

Position Statement

Subject: **Vitamin B12 and Folate testing – Use and interpretation**
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Introduction

This Position Statement clarifies the role of the different tests for Vitamin B12 and Folate for diagnosing and monitoring deficiency states of these essential compounds in the context of the recent changes to the relevant items in the Australian Medical Benefits Schedule (MBS).

Although rare, severe untreated Vitamin B12 deficiency can lead to permanent neurological damage and maternal folate deficiency is linked to fetal neural tube defects.¹

Summary of recommendations including changes to testing strategies:-

1. How to test

New Vitamin B12 testing protocol:- measure serum Total B12 first, and if this result is less than a laboratory determined sufficiency threshold, perform a holotranscobalamin level. Depending on the outcome of this test, a metabolite of a Vitamin B12-dependant metabolic pathway (eg homocysteine or methyl malonic acid (MMA)) may then be measured.

New Folate testing protocol:- serum Folate level is the first line test with red blood cell (RBC) Folate estimation only to be performed when the serum value is low.

2. Who to test

Vitamin B12 and Folate deficiencies should generally only be suspected in patients with neuropsychiatric symptoms, certain haematological disorders or Full Blood Examination [FBE] findings, malabsorption, Type 1 diabetes and in the malnourished and undernourished, or patients taking proton pump inhibitors long term. Testing for Vitamin B12 or Folate deficiencies in patients with non-specific symptoms such as weakness and tiredness is not recommended.

As risk factors for Vitamin B12 and Folate deficiency do not generally overlap, Vitamin B12 and Folate levels should not be routinely requested together (except in suspected malabsorption).

3. Testing following Vitamin B12/Folate supplementation

Only in the presence of haematological abnormalities, perform a follow up FBE / reticulocyte count at one week and one month to confirm normalisation of counts (Note: Deficient patients will often report improvement in feeling of well-being before there is any change in the FBE parameters).

Patients receiving long term parenteral Vitamin B12 at recommended intervals do not require serial monitoring of Total B12 levels or FBC (Note: Consideration should be given to

assessment of Total B12 and/or MMA/ homocysteine in patients on oral therapy where compliance is of concern).

4. General information

Usually 70-80% of Vitamin B12 in serum is bound to transcobalamin I, the remainder to transcobalamin II (Holotranscobalamin also known as "Active B12"); it is only the latter fraction that is available for cellular uptake by tissues.

The process of Vitamin B12 absorption is complex, requiring functional gastrointestinal mucosa; in particular gastric parietal cells and ileal enterocytes. Damage to these cells can lead to severe malabsorption of Vitamin B12. Inadequate intake of Vitamin B12 alone rarely causes severe deficiency.^{2,3}

Toxicity relating to excess of Vitamin B12 or Folate does not occur; very high total Vitamin B12 levels can occasionally be seen eg in malignancy.

Many Vitamin B12 or Folate deficient patients have no clinical signs and the FBE is often normal, including normal Haemoglobin levels and a normal Mean Corpuscular Volume.^{4, 5, 6}

Folate deficiency is rare now that Folate is added to flour.

Folate accumulates in RBCs during erythropoiesis and concentrations present in circulating RBCs reflect Folate levels during the formation of these RBCs.

References

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