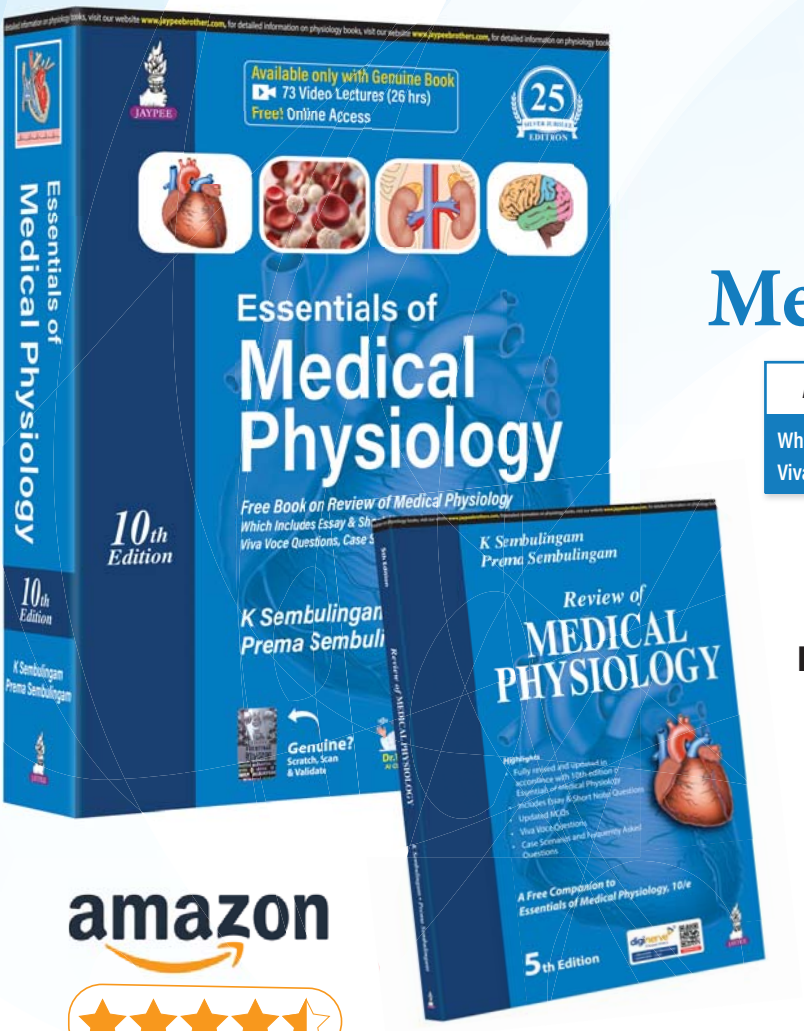

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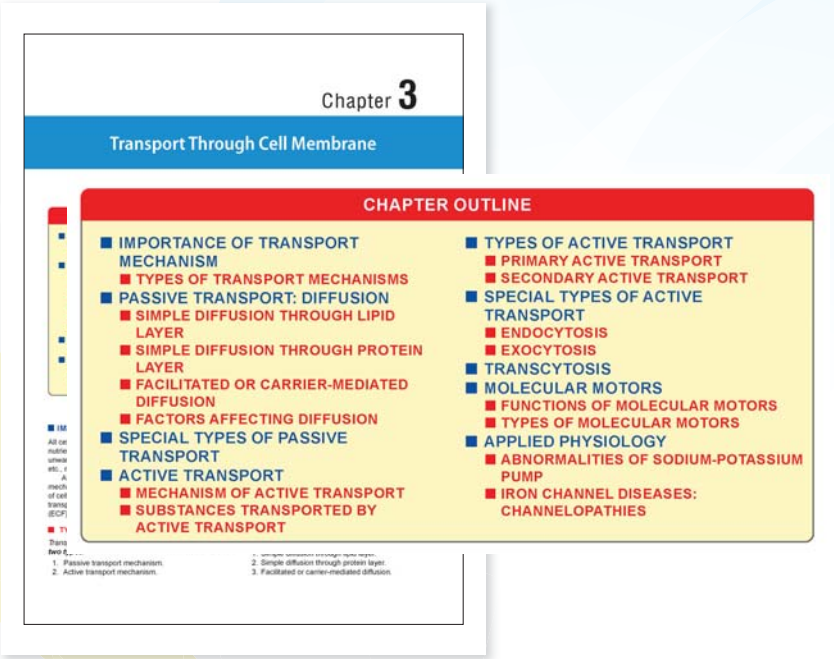


