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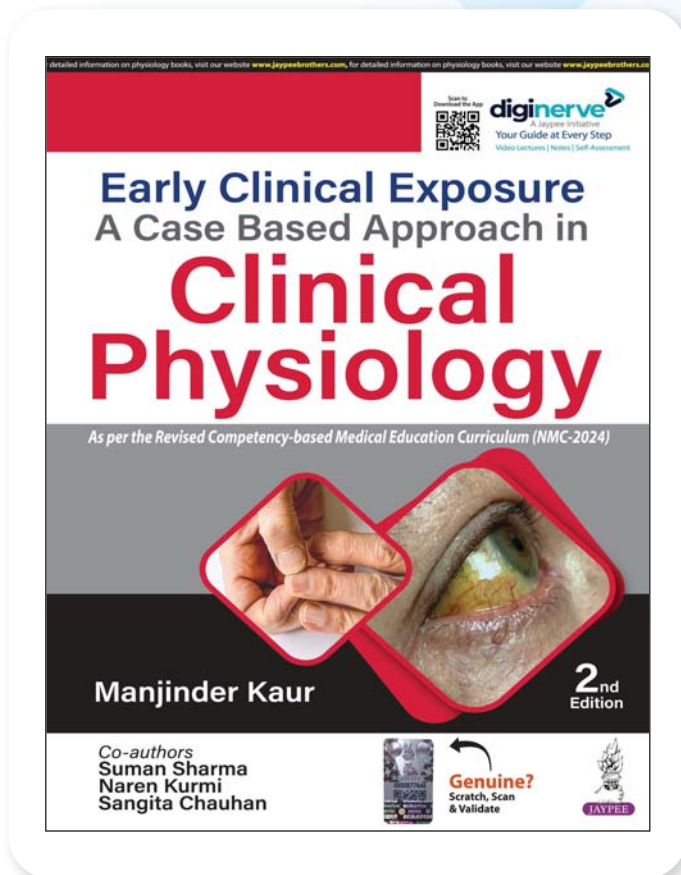
Early Clinical Exposure

A Case Based Approach in

Clinical Physiology

As per the Competency-Based Medical Education Curriculum (NMC)

2nd Edition
Manjinder Kaur



TOC & Sample Chapter



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Why to Buy this Book ?

- Thoroughly updated as per latest CBME curriculum led down by NMC 2024.
- Clinical case-based scenarios in each topic covered with addition of new cases as per syllabus.
- Emphasis has been laid on the physiological basis of diseases and their clinical presentation, with the help of appropriate diagrams and flowcharts.
- Easy-to-follow the content and reproduce in examinations.

SAMPLE PAGES

- PY2.5** Describe anemias and jaundice. Discuss their physiological principles of management.
- PY2.9** Describe hemostasis, coagulation pathways, mechanism of action of anticoagulants and briefly discuss pathophysiological aspects of bleeding and clotting disorders (e.g., hemophilia, purpura).

LEARNING OBJECTIVES

After finishing this module, you should be able to:

- ▶ Analyze the clinical problem on the basis of its signs and symptoms, laboratory findings, to reach a differential diagnosis for that problem.
- ▶ Describe the pathophysiology of the given clinical condition based on the clinical and laboratory findings.
- ▶ Discuss the rationale of management, based on the derangement of physiological parameters in a case scenario.

- **S. Ferritin** 9 nanogram/ml. (Reference value: 12–300 ng/ml)
- **Mean corpuscular volume (MCV)** 79 fL. (Reference value: 80–100 fL)
- **Total iron binding capacity (TIBC)** 500 microgram/dL. (Reference value: 280–450 microgram/dL)
- **Mean corpuscular hemoglobin concentration (MCHC)** 20%. (Reference value: 32–36%)
- **Peripheral blood film (PBF):** RBC are microcytic and hypochromic.

Basic competencies and learning objectives are provided at the beginning of each chapter to give a clear understanding of its content.

Each topic is classified in detail across all aspects and presented in tables for better understanding.

