Andrology in its widest sense is a fast growing medical discipline with special emphasis on the disturbances of male reproductive function including erectile dysfunction and problems of the ageing male. There is a great need to educate both the specialists who practise as andrologists, such as endocrinologists, urologists and dermatologists, as well as the general practitioner, who is often involved in the management of these patients. Three international scientists from different medical disciplines (dermatology, endocrinology and urology) have created an alternative to a classical textbook by providing a new format in this book to facilitate the review of information in the field provided by a large number of international experts.

This textbook is written in two parts. Part I provides easily accessible, brief, problem-oriented information about modern andrology including male factor infertility, male contraception, male genital tract infection and tumours. The book is intended to be of use to the busy clinician and to provide quick access to didactic information about current practice. Part II is subject-oriented and provides the background scientific information for the recommendations in Part I. The three editors are recognized experts in the field and have invited key international scientists to write various sections of this book but, by their extensive sub-editing, have created a homogeneous concept. The key features of this book are the clear recommendations about current practice and easy access to the underlying science. I have no doubt that this textbook will be an asset to the clinical andrologist by facilitating information on to the rapidly increasing scientific data in the fast growing field of andrology.

It is the aim of this textbook to reach doctors working in the field of andrology all over the world but should be of particular value in European countries. The book will be valuable for urologists, andrologists, dermatologists, endocrinologists, gynaecologists, reproductive biologists, general practitioners, gerontologists, psychologists, psychiatrists, paediatricians and paramedicals including all professions allied to medicine as well as pharmaceutical companies working in the field of andrology. I am sure that the book will be a great success and will be of great value to its readers.

David de Kretser
Monash Institute of Medical Research
Monash University, Melbourne
Andrology is the medical practice of disorders that afflict men. These include congenital and acquired abnormalities of the male reproductive system as well as disorders of the male endocrine system. As these may be treated by different disciplines including endocrinology, dermatology, urological surgery, plastic surgery, oncology, venereology, and sexual medicine, it is difficult for doctors in these various specialties to have a holistic view of andrology. We hope that this book will be a source of reference to the broad spectrum of andrological conditions and that it will promote a holistic view of andrology and catalyse interdisciplinary co-operation in the management of andrological disorders.

The book is written in two parts: Part I presents current clinical practice, whereas Part II provides the reader with more detail on the theoretical background. The reader will find chapters on the diagnosis and treatment of disorders of male fertility, disorders of male sexual function, sexually transmitted infections, disorders of androgen status, including ageing changes, and chapters on benign and malignant growths of the male reproductive organs. In addition, we have included chapters on phytotherapeutics and aesthetic dermatology and medical cosmetics because in practice many men seek these treatments and the competent andrologist needs to understand alternative as well as traditional approaches.

Our contributors are from many different countries and each is an acknowledged expert. Wherever possible, reference has been made to the results of randomized clinical trials and it has been our intention that the information in this book should be evidence-based. All contributors were asked to present a comprehensive review of their field as well as their own work.

In previous years, andrological problems have been relatively ignored but this is changing because of the development of effective treatments such as phosphodiesterase inhibitors for erectile dysfunction and 5-α-reductase inhibitors for prostatic enlargement, and as a result, greater media coverage of andrological disorders. Therefore, more men seek treatment and increasingly men expect their clinician to be well informed about all aspects of andrology. We hope that this book will help advance towards that objective.

Wolf-Bernhard Schill, Frank Comhaire, Timothy Hargreave
# Contents

**List of Contributors** ........................................... XXI

**Introduction**

Andrology: Definition, Clinical Issues and Prevalence
W. -B. Schill, F. Comhaire, T. B. Hargreve ........ 1
References .................................................. 3

Layout and How to Use the Book
F. Comhaire ................................................. 4

**General Considerations**

Evidence-Based Medicine in Reproductive Medicine and Andrology
F. Comhaire, A. Mahmoud ......................... 5
References .................................................. 6

Economic Cost and Cost-Effectiveness
F. Comhaire, A. Mahmoud ......................... 7
References .................................................. 9

Ethics of Reproductive Research and Treatment
T. B. Hargreve ............................................... 9
Introduction .................................................. 9
Basic Principles Underlying Ethical Considerations 10
Consent ....................................................... 10
Applying the Principles to Reproductive Medicine 11
Conclusion .................................................... 13
References .................................................... 13

Human Tissue for Research
T. B. Hargreve ............................................... 14

# I Diagnosing and Solving Clinical Problems

## I.1 Problem: Gender Dysphoria and Disorders of Sexual Differentiation

### I.1.1 Gender Dysphoria
G. G. R. T’Sjoen ......................................... 19

### I.1.1.1 Definition ........................................ 19

### I.1.1.2 Aetiology and Pathogenesis .................. 19

### I.1.1.3 Clinical Findings ............................... 19

### I.1.1.4 Treatment ........................................ 20

## I.1.5 Prognosis ............................................ 22
References .................................................. 22

## I.1.2 Disorders of Sexual Differentiation

G. G. R. T’Sjoen ............................................ 23

### I.1.2.1 Definition ........................................ 23

### I.1.2.2 Aetiology and Pathogenesis .................. 23

### I.1.2.3 Classification of Intersex ..................... 23

### I.1.2.4 Clinical Findings ............................... 24

### I.1.2.5 Management ..................................... 24

### I.1.2.6 Prevention ....................................... 25
References .................................................. 25

## I.2 Problem: Abnormal Pubertal Development

S. A. Wudy .................................................. 27

### I.2.1 Physiology .......................................... 27

### I.2.2 Precocious Puberty .............................. 27

### I.2.3 Delayed Puberty ................................... 28
References .................................................. 28

## I.3 Male Factor Fertility Problems

### I.3.1 Consensus-Based Approach to Standardized Diagnosis and Management of the Infertile Male
F. Comhaire, A. Mahmoud ......................... 29
References .................................................. 30

### I.3.2 WHO Recommended Diagnostic Flow Chart
F. Comhaire, A. Mahmoud ......................... 31

### I.3.3 Implications of Multifactorial Aetiology in the Diagnosis and Management of Male Infertility
F. Comhaire, A. Mahmoud ......................... 33
References .................................................. 35

