

FRIEDBERG

DISEASES
OF THE
HEART

SECOND
EDITION

SAUNDERS

DISEASES OF THE HEART

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S E C O N D E D I T I O N

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TO MY WIFE

AND

TO RICHARD AND BARBARA

PREFACE TO THE SECOND EDITION

The numerous advances in our knowledge of diseases of the heart since the first edition of this book have necessitated extensive rewriting of almost every chapter. However the basic objectives and the form of presentation of the first edition have been preserved.

A section of three chapters devoted to graphic methods of examination has been added because of the many recent contributions to this field.

Major sections of this revision have been devoted to cardiac surgery. New techniques of direct vision surgery, such as inflow stasis, hypothermia, cross circulation, external shunts and pump-oxygenators, and the results of their clinical application have been included. The availability of surgical therapy for certain cardiac lesions has imposed new responsibility on the physician. Accordingly, appropriate presentations have been made of the application of the various diagnostic techniques, the interpretation of findings, the indications for surgery and especially the risks and results thus far obtained with available surgical procedures.

Extensive revisions and additions have been made to the sections on treatment, other than surgical, throughout the book. These include, among others, the discussions of treatment of congestive heart failure, particularly intractable heart failure, the discussions of digitalis, quinidine, Pronestyl and mercurial diuretics, the use of oral diuretics, very low sodium diets, resins, the induction of hyperchloremic acidosis with Diamox and ammonium chloride to potentiate the mercurial diuretics, the use of radioactive iodine in the treatment of intractable angina pectoris and intractable heart failure as well as of thyrocardiac disease, a discussion of the host of drugs that have been used in the treatment of angina pectoris, prophylaxis against rheumatic fever by the treatment and prevention of *Streptococcus A* (hemolyticus) infections, the treatment of rheumatic fever with corticosteroid hormones and the possibility of preventing cardiac dam-

age, the modern antibiotic treatment of bacterial endocarditis including short term therapy, the control of tuberculous pericarditis with antituberculous drugs and the treatment of pulmonary (respiratory) and cardiac insufficiency in cor pulmonale according to the underlying pulmonary disease. The discussion of the treatment of acute myocardial infarction has been expanded particularly because of a more detailed consideration of the controversial questions of the use of anticoagulants, bed rest versus chair rest and the effectiveness of the vasopressor drugs in the treatment of shock. A number of new anticoagulants have been discussed as well as the use of Mephyton to control excessive hypoprothrombinemia or bleeding. The chapter on hypertensive heart disease has been greatly enlarged, partly because of the discussion of therapy, especially of the various newer hypertensive drugs.

The chapters on coronary atherosclerosis, congenital heart disease, chronic pulmonary heart disease have been greatly expanded. Extensive revisions or additions have been made in regard to the following subjects among others: the pathophysiology of cardiopulmonary disease, lung volumes and tests of pulmonary function, the viscoelastic properties of the lungs, the work and force of breathing, the relation of lipids and lipoproteins, of cholesterol metabolism, of cholesterol and fat intake and of sex hormones to coronary atherosclerosis; cardiac arrest, the use of cardiac massage, defibrillation, the external cardiac pacemaker and defibrillator, Starling curves of cardiac function, vectorcardiographic findings in cardiac hypertrophy, bundle branch block and myocardial infarction, extracellular and intracellular electrolytes and electrolyte disturbances in congestive heart failure, recent contributions to the theories of the arrhythmias and Wolff-Parkinson-White syndrome, the varieties of syncope, diagnostic tests for pheochromocytoma, revised criteria for the early diagnosis and treatment of bacterial endocarditis and hyperserotoninemia.

My indebtedness is acknowledged to my colleagues on the Attending and Resident Staff of The Mount Sinai Hospital, New York, for the knowledge gained in many fruitful discussions, to various members of the Cardiographic Department and of the Catheterization Group for their aid in obtaining additional illustrations and to members of the Library Staff for assistance in obtaining medical journals. To my wife, without whose help this revision could not have been completed, I am indebted for aid in the preparation and reading

New York City,

Preface to the Second Edition

of the manuscript, for typing my often illegible revisions, for checking the revised bibliography and its accurate reflection of additions and deletions in the text, for finding lost page numbers, initials and even authors, for proper changes in the order and numbering of the bibliographic references and typing them, for reading the galley and page proof and for rearranging and typing the new index. To my publishers, The W. B. Saunders Company, I am grateful for their encouragement and cooperation.

CHARLES K. FRIEDBERG

PREFACE TO THE FIRST EDITION

This book endeavors to provide a comprehensive and integrated exposition of the diseases of the heart. The swift pace of recent advances in this subject calls for a reorientation in presentation, and a modification in emphasis from that found in available standard works on cardiac disease.

