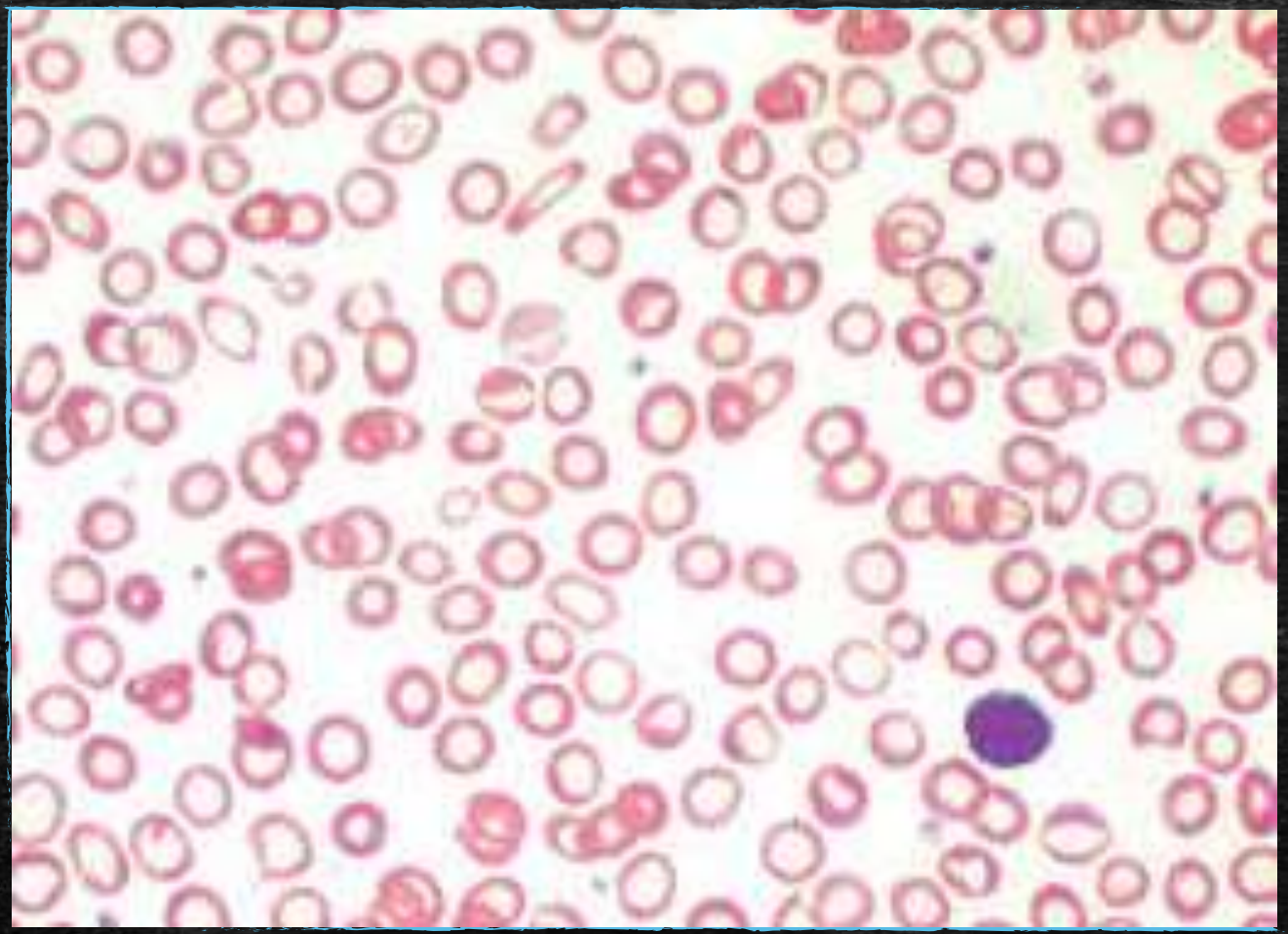
Evaluation of microcytic anaemia



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DISCLAIMER

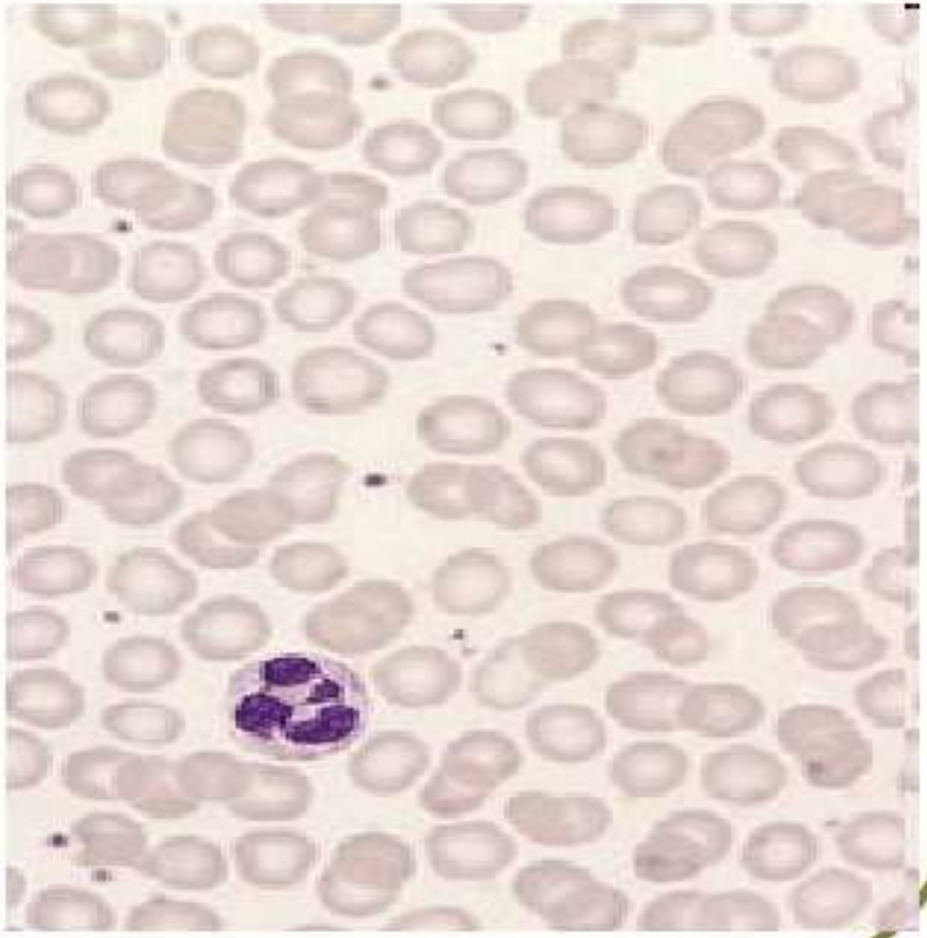
- No financial associations with any pharmaceutical company

