

AMB Order Panel: Anemia

Anemia: **Initial Orders:** CBC with diff, reticulocyte counts

MCV<80

Orders: Ferritin, Iron Deficiency Panel, ESR, CRP, TSH with reflex, Hb Electrophoresis, DNA sequencing, EMA binding test (or osmotic fragility test), lead levels, referral to hematology.

| MCV <80 | |
|---|--|
| Condition | Orders/tests |
| Iron deficiency: Most common cause worldwide. 1) Increased iron need (pregnancy) 2) Decreased intake or absorption 3) Chronic Bleeding (Menstrual for pre-menopausal female, GI cancer for >50 yo) | Ferritin, Iron Deficiency panel |
| β Thalassemia | Hb electrophoresis |
| α Thalassemia | DNA sequencing (heme referral) |
| Anemia of Inflammation | ESR, CRP |
| Hereditary Spherocytosis | EMA binding (#1) Osmotic Fragility Test (#2) |
| Lead Poisoning | Lead level |
| Fragmentation syndrome | LDH, Haptoglobin, LDH, CMP (AST & T bil) |
| Hyperthyroidism | TSH w/ Reflex, thyroid antibody groups |
| HbCC (Hemoglobin C disease) | Referral to hematology |
| Sideroblastic anemia | Ringed sideroblasts on bone marrow. Referral to hematology. |

MCV>100

Orders: B12, Folate, MMA, homocysteine, TSH w/ reflex, LDH, Haptoglobin, LFTs, SUD screening, UDS, Referral to hematology for bone marrow exam, copper level, ceruloplasmin.

| MCV>100 | |
|----------------------|--|
| Condition | Orders/tests |
| B12 Deficiency | B12, folate, MMA, homocysteine |
| Folate Deficiency | Folate, b12, MMA, homocysteine |
| Hypothyroidism | TFT's (TSH w/ reflex) |
| Alcohol Use Disorder | History, SUD screening, Random UDS |
| Liver Disease | LFT's |
| MDS | Referral/consult for bone marrow exam |
| Hemolysis | Haptoglobin, LDH, CMP (AST and T bil), reticulocyte count |
| Acute Bleeding * | See below |
| Copper Deficiency | Copper level, ceruloplasmin, peripheral smear |

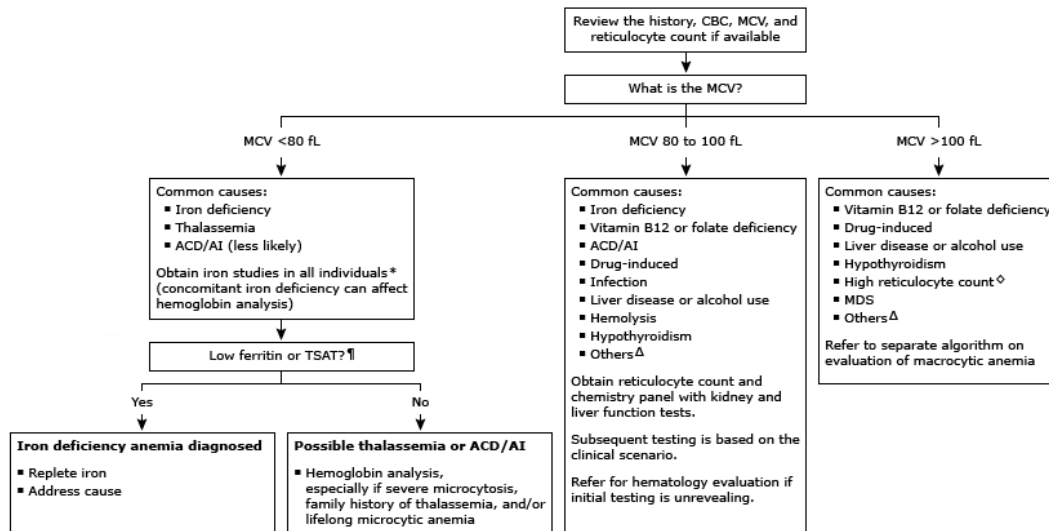
AMB Order Panel: Anemia

MCV 80-100

Orders: ferritin, iron deficiency, renal function panel, ESR, CRP, TSH with reflex, SPEP, testosterone level, referral to hematology

| MCV Normal 80-100 | |
|--|---------------------------------------|
| Condition | Orders/Tests |
| Iron Deficiency | Ferritin, Iron deficiency panel |
| Acute Bleeding * | Inpatient. |
| Anemia of CKD | RFP (BUN, Cr), ferritin |
| Anemia of inflammation | ESR, CRP |
| Hypothyroidism | TFT's (TSH w Reflex) |
| Hypogonadism in male | Testosterone level |
| Plasma Cell Dycrasia | SPEP |
| MDS & Other primary hematological disease, anemia of marrow infiltration ie leukemia, multiple myeloma, solid tumors, and scarring | Referral/consult for bone marrow exam |

* Acute before microcytosis develops which takes months. Not appropriate for outpt w/up time-line.



This algorithm addresses anemia in healthy outpatients, which is often an incidental finding or may be identified when a CBC is performed to evaluate mild symptoms such as fatigue. It is not appropriate for individuals who are acutely ill with fever, bleeding, neurologic symptoms, or any severe cytopenia (hemoglobin <7 to 8 g/dL; platelet count <50,000/microL, absolute neutrophil count [ANC] <1000/microL). Consider the history, CBC, MCV, and reticulocyte count (if available) simultaneously. Refer to UpToDate for details of testing for specific causes of anemia.

Notes:

- 1) Almost all anemias are normocytic in the early stages of the disorder.
- 2) Existence of multiple causes (ie IDA & liver disease or IDA & B12 deficiency) can result in normocytic anemia or a mixed picture.

AMB Order Panel: Anemia

- 3) Partial treatment of B12 or folate deficiency can result in normocytic anemia.
- 4) References: Uptodate & dynamed.