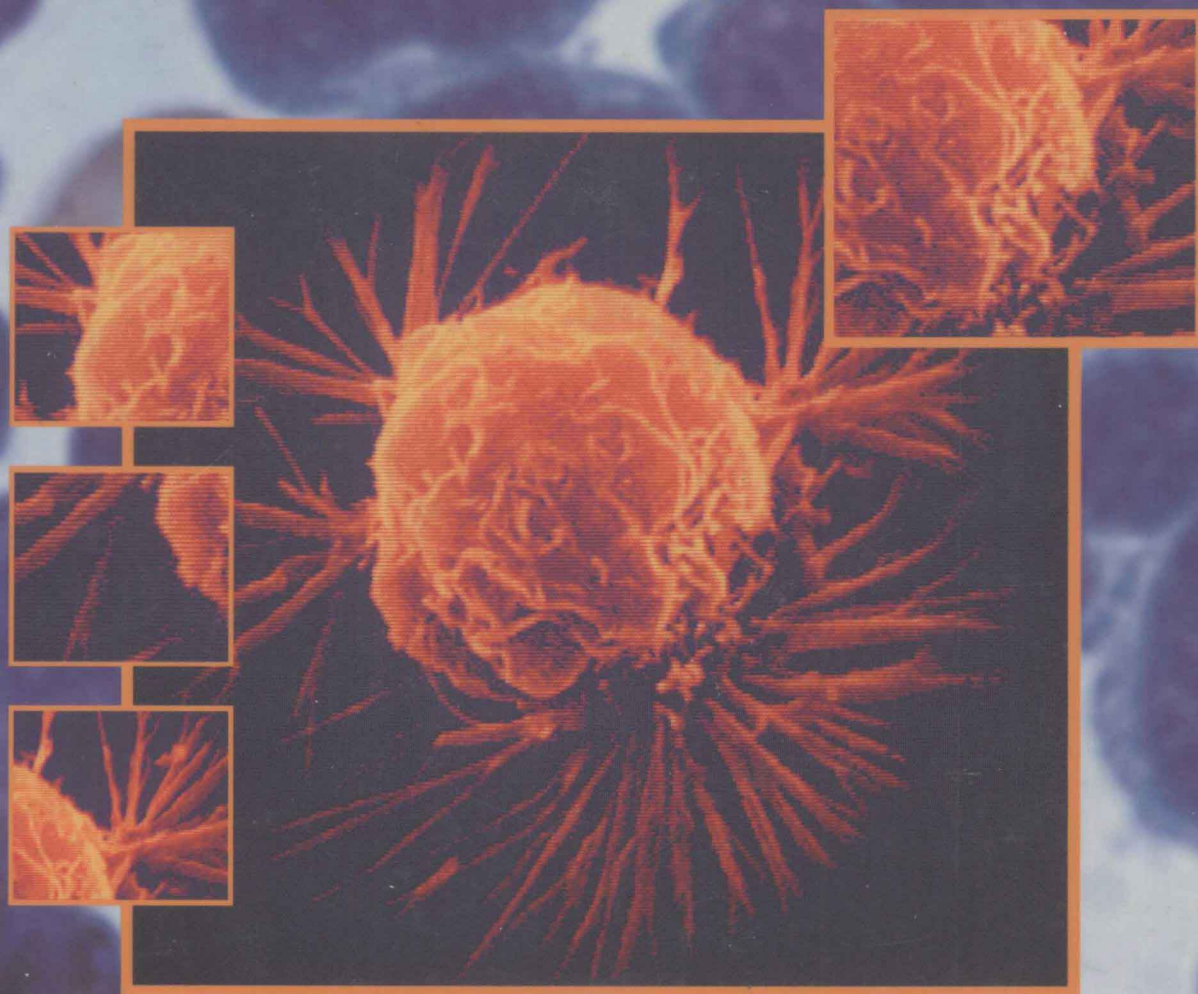


An Introduction to

# Human Disease

Pathology and Pathophysiology Correlations

Fifth Edition



Leonard V. Crowley





# An Introduction to Human Disease: Pathology and Pathophysiology Correlations

Fifth Edition

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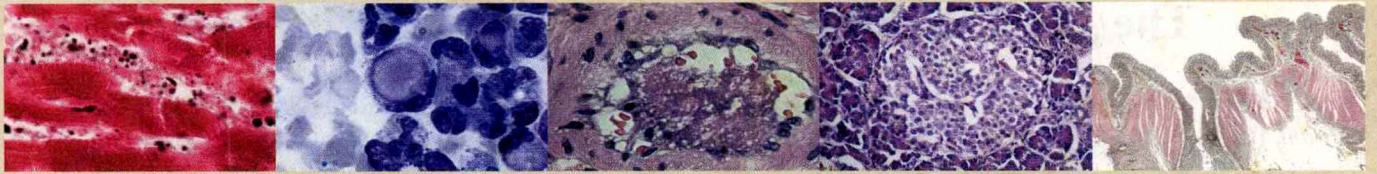
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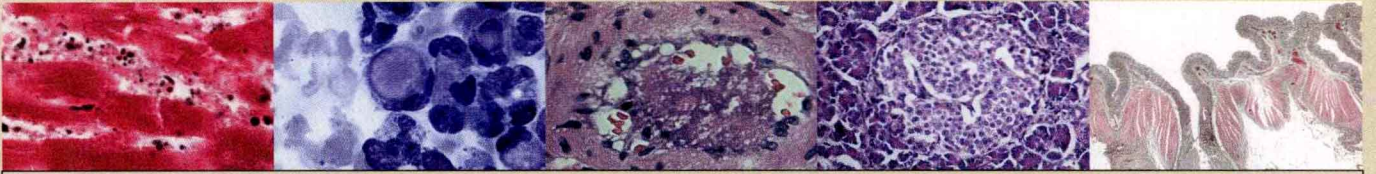
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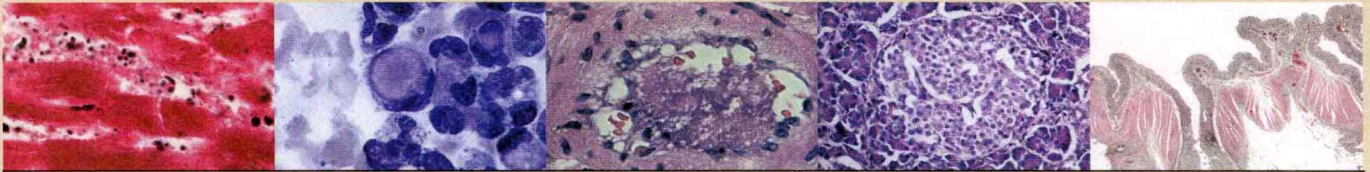




# Dedication

*To my wife,  
who was helpful and very understanding.*





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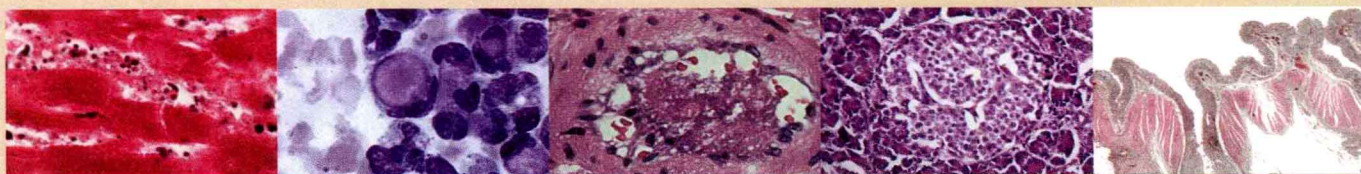
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# Preface

Many advances and new developments in medicine have occurred since the last edition of this book. I have attempted to distill the essential features from this wealth of new information, and have added some additional topics of current interest along with several new case studies. Several new figures have been added or updated, and I have expanded the annotated list of references at the end of each chapter. Almost all of the figures are in color, which provided a more realistic view of the various structures depicted in the illustrations. The organization of the book, as well as the study aids and other special features have been received favorably in previous editions, and have not been changed. These features are described in the Preface to the First Edition.

In the early chapters, there is a new section on the applications and limitations of screening for disease in asymptomatic subjects, material on mitochondrial inheritance, gene imprinting, and programmed cell death (apoptosis). The section on HIV infection and AIDS has been completely rewritten to reflect the changing concepts on management of infected persons. The role of herpesvirus 8 in the pathogenesis of Kaposi sarcoma is discussed. The section on tumors has been updated and expanded.

Much new material has been added to the section on cardiovascular disease. New and expanded topics include additional material on aortic stenosis, which is becoming one of the major valvular abnormalities as our population ages, and a new case study has been added dealing with this subject. Material on mitral valve prolapse has also been expanded, reflecting the importance of this condition. Other topics include updated material on enzyme tests used to aid in the diagnosis of a myocardial infarction, and material on valve disease related to the diet pill combination of fenfluramine and phenteramine (fen-phen). Material has been added on the use of aspirin to prevent myocardial infarcts and strokes, the role of homocysteine and *Chlamydia pneumoniae* infection as risk factors for cardiovascular disease, and the use of ACE inhibitors to treat patients in congestive cardiac failure.