Contents

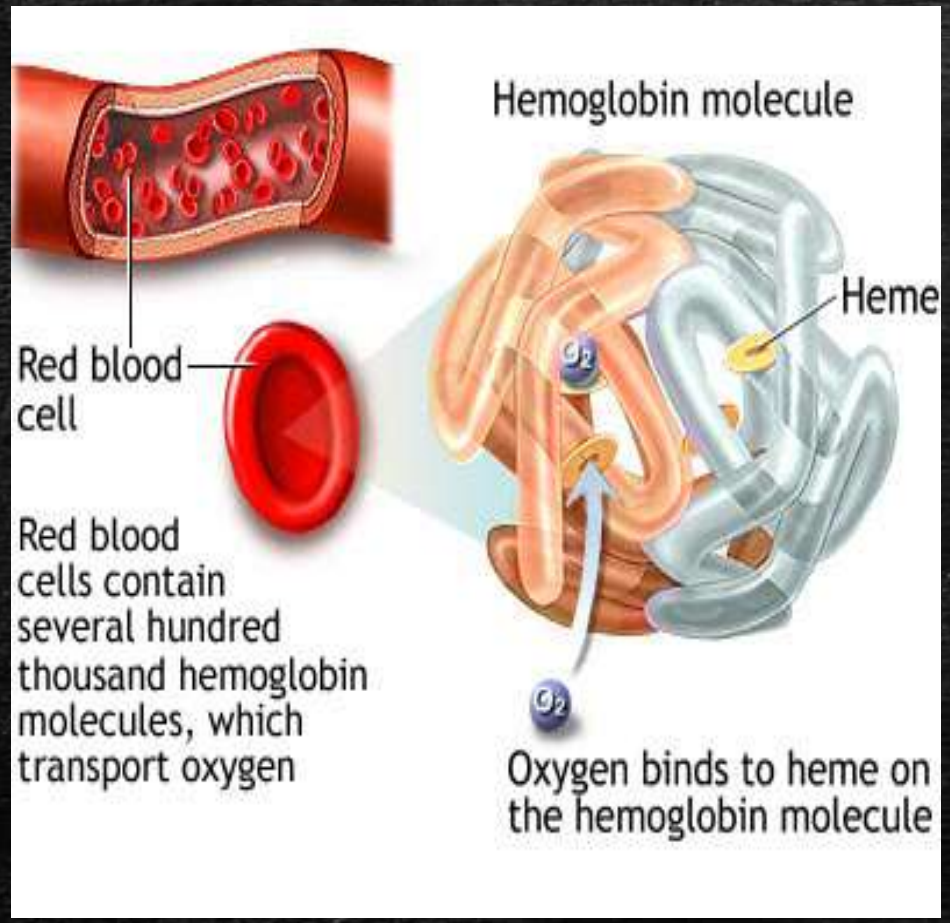
- Overview of definition of microcytic anaemia
- Brief review of haemoglobin structure
- Major causes of microcytic anemia
- IDA vs. thalassemia vs. anaemia of chronic disease
- References

