Vitamin B12 levels – Choosing when to test, wisely

Key Points

- SCL Hawkes Bay is changing the way it processes Folate and Vitamin B12 test request - these tests will be orderable separately.
- Vitamin B12 is not recommended for screening of asymptomatic patients.
- Practices using electronic lab requesting (eOrder) will need to review their existing My Tab order groups – any order groups that contain the combined Vitamin B12 and Folate test will need to be edited to include the standalone test/s.

Why do we care about Vitamin B12?

- Vitamin B12 is one of the nine vitamins essential for human health, and is needed for normal metabolism and DNA synthesis so it is essential for normal functioning of the brain and nervous system, and for the regeneration of red blood cells. Causes of deficiency usually fall into two categories: Malabsorption (from a range of causes) or dietary deficiency, and the causes are not always the same as those for Folate deficiency, hence the move to separate the ordering of these two tests.
- Deficiency is associated with macrocytosis and potentially irreversible neuropathy and neuropsychiatric changes, and patients with specific conditions e.g. those taking long term metformin, or patients with pernicious anaemia, are at greater risk of B12 deficiency.

Is serum B12 telling you what you really want to know?

Ideally, a single test would give a clear indication of whether or not a patient is B12 deficient. However, there is no single “gold standard” test to identify B12 deficiency, and none of the current markers used are able to do this in isolation in a general population screening setting. The reference interval we use at SCL is 170 – 800pmol/L. The cut-off between normal and deficiency varies by method and laboratory, and in our laboratory a value between 110-170pmol/L is in the intermediate range. Unfortunately, low levels are not diagnostic of deficiency and normal levels do not exclude deficiency. Therefore, results should be interpreted within the clinical context.

Low levels without deficiency may particularly be seen in pregnancy. However, the lower the level, the greater the likelihood of a true B12 deficiency. Experts suggest that if the **level is <110pmol/L** a MMA level can be checked to confirm the diagnosis of vitamin B12 deficiency. No single test establishes a diagnosis of vitamin B12

deficiency. Because the body stores about 1-5 mg Vitamin B12, the symptoms of deficiency can take several years to appear.

What do the international guidelines say?

- The significance of test results assessing Vitamin B12 status should always be assessed within the clinical setting.
- **Complete blood count should be performed first** followed by serum vitamin B12 if the results are suggestive of deficiency (BPAC) https://bpac.org.nz/BT/2013/February/02_principles.aspx
- Routine screening for Vitamin B12 deficiency is not indicated.
- There are no studies to support the use of Vitamin B12 testing in patients with dizziness or fatigue and BPAC guidelines for the investigation of tiredness do not include B12 or Folate levels as first-line tests.

Testing is recommended in the following settings:

- Haematologic: unexplained anaemia, macrocytosis
- Unexplained neurological or neuropsychiatric symptoms, e.g. subacute combined degeneration of the cord, peripheral neuropathy, dementia, unexplained neurology.
- GI disorders, e.g. Crohn's disease, coeliac disease or other such stomach or small intestinal disorders, previous gastric resection etc.
- Medication related: metformin, prolonged use of proton pump inhibitors or H2 receptor antagonists
- Pregnancy and lactation
- Long term vegan and vegetarian diets
- Elderly patients >75 years
- Glossitis

Retesting intervals are also covered in the literature, with the Australian Medical Benefits Scheme only funding B12 testing once every 12 months, after discerning that the majority of testing was occurring in a screening capacity. https://www1.health.gov.au/internet/main/publishing.nsf/Content/VitaminB12testing

SCL suggest a retest period of not less than 6 months when the above recommendations are followed.

From October 2022, the combined Vitamin B12 and Folate test will disappear from the Hawkes Bay SCL eOrder form and be replaced with the standalone tests. Any "My Tab Order Group" that contains the combined test will need to be manually edited to include the standalone tests by each user. After this date, the combined test will disappear.

Darelle Sayers
Biochemistry Technical Manager
SCL Hawkes Bay

Dr Marie van Drimmelen
Chemical Pathologist
SCL Wellington