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Paediatric Asthma

Edited by Kai-Håkon Carlsen and
Jorrit Gerritsen



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Paediatric Asthma

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Editor in Chief
Tobias Welte

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This book is one in a series of *European Respiratory Monographs*. Each individual issue provides a comprehensive overview of one specific clinical area of respiratory health, communicating information about the most advanced techniques and systems required for its investigation. It provides factual and useful scientific detail, drawing on specific case studies and looking into the diagnosis and management of individual patients. Previously published titles in this series are listed at the back of this *Monograph*.



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Guest Editors



Kai-Håkon Carlsen

Kai-Håkon Carlsen is Professor of Paediatric Respiratory Medicine and Allergology at the University of Oslo (Oslo, Norway), senior consultant of the Paediatric Clinic of Oslo University Hospital and Professor of Sports Medicine at the Norwegian School of Sports Sciences (Oslo). He was President of the European Paediatric Respiratory Society (1991–1993), President of the Norwegian Society of Allergy and Immunopathology (1989–1993), Head of the Paediatric Assembly of the European Respiratory Society (ERS) (1997–2001), Chair of the ERS School (2002–2005) and Chair of the European Lung Foundation (2007–2010). He has also been an Associate Editor of the European Respiratory Journal (*ERJ*) (1998–2003), an Associate Editor of *Acta Paediatrica* (2008–2011) and a member of the editorial board of *Allergy* (1999–2011). He has been a member of the editorial board of *Paediatric Allergy and Immunology* since October 1997. Kai-Håkon was also a member of the editorial board of *Paediatric Pulmonology* (1997–2004) and the first Chief Editor of *Breathe*, the educational journal of the ERS (2004–2005). He gave the prestigious Jean-Claude Yernault Lecture at the ERS Annual Congress in September 2007 and received the Life Time Achievement Award of the Paediatric Assembly of the ERS in 2010. Kai-Håkon is presently a member of the Tobacco Control Committee of the American Thoracic Society (ATS), has been a member of several Task Forces of the ERS, ATS and the European Academy of Allergy and Clinical Immunology (EAACI), and is presently part of the ERS/ATS Task Force on Bronchial Hyperresponsiveness, the ERS Task Force on Rare Lung Diseases and the Paediatric Asthma ICON Task Force of EAACI.



Jorrit Gerritsen

Jorrit Gerritsen served as Secretary and Head of the Paediatric Assembly of the ERS, and was President of the ERS from 2009 to 2010. He has been involved in follow-up studies of asthma from childhood to adulthood, epidemiological studies, studies on the role of the environment, the large Prevention and Incidence of Asthma and Mite Allergy (PIAMA) cohort study, studies on genetics of asthma and studies on cystic fibrosis. He was Editor of the *Dutch Paediatric Journal* and several other respiratory journals, and is an Associate Editor of the *ERJ*. He has been involved, as first author or as co-author, in more than 220 peer-reviewed international publications, has published several books, and has participated in writing chapters of international books.

Preface



There is no question about it: in terms of morbidity and healthcare costs, asthma is the most important respiratory disease in children and adolescents. Both research and clinical development have been tremendously successful over the last few decades, and understanding about the genetics, molecular biology, pathophysiology and clinical implications of asthma have been greatly improved. We have become aware that paediatric asthma is not a homogenous disease, but is very heterogeneous, with various clinical phenotypes that need different diagnostic and therapeutic approaches. Like bronchial malignancy, asthma may be one of the first diseases in which personalised, phenotype-driven medicine could be possible in the next few years. However, such an approach will not only have medical implications but will raise a number of questions with regard to educational programmes for physicians and patients, and will give a focus on pharmacoeconomic considerations.

Asthma research driven by paediatricians has produced impressive results in the past, and this will also be the case in the future. The winners of all of these ongoing efforts are the patients, as good research leads to better care with an improved quality of life.

This issue of the *European Respiratory Monograph* summarises the current knowledge on paediatric asthma but also focuses on future developments. I want to congratulate the Guest Editors for this excellent *Monograph*, which should be of interest to paediatricians but also to general medical doctors and pulmonary specialists treating adults. I am convinced that they will find this *Monograph* useful in daily practice.

Editor in Chief
Tobias Welte

Introduction

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Paediatric asthma remains a health problem on a global scale, for the health systems of individual countries, for the families of asthmatic children and for the asthmatic children themselves. At present, we have no cure for asthma, and paediatric asthma most often represents a lifelong problem, although modern and optimal treatment do offer good disease control; most children with asthma are able to have a “healthy” life, and participate in physical activities on an equal level with their healthy peers, with a normal development into adolescence and adulthood.

One major problem of paediatric asthma is the “lifelong” aspect. Recently, paediatric asthma has been reported as a major risk factor for chronic obstructive pulmonary disease (COPD) in adult life, thus underlining the need for early diagnosis, optimal treatment and monitoring of paediatric asthma.

This issue of the *European Respiratory Monograph* covers the different aspects of paediatric asthma. The many phenotypes of asthma with different clinical characteristics at different ages illustrate the heterogeneity of paediatric asthma. These include different levels of severity and, in particular, problematic severe asthma. Many different causative factors have a role in the pathogenesis of asthma and influence the clinical presentation. These include: food allergy; viral and bacterial infections; allergen exposure and exposure to indoor and outdoor pollutants; psychological factors; and physical activity and sports. The genetics of asthma is complicated, and epigenetics may help explain the increase in prevalence over recent decades.

The care and treatment of asthmatic children is one of the major tasks of paediatric respiratory medicine. There are different approaches to the treatment of asthma at different ages, and acute asthma requires particular concern and treatment strategies. Monitoring and follow-up of paediatric asthma remain important for optimal treatment.

All these aspects of handling paediatric asthma, as well as the many faces of paediatric asthma, are thoroughly discussed by distinguished paediatric pulmonologists in this issue of the *European Respiratory Monograph*. We hope that our young colleagues will find this Monograph useful in the clinical setting and that it will remain an inspiration in their future research.