

## Understanding Differences and Disorders of Sex Development (DSD)

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# Understanding Differences and Disorders of Sex Development (DSD)

Volume Editors

**O. Hiort** Lübeck

**S.F. Ahmed** Glasgow

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### Olaf Hiort

Sektion für Experimentelle Pädiatrische  
Endokrinologie und Diabetologie  
Hormonzentrum für Kinder und Jugendliche  
Klinik für Kinder- und Jugendmedizin  
Lübeck, Germany

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### S. Faisal Ahmed

Samson Gemmel Chair of Child Health  
Consultant in Paediatric Endocrinology  
School of Medicine, University of Glasgow  
Royal Hospital for Sick Children  
Glasgow, UK

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# Contents

## **VII Foreword**

Hiort, O. (Lübeck); Ahmed, S.F. (Glasgow)

## **IX Preface**

Hughes, I. (Cambridge); Lee, P. (Hershey, Pa.)

## Concepts

### **1 Gonadal Development**

Lucas-Herald, A.K. (Glasgow); Bashamboo, A. (Paris)

### **17 The Masculinization Programming Window**

Welsh, M. (Glasgow); Suzuki, H.; Yamada, G. (Wakayama)

### **28 Androgen Action**

Werner, R. (Lübeck); Holterhus, P.-M. (Kiel)

## Technological Advances

### **41 Steroid Biochemistry**

Kamrath, C.; Wudy, S.A. (Giessen); Krone, N. (Birmingham)

### **53 Next Generation Sequencing for Disorders of Sex Development**

Tobias, E.S. (Glasgow); McElreavey, K. (Paris)

### **63 Advances in Neuroimaging**

Rodie, M.E.; Forbes, K.P.; Muir, K. (Glasgow)

### **76 Imaging, Endoscopy and Diagnostic Surgery**

Wünsch, L.; Buchholz, M. (Lübeck)

### **87 Fertility Issues in the Management of Patients with Disorders of Sex Development**

Guercio, G.; Rey, R.A. (Buenos Aires)

## Communication

### **99 Disorders of Sex Development Peer Support**

Baratz, A.B. (Pittsburgh, Pa.); Sharp, M.K.; Sandberg, D.E. (Ann Arbor, Mich.)

### **113 Improving the Communication of Healthcare Professionals with Affected Children and Adolescents**

Nordenström, A. (Solna); Thyen, U. (Lübeck)

- 128 Working with Adolescents and Young Adults to Support Transition**  
Gleeson, H. (Leicester); Wisniewski, A.B. (Oklahoma City, Okla.)
- 138 Past Experiences of Adults with Disorders of Sex Development**  
GrApSIA; Audí, L. (Barcelona)

#### The Use of Drugs

- 149 Sex Hormone Replacement in Disorders of Sex Development**  
Birnbaum, W. (Lübeck); Bertelloni, S. (Pisa)
- 160 Hydrocortisone Replacement in Disorders of Sex Development**  
Blankenstein, O. (Berlin)

#### Tumours

- 172 Advances in Molecular Markers of Germ Cell Cancer in Patients with Disorders of Sex Development**  
van der Zwan, Y.G. (Rotterdam); Cools, M. (Gent); Looijenga, L.H.J. (Rotterdam)
- 185 Managing the Risk of Germ Cell Tumourigenesis in Disorders of Sex Development Patients**  
Cools, M. (Ghent); Looijenga, L.H.J.; Wolffenbuttel, K.P. (Rotterdam); T'Sjoen, G. (Ghent)

#### Timing of Surgery

- 197 Timing of Hypospadias Repair in Patients with Disorders of Sex Development**  
Springer, A. (Vienna); Baskin, L.S. (San Francisco, Calif.)
- 203 Timing of Surgery for Feminizing Genitoplasty in Patients Suffering from Congenital Adrenal Hyperplasia**  
Eckoldt-Wolke, F. (Jena)
- 210 Timing of Feminising Surgery in Disorders of Sex Development**  
Wolffenbuttel, K.P. (Rotterdam); Crouch, N.S. (Bristol)
- 222 Phalloplasty: A Panacea for 46,XY Disorder of Sex Development Conditions with Penile Deficiency?**  
Callens, N.; Hoebeke, P. (Ghent)

#### International Aspects

- 234 Rare Diseases Research and Practice**  
Polizzi, A. (Rome); Balsamo, A.; Bal, M.O. (Bologna); Taruscio, D. (Rome)
- 257 Achieving Diagnostic Certainty in Resource-Limited Settings**  
Raza, J. (Karachi); Mazen, I. (Cairo)
- 268 Global Application of Disorders of Sex Development-Related Electronic Resources: e-Learning, e-Consultation and e-Information Sharing**  
Muscarella, M. (Cambridge, Mass.); Kranenburg-van Koppen, L. (Rotterdam); Grijpink-van den Biggelaar, K. (Delft); Drop, S.L.S. (Rotterdam)
- 284 International Networks for Supporting Research and Clinical Care in the Field of Disorders of Sex Development**  
Ahmed, S.F.; Bryce, J. (Glasgow); Hiort, O. (Lübeck)
- 293 Author Index**
- 294 Subject Index**

## Foreword

It is a pleasure and a privilege to host as guest editors this monograph entitled *Understanding Differences and Disorders of Sex Development (DSD)*. A broad variety of experts have accepted to view this topic from various angles and specialities, and we are very grateful for their enthusiastic input and the compilation of informative and interesting chapters. Our thanks extend to Miriam Schulz and Thomas Nold from S. Karger AG, who dedicated considerable effort to help the authors and achieve timely publication in this series of *Endocrine Development*.

