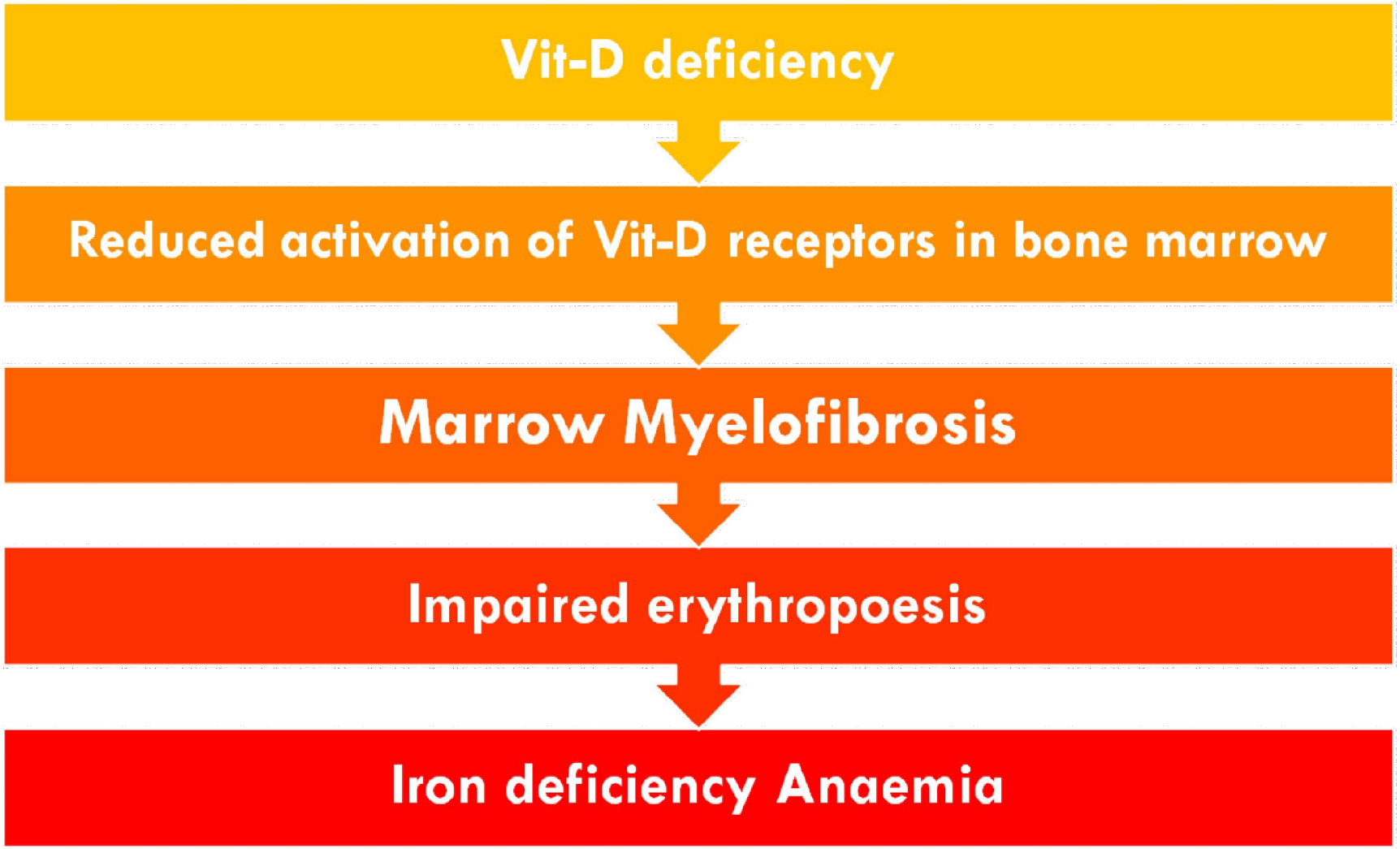
“INTERELATIONSHIP” BETWEEN IDA AND VITAMIN D DEFICIENCY IS NOW ESTABLISHED

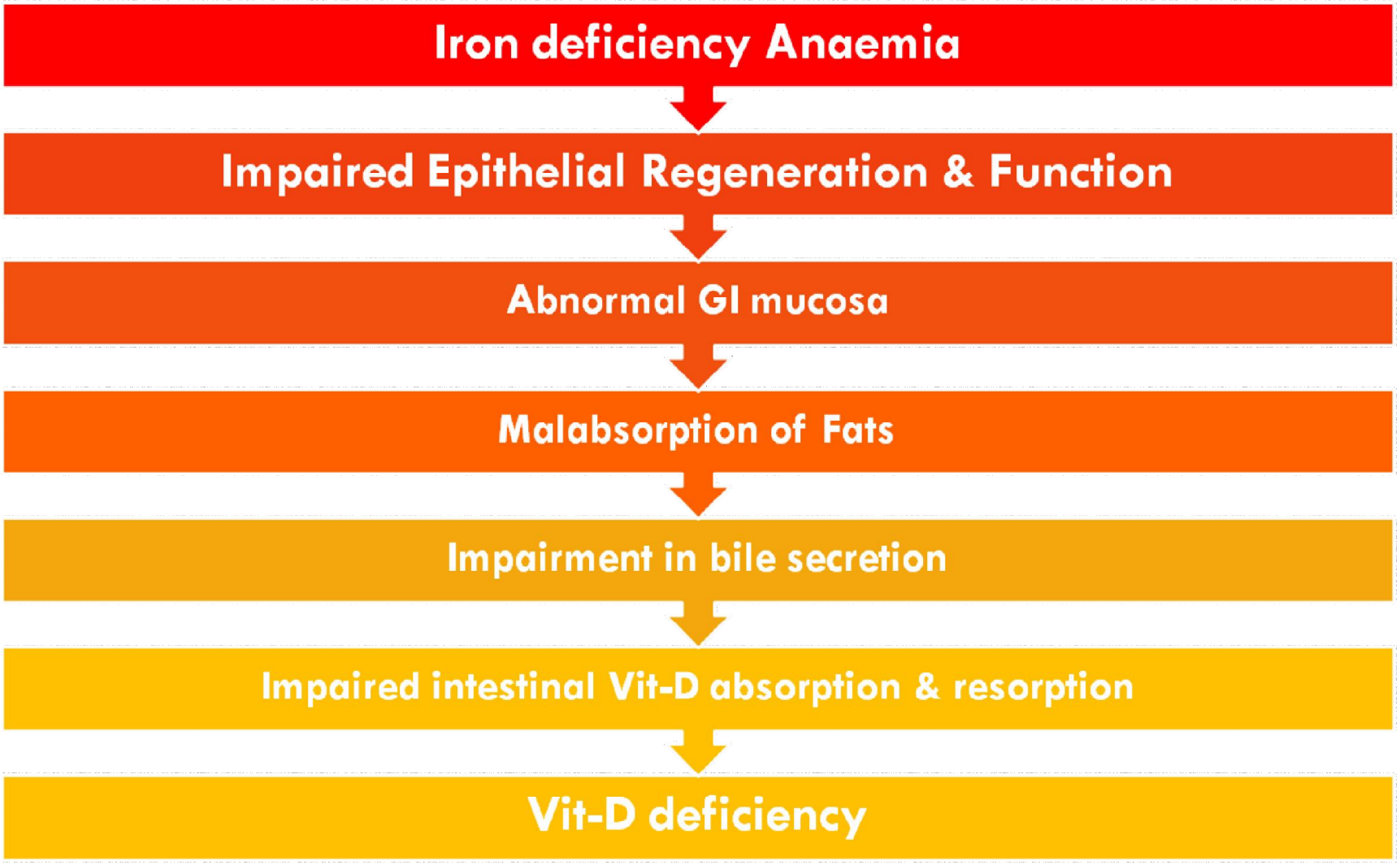
Rationale for Combining Iron & Vit-D

- **Vit – D** deficiency and **Iron deficiency Anaemia** the two most menacing disorders - are inter-related (interlinked)
- Deficiency of one leads to deficiency of other

