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**[B12](#b12)**

Only check if there is a clinical or laboratory indication e.g. neurological symptoms, macrocytic anaemia.

[**B12 Raised**](#Raisedvitb12)

Elevated B12 levels are common and non-specific.

Although B12 levels above the reference range have an association with cancer there is NO guidance about suggested investigation pathways.

Causes of raised B12 include:

* Malignancy
* Liver disease
* Alcohol excess
* Interstitial renal disease
* Autoimmune disease
* Infectious disease

Further tests should be guided by clinical symptoms and other blood tests results.

Haematology discussion is not required unless the FBC is abnormal.

Recommended tests:

1. FBC
2. Renal function and LFTs
3. Clinical review for alcohol, liver disease, autoimmune disorder

Tests to consider:

1. Myeloma screen
2. USS abdomen

**CLL -Standard advice on discharge of Stage A Chronic Lymphocytic Leukaemia (CLL) back to primary care**

Please monitor FBC at 6 – 12 monthly intervals and discuss again with Haematology if the patient;

* Develops unexplained anaemia (Hb <100 g/l), unexplained thrombocytopenia (platelet count <80) WITH a rising lymphocyte count
* Lymphocyte doubling time of 6 months or less
* New lymphadenopathy, B symptoms (drenching night sweats, unexplained weight loss of >10% over 6 month period).

Patients should also receive standard routine vaccination for Pneumococcus, Haemophilus Influenza, and Meningitis C, the annual influenza vaccination and AVOID live vaccinations such as shingles

**Ferritin-raised**

Ferritin is an acute phase reactant so please check inflammatory markers (ESR / CRP).

Check liver function tests and review drug / alcohol history.

* If ferritin persistently elevated and fasting transferrin saturation >50% in males and 40% in females then discuss with hepatology[**(Eastern Liver Guidelines)**](https://easternliver.files.wordpress.com/2022/02/hepatology_referral_pathways_for_gps_v15_may_2021.pdf)
* Persistently raised ferritin, please check table below (from [BSH guidance 2018).](https://b-s-h.org.uk/guidelines/guidelines/investigation-and-management-of-a-raised-serum-ferritin/)

| **Increased ferritin synthesis due to iron accumulation** | **Increase in ferritin synthesis not associated with significant iron accumulation** | **Increased ferritin as a result of cellular damage** |
| --- | --- | --- |
| Hereditary (genetic) haemochromatosis  Hereditary acaeruloplasminaemia  Secondary iron overload from blood transfusion or excessive iron intake  Ineffective erythropoiesis: sideroblastic anaemia, some myelodysplastic syndromes (e.g. refractory anaemia with ring sideroblasts)  Thalassaemias  Atransferrinaemia  Ferroportin disease | Malignancies  Malignant or reactive histiocytosis  Hereditary hyperferritinaemia with and without cataracts  Gaucher disease  Acute and chronic infections  Chronic inflammatory disorders  Autoimmune disorders | Liver diseases including: liver necrosis, chronic viral hepatitis, alcoholic and non-alcoholic steatohepatitis*a*  May also have iron overloading.  Chronic excess alcohol consumption |

**Immunoglobulins and protein electrophoresis**

Paraproteins are identified with the serum protein electrophoresis test

The tests report the levels of different immunoglobulins and whether there is a paraprotein there or not

The following guidance refers to the presence of a paraprotein (i.e. a monoclonal protein) – not to the total IgG, IgA or IgM, any of which if raised is a non-specific finding.

Discuss with haematology if a paraprotein is detected AND any of the following abnormalities are also present:

* Hypercalcaemia
* Renal impairment
* Unexplained Anaemia
* Lytic lesions or osteoporosis with compression fractures
* B symptoms (weight loss, night sweats, fevers)
* Lymphadenopathy or hepatosplenomegaly
* Recurrent bacterial infections (>2 episodes in 12 month)

For any paraprotein detected on routine tests or for other symptoms, please follow the diagram below:

IgG, IgA or IgM paraprotein 15g/L or less

IgG , IgA or IgM paraprotein more than 15 g /L

Life expectancy less than 5 years

Life expectancy more than 5 years

Refer to haematology

Monitor at 6 months, then annually if result is stable and if patient remains well

No further follow up.

