

Cyanocobalamin: Vitamin B₁₂

Since body stores of vitamin B₁₂ are adequate for up to five years, deficiency is generally the result of the body's prolonged failure to absorb it.

Suspected Vitamin B₁₂ Deficiency <100 pg per mL

Hematologic, neurologic, or psychiatric abnormalities

Gastric or ileal surgery

Prolonged use of histamine H₂-receptor blockers or proton pump inhibitors

Chronic gastrointestinal symptoms

Age >65 years

The traditional approach to treatment consists of Sub-Q injections of cyanocobalamin (IM injection; painful).

In patients with severe vitamin B₁₂ deficiency:

1,000 µg of cyanocobalamin **daily** for 5-7 days, followed by

1000 µg of cyanocobalamin **weekly** injections for four weeks.

Most patients usually require lifetime maintenance therapy consisting of 1,000 µg injections of cyanocobalamin **every one to three months**.

Hematologic improvement should begin within five to seven days, and the deficiency should resolve after three to four weeks of treatment.

However, six months of therapy or longer will be required for signs of improvement in the neurologic manifestations of vitamin B₁₂ deficiency.

Complete or partial resolution of neurologic symptoms occurs in as many as 80 percent of patients.

Neurologic improvement is less likely to occur in patients with severe or longstanding deficiency, and in patients whose accompanying anemia is less severe.

To determine whether maintenance therapy is adequate, serum cobalamin levels should be measured. Remember the neurological symptoms of vitamin B₁₂ deficiency do not consistently correlate with the severity of the anemia

Elevated serum methylmalonic acid (MMA) levels may be more sensitive indicators of vitamin B₁₂ deficiency. Recent data suggests that B₁₂ levels are not accurate in patients, especially in older patients. As many as 50% of patients will have low B₁₂ levels but not tissue deficiency. Up to 15% of patients with normal B₁₂ levels will have tissue deficiencies.

Oral Vitamin B₁₂

Most patients with Vit B₁₂ anemia will absorb 1 to 2 percent of orally ingested cobalamin without the need for intrinsic factor. Treating these patients with high oral

dosages of vitamin B₁₂, such as 1,000 to 2,000 µg daily, may be an alternative to parenteral therapy.

An intranasal gel containing cyanocobalamin (Nascobol) has recently been labeled for maintenance therapy of patients in hematologic remission after intramuscular vitamin B₁₂ therapy for a variety of deficiency states. Administration of this product once weekly provides a 500-µg dose of cyanocobalamin. The patient's hematologic parameters must be **within normal limits** at initiation of therapy and should be monitored very closely throughout treatment. Preliminary reports suggest that intranasal cyanocobalamin may also be effective as replacement therapy in patients with vitamin B₁₂ deficiency, although further study is needed to confirm its long-term effectiveness.

Vitamin B₁₂ Preparations

Preparation	Dosage	Cost*
Cyanocobalamin tablets	1,000 µg daily	\$ 2.87
Cyanocobalamin injection	1,000 µg monthly	2.88 to 5.60
Cyanocobalamin nasal gel (Nascobol)	500 µg weekly	67.19‡

Schedules for the Administration of Vitamin B₁₂

Route of administration	Replacement therapy	Maintenance therapy
Intramuscular	1,000 µg daily for five days, then 1,000 mg weekly for four weeks	1,000 µg every one to three months
Oral	1,000 to 2,000 µg daily	25 to 100 µg daily
Intranasal	1,500 µg weekly for three to four weeks*	500 µg weekly

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Important Note: This document is a guideline, and not a policy statement. Always use clinical judgment when making decisions for an individual patient.