Approach to Anemia

HEMATOLOGY

<70 g/L

KEY DECISION RULE

Restrictive transfusion (AABB 2023)[1]

Hb trigger, stable inpatients; <80 g/L if CV disease or ortho surgery

Hb <130 g/L (men) or <120 g/L (women), or a fall from baseline

→ Bleeding, diet, drug, alcohol history; CBC with MCV, RDW, other cell lines vs prior; smear[11]

→ Reticulocyte index; draw iron, B12, folate, hemolysis labs and T&S before transfusing[11]

→ **Unstable, bleeding or hemolyzing?**

Yes →

Unstable: resuscitate; urgent GI or hematology[8,11]

- Shock: low BP, tachycardia
- Angina or dyspnea at rest
- Pancytopenia or blasts on smear
- Melena, hematemesis or BRBPR
- Schistocytes, low platelets: TTP?
- Fast Hb fall, jaundice, dark urine

→ **Bleed/shock: transfuse now, not by Hb; MI: consider <100 g/L[9,11]**

If not: reticulocyte index, then MCV?

	Microcytic (RI <2%) MCV <80 fL	**Normocytic (RI <2%)** MCV 80–99 fL	**Macrocytic (RI <2%)** MCV ≥100 fL	**Hemolysis or blood loss** RI >2%
CAUSES	• Iron deficiency: blood loss, malabsorption • **Occult GI cancer causing iron loss** • Inflammation; thalassemia trait; lead	• Inflammation, CKD, endocrine • **Acute bleed before retics rise** • **Marrow failure, myeloma, infiltration**	• **B12 deficiency: pernicious anemia** • Folate lack; alcohol; liver disease • MTX, hydroxyurea, MDS, thyroid	• **Bleeding: GI, retroperitoneal** • **TTP/HUS/DIC; autoimmune hemolysis** • G6PD, sickle cell, spherocytosis, valve
CLUES	• Pica, koilonychia, restless legs[4] • Menorrhagia, melena, NSAIDs; celiac • Mentzer (MCV/RBC) <13: thalassemia[11]	• Anticoagulant, procedure, falling Hb • High RDW: mixed deficiency[11] • Other cytopenias, bone pain, high Ca	• Paresthesias, ataxia, low vibration[6] • Hypersegmented neutrophils[11] • Vegan, gastrectomy, PPI, metformin[6]	• Jaundice, dark urine, splenomegaly[11] • Schistocytes + low platelets: TMA[11] • Spherocytes: AIHA or hereditary[7,11]
WORKUP	• Ferritin <45 µg/L (<100 if inflamed)[2,4] • tTG; men/postmeno: EGD/colonoscopy[2,3] • Fe replete: Hb electrophoresis, lead[11]	• Serial Hb, creatinine, TSH, CRP, iron[11] • SPEP + free light chains if unexplained[11] • Marrow biopsy if cytopenias or blasts[11]	• B12, folate, TSH, LFTs; drug review[11] • Borderline B12: MMA ± homocysteine[6,11] • Low B12: anti-intrinsic factor Ab[11]	• LDH, bilirubin, haptoglobin, DAT, UA[11] • Schistocytes: PLASMIC, ADAMTS13[8,11] • Bleed: endoscopy or CT angiography
MANAGE	• Elemental Fe 50–100 mg daily/QOD[3,5] • IV iron if intolerant, malabsorption[3,11] • Treat source; iron 3 mo past Hb normal[3]	• Treat cause; iron if also deficient[11] • CKD: nephrology for iron ± ESA[11] • Marrow failure: urgent hematology[11]	• B12 1 mg IM if neuro, else 1–2 mg PO/d[6] • Folate 1–5 mg/d once B12 replete[6,11] • MDS suspected: hematology referral	• TTP: PLEX, steroids; avoid platelets[10,11] • Warm AIHA: steroids; call blood bank[7,11] • Bleed: stop source; transfuse by need[11]

Stethopedia
stethopedia.ca/approach/anemia

Evidence [1] Carson 2023, JAMA [2] Ko 2020, Gastroenterology [3] Snook 2021, Gut [4] Camaschella 2015, N Engl J Med [5] Stoffel 2017, Lancet Haematol [6] Stabler 2013, N Engl J Med [7] Brodsky 2019, N Engl J Med [8] Bendapudi 2017, Lancet Haematol [9] Carson 2023, N Engl J Med [10] Zheng 2020, J Thromb Haemost (Tx) [11] Manual 2024–25, pp. 133–134, 136, 141, 144