### I.3.4 Sexual Dysfunction and Male Fertility
T. B. Hargreve ............................................... 35

#### I.3.4.1 Definition of the Disease ...................... 35

#### I.3.4.2 Aetiology and Pathogenesis .................. 35

#### I.3.4.3 Clinical Findings: History, Physical Examination, Technical Investigations, Laboratory Findings ......................... 36
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.4.2.3 Clinical Findings: History, Physical Examination, Laboratory</td>
<td>98</td>
</tr>
<tr>
<td>Findings</td>
<td></td>
</tr>
<tr>
<td>I.3.15 Oligo-Astheno-Teratozoospermia with no Demonstrable Cause (Idiopathic O-A-T)</td>
<td>77</td>
</tr>
<tr>
<td>F. Comhaire, A. Mahmoud</td>
<td></td>
</tr>
<tr>
<td>I.3.15.1 Definition of the Disease</td>
<td>77</td>
</tr>
<tr>
<td>I.3.15.2 Aetiology and Pathogenesis</td>
<td>78</td>
</tr>
<tr>
<td>I.3.15.3 Clinical Findings: History, Physical Examination, Laboratory</td>
<td>78</td>
</tr>
<tr>
<td>Findings</td>
<td></td>
</tr>
<tr>
<td>I.1.4.2.6 Prevention</td>
<td>98</td>
</tr>
<tr>
<td>References</td>
<td>77</td>
</tr>
<tr>
<td>I.3.16 Azospermia</td>
<td>81</td>
</tr>
<tr>
<td>G.R. Dohle</td>
<td></td>
</tr>
<tr>
<td>I.3.16.1 Definition</td>
<td>81</td>
</tr>
<tr>
<td>I.3.16.2 Introduction</td>
<td>81</td>
</tr>
<tr>
<td>I.3.16.3 Investigations</td>
<td>82</td>
</tr>
<tr>
<td>References</td>
<td>80</td>
</tr>
<tr>
<td>I.4 Problem: Sexual Dysfunction</td>
<td></td>
</tr>
<tr>
<td>I.4.1 Erectile Dysfunction</td>
<td>85</td>
</tr>
<tr>
<td>I.4.1.1 Definition of the Disease</td>
<td>85</td>
</tr>
<tr>
<td>I.4.1.2 Aetiology and Pathogenesis</td>
<td>85</td>
</tr>
<tr>
<td>I.4.1.3 Clinical Findings: History, Physical Examination, Laboratory</td>
<td>87</td>
</tr>
<tr>
<td>Findings</td>
<td></td>
</tr>
<tr>
<td>I.4.4.3 Clinical Findings: History, Physical Examination, Laboratory</td>
<td>105</td>
</tr>
<tr>
<td>Findings</td>
<td></td>
</tr>
<tr>
<td>I.4.5 Abnormal Libido</td>
<td>107</td>
</tr>
<tr>
<td>B. Brosig</td>
<td></td>
</tr>
<tr>
<td>I.4.5.1 Definition</td>
<td>107</td>
</tr>
<tr>
<td>I.4.5.2 Epidemiology</td>
<td>108</td>
</tr>
<tr>
<td>I.4.5.3 Aetiology and Pathogenesis</td>
<td>108</td>
</tr>
<tr>
<td>I.4.5.4 Clinical Findings</td>
<td>109</td>
</tr>
<tr>
<td>I.4.5.5 Therapy</td>
<td>109</td>
</tr>
<tr>
<td>I.4.5.6 Prognosis</td>
<td>110</td>
</tr>
<tr>
<td>References</td>
<td>110</td>
</tr>
<tr>
<td>I.5 Problem: Male Contraception</td>
<td>113</td>
</tr>
<tr>
<td>I.5.1 Controversies Regarding Post-Vasectomy Management</td>
<td></td>
</tr>
<tr>
<td>J. Shah, H. Fisch</td>
<td>114</td>
</tr>
<tr>
<td>I.5.1.1 Introduction</td>
<td>114</td>
</tr>
<tr>
<td>I.5.1.2 Definition</td>
<td>114</td>
</tr>
<tr>
<td>I.5.1.3 Prevalence</td>
<td>114</td>
</tr>
<tr>
<td>I.5.1.4 Treatment</td>
<td>115</td>
</tr>
<tr>
<td>I.5.1.5 Results of Treatment</td>
<td>115</td>
</tr>
<tr>
<td>I.5.1.6 Conclusion</td>
<td>117</td>
</tr>
<tr>
<td>References</td>
<td>117</td>
</tr>
</tbody>
</table>
I.5.2 Vasectomy Reversal
A. Belker ..................................... 119
I.5.2.1 Indications ........................... 119
I.5.2.2 Contraindications ................. 119
I.5.2.3 Vasectomy Reversal Techniques .... 119
I.5.2.4 Postoperative Care ............... 120
I.5.2.5 Complications ..................... 120
I.5.2.6 Results ............................. 120
I.5.2.7 Conclusions ....................... 120
I.5.2.8 Other .............................. 120
I.5.3 Male Contraception
D. Handelsman, G. Waites ............... 121
I.5.3.1 Introduction ........................ 121
I.5.3.2 Hormonal Methods ............... 121
I.5.3.3 Nonhormonal Methods ............ 121
I.5.3.4 Vaccines .......................... 121
I.5.3.5 Conclusions ...................... 122
I.5.3.6 References ........................ 122
I.5.4 Traditional Methods
D. Handelsman, G. Waites ............... 122
I.5.4.1 Introduction ........................ 122
I.5.4.2 Conclusions ...................... 124
I.5.5 References .......................... 124

I.6 Problem: Reproductive Tract Infections
I.6.1 Reproductive Tract Infections/Sexually Transmitted Diseases
F.R. Ochsendorf ............................. 125
I.6.1.1 Definition of the Disease .......... 125
I.6.1.2 Aetiology and Pathogenesis ........ 125
I.6.1.3 Clinical Findings: History, Physical Examination, Technical Investigations, Laboratory Findings .................. 126
I.6.1.4 Differential Diagnosis ............ 129
I.6.1.5 Treatment .......................... 129
I.6.1.6 Results of Treatment ............. 129
I.6.1.7 Prognosis .......................... 129
I.6.1.8 Prevention ......................... 129
I.6.1.9 Other .............................. 129
I.6.1.10 References ....................... 130
I.6.2 HIV Infection
F.R. Ochsendorf ............................. 131
I.6.2.1 Definition of the Disease .......... 131
I.6.2.2 Aetiology and Pathogenesis ........ 131
I.6.2.3 Clinical Findings: History, Physical Examination, Technical Investigations, Laboratory Findings .................. 131
I.6.2.4 Treatment .......................... 131
I.6.2.5 Results of Treatment ............. 132
I.6.2.6 Prognosis .......................... 132
I.6.2.7 Prevention ......................... 132
I.6.2.8 Other .............................. 132
I.6.2.9 References ....................... 132

I.7 Problem: Emergencies in Andrology
I.7.1 Testicular Torsion
C.F. Heyns, A.J. Visser .......................... 134
I.7.1.1 Definition .......................... 134
I.7.1.2 Aetiology and Pathogenesis ........ 136
I.7.1.3 Clinical Findings .................... 138
I.7.1.4 Differential Diagnosis ............ 145
I.7.1.5 Treatment .......................... 146
I.7.1.6 Results of Treatment ............. 150
I.7.1.7 Prognosis .......................... 151
I.7.1.8 Prevention ......................... 155
I.7.1.9 Conclusions ....................... 156
I.7.2 Blunt Testicular Trauma
J. Vale ........................................ 162
I.7.2.1 Definition .......................... 162
I.7.2.2 Aetiology and Pathogenesis ........ 162
I.7.2.3 Diagnosis .......................... 162
I.7.2.4 Treatment – Conservative Versus Surgical .... 163
I.7.2.5 Postoperative Follow-up .......... 163
I.7.2.6 References ........................ 163
I.7.3 Penile Fractures
W.D. Aiken .................................. 164
I.7.3.1 Definition of the Disease .......... 164
I.7.3.2 Aetiology and Pathogenesis ........ 164
I.7.3.3 Clinical Findings .................... 164
I.7.3.4 Physical Examination .......... 165
I.7.3.5 Investigations ...................... 165
I.7.3.6 Differential Diagnosis ............ 165
I.7.3.7 Treatment .......................... 165
I.7.3.8 Results of Treatment ............. 166
I.7.3.9 Prognosis .......................... 166
I.7.3.10 Prevention ......................... 166
I.7.3.11 References ....................... 166
I.7.4 Priapism
P. Kumar, D.J. Ralph ......................... 166
I.7.4.1 Definition .......................... 166
I.7.4.2 Aetiology and Pathogenesis ........ 166
I.7.4.3 Clinical Findings, Technical Investigations and Laboratory Findings .................. 167
I.7.4.4 Treatment .......................... 168
I.7.4.5 Conclusion ......................... 169
I.7.4.6 References ....................... 169
I.7.5 Testicular Pain and Related Pain Syndromes
T.B. Hargreave, L. Turner-Stokes ......... 170
I.7.5.1 Definition of the Disease .......... 170
I.7.5.2 Aetiology and Pathogenesis ........ 170
I.7.5.3 Clinical Findings: History, Physical Examination, Technical Investigations, Laboratory Findings .................. 173
I.7.5.4 Differential Diagnosis ............ 174
I.7.5.5 Treatment .......................... 174
I.8.2.2 Carcinoma-in-Situ of the Testis

