



Vitamin B-12

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Aims & Objectives

- What is B12, and when to check for deficiency
- Understand the prescribing guidelines
- Discuss the current issues with over-prescribing injections & over-medicalising B12 deficiency
- Case study - How we have reviewed our local prescribing of B12 injections



What is it?

- A vitamin crucial for **DNA synthesis (especially neurone development and maintenance)** and **red cell maturation**
- have to get it from **animal-based foods** or **supplements**
- have to get it *regularly* to maintain the body's store (largely stored in the liver)



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How Much B12 Do We Need ?

This varies with age, eating habits, medical conditions & medications.

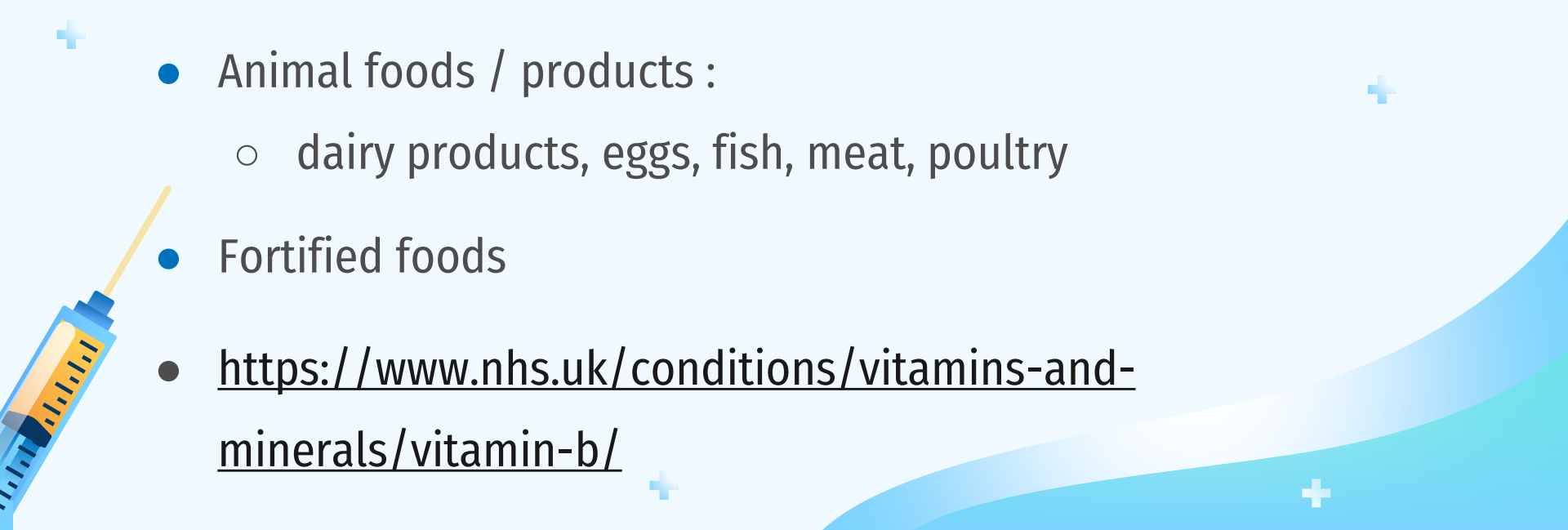

- Infants up to age 6 months:
0.4 mcg
- Babies age 7-12 months:
0.5 mcg
- Children age 1-3 years:
0.9 mcg
- Kids age 4-8 years:
1.2 mcg
- Children age 9-13 years:
1.8 mcg
- Teens age 14-18:



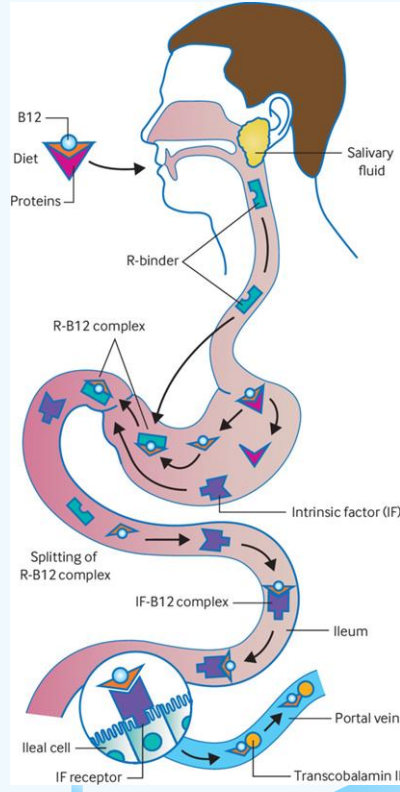


Where Can We Get B12 From?

