PHYSIOLOGICAL BASIS OF ACUTE CARE

Edited by
Yoo Kuen Chan
Kwee Peng Ng

Medical illustrations by
Frank H. Netter

SAUNDERS
ELSEVIER
INTRODUCTION

Oxygen and energy sources are brought to the tissues in the flow of blood. The delivery of the oxygen and energy depends on the ability of the cardiovascular system to match the needs of the tissues. The vehicle through which these essential life-sustaining molecules are transported and moved is fluid, basically water. The energy substrates and oxygen not only traverse in the flow of blood but also move from one fluid compartment to another to reach their final destination within the cells. The journey of these molecules involves different transport processes, some requiring energy while others do not.

DISTRIBUTION OF THE FLUID COMPARTMENTS

The total body water (TBW) in an adult 70 kg man is about 42 L. This constitutes 60% of the total body weight. The water is distributed into two main compartments in the body (Figure 13.1, overleaf):

- Intracellular fluid (ICF) compartment: 2/3 of the 42 L TBW (28 L).
- Extracellular fluid (ECF) compartment: 1/3 of the 42 L TBW (14 L).

The ECF can be further subdivided into:

- Interstitial fluid compartment, water in dense connective tissue and water of bone and transcellular fluid compartment (ISF): 75% of ECF.
- Intravascular fluid compartment (Plasma): 25% of ECF.

The transcellular fluid compartment consists of a collection of fluids, formed during the process of the transport activities in cells and is found mainly in epithelial lined spaces. They are important because of the special roles they play in the body. Examples of transcellular fluids are cerebrospinal fluid, joint fluid, fluid in the bowel, fluid in body cavities, aqueous humour, bile in the gall bladder and urine in the bladder.
Physiological Basis of Acute Care is a short, easy-to-read-book that features:

- Chapters that link the management of life such as Basis of Life and Physiology of Death for frontline providers.
- Chapters covering important organ systems from airway to kidney, including energy, heat and acid-base balance.
- Special chapters on maternal-foetal, paediatrics, elderly and obesity.
- Clinical implication and application sections within each chapter for students to relate to clinical practice.
- Medical illustrations by Frank Netter, the foremost master of medical illustration.
- 58 fully coloured illustrations, diagrams and charts to enhance learning and understanding.

Also features:

- Content reviewed by international and Malaysian academicians.
- Foreword by Dr Angela Enright, President, World Federation of Societies of Anaesthesiologists (WFSA), United Kingdom.

---

This book achieves its objectives of presenting simple, basic physiology in an uncomplicated manner.”
— Michael FM James, Professor and Head, Department of Anaesthesia, University of Cape Town, South Africa

“This book is simple and enjoyable to read, and presents the subject in a systematic fashion.”
— Thiam Aun Lim, Professor, Anaesthesiology Unit, Universiti Putra Malaysia, Malaysia

SAUNDERS
ELSEVIER
www.asia.elsevierhealth.com