Additional investigations only in case of symptoms suggestive of myeloma

Refer to secondary care

**Lymphocytosis**

* Persistent lymphocytosis >10.0 (e.g. 6 months apart) – Routine referral to Haematology OP.
* Persistent lymphocytosis <10.0 with additional features of either B symptoms, lymphadenopathy or hepatosplenomegaly (and viral causes excluded) – Urgent referral to Haematology

**Lymphopenia**

* Isolated lymphopenia in the absence of B symptoms (drenching night sweats, weight loss of >10% over 6 months) or lymphadenopathy does not need require any further haematology investigation.
* It is usually of little clinical significance and therefore monitoring of the FBC is not required unless otherwise clinically indicated by the GP.
* Lymphopenia can be associated with incesasing age, bacterial infection, autoimmune disease, and certain medications such as immunosuppressants, alcohol excess and HIV infection.
* A HIV test should always be considered.

**Macrocytosis**

**Common causes:**

Haematinic deficiency, alcohol excess, medication, myelodysplasia, pregnancy, haemolysis, liver disease, myeloma and hypothyroidism.

**Investigations:**

Blood film, LFT’s, thyroid function, B12/folate, haemolysis screen (LDH, reticulocytes, and direct antiglobulin test), protein electrophoresis.

**Refer to haematology if:**

Abnormalities in the haemolysis screen, paraproteinaemia >15g/L or dysplasia reported on blood film.

**Polycythaemia**

* Repeat to confirm results in 2 weeks
* Look for secondary causes (Chronic lung disease, obstructive sleep apnoea, cyanotic heart disease, heavy smoker, diuretics, uncontrolled diabetes, excess alcohol intake, testosterone replacement, anabolic steroid use / body building supplements).
* If haematocrit is persistently elevated above upper limit of normal with no secondary causes - Discuss with Haematology

**Neutrophilia**

* Usually reactive to infection / inflammation / known non-haematological malignancy / post- operative state.
* Smoking, corticosteroid use, obesity and pregnancy can cause mild neutrophilia.
* If associated with lymphocytosis, viral infection is a common cause.
* Requires;
  + History and examination
  + Medication review
  + CRP
  + Suggest repeat when clinical condition improves or again in 4- 6 weeks
* If neutrophilia persists with normal inflammatory markers and no clear cause as above - Discuss with Haematology

**Neutropenia**

* Common causes for neutropenia include:
  + Infection (particularly viral), medication, racial variants (black or middle eastern), autoimmune, haematinic deficiency, thyroid disease and bone marrow conditions
* Persistent neutropenia with either anaemia, thrombocytopenia, lymphocytosis, monocytosis or other blood count abnormalities:
  + Review history and medication and then discuss with Haematology
* Isolated neutropenia
  + If <1.0 on 2 occasions one week apart and and no known cause (such as acute infection or medication) with no suspicious features on the blood film – Discuss urgently with Haematology
  + If mild i.e. 1.0-1.8 and persistent (over 3 months) but stable; this is unlikely to be associated with significant risk of infection - discuss with Haematology routinely
  + Consider HIV testing

**Thrombocytosis**

* An acutely raised platelet count is commonly reactive to either infection or bleeding ng and can be observed and followed up with a repeat FBC.
* A persistent thrombocytosis >450 more than 6 weeks apart with normal inflammatory markers (ESR/CRP) and a normal ferritin – Refer to Haematology routinely

**Thrombocytopenia**

* Isolated thrombocytopenia
* If only one abnormal result, please repeat to confirm low platelets.
* If platelets persistently <100
  + Assess for liver disease (LFT’s, hepatitis screen, upper abdominal ultrasound)
  + Review medication and alcohol history
  + HIV, coagulation screen, B12/ folate, thyroid function and autoantibody screen
* If platelets persistently < 70
  + Routine referral to Haematology if you have excluded it is medication related, due to alcohol excess or due to liver disease / cirrhosis.
  + If the thrombocytopenia is associated with abnormalities in the Hb or white cell count discuss with haematology
* Standard advice if patients with mild / stable thrombocytopenia are discharged from clinic
  + Routine FBC monitoring is not required unless patient has haemorrhagic symptoms or requires a surgical procedure.
  + Avoid NSAIDS and use anti-platelets and anticoagulants with caution weighing up risks and benefits.