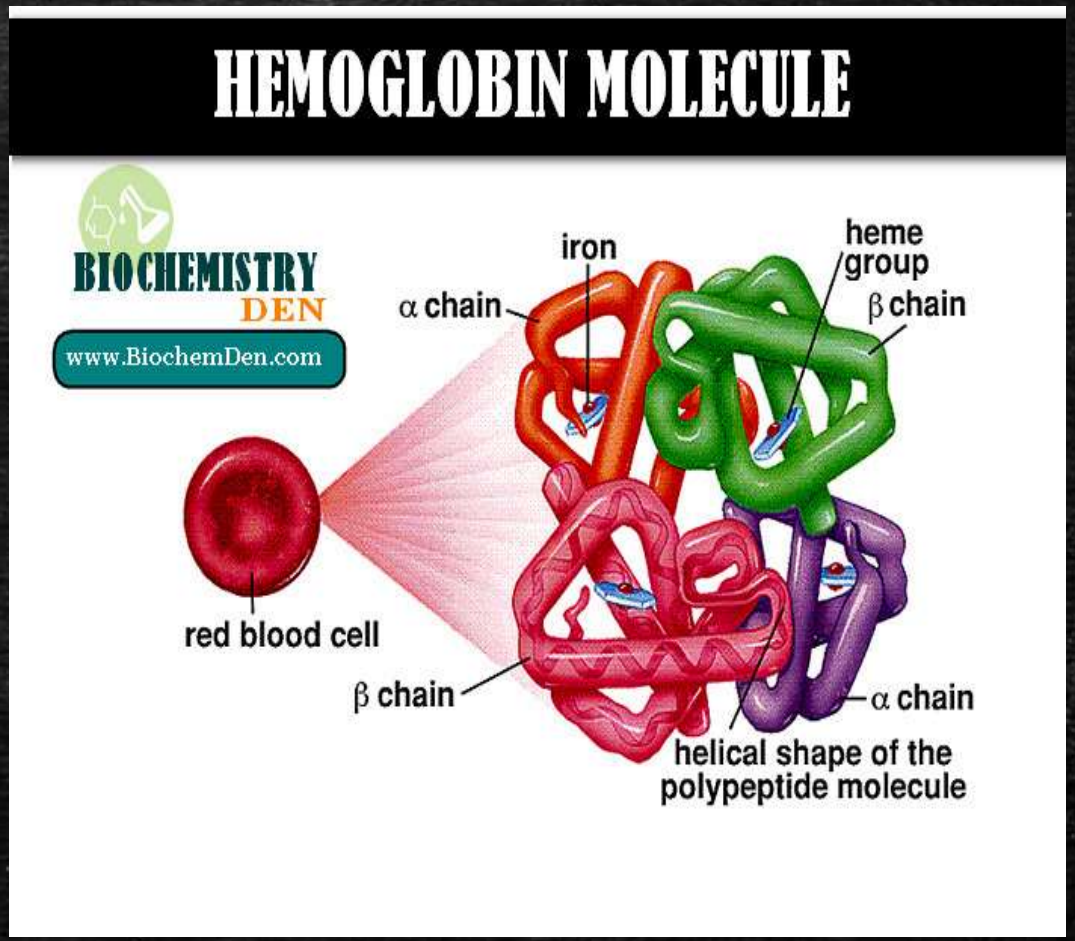
Microcytosis

- The term microcytosis means that red cells are smaller than normal. Small red cells are referred to as microcytes. This blood film is from a blood sample with a mean cell volume (MCV) of 72 fl (normal range 82-98). There is also hypochromia, i.e. the cells have an increased area of central pallor.



Haemoglobin





Major Causes of microcytic anaemia

