Nutrition Support for Infants and Children at Risk
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Editors
Richard J. Cooke, Memphis, TN, USA
Yvan Vandenplas, Brussels, Belgium
Ulrich Wahn, Berlin, Germany
Contents

VII Preface
X Foreword
XIII Contributors

Allergy

1 The Development of Atopic Phenotypes: Genetic and Environmental Determinants
Wahn, U.; von Mutius, E.; Lau, S.; Nickel, R. (Germany)

17 Food Allergy to Proteins
Nowak-Wegrzyn, A. (USA)

37 Hypoallergenicity: A Principle for the Treatment of Food Allergy
Beyer, K. (Germany)

49 The Concept of Hypoallergenicity for Atopy Prevention
von Berg, A. (Germany)

63 The Concept of Oral Tolerance Induction to Foods
Lack, G. (UK)

Gastrointestinal Disorders

73 Chronic Enteropathy: Molecular Basis
Ruemmele, F.M. (France)
89 Chronic Enteropathy: Clinical Aspects
Gibbons, T.; Fuchs, G.J. (USA)

105 Transition from Parenteral to Enteral Nutrition
Milla, P.J. (UK)

115 Chronic Enteropathy and Feeding
Salvatore, S. (Italy); Hauser, B.; Vandenplas, Y. (Belgium)

133 Stressed Mucosa
Davidson, G.; Kritas, S.; Butler, R. (Australia)

147 Nutrition for Children with Cholestatic Liver Disease
Verkade, H.J.; Rings, E.H.H.M. (The Netherlands)

Nutrition for Preterm Infants

161 Nutrient Requirements of Premature Infants
Ziegler, E.E. (USA)

177 Nutritional Assessment in Preterm Infants
Griffin, I.J. (USA)

193 Early Aggressive Nutrition in Very Preterm Infants
Thureen, P.J. (USA)

209 Discussion on ‘Human Milk Fortification’
Putet, G. (France)

213 Postdischarge Nutrition of Preterm Infants: More Questions than Answers
Cooke, R.J. (USA)

229 Concluding Remarks

233 Subject Index
Preface

The first manifestation of atopic diseases in many cases is atopic dermatitis, which may or may not be associated with IgE-mediated allergic reactions to food proteins, particularly hen's egg and cow's milk. Prospective birth cohort studies have provided clear evidence for the fact that infantile IgE responses to food protein may not just indicate infantile food allergy, but also have to be considered as the earliest markers for the atopic march resulting ultimately in persistent allergic inflammation of the upper or lower airways (bronchial asthma). For the pediatric allergist it is important to understand the mechanism regulating IgE responses as well as potential options for interventions aiming at primary or secondary prevention.

For decades breastfeeding was considered as the optimum measure for preventing food allergy in childhood. However, recent data indicate that the effects regarding the atopic march are limited. Different approaches include the use of hypoallergenic formulae, in which the allergenic activity has been reduced by enzymatic treatment. Prospective well-controlled trials have indeed suggested that this approach of preventative intervention has a role at least in the prevention of early atopic dermatitis. Other attempts in modulating infantile immune responses are represented by the addition of probiotics (lactobacilli) or prebiotics (oligosaccharides) to infant formulae. The long-term effects of these approaches are still under investigation.

I am particularly pleased that allergic diseases in childhood are acknowledged by a wide spectrum of pediatricians, nutritionists and public health authorities as a major health problem for children in the 21st century. Therefore, the challenge of prevention and early intervention needs to be met not only by pediatric allergists, but by all pediatricians, who share responsibility for a child's health from infancy to adolescence.

