

FLUIDS AND ELECTROLYTES

with CLINICAL APPLICATIONS

A PROGRAMMED APPROACH

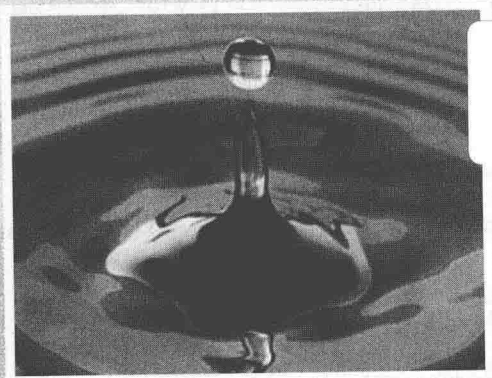
6TH EDITION



Joyce LeFever Kee
Betty J. Paulanka

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WITH CLINICAL APPLICATIONS



A Programmed Approach

Sixth Edition

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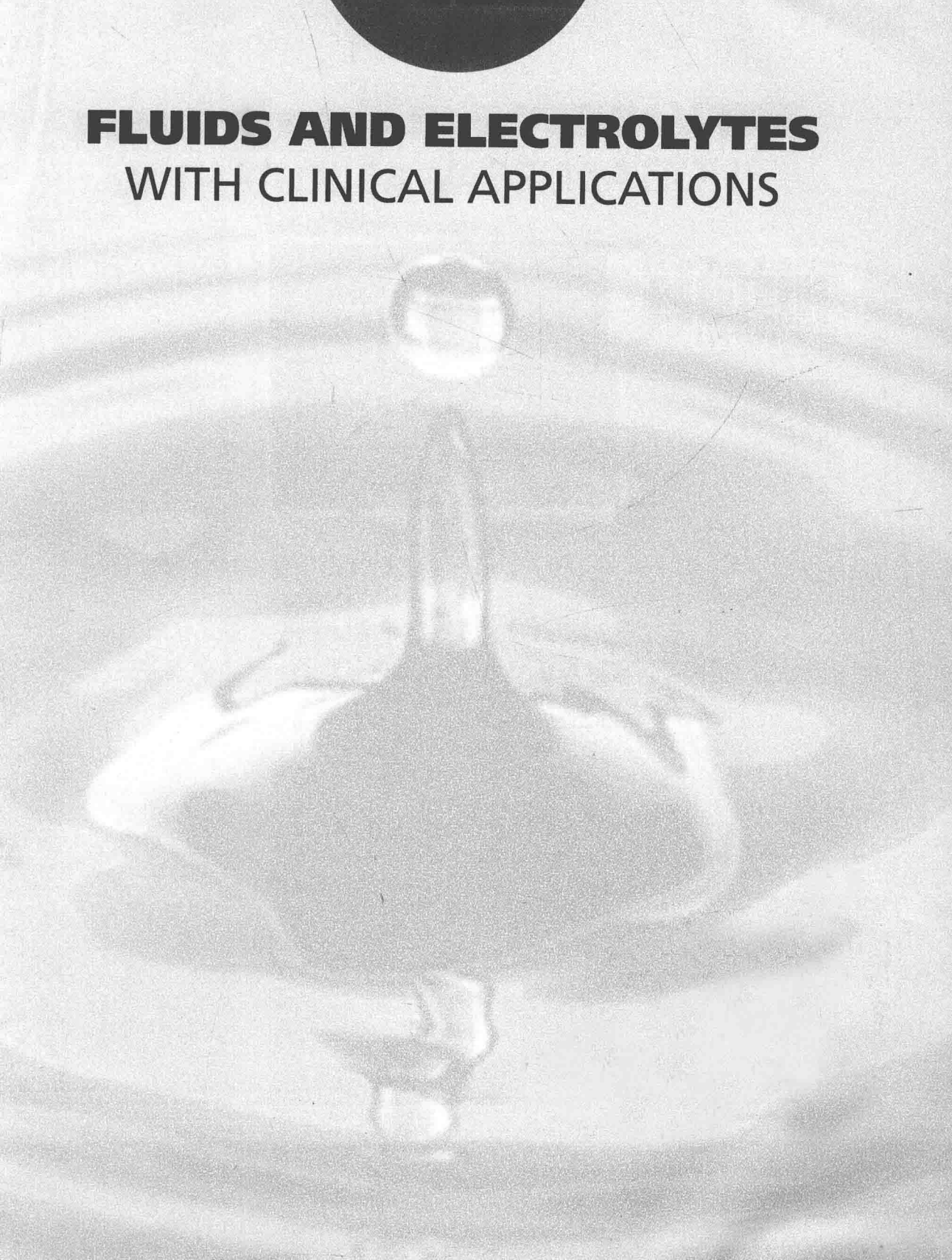
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CIP

FLUIDS AND ELECTROLYTES

WITH CLINICAL APPLICATIONS





Dedication

To

My Children—Eric, Katherine, and Wanda

Joyce LeFever Kee

To

My Children—Christie and Elaine

Betty J. Paulanka

Preface

Nurses and health professionals are involved continually in the assessment of fluid and electrolyte imbalance. Medical advances and new treatment modalities have increased the importance of a strong background in the physiologic concepts associated with these imbalances. Additionally, the expanded role of nurses in the community requires them to function more autonomously in assisting clients to control fluid and electrolyte imbalances. Every seriously or chronically ill person is likely to develop one or more of these imbalances, and the very young and the very old are especially vulnerable to changes in fluid and electrolyte balance. Even those who are only moderately ill are at high risk for these imbalances. Multiple health providers are responsible for maintaining homeostasis of fluid and electrolyte balance when caring for clients. After completing this book, the participant should understand more fully the effects of fluid, electrolyte, and acid-base balance and imbalance on the body as they occur in many clinical health problems.