I.8.1.5 Other Benign Epididymal Lesions: Sperm Granuloma

I.8.1.4 Other Benign Epididymal Lesions: Tuberculosis of the Epididymis

I.8.1.3 Epididymal Tumours

I.8.1.2 Epididymal Cysts

I.8.1.1 Hydrocele

I.8.1 Scrotal Benign Lesions, Epididymal Cysts, Epididymal Tumours

K. Turner

I.8.2 Testicular Cancer, CIS, Microcalcifications, TNM Classification

O. Ståhl, J. Eberhard, A. Giwercman

I.8.3 Penile Inflammations

F.-M. Köhn

I.8.3.1 Introduction

I.8.3.2 Pearly Penile Papules

I.8.3.3 Sclerosing Lymphangitis of the Penis

I.8.3.4 Balanitis and Balanoposthitis

I.8.3.5 Lichen Sclerosus et Atrophicus

I.8.3.6 Balanitis Circumscripta Plasmacellularis (Zoon’s Balanitis)

I.8.3.7 Balanitis Circinata

I.8.3.8 Psoriasis Vulgaris

I.8.3.9 Lichen Planus

I.8.3.10 Fixed Drug Eruption

I.8.3.11 Other Drug-Induced Lesions of the Penis

I.8.3.12 Allergic and Irritant Contact Dermatitis of the Penis

I.8.3.13 Atopic Dermatitis

I.8.3.14 Seborrheic Dermatitis

I.8.4 Penile Cancer

I.D.C. Mitchell

I.8.4.1 Definition

I.8.4.2 Aetiology and Pathogenesis

I.8.4.3 Clinical Findings

I.8.4.4 Differential Diagnosis

I.8.4.5 Treatment

I.8.4.6 Results of Treatment

I.8.4.7 Prognosis

I.8.4.8 Prevention

I.8.4.9 Other

I.8.5 Circumcision

C.F. Heyns, J.N. Krieger

I.8.5.1 Introduction

I.8.5.2 Epidemiology of Circumcision

I.8.5.3 Embryology and Function of the Foreskin

I.8.5.4 Indications for Circumcision

I.8.5.5 Contraindications for Circumcision

I.8.5.6 Complications of Circumcision

I.8.5.7 Current Controversies About Circumcision

I.8.5.8 Alternatives to Circumcision

I.8.5.9 Conclusions

I.9 Problem: Diseases of the Prostate (Infection, Benign Prostatic Hyperplasia, Cancer)

I.9.1 Benign Prostatic Hyperplasia and Prostatic Cancer

S.A. McNeill, S.K.W. Leung

I.9.1.1 Introduction

I.9.1.2 Aetiology and Pathogenesis

I.9.1.3 Prostate Cancer

I.9.1.4 Symptoms, Diagnosis and Treatment

I.9.2 Prostatitis

M.C. Bishop

I.9.2.1 Introduction

I.9.2.2 Diagnosis of Prostatitis

I.9.2.3 Aetiology of Chronic Prostatitis

I.9.2.4 Treatment

I.9.3 Benign Prostatic Hyperplasia and Prostatic Cancer

I.9.3.1 Definition, Epidemiology

I.9.3.2 Aetiology and Pathogenesis

I.9.3.3 Clinical Features

I.9.3.4 Histopathology

I.9.3.5 Genetic Risk Factors

I.9.3.6 Diagnostic Procedures

I.9.3.7 Prevention and Treatment

I.9.4 Complications

I.9.5 Other

I.9.6 Other

I.10 Problem: Male Breast Disorder

I.10.1 Gynaecomastia and Benign Breast Hyperplasia Including Iatrogenic Causes

W. Krause

I.10.1.1 Definition, Epidemiology

I.10.1.2 Aetiology and Pathogenesis

I.10.1.3 Clinical Features

I.10.1.4 Histopathology

I.10.1.5 Genetic Risk Factors

I.10.1.6 Diagnostic Procedures

I.10.1.7 Prevention and Treatment

I.10.2 Skin Diseases of the Male Nipple

W. Krause

I.10.2.1 General Skin Diseases

I.10.2.2 Localized Inflammatory Diseases

I.10.2.3 Tumours

I.10.2.4 Malformations

I.10.2.5 Surgical Interventions

I.10.3 Other

I.10.4 Other

I.10.5 Other
I.10.3 Male Breast Cancer
P.S.H. Soon, J.M. Dixon ................. 237
I.10.3.1 Incidence ......................... 237
I.10.3.2 Risk Factors ....................... 237
I.10.3.3 Pathology ......................... 238
I.10.3.4 Presentation ...................... 238
I.10.3.5 Investigation ...................... 239
I.10.3.6 Management of Early Breast Cancer .... 239
I.10.3.7 Management of Metastatic Breast Cancer ... 240
I.10.3.8 Follow-up ......................... 240
I.10.3.9 Conclusion ......................... 240
References .................................. 240

I.11 Problem: Male Ageing

I.11.1 Neuroendocrine Regulation of Testicular Function
J.M. Kaufman ............................... 241
I.11.1.1 Definition ............................ 241
I.11.1.2 Aetiology and Pathogenesis ........ 241
I.11.1.3 Clinical Findings, Technical Investigations and Laboratory Findings ............... 246
I.11.1.4 Differential Diagnosis ............... 246
I.11.1.5 Treatment ......................... 246
I.11.1.6 Results of Treatment ............... 246
I.11.1.7 Summary and Conclusions .......... 246
References .................................. 246

I.11.2 Male Ageing: Wear and Tear
F. Comhaire, A. Mahmoud ............... 249
I.11.2.1 Definition and Pathogenesis ....... 249
I.11.2.2 Clinical Findings: History, Physical Examination, Technical Investigations, Laboratory Findings ............... 249
I.11.2.3 Treatment and Prevention .......... 250
I.11.2.4 Other ............................. 250
References .................................. 250

I.11.3 Organ Failure and Common Disease of the Ageing Male
E.J.H. Meuleman, F. Comhaire .......... 251
I.11.3.1 Introduction and Definition of the Disease ......................... 251
I.11.3.2 Aetiology and Pathogenesis ........ 251
I.11.3.3 Clinical Findings: History, Physical Examinations and Laboratory Findings .... 253
I.11.3.4 Differential Diagnosis ............... 254
I.11.3.5 Treatment ......................... 254
I.11.3.6 Prevention ......................... 255
References .................................. 255