2 Chapter 1 Hematology

Based on the above case, answer the following questions:

1. What do you think this patient is suffering from?
2. How would you grade the anemia of this patient based on clinical classification?
3. What do you understand about microcytic and hypochromic RBCs in this patient?
4. How is the deficient nutrient absorbed and utilized in our body?
5. Define anemia.
6. Classify anemia according to the etiology (causal).
7. Classify anemia according to the morphology of RBCs.
8. Describe the physiological basis of clinical features/symptoms of this disease.

Provisional diagnosis: Iron deficiency anemia (IDA).
Definition: Decreased oxygen carrying capacity of blood with or without decreased

Classification of Anemia

Etiological Classification

Table 1.1: Etiological classification of anemia.

| Main etiology | Increased blood loss | Increased breakdown of RBC | | | Decreased production of RBC | |
|----------------|--|--|--|---|-----------------------------|--|
| Various causes | Acute blood loss | Chronic blood loss | Red cell membrane defects | Enzyme defects | Abnormal hemoglobin | Immune mediated hemolysis |
| Examples | Acute hemorrhage due to road traffic accident, major surgeries, etc. | Hemorrhoids (piles), hookworm infestation, dysfunctional uterine bleeding in women, etc. | Hereditary spherocytosis, ovalocytosis | Glucose-6-phosphate dehydrogenase (G6PD) deficiency | Sickle cell anemia | Incompatible ABO blood transfusion |
| | | | | | | Iron deficiency, folic acid/vitamin B ₁₂ deficiency, protein deficiency |
| | | | | | | Aplastic anemia, etc. |

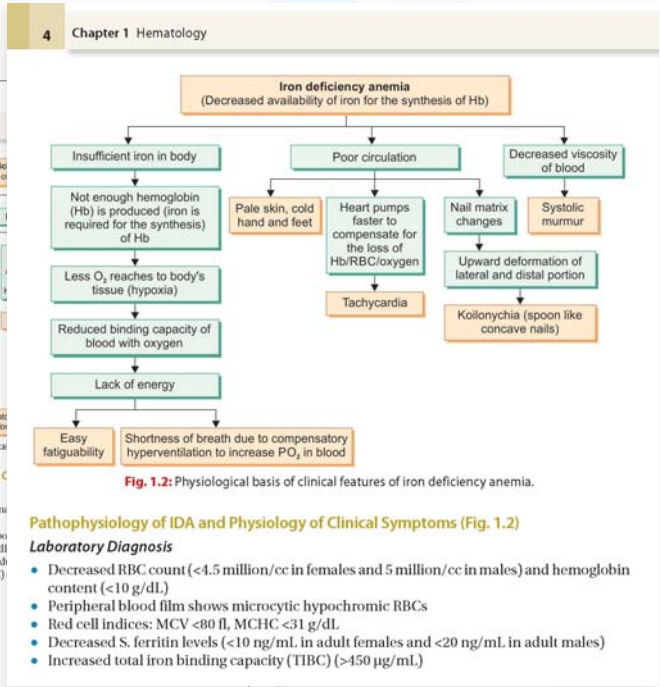
Morphological Classification

Table 1.2: Morphological classification of anemia.

| | Hypochromic (MCHC <31 g/dL) | Normochromic (MCHC = 31–33 g/dL) |
|--|---|---|
| Size of RBC <7 µm (microcytic; MCV <80 fL) | Iron deficiency anemia thalassemia lead poisoning | Chronic infection |
| Size of RBC = 7 µm (normocytic; MCV = 80–100 fL) | Chronic hemorrhage | Acute blood loss hemolytic anemia Aplastic anemia |
| Size of RBC >7 µm (macrocytic; MCV >100 fL) | Liver disease | Vitamin B ₁₂ deficiency Folic acid deficiency |

