

Pediatric Nutrition in Developmental Disorders

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Nutritionists from thirteen centers for handicapped children have joined together to produce this comprehensive analysis of the nutritional dimension of developmental disorders. Their discussions span the entire range of such conditions, from minimal brain dysfunction to cerebral palsy and meningomyelocele. The text also covers hereditary metabolic disorders and nutrient deficiency disorders. In each case, nutritional diagnostic, preventive and therapeutic techniques are described. This book is designed for nutritionists, dietitians, pediatricians and related professionals who recognize the need for nutritional programs for the handicapped and who are looking for new directions in nutritional research.

With a Foreword by

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PEDIATRIC NUTRITION IN DEVELOPMENTAL DISORDERS

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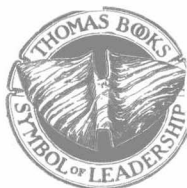
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PEDIATRIC NUTRITION IN
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To the millions of children in America and throughout
the world who deserve our care and concerted efforts,
and to our husbands Mark and Ray, who share our
concerns.

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FOREWORD

IN RECENT YEARS, the field of development disabilities has burgeoned with expanded knowledge and increased public awareness of the needs of disabled children. It is indeed timely that this book dedicated to nutritional issues, combining research and clinical experience, is now available not only to nutritionists but to the broad range of professionals serving the developmentally disabled.

The importance of nutrition in the growth and development of human potential cannot be overemphasized. The enduring influence of nutrition in early life, the effects of deprivation, and the subsequent retardation that may occur are of deep concern to all who care about children. Understanding the nutritional requirements for optimum life conditions, with respect to the developmentally disabled child, is an area of ongoing study. It is exciting to have a volume bringing together the current knowledge in this field. Disorders such as Down's syndrome, minimal brain dysfunction, epilepsy, cerebral palsy—all are household words in the field of developmental disabilities—but the relationship of nutritional factors and clinical strategies to these disabilities is not commonly understood. The role metabolic disorders and nutrient deficiencies play in child development is of special concern. It is impressive that the editors of this book bring together clinically important research and experience to focus on a vast number of critical issues in this field. The variety of contributions by a large number of competent authors gives a breadth and depth to the subject available nowhere else. Each chapter on developmental disabilities, metabolic disorders, and nutrient deficiencies represents a diversity and plethora of research and clinical information.

It is especially significant that the authors throughout this volume look toward prevention, as well as intervention, for it is in the prevention of handicaps and deficits that we will provide a major impact on human development. The consideration of preventive nutrition, high risk factors, early identification, and intervention are of great importance. We know that fetal nutrition and the nutritional status of the parenting population strongly influence later development. The information in this book will be of great assistance to professionals working toward preventive nutrition in developmental disabilities.

The two major authors and editors of this book, Sushma Palmer and Shirley Ekvall, bring a special perspective to the field, reflected in the ap-

proach and content of this book. Each of them not only has done distinguished work in the field of nutrition and developmental disabilities, but also has served in an interdisciplinary setting where the nutritionist's role and knowledge is integrated with the expertise of many other professionals. This broad base of experience has served to enhance and elaborate the nutritional content of this book. They have sampled widely from the range of nutrition experts in the field of developmental disorders after highlighting the special expertise of each of the contributors. *Pediatric Nutrition in Developmental Disorders* promises to be a landmark volume in its field, bridging the gap between research and clinical application, and notable for its relevance to the nutritionist and other health-related professionals.

PHYLLIS MAGRAB, Ph.D.

PHILIP CALCAGNO, M.D.

PREFACE

AT NO TIME have North Americans been more conscious or concerned about the nutritional health of our population. Yet, the nutritional problems confronting our estimated 2.5 million retarded children have received insignificant attention. *Pediatric Nutrition in Developmental Disorders* brings practical information to those concerned about handicapped children and their nutritional status.