II Rationale

II.1 Understanding Normal Anatomy and Function

II.1.1 Anatomy and Histology of the Male Genital Tract
A. Meinhardt ............................... 259
II.1.1.1 Testis and Scrotum .................. 259
II.1.1.2 Epididymis .......................... 260
II.1.1.3 Spermatids and Ductus Deferen s .... 261
II.1.1.4 Prostate ............................. 262
II.1.1.5 Seminal Vesicle, Bulbourethral Gland ... 263
II.1.1.6 Penis and Urethra ................. 263
Suggested Reading ......................... 266

II.1.2 Sexual Differentiation and Development
Y.L. Giwercman, A. Nordenskjöld .... 266
II.1.2.1 Introduction ......................... 266
II.1.2.2 Genes Involved in Male Sex
Differentiation ......................... 268
II.1.2.3 Diagnosis of Sexual Ambiguity ........ 271
References .................................. 271

II.1.3 Physiology of Spermatogenesis
M. Bergmann ............................... 272
II.1.3.1 Spermatogenesis ..................... 272
II.1.3.2 Seminiferous Tubules ............... 272
II.1.3.3 Spermatogonia ....................... 274
II.1.3.4 Spermatocytes/Meiosis ............... 274
II.1.3.5 Spermatids/Spermiogenesis ........ 274
II.1.3.6 Spermatozoon ...................... 276
II.1.3.7 Sertoli Cell........................ 276
II.1.3.8 Apoptosis and Spermatogenesis .... 278
II.1.3.9 Kinetics of Spermatogenesis ........ 278
II.1.3.10 Pathophysiology of Spermatogenesis and Infertility .................. 279
References .................................. 280

II.1.4 Physiology of Sexual Function
O. Baldo, I. Eardley ....................... 281
II.1.4.1 Penile Erection ....................... 282
II.1.4.2 Ejaculation and Orgasm .......... 285
References .................................. 285

II.1.5 Endocrine Regulation
F. Comhaire, A. Mahmoud ................ 288
II.1.5.1 Hypothalamo–Pituitary–Testicular Axis ................................ 288
References .................................. 290

II.1.6 Immunology of the Testis and Excurrent Ducts
H.-C. Schuppe, A. Meinhardt ............ 292
II.1.6.1 Immune Privilege of the Testis .... 292
II.1.6.2 Immune Cells in the Testis ........ 292
II.1.6.3 Blood–Testis Barrier ............... 293
II.1.6.4 Mechanisms of Immune Tolerance in the Testis .................. 294
II.1.6.5 Local Factors of Testicular Immuno-
regulation – The Dual Role of Cytokines 294
II.1.6.6 Inflammation of the Testis ......... 296
II.1.6.7 Immunobiology and Pathology of the Excurrent Ducts .... 297
References .................................. 298
## II.2 Mechanisms of Dysfunction and Pathology

### II.2.1 Disorders of Prenatal Sexual Development

- **P. Wieacker** ........................................... 305
  - **II.2.1.1 Introduction** ........................... 305
  - **II.2.1.2 Primary Disorders of Gonadal Development** ................................. 305
  - **II.2.1.3 Disorders of Steroid Hormone Biosynthesis** .......................... 309
  - **II.2.1.4 Androgen Insensitivity** .................. 310
  - **II.2.1.5 Disorders of AMH Action** .............. 311
  - **II.2.1.6 Disorders of the Hypothalamic – Pituitary – Gonadal Axis** ........ 311
  - **II.2.1.7 Hypospadia and Undescended Testis** .......................... 311
  - **II.2.1.8 References** .............................. 311

### II.2.2 Endocrine Disorders and the Role of Hormone Disrupters

- **A. Mahmoud, Frank Comhaire** .............. 313
  - **II.2.2.1 Introduction** ........................... 313
  - **II.2.2.2 Endocrine Disorders** .................. 313
  - **II.2.2.3 The Role of Hormone Disrupters** ........... 315
  - **II.2.2.4 References** .............................. 319

### II.2.3 Infection/Inflammation of the Male Genital Tract as Cause of Abnormal Spermatozoa

- **C. Depuydt, A. Mahmoud, K. Everaert** .......... 322
  - **II.2.3.1 Introduction** ........................... 322
  - **II.2.3.2 Causal Factors and the Role of Cytokines** .......................... 323
  - **II.2.3.3 White Blood Cells and Reactive Oxygen Species** .................. 325
  - **II.2.3.4 Obstruction of Sperm Transport and Anti-sperm Antibodies** ........ 325
  - **II.2.3.5 References** .............................. 326

### II.2.4 Urethritis, Sexually Transmitted Diseases (STD), Acquired Immunodeficiency Syndrome (AIDS)

- **F.R. Ochsendorf** ................................. 327
  - **II.2.4.1 Introduction** ........................... 327
  - **II.2.4.2 Urethritis** .............................. 328
  - **II.2.4.3 STD** ........................................ 331
  - **II.2.4.4 HIV** ........................................ 331
  - **II.2.4.5 References** .............................. 334

### II.2.5 Disorders of Blood Flow: Arterial and Venous/Sexual Dysfunction and Varicocele

- **G.M. Colpi, M. Mancini, G. Piediferro, F.I. Scroppo** .......................... 338
  - **II.2.5.1 Erectile Dysfunction and Vascular Disease** .............. 339
  - **II.2.5.2 Varicocele** ................................ 340
  - **II.2.5.3 Testicular Torsion** ........................ 342
  - **II.2.5.4 Undescended Testis** ..................... 343
  - **II.2.5.5 Male-Mediated Developmental Toxicity** .................... 354
  - **II.2.5.6 References** .............................. 355

### II.2.6 Effects of Lifestyle and Toxicants

- **J. P. Bonde** ........................................ 358
  - **II.2.6.1 Introduction** ........................... 358
  - **II.2.6.2 Lifestyle Factors** ...................... 359
  - **II.2.6.3 Workplace Factors** ........................ 359
  - **II.2.6.4 Environmental Exposures** .............. 354
  - **II.2.6.5 Male-Mediated Developmental Toxicity** .................... 354
  - **II.2.6.6 References** .............................. 355

### II.2.7 Influence of Systemic Diseases and Iatrogenic Factors on Sexual and Reproductive Functions

- **R. Bornman** ........................................ 362
  - **II.2.7.1 Introduction** ........................... 362
  - **II.2.7.2 Sexual and Reproductive Function** .............. 366
  - **II.2.7.3 Systemic Diseases and Fertility** .................... 369
  - **II.2.7.4 Pathogenesis of Cancer in General** .............. 370
  - **II.2.7.5 References** .............................. 370

### II.2.8 Mechanisms of Pathogenesis of Uro-Genital Cancers

- **T.F. 'Aho, D.E. Neal** ............................ 362
  - **II.2.8.1 Pathogenesis of Cancer in General** .............. 362
  - **II.2.8.2 Pathogenesis of Prostate Cancer** .............. 366
  - **II.2.8.3 Pathogenesis of Testis Cancer** .............. 368
  - **II.2.8.4 Pathogenesis of Penile Cancer** .............. 369
  - **II.2.8.5 Future** .................................. 370
  - **II.2.8.6 References** .............................. 370

### II.3 Diagnostic Tools

#### II.3.1 History and Examination for Andrological Problems

- **T.B. Hargrave** .................................... 371
  - **II.3.1.1 History Taking** ......................... 371
  - **II.3.1.2 Scheme for History Taking** .......... 371
  - **II.3.1.3 Problem-Specific Special History Taking** .............. 372
  - **II.3.1.4 Clinical Examination for Andrological Conditions** .............. 376
  - **II.3.1.5 References** .............................. 380

