostatectomy Patients 113**
 - Introduction 113
 - Assessment 113
 - Treatment 114
 - Post-prostatectomy complications 117
 - Post-prostatectomy erectile dysfunction 119
 - Summary 120
 - Frequently asked questions 120
- 12 Medication 123**
 - Introduction 123

- Pharmacotherapy for detrusor overactivity 124
- Pharmacotherapy for stress urinary incontinence 126
- Pharmacotherapy for nocturnal enuresis 127
- Medication for nocturia 127
- Medication which may have an adverse effect on lower urinary tract function 128
- Medication which reduces the size of the prostate gland 130
- Medication which relaxes the smooth muscle of the bladder neck 130
- Medication for prostate cancer 130
- Medication for hypocontractile bladder 131
- Medication for erectile dysfunction 131
- Medication which changes the colour of the urine 131
- Summary 131
- 13 Faecal Incontinence 133**
 - Introduction 133
 - Digestive system 133
 - Defaecation 134
 - Pelvic floor muscles 134
 - Causes of faecal leakage 137
 - Treatment for faecal leakage 138
 - Summary 144
- 14 Male Sexual Dysfunction 145**
 - Introduction 145
 - Low libido 145
 - Erectile dysfunction 146
 - Orgasmic and ejaculatory disorders 153
 - Anejaculation 154
 - Retrograde ejaculation 155
 - Retarded ejaculation 156
 - Premature ejaculation 157
 - Aspermia 158
 - Haemospermia 158
 - Low-volume ejaculate 159
 - Painful ejaculation 159
 - Anhedonia 159
 - Sexual pain 160
 - Summary 160
- 15 Treatment of Male Sexual Dysfunction 161**
 - Introduction 161
 - Low libido 161
 - Erectile dysfunction 162

Literature review of physical therapy for erectile dysfunction	163
Premature ejaculation	174
Conclusions	176
16 Setting up a Continence Service	177
Introduction	177
Integrated continence services	177
Director of continence services	179
Contacts for specialist groups	182
Suppliers	183
Helplines for men in the UK	183
Books and videos for professionals	185
Books for patients	186
Video for patients	187
Summary	187
Appendix: Male Continence Assessment Form	189
Glossary	197
References	201
Index	217

List of Figures

1. HISTORY OF THE MALE PELVIC FLOOR

- 1.1 Male pelvic floor muscles 2
- 1.2 Early pelvic floor exercises 4

3. ANATOMY AND PHYSIOLOGY OF THE LOWER URINARY TRACT

- 3.1 Male pelvic viscera 16
- 3.2 Male lower urinary tract 16
- 3.3 Prostate gland 17
- 3.4 Superior view of the deep pelvic floor muscles 18
- 3.5 Inferior view of the deep pelvic floor muscles 19
- 3.6 Male superficial pelvic floor muscles 21
- 3.7 Preganglionic and postganglionic neurotransmitters 23
- 3.8 Sacral dermatomes 24
- 3.9 Hypospadias 24
- 3.10 Epispadias 25
- 3.11 Exstrophy of the bladder 25
- 3.12 Megaureter 26

4. NERVOUS CONTROL OF LOWER URINARY TRACT FUNCTION

- 4.1 Bladder filling 30
- 4.2 Bladder voiding 31
- 4.3 Neurological control of the bladder 32
- 4.4 Reflexes of the bladder and sphincters 34

5. PROSTATE CONDITIONS AND THEIR TREATMENT

- 5.1 Uroflowmeter 38
- 5.2 Benign prostatic hyperplasia 39
- 5.3 Prostate cancer 40

6. URINARY INCONTINENCE

- 6.1 Stress urinary incontinence following transurethral resection of prostate 46
- 6.2 Urge urinary incontinence 46

