

Alkaline Phosphatase (ALP)

Description	ALP hydrolyses phosphate esters at alkaline pH. ALP is present as several isoenzymes; liver, bone, placental, intestinal and kidney. Serum ALP is principally liver and bone isoforms; liver ALP derived from the biliary canicular membrane and bone ALP from osteoblasts.
Indication	Hepatobiliary disease, bone disease associated with increased osteoblastic activity (Paget's disease, osteomalacia, rickets), disorders of calcium homeostasis and malignancy.
Additional Info	Consider age of patient when interpreting level as higher levels can be observed in childhood (growth spurt), pregnancy and old age.
Concurrent Tests	If elevated >200 U/L and cause unknown (normal GGT, adjusted calcium, phosphate, Vitamin D and PTH), ALP isoenzymes may be useful to elucidate origin.
Dietary Requirements	N/A
Interpretation	<p>Serum ALP activity primarily reflects changes in bone and liver function, even though there are other isoenzymes.</p> <p>Hepatobiliary disease: higher levels indicative of cholestasis (intra or extra hepatic). Intra-hepatic causes are e.g. hepatitis, drug reaction, liver metastasis, PBC. Extra-hepatic causes include gallstones or carcinoma of head of pancreas.</p> <p>Bone disease: Markedly high levels are often associated with Paget's disease. Moderate increases can occur in osteomalacia, metastatic bone disease and hyperparathyroidism.</p> <p>Pregnancy: Modest increases (2-3x ULN) may occur due to ALP of placental origin.</p> <p>Growth: Modest increases are seen during periods of rapid bone growth in childhood and adolescence.</p> <p>Thyrotoxicosis can also result in a minor increase in ALP</p> <p>In children and newborn it is possible to observe a transient benign rise in ALP</p> <p>Decreased levels of ALP can be seen in malnutrition, (Kwashiorkor in children), vitamin B12 deficiency, magnesium deficiency, zinc deficiency, gross anaemias and post cardiac surgery.</p> <p>Hypophosphatasia is an inherited disorder associated with low ALP activity, which in the childhood form is characterised by dental and bone abnormalities.</p>
Collection Conditions	N/A
Frequency of testing	