- 1. Iron deficiency anaemia
- 2. Thalassemia
- 3. Anaemia of chronic disease or anemia associated with inflammation
- 4. Sideroblastic anaemia (hereditary or acquired)
- 5. Lead poisoning

IRON DEFICENCY ANAEMIA

IDA

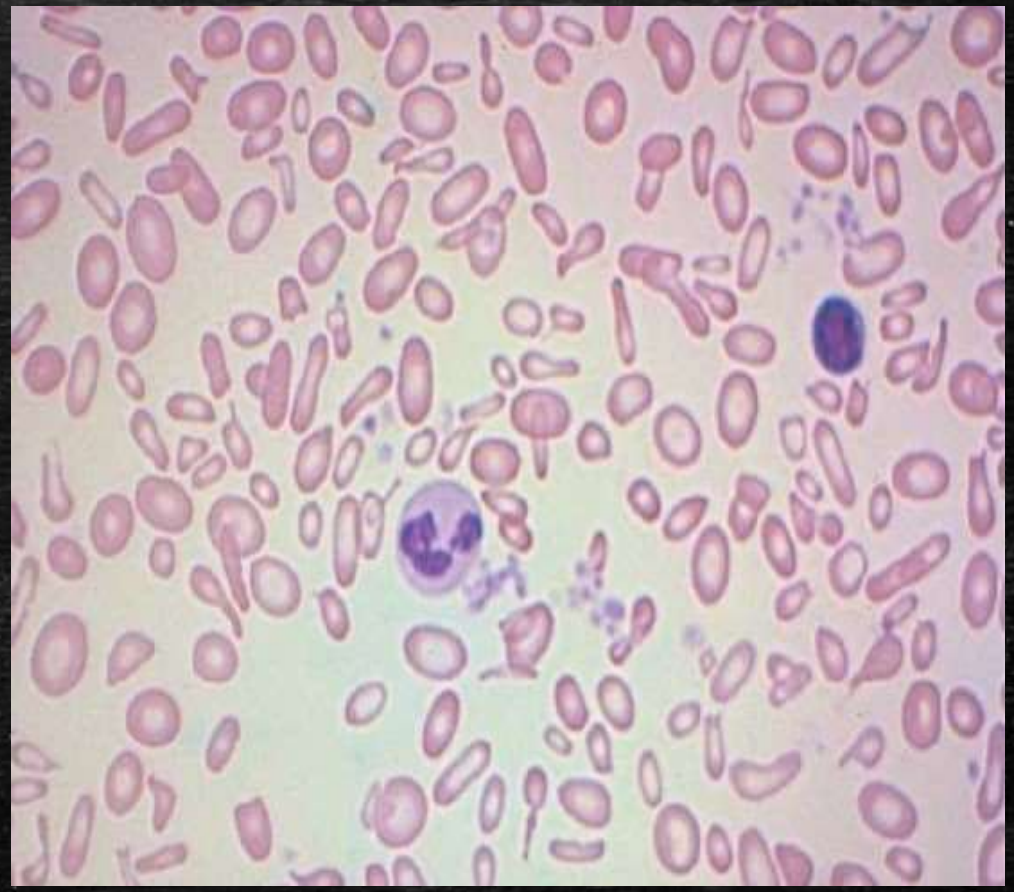
- Most common cause of microcytic anaemia
- Lack of iron either through diet or bleeding
- Always need to determine the underlying cause

