



**BLOOD MANAGEMENT  
CLINICAL PRACTICE GUIDELINE**

# Vitamin B12 deficiency: Management during pregnancy

**Scope (Staff):** WNHS Obstetrics and Gynaecology Directorate staff

**Scope (Area):** Obstetrics and Gynaecology Directorate clinical areas at KEMH and OPH

This document should be read in conjunction with this [Disclaimer](#)

## Aim

To provide the best practice requirements for the management of vitamin B12 deficiency for women receiving treatment and care at WNHS.

## Background

B12 deficiency is rare, particularly in pregnancy, however B12 deficiency should be excluded in women with unexplained anaemia<sup>1</sup> especially if the MCV is elevated or in women who fail to respond to treatment for iron deficiency anaemia. In normal pregnancy, B12 levels fall by 30% by the third trimester of pregnancy.<sup>2</sup> As B12 plays an important role in new tissue development, deficiency can be associated with infertility and repeated miscarriage.<sup>3</sup> Untreated B12 has been associated with adverse neurological outcomes in exclusively breastfed infants.<sup>4</sup>

B12 is generally only found in foodstuffs from animals.<sup>5</sup> Deficiency can occur as a result of insufficient dietary intake or as a result of malabsorption (e.g. post-surgical, pernicious anaemia).<sup>3</sup> The most common cause of B12 deficiency in pregnant women relates to vegetarian or vegan diets.<sup>3</sup>

## Women at risk of developing B12 deficiency

- Those with vegetarian, particularly vegan, diet<sup>1</sup>
- Bariatric or weight loss surgery
- Intestinal diseases, history of coeliac disease or inflammatory bowel disease<sup>1</sup>
- Autoimmune disorders which are associated with an increased risk of pernicious anaemia (e.g. Graves' disease, thyroiditis, vitiligo)<sup>1</sup>
- Prolonged use of proton pump inhibitors, H2 receptor antagonists and biguanides (e.g. metformin)<sup>1</sup> as these may interfere with absorption of B12



## Signs and symptoms of B12 deficiency

Symptoms are slow to develop as it may take up to 5 years for B12 depletion.<sup>3</sup>

Symptoms can include neuropsychiatric deficits including paraesthesia, numbness, memory loss, ataxia,<sup>6</sup> depression, irritability and impaired cognition.<sup>3</sup> Symptoms of anaemia may manifest though are uncommon in isolation. Folic acid supplementation may mask (or partially mask) the haematological manifestations of B12 deficiency though does not impact neurological features.

Clinical signs of B12 deficiency include glossitis and mouth ulceration.<sup>2</sup>

## Diagnosis of B12 deficiency

Interpretation of blood results to determine presence and severity of B12 deficiency can be challenging due to the physiological fall in vitamin B12 seen in pregnancy.<sup>6</sup> Advice from a Haematologist may be required.

Vitamin B12 deficiency is diagnosed by holotranscobalamin (HTC, **active B12**)  $\leq 35$  pmol/L. Holotranscobalamin is a more reliable marker of low vitamin B12 stores than total vitamin B12 and is most useful when the total vitamin B12 is low or indeterminate.

The full blood count may demonstrate an elevated MCV (abnormally large red blood cells) though this may be masked by co-existing iron deficiency or thalassaemia trait. Neutrophil hypersegmentation may be seen on blood film.<sup>2</sup>

## Screening for B12 deficiency

Screening for B12 deficiency is available to:

- Women at increased risk of B12 deficiency (see above)
- Women with unexplained anaemia
- Women who fail to respond to treatment for iron deficiency anaemia

To screen for vitamin B12 deficiency request 'serum vitamin B12'. A holotranscobalamin (HTC) assay will be automatically performed by the laboratory when the total vitamin B12 is  $<250$  pmol/L.

## Preventing and treating B12 deficiency

Dietary requirements for B12 are 2.4 mcg/day for non-pregnant women.<sup>7</sup> Supplementation is recommended for vegetarians and vegan women in pregnancy and lactation with a recommended daily intake (RDI) of 2.6 mcg/day in pregnancy and 2.8 mcg/day in lactation.<sup>4, 7</sup>

As B12 deficiency is generally due to impaired absorption, the recommended form of treatment is parenteral B12.<sup>3</sup> If there is a strong suspicion of dietary B12 deficiency, a short course of oral B12 (e.g. cyanocobalamin 1000 mcg/day) should be given. Early repeat B12 assay (e.g. 3-4 weeks) is recommended to ensure response.

Parenteral therapy with hydroxocobalamin (1000 mcg/1 mL), given by intramuscular injection, once weekly for 3 weeks or three times a week for 2 weeks depending on the severity of symptoms<sup>3</sup>. Seek Haematologist advice.

It is important to diagnose and correct underlying iron deficiency as treatment with B12 can increase red cell production and exacerbate iron depletion.<sup>1</sup> B12 should be replaced prior to iron replacement to decrease the risk of subacute combined degeneration of the spinal cord.

If pernicious anaemia or coeliac disease are possible causes screening with intrinsic factor and parietal cell antibodies and tissue transglutaminase can be considered.

## Notes on treatment of outpatients

The patient can arrange for treatment for B12 deficiency directly with her GP, or be provided with a prescription for 3 doses, to be administered at GP practice or on return visits to clinic.