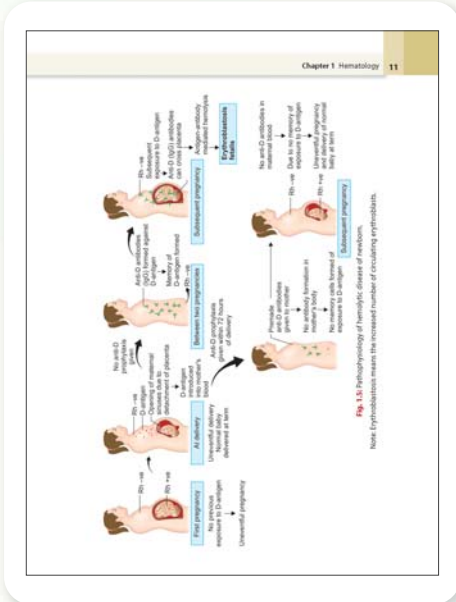
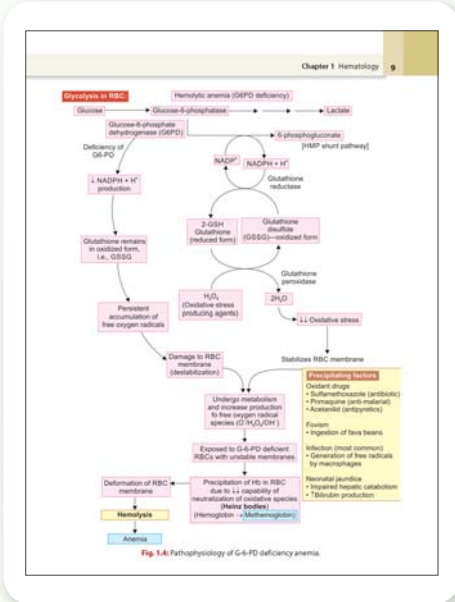
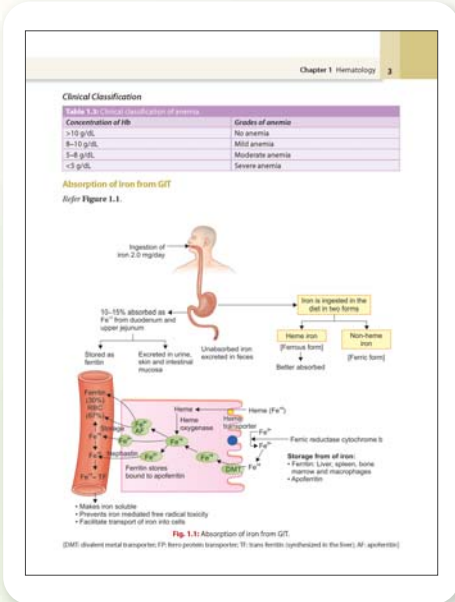
| Increased breakdown of RBC | Decreased production of RBC |
|----------------------------|--|
| Abnormal hemoglobin | Deficiency of nutrients |
| Immune mediated hemolysis | Deficiency of bone marrow disorders |
| Iron deficiency anemia | Iron deficiency, folic acid/vitamin B ₁₂ deficiency, protein deficiency |
| Aplastic anemia, etc. | |

| MCHC <31 g/dL | Normochromic (MCHC = 31–33 g/dL) |
|---------------------------------------|---|
| Iron deficiency anemia thalassemia | Chronic infection |
| | Acute blood loss hemolytic anemia Aplastic anemia Vitamin B ₁₂ deficiency Folic acid deficiency |

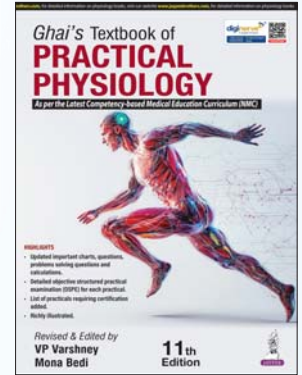
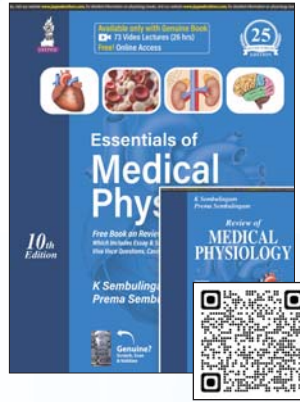
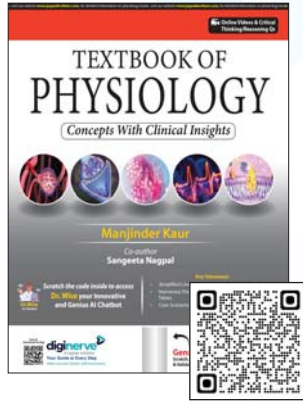
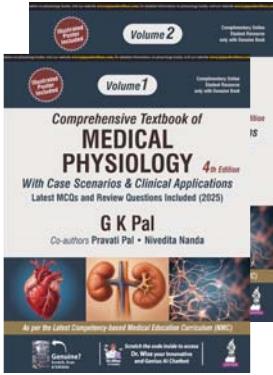


