Vitamin B12 (Cobalamin)

**Function:**

Vitamin B12 is needed to form blood and immune cells, and support a healthy nervous system. A series of closely-related compounds known collectively as cobalamins or vitamin B12 are converted into active forms methylcobalamin or 5’-deoxyadenosylcobalamin. Methylcobalamin interacts with folate metabolism, preventing folate derivatives from being trapped in unusable states. Adenosylcobalamin is involved in the metabolism of odd-chain fatty acids and branched-chain amino acids.

**Deficiency Symptoms:**

Deficiency symptoms of vitamin B12 are both hematological (pernicious anemia) and neurological. A megaloblastic anemia may occur because the effects of the vitamin B12 deficiency on folate metabolism. Shortness of breath, fatigue, weakness, irritability, sore tongue, decrease in blood cell counts (red, white and platelets) are all clinical signs of a vitamin B12 deficiency. Neurological symptoms are manifested as a progressive neuropathy, with loss of position sense and ataxia. If vitamin B12 repletion is not initiated, permanent neurological damage, including degeneration of nerves and spinal cord can result. Recent evidence suggests that mental symptoms of depression and fatigue are detectable before anemia develops. Vitamin B12 is necessary to prevent accumulation of homocystine, a toxic metabolic byproduct linked to cardiovascular disease and connective tissue abnormalities. Hypochlorhydria and gastrointestinal disturbances are frequently associated with vitamin B12 deficiency.

**Repletion information:**

Dietary sources for cobalamins are strictly from animal foodstuffs. Vitamin B12 is not found in plant foodstuffs. Dietary supplements can also contain vitamin B12.

The 1989 RDA for vitamin B12 is 2.0 μg for adults. No toxic effects of oral vitamin B12 intake have been demonstrated, even in doses over 1000 μg daily.

Since the absorption and intracellular activation of oral vitamin B12 are frequently difficult, consideration should be given to injectable forms of vitamin B12. Some patients may require more frequent or larger doses than usual before repletion occurs.