Mechanism – Vit-D deficiency causes Anaemia

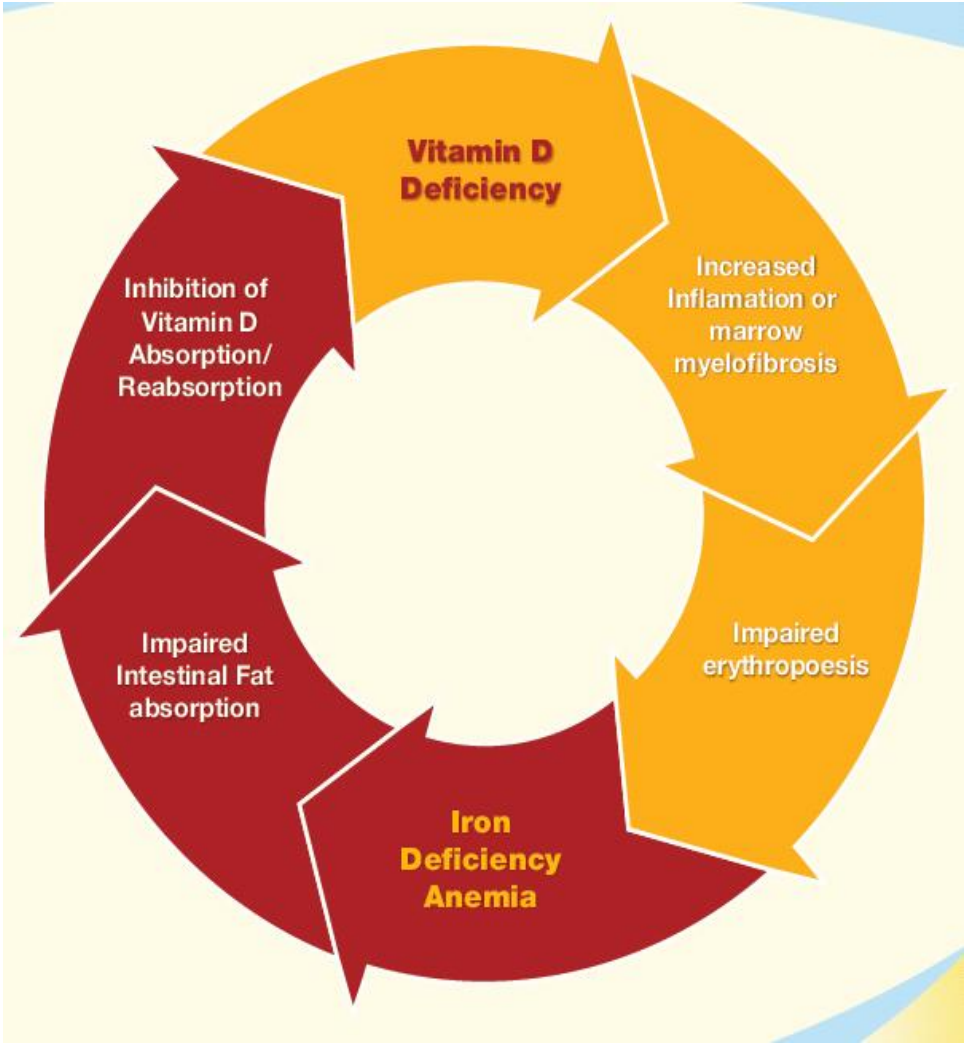


Mechanism – Iron deficiency Anaemia causes Vit-D deficiency



Continuous Viscous cycle

- Supplementation of both Iron and Vit-D would provide optimum benefit.



Anaemia

Deficiency in the oxygen-carrying capacity of the blood due to a diminished erythrocyte mass.

- May be due to:
  - **Erythrocyte loss** (blood loss)
  - **Decreased Erythrocyte production**
    - Low erythropoietin
    - Decreased marrow response to erythropoietin
  - **Increased Erythrocyte destruction** (hemolysis)

Classification Based on Severity in Pregnancy

	ICMR	WHO
Mild	10 – 11 gm/dl	9 – 11 gm/dl
Moderate	7 – 10	7 - 9
Severe	4 – 7	<7
Very severe	<4	

Causes of Anemia in Pregnancy

- Physiological anemia
- Nutritional anemia – IDA, megaloblastic
- Anemia of chronic illness
- Blood loss
- Hemolysis and hemolytic anemias
- Hemoglobinopathies
- Other hereditary anemias
- Aplastic anemia