New to This Edition

The sixth edition of this programmed text, *Fluids and Electrolytes with Clinical Applications*, has been completely revised to meet the current assessment, management, and clinical interventions recommended for fluid, electrolyte, and acid-base imbalances and related clinical health problems. The chapters include objectives, introduction, pathophysiology, etiology, clinical

manifestations, clinical management, clinical applications, clinical considerations, case studies, and nursing diagnoses with clinical interventions, appropriate rationale, and evaluations. This new edition also includes:

- The reorganization of content into 6 units and 26 chapters helps set the foundation from simple to more complex fluid and electrolyte concepts.
- The design has been changed to make it more user friendly.
- Increased emphasis on evaluation and outcome for each chapter.
- The electrolytes sodium and chloride are presented as one chapter because of their close physiological relationship.
- Extensive revisions have been made for the chapters related to life-span issues in *Fluid Problems of Infants and Children* and *Fluid Problems of the Aging*.
- New summary charts, *Clinical Considerations*, for fluids and electrolytes, are included as quick reference sources for pertinent information related to the imbalance.
- A new chapter, *Chronic Diseases with Fluid and Electrolyte Imbalances*, contains the three common yet complex chronic health problems, congestive heart failure (CHF), diabetic ketoacidosis, and chronic obstructive pulmonary disease (COPD). This helps students learn how to apply multiple fluid and electrolyte concepts in complex situations.
- There are over 150 diagrams and tables. Many new tables and figures have been added for quick reference to pertinent information.
- There are five new appendices: (A) Clinical Pathways, (B) Summary of Acid-Base Imbalances, (C) Clinical Problems Associated with Fluid Imbalances, (D) Clinical Problems Associated with Electrolyte Imbalances, (E) Clinical Assessment Tool: Fluid, Electrolyte, and Acid-Base Imbalances, and (F) Foods Rich in Potassium, Sodium, Calcium, Magnesium, Chloride, and Phosphorus.

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The content of this book has been geared to three levels of learning among the health professions. First, it is intended for beginning students who have had some background in the biological sciences or who have completed an anatomy and physiology course. Second, it is for students who have a sufficient background in the biological sciences, chemistry, and physics but who need to learn about intravenous therapy and specific clinical health problems that cause fluid and electrolyte imbalances. Many of these students might wish to review the entire text to reinforce their previous knowledge and/or practice their skills in handling clinical nursing assessments and interventions. Finally, this book is intended to aid graduate nurses who wish to review and improve their knowledge of fluid and electrolyte changes in order to assess their clients' needs and enhance the quality of client care. Summary charts have been included as quick reference sources for the working professionals.

What Is a Programmed Approach?

The programmed approach is a self-instructional method of learning that helps the instructor to use class time more efficiently, and enables students to work at their own pace while learning the principles, concepts, and applications of fluids and electrolytes.

Throughout, an asterisk (*) on an answer line indicates a multiple-word answer. The meanings for the following symbols are: ↑ increased, ↓ decreased, > greater than, < less than. A dagger (†) in tables indicates the most common signs and symptoms. A glossary covers words and terms used throughout the text. It should be useful to the student who has minimal preparation in the biological sciences.

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Betty J. Paulanka, RN, EdD

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Helpful Suggestions from the Authors

To the Student

Many students believe that the subject of fluids and electrolytes is very difficult to comprehend. This programmed book provides you with important data on fluids and electrolytes from various points of view. If you apply this material to clinical problems and previous and present experiences, it is not so difficult to understand and retain.

By taking easy steps provided in this book, you can proceed through the chapters more quickly than you might expect. This book is written using a self-instruction format that allows you to proceed at your own speed. Each step is a learning process. A better quality of learning occurs when you either complete a chapter at a time or spend a minimum of two hours at one sitting. Never end the study period without at least completing all questions related to a single topic.

It is helpful to begin each study session with the final questions from the previous material; this enables you to check your retention of material that was presented previously. The case study reviews in each chapter give immediate reinforcement of the data learned. The assessment factors, diagnoses, and interventions should be useful when applying fluid, electrolyte, and acid-base concepts in various clinical settings. The six appendices act as a

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quick reference for obtaining data related to health problems of fluid and electrolyte imbalances. The clinical assessment tool is useful for determining fluid, electrolyte, and acid-base balance and imbalance. A glossary is included to assist you with words and terms used throughout the text.

Study each diagram and table before proceeding to the questions. If you make mistakes in the program, you need not be concerned so long as you rectify the mistakes. This learning modality and the content in this book should increase your knowledge and understanding of fluids and electrolytes. This model of learning can be a great asset for applying this knowledge to your clinical practicum experiences.

To the Instructor

Class time is frequently spent on reviewing material or presenting new material that can easily be given through programmed (learning) instruction. This method of instruction enables the teacher to minimize the time spent in lecture on fluids and electrolytes, thus devoting more time to clinical discussions and seminar format to enhance the students' understanding of fluid and electrolyte imbalance by active class participation.

You may find it helpful to cover the material in this book by one of three ways: (1) assigning the students a chapter at a time; (2) assigning a unit for the students to complete by a certain date; or (3) assigning the students a given length of time to complete the entire text and having them present material using their clinical experience.

*Joyce LeFever Kee
Betty J. Paulanka*

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