#### II.3.2 Semen Analysis and Sperm Function Tests

- **F. Comhaire, A. Mahmoud** ........................ 381
  - **II.3.2.1 Introduction** ........................... 381
  - **II.3.2.2 Sample Collection and Delivery** .......... 381
  - **II.3.2.3 Initial Macroscopic Examination** .......... 382
  - **II.3.2.4 Initial Microscopic Investigation** .......... 382
  - **II.3.2.5 Evaluation of Morphological Characteristics** .............. 385
  - **II.3.2.6 Testing for Antibody-Coated Spermatozoa** .............. 386
  - **II.3.2.7 Counting of Spermatozoa** .............. 387
## Contents

### II.3.3

**Cytomorphological Semen Analysis**

- G. Haidl, H.-C. Schuppe .......................... 395
- Introduction .................................... 395
- Methodological Aspects .......................... 395
- Predictive Value of Sperm Morphology
  - In Vivo and In Vitro ............................ 397
- Clinical Relevance of Cytomorphological
  - Semen Analysis ............................... 398
- Sperm Morphology and ICSI ..................... 399
- References ...................................... 399

### II.3.4

**Clinical Microbiology**

- H.G. Schiefer, A. von Graevenitz ............ 401
- Normal Flora of the Male Urogenital
  - Tract ........................................ 401
- Diagnosis of Pathogens in the Male
  - Urogenital Tract .............................. 401
- Microbiological Examinations in the
  - Diagnosis of Male Urogenital Infections
  - References ................................. 407

### II.3.5

**Hormonal Evaluation in Infertility and Sexual Dysfunction**

- D. Klingmüller, N. Bliesener, G. Haidl ............ 408
- Introduction .................................... 408
- Total Testosterone .............................. 409
- Free Testosterone ................................ 409
- Luteinizing Hormone (LH) and Follicle-
  - Stimulating Hormone (FSH) ................... 409
- Inhibin B ....................................... 410
- Anti-Müllerian Hormone ......................... 410
- Oestradiol ....................................... 410
- Sex Hormone Binding Globulin (SHBG) ........... 411
- Prolactin ........................................ 411
- Dihydrotestosterone ................................ 411
- Hormonal Evaluation of Sexual Dysfunction ....... 411
- Human Chorionic Gonadotrophin (hCG)
  - Stimulation Test ................................ 412
- Gonadotrophin Releasing-Hormone (GnRH)
  - Stimulation Test ................................ 412
- Stimulation Tests ................................ 413
- References ...................................... 413

### II.3.6

**Tumour Markers in Andrology**

- M. E. Bracke ................................... 415
- Introduction .................................... 415
- Markers for Prostatic Carcinoma:
  - Prostate-specific Antigen (PSA)
  - and Others ................................. 415
- Markers for Testicular Carcinoma:
  - α-Fetoprotein, Human Chorionic
    - Gonadotrophin and Others ............... 418
- References ...................................... 421

### II.3.7

**Technical Investigations Including Imaging Procedures: Doppler, MRI, PET, Echo for Tumours**

- E.L.F. Nijs, R.H. Oyen .......................... 425
- Ultrasound (US) .................................. 425
- Doppler .......................................... 437
- MRI (Magnetic Resonance Imaging) ............ 439
- PET (Positron Emission Tomography) .......... 441
- Emergencies in Andrology ............... 442
- Tumours ........................................ 445
- References ...................................... 446

### II.3.8


- Y. Gat, M. Gornish .................. 447
- Introduction on the Bilaterality of the Disease .............................................. 447
- How to Use Contact Scrotal Thermograph .............................................. 448
- Medical Importance of the Complete and Accurate Diagnosis of Varicocele ............ 449
- Is There a Relationship Between Varicocele and Male Infertility? .................. 450
- Is Subclinical Varicocele Relevant to Male Infertility and Does it Require Treatment? .................. 450
- Is Ultrasoundography a Better Diagnostic Tool Because Venography is Subject to Technical Variations? .................. 451
- Why Right Varicocele Could Not Be Detected .............................................. 451
- Goren-Gat Technique for Detection and Treatment of Right and Left Varicocele ......... 451
- “Recurrent” Varicocele After Left High Ligation is Actually “Survived” Varicocele References .................. 452
- Evaluation of Testicular Biopsy Samples from the Clinical Perspective
  - M. Bergmann ................................ 454
- Indication ....................................... 454
- Preparation ..................................... 455
- Evaluation ....................................... 455
- References ...................................... 461

### II.3.10

**Genetics and Male Infertility**

- T.B. Hargreave, D.J. Elliott ............ 462
- Introduction .................................... 462
II.4.9 Treatment of Sexual Dysfunction
L.J.G. Gooren

II.4.10 Therapeutic Options for Benign Prostate Hyperplasia (BPH) and Prostatic Cancer
S.K.W. Leung, S.A. Mc Neill

II.4.11 Partial Androgen Deficiency of the Ageing Male (PADAM) and Testosterone Supplementation: Use, Misuse or Abuse?
D. Vanderschueren

II.4.12 Abuse of Androgens
H.-C. Schuppe, A. Jung, W.-B. Schill

II.4.13 Exotic Hormones
F. Comhaire, A. Mahmoud

II.4.14 Anti-Ageing Nutrition and Food Supplements
F. Comhaire, A. Mahmoud

II.4.15 Nutriceuticals and Food Supplements in the Treatment of the Infertile Man
F. Comhaire, A. Mahmoud

II.4.16 Assisted Reproductive Techniques
W. Ombelet

II.4.17 Cryopreservation of Spermatozoa and Testicular Tissue Including Autotransplantation of Germinal Epithelium
F.-M. Köhn

II.4.18 Cryopreservation of Spermatozoa and Protection From Radiation or Cytotoxic Treatment

References

Supplementation: Use, Misuse or Abuse?
Ageing Male (PADAM) and Testosterone Replacement in Elderly Men?

Partial Androgen Deficiency of the Ageing Male (PADAM) and Testosterone Supplementation: Use, Misuse or Abuse?

References

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction

Introduction
II.4.18 Current Research and Future Prospects for Gene Therapy in Andrology
Y. Kojima, S. Sasaki, K. Kohri ........ 592
II.4.18.1 Introduction ......................... 592
II.4.18.2 Ethical Issue in Gene Therapy ........ 593
II.4.18.3 Gene Transfer Vectors ............... 593
II.4.18.4 Gene Therapy for Prostate Cancer .... 593
II.4.18.5 Gene Therapy for Male Infertility .... 595
II.4.18.6 Gene Transfer for Treatment of Erectile Dysfunction ........ 596
II.4.18.7 Conclusions ........................ 597
References ................................. 597

II.4.19 Behavioural Therapy and Counselling
E.A. Jannini, A. Lenzi, G. Wagner .......... 598
II.4.19.1 Fertility Problem Counselling ......... 598
II.4.19.2 Sexual Dysfunction ................... 599
II.4.19.3 Genetic Counselling ................... 602
II.4.19.4 Cancer Counselling .................... 603
II.4.19.5 Gender Dysphoria ..................... 605
References ................................. 605