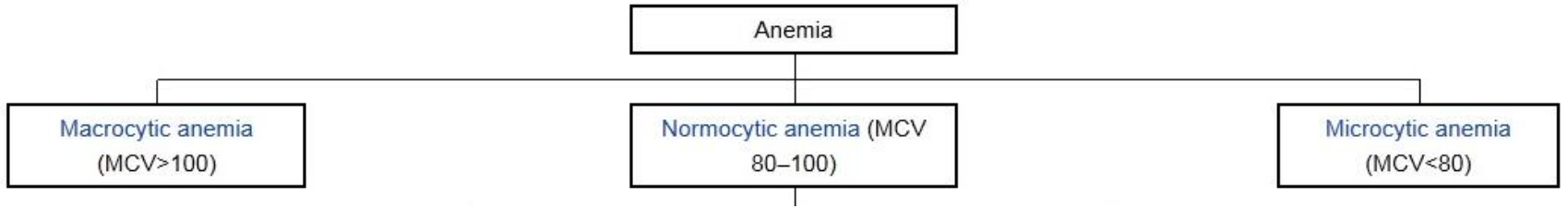
Measurements of Anemia

- **Hemoglobin** = grams of hemoglobin per 100 mL of whole blood (g/dL)
- **Hematocrit** = percent of a sample of whole blood occupied by intact red blood cells
- **RBC** = millions of red blood cells per microL of whole blood
- **MCV** = Mean corpuscular volume

Morphological Classification

- By the size of the RBCs
- Macrocytic anemia (MCV > 100)
- Normocytic anemia (80 < MCV < 100)
- Microcytic anemia (MCV < 80)

Morphological Classification



- **Size of erythrocytes is larger than normal**
- **Megaloblastic anemia** – Vitamin B12, Folate deficiency.

- **Hb levels decreased**
- **MCV normal**
- Acute blood loss
- Anemia of chronic disease
- Aplastic anemia
- Hemolytic anemia

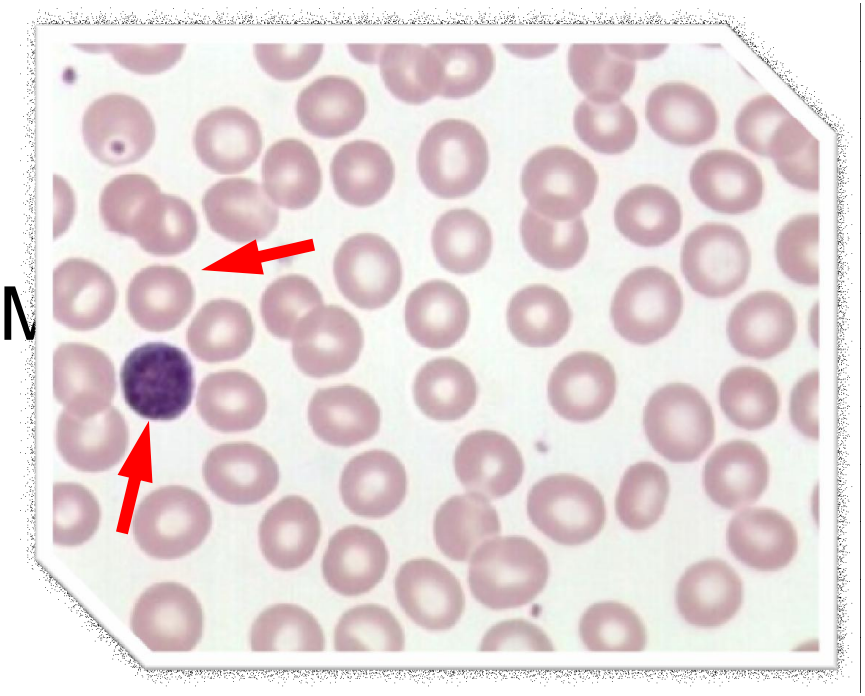
- **Size of erythrocytes is smaller than normal**
- Heme synthesis defect
  - Iron deficiency anemia
  - Anemia of chronic disease
- Thalassemia

Normocytic Anemia

Is a condition in which the size & Hb content of RBCs is normal but the number of RBCs is decreased.

