# Anaemia in adults

## *Executive summary*

## Introduction

Anaemia is a condition in which the number of the red blood cells or their oxygen carrying capacity is insufficient to meet physiological needs, or the number of red blood cells or haemoglobin concentration is reduced below normal value for age. It varies according to age, sex, altitude, smoking and pregnancy status.

Having a correct number of red blood cells and prevention of anaemia requires cooperation between the kidneys, the bone marrow and the nutrients within the body.

Anaemia is actually a sign of a disease process rather than being a disease itself.

Red blood cells have a life span of 90 – 100 days so the body is constantly trying to replace them.

Young women are twice as likely to have anaemia as young men because of regular menstrual bleeding.

## Target users

* Doctors
* Nurses

## Target area of use

* Ward
* Outpatient department

## Key areas of focus / New additions / Changes

This addresses the investigation and management of anaemia – focussing on adults.

## Limitations

Blood transfusion services are not available at Keneba.

## Causes of anaemia

The causes of anaemia can be acquired or inherited. Where possible the cause should be identified as different types of anaemia need different treatment. If the cause cannot be identified, there should still be an attempt to classify which group the cause is likely to fall into.

1. **Malaria**
2. **Iron deficiency anaemia (Microcytic hypochromic)** is the most common type of anaemia worldwide.

Causes include:

* reduced intake of iron examples of foods rich in iron include meat, eggs, leafy green vegetables and iron fortified foods;
* reduced absorption of iron - such as occurs in celiac disease atrophic gastritis and post gastrectomy;
* increased iron requirements as in pregnancy, growth spurts and chronic haemolysis;
* blood loss – gastrointestinal diseases like peptic ulcer, malignancy, angiodysplasia and hookworm infestation, menstruation, hematuria and drugs e.g. NSAID; frequent blood donation .

1. **Normocytic anaemia** – anaemia with normal sized red blood cells seen in

* anaemia of chronic disease seen in chronic kidney disease, rheumatoid diseases, polymyalgia rheumatica;
* combined deficiencies – iron and folate deficiencies in coeliac disease;
* haematological malignancies – acute or chronic leukaemia, myelodysplasia;
* acute blood loss – haemorrhage;
* organ failure – kidney, liver, thyroid and pituitary.

1. **Macrocytic anaemia** – the red blood cells are large but have low haemoglobin concentration. Causes include:

* Vit B12 deficiency due to:
  + reduced intake, seen in vegetarians and folate deficiency in elderly & alcoholics
  + reduced absorption in pernicious anaemia, post gastrectomy, post-ileal resection in Crohn’s disease, stagnant loops, fish tapeworm infestation
* Folate deficiency due to:
  + increased requirements – folate deficiency seen in pregnancy, chronic hemolysis, dialysis and exfoliative dermatitis
  + reduced absorption in coeliac disease, tropical sprue, Crohn’s disease and stagnant loops
  + drugs which affect absorption: phenytoin, sodium valproate, combined oral contraceptive
  + drugs which oppose folate: methotrexate, septrin
* Drugs which directly cause megaloblastic anaemia: alcohol; hydroxycarbamide (hydroxyurea), azathioprine, azidothymidine (AZT), cytosine – arabinoside

1. **Haemolytic anaemia**: where red blood cells are destroyed faster than they can be made, due to:

* inherited conditions such as sickle cell disease or thalassemia
* stressors such as infections, drugs, snake and spider venom, and certain foods
* autoimmune disease such as haemolytic disease of the new born
* direct damage to red blood cells by vascular grafts, prosthetic heart values; tumours; severe burns; exposure to certain chemicals.

1. **Aplastic anaemia:** occurs when the bone fails producing enough new blood cells. Causes include: Idiopathic causes, infections causes such as hepatitis, viruses, Epstein – Barr (EBV) virus, HIV, parvovirus and mycobacteria; exposure to radiation.

## Grading of anaemia

Anaemia can be graded clinically or according to the haemoglobin.

### Clinical grading:

* Mild – pale conjunctiva and mucous membranes
* Moderate – mild plus pale skin
* Severe – moderate plus pale palms.

