Guideline for the management of Vitamin B12 deficiency

(For adults)

Anaemia or Strong Clinical suspicion e.g Visual disturbance, memory loss, psychiatric abnormalities, loss of peripheral nerve function that can result in impaired sensation, movement or organ function **with no other identifiable cause**

Check vitamin B12

<145 ng/L

≥145 ng/L

Offer pt dietary advice and recheck in 3 months. Pt may purchase OTC cyanocobalamin 50-100mcg OD

≥180 ng/L & no symptoms: no further investigation

B12 dropped to <145 ng/L

Asymptomatic and B12 ≥180. Continue with dietary control, no further investigation

B12 remains 145-180 ng/L **or** ≥180 in pt with strong clinical suspiscion

Check IFAB

Positive

Negative

Check Intrinsic Factor Antibody (IFAB) but proceed to treatment regardless

NO neurological symptoms

IM hydroxocobalamin 1mg x3/wk for 2 wks

Maintenance:

- Dietary cause: Oral cyanocobalamin 50-150mcg daily (OTC)
- Non-dietary cause: IM hydroxocobalamin 1000mcg every 3 months for life

NO neuro symptoms

Neuro symptoms

NO neuro symptoms

Neurological symptoms

Seek *specialist advice (include IFAB result)

Management as per their advice but if immediately not available, initiate treatment with:

IM hydroxocobalamin 1mg every 2nd day

until no symptomatic improvement.

Maintenance – IM hydroxocobalamin 1000mcg every 2-3 months for life – if advised by specialist.

Neuro symptoms

Pt to continue with OTC cyanocobalamin while *specialist advice is sought

Continue with dietary control (+/- oral cyanocobalamin OTC), no further investigation

Specialist recommendation only

***Specialist advice**

- Seek advice from most appropriate clinician, considering cause (gastro) or symptoms (neuro) or pt factors (Care of older person)
- Remote advice usually sufficient. For **MEHT**: use ERS Advice and guidance. For **CHUFT**, use Consultant Connect
- Refer to haematology if no prompt rise in Hb (No need to recheck Vit B12 in pts on IM Tx. Use FBC to monitor response)

Medication/conditions that may affect levels Vitamin B12	Comments
Metformin (for longer than 12 months)	• Usually improved with dietary improvement of B12 intake • Only assess if objective evidence of deficiency is present including peripheral neuropathy or macrocytic anaemia • If low levels check IFAB and should be treated with a short course of OTC oral cyanocobalamin (50 micrograms orally for 4 weeks). Response should be assessed clinically and continued if benefit is shown • No need for prophylactic B12 administration
Proton pump inhibitors and H2 antagonists	• OTC oral replacement (25-100 micrograms orally) may be appropriate **if** objective evidence of deficiency is found
Anticonvulsants	• If no objective features of B12 deficiency- no need for replacement • OTC oral replacement (25-100 micrograms orally) may be appropriate **if** objective evidence of deficiency is found
Oral contraceptives and hormone replacement therapy	• Only be assessed if objective symptoms develop and this is the only indication for treatment • OTC oral replacement (25-100 micrograms orally) may be appropriate **if** objective evidence of deficiency is found
Colchicine	• Low levels can easily be increased with dietary supplementation
Antibiotics	• Low levels can easily be increased with dietary supplementation
Gastrointestinal surgery	• Both gastrectomy and bariatric surgery can lead to B12 deficiency and require regular monitoring and replacement if levels are falling despite good dietary intake. Oral replacement is often **inadequate** in these patients since the cause is likely malabsorption
Pregnancy	• Not routinely measured during pregnancy therefore only identified if symptoms develop – in which case follow pathway as for non-pregnant people
Vegetarian and vegan diets	• Vegetarians and vegans are at increased risk of B12 deficiency especially during pregnancy and when breastfeeding • Monitoring should be considered, especially at high-risk times, and OTC oral supplementation (cyanocobalamin 50mcg daily) may be required

Vitamin B12 frequently asked questions

1. **If laboratory results show low (<145ng/L) vitamin B12 levels can oral supplementation be considered?**
   The NICE Clinical Knowledge of Summaries recommends that the intramuscular (IM) route should be used in all deficiency cases where there are neurological symptoms as an acute dose (hydroxocobalamin 1mg on alternate days for two weeks). Usually IM will then be used as maintenance. However, if the cause is dietary and the patient does not display neurological symptoms, OTC oral supplements may be used

