

Guidance for Primary Care on the Interpretation of Haematinics

B12, Folate and Ferritin

Department of Clinical Biochemistry

References:

- Devalia, V. *et al.* (2014). Guidelines for the diagnosis and treatment of cobalamin and folate disorders. *British Journal of Haematology*, 496-513.
- NICE Clinical Knowledge Summary (CKS) on B12 and Folate Deficiency: <https://cks.nice.org.uk/anaemia-b12-and-folate-deficiency#!diagnosis>
- NICE CKS on Iron Deficiency: <https://cks.nice.org.uk/anaemia-iron-deficiency#!diagnosis>
- BMJ Best Practice Guidelines for Iron Deficiency Anaemia: <https://bestpractice.bmj.com/topics/en-gb/94/pdf/94.pdf>
- Kelly, A. *et al.* (2017) Interpreting Iron Studies. *BMJ*: <https://www.bmj.com/content/bmj/357/bmj.j2513.full.pdf>

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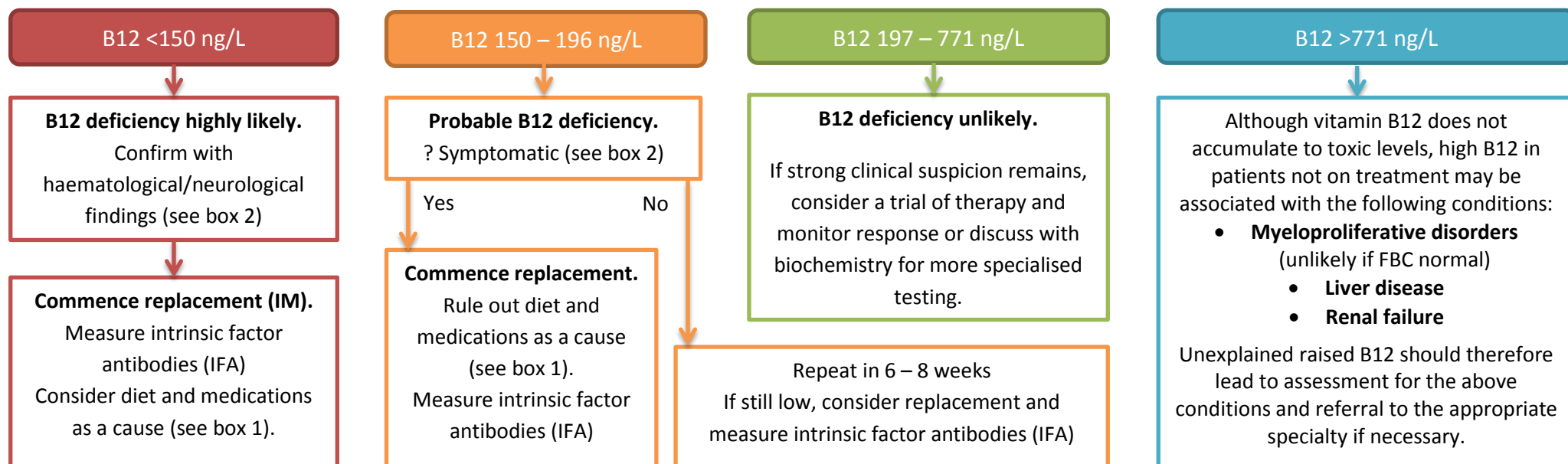
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Vitamin B12

B12 deficiency does not usually require secondary care referral.

Replacement is usually given by IM injection. Oral replacement may be appropriate for mild deficiencies where the IF antibody result is negative.

It is not appropriate to measure B12 in patients on supplements. Monitor response to therapy using the full blood count (Hb and MCV).



Box 1

Causes of low B12 include:

- **Pregnancy, OCP, HRT** (not thought to represent a functional B12 deficiency)
- **Medications:** metformin, PPI, anti-convulsants e.g. phenytoin, antibiotics, colchicine
- **Vegetarian/vegan/poor diet**
- **Malabsorption** – consider other features of malabsorption/pancreatic insufficiency
- **Pernicious anaemia** – consider history of autoimmune disease and/or family history
- **Folate deficiency**
- **Parasitic infection, HIV, Myeloma**

Box 2

B12 levels are not easily correlated with clinical features, and low levels may not represent a functional B12 deficiency.