### Lab-based grading:

|  |  |  |
| --- | --- | --- |
| **Grade** |  | **Haemoglobin** |
| 1 | mild | 10-10.9 |
| 2 | moderate | 7-9.9 |
| 3 | severe | 5-6.9 |
| 4 | life threatening | ≤ 5 |

## Presenting symptoms and signs

Patients may complain of easy fatigue, loss of energy and strength, headache, dizziness, lack of sleep, difficulty in concentrating, shortness of breath particularly with exercise, rapid heartbeat especially with exercise, pale skin and palms, cramps in the limbs, chest pain, blackouts.

## Examination findings

* Pallor, lethargy, tachypnoea.
* Tachycardia and hypotension may suggest a recent bleed.
* Jaundice may indicate haemolysis.
* Do not forget rectal examination.

## Management at the Gate Clinic

Mild anaemias with Hb of 10-10.9 g/dl or PCV 30-32.7% can be managed at the Gate Clinic.

Take a brief history with relevant past medical history and examination; send the patient to the lab and look for malaria parasites and the PCV or Hb.

Treat malaria appropriately if present.

Deworm with mebendazole 100 mg BD for 3 days or albendazole 400 mg single dose if the individual has not received anthelminthic in the past 4 - 6 months.

Give adult patients ferrous sulphate 200 mg OD for 1 month.

Refer patients to the OPD if

* Hb < 10 g/dl,
* active blood loss,
* the patient is very sick,
* history of recurrent blood transfusions
* any concerning history or examination findings.

## Management at the OPD

Take a proper history including dietary history, blood loss, gastrointestinal symptoms, menstrual cycle, menorrhagia, use of drugs and alcohol consumption.

The past medical history of previous admissions and blood transfusion, blood loss or anaemia, surgical procedures and family history of anaemia is important.

### Examination findings

A general examination and complete systemic examination is important to identify any underlying condition, which can affect any system.

Take care to note tachycardia, tachypnoea, hypotension, heart murmurs, jaundice, abdominal tenderness and organ enlargement and never forget digital rectal examination and, where relevant, vaginal examination.

### Investigations

At first consultation request a FBC and blood film comment to classify the kind of anaemia. Malaria blood film is also important during the transmission season.

Further investigations may be indicated depending on the initial findings. These include:

* Direct Coombs test, reticulocyte count, Hb genotype, ESR (but beware that this will be raised by severe anaemia itself).
* Biochemistry – electrolytes, urea and creatinine, liver function tests, bone profile.
* Radiology to look for evidence of myeloma, metastases or bony malignancy.
* Ultrasound studies to look for other malignancies.
* Gastrointestinal investigations including faecal occult blood, upper and lower gastrointestinal endoscopy and barium studies of the bowel.

Other tests that would be useful, but are usually not available to us include:

* Serum iron ferritin and total iron binding capacity
* Serum B12 and folate.
* Bone marrow aspirate or biopsy studies (this is sometimes available at EFSTH).

### Treatment

Moderate anaemia in haemodynamically stable patients can be treated in the OPD. Patient with the following problems should be admitted to the ward (*Fajara*) or referred emergently to Bwiam (*Keneba*):

* Severe to life threatening anaemia.
* Signs of heart failure, tachycardia, tachypnoea and hepatomegaly.
* Severe malaria with anaemia.
* Acute massive blood loss.
* Extensive severe burns.

The treatment of anaemia depends on the suspected cause:

**Iron deficiency anaemia:** Ferrous sulphate 200 mg OD. The efficiency of iron absorption is reduced as the dose increases. Where the Hb is < 8 g/dl, increasing frequency will increased absorption somewhat, but the side effects may become more prominent. Greater absorption is achieved when you prescribe the iron TDS on alternate days rather than giving it BD every day. Iron should be continued until the Hb has returned to normal and then for a further 3 months after this.

**Normocytic anaemia:** The main priority is to treat any identifiable underlying cause or abnormality and stop any precipitating drugs. This may reflect mixed iron and folate deficiency, so if no other cause is identified, a trial of treatment is indicated.

**Macrocytic anaemia:** correct any haematinic deficiency and treat any underlying cause.

Vitamin B12 deficiency – give im cyanocobalamin 1 mg alternate days until 10 doses have been given, then monthly until the full blood count is normal. Continue treatment every three months, unless a clear cause for the deficiency was identified.