In particular, special emphasis has been placed on the pathologic physiology of cardiac disorders, including the pathogenesis or mechanism of the symptoms and signs of circulatory failure, of angina pectoris and myocardial infarction, and of the various manifestations of the individual cardiac diseases. These discussions are not exhibited for mere academic consumption, but with the belief that an understanding of the dynamic events responsible for clinical phenomena is essential for maximum skill in diagnosis and treatment.

The increased utilization of quantitative measurements in the clinical study of circulatory disease is reflected in detailed discussions of the cardiac output, blood volume and extracellular volume, peripheral and intracardiac blood oxygen concentration and intracardiac pressures, body fluid and tissue electrolytes, and renal and pulmonary blood flow. Throughout the book these measurements are applied to clinical understanding and practical usage in the every-day diagnosis and treatment of cardiac disease.

Certain subjects of predominant importance have been presented as individual monographs. Ten chapters have been devoted to circulatory failure, eight chapters to diseases of the coronary circulation, and three to rheumatic fever and rheumatic heart disease. Bacterial endocarditis has been discussed extensively because it is the most frequent curable cardiac disease. Its bacteriological aspects have been presented in some detail because of their importance for effective diagnosis and treatment. Congenital heart disease has likewise been fully described because of the many recent advances in diagnosis and treatment. Special recognition has been given to cardiac

catheterization, oxygen and pressure studies and angiocardiology as aids to the exact diagnosis essential for possible surgical treatment. The diagnosis and treatment of other remediable cardiac conditions have been emphasized, e.g., thyrocardiac disease, constrictive pericarditis, and heart failure due to anemia, avitaminosis, arteriovenous aneurysm and myxedema. Reference is also made to very recent advances in the surgical treatment of various clinical and experimental cardiac lesions including coronary artery disease, valvular disease and septal defects as well as other congenital anomalies, tumors and traumatic disturbances. To avoid repetition, no special chapter is devoted to cardiovascular emergencies, but appropriate discussions may be found rapidly by reference to the individual conditions under the heading "emergencies, acute cardiovascular" in the index.

Certain less common forms of cardiac disease have been described in greater detail than is usually found in standard books, e.g., cardiac disease related to endocrine, metabolic and nutritional disturbances, including also the cardiac effects of hemochromatosis, von Gierke's disease, xanthomatosis, amyloidosis and acute porphyria. Ample consideration has been given to the effects of various infections on the heart, to nonspecific myocarditis, and to other myocardial diseases of obscure origin, e.g., idiopathic hypertrophy, scleroderma and myotonia atrophica.

Roentgenology and electrocardiography have become essential elements of cardiologic practice and are thoroughly discussed throughout the book. Individual chapters devoted exclusively to a formal presentation of electrocardiography and roentgenology have been omitted, partly to avoid duplication and save space, but chiefly because as isolated subjects they could not be presented adequately in single chapters. Instead, emphasis has been placed on the application of electrocardiographic and roentgenologic interpretation to clinical practice, in which these findings must

be integrated with the clinical history, symptomatology and other objective data.

Electrocardiography has been discussed in detail in connection with the arrhythmias, angina pectoris, myocardial infarction, pericarditis and myocardial disease, while both electrocardiography and roentgenology, including angiocardiology, have been amply considered in connection with such subjects as chamber enlargement, valvular heart disease and congenital cardiac lesions. To a lesser extent electrocardiographic and roentgenologic findings are also described in connection with almost every other type of heart disease, according to the importance and diagnostic value of these findings relative to other clinical features. A number of other graphic methods, including phonocardiography, roentgenkymography, electrokymography (fluorocardiography) and endocardial electrocardiography, have recently received increasing attention from cardiac investigators and these have been briefly mentioned when pertinent. However, because of their limited practical value at the present time these and other subjects in which the author may have a special interest have not been unjustly emphasized.

It is impossible to make specific acknowledgment to the host of individuals who, directly or indirectly, have helped provide the knowledge which is the basis for this book. I owe much to hospital colleagues and associ-

ates, and especially to Dr. Arthur Fishberg. Of the numerous teachers and collaborators to whom I am indebted I wish to mention specifically the late Dr. C. J. Rothberger of Vienna who trained me in experimental cardiology and electrocardiography, the late Dr. Louis Gross in cardiac pathology and the late Dr. Emanuel Libman in clinical cardiology.

For the opportunity of studying and utilizing the clinical material on his wards and for his encouragement in clinical research, I am especially grateful to Dr. George Baehr. I also wish to offer thanks to Dr. B. S. Oppenheimer and Dr. I. Snapper, under whom I have served for brief periods. Dr. A. Master kindly permitted my use of the electrocardiographic files and Dr. M. Sussman permitted the use of the roentgenologic files of The Mount Sinai Hospital. I am grateful to Drs. A. Grishman and Joan J. Lipsay for their assistance in choosing most of the material for illustrations and to Drs. J. B. Schwedel and R. H. Marshak for isolated roentgenograms. To my wife I am indebted for typing the original manuscript and its several revisions, for editorial assistance and especially for her tolerance during my writing of this book.