II.4.20 Donor Insemination, Egg and Embryo Donation
G.T. Kovacs, A. Trounson, K. Dawson .......... 607
II.4.20.1 Introduction ......................... 607
II.4.20.2 Donor Insemination ................... 607
II.4.20.3 Oocyte Donation ..................... 610
II.4.20.4 Embryo Donation .................... 612
II.4.20.5 Informing the Children of their Origin 613
II.4.20.6 Looking to the Future ................ 614
References ................................. 614

II.4.21 Aesthetic Andrology: Surgical Interventions
R. Ponchietti ................................. 617
II.4.21.1 Normal Size Measurements of the Penis 617
II.4.21.2 Indications and Contraindications for Penis Enlargement Surgery ........ 618
II.4.21.3 Preferred Techniques of Penis Enlargement Surgery ............ 618
II.4.21.4 Phalloplasty ........................... 619
II.4.21.5 Testicular Prosthesis .................. 619
II.4.21.6 Scrotal Skin Redundancy ............. 620
References ................................. 620

II.4.22 Aesthetic Andrology: Skin Care for Men – Male Cosmetics and Cosmetic Dermatologic Procedures
C. Müller, W.B. Schill .......................... 621
II.4.22.1 Trends in Male Skin Care ............. 621
II.4.22.2 Basic Concepts of Male Skin Science .. 622
II.4.22.3 Cosmetic Dermatologic Procedures ... 624
References ................................. 632

Subject Index ............................... 635
List of Contributors

Wolf-Bernhard Schill, Co-ordinating Editor
Centre of Dermatology and Andrology, Justus Liebig University Giessen, Gaffystr. 14, 35385 Giessen, Germany (e-mail: wb@prof_schill.de/www.prof-schill.de)

Tevita F. 'Aho
Addenbrooke’s NHS Foundation Trust, Department of Urology, Box 43, Hills Rd, Cambridge CB2 2QQ, UK (e-mail: tevita.aho@addenbrookes.nhs.uk)

William Derval Aiken
Department of Surgery, University of the West Indies Mona, Kingston 7, Jamaica (e-mail: uroplum23@yahoo.com)

Omer Baldo
Pyrah Department of Urology, St. James University Hospital, Beckett Street, Leeds LS9 7TF, UK

Arnold M. Belker
University of Louisville School of Medicine, Department of Urology, Louisville, Kentucky 40292, USA, 250 E. Liberty St., Suite 602, Louisville, KY 40202 USA (e-mail: abelker@aol.com)

Martin Bergmann
Institute of Veterinary Anatomy, Histology and Embryology, Justus Liebig University, Frankfurterstr. 98, 35392 Giessen, Germany (e-mail: martin.bergmann@vetmed.uni-giessen.de)

Manfred Beutel
Clinic and Policlinic for Psychosomatic Medicine and Psychotherapy, Johannes Gutenberg University, Untere Zahlbacher Str. 8, 55131 Mainz, Germany (e-mail: beutel@psychosomatik.klinik.uni-mainz.de)

M.C. Bishop
Department of Urology, Nottingham City Hospital NHS Trust, Nottingham, NG5 1 PB, UK (e-mail: tguyler@ncht.trent.nhs.uk)

N. Bliesener
Institute for Clinical Biochemistry, Endocrinology, University of Bonn, Sigmund-Freud-Str. 25, 53105 Bonn, Germany

Jens Peter Bonde
Department of Occupational Medicine, Århus University Hospital, Nørrebrogade 44, Building 2 C, 8000 Århus C, Denmark (e-mail: jpbob@akh.aaa.dk)

Riana Bornman
Department of Urology, Faculty of Health Sciences, University of Pretoria, PO Box 169 Pretoria 0001, South Africa (e-mail: mbornman@medic.up.ac.za)

Marc E. Bracke
Laboratory of Experimental Cancerology, Department of Radiotherapy and Nuclear Medicine, University Hospital, De Pintelaan 185, 9000 Ghent, Belgium, Laboratory Nuytinck, Reibroekstraat 13, 9940 Evergem, Belgium (e-mail: brackemarc@hotmail.com)

Burkhard Brosig
Centre of Psychosomatic Medicine, Clinic for Psychosomatics and Psychotherapy, Ludwigstr. 76, 35392 Giessen, Germany (e-mail: Burkhard.Brosig@psycho.med.uni-giessen.de)

Giovanni M. Colpi
Unità di Andrologia, Ospedale San Paolo, Polo Universitario, Milano, Italy (e-mail: gmcolpi@yahoo.com)

Frank Comhaire
Centre for Medical and Urological Andrology and Reproductive Endocrinology, University Hospital Ghent 6K12IE, De Pintelaan 185, 9000 Ghent, Belgium (e-mail: Frank.Comhaire@Ugent.be)

K. Dawson
Monash Immunology and Stem Cell Laboratories, Monash University, Wellington Road, Clayton, Victoria, 3800, Australia

Christophe Depuydt
Laboratory for Clinical Pathology, Amerikalei 62 – 64, 2000 Antwerp, Belgium (e-mail: Christophe.Depuydt@riatol.be)
J. Michael Dixon  
Edinburgh Breast Unit, Western General Hospital, Crewe Road South, Edinburgh EH4 2XU, UK  
(e-mail: mike.dixon@ed.ac.uk)

Gert R. Dohle  
Department of Urology, Erasmus Medisch Centrum Rotterdam, P.O. Box 2040, 3000 CA Rotterdam, The Netherlands  
(e-mail: G.R.Dohle@erasmusmc.nl)

Ian Eardley  
Pyrah Department of Urology, St. James University Hospital, Beckett Street, Leeds LS9 7TF, UK  
(e-mail: ian.eardley@btinternet.com)

Jakob Eberhard  
Department of Oncology, Lund University Hospital, Lund, Sweden  
(e-mail: jakob.eberhard@kir.mas.lu.se)

David J. Elliott  
Institute of Human Genetics, International Centre for Life, University of Newcastle-upon-Tyne, Central Parkway, Newcastle NE1 3BZ, UK  
(e-mail: David.Elliott@ncl.ac.uk)

Christine Mary Evans  
Smithy Cottage, Llanarmon-yn-ial, Mold, CH74QXN, Wales, UK  
(e-mail: christinemaryevans@hotmail.com)

K. Everaert  
Department of Urology, Ghent University Hospital, De Pintelaan 185, 9000 Ghent, Belgium  
(e-mail: karel.everaert@UGent.be, Tel.: + 32-92-402276)

Harry Fisch  
Clinical Urology Department of Urology, Columbia University, Columbia University Medical Center of New York, Presbyterian Hospital, 944 Park Avenue, New York, NY, USA  
(e-mail: harryfisch@aol.com)

Yigal Gat  
Andrology Unit, Department of Obstetrics and Gynecology, Rabin Medical Center, Beilinson Campus, Petah Tiqva and Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel  
(e-mail: yigalgat@yahoo.com)

Aleksander Giwercman  
Fertility Centre, Malmö University Hospital, 20502 Malmö, Sweden  
(e-mail: aleksander.giwercman@kir.mas.lu.se)

Louis J.G. Gooren  
Department of Endocrinology, Andrology section, Vrije Universiteit Medical Centre, P.O. Box 7057, 1007 MB Amsterdam, The Netherlands  
(e-mail: ljg.gooren@vumc.nl)

Michael Gornish  
Department of Radiology and the Interventional and Vascular Unit, Rabin Medical Center, Beilinson Campus, Petah Tiqva and Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

