

with vitamin D and calcitonin, PTH regulates the homeostasis of serum calcium concentrations ([Gardner and Shoback, 2011](#)). The effect of PTH on calcium is opposite that of calcitonin. PTH and vitamin D work together to maintain serum calcium levels within a narrow normal range. They are required for bone mineralization. Secretion of PTH is controlled by a negative feedback system involving the serum calcium ion concentration. Low ionized calcium levels stimulate PTH secretion, causing absorption of calcium by the target tissues; high ionized calcium concentrations suppress PTH.

## Hypoparathyroidism

Hypoparathyroidism is a spectrum of disorders that result in deficient PTH. **Congenital hypoparathyroidism** may be caused by a specific defect in the synthesis or cellular processing of PTH, or by aplasia or hypoplasia of the gland ([Gardner and Shoback, 2011](#)).

Hypoparathyroidism may occur secondary to other causes, including infection and autoimmune syndromes. Postoperative hypoparathyroidism may follow thyroidectomy. Two forms of transient hypoparathyroidism may be present in newborns, both of which are the result of PTH deficiency. One type is caused by maternal hyperparathyroidism. A more common form appears almost exclusively in infants fed a milk formula with a high phosphate-to-calcium ratio.

**Pseudohypoparathyroidism** occurs when there is a genetic defect in the cellular receptors to PTH. The result is normal parathyroid gland and PTH levels. Abnormal calcium and phosphorus levels are not affected by administration of PTH. These children typically have a short, stocky build; a round face; and abnormally shaped hands and fingers. Other endocrine dysfunction may be found concurrently ([Shoback, 2008](#)).

Clinical signs of hypoparathyroidism are found in [Box 28-8](#). Muscle cramps are an early symptom, progressing to numbness, stiffness, and tingling in the hands and feet. A positive Chvostek or Trousseau sign or laryngeal spasms may be present. Convulsions with loss of consciousness may occur. These episodes may be preceded by abdominal discomfort, tonic rigidity, head retraction, and cyanosis. Headaches and vomiting with increased intracranial