The editorial and administrative staffs of my publisher, the W. B. Saunders Company, have been helpful and cooperative.

CHARLES K. FRIEDBERG

New York City

CONTENTS

PART I. GRAPHIC METHODS OF CARDIAC EXAMINATION

1. ROENTGENOLOGIC EXAMINATION OF THE HEART.....	3
Roentgenologic Techniques.....	3
FLUOROSCOPY.....	3
TELEOROENTGENOGRAPHY.....	4
ORTHODIAGRAPY.....	4
The Normal Cardiac Silhouette.....	4
The Posteroanterior View, 4; The Right Anterior Oblique View, 5; The Left Anterior Oblique View, 6; Factors Modifying the Normal Cardiac Silhouette, 7.	
CARDIAC TOMOGRAPHY.....	7
ROENTGENKYMOGRAPHY AND ELECTROKYMOGRAPHY.....	9
Roentgenkymography, 9; Electrokymography, 9; Evaluation of Electrokymography, 10.	
ANGIOCARDIOGRAPHY.....	11
Radiopaque Contrast Substances, 11; Technique of Angiocardiography, 11; Side Actions and Dangers of Angiocardiography, 12; Structures Depicted in Successive Angiocardiograms, 13; Indications for and Value of Angiocardiography, 13; Rapid Biplane Angiocardiography, 15; Photofluorography (Cineangiocardiography), 15; Selective Angiocardiography, 15; Fluoroscopic Image Amplification, 16; Thoracic Aortography. Retrograde Aortography, 16.	
2. ELECTROCARDIOGRAPHY AND VECTORCARDIOGRAPHY.....	18
Electrocardiography.....	18
THE ELECTROPHYSIOLOGIC BASIS OF THE ELECTROCARDIOGRAM.....	18
Polarization-Membrane Theory, 18; Depolarization (Accession, Excitation). The Dipole Theory, 18. Depolarization in a Muscle Fiber, 19; Repolarization, 20.	
THE LEADS OF THE ELECTROCARDIOGRAM.....	21
The Standard Leads, 22; The Einthoven Triangle and The Einthoven Law (Equation), 22; Unipolar Leads and Wilson's Central Terminal, 22; Unipolar Precordial or Chest Leads, 24; Unipolar Limb Leads, 24; Esophageal Leads, 24; Intracardiac Electrocardiograms, 25; Intrabronchial Electrocardiograms, 25; Fetal Electrocardiography, 25.	
THE NORMAL ELECTROCARDIOGRAM AND ITS GENESIS.....	25
The P Wave, 26; The P-Q or P-R Interval, 26; The QRS Complex, 27; The RS-T Segment, 30; The T Wave, 31; The Q-T Interval, 32; The U Wave, 33.	

Vectorcardiography (Vector Electrocardiography).....	33
Relationship Between Electrocardiography and Vectorcardiography, 33; The Spatial Cardiac Vector, 34; The Dipole Theory and Vectorcardiography, 34; The Mean Electrical Axis and Angle of Deviation, 35; Determination of Electrical Axis, 36; Derivation of the Vectorcardiogram from the Electrocardiogram, 37; Vectorcardiography by Cathode Ray Oscilloscope, 40; Reference Systems and Electrode Placement, 42.	
THE NORMAL VECTORCARDIOGRAM.....	44
The QRS sÊ Loop, 44; The T sÊ Loop, 46; The P sÊ Loop, 46; Derivation of Electrocardiographic Leads from the Vectorcardiogram, 47; The S-T Vector and Segment, 49.	
CLINICAL APPLICATIONS OF VECTORCARDIOGRAPHY.....	50
VENTRICULAR GRADIENT.....	51
 3. BALLISTOCARDIOGRAPHY, PHONOCARDIOGRAPHY, CARDIAC CATHETERIZATION AND OTHER GRAPHIC METHODS.....	55
Ballistocardiography.....	55
BALLISTOCARDIOGRAPH MACHINES.....	55
PICKUP DEVICES.....	56
Photoelectric Device, 56; Electromagnetic Pickup Device, 56; Acceleration Ballistocardiogram, 57.	
THE NORMAL BALLISTOCARDIOGRAM.....	57
Atrial Ballistocardiographic Complex, 57; Ventricular Systolic Complex, 58; Effect of Respiration on the Ballistocardiogram, 59; Effect of Exercise, 59; Effect of Aging, 59.	
THE ABNORMAL BALLISTOCARDIOGRAM.....	60
Abnormalities of I-J Complex, 61; Abnormalities in the K Wave, 61; Abnormalities in the H Wave, 61; Changes in the Diastolic Waves (L, M, N, O), 61.	
CLINICAL CORRELATIONS OF THE BALLISTOCARDIOGRAM.....	61
Coronary Artery Disease, Angina Pectoris, Myocardial Infarction, 62; Hypertension, 63; Mitral Stenosis, 63; Mitral Insufficiency, 63; Aortic Insufficiency, 63; Aortic Stenosis, 64; Congenital Heart Disease, 64; Constrictive Pericarditis, 64; Heart Failure, 64.	
CLINICAL EVALUATION.....	64
Phonocardiography-Heart Sounds.....	65
THE NORMAL HEART SOUNDS.....	66
First Heart Sound 66; Second Heart Sound, 67; Third Heart Sound, 68; Fourth Heart Sound 68.	
GALLOP RHYTHM.....	68
Protodiastolic Gallop Rhythm, 69; Presystolic Gallop Rhythm, 69; Summation Gallop, 69; Systolic Click (Gallop), 69.....	
THE OPENING SNAP OF MITRAL STENOSIS.....	70
CARDIAC MURMURS.....	70
Systolic Murmurs, 70; Apical Diastolic Murmurs, 71; Basal Diastolic Murmurs, 71; Continuous Murmur, 71.	
The Jugular Vein Tracing (Venous Pulse).....	71
The Normal Jugular Venous Pulse, 72.	
Hepatic Pulse Tracing.....	73
Normal Hepatic Pulse, 73; Positive (Systolic) Liver Pulse, 73; Presystolic Liver Pulse, 74.	