Where to advise patients to get B12 from in their diets:

- 
- Animal foods / products :
 - dairy products, eggs, fish, meat, poultry
 - Fortified foods
 - <https://www.nhs.uk/conditions/vitamins-and-minerals/vitamin-b/>
- 

How is B12 absorbed?



Gastric parietal cells in the stomach secrete intrinsic factor, which binds and aids absorption of Vitamin B12

Testing for a Vitamin B12

The main indications for testing are:

- Haematological abnormalities
 - A raised MCV, especially if anaemia
 - Any anaemia (as MCV may be brought down eg by iron deficiency)
 - Pancytopenia
- Neurological symptoms
 - Parasthesia
 - Absent reflexes
 - Limb weakness
 - Cognitive impairment
- Tiredness? Vague symptoms? Often does get checked but no specific indication

The result is low...

Serum B12 reference range in non-pregnant adults (ng/L):

	GWH	RUH	SFT
Normal	181-914	200-960	147-840
Borderline	145-180	X	100-146
Low	<145	X	<100

<https://prescribing.bswccg.nhs.uk/?wpdmdl=6585>

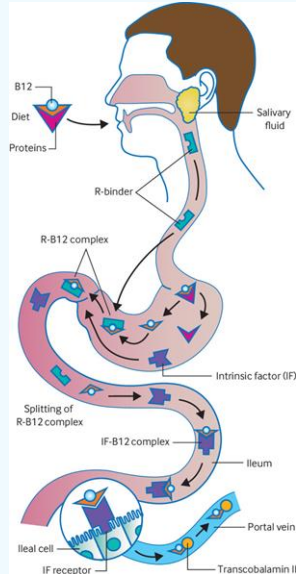


How should I treat it

- Guidelines vs tramlines vs no lines
- NICE CKS:
 - <https://cks.nice.org.uk/topics/anaemia-b12-folate-deficiency/management/management/>
- Bath RUH:
 - https://www.ruh.nhs.uk/For_Clinicians/departments_ruh/Pathology/documents/haematology/B12_-_advice_on_investigation_management.pdf
- BSW CCG
 - <https://prescribing.bswccg.nhs.uk/?wpdmdl=6585>

How should I treat low B12?

- Think of the underlying cause



Cause	Effect
MALABSORPTION	
Gastric bypass	↓ IF production
Gastrointestinal infection with <i>H. Pylori</i>	↓ IF production
Ileal resection	↓ Absorption of B12-IF
Bacterial overgrowth	↓ Absorption of B12-IF
Intestinal disease (e.g., Crohn)	↓ Absorption of B12-IF
Pernicious anemia	Antibodies against IF or parietal cells
Difficulties in chewing foods	Releasing of B12 from food proteins
NUTRITIONAL	
Malnutrition	↓ Vitamin B12 consumption
Vegetarian or vegan diet	↓ Intake of B12 containing animal products
DRUGS	
Proton-pump inhibitors	Defective release of B12 from food
Metformin	↓ Absorption of B12
Nitrous oxide	Inactivation of methionine synthase (in case of NO)

How should I treat low B12 - short term



1. If clinical features of low B12, or concerned about malabsorption, then treat with IM injections of hydroxocobalamin 3/week for 2 weeks.
 - Macrocytosis, or haematological features
 - Neurological features (should continue until symptoms improve, and seek haematology advice)
2. If no clinical features of low B12 and no concern about malabsorption, then consider oral replacement and recheck in 3-4 months



How should I treat low B12-long term

- Ongoing treatment...need to think of the underlying cause
 - Sinister 2ww cause= gastric cancer - consider if pain, vomiting or weight loss
- My thought process
 - Do they have pernicious anaemia (check IF and gastric parietal cell antibodies)?
 - Do they have GI malabsorption (check TTG, any history of upper GI surgery or IBD)
 - Are they on PPI or metformin?
 - Do they drink excessive alcohol?
 - Are they vegan?

