Cobalamin (Vitamin B12)

Cobalamin (Vitamin B12) is a purified form of vitamin B12 that promotes cell growth and reproduction, hematopoiesis, and myelin synthesis. It requires the intrinsic factor secreted by stomach parietal cells for effective absorption. This medication is indicated for vitamin B12 deficiency and pernicious anemia. Side effects may include hypokalemia, arthralgia, and dizziness. Cobalamin is administered orally or parenterally. Intravenous administration of cobalamin is ineffective due to rapid urinary excretion.



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Mechanism

Vitamin B12
(12) Dozen Viking (B) Bees
Vitamin B12 helps activate folic acid, an essential component for DNA synthesis and cell growth and division. This vitamin is activated by intrinsic factor secreted by stomach parietal cells. Vitamin B12 is essential for proper cell growth and division, especially in the bone marrow, GI tract, and nervous system.

Indications

Vitamin Deficiency
Broken Vikings
Vitamin B12 deficiency is commonly caused by impaired absorption related to celiac disease or low gastric acidity. Vitamin B12 deficiency causes neuronal demyelination and may lead to irreversible neurological damage. A lack of this vitamin prevents folic acid activation and leads to underproduction of white blood cells and platelets. Since humans cannot biosynthesize this vitamin, patients deficient in vitamin B12 must consume animal products, vitamin B12-fortified food, or a supplement.

Pernicious Anemia
Prune Anemone
Pernicious anemia is a potentially fatal condition caused by a lack of intrinsic factor necessary for vitamin B12 absorption. Administering cyanocobalamin (cobalamin) in patients lacking the intrinsic factor helps normalize the production of red blood cells and quickly reverses the effects of anemia.

Side Effects

Hypokalemia
Hippo-banana
Cobalamin increases the production of erythrocytes, which require potassium for synthesis. As more potassium is used for erythrocyte production, the level of serum potassium decreases and results in hypokalemia. Assess the patient for weakness, cramping, and abnormal arrhythmias.

Arthralgia
King Arthur-algae
Arthralgia, or joint pain, may be a side effect of cobalamin therapy. Assess the patient's level of pain.

Dizziness
Dizzy-eyes
Cobalamin may lead to dizziness, weakness, or headache. Severe dizziness may be related to a serious allergic reaction and requires immediate medical attention.

Considerations

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IM Injection for Pernicious Anemia

In-muscle Injection on Prune Anemone

Cobalamin may be administered via IM injection for patients with pernicious anemia related to a lack of intrinsic factor or parietal cell atrophy. Patients with B12 malabsorption may require lifelong cobalamin therapy. Although injecting this drug is generally well tolerated, the patient may experience some pain or redness at the injection site. It can also be given as a deep subcutaneous injection.

Never Give IV

Never IV-stand

Cobalamin may be administered orally, parenterally (IM or deep SQ injection), or intranasally. Since cobalamin is a water-soluble vitamin, do not administer intravenously due to rapid urine excretion resulting in minimal therapeutic effect.

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