Alexander von Graevenitz  
Department of Medical Microbiology, University of Zürich, Gloriorastrasse 32, 8028 Zürich, Switzerland  
(e-mail: avg@imm.unizh.ch)

Gerhard Haidl  
Department of Dermatology/Andrology Unit, University of Bonn, Sigmund-Freud-Str. 25, 53105 Bonn, Germany  
(e-mail: gerhard.haidl@ukb.uni-bonn.de)

David J. Handelsman  
ANZAC, Research Institute & Department of Andrology, Concord Hospital, University of Sydney, Sydney NSW 2139, Australia  
(e-mail: djh@anzac.edu.au)

Timothy B. Hargreave  
Department of Oncology, Edinburgh University, Human Genetics Building, Western General Hospital, Edinburgh EH4 2XU, UK  
(e-mail: tbhargreave@btinternet.com)

Christiaan Frederik Heyns  
Department of Urology, Faculty of Health Sciences, University of Stellenbosch and Tygerberg Hospital, PO Box 19063, Tygerberg 7505, South Africa  
(e-mail: Cf2h@sun.ac.za)

Emmanuele A. Jannini  
Course of Medical Sexology and Endocrinology, Dept. of Experimental Medicine, University of L’Aquila Coppito, Bldg. 2, Room A2/54, Via Vetoio, 67100 L’Aquila, Italy  
(e-mail: eaj@iol.it)

Andreas Jung  
Justus Liebig University Giessen, Gaffkystr. 14, 35385 Giessen, Germany  
(e-mail: Andreas.Jung@derma-med.uni-giessen.de)

Jean M. Kaufman  
Department of Endocrinology, Laboratory of Hormonology and Unit for Osteoporosis and Metabolic Bone Diseases, Ghent University Hospital, De Pintelaan 185, 9000 Ghent, Belgium  
(e-mail: Jean.Kaufman@ugen.be)

David Kirk  
Urology Department, Gartnavel General Hospital, 1053 Great Western Road, Glasgow G12 0YN, UK  
(e-mail: Dkirk70683@aol.com)

Dietrich Klingmüller  
Institute for Clinical Biochemistry, Endocrinology, University of Bonn, Sigmund-Freud-Str. 25, 53105 Bonn, Germany  
(e-mail: d.Klingmueller@uni-bonn.de)
List of Contributors XXIII

Frank-Michael Köhn  
Department of Dermatology and Allergology, Technical University, Biedersteiner Str. 29, 80802 Munich, Germany (e-mail: Frank.Koehn@lrz.tu-muenchen.de)

Kenjiro Kohri  
Department of Nephro-urology, Nagoya City University Graduate School of Medical Sciences, 1 Kawasaki, Mizuho-cho, Mizuho-ku, Nagoya 467–8601, Japan (e-mail: kohri@med.nagoya-cu.ac.jp)

Yoshiyuki Kojima  
Department of Nephro-urology, Nagoya City University Graduate School of Medical Sciences, 1 Kawasaki, Mizuho-cho, Mizuho-ku, Nagoya 467–8601, Japan (e-mail: ykojima@med.nagoya-cu.ac.jp)

Gabor Thomas Kovacs  
Monash University, Department of Obstetrics and Gynaecology, Box Hill Hospital, Victoria, Australia (e-mail: gab.kovacs@boxhill.org.au)

Walter Krause  
Department of Andrology and Venerology, University Hospital, Philipp University, 35033 Marburg, Germany (e-mail: Krause@mailer.uni-marburg.de)

John N. Krieger  
Department of Urology, University of Washington School of Medicine, Box 356510, Seattle, WA 98195, USA (e-mail: jkrieger@u.washington.edu)

Pardeep Kumar  
The St Peter's Andrology Centre and Institute of Urology, 48 Riding House St, London W1P 7PN, UK (e-mail: pardeepkumar@hotmail.com)

Jan Kunnen  
Department of Radiology and Medical Imaging, ZNA Middelheim Hospital, Lindendraaf 1, 2020 Antwerp, Belgium (e-mail: Jan.Kunnen@zna.be)

Marc Kunnen  
Department of Radiology and Medical Imaging, University Hospital Ghent, De Pintelaan 185, 9000 Ghent, Belgium

Andrea Lenzi  
Chair of Clinical Pathology, Department of Medical Physiopathology, University of Rome „La Sapienza“ Pollicinico Umberto I, 00161 Rome, Italy (e-mail: andrea.lenzi@uniroma1.it)

Steve Ken Wing Leung  
Prostate Research Group, School of Molecular and Clinical Medicine, The University of Edinburgh, Western General Hospital, Crewe Road South, Edinburgh EH4 2XU, UK (e-mail: Steem21@hotmail.com)

Yvonne Lundberg Giwercman  
Department of Urology, Wallenberg Laboratory, Malmö University Hospital, 20502 Malmö, Sweden (e-mail: Yvonne.Giwercman@kir.mas.lu.se)

Ahmed Mahmoud  
Center for Medical and Urological Andrology and Reproductive Endocrinology, University Hospital Ghent 6K121E, De Pintelaan 185, 9000 Ghent, Belgium (e-mail: ahmed.mahmoud@ugent.be)

Mario Mancini  
Unità di Andrologia, Ospedale San Paolo, Polo Universitario, Milano, Italy

S. Alan McNeill  
Department of Urology, Western General Hospital, Crewe Road, Edinburgh, EH4 2XU, UK (e-mail: alan.mcneill@luht.scot.nhs.uk)

Andreas Meinhardt  
Department of Anatomy and Cell Biology, Justus-Liebig University Giessen, Aufweg 123, 35385 Giessen, Germany (e-mail: Andreas.Meinhardt@anatomie.med.uni-giessen.de)

E.J.H. Meuleman  
Free University of Amsterdam, Medical Centre Department of Urology, de Boelelaan 1117, 1081 HV Amsterdam, The Netherlands

Ian David Cumming Mitchell  
Department of Urology, Queen Margaret Hospital, Whitefield Road Dunfermline, Fife KY12 0SU, UK (e-mail: iandcmitchell@btinternet.com)

Christina Müller  
Centre of Dermatology and Andrology, Justus Liebig University, Gaffkystr. 14, 35385, Giessen, Germany (e-mail: Christina.mueller@derma.med.uni-giessen.de)

David Edgar Neal  
Department of Urology, Addenbrooke's NHS Foundation Trust, Department of Oncology, Oncology Centre, Box 193, Addenbrooke's Site, Hills Road, Cambridge CB2 2QQ, UK (e-mail: Den22@cam.ac.uk)

Els L.F. Nijs  
Department of Radiology, University Hospitals Gasthuisberg, Katholieke Universiteit Leuven, Herestraat 49, 3000 Leuven, Belgium (e-mail: Els.Nijs@uz.kuleuven.ac.be)

Agnete Nordenskjöld  
Department of Molecular Medicine, CMM 02, Karolinska Hospital, 17176 Stockholm, Sweden (e-mail: Agnete.Nordenskjold@cmmed.ki.se)
F.R. Ochsendorf
Centre of Dermatology and Venerology, J.W. Goethe University, Theodor-Stern-Kai 7, 60590-Frankfurt/M, Germany (e-mail: ochsendorf@em.uni-frankfurt.de)

Willem Ombelet
Genk Institute for Fertility Technology, Schiepse Bos 6, 3600 Genk, Belgium (e-mail: willem.ombelet@pandora.be)