The section on the hematopoietic system includes new material on iron metabolism and the major diagnostic tests to evaluate both iron deficiency and iron excess. The relatively common genetic disease hemochromatosis is discussed and illustrated with a case study.

Topics considered in other chapters include lung reduction surgery for emphysema, updated material on respiratory distress syndrome, BRCA1 and BRCA2 genes and breast carcinoma, and current concepts on the adverse effects of long-term use



of estrogen or estrogen-progestin combinations by postmenopausal women. The section on gestational trophoblast disease has been expanded and illustrative cases have been added. The material on hepatitis has been updated, including much new information about hepatitis C and its long term problems. Material on biliary cirrhosis has been added. More material has been added on diabetes, including use of glycosylated hemoglobin measurements as an index of diabetes control, the possible role of glycosylation of body proteins in the pathogenesis of late complication of diabetes, and the value of "tight control" of blood glucose to forestall late complication. Maturity onset diabetes of the young (MODY) is also considered.

In the chapter on the gastrointestinal tract, a unit on antibiotic-related colitis has been added. The endocrine section includes new material on aldosterone secreting adrenal cortical tumors. Mad cow disease is discussed in the nervous system chapter, and a section on scoliosis has been added to the chapter on the musculoskeletal system.

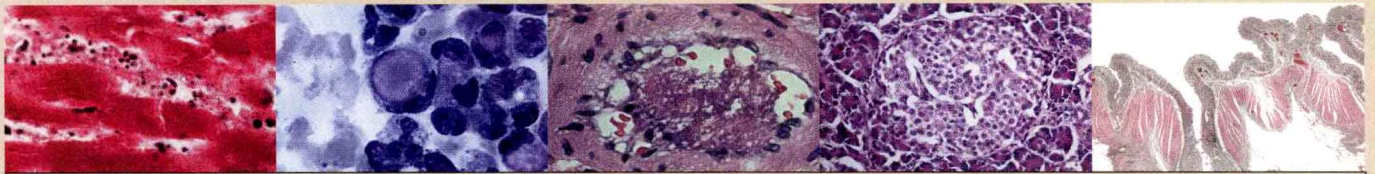
Although the book has undergone considerable updating and rewriting, I have attempted to retain the same basic format and orientation of the earlier editions, emphasizing the major structural and functional changes of disease and the basic principles of treatment. Normal structure and function are interrelated, and so also are the structural derangements associated with disease (pathology) and the accompanying disturbances in organ function (pathophysiology). Moreover, if one has a clear concept of the structural derangements associated with disease, one also has a better grasp of the relevant pathophysiology, and can usually also deduce the clinical manifestations of various diseases and can also understand how treatment can influence the course of a disease.

Several colleagues have made helpful suggestions. In particular, I would like to thank Dr. Robert Naviaux who reviewed the material on gene therapy, mitochondrial inheritance, and gene imprinting.

I would also like to thank the many persons teaching human disease courses who provided the publisher and me with helpful suggestions and editorial comments that helped to improve this edition. Special thanks also go to Ms. Suzanne Jeans and Ms. Rebecca Marks at Jones and Bartlett Publishers for their enthusiasm, help, and encouragement during the preparation of this edition.

Leonard V. Crowley





# Preface to the First Edition

## Purpose and Scope of the Book

This book is based on courses given for many years to students in nursing and other health professions. It is designed to provide a solid foundation on which students can build for the remainder of their professional careers. A fundamental knowledge of disease requires a clear conception of both the structural and the functional changes caused by disease in tissues and organs, as a basis for understanding the clinical manifestations and principles of treatment. Consequently, to facilitate learning, many illustrations of the salient features of the more important diseases have been included. Photographs of x-ray films, angiograms, and CT scans also are used where appropriate, because such studies are widely used by health professionals to diagnose disease and evaluate response to therapy. A number of brief case studies have been included so that students can more easily relate the clinical manifestations, diagnosis, and treatment of a specific disease to an individual patient.

## Organization

The book is organized into two main sections. The first section, comprising the first twelve chapters, deals with general concepts and with diseases affecting the body as a whole. The second section, which includes the remaining fifteen chapters, considers the various organ systems and their diseases.

In the first section, chapter 1 discusses manifestations of disease, classification, diagnosis, and principles of treatment. Chapter 2 considers the organization and basic function of cells and tissues in health and disease. Chapter 3 deals with genes, chromosomes, cell division, and chromosome analysis, as well as the HLA system and its relation to disease. Chapters 4 and 5 consider the body's defenses, the inflammatory reaction and the immune system, and their disorders. Chapters 6 and 7 are concerned with the various pathogenic microorganisms and parasites and the diseases they cause. This material is followed by a discussion of the transmission and control of communicable diseases in Chapter 8 and includes discussion of the clinically important sexually transmitted diseases. Chapter 9 considers congenital and hereditary diseases, and Chapter 10 deals with tumors. Chapter 11 describes the coagulation of the blood and conditions in which the blood does not clot normally.