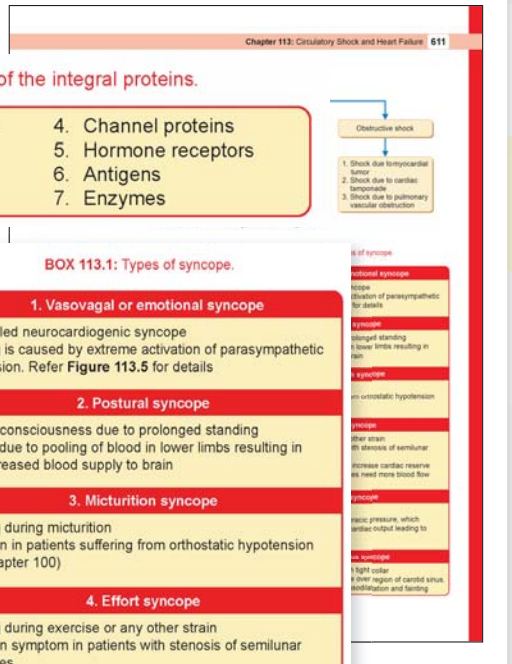
Chapter 3

Transport Through Cell Membrane

CHAPTER OUTLINE

- IMPORTANCE OF TRANSPORT MECHANISM
  - TYPES OF TRANSPORT MECHANISMS
- PASSIVE TRANSPORT: DIFFUSION
  - SIMPLE DIFFUSION THROUGH LIPID LAYER
  - SIMPLE DIFFUSION THROUGH PROTEIN LAYER
  - FACILITATED OR CARRIER-MEDIATED DIFFUSION
  - FACTORS AFFECTING DIFFUSION
- SPECIAL TYPES OF PASSIVE TRANSPORT
- ACTIVE TRANSPORT
  - MECHANISM OF ACTIVE TRANSPORT
  - SUBSTANCES TRANSPORTED BY ACTIVE TRANSPORT
- TYPES OF ACTIVE TRANSPORT
  - PRIMARY ACTIVE TRANSPORT
  - SECONDARY ACTIVE TRANSPORT
- SPECIAL TYPES OF ACTIVE TRANSPORT
  - ENDOCYTOSIS
  - EXOCYTOSIS
- TRANSCYTOSIS
- MOLECULAR MOTORS
  - FUNCTIONS OF MOLECULAR MOTORS
  - TYPES OF MOLECULAR MOTORS
- APPLIED PHYSIOLOGY
  - ABNORMALITIES OF SODIUM-POTASSIUM PUMP
  - IRON CHANNEL DISEASES: CHANNELOPATHIES

Chapter outlines are given at the beginning of each chapter.



Chapter 113: Circulatory Shock and Heart Failure 611

BOX 1.3: Some of the integral proteins.

1. Cell adhesion proteins
2. Cell junction proteins
3. Carrier (transport) proteins
4. Channel proteins
5. Hormone receptors
6. Antigens
7. Enzymes

BOX 113.1: Types of syncope.

