

Anemia

♂ < 13.5
♀ < 12

Hemorrhage

- Clinically obvious
- Not clinically obvious
 - RP
 - tighs } CTAP

↑ destruction (Hemolysis)

Inherited

- Enzyme deficiency
 - G6PD
- Intrinsic membrane
 - Spherocytes
 - Elliptocytes
- Hemoglobinopathies
 - Sickle cell
 - Thalassemia

Acquired

- Microangiopathic
 - DIC
 - TTP
 - HUS
 - HELLP
- Macroangiopathic
 - Mechanical valve
- Autoimmune Hemolytic Anemia
 - Warm/Cold
- PNH
- Infectious
 - Malaria
 - Babesiosis

↓ Production

MCV

Microcytic MCV < 80

- Iron deficiency
- Anemia of chronic disease
- Thalassemia

Normocytic MCV 80-100

- ↓ retic
 - Anemia of chronic disease
 - BM infiltrate
 - Leukemia
 - MM
 - Myelofibrosis
 - MDS
 - Renal disease
 - Liver disease
 - Endo disease
- ↑ retic
 - Hemolytic anemia
 - Chronic blood loss

Macrocytic MCV > 100

- Vit B12 deficiency
- Folate deficiency
- ETOH
- Liver disease
- Drugs:
 - Bactrim
 - PPI
 - MTX
 - Hydroxyurea
 - Metformin

Normal Lab Values

MCV 80-100
RDW 11-14
LDH ≤ 220
Haptoglobin 30-200

Iron 40-160
TIBC 175-400
% Sat 15-60%
ferritin ♀ 30, ♂ 100
200 = adequate iron stores
B12 200-900
folate 3-13
retic % 0.5-1.3%

$$\text{Retic Index} = \text{retic \%} \times \frac{\text{Hct}}{\text{normal Hct}} \times \frac{1}{2}$$

- Hct (normal) ♂ 45, ♀ 40
- $\frac{1}{2}$ = approximation for shift cells.

RI < 2% = ↓ production / inadequate response
RI > 3% = loss / destruction

$$\text{Mentzer Index} = \frac{\text{MCV}}{\text{RBC}}$$

< 13 rules in thalassemia.