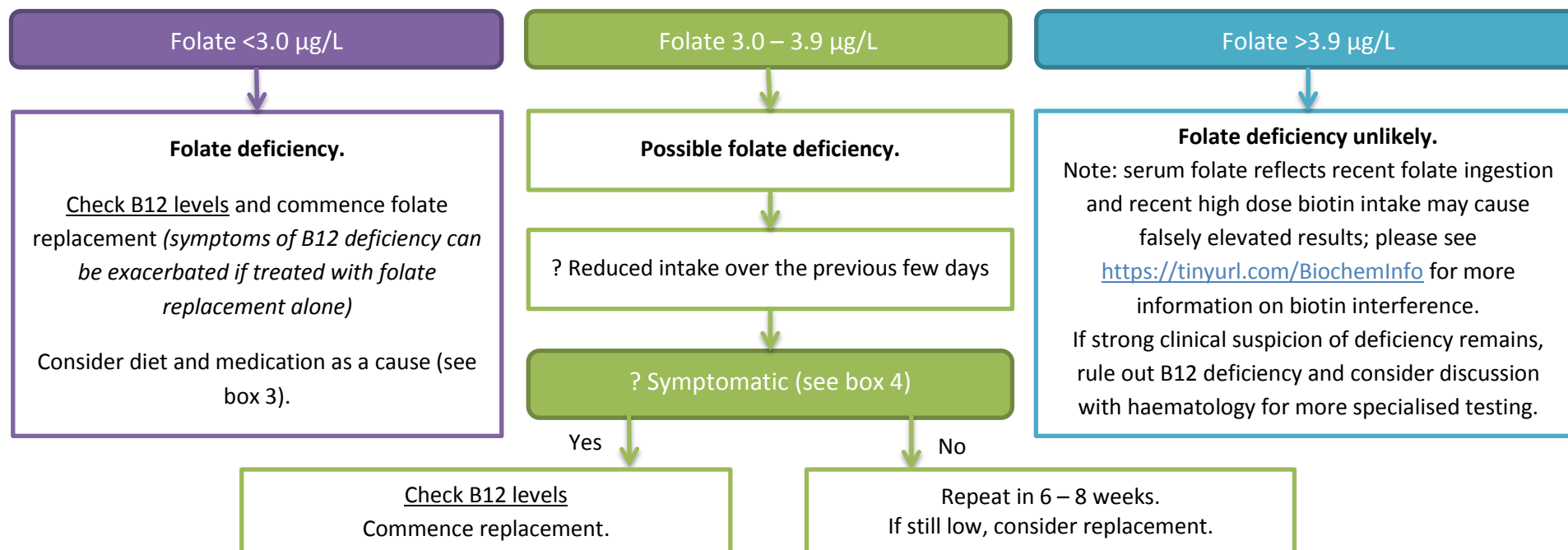
Features of B12 deficiency may include:

- Macrocytic anaemia (MCV >101 fl)*
- Glossitis
- Paraesthesia, unsteadiness, peripheral neuropathy

*Note co-existing iron deficiency/thalassaemia trait may mask macrocytosis

Folate

It is not appropriate to measure folate in patients on supplements. Monitor response to therapy using the full blood count (Hb and MCV).
 Serum folate should always be measured with B12; in the presence of true B12 deficiency, serum folate may be elevated.



Box 3

Conditions associated with low folate include:

- **Dietary deficiency/anorexia**
- **Pregnancy**
- **Alcoholism**
- **Malabsorption** – consider other features of malabsorption/pancreatic insufficiency
- **Haemolysis**
- **Malignancy**
- **Medications:** Anti-convulsants
- **Sample collection immediately post-dialysis**