Over the last decade, both the scientific approach as well as the clinical management in the field of differences or disorders of sex development (DSD) has changed considerably. DSD, as an acronym, has become accepted and recognised both across the medical professions and by the lay public; however, the ongoing debate is demonstrated by the different terms behind the acronym, namely ‘differences of sex development’ and ‘disorders of sex development’. While at the time of the Chicago Conference in 2005 a biological umbrella was sought to encompass a variety of genetic and medical conditions affecting the urogenital tract and reproductive organs, it has subsequently become clear that the clinical management requires a very thoughtful and structured approach, especially in those situations where imminent medical problems are not anticipated.

To reflect this pathway of the physiology and pathophysiology of sex development, as well as the holistic view on structured management, we have decided to incorporate both terms into this book. ‘Differences’ and ‘disorders’ do not exclude each other, but demonstrate the bridging from biological understanding to medical care. These conditions are an excellent example of what can be gained from working with people with rare conditions. They show us that we learn a lot from studying usual and unusual molecular pathways, mostly due to monogenic diversity. However, they also teach us to accept the lively variety of nature and not to transfer knowledge on biological disorders into medical treatment approaches without evidence for a gain in overall quality-of-life.

Therefore, within this monograph, we have included chapters under different subsections. It starts with ‘Concepts’, which gives a state-of-the-art review on developmental aspects of gonadal development, the temporal aspects of programming and

the current knowledge of androgen action as the major determinant of sex phenotype. 'Technological Advances' have translated this basic knowledge into diagnostic procedures, in laboratory and genetic assessment as well as imaging techniques, including future perspectives on fertility. 'Communication' plays a major role in managing these complex conditions and is a prerequisite for the informed decision-making process at all ages. The next sections consider decisions that have to be made, including 'The Use of Drugs', the management of the gonads with regard to 'Tumours', and the 'Timing of Surgery'. We appreciate that in some situations controversy will exist, especially when there is little evidence to support the opinion. In such a situation, we have elected to present both views as separate chapters. Any management of DSD has to be made with the best knowledge of the underlying molecular events, as well as the highest expertise; therefore, we have included a subsection on 'International Aspects', reflecting the current discussion on rare disease research and practice, modern aspects of electronic media and communication, as well as the struggle with limited resources in many areas of the world. The invitation from Karger for this monograph coincided with the 4th International DSD Meeting when, for the first time, patients, parents and members of advocacy groups were present in the scientific sessions of a DSD meeting. This meeting was a watershed moment in the field of DSD and it is only appropriate that this monograph also covers the role that support groups play.

A major consequence of the Chicago Conference was a willingness to collaborate and develop consensus across international boundaries. We describe the current state of DSD networking, which is exemplified by two complementary activities, the International DSD Registry, funded by the Medical Research Council of the UK and the EU, and DSDnet, recently funded by the Cooperation of Science and Technology of the European Science Foundation.

This book will be useful to anybody interested in DSD, both from aspects of novel research findings in human sexual development and clinical aspects of the approach, to the management of individuals with these conditions.

*Olaf Hiort, Lübeck*  
*S. Faisal Ahmed, Glasgow*



## Preface

It has been nearly a decade since the Chicago Consensus Conference set out a range of proposals relating to disorders of sex development (DSD). These included a new nomenclature, a classification based on the karyotype, the need for clarity on sex assignment, and recommendations for diagnostic investigations. Allied to these proposals, the Consensus document discussed contentious issues relating to surgery, the emerging evidence for gonadal tumour risk in DSD and the importance of quality-of-life outcome studies. Above all, it was implicit that management of DSD should be the responsibility of a multidisciplinary team, with the family at the heart of the decision-making process. Since that time, considerable new data have become available so that a book on *Understanding Differences and Disorders of Sex Development (DSD)* in the *Endocrine Development* series is timely. Interestingly, the guest editors have included the word ‘differences’ in the title as perhaps reflecting concern expressed by some individuals about utilising ‘disorder’ as part of nomenclature.

A range of experts have contributed to the content, which is subdivided into 7 main sections. These cover expected areas such as the genetic control of gonad development, the application of newer technologies (imaging as well as genetic and biochemical), hormone treatment, surgical practice and identifying the risk of gonad tumour development. It is refreshing to see an entire section on communication, which is a crucial component of DSD management. Emphasis is placed on peer support groups, a concept relatively new to DSD compared with other medical conditions. Communicating with children and adolescents is vital so that the child with DSD can ‘grow into disclosure’ about their condition. With any chronic medical condition, the subsequent transitioning to adult care is fraught, and not least for DSD, where much needs to be done to ensure young adults are not lost to care. How patient support groups can play their important role is vividly illustrated here in the section on communication, through current and historical views of adults with DSD.

The final section uniquely covers international aspects. It recognises the essential need for worldwide collaboration to better understand rare conditions such as DSD, acknowledges the limitations of care in resource-poor countries, and emphasises the value of e-learning and the use of the web as an educational tool to engage professionals worldwide across the spectrum of DSD.

The Chicago Consensus strongly recommended the establishment of national and international registries to enable collaborative studies on rare diseases to thrive. The editors of this book have been at the forefront of beginning to realise that goal, aided by grant-awarding bodies now recognising the importance of research into rare diseases. This book illustrates evidence of the considerable progress made in the field of DSD in the past decade. It provides the basis for important additional studies which can be the catalyst for even greater progress over the next decade towards the goal of better care and support for families with DSD.

*Ieuan Hughes, Cambridge*  
*Peter Lee, Hershey, Pa.*