Chapter 12 considers conditions in which the blood clots too readily and its attendant complications—thrombosis and embolism.

In the second section, the individual organ systems and their diseases are considered in a systematic manner, with emphasis on the more common and important diseases. Basic pathologic physiology, pathology, and principles of diagnosis and treatment are discussed. Newer diagnostic procedures and methods of treatment are emphasized. Chapter 13 describes diseases of the cardiovascular system and includes an extensive discussion of coronary heart disease, one of the most prevalent diseases in the developed nations of the world. Diseases of the hematopoietic and lymphatic systems are considered together in Chapter 14, followed by diseases of the respiratory system in Chapter 15. Chapters 16, 17, and 18 should be considered as a unit: diseases of the breast, the female reproductive system, prenatal development, and diseases associated with pregnancy. Chapter 19, diseases of the urinary system, and Chapter 20, which is concerned with the male reproductive system, are also best considered as a unit. Chapter 21 describes derangements of the liver and biliary system. This is followed in Chapter 22 by diseases of the pancreas, including diabetes mellitus. The upper and lower intestinal tracts and their diseases follow in Chapter 23. Chapter 24 departs from the organ system approach and considers disturbances of fluid, electrolyte, and acid-base balance. The material is introduced here rather than in the first section because it is more easily understood and related to specific organ system diseases when considered after Chapters 19 through 23. The final three chapters deal, respectively, with diseases of the endocrine glands, nervous system, and musculoskeletal system.

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## Study Aids and Special Features

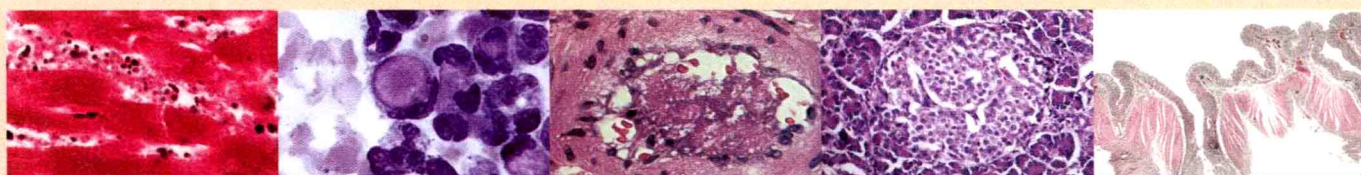
Various learning and study aids are included to enhance the usefulness of the book. Learning objectives, review questions, and a detailed outline summary are provided for each chapter. Literature for further study is listed at the end of each chapter, and a listing of general references is included at the end of the book. These additional sources should prove useful to students who wish to pursue a subject in greater detail. A glossary with pronunciation guide is appended to the end of the text. This may prove useful to students who have not already had a course in medical terminology and can serve as a convenient reference for other students who wish a quick review of a particular term. Words appearing in the glossary are set in boldface type in the text for easy reference.

---

## Acknowledgments

Many people helped with the book in various ways, and I would like to acknowledge their assistance. Several colleagues at St. Mary's Hospital in Minneapolis and in the Department of Laboratory Medicine and Pathology at the University of Minnesota made suggestions and comments. Colleagues in the Department of Family Practice and Community Health at the University of Minnesota, at St. Paul–Ramsey Medical Center, and at the West Side Community Health Center in St. Paul also provided helpful comments. Several of the concepts and clinical cases used in the book were based on these clinical contacts and activities.

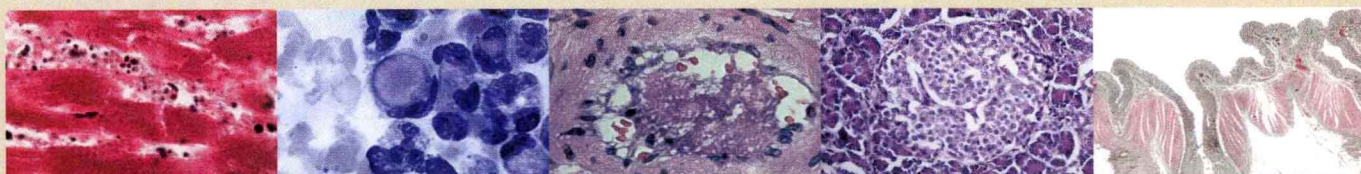




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