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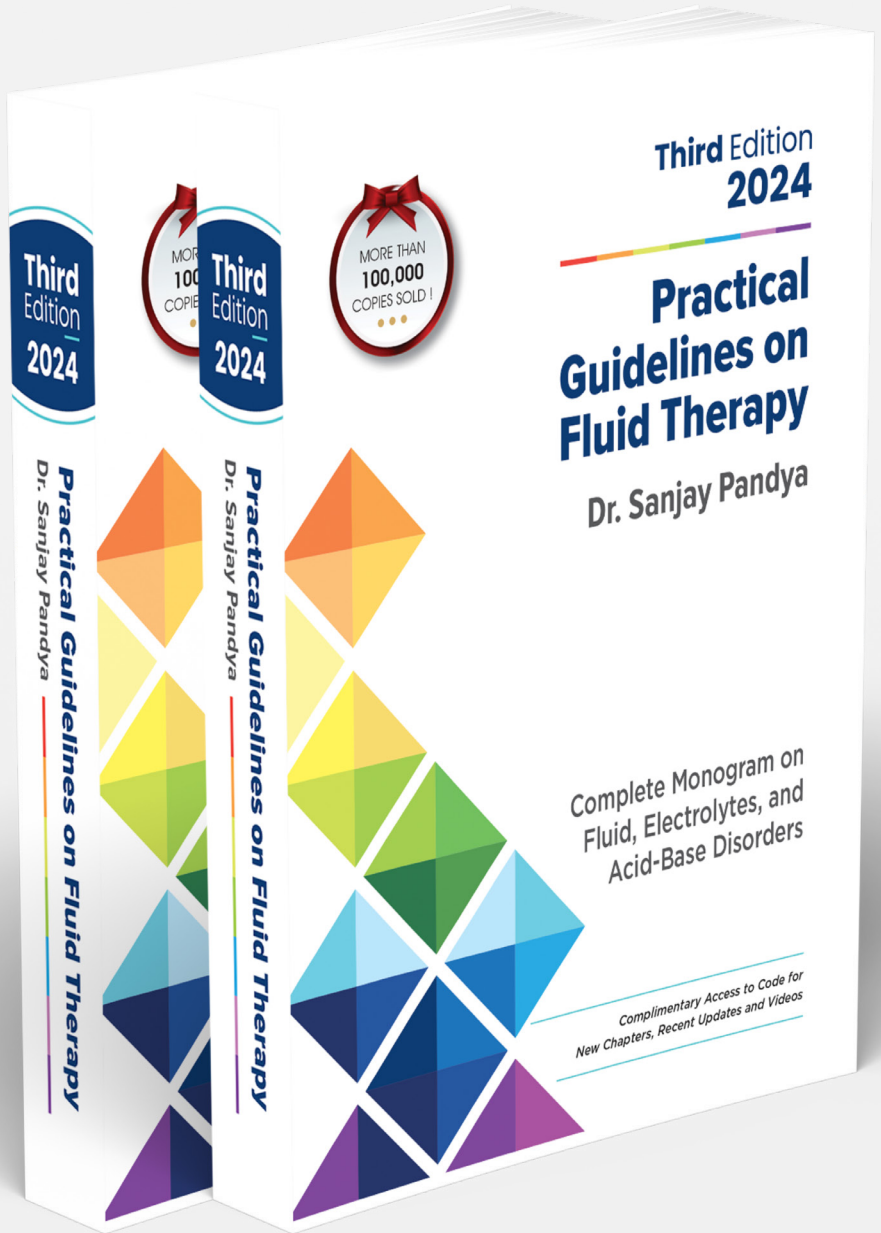
Chapter 30:

Basic Understanding and Approach to Acid-Base Disorders



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30 Basic Understanding and Approach to Acid–Base Disorders

Arterial blood gas (ABG) measurements are a crucial diagnostic test in medicine, providing vital insights for diagnosing acid-base disorders and guiding life-saving treatments in critically ill patients. Acid-base disorders frequently manifest in critically ill patients and can also serve as initial indicators of underlying diseases, such as Kussmaul's breathing presenting in diabetic ketoacidosis or renal failure.

To clearly understand the subject and its approach, this chapter outlines basic terminology, the physiology of pH regulation, compensation in various acid-base disorders, and the diagnostic approach.

UNDERSTANDING BASIC TERMINOLOGY

Basic terminology used to discuss acid-base disorders and their values in simple acid-base disorders are summarized below (Table 30.1).

pH: pH represents the concentration of free hydrogen ions (H^+). It has an inverse relationship with H^+ ion concentration. The normal value of pH in arterial blood is 7.4 (7.35–7.45).

Acid, acidemia and acidosis

- A decrease in pH indicates an increase in H^+ ion concentration.
- An acid is a substance that can donate H^+ ions or, when added to a solution, increase the H^+ ion concentration, thereby lowering the pH.
- An acidemia, which refers to "acid blood", is characterized by a blood pH below normal (pH <7.35) and an increased H^+ ion concentration.
- Acidosis is an abnormal process or disease that reduces pH (pH <7.35) due to an increase in acid or a decrease in alkali.

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