Cardiac Catheterization—Tracings of Intracardiac and Intravascular Pressure	74
RIGHT HEART CATHETERIZATION.....	74
Indications, 74; Preparation and Premedication of the Patient, 74; Technique, 75; Complications, 76.	
CATHETERIZATION OF THE LEFT HEART AND AORTA.....	77
NORMAL PRESSURES IN THE CARDIAC CHAMBERS AND PULMONARY ARTERY.....	77
Other Graphic Methods.....	77
CARDIOGRAPHY-KINETOCARDIOGRAPHY.....	77
RADIOCARDIOGRAPHY.....	78
RHEOCARDIOGRAPHY.....	78
DYE-DILUTION CURVES.....	79

PART II. CIRCULATORY FAILURE

4. CARDIAC FUNCTION AND CARDIAC FAILURE.....	85
Definition.....	85
The Law of the Heart.....	85
Cardiac Response to Increased Venous Inflow, 85; Cardiac Response to Increased Aortic Resistance, 85; Starling Curves, 86; Oxygen Consumption and Mechanical Efficiency, 87.	
Adaptability of the Heart.....	87
Cardiac Reserve, 87; Cardiac Tonus or Tone, 88; Reflex Control of Cardiac Output, 88; Factors Impairing Cardiac Output, 89.	
Cardiac and Circulatory Compensations.....	90
Compensation and Decompensation, 90; Types of Cardiac and Circulatory Adjustments, 90.	
CARDIAC COMPENSATION BY TACHYCARDIA.....	90
Pathogenesis of Compensatory Tachycardia, 91.	
CARDIAC DILATATION.....	91
Cardiovascular Diseases and Compensatory Dilatation, 91.	
CARDIAC HYPERTROPHY.....	92
The Compensatory Nature of Cardiac Hypertrophy, 93; Relation of Cardiac Dilatation and Cardiac Hypertrophy, 93; Pathogenesis of Cardiac Hypertrophy, 93; Reversibility of Cardiac Dilatation and Hypertrophy, 94	
CIRCULATORY COMPENSATION BY INCREASED BLOOD VOLUME AND VENOUS RETURN.....	94
CIRCULATORY COMPENSATION BY REDISTRIBUTION OF A DIMINISHED CARDIAC OUTPUT.....	95
Relation of Compensatory Mechanisms to Clinical Manifestations of Cardiac and Circulatory Dysfunction, 95.	
CLASSIFICATION OF CIRCULATORY FAILURE.....	96
5. ENLARGEMENT OF THE HEART.....	98
Physical Signs of Cardiac Enlargement.....	98
Roentgenologic Diagnosis of Cardiac Enlargement.....	98
CARDIAC MENSURATION.....	99
Cardiothoracic Ratio, 99; The Transverse Diameter, 99; The Long and Broad Diameters, 101; The Area of the Frontal Car-	