U. Wahn
Preface

There is universal consensus that quantity and quality of nutrition is relevant for general health, both in the short and the long-term. However, the gastrointestinal tract, whose most relevant function is the absorption of nutrients, is diseased in many situations. Acute gastroenteritis causes transient but sometimes severe alterations of gastrointestinal function. Other diseases, such as food allergy, celiac disease and Crohn’s disease, cause further chronic alterations. Fundamental research has highlighted in recent years the molecular basis of some diseases causing chronic enteropathy such as microvillous atrophy. Extrapolation of this new knowledge in rare etiologies of severe chronic enteropathies to the enteropathy as it occurs in cow’s milk protein allergy offers an interesting insight in the latter. After the molecular aspects, the main causes of chronic enteropathy were developed. Chronic enteropathy in developing countries is still a major cause of death of children (>1 million deaths/year). The etiologies of enteropathy differ in the developed and developing world. A direct interaction exists between intestinal mucosal injury, malnutrition and impaired immunity. Recovery from chronic enteropathy is dependent on proper nutritional management and rehabilitation. Parenteral nutrition is the final nutritional option in intestinal failure. In intestinal failure, parenteral nutrition can be life-saving but is at the same time potentially dangerous. The earlier (partial) enteral nutrition can be introduced, the better: ‘If the gut works, use it’. Minimal enteral feeding decreases the need for total parenteral nutrition by optimizing intestinal adaptation. New semielemental diets directly influence inflammation and food intolerance. Nutrition has become more than an ingestion of calories and nutrients; the concept of ‘functional food’ opens a new area of research, of major interest in many different diseases such as gastrointestinal infection, celiac disease, or inflammatory bowel disease. Immunologic properties of lipids, nucleotides and probiotics have become a topic of research. It has become obvious that the strain specificity of probiotic organisms is of major importance. New semielemental diets are well tolerated and accepted. Many diseases affect gastrointestinal function by altering the barrier function. Also medications, such as antimycotic drugs, cause mucosal injury. Noninvasive techniques may provide a better way to assess the effects of stress and also a simple way to assess nutritional interventions. Finally, interest will be given to nutrition in the cholestatic patient. Children with chronic liver disease are not only prone to severe malnutrition, they also have special nutritional needs. The topics in the second part of the symposium (Gastrointestinal Disorders) highlight that nutrition has become more than feeding. Nutrition has functional properties, which means that feeding actively intervenes with therapy.

Y. Vandenplas
Nutrition plays a critical role in the promotion of normal health and prevention of disease. Nowhere is this more important than during infancy and childhood, where even short periods of malnutrition may have long-lasting effects on growth, development and health in adult life. During infancy and childhood, there are several high-risk scenarios for the development of malnutrition and these are the focus of the current workshop.

Although the incidence of prematurity has not changed smaller and more immature infants are now surviving, presenting a series of unique challenges to the neonatologist. It takes time to establish adequate dietary intakes in the ‘sick’ immature infant. Once established, adequate intakes are rarely maintained throughout hospital stay. In effect, all infants accrue a nutritional deficit, the smaller the infant the greater the deficit.

Nutritional requirements are not well defined in preterm infants. It was assumed that needs were similar for all low-birth-weight infants. Yet, recent data suggest that needs change with advancing maturity and one formulation may not meet all requirements. Requirements are also based upon needs for maintenance and normal growth; no allowances are made for ‘catch-up’ growth.

Furthermore, sensitive, accurate and precise measures of nutritional outcome are not well defined in these infants. Weight gain is the primary reference for assessing adequacy of intake but this tells little about the composition of gain, a critical consideration when interpreting the relationship between early growth and later health.

The net effect of these uncertainties is that 100% of very-low-birth-weight infants are growth retarded at hospital discharge, the smaller and more immature the infant the greater the degree of growth retardation at initial hospital discharge. In the section on Nutrition for Preterm Infants, many of these issues will be reviewed, as will strategies for improving growth in these high-risk infants.

R.J. Cooke
Foreword

The 59th Nestlé Nutrition Pediatric Workshop on ‘Nutrition Support for Infants and Children at Risk’, held in Berlin in early April 2006, represents an important milestone in this workshop series since it is 25 years since the 1st Nestlé Nutrition Workshop entitled ‘Maternal Nutrition in Pregnancy – Eating for Two’ chaired by Prof. John Dobbing was published in 1981. Since then, two series of workshops have emerged giving rise to their respective books of proceedings, the so-called ‘Blue Series’ emanating from the pediatric workshops, with over 6,000 copies per workshop making it one of the largest medical publication in the world, and the ‘Silver Series’ resulting from our clinical and performance nutrition workshops. Moreover, we are proud to announce that the high quality of the ‘Blue Series’ has been recognized by the US National Libraries of Medicine, meaning that the scientific review articles they contain are now indexed on Medline.

