

Imbalance and Related Causes	Signs and Symptoms
Respiratory Acidosis	
Hypoventilation Resulting From Primary Respiratory Problems	
Atelectasis (obstruction of small airways often caused by retained mucus)	<i>Physical examination:</i> confusion, dizziness, lethargy, headache, ventricular dysrhythmias, warm and flushed skin, muscular twitching, convulsions, and coma
Pneumonia	
Cystic fibrosis	
Respiratory failure	<i>Laboratory findings:</i> arterial blood gas alterations: pH <7.35, PaCO ₂ >45 mm Hg, PaO ₂ <80 mm Hg, and bicarbonate level normal (if uncompensated) or >26 mEq/L (if compensated)
Airway obstruction	
Chest wall injury	
Hypoventilation Resulting From Factors Outside of the Respiratory System	
Drug overdose with a respiratory depressant	
Paralysis of respiratory muscles caused by various neurological alterations	
Head injury	
Obesity	
Respiratory Alkalosis	
Hyperventilation Resulting From Primary Respiratory Problems	
Asthma	<i>Physical examination:</i> dizziness, confusion, dysrhythmias, tachypnea, numbness and tingling of extremities, convulsions, and coma
Pneumonia	
Inappropriate mechanical ventilator settings	<i>Laboratory findings:</i> arterial blood gas alterations: pH >7.45, PaCO ₂ <35 mm Hg, PaO ₂ normal, and bicarbonate level normal (if short lived or uncompensated) or <22 mEq/L (if compensated)
Hyperventilation Resulting From Factors Outside of the Respiratory System	
Anxiety	
Hypermetabolic states (fever, exercise)	
Disorders of the central nervous system (head injuries, infections)	
Salicylate overdose	
Metabolic Acidosis	
High Anion Gap	
Starvation	<i>Physical examination:</i> headache, lethargy, confusion, dysrhythmias, tachypnea with deep respirations, abdominal cramps, and flushed skin
Diabetic ketoacidosis	
Renal failure	
Lactic acidosis from heavy exercise	<i>Laboratory findings:</i> arterial blood gas alterations: pH <7.35, PaCO ₂ normal (if uncompensated) or <35 mm Hg (if compensated), PaO ₂ normal or increased (with rapid, deep respirations), bicarbonate level <22 mEq/L, and oxygen saturation normal
Use of drugs (e.g., methanol, ethanol, formic acid, paraldehyde, aspirin)	
Normal Anion Gap	
Renal tubular acidosis	
Diarrhea	
Metabolic Alkalosis	
Excessive vomiting	<i>Physical examination:</i> dizziness, dysrhythmias, numbness and tingling of fingers, toes, and circumoral region; muscle cramps, tetany
Prolonged gastric suctioning	
Hypokalemia or hypercalcemia	
Excess aldosterone	<i>Laboratory findings:</i> arterial blood gas alterations: pH >7.45, PaCO ₂ normal (if uncompensated) or >45 mm Hg (if compensated), PaO ₂ normal, and bicarbonate level >26 mEq/L
Use of drugs (steroids, sodium bicarbonate, diuretics)	

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