diac Silhouette, 101; Volume of the Heart, 101.	
ENLARGEMENT OF THE INDIVIDUAL CHAMBERS.....	102
Left Ventricle, 102; Left Atrium, 103; Right Ventricle, 105;	
Right Atrium, 106.	
Electrocardiographic and Vectorcardiographic Signs of Cardiac Enlargement	107
DEVIATION OF THE ELECTRICAL AXIS.....	108
The Recognition of Axis Deviation, 108; The Electrical Axis	
in Relation to Anatomic Axis of the Heart and Body Build,	
110; Axis Deviation Due to Positional Change or Cardiac	
Enlargement, 111.	
THE ELECTROCARDIOGRAM IN HYPERTROPHY OF THE LEFT VENTRICLE	
(LEFT VENTRICULAR STRAIN).....	111
THE VECTORCARDIOGRAM IN LEFT VENTRICULAR HYPERTROPHY.....	113
THE ELECTROCARDIOGRAM IN RIGHT VENTRICULAR HYPERTROPHY.....	113
Genesis of Electrocardiographic Pattern, 113; The Electrocar-	
diographic Pattern of Right Ventricular Hypertrophy, 115.	
THE VECTORCARDIOGRAM IN RIGHT VENTRICULAR HYPERTROPHY....	116
THE ELECTROCARDIOGRAM IN COMBINED VENTRICULAR HYPERTROPHY.	118
THE VECTORCARDIOGRAM IN COMBINED VENTRICULAR HYPERTROPHY..	118
THE ELECTROCARDIOGRAM IN ENLARGEMENT OF THE ATRIA.....	118
VECTORCARDIOGRAM OF ATRIAL ENLARGEMENT.....	122
 6. ETIOLOGY OF CHRONIC (CONGESTIVE) HEART FAILURE.....	124
The Fundamental Mechanism of Cardiac Failure.....	124
THE PATHOLOGIC BASIS OF CARDIAC FAILURE.....	124
Extent of Anatomic Alterations in Heart with Failure, 124;	
Conflicting Opinions as to the Significance of Microscopic Car-	
diac Lesions, 125; Individual Pathologic Cardiac Abnormal-	
ities in Heart Failure, 125.	
CAUSES OF FAILURE IN THE ENLARGED HEART.....	127
Compensatory Limitation of Cardiac Enlargement, 127;	
Mechanical Inefficiency of the Enlarged Heart, 128; Physi-	
cochemical Disadvantage of the Hypertrophied Heart, 129;	
Deficient Blood Supply of the Enlarged Heart, 129; Sum-	
mary: Causes for Failure of the Enlarged Heart, 130.	
THE CHEMICAL BASIS OF CARDIAC FAILURE.....	130
Myocardial Metabolism and Cardiac Contraction, 130; Muscle	
Proteins and Myocardial Contraction, 132; Cardiac Muscle	
Metabolism and Heart Failure, 133.	
Precipitating Clinical Causes of Congestive Heart Failure.....	137
Infections, 137; Inadequate Coronary Blood Flow, 137;	
Changes in Rate and Rhythm, 138; Excessive Sodium Intake,	
138; Discontinuation of Digitalis, 138; Pregnancy and	
Childbirth, 138; Hemorrhage and Anemia, 138; Pulmonary	
Embolism, 138; Transfusions and Sodium-Containing Infu-	
sions, 138; Physical and Emotional Strains, 138; Environmen-	
tal Heat and Humidity, 139.	
SIGNIFICANCE OF THE PRECIPITATING CAUSES OF CONGESTIVE CARDIAC	
FAILURE.....	139
Underlying Causes of Congestive Heart Failure.....	139
 7. CLINICAL AND PATHOLOGIC FEATURES OF CHRONIC (CONGESTIVE)	
HEART FAILURE.....	141