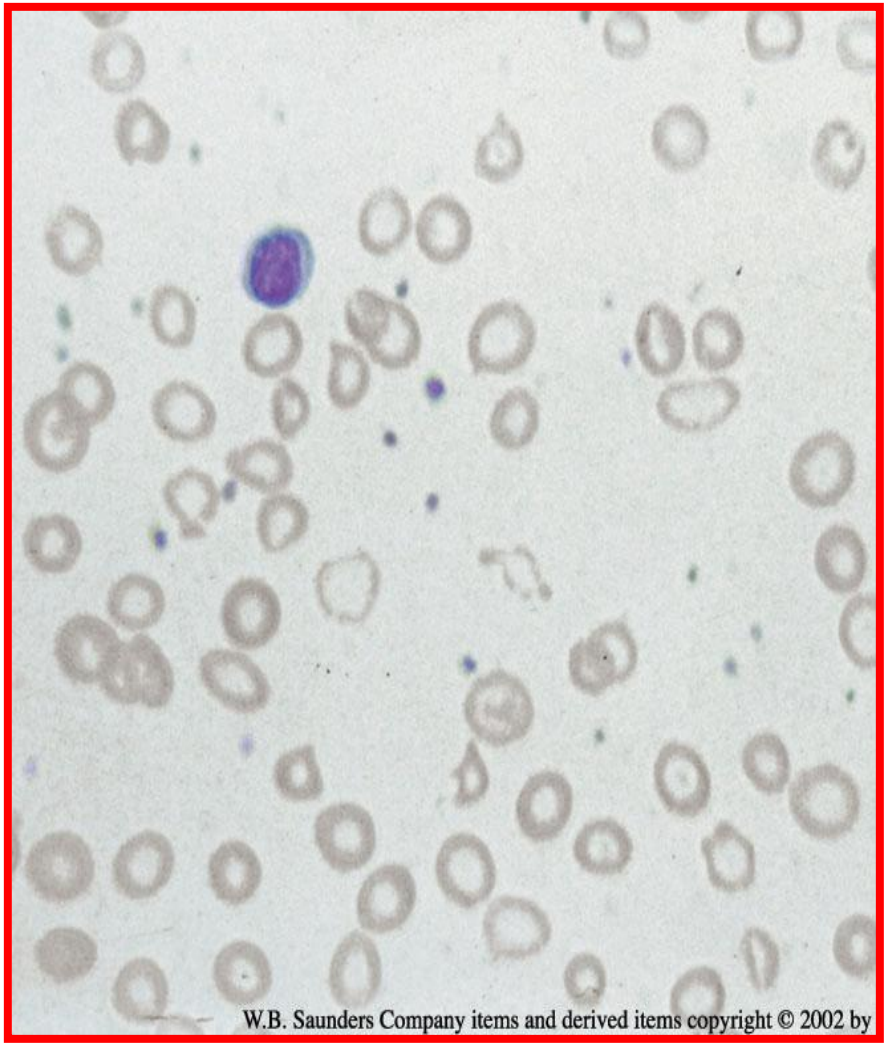
It includes

- Aplastic anemia due to BM failure
- Blood loss anemia
- Hemolytic anemia



Microcytic Anemia

- any RBCs smaller than nucleus of normal lymphocytes
- ncreased central pallor.
- ncludes
  - Iron deficiency anemia
  - Thalassemia
  - Anemia of chronic disease
  - Sideroblastic anemia
  - Lead poisoning



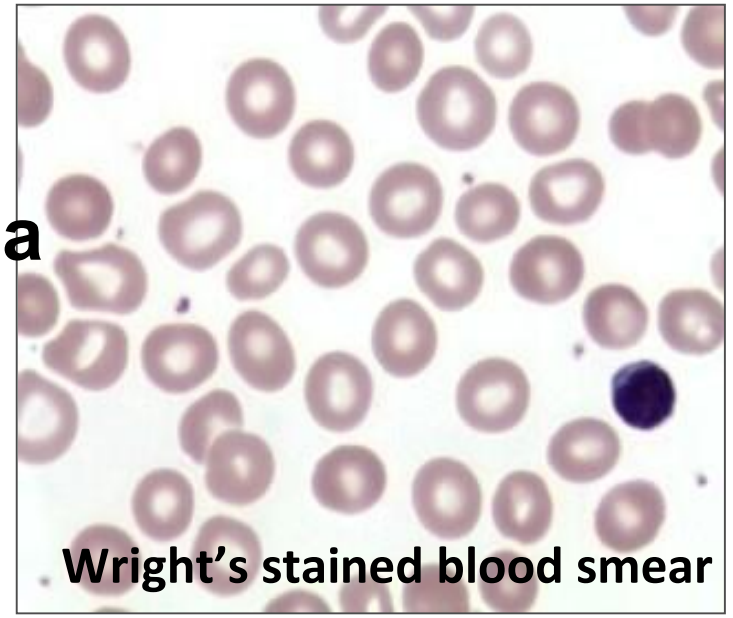
Macrocytic Anemias

A. MEGALOBLASTIC ANEMIA

- Vitamin B12 deficiency
- Folate deficiency
- Abnormal metabolism of folate and vit B12