8. PATIENT ASSESSMENT

- 8.1 Normal flow curve 71
- 8.2 Reduced flow due to obstruction or poor bladder contraction 71
- 8.3 Normal cystometrogram trace 72
- 8.4 Cystometrogram showing detrusor overactivity 73
- 8.5 Cystometrogram showing stress urinary incontinence 73

9. CONSERVATIVE TREATMENT

- 9.1 Male superficial pelvic floor muscles 78
- 9.2 Perineometer with anal pressure probe 82
- 9.3 Computerised biofeedback equipment 82
- 9.4 Anal pressure probe 83
- 9.5 Anal probe for EMG or electrical stimulation 84
- 9.6 Position of surface sensors for EMG biofeedback 84
- 9.7 EMG biofeedback shown on a computer screen 85
- 9.8 Position of surface electrodes for electrical stimulation 86
- 9.9 Artificial urinary sphincter 93
- 9.10 Dribble pouch 95
- 9.11 Shaped incontinence pad 95
- 9.12 Sheath and leg bag 96
- 9.13 Penile clamp 97

10. LITERATURE REVIEW OF TREATMENT BEFORE AND AFTER PROSTATECTOMY

- 10.1 Male pelvic floor muscles 102

11. TREATMENT OF POST-PROSTATECTOMY PATIENTS

- 11.1 Monthly urinary leakage during pelvic floor muscle training commenced one year after prostatectomy 118

13. FAECAL INCONTINENCE

- 13.1 Alimentary canal 134
- 13.2 Defaecation 135
- 13.3 Squeezing the anal sphincter to postpone defaecation 135
- 13.4 Rectal prolapse 136
- 13.5 Bristol Stool Form Scale 140

14. MALE SEXUAL DYSFUNCTION

- 14.1 Anatomy of the penis 149
- 14.2 Cross-section of the penis 150
- 14.3 Venio-occlusive mechanism of penile erection 151
- 14.4 Male superficial pelvic floor muscles 153

15. TREATMENT OF MALE SEXUAL DYSFUNCTION

- 15.1 Changes in KEED at 3 months compared to baseline 169
- 15.2 Mean erectile function domain of IIEF scores for both groups at each assessment 170
- 15.3 Suggested algorithm for treatment of erectile dysfunction 173

List of Tables

2. LOWER URINARY TRACT SYMPTOMS

- 2.1 Lower urinary tract symptoms in men 10
- 2.2 Age-specific prevalence of men with moderate to severe LUTS 12

3. ANATOMY AND PHYSIOLOGY OF THE LOWER URINARY TRACT

- 3.1 The prevalence of clinical BPH and symptoms with ageing 17

6. URINARY INCONTINENCE

- 6.1 Definitions of the classification and aetiology of nocturia 48
- 6.2 Major factors associated with nocturia 49
- 6.3 Causes of nocturnal polyuria 49

8. PATIENT ASSESSMENT

- 8.1 Bladder diary of a man with stress urinary incontinence 67
- 8.2 Bladder diary of a man with urge urinary incontinence 68
- 8.3 Assessment of male pelvic floor muscle strength 71

9. CONSERVATIVE TREATMENT

- 9.1 Physiotherapy treatment for urinary incontinence in men 76
- 9.2 Components of fitness ('S' factors) 79
- 9.3 Contraindications for electrical stimulation 86
- 9.4 Urge-suppression techniques 88
- 9.5 Skin care for incontinent patients 97

10. LITERATURE REVIEW OF TREATMENT BEFORE AND AFTER PROSTATECTOMY

- 10.1 Levels of evidence 103
- 10.2 Review of RCTs using pelvic floor muscle training before and after prostatectomy 104

11. TREATMENT OF POST-PROSTATECTOMY PATIENTS

- 11.1 Problems which may arise following prostatectomy 117

12. MEDICATION

- 12.1 Medication which may have an adverse effect on lower urinary tract function 128

13. FAECAL INCONTINENCE

- 13.1 How to avoid constipation 139
- 13.2 Effect of different foods on stool formation 141
- 13.3 Advice for men with faecal incontinence 143