2. **What if the patient is unwilling to have the IM route?**
   If the deficiency is thought to be diet related and not due to lack intrinsic factor, then it is **possible** to use oral Cyanocobalamin. It is available as cyanocobalamin 50mcg tablets which may be **purchased over the counter**. Parenteral therapy is preferable for deficient symptomatic patients, as it is retained in the body for longer than oral tablets. Malabsorption is frequently a cause of deficiency, in such cases, oral supplements are unlikely to be effective. This should be explained to the patient although any decision to inject will obviously require informed patient consent. If this is not obtainable, the patient may choose to purchase OTC, but should be advised this may not be as effective as injection in their circumstances.
   (*Please note that Vitamin B Co strong tablets do not contain any vitamin b12 and therefore cannot be used to treat B12 deficiency)*

3. **How do you treat low vitamin B12 patients with Type 2 diabetes (on long term metformin longer than 12 months)?**
   Give patient dietary advice to increase their vitamin B12 levels, advise them to supplement with OTC oral cyanocobalamin. Monitor serum B12 every 6 months. If still low check IFAB. If positive, then treat lifelong with IM hydroxocobalamin every three months. If IFAB is negative, the reduced level may be purely as a result of metformin, increase dose of oral cyanocobalamin to 150mcg daily, if still not able to raise B12 levels, treatment with three injections of IM hydroxocobalamin with subsequent monitoring of serum B12 at 6 monthly intervals is suggested.

4. **What if a person is still symptomatic despite maintenance IM vitamin B12 treatment?**
   If levels were borderline to begin with and only treated due to symptoms, then this suggests the B12 has not been effective. Trial withdrawal and investigate other causes of symptoms. If initially B12 deficient, retest the B12 level: if remains low, seek specialist advice. If this is corrected to normal levels, continue maintenance dose interval and investigate other causes of symptoms.
   If a person's symptoms recur before the next injection is due, seek specialist advice from a haematologist.

5. **What dose of cyanocobalamin is recommended for purchase?**
   If mild deficiency is thought to be diet related, advise people to take oral cyanocobalamin tablets 50–150 micrograms daily between meals. Doses within this range are safe and sufficient to prevent dietary deficiency. Example products are shown on page 4.

6. **What foods can I advise patients to eat to increase their dietary intake of Vitamin B12?**
   Foods that are a good source of B12: eggs, meat, milk and other dairy products, salmon and cod; as well as foods which have been fortified with B12 (some soy products, breakfast cereals and breads)

Examples of cyanocobalamin available to purchase (other products are available)

Holland and Barrett (available on the high street or online):

- 100mcg vitamin B12 tablets x 100
- Take ONE tablet daily
- £7.49 (price at time of writing, also included in buy one get one half-price offer)

Nature's Best (online)

- 100mcg vitamin B12 tablets x 100.
- Take ONE tablet daily
- £4.99 (price at time of writing, plus £1 delivery charge)

MyProtein (suitable for vegans)

- 1000mcg vitamin B12 tablets x 60
- Take ONE tablet daily (dose is more than is necessary but will not cause harm)
- £4.49 (price at time of writing)

Title	Guideline for the management of Vitamin B12 deficiency (For adults)
Document reference	B12DeficiencyGUI201809V1.0FINAL
Author	Mid Essex CCG Medicines Optimisation Team
References	https://www.cmft.nhs.uk/media/499600/manchester%20anaemia%20guide.pdf https://cks.nice.org.uk/anaemia-b12-and-folate-deficiency#!topicsummary
Consulted with	Emily Leach - Consultant Clinical Biochemist; NHS Mid Essex Medicines Management Committee
Approved by	Joint Mid Essex Area Prescribing Committee
Date approved	September 2018
Next review date	September 2020
Location in shared drive	Prescribing/Medicines Guidance Current/BNF Chapter 9/Nutrition and Blood
Location on MECCG wesbite	https://midessexccg.nhs.uk/your-health-services/medicines-optimisation/clinical-pathways-and-medication-guidelines/chapter-9-nutrition-and-blood-2