. Non megaloblastic anemia

- Liver disease
- Alcoholism
- Post splenoctomy
- Neonatal macrocytosis
- Stress erythropoiesis



Wright's stained blood smear

Clinical Features - Symptoms

- Moderate anemia - weakness, fatigue, exhaustion, loss of appetite, indigestion, giddiness, breathlessness
- Severe anemia - palpitations, tachycardia, breathlessness, increased cardiac output, cardiac failure, pulmonary edema

Clinical Features - Signs

- Pallor
- Nail changes
- Cheilosis, Glossitis, Stomatitis
- Edema
- Hyperdynamic circulation (short & soft systolic murmur)
- Fine crepitations

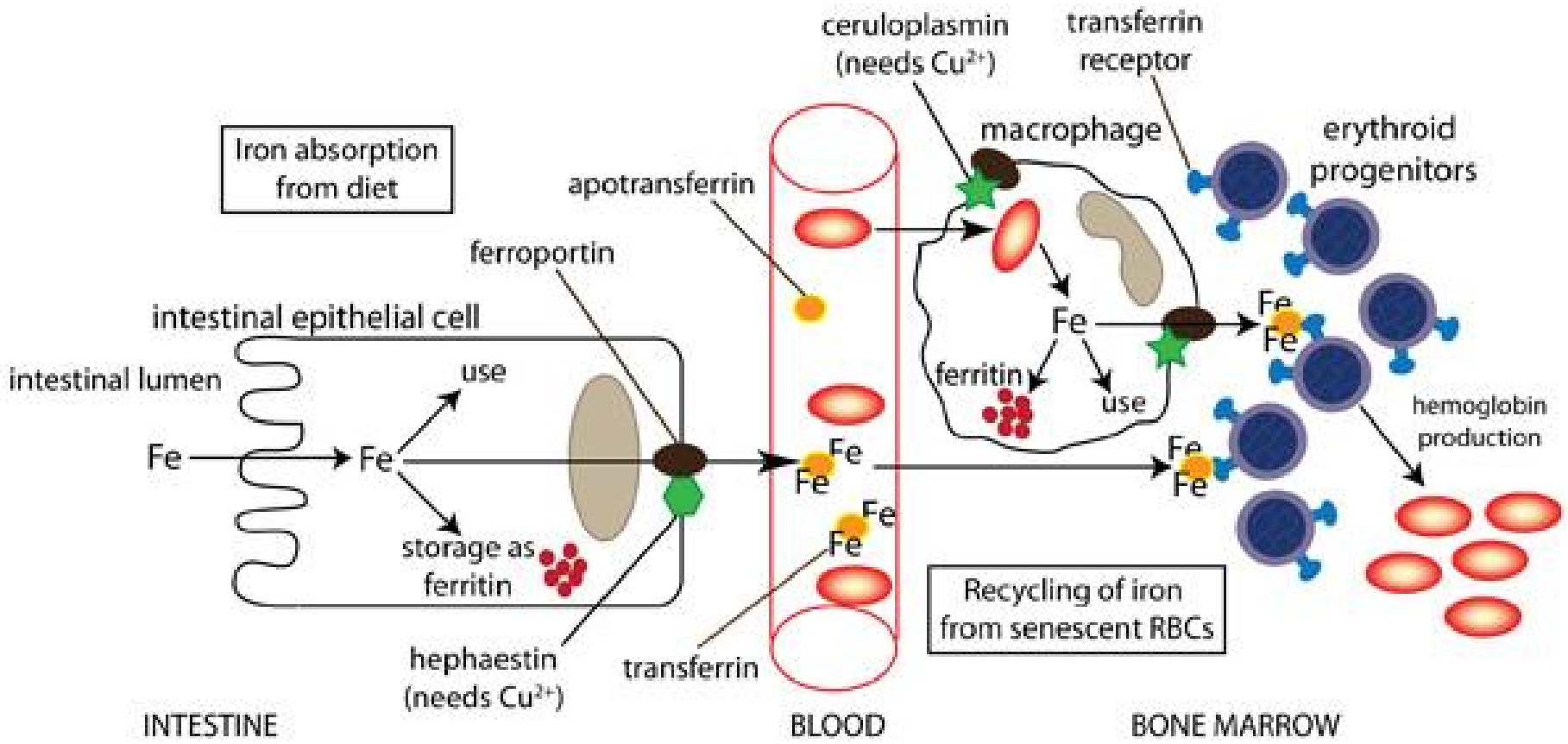
Iron Requirement in Pregnancy

- 2.5mg /day in early pregnancy
- 5.5mg /day from 20 -32 weeks
- 6 – 8 mg/ day after 32 weeks
- Average 4 mg/ day

Iron Absorption

Step 1	Reduction: Fe^{3+} (Du Cyt B/ Ascorbic acid) Fe^{2+}	Intestinal Lumen
Step 2	Absorption : Fe^{2+} (DMT 1) Fe^{2+}	Intestinal Lumen
Step 3	Transportation: Fe^{2+} (Ferroportin + Hephaestin)	Enterocyte
Step 4	Transferrin:	Blood
Step 5		Bone Marrow

Iron Absorption



New Therapeutic Alternatives

- The side effects of older Iron preparations & their poor compliance even on providing free tablets are the most important reasons of failure of anaemia control programmes