The three topics covered within this workshop have already been addressed in previous Nestlé Nutrition Pediatric Workshops. The first of our workshops focusing on allergy took place in 1987, followed by two workshops in 1993 and 2003 dealing with aspects of intestinal immunology and the etiology, prevention and treatment of allergy. The 2nd Nestlé Nutrition Workshop on ‘Acute Diarrhea: Its Nutritional Consequences in Children’ was followed by ‘Chronic Diarrhea’ in 1983, ‘Diarrheal Diseases’ in 1993 and ‘The Control of Food and Fluid Intake in Health and Disease’ in 2002. As for nutrition for premature infants we held two workshops in 1992 and 1998 reviewing advances in this field. But nutrition of the premature infant has advanced considerably through modern intensive care medicine, and we now have to care for 500-gram premature infants needing proper nourishment after intensive care in order to grow and develop appropriately.

We are deeply indebted to the three chairpersons of this workshop, Prof. Ulrich Wahn from Berlin, Prof. Yvan Vandenplas from Brussels and Richard Cooke from Memphis, experts recognized worldwide in their respective fields of nutrition for allergy, gastrointestinal disorders and prematurity, for putting together this exciting workshop program. We also...
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Prof. Ferdinand Haschke, MD, PhD
Chairman
Nestlé Nutrition Institute
Vevey, Switzerland

Dr. Denis Barclay, PhD
Scientific Advisor
Nestlé Nutrition Institute
Vevey, Switzerland
59th Nestlé Nutrition Workshop
Pediatric Program
Berlin, Germany, April 2–6, 2006
Contributors

Chairpersons & Speakers

**Dr. Kirsten Beyer**
Charité Universitätsmedizin
Department of Pediatric Pneumology
and Immunology
Augustenburger Platz 1
DE–13353 Berlin
Germany
E-Mail kirsten.beyer@charite.de

**Prof. Richard J. Cooke**
Division of Neonatology
University of Tennessee
Center for Health Sciences
853 Jefferson Ave
Memphis, TN 38163
USA
E-Mail rcooke@utmem.edu

**Prof. Geoffrey Davidson**
Centre for Paediatric and Adolescent Gastroenterology
Women’s and Children’s Hospital
Children, Youth and Women’s Health Service
72 King William Rd.
North Adelaide, SA 5006
Australia
E-Mail geoff.davidson@cywhs.sa.gov.au

**Prof. J. George Fuchs**
Pediatric Gastroenterology,
Hepatology and Nutrition
University of Arkansas
for Medical Sciences
4301 W. Markham Street, Slot #512-7
Little Rock, AR 72205
USA
E-Mail fuchsgeorgej@uams.edu

**Prof. Ian J. Griffin**
Research Center
Section of Neonatology
Department of Pediatrics
USDA/ARS Children’s Nutrition
1100 Bates Street
Houston, TX 77030
USA
E-Mail igriffin@bcm.tmc.edu

**Prof. Gideon Lack**
King’s College London
Paediatric Unit
Department of Medicine
4th Floor, North Wing
St. Thomas’ Hospital
Lambeth Palace Road
London SE1 7EH
UK
E-Mail gideon.lack@kcl.ac.uk
Contributors

Prof. Peter J. Milla
Institute of Child Health
30 Guilford Street
London, WC1N 1EH
UK
E-Mail p.milla@ich.ucl.ac.uk

Prof. Anna Nowak-Wegrzyn
Division of Allergy and Immunology
Department of Pediatrics
New York, NY 10029
USA
E-Mail anna.nowak-wegrzyn@mssm.edu

Prof. Guy Putet
Néonatologie et reanimation néonatales
Hôpital de la Croix Rousse
103 Grande Rue de la Croix Rousse
FR–69317 Lyon Cedex 04
France
E-Mail guy.putet@chu-lyon.fr

Dr. H.H.M. Edmond Rings
Division of Pediatric Gastroenterology
Beatrix Kinderkliniek
University Medical Center Groningen
Postbus 30.001
NL–9700 RB Groningen
The Netherlands
E-Mail e.h.h.m.rings@bkk.umcg.nl

