Anaemia Diagnosis and Management Protocol (Adults)

Signs and Symptoms
- Pallor
- Fatigue
- Weakness
- Shortness of breath
- Poor exercise tolerance
- Physical signs of specific vitamin deficiencies

Anaemia on Full Blood Count

Hb <11g/dl pregnancy
Hb <12 g/dl non-pregnant women
Hb <13g/dl men

N = 13.5 – 17.5 g/dl (men); 12 – 15.5 g/dl (women)

Key at-risk patient subgroups
- Vegans/poor nutrition adequacy/malnutrition
- Chronic inflammatory conditions
- Chronic diseases (esp renal/liver failure)
- Source of acute/chronic blood loss
- Malabsorption/GIT disorders/ulcers

Normochromic (↓MCV)

Measure reticulocyte count

Reticulocytes >3%

Investigate source of blood loss or red blood cell destruction

Medical Nutrition Therapy
- If malignancy or GIT disease confirmed, manage accordingly.
- **NOTE:** Ensure sufficient iron, folate, B12 and protein intake to support RBC production.

Reticulocytes <2%
- Investigate bone marrow function, organ failures, chronic diseases
- Treat as per diagnosis

Medical Nutrition Therapy
- Manage diagnosis of liver disease, chronic renal failure or other chronic inflammatory disease according to prevailing guidelines.
- **NOTE:** If chronic renal failure is managed using dialysis and/or EPO therapy, check iron stores and supplement iron to support RBC production.
- **NOTE:** consider early stage iron, folate, B12 deficiency and manage accordingly.

Microcytic (MCV normal)

Iron studies

Low serum iron

	Serum Fe (umol/l)	Ferritin (ug/ml)	TIBC (umol/l)	Transferrin (g/l)	Transferrin saturation
Iron deficiency	<9 females <12 males	<30	>70	>3.6	<15% females <20% males
Chronic disease (inflammation)	<9 females <12 males	30 – 100	<42	<2.2 males <2.5 females	<15% females <20% males

Medical Nutrition Therapy
- Manage diagnosis of chronic inflammatory disease according to prevailing guidelines.
- **Replace iron in iron deficiency but not routinely in anaemia of chronic disease:**
- **Dose:** 60-200mg elemental iron daily in divided doses, equivalent to
  - Ferrous sulphate 600-900mg/day
  - Ferrous gluconate 1.2 – 1.8 g/day
  - IV iron is higher risk and reserved for patients with failed oral iron therapy

Normal/high serum iron

	Serum Fe (umol/l)	Ferritin (ug/ml)	TIBC (umol/l)	Transferrin (g/l)	Transferrin saturation
Thalassaemia	≥ 10-30	>200 males >300 females	<42 – 70	2-3.6	≥ 30%
Sideroblastic	≥ 30	>200 males >300 females	>70	2-3.6	≥ 30%

Medical Nutrition Therapy
- Inherited sideroblastic anaemia may respond to 50-200mg of vitamin B6 per day.
- Sideroblastic anaemia unresponsive to vit B6 is suggestive of a cause such as drug exposure or alcoholism.

Macrocytic (↑MCV)

Peripheral smear

Megaloblasts
Hyper-segmented neutrophils

- **Evaluate medications**
- **Check folate and vit B12:**

Folate deficiency:
<10 nmol/l
Vit B12 deficiency:
< 150 – 200 pmol/l

- If vit B12 low, investigate cause:
  - Dietary deficiency (vegans)
  - Distal ileal disease/resection
  - Gastrectomy
  - Pernicious (intrinsic factor antibodies, autoimmune gastritis/achlorhydria)

Medical Nutrition Therapy

Replace folate: 5mg oral daily until at least 3 months after anaemia resolved**NOTE:** combination iron/folate supplements are too low in folate to treat folate deficiency.

Replace vit B12: 1000 ug IM alternate days for 2 weeks, then weekly til serum levels normalize, then monthly. Lifelong replacement may be necessary so long as risk factors persist. Vit B12 deficiency may precipitate secondary folate deficiency due to the methyl folate trap.

IMPORTANT:
Folate should not be given without vit B12 in megaloblastic anaemia where vit B12 level is not known. Folate replacement will mask continuing B12 deficiency which can lead to irreversible neurological damage. In mixed folate and B12 deficiency, replace B12 first.

No megaloblasts

Investigate the possible causes (alcoholism, liver disease, myelodysplastic conditions).

Medical Nutrition Therapy
- If there is a role for medical nutrition therapy in the underlying condition, manage according to prevailing guidelines.

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