Flowcharts are used to simplify complex information and improve conceptual clarity.

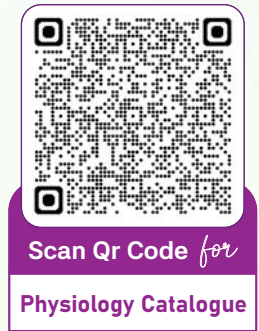
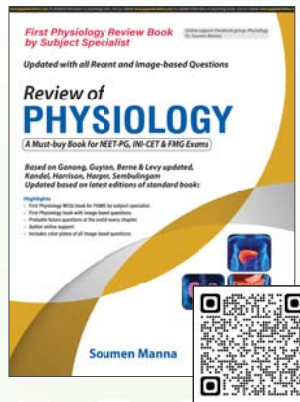
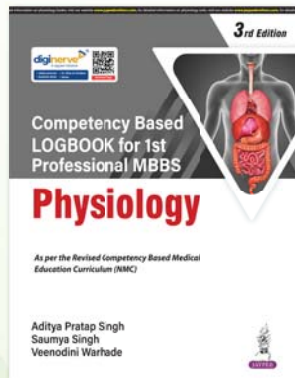
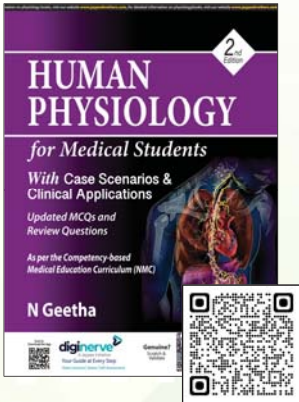
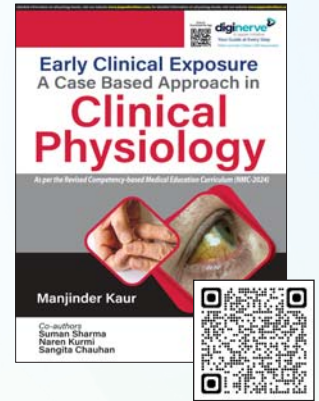
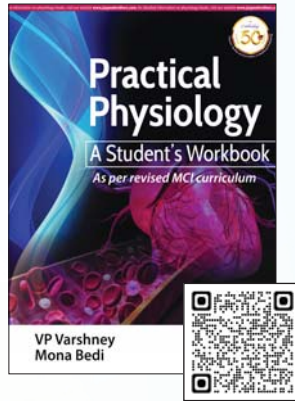
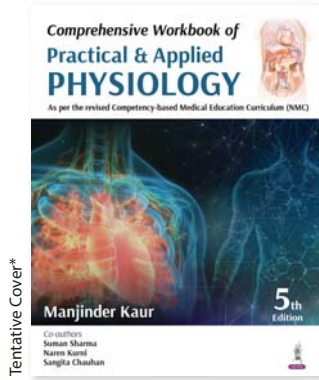
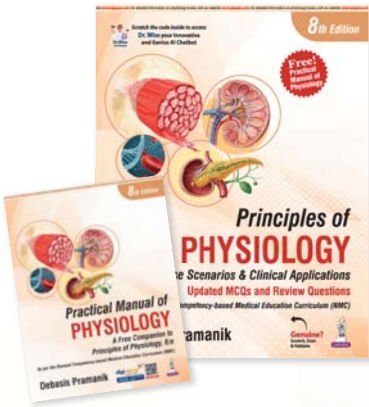
Detailed diagrams and flowcharts highlight the physiological basis and clinical features of diseases for easier comprehension.



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