

Vitamin B12



Methylcobalamin

High-Dose Sublingual 5 mg and 15 mg Tablets

- High-dose methylcobalamin, an active coenzyme form of vitamin B₁₂
- Supports the production and maintenance of healthy red blood cells
- Promotes healthy nerve function
- Helps to lower homocysteine levels for cardiovascular benefits
- Sublingual tablets allow for fast-acting delivery system directly into the bloodstream
- Suitable for vegans
- Delicious natural grape flavour



Addressing a vitamin B₁₂ deficiency can prove to be a simple intervention with many benefits. Vitamin B₁₂ is instrumental for immune-system performance, DNA synthesis, cellular energy production, and red-blood-cell formation. With such a broad range of biological tasks, it's easy to consider how supplementation can benefit your health.

Oral **Vitamin B12** tablets are a great alternative to B₁₂ injections that are often given to overcome a B₁₂ deficiency and to support conditions associated with suboptimal B₁₂ levels.^{[1][2]} Sublingual dosage exploits the extremely vascular tissue below the tongue for direct access to the bloodstream, while circumventing the digestive system.

Mechanisms

- **Vitamin B₁₂ Deficiency:** The main causes of vitamin B₁₂ deficiency include vitamin B₁₂ malabsorption from food, pernicious anemia, postsurgical malabsorption, and dietary deficiency. Vitamin B₁₂ is necessary for the rapid synthesis of DNA during cell division. This is especially important for red-blood-cell formation. Low red-blood-cell production or megaloblastic anemia can indicate a B₁₂ deficiency, which can lead to adverse effects on nerves, heart health, mental health, and cognition. Vegetarians are particularly prone to B₁₂ deficiency due to vitamin B₁₂ being an essential vitamin found mainly in animal food sources.^[3] Those at risk of vitamin B₁₂ deficiency include older adults, people with gastrointestinal surgeries such as Crohn's and celiac disease, post-bariatric surgery, vegans and vegetarians, those taking metformin for blood-sugar control, and those taking proton-pump inhibitors for chronic heartburn. Some signs and symptoms of a vitamin B₁₂ deficiency can include high homocysteine, pernicious anemia, mood changes, fatigue, depression, dementia, red burning tongue, muscle weakness, shortness of breath, dizziness, numbness (fingers, toes, etc.), heart palpitations, bleeding gums and mouth sores, nausea, and poor appetite.
- **Poststroke Recovery and Depression:** Low levels of B₁₂ have been linked to depression and other types of cognitive and mental impairment. Supplemental B₁₂ has been shown to help poststroke depression, recovery rate, and carpal tunnel syndrome.^{[4][5][6]}
- **Elevated Homocysteine:** B₁₂ deficiency causes excess homocysteine in the body. Homocysteine is a powerful vascular toxin and is linked to increased risk of stroke, dementia, cognitive decline, and depression. Homocysteine is an amino acid that is used by the vitamin B₁₂-dependent enzyme to create methionine. When B₁₂ concentrations are lower than optimal (and this enzyme is underactive), concentrations of homocysteine are elevated. Methylcobalamin provides the methyl group required to convert homocysteine to methionine, so it does not accumulate in the body and cause harm. Several studies have shown that B₁₂ supplementation reduces homocysteine,^{[3][7][8]} prevents homocysteine-associated atherosclerosis,^[9] and reduces homocysteine due to nitrous oxide exposure (general anaesthesia).^[10]
- **Energy Production:** Vitamin B₁₂ is a cofactor in enzymatic reactions with diverse physiological functions. It is required for the conversion of methyl-malonyl CoA to succinyl CoA as well as for the conversion of homocysteine to methionine by methionine synthase, which is then converted into S-adenosylmethionine. A B₁₂ deficiency causes impairments in both of these pathways, disrupting neurological function, including poor formation of myelin nerve sheaths, production of toxic levels of homocysteine, and inefficient energy production in all cells.^{[11][12]}
- **Nerve Pain and Damage / Diabetic Complications:** Vitamin B₁₂ is crucial for the maintenance of a healthy nervous system in conditions where nerve damage may occur. Specifically, it has been shown in clinical studies to reduce pain symptoms in neuralgia and diabetic neuropathy.^{[11][13][15][16]} B₁₂ supplementation may be useful in chemotherapy which can increase oxidative stress, leading to a functional vitamin B₁₂ deficiency. A review suggested that correcting B₁₂ deficiencies should be considered in chemotherapy-induced neuropathy treatment.^[14]
- **Sleep-Wake Rhythm Disorders:** Vitamin B₁₂ is needed for the synthesis of melatonin, as melatonin formation requires the donation of a methyl group. Methylcobalamin supplementation has been suggested to regulate melatonin secretion, improve light sensitivity, and normalize circadian and sleep-wake rhythms.^[17]
- **Recurrent Aphthous Stomatitis (RAS):** This common problem is present in up to 25% in the general population. B₁₂ supplementation has been shown to reduce the duration and pain associated with RAS regardless of B₁₂ level status.^[18]