1. Vasovagal or emotional syncope

Also called neurocardiogenic syncope
Fainting is caused by extreme activation of parasympathetic division. Refer **Figure 113.5** for details

2. Postural syncope

Loss of consciousness due to prolonged standing
Occurs due to pooling of blood in lower limbs resulting in decreased blood supply to brain

3. Micturition syncope

Fainting during micturition
Common in patients suffering from orthostatic hypotension (Chapter 100)

4. Effort syncope

Fainting during exercise or any other strain
Common symptom in patients with stenosis of semilunar valves
Occurs due to failure of heart to increase cardiac reserve (Chapter 95), when the tissues need more blood flow

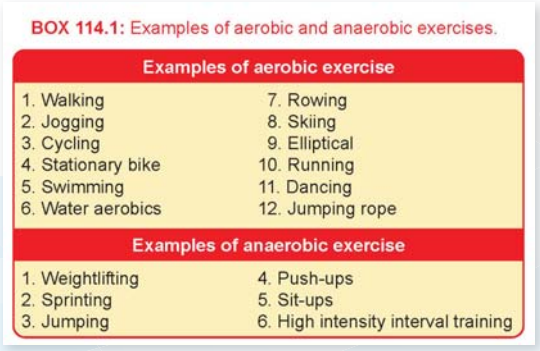
5. Cough syncope

Fainting while coughing
Severe cough increases intrathoracic pressure, which reduces venous return and cardiac output leading to fainting

6. Carotid sinus syncope

Fainting while wearing dress with tight collar
Tight collar dress exerts pressure over region of carotid sinus. This leads to bradycardia, vasodilatation and fainting

Complex physiology topics are featured in red boxes.



BOX 114.1: Examples of aerobic and anaerobic exercises.

Examples of aerobic exercise	
1. Walking	7. Rowing
2. Jogging	8. Skiing
3. Cycling	9. Elliptical
4. Stationary bike	10. Running
5. Swimming	11. Dancing
6. Water aerobics	12. Jumping rope

Examples of anaerobic exercise	
1. Weightlifting	4. Push-ups
2. Sprinting	5. Sit-ups
3. Jumping	6. High intensity interval training

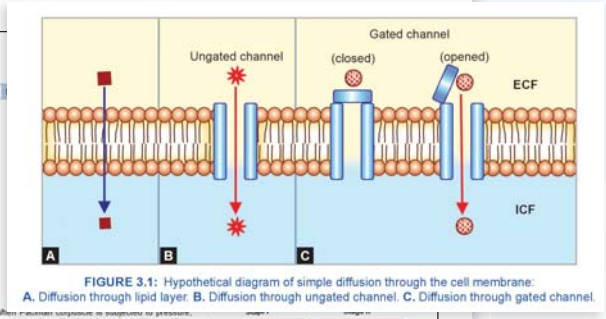


FIGURE 3.1: Hypothetical diagram of simple diffusion through the cell membrane: **A.** Diffusion through lipid layer. **B.** Diffusion through ungated channel. **C.** Diffusion through gated channel.

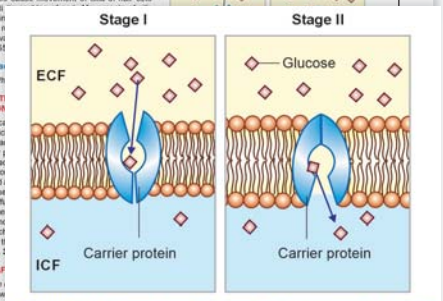


FIGURE 3.2: Hypothetical diagram of facilitated diffusion from higher concentration [extracellular fluid (ECF)] to lower concentration [intracellular fluid (ICF)].

Stage I: Glucose binds with carrier protein. Stage II: Conformational change occurs in the carrier protein and glucose is released into ICF.

600+ Figures & Discriptive Color Diagrams are included to enhance visual learning.