Left-Sided Heart Failure.....	141
CAUSES OF LEFT-SIDED HEART FAILURE.....	141
PATHOLOGIC PHYSIOLOGY OF LEFT-SIDED HEART FAILURE.....	141
PATHOLOGY OF LEFT-SIDED HEART FAILURE.....	142
CLINICAL FEATURES OF LEFT-SIDED HEART FAILURE.....	142
Symptoms, 142; Lung Volumes, 147; Roentgenologic Appearance of the Heart and Lungs in Left-Sided Heart Failure, 148; Circulatory Measurements, 149.	
DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS OF LEFT-SIDED HEART FAILURE.....	149
Right-Sided Heart Failure.....	150
CAUSES OF RIGHT-SIDED HEART FAILURE.....	150
PATHOLOGIC PHYSIOLOGY OF RIGHT-SIDED HEART FAILURE.....	150
PATHOLOGY OF RIGHT-SIDED HEART FAILURE.....	151
Liver, 151; Peritoneal Cavity, Gastrointestinal Tract, Spleen and Pancreas, 151; The Kidney, 151; The Brain, 151.	
CLINICAL PICTURE OF RIGHT-SIDED HEART FAILURE.....	151
Symptoms and Signs of Right-Sided Heart Failure, 152; Urinary Findings, 155; The Erythrocyte Sedimentation Rate, 156; Blood Chemistry, 156; Blood Electrolytes, 156.	
DIAGNOSIS OF RIGHT-SIDED HEART FAILURE.....	157
Functional Classification of Heart Disease (Severity of Heart Failure).....	157
Complications of Congestive Heart Failure.....	157
Course and Prognosis of Congestive Heart Failure.....	158
 8. THE PATHOGENESIS OF CHRONIC CONGESTIVE HEART FAILURE..	161
Pathologic Physiology of Heart Failure.....	161
ALTERATIONS IN CIRCULATORY DYNAMICS.....	161
The Cardiac Output in Congestive Heart Failure, 161; Pulmonary Ventilation and Oxygen Consumption in Heart Failure, 165; The Intracardiac Pressures, 165; The Circulating Blood Volume, 166; The Circulation Time, 167.	
FLUID AND ELECTROLYTES IN CONGESTIVE HEART FAILURE.....	168
Fluid Retention and Abnormal Distribution, 168; Sodium Retention in Heart Failure, 169; Electrolyte Concentrations in Extracellular and Intracellular Fluid, 170; Mechanism of the Abnormal Renal Retention of Sodium in Heart Failure, 171; Mechanisms Increasing Tubular Reabsorption of Sodium, 173; Exercise and Renal Excretion of Sodium, 174; Possible Stimulus and Receptor Sites for Renal Retention of Sodium and Water, 175.	
Theories of Mechanism of Heart Failure.....	177
THE BACKWARD FAILURE THEORY.....	177
Correlation of Experimental Circulatory Studies with Backward Failure Theory, 177; Pathologic Support for Backward Failure Theory, 178; Clinical Observations Supporting Backward Failure Theory, 178.	
THE FORWARD FAILURE THEORY.....	178
Elevated Venous Pressure Versus Renal Retention of Sodium and Water, 179.	
CRITICISMS OF BACKWARD FAILURE AND FORWARD FAILURE THEORIES	179
The Mechanism of Congestive Heart Failure.....	180
Initial Disturbances in Heart Failure, 180; Homeostatic Mechanisms Controlling the Cardiac Output, 181; The Rela-	

	tion of Increased Blood Volume to Venous Return and Venous Pressure, 182; Relation of Venous Return and Venous Pressure to Cardiac Output, 184.	
Pathogenesis	of Left-Sided and Right-Sided Heart Failure.....	184
	Relation of Exercise to Pathogenesis of Symptoms of Heart Failure, 185.	
The Pathogenesis	of High-Output Heart Failure.....	186
9. THE PATHOGENESIS OF INDIVIDUAL MANIFESTATIONS OF CONGESTIVE HEART FAILURE.....		189
Pathogenesis of Cardiac Dyspnea.....		189
	CEREBRAL BLOOD FLOW AND DYSPNEA.....	189
	BLOOD CHEMICAL CHANGES AND DYSPNEA.....	189
	Arterial Oxygen, 190; Arterial Carbon Dioxide, 190; Hydrogen Ion Concentration, 190.	
	PULMONARY CONGESTION AND RIGIDITY AS THE CAUSE OF CARDIAC DYSPNEA.....	190
	The Hering-Breuer Reflex, 191; Pulmonary Congestion and Reflex Stimulation of Respiration, 191; Pulmonary Congestion and the Rapid Shallow Respiration of Cardiac Dyspnea, 191; Pathogenesis of Tachypnea in Heart Failure, 191; Relation of Cardiac Dyspnea to Pulmonary Ventilation and Vital Capacity, 192.	
	PATHOGENESIS OF SUBJECTIVE DISTRESS DURING DYSPNEA.....	193
	PRODUCTION OF DYSPNEA DURING RIGHT-SIDED HEART FAILURE.....	193
	RELATION OF EFFORT TO CARDIAC DYSPNEA.....	194
Pathogenesis of Orthopnea.....		194
	Increased Pulmonary Congestion in Recumbent Position, 194; Mechanical Interference with Pulmonary Ventilation in Recumbent Position, 195.	
Pathogenesis of Paroxysmal Dyspnea and Cardiac Asthma.....		195
	Relation to Pulmonary Congestion, 195; Mechanism of Precipitating Factors in Paroxysmal Dyspnea or Cardiac Asthma, 195.	
Pathogenesis of Acute Pulmonary Edema.....		196
	Other Theories of Pulmonary Edema, 197.	
Pathogenesis of Cheyne-Stokes Respiration.....		198
	Diminished Sensitivity of Respiratory Center, 198; Inadequate Respiratory Stimulus (Acapnia), 198; The Cycle of Cheyne-Stokes Respiration, 198; Arterial Hypoxemia, 199; Cheyne-Stokes Respiration and the Adams-Stokes Syndrome, 199.	
Pathogenesis of Cardiac Edema.....		199
	Sodium-Water Retention, 199; Increased Venous Pressure, 199; Reduction in Colloid Osmotic Pressure, 201; Tissue Pressure, 201; Lymphatic Drainage, 202; Capillary Permeability, 202; Hormones, 203.	
Pathogenesis of Cardiac Hydrothorax.....		203
Pathogenesis of Ascites.....		203
Pathogenesis of Cyanosis.....		204
	THE AMOUNT OF REDUCED HEMOGLOBIN IN THE BLOOD.....	204
	Total Hemoglobin Content, 204; Degree of Oxygen Unsaturation, 204.	
	THE AMOUNT OF BLOOD VISIBLE IN THE VESSELS OF THE SKIN.....	205