Laboratory testing

- CBC: low RBC, low MCHC, low reticulocyte, platelet count increased
- Film : pencil cells pathognomic
- Other test : iron studies, serum ferritin

  Guyat et al J Int Med 1992

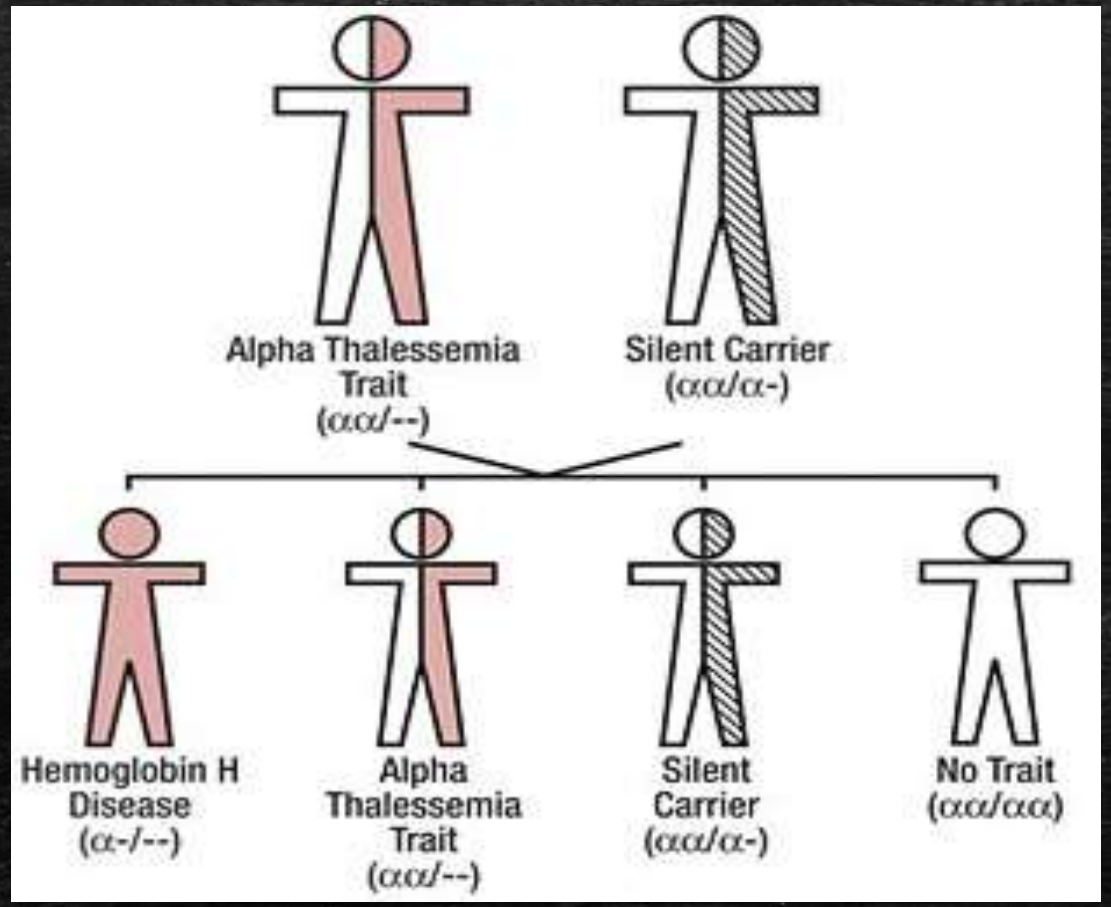
- Response to therapy



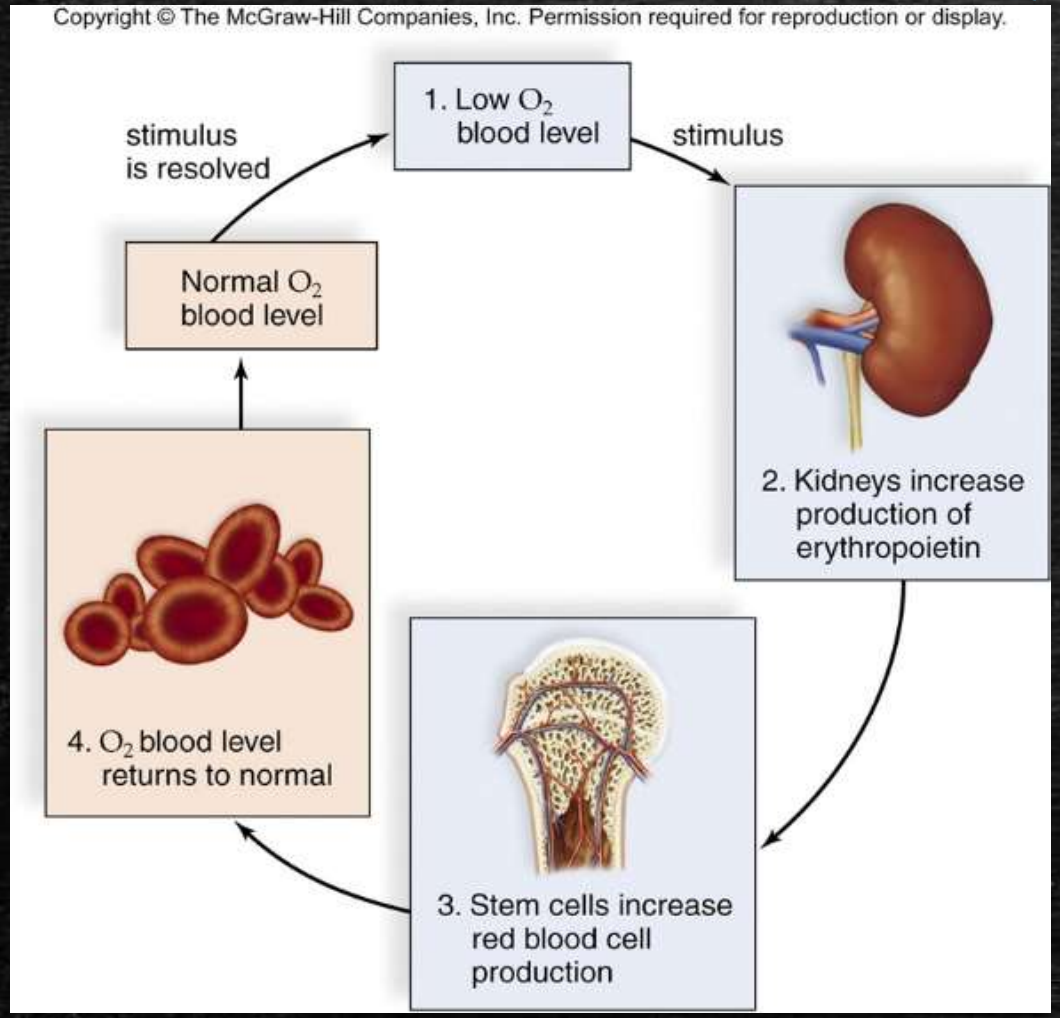
Thalassemia

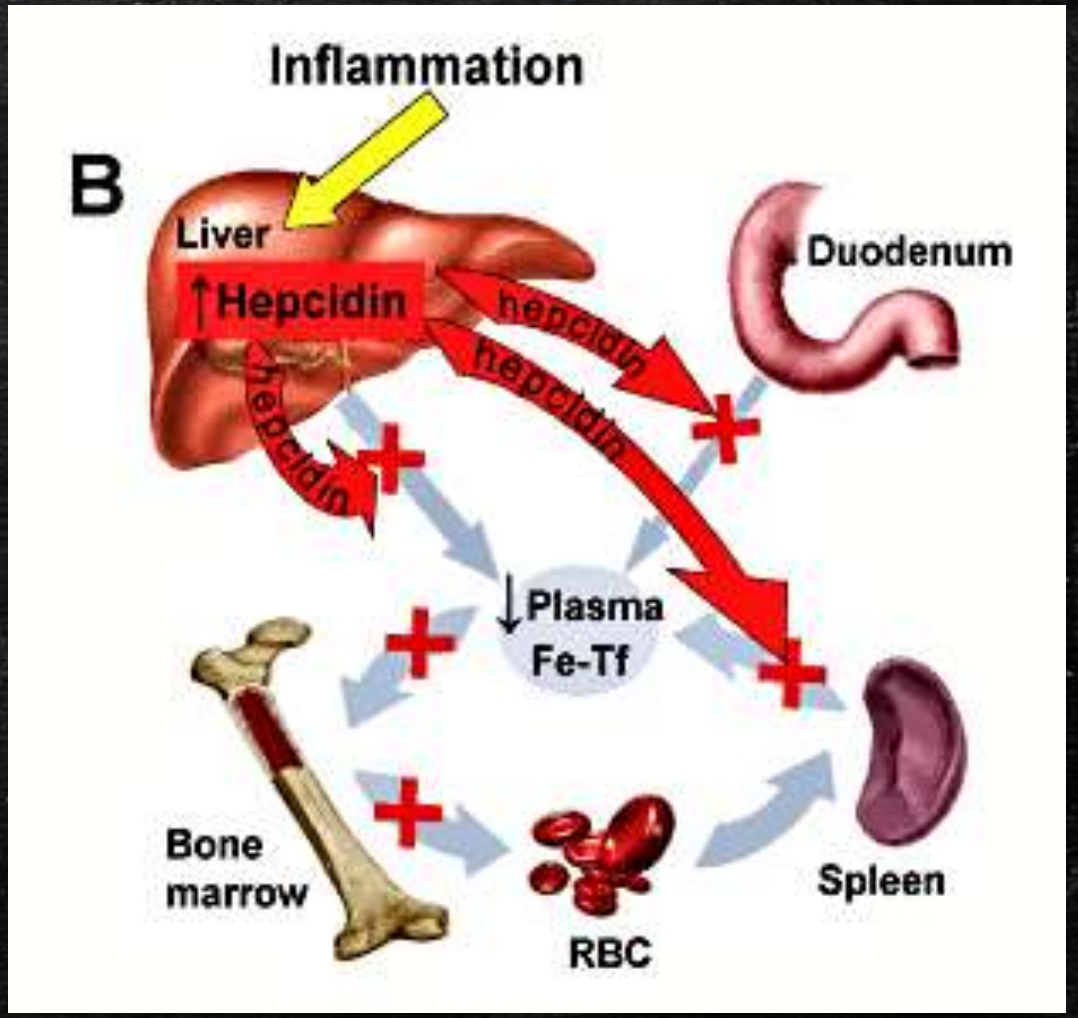
- More common in our population is the beta-thalassemia trait
- Usually asymptomatic and may be discovered with blood tests
- Defects in chromosome 11

α-thalassemia



Anaemia of chronic disease





Differentiating IDA vs. thalassemia vs. anaemia of chronic disease

- Use of blood indexes to differentiate IDA and thalassemia
- Serum ferritin in presence of inflammation
- electrophoresis

	IDA	Thal	Inflamm
Degree of anaemia	Hb> 10	α: 12-13 β: 9-10	8-10
MCV	<70	65-75	>/=70
Blood film	Pencil cells	Target cells	-
Ferritin	<15 ng/mL	normal	elevated
Iron studies	Low Fe, saturation and high TIBC	normal	Low Fe, Low/normal TIBC, low/normal saturation

Summary

- Always look for the underlying cause for a microcytic anaemia
- Use the best lab investigation profile along with a detailed history
- If the patient fails to respond appropriately to treatment, consider compliance or that the diagnosis is incorrect

References

- Microcytic anaemia NEJM 2014;371:1324-1331
- Iron deficiency anemia NEJM 2015;372: 1832-1843
- Aafp.org/afp/2010/1011/p1117.hmtl
- UpToDate : approach to anemia in children and adults