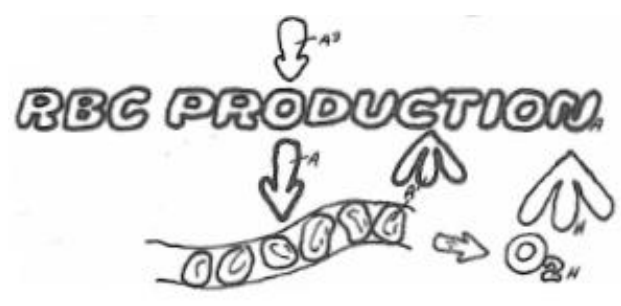
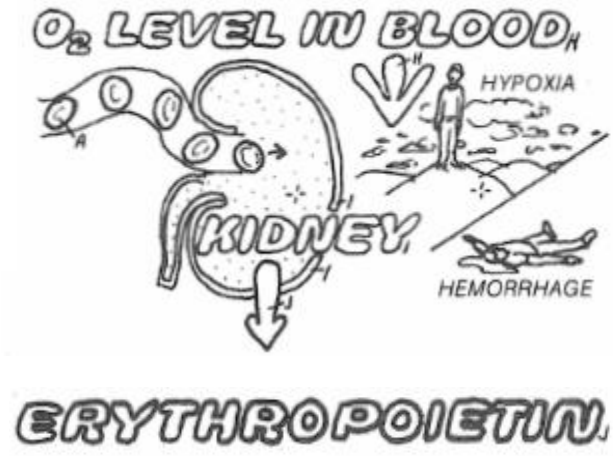


O_2 REGULATION IN THE BLOOD

RBC formation is regulated by the hormone erythropoietin, secreted by the kidney. A reduction in blood O_2 levels (e.g., after a hemorrhage or at high altitude), triggers the release of erythropoietin;

this hormone stimulates the stem cells of bone marrow to proliferate, increasing RBC formation.

An increased number of RBCs enhances O_2 levels.



CAUSES OF ANEMIA



Anemias, ailments or diseases associated with reduced Hb hematocrit levels and RBC numbers, cause many abnormalities due to reduced oxygen supply to tissues. Anemias are caused by different factors and conditions:

A. Hemorrhage, internal bleeding, or more frequently, severe menstruation involving excessive blood loss.



B. Diseases of bone marrow (aplasia) caused by intrinsic abnormalities or by exposure to ionizing radiation or harmful chemicals are important causes of anemias.



C. Dietary deficiencies may also lead to anemias, because iron and vitamin B₁₂ are important for erythropoiesis. Thus, reduced intake of iron or vitamin B₁₂ may result in anemia.

1. VITAMIN B₁₂ V_k

INTRINSIC FACTOR V_i
(PERNICIOUS ANEMIA)



Anemias caused by vitamin B₁₂ deficiencies are called pernicious anemias. Strictly vegetarian diets lack vitamin B₁₂ and may result in pernicious anemias.

2. FOLIC ACID V_m

However, in most cases, pernicious anemias are caused by the absence of the intrinsic factor, a substance secreted by the parietal cells of the stomach glands that is required for the absorption of vitamin B₁₂ by intestinal mucosa.

3. IRON V_n



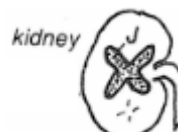
Severe gastritis or a total loss of the stomach eliminates the intrinsic factor. Dietary intake of iron of iron and vitamin B₁₂ must be increased in pregnancy and during childhood development.

D: DESTRUCTION OF RED BLOOD CELLS



D. Other causes of anemias are associated with increased destruction of abnormal red cells, as in sickle cell anemia.

E: LOSS OF ERYTHROPOEITIN



E. Lastly, diseases of the kidney resulting in the reduced level of erythropoietin can also cause anemias.