The central purpose of this book is to bridge the gap between research and clinical practice. Although the general linkage between malnutrition and mental development has been discussed at some length, little or no emphasis has been placed on nutritional problems in such specific developmental disorders as Down's syndrome, epilepsy, cerebral palsy, minimal brain dysfunction, and autism. A partial reason for this is simply the paucity of information.

While isolated pockets of related information exist on particular developmental disorders and a greater amount pertains to hereditary metabolic diseases, little, if any, effort has been made to date to integrate this information and supply it to the clinician in a usable form.

This manuscript identifies nutritional disorders in the handicapped or developmentally disabled population, focuses individually on the major developmental disabilities, and outlines specific factors to consider in nutritional diagnosis and intervention.

Nutrition is crucial in both the *prevention* and the *treatment* of developmental disorders.

In a pioneering report in 1970, *The President's Committee on Mental Retardation* noted that "a large number of studies conducted with controls of age, sex, race, and socioeconomic background have shown that malnourished children have severely impaired or retarded neurological and mental functions as well as emotional and behavioral abnormalities." Similarly, the *Ten-State Nutrition Survey* and the *First Health and Nutrition Examination Survey (HANES)* have recorded, in certain populations, the widespread occurrence of malnutrition in the form of iron deficiency anemia, vitamin A deficiency, suboptimal riboflavin nutriture, and evidence of retarded growth in low income groups. These findings have been largely confirmed in a recent nutritional study of preschool children and have brought us closer to recognizing that nutritional disorders are not simply a problem of the developing world.

Though considerable efforts have been made in the last two decades to elucidate this crucial factor—the relationship between malnutrition and the human developmental pattern—and though the exact nature of this relationship is still murky, it is now generally accepted that severe malnutrition pre- and postnatally reduces the size of brain, decreases the number of brain cells, and may be responsible for abnormalities in behavior. However, despite supportive data from numerous studies and frequent expressions of grave concern, clinical expertise and interest in the field of nutrition and developmental disorders is still scarce.

This book is geared to the professional nutritionist, the dietitian, the pediatrician, the baccalaureate or advanced degree student in nutrition, and to other professionals and students engaged in the field of developmental disabilities. It is a compilation of relevant information on nutrition and developmental disabilities, citing pertinent research as reported in the literature as well as incorporating clinical experiences of nutritionists in this field. It presents this information in a practical manner, allowing easy implementation in clinical programs for handicapped children. It can serve as a useful reference, a source of knowledge, and most significantly, as a handy guide for identifying, treating, and preventing nutritional problems in this population.

The introductory chapter summarizes the current concepts on nutrition, growth, and development, emphasizing growth deviations in malnourished children.

Subsequent chapters deal with each developmental disorder individually, outlining the biochemical and nutritional implications in each case and describing the techniques for diagnosis and treatment of the problems.

Section I describes the nutritional problems encountered in some disorders from the following categories of developmental disabilities: chromosomal aberrations, congenital anomalies, neurological impairments, loss of input to sensory organs, muscular incoordination, learning disabilities, and severe emotional disturbances. In each case, biochemical and nutritional implications are summarized, and clinical techniques for nutritional diagnosis and treatment are outlined.

Section II focuses on hereditary metabolic diseases, the biochemical and nutritional problems resulting from these genetic disorders, and provides guidelines for dietary management of these conditions.

Section III discusses select nutrient deficiency disorders likely to be encountered in or associated with mental or physical retardation. Included in this section are both disorders which arise primarily from exogenous malnutrition, such as protein-calorie deficiency, and those due to endogenous malnutrition such as drug-nutrient interactions.

Section IV focuses on preventive nutrition, highlighting high risk factors in pregnancy and during infancy. It provides suggestions for nutrition education and discusses the basic tools in assessment of nutritional status.

The authors view this as a preliminary step towards a complete work on the subject. It is designed to coordinate and share existing experiences and knowledge. Fundamentally, it is meant as a challenge to others in the field to open fresh vistas, to stimulate new ideas, and to motivate clinical research in the area of nutrition and developmental disorders.

SUSHMA PALMER
SHIRLEY EKVALL

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S.P.

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