**Anaemia**

### Presentation

**Definition**

- Anaemia is defined as an Hb < 130 g/l in males and 120 g/l in females.
- In Pregnancy: Hb <110 g/l (T1), <105 g/l (T2), <100 g/l (T3).

### Clinical Findings

- Step 1 is to establish the presence of anaemia: FBC noting Hb, MCV, MCH.
- Step 2: confirm with repeat FBC as well as other tests (reticulocytes, ferritin, B12/folate, U+E, creatinine, LFTs, CRP, blood film) with full clinical history and examination.
- Step 3: Establish type of anaemia and commence appropriate corrective therapy
- Step 4: monitor response to corrective treatment. Consider referral to appropriate speciality e.g. iron deficiency anaemia to gastroenterology / abnormal blood film to haematology.

### Causes

| Microcytic anaemia (MCV <80fl) | 1) Iron deficiency anaemia: if ferritin <30 very likely. If ferritin >30 check iron studies and CRP. 
  2) Non-iron deficient causes  
    a) Non-haematological: acute or chronic inflammation, chronic infection, malignancy, liver disease, renal failure  
    b) Haematological causes: Haemoglobinopathy e.g. Beta thalassaemia trait,  
    c) Rare causes: e.g. sideroblastic anaemia, paroxysmal nocturnal haemoglobinuria. |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Macrocytic anaemia (MCV >100fl) | 1) Low B12 / folate: reticulocytes usually low, can get other cytopenias  
  2) Haemolysis: reticulocytes raised, Blood film often suggestive (needs haematology referral)  
  3) Alcohol / liver disease  
  4) Hypothyroidism  
  5) Drugs  
  6) Pregnancy  
  7) Bone marrow disorder e.g. MDS / myeloma / aplastic anaemia |
| Normocytic anaemia (MCV 80-100fl) | Wide differential diagnosis. Particularly in elderly patients often multifactorial cause if mild.  
  1) Iron deficiency (early)  
  2) Mixed haematinic deficiency  
  3) Non-haematological e.g. renal failure, liver failure, hypothyroidism, anorexia / nutritional  
  4) Haematological e.g. myeloma / haemolysis / Hb S,C,D. |
**History**

Clinical history should include:

- Bleeding history / bowel symptoms
- Drug history
- Family history
- Social history including diet, alcohol and ethnic group

**Symptoms and Signs**

- Are there constitutional symptoms suggestive of malignancy (fever, weight loss, night sweats)
- Assess for lymphadenopathy and hepatosplenomegaly and masses.

**Investigations**

- Initial investigations should be directed by the MCV/MCH, reticulocytes and blood film

![Diagram of investigation process]

Initial investigations (once anaemia established) | Investigations to consider
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Repeat FBC + Blood film and reticulocytes | LDH, direct coombes test, haptoglobins (if haemolysis suspected)
B12/folate | TFTs
U+E / LFTs | Serum immunoglobulins and protein electrophoresis
Ferritin / iron studies | Auto-antibody screen: if connective tissue disorder suspected
CRP | Erythropoietin level
| Testosterone
| Coeliac / pernicious anaemia screen

**Referral**

**Patients that SHOULD NOT be referred to haematology**
- Patients with iron deficiency anaemia or blood loss (raised reticulocytes with no evidence of haemolysis) should be referred to the gastroenterologist (other than menstruating women).
- Uncomplicated B12 or folate deficiency does not need to be referred to haematology.
- Anaemia due to chronic kidney disease

**Indications for urgent referral to haematology for assessment**
- Unexplained progressive symptomatic anaemia (usually Hb < 90 g/l)
- Evidence of haemolytic anaemia
- Anaemia with leucoerythroblastic blood film (without other cause e.g. prostate cancer)
- Anaemia with associated cytopenias, splenomegaly or lymphadenopathy
- Anaemia with abnormal blood film where haematology referral recommended
- Consider discussing / referring patients with persistent unexplained anaemia

**References**