Dr. Frank Ruemmele
Pediatric Gastroenterology, Hepatology and Nutrition
Hôpital Necker-Enfants Malades
149 Rue de Sèvres
FR–75743 Paris Cedex 15
France
E-Mail frank.ruemmele@nck.ap-hop-paris.fr

Dr. Patti Thureen
Department of Pediatrics
University of Colorado Health Sciences Center
Denver, CO 80222
USA
E-Mail patti.thureen@uchsc.edu

Prof. Yvan Vandenplas
AZ-VUB
Laarbeeklaan 101
BE–1090 Brussels
Belgium
E-Mail yvan.vandenplas@az.vub.ac.be

Dr. Andrea von Berg
Research Institute for the Prevention of Allergies and Respiratory Diseases
Wesel
Marien Hospital
Pastor-Janssen Strasse 8–38
DE–46483 Wesel
Germany
E-Mail Forschung1@marien-hospital-wesel.de

Prof. Ulrich Wahn
Charité Universitätsmedizin
Department of Pneumology
Augustenburger Platz 1
DE–13353 Berlin
Germany
E-Mail ulrich.wahn@charite.de

Prof. Ekhard E. Ziegler
Department of Pediatrics
University of Iowa
200 Hawkins Drive
Iowa City, IA 52242-1082
USA
E-Mail ekhard-ziegler@uiowa.edu
Contributors

Moderators

Prof. Christoph Fusch
Zentrum für Kinder- und Jugendmedizin
Ernst-Moritz-Arndt-Universität
Soldmannstrasse 15
DE–17487 Greifswald
Germany
E-Mail fusch@uni-greifswald.de

Prof. Berthold Koletzko
Kinderklinik und Poliklinik
Abteilung Stoffwechselkrankheiten und Ernährung
Dr. von Haunersches Kinderspital
Lindwurmstrasse 4
DE–80337 Munich
Germany
E-Mail Berthold.Koletzko@
med.uni-muenchen.de

Dr. Sibylle Koletzko
Abteilung für Pädiatrische Gastroenterologie
Dr. von Haunersches Kinderspital,
Klinikum der Universität München
Lindwurmstrasse 4
DE–80337 Munich
Germany
E-Mail Sibylle.Koletzko@
med.uni-muenchen.de

Prof. Michael J. Lentze
Zentrum für Kinderheilkunde der Universität Bonn, Allgemeine Pädiatrie und Poliklinik
Adenauerallee 119
DE–53113 Bonn
Germany
E-Mail michael.lentze@
ukb.uni-bonn.de

Dr. Andrea von Berg
Research Institute for the Prevention of Allergies and Respiratory Diseases
Wesel
Marien Hospital
Pastor-Janssen-Strasse 8–38
DE–46483 Wesel
Germany
E-Mail vonberg@
marien-hospital-wesel.de

Invited attendees

Dr. Luis Bernardino/Angola
Dr. Ralf Heine/Australia
Prof. Wilhelm Kaufersch/Austria
Dr. Patrick Degomme/Belgium
Dr. Marc Raes/Belgium
Dr. Cristina Jacob/Brazil
Dr. José Roberto de Moraes Ramos/Brazil
Dr. Marie-Josée Francoeur/Canada
Dr. Louis Beaumier/Canada
Dr. Kevan Jacobson/Canada
Dr. Sylvia Cruchet/Chile
Dr. Guofang Ding/China
Dr. Orjena Žaja Franulović/Croatia
Dr. Pavel Frühau/Czech Republic
Prof. Luis Rivera/Dominican Republic
Dr. Rafael Aulestia/Ecuador
Prof. Gamal Aly/Egypt
Prof. Sanaa Shaaban/Egypt
Prof. Jean-Charles Picaud/France
Prof. Dietrich Berdel/Germany
Prof. Renate Bergmann/Germany
Dr. Stephan Buderus/Germany
Dr. Roland Hentschel/Germany
Dr. F. Jochum/Germany
Dr. Martina Kohl/Germany
Dr. Uta Lässker/Germany
Prof. Michael J. Lentze/Germany
Dr. Gesine Müller-Teicher/Germany
Prof. Michael Radke/Germany
Dr. Jutta Zimmermann/Germany
Prof. George Puplampu/Ghana
Contributors