Box 4

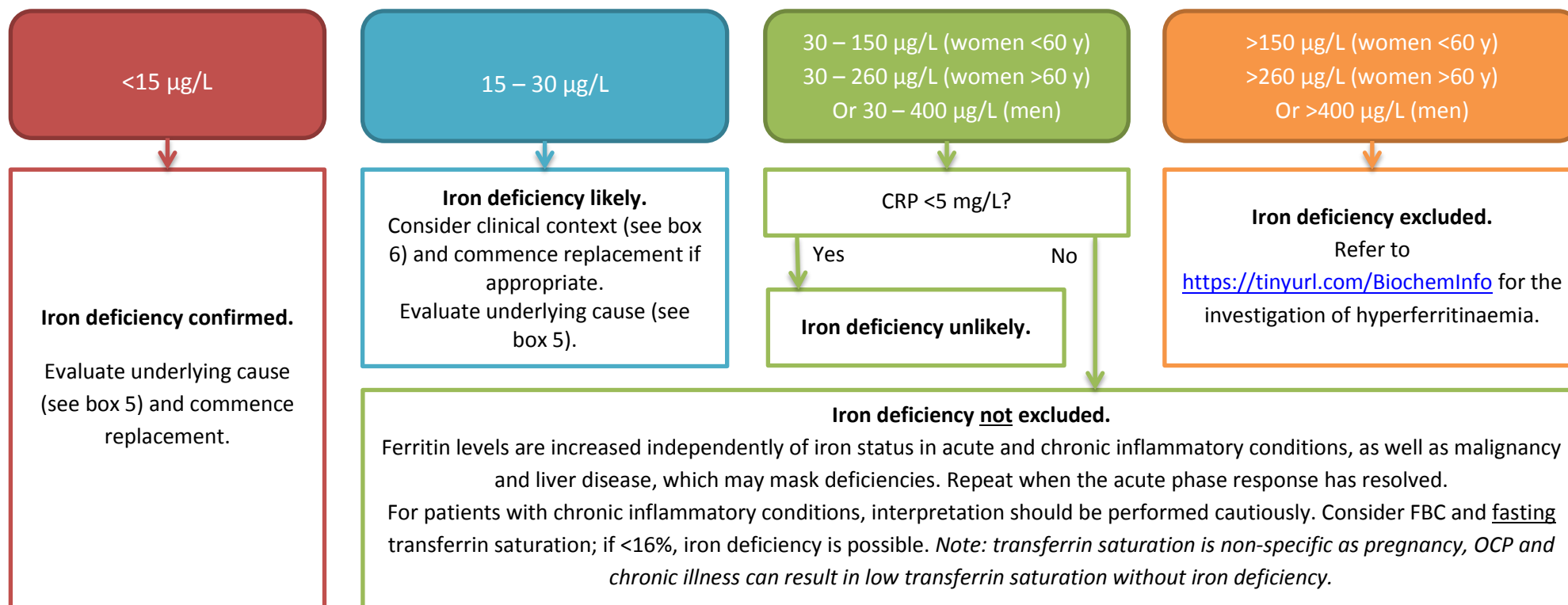
Features of folate deficiency include:

- Macrocytic anaemia (MCV >101 fl)*
- Angular cheilosis/stomatitis

*Note: co-existing iron deficiency/thalassaemia trait may mask macrocytosis

Ferritin

Serum ferritin is the biochemical test which most reliably correlates with relative total body iron stores; low levels generally indicate low iron stores. For the investigation of iron deficiency, serum ferritin is superior to the measurement of iron and transferrin saturation, which are rarely useful. Monitor response to therapy using FBC (Hb and MCV). There is no need to re-check ferritin levels within 6 – 8 weeks.



Box 5

Causes of iron deficiency include:

- **Inadequate diet or malabsorption**
- **Bleeding**, e.g. GI bleeding, menorrhagia or blood donation
- **Chronic renal failure** and haemodialysis
- **Infancy, pregnancy or lactation**
- **Idiopathic**

Box 6

Features of iron deficiency include:

- Microcytic hypochromic anaemia (MCV <79 fl)
- Symptoms of anaemia – fatigue, dyspnoea, pallor.
- Symptoms of iron deficiency may occur without anaemia: fatigue, lack of concentration, irritability, hair loss, dry skin, angular cheilosis, atrophic glossitis, spoon-shaped nails, and unusual cravings for ice or non-food items (phenomenon known as pica).