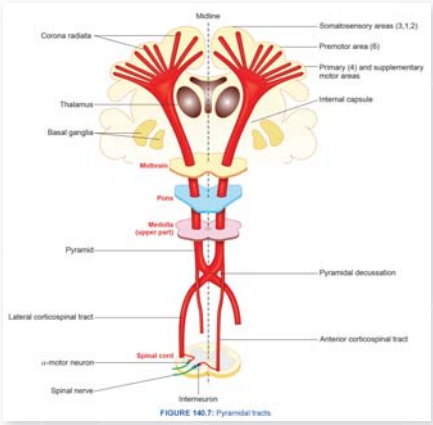


FIGURE 140.7: Pyramidal tracts

Flow Charts are provided to Break Down Broad Concepts.

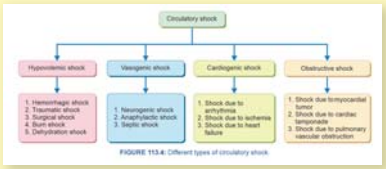


FIGURE 113.4: Different types of circulatory shock

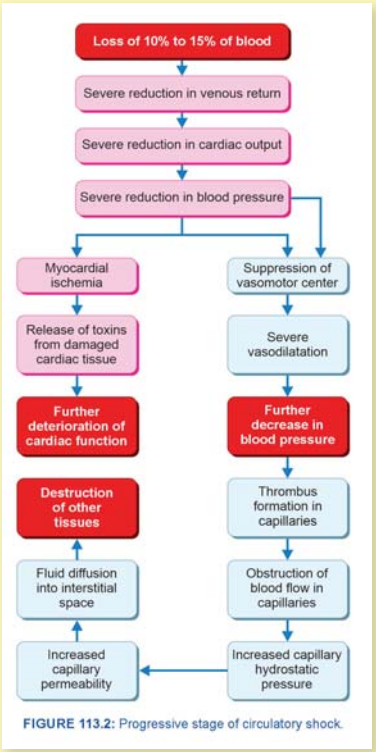


FIGURE 113.2: Progressive stage of circulatory shock.

TABLE 14.7: Actions of substances secreted by basophils.

Substance secreted	Actions
1. Heparin	Prevention of intravascular blood clotting
2. Histamine	Production of acute hypersensitivity reactions by causing vascular and tissue responses
3. Bradykinin	
4. Serotonin	
5. Proteases	Destruction of microorganisms
6. Myeloperoxidases	
7. Cytokine: Interleukin-4	Destruction of invading organisms by accelerating inflammatory response

TABLE 14.8: Substances secreted by monocytes and their actions.

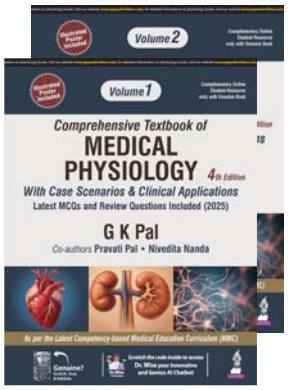
Substance secreted	Actions
1. Interleukin-1	Acceleration of inflammatory response Destruction of invading organisms
2. Macrophage colony-stimulating factor	Formation of macrophage
3. Platelet-activating factor	Aggregation of plateletes
4. Chemokines	Chemotaxis

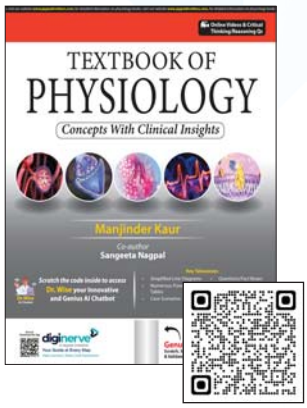
TABLE 14.9: Substances secreted by T lymphocytes and their actions.

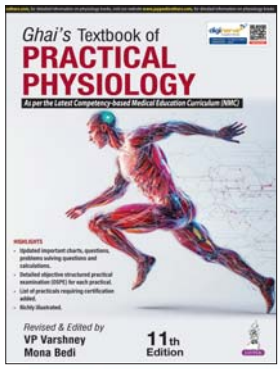
Substance secreted	Actions
1. Interleukins-2, 4, 5, 6 and 10	Acceleration of inflammatory response Destruction of invading organisms Activation of T cells and B cells
2. Gamma interferon	Stimulation of phagocytic actions of cytotoxic cells, macrophages and natural killer cells
3. Lysosomal enzymes	Destruction of invading organisms
4. Tumor necrosis factor	Necrosis of tumor Activation of immune system Promotion of inflammation
5. Chemokines	Chemotaxis

Key information is highlighted using Tables.

