PHYSIOLOGICAL BASIS OF ACUTE CARE

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What Is Physiology?

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INTRODUCTION

Physiology is the study of life. Physiology focuses on how cells, tissues and organs work interdependently to enable the organism to live, grow and reproduce.

SUSTAINING LIFE

The basic life-maintaining physiological processes aim to maintain every cell in the body in a milieu in which the cell can function and stay alive. This milieu surrounding the cells is the interstitial fluid that must be traversed by all substances exchanged between the blood and cell.

Needs of a single-celled organism are met by simple transfer mechanisms e.g. diffusion from the external environment into and out of the cell. The unicellular organism is free to move in search of an environment rich in nutrients and oxygen, and remove itself from less desirable conditions. This obviously is not possible in more complex organisms, so physiological processes evolved with the ultimate function of maintaining a 'healthy interstitial fluid compartment'.

In the human body, oxygen is extracted from the environment via the airway into the lungs and nutrients from the gastrointestinal tract, and these are ultimately delivered to cells via an intact circulatory system. Metabolic waste products are removed from the interstitial fluid by the lymphatic and circulatory systems and excreted from the body through the skin, lungs and kidneys. The milieu surrounding the cells is meticulously maintained through various mechanisms and processes, the complexity of which increases with the complexity of the organism.

LIFE-SUSTAINING NEEDS

All organisms have simple needs to survive. Oxygen and glucose (and other energy substrates, such as fats and proteins) are needed for producing energy (Figure 1.1, overleaf), proteins for structural needs and various minerals and elements for special functional needs.