14. MALE SEXUAL DYSFUNCTION

- 14.1 Risk factors for erectile dysfunction 148
- 14.2 Classification of the psychological causes of erectile dysfunction 149

15. TREATMENT OF MALE SEXUAL DYSFUNCTION

- 15.1 Levels of evidence 164
- 15.2 Literature review of physical therapy for erectile dysfunction 165
- 15.3 Literature review of physical therapy for premature ejaculation 175

16. SETTING UP A CONTINENCE SERVICE

- 16.1 Interdisciplinary team involved in a continence service 179

Preface

This textbook follows my first textbook published in 2001 entitled *Conservative Treatment of Male Urinary Incontinence and Erectile Dysfunction*. It contains seven new chapters and existing chapters have been extensively updated. It is written primarily for those specialist continence physiotherapists who are unsure of the treatment for male patients with lower urinary tract symptoms. It will be a useful reference tool for urology nurses, continence specialist nurses and continence advisors; and those medical students, student nurses and physiotherapy students suddenly finding themselves on a urology placement. It will provide a greater knowledge of conservative treatment in this speciality for urologists and GPs. Where possible, the information is based on the current literature, even though this remains sparse in some areas. The avid reader and the questioning research student may find the references provide further, fascinating and more in-depth reading.

There is a new chapter concerning the history of the male pelvic floor. Our understanding of the male pelvic floor has evolved over more than two thousand years. Gradually medical science has sought to dispel ancient myths and untruths.

Background details concerning the prevalence of male lower urinary tract symptoms, the anatomy and physiology of the pelvic floor and the physiology of the continence mechanism are provided in order to understand the dysfunction that can occur. A new chapter entitled 'Nervous control of lower urinary tract function' provides current thinking and new diagrams concerning bladder and sphincter reflexes.

The different prostatic conditions are covered in detail, plus the range of standardised medical and surgical investigations and treatments. The classification of male urinary incontinence has been restructured in line with the International Continence Society standardisation of terminology. The subjective and objective physiotherapy assessment is covered chronologically, to enable the clinician to conduct a meaningful investigation and arrive at a logical diagnosis.

Recommended therapeutic options are provided for each type of incontinence, with a range of patient advice added for completeness. Treatment outcomes, which may vary considerably, are discussed. Following the treatment chapter, there are case studies, which provide question and answer sessions for the student to check their knowledge base.

There are two new chapters covering the conservative treatment of men who have experienced prostate surgery. The first of these chapters reviews

the evidence from randomised controlled trials for post-prostatectomy patients. The second chapter provides details of treatment regimes for these men.

There is a novel chapter detailing treatment regimes for men with faecal incontinence.

There are two new chapters covering the conservative treatment for men with sexual dysfunction. The first of these chapters explains the range of sexual dysfunction in men. The second chapter provides details of treatment regimes for these men based on current evidence from literature reviews.

The Appendix includes an updated male continence assessment form.

In the Glossary at the end of the book, definitions have been added to explain the medical jargon, as some readers may not have a medical background, while others may lack knowledge of some of the obscure urology terminology.

I hope you will find this book interesting, informative and a useful reference source. Enjoy your studies.

Indeed, it is the book that I would have welcomed before embarking on my MSc. It contains information which I have gathered, analysed and compiled over the last nine years.

Acknowledgements

I would like to acknowledge the help of some very special people. I am indebted to Debbie Rigby, Stephanie Knight, Professor Michael Craggs, Mr Raj Persad, Jane Dixon, Tracy James and Jeannie Smith for their contribution, wisdom and guidance. Importantly, I would like to thank my son, Martin, and daughter, Claire, for the support and encouragement they have given me in my chosen field and my daughter, Claire, for her accurate anatomical illustrations.

Grace Dorey

Illustrator

Claire Dorey, BA