If yes to any of the above, likely to give B12 injections every 2-3 months

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 - Are they on PPI or metformin?
 - Do they drink excessive alcohol?
 - Are they vegan?
- If no to above, my plan is usually:
 - B12 loading, check bloods in 3 months including FBC, IF antibodies, Gastric Parietal cell antibodies, TTG, B12 & Folate then review



CASE

78 YR OLD Female

Hb= 108 (low=anaemic)

MCV= 108 (high=macrocytic)

B12= 98 (low)

No neurological symptoms

- A. Treat with loading course of B12 injections
- B. Give dietary advice to boost B12
- c. Offer oral Vitamin B12

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CASE

48YR OLD MALE

Hb= 138 (normal)

MCV= 88 (normal)

B12= 168 (borderline)

No neurological symptoms

Known Crohns Disease

- A. Loading B12 injections + review at 3 months
- B. Oral Vitamin B12 + review at 3 months
- c. Loading B12 injections + injection every 2-3 months without review

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- c. **Loading B12 injections + injection every 2-3 months without review**

CASE

31YR OLD MALE

Hb= 145 (normal)

MCV= 96 (normal)

B12= 170 (borderline)

No neurological symptoms

No medical history, not on medicines, not vegan,
no alcohol

- A. Loading B12 injections + review at 3 months
- B. Oral Vitamin B12 + review at 3 months
- C. Loading B12 injections + injection every 2-3 months without review

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65 YR OLD Male

Hb= 108 (low=anaemic)

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1 month epigastric discomfort and weight loss

No neurological symptoms

- A. Loading course of B12 injections + review in 3 months
- B. Loading course of B12 injections + 2 week wait to Upper GI surgeons
- c. Offer oral Vitamin B12

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**Why are so many
patients on B12
injections ?**

How easy is to stop?

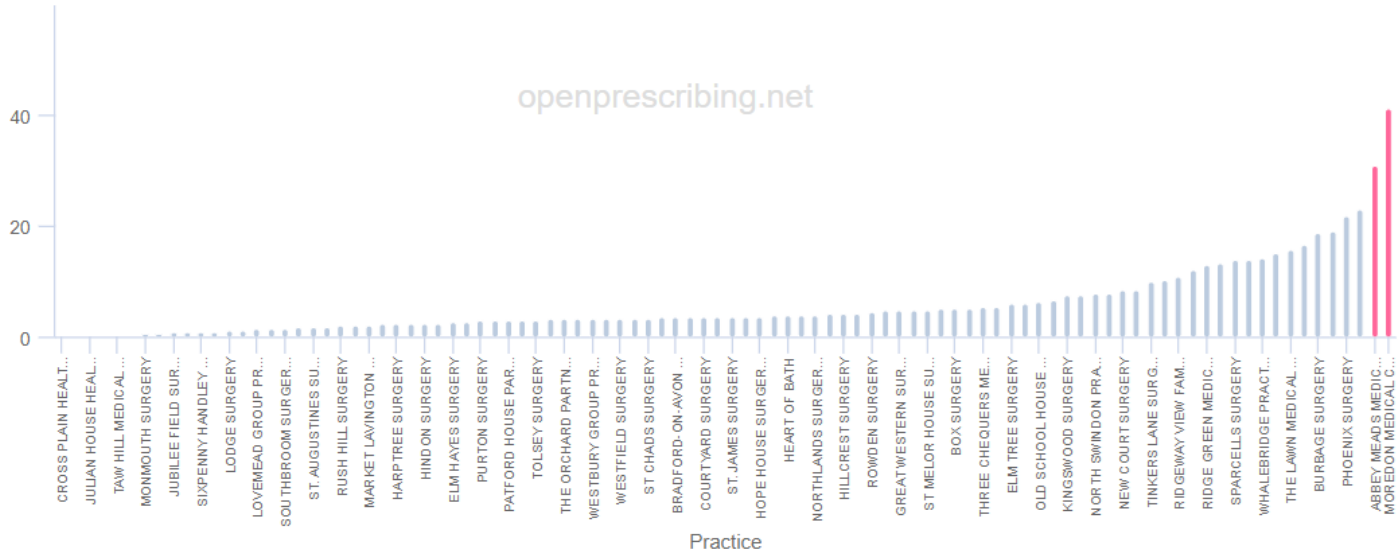
Patient perception and understanding
Clinician perception and understanding