- Newer preparations are better tolerated, have less side effects with better compliance
- Carbonyl Iron
- **Ferrous ascorbate**

Merits of New Preparations (Ferrous Ascorbate)

- Outstanding GI Tolerance in contrast to 20% severe side effects with conventional therapy
- Very safe with no poisoning even in high doses
- No interaction with food stuffs
- The newer preparations are delicious with non-metallic taste and don’t stain the patients’ teeth
- Hence the compliance is very high

Indications

In

- Pregnancy
- Lactation
- IDA
- Blood loss during Menstruation

USP's

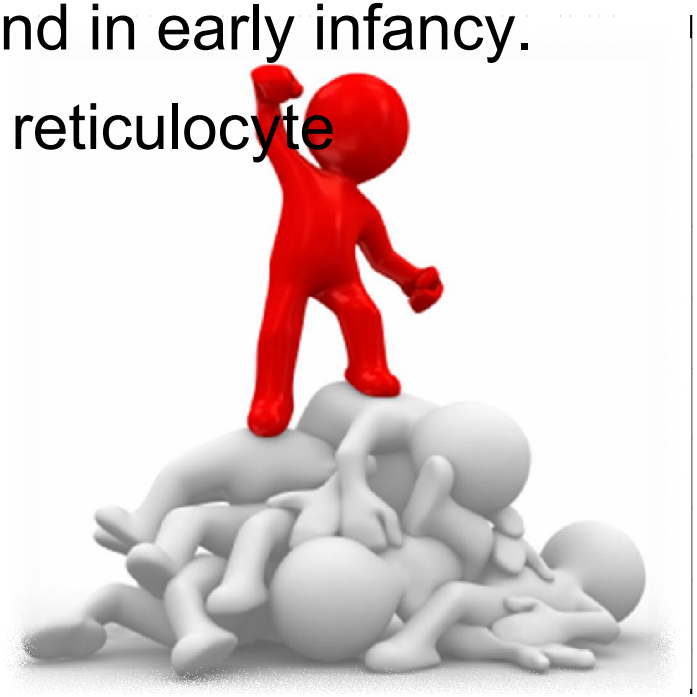
Ferrous Ascorbate:

- High Bioavailability
- Faster Hb rise
- High Absorption : Ascorbate component of Ferrous ascorbate inc. the iron absorption by 6 times.
- Better safety and tolerability compared to conventional salts.
- Lesser GI irritation, hence better compliance.

USP's

Vitamin D3

- Activates erythroid precursors, helps in the initial phase of Erythropoiesis.
- Essential for the prevention of hypovitaminosis D in the fetus and deficiency at birth and in early infancy.
- Increases hemoglobin levels and reticulocyte count in hematological disorders



Vitamin B12 + Folic Acid

- Helps in the production of RBC's