

CLINICAL
NUTRITION

Volume 2

Parenteral Nutrition

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Volume **2**

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Foreword

Dr. Michael D. Caldwell and Dr. John L. Rombeau edited a very useful volume on Enteral Nutrition and Tube Feeding that was published in 1984. They have followed this, as expected, with this volume on Parenteral Nutrition.

While nearly 100 per cent of the human race take their nourishment orally, and even in hospital populations, over 95 per cent are nourished orally or enterally, parenteral nutrition has a special field of usefulness. Because of the relative abundance of nourishment in the United States and in most Western countries, protein-calorie malnutrition is seldom seen except in patients who have an intrinsic nutritional disability, such as a stricture of the alimentary tract, a fistula, or a very abnormal rate of nutrient loss caused either by a fistula from the alimentary tract or by a protein-losing lesion such as an extensive burn, or in some cases of Ménétrier's syndrome in which albumin escapes through the stomach. Thus, one finds that the very people who need nutritional support most urgently tend to be the same people for whom it cannot be provided by the enteral route. Because so many of these patients have lesions of the alimentary tract, they tend to gravitate toward surgical services, where gastrointestinal surgeons undertake to re-establish functioning alimentary tracts by operative correction of the defects. Unfortunately, patients with severe nutritional deficits are relatively poor surgical risks, a theme that will be expanded in the body of this text. Therefore, methods of restoring the patient's nutritional deficits prior to operation become of crucial importance. It was, indeed, this motive that led to many of the developments in parenteral nutrition, particularly so-called *intravenous hyperalimentation* (IVH), by which we refer to regimens providing substantially more caloric and nitrogen intake than is required even to meet the postoperative hypermetabolic state. Indeed, it was not until the goal of nitrogen equilibrium had been superseded by 30 to 50 per cent that Dudrick, Vars, and Rhoads began to see the dramatic changes that can often be brought about by appropriate intravenous feeding.

Both Dr. Caldwell and Dr. Rombeau have been pioneers in the clinical nutrition field. Dr. Caldwell had the special advantage of being the original editor of the *Journal of Parenteral and Enteral Nutrition*, the official organ of the American Society for Parenteral and Enteral Nutrition (known as ASPEN). He saw most of the reports in this field for a number of years and proved himself to be a superb editor. He is now on the faculty of Brown University School of Medicine, Director of the Nutritional Support Service at the Rhode Island Hospital, and Director of the Surgical Metabolism Laboratory at the same hospital. Dr. Rombeau is on the faculty at the School of Medicine of the University of Pennsylvania and is Director of the Nutrition Support Service at the Philadelphia VA Medical Center. In editing this volume, they have called

on many, indeed most, of the people who brought this field from its early laboratory stages at the University of Pennsylvania to the very wide use it serves today. This has been done by careful study and refinement of the details of the parenteral nutrition procedure, resulting in a diminished risk, improved products, advances in the techniques of administration, and far better organization of nutritional support teams.

This volume begins with a chapter on the history of the development of intravenous feeding, going far back in medical history to the many roots of physiologic chemistry and nutritional science, and proceeds in an orderly way to chapters on the basic biochemistry of the nutritional process, the experimental pathology attending nutritional deficits in animals and humans, the assessment of nutritional deficits in patients, and the many phases of the problem, both theoretical and practical. It should serve not only as a book of reference but also as a practical guide to the management of a wide variety of nutritional problems seen in clinical medicine, pediatrics, and surgery.

JONATHAN E. RHOADS, M.D., D.Sc.

Preface

The science of parenteral nutrition has undergone many changes since the report that documented its efficacy in 1967. Similar to what occurred with other medical advances, a period of underutilization was followed by a time of overutilization. More recently, attempts have been made via controlled clinical trials to identify the appropriate utilization of parenteral nutrition and to confirm its metabolic and clinical benefits. Certainly, no one can deny that parenteral nutrition has been life-saving for many individuals, such as those afflicted with short-gut syndromes. It is less clear, however, whether its use is justified in illnesses such as severe hepatic failure or extensive cancer. What can be concluded is that, in most instances, parenteral nutrition functions as a therapy adjuvant to primary treatments such as surgery, antibiotics, and other medical therapies.

The most important need in the field of parenteral nutrition is for the documentation of its effect on clinical outcome. Unfortunately, this may be an impossible task because of the multiple factors that influence clinical outcome. Furthermore, this issue is compounded by the moral and ethical dilemmas that arise when one realizes that the only alternative to parenteral nutrition, in some instances, is starvation.

There are many available texts on parenteral nutrition, and therefore it is important to question the rationale for another book. In our opinion the justification for this text results from the need to communicate the clinical and metabolic advances in parenteral feeding that have occurred so rapidly over the past few years. Furthermore, there has been a recent transition from the general applications of parenteral nutrition to more specific approaches based on nutrient requirements of individual disease states. In other words, parenteral feeding has evolved into an era of prescription nutrition. A major objective of this text has been to reflect these changes and to incorporate them into a reference source for parenteral nutrition. To meet this objective, contributors have been chosen with both clinical and research expertise, and they have been encouraged to document their chapters as extensively as possible.

This is the second volume of a two-volume set. Because of this format, certain general topics that are covered in Volume I, such as nutritional assessment, have not been repeated in Volume II. Other topics covered in Volume I have been included in Volume II when sufficient information specifically relevant to parenteral nutrition is available. It is acknowledged that many readers will be interested only in one volume; therefore, some topics are included in Volume II with the realization that a degree of overlap with Volume I is unavoidable.

Several important new areas are included in this volume. An improved understanding of disease-specific substrate requirements has led to contemporary chapters on this topic. Important advances have occurred in trace element requirements for parenteral nutrition, and this topic is covered extensively. Furthermore, there is now sufficient new information to include specific chapters on the role of parenteral nutrition in the treatment of anorexia nervosa, geriatric illnesses, sepsis, and in ameliorating the gastrointestinal complications associated with pregnancy. Finally, and of major importance, is an objective discussion of the costs and risks and benefits of parenteral nutrition.

It is acknowledged that a major improvement in the delivery of parenteral nutrition has resulted from the formation of multidisciplinary support teams. There is a need to provide updated scientific information to assist these teams in the provision of optimal nutritional care. Therefore, this text includes chapters of interest to such hospital nutrition team members as pharmacists, nurses, and dietitians; however, it is emphasized that its contents are directed primarily to the physician.

We wish to acknowledge the outstanding secretarial support of Jo Ann Graham and Betty Hoaque. A special thanks is extended to Linda Belfus, John Dyson, Evelyn Weiman, and Janet Macnamara-Barnett at the W. B. Saunders Company for their outstanding editorial assistance. Our gratitude is also extended to the many faculty, fellows, and residents who have directly and indirectly made important suggestions in the development of this book. Finally, our deepest gratitude is expressed to our wives and families for their inordinate understanding and forbearance.

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