Our Local Experience - October 2019

Items for Hydroxocobalamin vs patients on list by MOREDON MEDICAL CENTRE + ABBEY MEADS MEDICAL PRACT and other practices in CCG in Oct '19

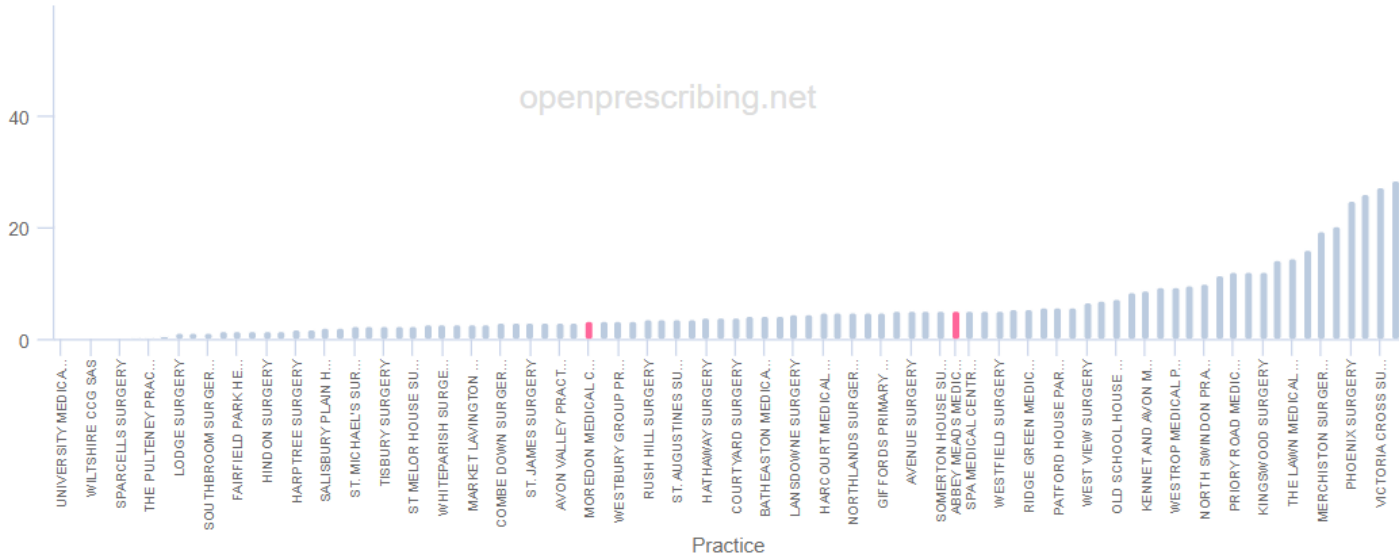
Items for Hydroxocobalamin per 1,000 patients on list



Our Local Experience - August 2021

Items for Hydroxocobalamin vs patients on list by MOREDON MEDICAL CENTRE + ABBEY MEADS MEDICAL PRACT and other practices in CCG
in Aug '21

Items for Hydroxocobalamin
per 1,000 patients on list



How to achieve this?

BUILD TEMPLATES SO THAT
IT IS EASY TO REVIEW

EDUCATION OF ADMIN

EDUCATION OF CLINICIANS

EDUCATION OF PATIENTS

GOOD CODING

HAVE PRE-MADE EASY TO SEND LETTERS

USE YOUR REPORTING
TOOLS





QUESTIONS?



THE END