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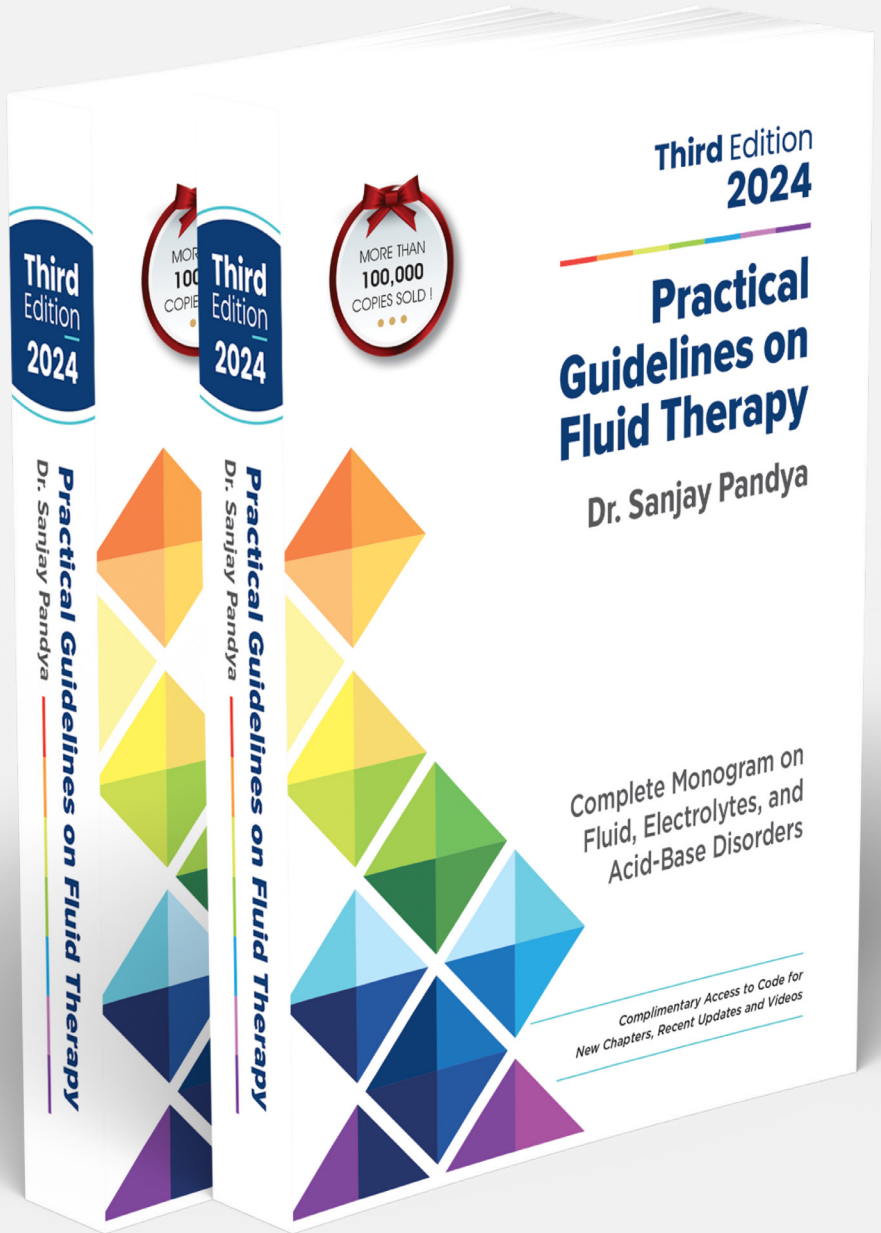
Chapter 31:
Metabolic Acidosis



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31 Metabolic Acidosis

Metabolic acidosis is a frequently encountered acid-base disorder in critical care patients, demanding meticulous attention and effective management due to its potential for serious consequences.

DEFINITION

It is characterized by a fall in plasma HCO_3 and a fall in pH (below 7.35). The $PaCO_2$ is reduced secondarily by hyperventilation, and this compensatory mechanism minimizes the fall in pH.

ETIOLOGY

Metabolic acidosis can result from the loss of HCO_3 via the gastrointestinal (GI) tract or kidneys, overproduction of endogenous nonvolatile acids, ingestion or infusion of acid or potential acids, and failure of H^+ excretion by the kidney.

Calculation of anion gap (AG) is extremely helpful in narrowing etiological diagnosis:

Anion Gap (AG)
$= Na^+ - (Cl^- + HCO_3)$
$= 12 \pm 2$ (Normal Value)

Metabolic acidosis can be classified into two groups based on the anion gap: high anion gap acidosis (e.g., lactic acidosis, ketoacidosis, ingested toxins, and acute or chronic renal impairment) and normal anion gap acidosis (e.g., diarrhea, renal tubular acidosis, or large volume saline administration). Table 31.1 summarizes the causes of metabolic acidosis classified based on the anion gap, their mechanisms of development, and how acidosis occurs in each cause.

The mnemonic "GOLDMARK" is helpful for remembering the causes of high anion gap metabolic acidosis (Table 31.2) [1].

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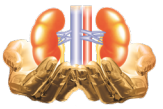
KidneyEducation 

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