



Accurate Clinic

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www.AccurateClinic.com

Vitamin B12 plays a key role in the normal functioning of the brain and nervous system and the formation of blood. Vitamin B12 is needed for DNA synthesis and regulation, fatty acid synthesis, and energy production.

The only dietary source of Vitamin B12 is animal and fish, it is not found in significant amounts in vegetables or fruits. Vitamin B12 is bound to protein in food so this bond must first be broken by the activity of stomach acids and enzymes. Then, to be absorbed, Vitamin B12 must attach to "intrinsic factor" manufactured by the lining of the stomach. Any condition, or medication, that reduces these stomach acids, enzymes or intrinsic factor can lead to Vitamin B12 deficiency.

Conditions associated with increased risk for Vitamin B12 deficiency:

- Strict vegetarian diet
- Stomach surgery or bypass
- Scarring or inflammation of the stomach
- Age over 50 years old
- Prolonged use of medications including metformin, medications to reduce stomach acids such as Prilosec (omeprazole), Nexium (esomeprazole), Protonix (pantoprazole), Zantac (ranitidine), Pepcid (famotidine) and antacids.

Symptoms of Vitamin B12 deficiency may include anemia, fatigue, weakness, constipation, loss of appetite, and weight loss. Nerve changes, such as numbness and tingling in the hands and feet, can also occur. Additional symptoms of Vitamin B12 deficiency include difficulty maintaining balance, depression, confusion, dementia, poor memory, and soreness of the mouth or tongue.

Prevention of Vitamin B12 Deficiency

The Institute of Medicine recommends daily intake of 2.4 mcg of Vitamin B12 in adults older than 18 years to prevent Vitamin B12 deficiency. Because crystalline formulations found in Vitamin B12 supplements are better absorbed than naturally occurring Vitamin B12, people older than 50 years should eat foods fortified with Vitamin B12 or take Vitamin B12 supplements rather than attempt to get Vitamin B12 strictly from dietary sources.

Supplements

Vitamin B12 dietary supplements are usually cyanocobalamin, a form that the body readily converts to active forms but supplements can also contain methylcobalamin and other forms of Vitamin B12. Existing evidence does not confirm any differences among forms with respect to absorption or bioavailability. However, methylcobalamin is thought by some to be more effectively absorbed by nerve cells and therefore methylcobalamin may be better for treating nerve disorders.

The body's ability to absorb Vitamin B12 from dietary supplements is largely limited by the capacity of intrinsic factor. For example, only about 10 mcg of a 500 mcg oral supplement is actually absorbed in healthy people. In addition to oral dietary supplements, Vitamin B12 is available as sublingual tablets or lozenges. Sublingual preparations are frequently marketed as having superior bioavailability but evidence suggests no difference between oral and sublingual forms. For those with difficulty absorbing Vitamin B12 from their stomach, sublingual preparations and intramuscular injections of Vitamin B12 may be preferred. Recent research, however, indicates high dosages of oral Vitamin B12 (1 to 2 mg daily) for 90 to 120 days had an improvement in serum Vitamin B12 similar to patients who received intramuscular injections of Vitamin B12. These results were consistent in patients regardless of the reason for the Vitamin B12 deficiency, including malabsorption.

Testing for Vitamin B12 Deficiency

Patients at risk for Vitamin B12 deficiency should be tested with blood tests that may include vitamin B12 levels as well as methylmalonic acid levels, a more sensitive indicator of functional Vitamin B12 deficiency.



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Therapeutic Supplementation with Vitamin B12

In addition to treating Vitamin B12 deficiency, Vitamin B12 is sometimes been recommended for the following conditions:

Energy and endurance

Due to its role in energy metabolism, Vitamin B12 is frequently promoted as an energy enhancer and endurance booster. However, most studies regarding vitamin B12 supplementation appear to show no beneficial effect on performance in the absence of a nutritional deficit. There are limited studies that suggest improved mental function, mood and well-being.

Diabetic Peripheral Neuropathy (DPN)

Supplementation with Vitamin B12 has been shown by multiple studies to benefit patients with DPN. Methylcobalamin has been shown to improve nerve conduction, nerve regeneration and nerve pain. Diabetic retinopathy has also shown to benefit from Vitamin B12.

Neuralgias and Bell's Palsy

There is evidence that Vitamin B12 reduces the pain of trigeminal neuralgia, herpetic neuralgia (shingles) and glossopharyngeal neuralgia (a nerve disorder associated with facial pain). Studies also show benefit for Bell's Palsy with reduced symptoms and recovery time.

MTHFR Variants

For people with MTHFR genetic variants resulting in impaired capacity to convert folic acid to methylfolate, the maintenance of adequate intake of Vitamin B12, along with other B vitamins including riboflavin and thiamine, supplementation is recommended.

Neck and Low Back Pain

While the research is very limited there are recent studies published showing Vitamin B12 to reduce nonspecific neck and low back pain.

Neuropathic Pain

While there is little research to generalize recommendations for the use of Vitamin B12 for all pain related to nerves, the fact is that vitamin B12 is necessary for nerve health, particularly related to the structural maintenance of nerves. Most conditions associated with nerve pain are likely to reflect disruption of the structural health of the involved nerve(s) and therefore are likely to benefit from supplemental vitamin B12.

Dosing of Vitamin B12

Treatment of clinical Vitamin B12 deficiency has traditionally been intra-muscular injection of crystalline Vitamin B12 at a dosage of 1 mg weekly for eight weeks, followed by 1 mg monthly for life.

When supplementing with Vitamin B12, the usual doses are ½-2 mg/daily up to 4-6 weeks followed by weekly or monthly supplements. There is no consistently recommended dose. If you contemplate supplementing with Vitamin B12, please consult your physician.