

Calcium Homeostasis

	Calcium	Serum PTH	25-OHD	Alk Phos
Hypoparathyroidism	Low	Low	Normal	Normal
PTH Resistance	Low	High	Normal	Normal
Vit D Deficiency	Low	High	Low	Normal/high
Vit D Resistance	Low	High	Normal	Normal
Renal Disease	Low	High	Normal/low	Normal/high
Hypomagnesemia	Low	Normal	Normal/low	Normal
Metastatic Disease	High	High	Normal	High

Hypocalcemia

Definition	<ul style="list-style-type: none"> • Normal values are age specific and vary between labs • Hypoalbuminemia will lower the serum calcium concentration by 0.8 mg/dL for every 1.0 g/dL reduction in serum albumin (below 4 g/dL) 																
Etiology	<table border="1"> <tr> <td colspan="2">Low PTH</td></tr> <tr> <td colspan="2">Congenital</td></tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> • Genetic syndromes (DiGeorge, mitochondrial d/o, HDR hypoparathyroidism, deafness, renal anomaly, etc) • Mutations in production of PTH • CaSR activating mutations • Parathyroid aplasia/dysplasia </td></tr> <tr> <td colspan="2">Acquired</td></tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> • Hypomagnesemia or hypermagnesemia • Autoimmune (APS1) • Infiltrative disease (copper/iron deposition) • Acquired post-surgery </td></tr> <tr> <td colspan="2">High PTH</td></tr> <tr> <td colspan="2">Renal Failure</td></tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> • Vit D deficiency or increased Vit D metabolism (liver/renal disease, meds) • Pseudohypoparathyroidism (end organ resistance to PTH) • Excess phosphate intake • 1α-hydroxylase deficiency, defects in vitamin D receptor </td></tr> </table>	Low PTH		Congenital		<ul style="list-style-type: none"> • Genetic syndromes (DiGeorge, mitochondrial d/o, HDR hypoparathyroidism, deafness, renal anomaly, etc) • Mutations in production of PTH • CaSR activating mutations • Parathyroid aplasia/dysplasia 		Acquired		<ul style="list-style-type: none"> • Hypomagnesemia or hypermagnesemia • Autoimmune (APS1) • Infiltrative disease (copper/iron deposition) • Acquired post-surgery 		High PTH		Renal Failure		<ul style="list-style-type: none"> • Vit D deficiency or increased Vit D metabolism (liver/renal disease, meds) • Pseudohypoparathyroidism (end organ resistance to PTH) • Excess phosphate intake • 1α-hydroxylase deficiency, defects in vitamin D receptor 	
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