FACTORS MODIFYING CYANOTIC HUE.....	205
Pathogenesis of Icterus in Heart Disease.....	205
Pathogenesis of Gallop Rhythm.....	206
Pathogenesis of Pulsus Alternans.....	206
10. CIRCULATORY AND RELATED MEASUREMENTS.....	209
The Cardiac Output.....	209
MEASUREMENT OF THE CARDIAC OUTPUT.....	209
The Fick Principle, 209; The Direct Fick Method, 209; Dilution Methods, 210; Intravenous Injection of Radioisotopes, 211; Physical Methods, 211.	
THE CARDIAC OUTPUT IN HEALTH AND DISEASE.....	212
Diminished Cardiac Output, 213; Pathologic Conditions Associated with a Diminished Cardiac Output, 213; Increased Cardiac Output, 213; Pathologic Conditions Associated with Increased Cardiac Output, 213.	
The Circulation Time.....	213
METHODS OF DETERMINING THE CIRCULATION TIME.....	214
Clinical Methods, 214.	
CLINICAL ABNORMALITIES OF THE CIRCULATION TIME.....	215
Diminished Circulation Time, 215; Prolonged Circulation Time, 215.	
DIAGNOSTIC VALUE OF THE CIRCULATION TIME.....	215
Venous Pressure.....	216
Estimation of the Venous Pressure by Clinical Inspection, 216; Indirect Method of Determining Venous Pressure, 217; Direct Methods of Measuring Venous Pressure, 217; Normal and Pathologic Venous Pressures, 218; Clinical Application of Determination of Venous Pressure, 219.	
Blood Volume.....	220
DETERMINATION OF THE CIRCULATING BLOOD VOLUME.....	221
Evans Blue (T-1824), 221; Radioactive Substances, 221.	
THE NORMAL CIRCULATING BLOOD VOLUME.....	221
PHYSIOLOGIC AND PATHOLOGIC VARIATIONS IN BLOOD VOLUME.....	222
Increased Blood Volume, 222; Diminished Blood Volume, 222.	
THE INTRATHORACIC BLOOD VOLUME.....	223
THE CIRCULATING BLOOD VOLUME IN CONGESTIVE HEART FAILURE....	223
Body Water.....	223
Total Body Water, 223; Extracellular Fluid Volume, 224; Intracellular Fluid Volume, 224.	
Extracellular and Intracellular Electrolytes.....	224
Extracellular Sodium and Potassium, 224; Intracellular and Total Exchangeable Sodium and Potassium, 225; Bone Sodium and Potassium, 225; Chlorides, 226.	
Blood pH and Blood Gases.....	226
Blood pH, 226; Carbon Dioxide Content and Tension, 227; Oxygen in the Blood, 227.	
Test of Pulmonary Function.....	229
Tests of Myocardial Reserve.....	229
11. THE TREATMENT OF CONGESTIVE HEART FAILURE.....	234
Treatment of the Underlying Causes of Heart Failure, 234; Preventive Measures, 234.	

