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VITAMIN B12 (COBALAMIN)

Introduction:

Vitamin B12 or Cobalamin is a water-soluble vitamin, which is necessary for a healthy nervous system and a healthy red blood cell. It is the largest and most structurally complicated vitamin. The healthy human body can store enough Vitamin B12 to last up to 4 years. The metabolism of every cell in the body depends on Vitamin B12, as it plays a part in the synthesis of fatty acids and energy production. It enables the release of energy by helping the human body absorb Folic Acid. Vitamin B12 can be found naturally in animal products, such as fish, meat, eggs, and dairy products.

The recommended dietary intake for Vitamin B12 in adults is 2.4 microgram (mcg, or µg).

What are the causes of vitamin B12 deficiency?

Vitamin B12 deficiency could occur in the following:

- Certain stomach disease e.g., atrophic gastritis.
- Malabsorption disorders e.g., coeliac disease, after coeliac disease after bariatric surgery.
- Autoimmune disorder.
- Vegan diet.
- Pregnancy, due to increased vitamin B12 requirements.
- Famine.
- Excess alcohol consumption.
- Certain medication such as Omeprazole (Prilosec or Losec), Metformin (Glucophage), Anti-epilepsy medication.

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Vitamin B12 and Diabetes:

Long-term treatment of Metformin (e.g., Glucophage), a medication commonly used for treatment of Type 2 Diabetes Mellitus patients affects the absorption of Vitamin B12 in the ileum of the small intestine may cause Vitamin B12 deficiency, on the long term of use.

Symptoms of Vitamin B12 Deficiency:

- Constipation or diarrhea.
- Weight Loss.
- Strange sensations, numbness or tingling in the hands, leg or feet.
- Difficulty in walking (staggering, balance problem).
- Swollen, inflamed tongue.
- Anemia.
- Difficulty in thinking and reasoning (cognitive difficulty) or memory loss.
- Muscle Weakness.
- Fatigue.
- Rapid irregular heartbeats.

How is the test used?

1. To detect low levels of B12 (deficiency).
2. Diagnose the cause of certain anemias such as pernicious anemia.
3. Help to determine the cause for altered mental state or other behavioral changes, especially in the elderly.
4. To determine the cause of signs and symptoms of neuropathy (condition affecting nerves).

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Type of Specimen:

Blood sample. Fasting is not required.

In certain analytes Biotin can give false normal or high results, advise to stop Biotin supplements 72 hours before the test.

Interpretation of Test Results:

Different testing laboratories may have different normal ranges.

Normal Range	Deficient Range
133 – 675 pmol/L	< 107 pmol/L

High Levels of Vitamin B12 is uncommon, but may be seen in the following conditions:

- Heart failure
- Obesity
- AIDS
- Severe liver disease

Prevention and Treatment:

The doctor will advise you to increase dietary food intake rich in Vitamin B12 which is found in meat products or food fortified with Vitamin B12 like bread, cereal, and tofu.

Physicians may advise patients to take an oral Vitamin B12 supplement or injections if severely deficient.

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References:

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- *www.mayoclinic.org*
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