Other Useful Titles







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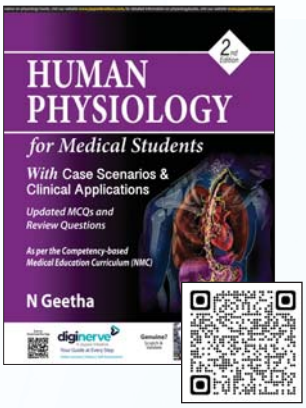

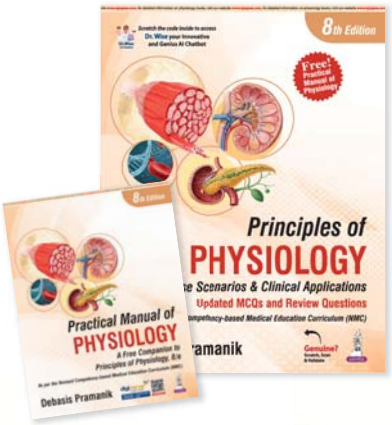

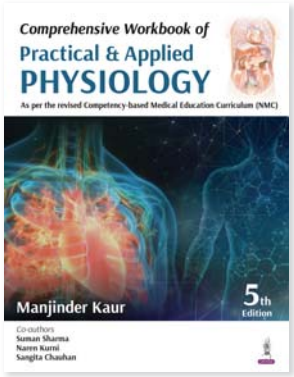

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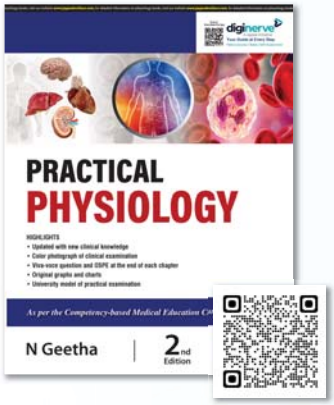

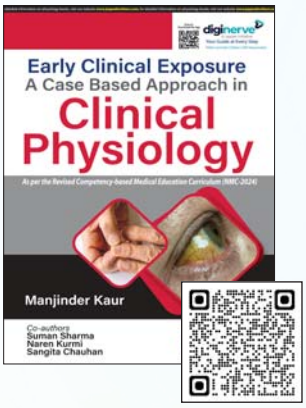

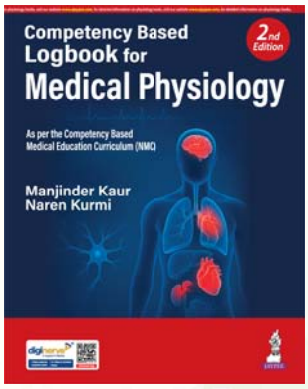

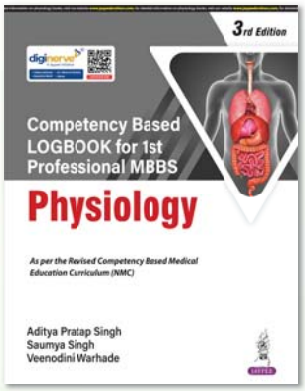

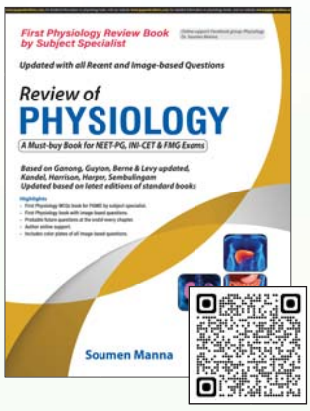

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