Folate deficiency: give folic acid 5 mg orally once daily. Do not start folate supplements until the initial 10 doses of vitamin B12 have been given. Folate replacement in B12 deficiency can precipitate neurological problems.

**Haemolytic anaemia:** this usually requires further investigation to rule out underlying lymphoproliferative disorders and the identify the exact cause for the haemolysis. Refer to the haematologist whenever possible. If this is not possible, then consider treatment with prednisolone at a dose of 1 mg/kg OD to see if the patient responds. Note that this may initially be effective even in the presence of lymphoma, so the patient must be kept under review.

**Aplastic anaemia:** again this diagnosis require further investigation to identify the underlying cause. In some cases, the patient will gradually recover and can be given transfusions until this occurs. In others, the patient will be permanently transfusion dependent. If possible, refer to a haematologist.

## Management on the ward

Take a proper and detailed history.

Do a complete physical examination – general and systemic.

Arrange investigations as for outpatients. Consider adding:

* blood, urine and stool MC&S
* faecal occult blood
* X-ray and ultrasound investigations
* endoscopic investigations.

### Treatment on the ward

* Treat malaria if present
* Treat any infections
* Treat the underlying cause of the anaemia.
* Consider transfusion in severe or life-threatening anaemia.

### Indications for blood transfusion

1. Whole blood transfusion: give 20 ml/kg over 4 hours.

* Haemorrhage – sudden loss of ≥ 25% of blood volume.
* Patients undergoing exchange transfusion (this is not routinely offered here).
* Patients who continue to bleed after receiving 4 units of packed red blood cells.

1. **Packed cell transfusion**: one unit of packed cell typically increases the level of haemoglobin by 1 g/dl and haematocrit by 3%. They should be used when whole blood might overload the circulation. Give 15 ml/kg over 4 hours.

* Symptomatic chronic anaemia without haemorrhage
* Acute sickle cell crises
* Cardiac failure
* Acute blood loss (30% or more)
* Preoperative anaemia

Note that the target post-transfusion Hb in most conditions is 7 g/dl.

### When to refer to the Teaching Hospital:

* Acute massive or ongoing uncontrolled blood loss.
* Unavailability of a compatible blood donor

## Key Issues for Nursing care

* Regular vital signs while patients are on blood transfusion.
* Watch for any sign of reaction. If present stop the transfusion and inform the senior nurse / doctor on duty.
* Transfuse blood over the period recommended.
* Teach patients how to prevent further iron deficiency anaemia
  + Sleep under insecticide treated mosquito nets.
  + Avoid drinking tea or coffee with meals as they can affect iron absorption.
  + Eat plenty of iron rich foods such as green leafy vegetables, lean red meat, beans, iron fortified cereals, liver, seafood and fish.
  + Eat / drink Vitamin C rich foods.
  + Daily prophylactic iron and folate is recommended in pregnancy.

## References

Anemia - Diagnosis and treatment - Mayo Clinic. https://www.mayoclinic.org/diseases-conditions/anemia/diagnosis-treatment/drc-20351366 (accessed Aug 30, 2019).

Haematology and Oncology. Blackwell Science, 2001.

How Anemia Is Diagnosed and Treated. WebMD. https://www.webmd.com/a-to-z-guides/understanding-anemia-treatment (accessed Aug 30, 2019).

Anemia - American Family Physician. https://www.aafp.org/afp/topicModules/viewTopicModule. htm?topicModuleId=2 (accessed Aug 30, 2019).

Anemia. 2018; published online Aug 1. /Patients/Anemia/ (accessed Aug 30, 2019).

Mabey D, Gill G, Parry E, Weber MW, Whitty CJM. Principles of Medicine in Africa. Cambridge University Press, 2013.

|  |  |  |
| --- | --- | --- |
| **Written by:** | Name: Danlami Garba | Date: |
| **Reviewed by:** | Name: Karen Forrest | Date: 15 July 2019 |
| **Version:** | **Change history:** | **Review due date:** |
| 1.0 | New document | 30 August 2021 |
| Review Comments (*if applicable)* |  |  |