Table 1. Clinical Studies of Vitamin B₁₂

Indication	Design	Outcomes	Notes
Correcting Vitamin B ₁₂ Deficiency: Oral v. IM Injection	A Cochrane meta-analysis to assess the effectiveness of oral vitamin B ₁₂ v. intramuscular injection B ₁₂ for vitamin B ₁₂ deficiency. Three randomized controlled studies met inclusion criteria. The studies randomized 153 participants (74 participants to oral vitamin B ₁₂ and 79 participants to intramuscular vitamin B ₁₂). Treatment duration and follow-up ranged between three and four months. Age ranged 39–72 years.	Oral and IM vitamin B ₁₂ have similar effects in terms of normalising serum vitamin B ₁₂ levels, but oral treatment costs less. Oral vitamin B ₁₂ appears as safe as IM vitamin B ₁₂ .	[1]
Correcting Vitamin B ₁₂ Deficiency: Sublingual B ₁₂ Supplementation	Prospective open-labelled study, 18 patients with B ₁₂ deficiency of various causes were treated with 2 mg sublingual cobalamin for 7–12 days and assessed the efficacy of treatment. Serum B ₁₂ concentrations before therapy and two days after completion of the loading phase were measured.	Normalization of serum B ₁₂ concentration was seen in all patients. Administration was efficacious and convenient, and compliance was high.	[2]
Arterial Function in Vegetarians	Randomized controlled trial of 50 healthy adult vegetarians of at least six years who were given 500 mcg/d of oral vitamin B ₁₂ or identical placebo, for 12 weeks. Arterial function was measured by ultrasound.	Oral vitamin B ₁₂ supplementation improved arterial function in vegetarian individuals with low B ₁₂ status.	[3]
Depression Among Stroke Survivors	Randomized, double-blind, placebo-controlled trial of homocysteine-lowering treatment with daily folic acid (2 mg), vitamin B ₆ (25 mg), and vitamin B ₁₂ (0.5 mg) given for one to 10.5 years in stroke survivors.	After seven years of follow-up, B vitamins were associated with a lower hazard of major depression compared with placebo (18.4% v. 23.3%).	[4]
Stroke Recovery Rate	Pilot cohort study of 14 participants over the age of 45 who suffered from lacunar stroke were given oral 1,000 mcg/d of hydroxycobalamin B ₁₂ for at least three weeks.	Six of the 14 participants reported greater verbal learning. No effect on depression or fatigue.	[5]
Carpal Tunnel Syndrome (CTS) Following Stroke	An open-label two-year study. Oral methylcobalamin (1,500 mcg) in the treatment of carpal tunnel syndrome (CTS) in 67 elderly hemiplegic patients following stroke.	Significant decreases in the number of patients meeting the criteria for CTS assigned to the methylcobalamin group and improvement in electrophysiological indices were found compared to the untreated group.	[6]
Homocysteine	Double-blind, randomized controlled trial of 100 overweight subjects aged 65+ years who were determined as deficient or borderline deficient in B ₁₂ were given either 10, 100, or 500 mcg of cyanocobalamin for eight weeks.	Plasma homocysteine was reduced at the two higher dosages (100 and 500 mcg) and normalized biomarkers of B ₁₂ deficiency in most subjects.	[7]
Homocysteine	A meta-analysis including 19 studies and 47,921 participants.	Supplementation of B vitamins was associated with reduced homocysteine and a 12% reduced risk of having a stroke.	[8]
Atherosclerosis	Double-blind, randomized controlled trial (<i>n</i> = 506) where 0.4 mg vitamin B ₁₂ along with 50 mg vitamin B ₆ and 5 mg folic acid, or matching placebo, was given for 3.1 years. Participants were 40–89 years of age with an initial t _{Hcy} > 8.5 μmol/L without diabetes and low risk of cardiovascular disease. Subclinical atherosclerosis progression was assessed.	High-dose B-vitamin supplementation significantly reduced progression of early-stage subclinical atherosclerosis.	[9]

