

Introduction

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“A man cannot become a competent surgeon without the full knowledge of human anatomy and physiology, and the physician without physiology and chemistry flounders along in an aimless fashion, never able to gain any accurate conception of disease, practicing a sort of popgun pharmacy, hitting now the malady and again the patient, he himself not knowing which.”

Sir William Osler (1849–1919)

Osler expresses particularly well the relation between the basic sciences and clinical medicine in the aphorism cited above. Indeed, ever since the Middle Ages, wise physicians and others concerned with the sick and their care have realized that most human disease may be understood in a real sense as disordered physiology (pathophysiology). Something (eg, a mutation in a gene or invasion by a bacterial organism) triggers an illness, and the body reacts with molecular, cellular, and systemic responses that are the symptoms and signs of the disease. Therefore, with proper knowledge of the body’s normal structure and function, and the ways in which these can become disordered, comes the ability to understand disease and to design rational and effective treatment. In addition, of course, the relation between pathophysiology and disease is a two-way street. Diseases may be viewed as “experiments of nature” that may uncover previously unknown or unappreciated physiologic mechanisms, and the investigation of these physiologic mechanisms in normal individuals advances our fundamental biomedical knowledge. Therefore, it is important that students understand normal structure and function, and

how they can become disordered, and apply this knowledge to disease.

The aim of this book is to provide students with an introduction to clinical medicine through the study of diseases as manifestations of pathophysiology. The authors (all experts in their respective fields) have provided a brief review of the relevant normal structure and function of each system in the body, followed by a description of the underlying pathophysiologic mechanisms that underlie several common diseases related to that system. With this approach comes an explication of the symptoms and signs of each disease state and an essential framework for the student’s later mastery of treatment strategies. Several subject areas that are not restricted to a single body system are also covered (eg, neoplasia and infectious disease), but the same approach is used in these instances as well. For the most part, diagnosis and treatment are not covered here but are left for later, more detailed study and textbooks such as the annually updated *Current Medical Diagnosis & Treatment*. No attempt is made here to be comprehensive or complete; the pathophysiology section of each chapter discusses one to five relevant clinical entities, based either on their frequency (eg, coronary artery disease and hypertension) or on their importance to understanding how physiologic systems may become disordered (eg, fragile X mental retardation or pheochromocytoma). The aim is to introduce students to diseases as manifestations of disordered function and to start them thinking about the related symptoms and signs in terms of their pathophysiologic basis.