General Therapeutic Measures.....	235
Principles of Treatment, 235.	
Rest.....	235
The Rationale of Rest, 235; Duration of the Rest Period in Bed, 236; Complete Bed Rest, 237; Mental Repose, 237; Modified Bed Rest, 237; Convalescence and Exercise, 238.	
Restriction of Sodium and Fluid.....	238
Sodium Restriction, 239; Fluid Intake, 242; Diet, 242; Cationic Exchange Resins, 244.	
Digitalis and Related Drugs.....	246
THE ACTION OF DIGITALIS.....	247
Improvement of Myocardial Function, 247; Slowing of the Cardiac Rate, 248; Peripheral Action of Digitalis, 249; Digitalis and Cardiac Size, 249; Digitalis and Circulatory Dynamics, 250; Digitalis and Electrolyte Excretion and Renal Function, 251.	
INDICATIONS FOR DIGITALIS THERAPY.....	251
Congestive Heart Failure, 251; Atrial Fibrillation, 252; Atrial Flutter, 252; Paroxysmal Tachycardia, 253.	
FACTORS MODIFYING THE INDICATIONS FOR DIGITALIS.....	253
CONTRAINDICATIONS AND NON-INDICATIONS FOR DIGITALIS THERAPY..	253
Arrhythmias and Tachycardias, 253; Conduction Disturbances, 253; Coronary Heart Disease, 254; Shock and Infection, 254; Surgical Procedures, 254; Hypertension and Nephritis, 254; Concomitant Drugs, 255; Compensated Heart Disease, 255; Toxic Symptoms, 255.	
PREPARATIONS AND DOSAGE OF DIGITALIS.....	255
Powdered Whole Leaf, 255; Digilanid, 255; Digitoxin and Other Pure Digitalis Glycosides, 255; Digoxin, 256; Gitalin, 257; Lanatoside C, 257; Ouabain and Other Strophanthins, 258; Other Digitalis-like Preparations—Squill, 258.	
STANDARDIZATION AND ASSAY OF DIGITALIS PREPARATIONS.....	258
THE ADMINISTRATION OF DIGITALIS.....	259
Choice of Digitalis Preparation, 259; Methods of Inducing Digitalization (Oral Methods), 259; Maintenance of Digitalization, 261; Digitalization of Children, 261; Intravenous Administration of Digitalis or Strophanthin (Ouabain). Intramuscular Digitalization, 262; Rectal Administration of Digitalis, 264.	
EVIDENCES OF DIGITALIS OVERDOSAGE.....	264
Anorexia, Nausea, Vomiting, 264; Cardiac Disturbances, 265; Nervous and Other Symptoms, 268; Other Toxic Effects, 268; Increasing Cardiac Failure or Intractable Heart Failure, 268; Thrombotic Effect of Digitalis, 269; Pathologic Myocardial Lesions, 269.	
THE EFFECT OF DIGITALIS ON THE ELECTROCARDIOGRAM.....	269
Diuretics.....	270
MERCURIAL DIURETICS.....	271
Action of Mercurial Diuretics, 271; Indications for Mercurial Diuretics, 273; Contraindications to Mercurial Diuretics, 273; Toxic and Other Undesirable Effects of Mercurial Diuretics, 274; Disturbances in Blood Electrolyte Pattern, 275; The Administration and Dosage of Mercurial Diuretics, 280.	
ORAL DIURETICS, MERCURIALS AND CARBONIC ANHYDRASE INHIBITORS	281

ACIDIFYING SALTS.....	284
XANTHINE DERIVATIVES.....	284
URACILS.....	285
UREA.....	285
POTASSIUM SALTS.....	286
ALCOHOL.....	286
Other Drugs.....	286
Morphine, 286; Codeine, 286; Sedatives, 287; Antibiotics, 287; Dicumarol, 287; Hypotensive Drugs, 287; Laxatives and Ca- thartics, 288.	
Oxygen Therapy and Positive Pressure Respiration.....	288
Phlebotomy (Venesection).....	289
Tourniquets, 290.	
Mechanical Removal of Serous Effusion and Edema Fluid.....	290
Thoracentesis, 290; Abdominal Paracentesis, 290.	
Ligation of the Inferior Vena Cava.....	290
Total Thyroidectomy, Antithyroid Drugs, Radioiodine.....	291
Thiouracil and Other Antithyroid Drugs, 291; Radioactive Iodine (I^{131}), 291.	
Emergency Treatment of Acute Left Ventricular Failure (Cardiac Asthma; Pulmonary Edema).....	292
Treatment of Intractable Heart Failure.....	293
Review of Accuracy of Diagnosis, 293; Remediable Factors Responsible for Persistent Heart Failure, 293; Adequacy of Therapy of Heart Failure, 294.	
 12. ACUTE CIRCULATORY FAILURE: SHOCK, SYNCOPE AND SUDDEN DEATH.....	 300
Acute and Chronic Circulatory Failure, 300.	
Shock.....	300
DEFINITION OF SHOCK.....	300
CLASSIFICATION OF SHOCK.....	301
PATHOLOGIC PHYSIOLOGY.....	301
Fundamental Mechanism, 301.	
ETIOLOGY AND PATHOGENESIS.....	304
Bacterial Infection, 304; Acute Deficiency in Venous Return Caused by Loss of Blood or Plasma Volume, 305; Theories of Reduction in Blood Volume, 305; Acute Deficiency in Blood Volume and Venous Return Due to Dehydration, 306; Acute Deficiency in Venous Return Due to Pooling of Blood in Small Vessels, 307; Acute Deficiency in Cardiac Filling, 307; Acute Deficiency in Cardiac Emptying, 307.	
PATHOLOGY OF SHOCK.....	307
CLINICAL FEATURES OF SHOCK.....	308
General Appearance and Behavior, 308; The Skin, 308; The Pulse, 308; The Respiration, 308; The Blood Pressure, 308; The Heart, 308; The Veins, 308; The Urine, 308; The Blood, 308.	
TREATMENT OF SHOCK.....	309
Prophylaxis, 309; Early Treatment, 309; Treatment, 309.	
Syncope.....	312
Vasodepressor Syncope, 312; Postural Syncope and Chronic Orthostatic Hypotension, 313; Cardiac Syncope, 314; Anoxic Syncope, 314; Tussive Syncope, 315; Hyperventilation Caus-	