

[Foreword]

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Acid-base balance is a crucial pillar of homeostasis. Maintaining the equilibrium between acids and bases throughout the body's organ systems is fundamental to normal cellular function and to multiple vital biological processes. Understanding the mechanisms, consequences, and solutions to acid-base imbalance is thus essential to ensuring and maintaining good organ function and to optimizing patient outcomes.

This textbook provides an in-depth exploration of the intricacies of acid-base balance, using the approach developed by the Canadian physiologist Peter Stewart. This mechanistic, physicochemical framework for acid-base-interpretation treats the partial pressure of CO_2 , strong ion difference, and total weak acid concentration as independent variables and thus includes the effects of electrolytes and albumin, making it particularly useful for analyzing complex acid-base disturbances in critically ill patients.

The book covers fundamental theoretical concepts, physiological considerations, and practical clinical applications. Its purpose is to help the reader develop a deep understanding of the underlying principles of acid-base balance and learn how to identify, interpret, and manage acid-base imbalance in daily clinical practice. Knowing how to correctly interpret different acid-base variables via blood gas analysis, is important in multiple clinical scenarios, including, for example, the optimal management of respiratory and metabolic alterations, appropriate adjustment of ventilator settings, and interpretation of blood lactate levels.

This updated 3rd edition of Stewart's Textbook of Acid-Base consists of 29 chapters, written by leading international experts in this field, and grouped into three parts: Part I reproduces Peter Stewart's original explanation of his approach to acid-base theory from 1981; Part II covers physiological considerations including a new chapter on cerebrospinal fluid acid-base homeostasis; and part III focuses on clinical applications with new chapters on respiratory disorders and metabolic alkalosis. The last chapter of the book provides useful example cases. The book is designed both for those who are unfamiliar with acid-base physiology and for the more expert clinician who is looking for the latest evidence and practical guidance. Not necessarily meant to be read cover-to-

cover, it can also be dipped into when a specific question or case arises.

I am sure this comprehensive book will find a place as a valuable reference volume on the shelves, whether virtual or real, of students and clinicians worldwide.