Raymond H. Oyen
Department of Radiology, University Hospitals Gasthuisberg, Katholieke Universiteit Leuven, Herestraat 49, 3000 Leuven, Belgium (e-mail: Raymond.Oyen@uz.kuleuven.ac.be)

Guido Piediferro
Unità di Andrologia, Ospedale San Paolo, Policlinico Universitario, Milano, Italy

Roberto Ponchietti
University of Siena, Cattedra di Urologia, Policlinico S., Maria alle Scotte, Viale Bracci 13, 53110 Siena, Italy (e-mail: ponchietti@unisi.it)

David J. Ralph
The St Peter’s Andrology Centre and Institute of Urology, 48 Riding House St, London W1P 7PN, UK (e-mail: dralph@andrology.co.uk)

Shoichi Sasaki
Department of Nephro-urology, Nagoya City University Graduate School of Medical Sciences, 1 Kawasaki, Mizuho-cho, Mizuho-ku, Nagoya 467–8601, Japan (e-mail: sshk@med.nagoya-cu.ac.jp)

Hans Gerd Schiefer
Department of Medical Microbiology, Justus Liebig University Giessen, Schubertstr. 1, 35392 Giessen, Germany (e-mail: agnes.kroener@ mikrobio.med.uni-giessen.de)

Frank Schoonjans
Centre for Medical and Urological Andrology and Reproductive Endocrinology, University Hospital Ghent, 6K121E, De Pintelaan 185, 9000 Ghent, Belgium (e-mail: Frank.Schoonjans@ugent.be)

Hans-Christian Schuppe
Centre of Dermatology and Andrology, Justus Liebig University, Gaffkystr. 14, 35385 Giessen, Germany (e-mail: Hans-Christian.Schuppe@derma.med.uni-giessen.de)

Fabrizio I. Scroppo
Unità di Andrologia, Ospedale San Paolo, Polo Universitario, Milano, Italy

Jay B. Shah
Squier Urological Clinic, Columbia University Medical Center, 161 Fort Washington Avenue, New York, NY 10032, USA (e-mail: jbs58@columbia.edu)

P.H. Soon
Edinburgh Breast Unit, Western General Hospital, Crewe Road South, Edinburgh EH4 2XU, UK

Olof Ståhl
Department of Oncology, Lund University Hospital, Lund, Sweden (e-mail: olof.stahl@kir.mas.lu.se)

Oleg Tatarov
Urology Department, Gartnave General Hospital, 1053 Great Western Road, Glasgow G12 0YN, UK (e-mail: olegtatarov@hotmail.com)

Herman J. Tournaye
Centre for Reproductive Medicine, Dutch-speaking Brussels Free University Hospital, 101, Laarbeeklaan, 1090 Brussels, Belgium (e-mail: tournaye@az.vub.ac.be)

Alan Trounson
Monash Immunology and Stem Cell Laboratories, Monash University, Wellington Road, Clayton, Victoria, 3800, Australia (e-mail: jill.mcfadyean@med.monash.edu.au)

Guy G.R. T’Sjoen
Department of Endocrinology, University Hospital, Belgium 9K121E, De Pintelaan 185, 9000 Ghent, Belgium (e-mail: guy.tsjoen@ugent.be)

Kevin James Turner
Department of Urology, Western General Hospital, Edinburgh, EH4 2XU, UK (e-mail: kevin@kktturner.freeserve.co.uk)

Lynne Turner-Stokes
Regional Rehabilitation Unit, Northwick Park Hospital, Watford Road Harrow, Middlesex HA1 3UJ, UK

Justin Alastair Vale
Consultant Urological Surgeon, St Mary’s Hospital, Praed Street, London W2 1NY, UK (e-mail: j.vale@imperial.ac.uk)

Dirk Vanderschueren
Laboratory for Experimental Medicine and Endocrinology, Katholieke Universiteit Leuven, Campus Gasthuisberg, Onderwijs & Navorsing, Herestraat 49, 3000 Leuven, Belgium (e-mail: Dirk.Vanderschueren@uz.kuleuven.ac.be)

A.J. Visser
Garden City Hospital, Johannesburg, South Africa

Gorm Wagner
Dept. Medical Physiology, University of Copenhagen, Blegdamsvej 3, 2200 Copenhagen N, Denmark (e-mail: gorm@mfi.ku.dk)

P.S.H. Soon
Edinburgh Breast Unit, Western General Hospital, Crewe Road South, Edinburgh EH4 2XU, UK

Olof Ståhl
Department of Oncology, Lund University Hospital, Lund, Sweden (e-mail: olof.stahl@kir.mas.lu.se)

Oleg Tatarov
Urology Department, Gartnave General Hospital, 1053 Great Western Road, Glasgow G12 0YN, UK (e-mail: olegtatarov@hotmail.com)

Herman J. Tournaye
Centre for Reproductive Medicine, Dutch-speaking Brussels Free University Hospital, 101, Laarbeeklaan, 1090 Brussels, Belgium (e-mail: tournaye@az.vub.ac.be)

Alan Trounson
Monash Immunology and Stem Cell Laboratories, Monash University, Wellington Road, Clayton, Victoria, 3800, Australia (e-mail: jill.mcfadyean@med.monash.edu.au)

Guy G.R. T’Sjoen
Department of Endocrinology, University Hospital, Belgium 9K121E, De Pintelaan 185, 9000 Ghent, Belgium (e-mail: guy.tsjoen@ugent.be)

Kevin James Turner
Department of Urology, Western General Hospital, Edinburgh, EH4 2XU, UK (e-mail: kevin@kktturner.freeserve.co.uk)

Lynne Turner-Stokes
Regional Rehabilitation Unit, Northwick Park Hospital, Watford Road Harrow, Middlesex HA1 3UJ, UK

Justin Alastair Vale
Consultant Urological Surgeon, St Mary’s Hospital, Praed Street, London W2 1NY, UK (e-mail: j.vale@imperial.ac.uk)

Dirk Vanderschueren
Laboratory for Experimental Medicine and Endocrinology, Katholieke Universiteit Leuven, Campus Gasthuisberg, Onderwijs & Navorsing, Herestraat 49, 3000 Leuven, Belgium (e-mail: Dirk.Vanderschueren@uz.kuleuven.ac.be)

A.J. Visser
Garden City Hospital, Johannesburg, South Africa

Gorm Wagner
Dept. Medical Physiology, University of Copenhagen, Blegdamsvej 3, 2200 Copenhagen N, Denmark (e-mail: gorm@mfi.ku.dk)
Geoffrey Malcolm Hasting Waites (deceased)
ANZAC, Research Institute & Department of Andrology, Concord Hospital, University of Sydney, Sydney NSW 2139, Australia

R.F.A. Weber
Department of Andrology Erasmus MC, Dr. Molewaterplein, 40 3015 GD Rotterdam, The Netherlands (e-mail: r.f.a.weber@erasmusmc.nl)

Peter F. Wieacker
Institute for Human Genetics, Otto-von-Guericke University of Magdeburg, Leipziger Strasse 44, 39120 Magdeburg, Germany
(e-mail: Peter.Wieacker@medizin.uni-magdeburg.de)

Stefan A. Wudy
Centre of Child and Adolescent Medicine, Justus Liebig University, Feulgenstr. 12, 35392 Giessen, Germany
(e-mail: Stefan.wudy@paediat.med.uni-giessen.de)