**NOTE: Endorsed Midwives are able to prescribe vitamin B12.**

## Follow up of patients following treatment

If the patient continues to demonstrate a poor haematological response to treatment, consider referral to a Haematologist for further investigations. Women should be followed up and investigated individually by their GP following delivery. If they have received treatment for B12 deficiency during the pregnancy, B12 levels should be reassessed 2 months post-partum to confirm if the levels have returned to the reference ranges.<sup>2</sup>

## References

1. Hvas AM, Nexo E. Diagnosis and treatment of vitamin B12 deficiency: An update. *Haematologica*. 2006;91(11):1506-12. Available from: <https://haematologica.org/article/view/4210>
2. Devalia V, Hamilton MS, Molloy AM, the British Committee for Standards in Haematology. Guidelines for the diagnosis and treatment of cobalamin and folate disorders. *Br J Haematol*. 2014;166(4):496-513. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/bjh.12959>
3. Strong J. Haematinic deficiencies In: Pavord S, Hunt B., editors. The obstetric hematology manual. 2nd ed. Cambridge, UK: Cambridge University Press; 2018.
4. RANZCOG. C-Obs 25: Vitamin and mineral supplementation and pregnancy. **RANZCOG**. 2019. Available from: <https://r anz cog.edu.au/statements-guidelines>
5. Department of Health. Clinical Practice Guidelines: Pregnancy Care: 11.2.1 Vitamins. Canberra: Australian Government Department of Health; 2021 Available from: <https://beta.health.gov.au/resources/publications/pregnancy-care-guidelines>
6. Hudson B. 10 minute consultation: Vitamin B-12 deficiency. BMJ [Internet]. 2010; 340. Available from: <https://www.bmjjournals.org/content/340/bmj.c2305.long>
7. National Health and Medical Research Council. Nutrient reference values for Australia and New Zealand: Including recommended dietary intakes. NHMRC [Internet]. 2017; v1.2. Available from: <https://www.nhmrc.gov.au/about-us/publications/nutrient-reference-values-australia-and-new-zealand-including-recommended-dietary-intakes#block-views-block-file-attachments-content-block-1>

## Additional resources

Pavord S, Hunt B (Eds.). The obstetric haematology manual.

## Related WNHS policies, guidelines and procedures

WNHS Obstetrics and Gynaecology clinical guideline:

- [Anaemia and Iron Deficiency: Management in Pregnancy and Postpartum](#)

Keywords:	Vitamin, B12, pregnancy, deficiency, screening, preventing, treating		
Document owner:	Obstetrics and Gynaecology Directorate		
Author / Reviewer:	Consultant Obstetrician, Senior Pharmacist, Haematology Head of Department		
Date first issued:	October 2015 (v1- in Obstetrics and Gynaecology Directorate)		
Last reviewed:	[July 2016 (v2); Sept 2021 (v3); - in OGD guidelines]; April 2025 (v4- moved to Blood Management guidelines)	Next review date:	April 2028
Approved by:	Medicines and Therapeutics Committee— out of session approval	Date:	14/02/2025
Approved by:	Midwifery and Obstetrics Clinical Practice Outcomes Committee	Date:	13/03/2025
Endorsed by:	Blood Management Committee	Date:	08/04/2025
NSQHS Standards (v2) applicable:	<input checked="" type="checkbox"/>  1: Clinical Governance <input type="checkbox"/>  2: Partnering with Consumers <input type="checkbox"/>  3: Preventing and Controlling Healthcare Associated Infection <input checked="" type="checkbox"/>  4: Medication Safety	<input type="checkbox"/>  5: Comprehensive Care <input type="checkbox"/>  6: Communicating for Safety <input checked="" type="checkbox"/>  7: Blood Management <input type="checkbox"/>  8: Recognising and Responding to Acute Deterioration	
<b>Printed or personally saved electronic copies of this document are considered uncontrolled.</b> <b>Access the current version from WNHS HealthPoint.</b>			

## Version history

Number	Date	Summary
1	Oct 2015	First version
2	July 2016	Pathology testing at QELL commenced offering additional test (holoTranscobalamin) for patients with equivocal or low total vitamin B 12 levels. This is added by the laboratory if B12 below the consensus cut off.
3	Sept 2021	<ul style="list-style-type: none"> <li>• Background, risk list and diagnosis sections updated</li> <li>• To screen for deficiency request 'serum vitamin B12'</li> <li>• Symptoms of anaemia may manifest though are uncommon in isolation. Folic acid supplementation may mask (or partially mask) the haematological manifestations of B12 deficiency though does not impact neurological features.</li> <li>• RDI changed to 2.6mcg/day in pregnancy and 2.8 mcg/day in lactation</li> <li>• If oral treatment, early repeat B12 assay (e.g. 3-4 weeks) is recommended to ensure response</li> </ul>
4	April 2025	<ul style="list-style-type: none"> <li>• Ownership of Guideline moved from Obstetrics and Gynaecology to Blood Management Department. File naming changed. Contact OGD Guideline Coordinator for previous versions.</li> <li>• Review and update of content by key specialists in Obstetrics and Gynaecology, Pharmacy and Haematology/Blood Management.</li> <li>• Endorsed midwives can also prescribe Vitamin B12.</li> </ul>

This document can be made available in alternative formats on request for a person with a disability.

© North Metropolitan Health Service 2025

Copyright to this material is vested in the State of Western Australia unless otherwise indicated. Apart from any fair dealing for the purposes of private study, research, criticism or review, as permitted under the provisions of the *Copyright Act 1968*, no part may be reproduced or re-used for any purposes whatsoever without written permission of the State of Western Australia.

[www.nmhs.health.wa.gov.au](http://www.nmhs.health.wa.gov.au)