Nitrous Oxide-Induced Homocysteine Increase	Double-blind, randomized controlled trial ($n = 60$). Intervention: Single dose of intravenous infusions of vitamin B ₁₂ before and after general anesthesia. Homocysteine levels were measured before and 24 hours after surgery. They were randomized into three groups. · Vitamin B ₁₂ solution (1 mg/100 mL normal saline) and 100 mL of normal saline as a placebo infused before and after anesthesia. · Placebo and vitamin B ₁₂ infusion in the reverse order. · Placebo at both times.	Patients who had been infused with vitamin B ₁₂ before the surgery had much lower levels of homocysteine than the two other groups, whose levels of homocysteine increased significantly after the surgery.	[10]
Diabetic Neuropathy	A meta-analysis of seven clinical trials confirmed its moderate benefits for some symptoms of diabetic neuropathy, including pain.	High-dose oral cyanocobalamin or methylcobalamin had beneficial effects on symptoms of diabetic neuropathy. In three studies, methylcobalamin also improved autonomic symptoms. Effects on vibration perception and electrophysiologic measures were not consistent.	[11]
Chemotherapy-Induced Polyneuropathy (CIPN)	Randomized, placebo-controlled pilot trial. A total of 71 participants were enrolled into the study and randomized to a B vitamin group ($n = 38$) or placebo ($n = 33$). The B group were given an oral capsule with 500 mcg of cyanocobalamin and other B vitamins, twice per day. Total neuropathy score, as well as serum vitamin B levels, quality of life, pain inventory, and patient neurotoxicity questionnaires were outcomes measured at baseline, 12, 24, and 36 weeks. A review was then published that suggested B ₁₂ deficiency should be assessed and treated.	Although the B vitamin group was not superior to placebo with regards to CIPN prevention, it did show a perceived decrease in sensory peripheral neuropathy at 12 weeks. One patient with severe CIPN and measured B ₁₂ deficiency dramatically improved with B ₁₂ treatment.	[13][14]
Peripheral Neuropathy	Phase I/II open-label clinical trial of 14 patients with immune-mediated or hereditary neuropathy in the chronic progressive or stable phase were administered 25 mg/d of vitamin B ₁₂ for 10 days followed by 25 mg monthly for five months. The patients were evaluated before and one year following treatment. The primary endpoints were safety and improvement in a scoring tool.	The measured score was improved in seven (half) of the patients and unchanged or worsened in the five remaining patients. There were no adverse effects in 12 of the patients.	[15]
Neuropathic Pain	In an open-labeled, single arm, observational clinical study, patients received a fixed dose of combination of 75 or 150 mg sustained-release pregabalin combined with 1,500 mcg immediate-release methylcobalamin.	Significant reductions in neuropathic pain, along with substantial improvement of neuropathy-associated symptoms.	[16]
Sleep	In a preliminary study without controls, six healthy adult women and 14 healthy adult men were randomly assigned to treatment for 14 days with 3 mg cyanocobalamin or methylcobalamin. Changes in circadian rhythms were assessed.	Vitamin B ₁₂ exerted a direct influence on melatonin. Only methylcobalamin had a positive psychotropic alerting effect, with a distribution of the sleep-wake cycle toward sleep reduction. Cortisol excretion and temperature were not affected by either medication.	[17]
Recurrent Aphthous Stomatitis	A randomized controlled trial evaluated the effectiveness of sublingual vitamin B ₁₂ supplementation at 1,000 mcg/d in treating recurrent aphthous stomatitis.	The study results showed that the duration of outbreaks, number of ulcers, and level of pain were significantly reduced at five and six months after treatment with vitamin B ₁₂ , regardless of initial B ₁₂ levels in the blood.	[18]

References

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— 5 mg —

Each sublingual tablet contains:
 Vitamin B₁₂ (methylcobalamin) 5 mg
Also contains: Natural grape flavour, mannitol, xylitol, vegetable magnesium stearate, and silicon dioxide.
Directions of use: Adults: Hold under tongue until dissolved, and then swallow. Take 1 tablet one to three times daily with food or as directed by your health-care practitioner.
 #2244 · 30 sublingual tablets · NPN 80076432 · V0618-R1

— 15 mg —

Each sublingual tablet contains:
 Vitamin B₁₂ (methylcobalamin) 15 mg
Also contains: Natural grape flavour, mannitol, xylitol, vegetable magnesium stearate, silicon dioxide, and vegetable stearic acid.
Directions of use: Adults: Hold under tongue until dissolved, and then swallow. Take 1 tablet daily with food or as directed by your health-care practitioner.
 #2246 · 30 sublingual tablets · NPN 80076434 · V0622-R2