Dr. Christos Costalos/Greece
Dr. Elisavet Diamanti/Greece
Prof. Eleftheria Roma/Greece
Dr. Eva Micskey/Hungary
Dr. Ekawaty Lutfia Haksari/Indonesia
Dr. Aryono Hendarto/Indonesia
Dr. Ruskandi Martaadmadja/Indonesia
Dr. Seyed Hossein Fakhraei/Iran
Dr. Farid Imanzadeh/Iran
Dr. Aliakbar Sayyari/Iran
Dr. Costantino de Giacomo/Italy
Dr. Silvia Salvatore/Italy
Dr. Leslie Gabay/Jamaica
Dr. Rose Kamenwa/Kenya
Dr. Leva Eglite/Latvia
Dr. Sonja Bojadzieva/Macedonia
Dr. Liang-Choo Hung/Malaysia
Dr. Ravi Chandran/Malaysia
Dr. Diego Benavides-Hernandez/Mexico
Dr. Francisco Javier Espinosa/Mexico
Dr. Thomas Mason/Mexico
Dr. Ignacio Ortiz/Mexico
Dr. Enrique Romero-Velarde/Mexico
Dr. Hans Hoekstra/The Netherlands
Dr. Frank Kneepkens/The Netherlands

Dr. Oscar Segreda/Panama
Dr. Efren Balanag/Philippines
Dr. William Bayton Jr./Philippines
Prof. Maciej Kaczmarski/Poland
Prof. Jerzy Socha/Poland
Prof. Hania Szajewska/Poland
Dr. Jaime Marcal/Portugal
Dr. José Manuel Tojal

Monterio/Portugal
Prof. Silvia Stoicescu/Romania
Prof. Antonina I. Chubarova/Russia
Dr. Ali al Muhaideb/Saudi Arabia
Dr. Talal Iskandarani/Saudi Arabia
Dr. Peter Krcho/Slovakia
Dr. Anli Grobler/South Africa
Dr. Michele Zuckerman/South Africa
Prof. Félix Sánchez-Valverde/Spain
Prof. Maximo Vento/Spain
Dr. Alexander Rakow/Sweden
Prof. Christian Peter
Braegger/Switzerland
Dr. Suwat Benjaponpitak/Thailand
Dr. Nihat Sapan/Turkey
Ms. Isabel Skypala/UK
Prof. Ramasubareddy
Dhaniredy/USA
Prof. Ricardo Sorensen/USA

Nestlé participants

Ms. Julie Muddiman/Australia
Ms. Lynn Weaver/Canada
Dr. Wilson Daza/Colombia
Dr. Louis-Dominique van Egroo/France
Dr. Regina Berwind/Germany
Ms. Mechthild Göbel/Germany
Ms. Beate Grum/Germany
Dr. Dagmar Kreft/Germany
Mr. Herwig Piepenbring/Germany
Mr. Mike Possner/Germany
Mr. Gustav Quast/Germany
Mr. Serge Dzeukou/Ghana
Mr. Panagiotis Bagkas/Greece
Mr. Fernando Infante/Mexico
Dr. Mihaela Cerbu/Romania
Dr. Olga Netrebenko/Russia

Dr. Bianca-Maria Exl-Preysch/Singapore
Dr. Anette Järvi/Sweden
Dr. Denis Barclay/Switzerland
Dr. Marie-Claire Fichot/Switzerland
Dr. Clara Garcia/Switzerland
Prof. Ferdinand Haschke/Switzerland
Dr. Annick Mercenier/Switzerland
Mr. Urs Moser/Switzerland
Ms. Karin Rexeisen/Switzerland
Dr. Evelyn Spivey-Krobath/Switzerland
Dr. Peter van Dael/Switzerland
Dr. Thierry von der Weid/Switzerland
Ms. Zelda Wilson/UK
Mrs. Linda Hsieh/USA
Dr. José Saavedra/USA