

# CONTENTS

## Part I

**v**

### NORMAL AND PATHOLOGIC PHYSIOLOGY

|   |     |
|---|-----|
| 1. DEVELOPMENT OF THE HEART AND THE FETAL CIRCULATION.....  | 3   |
| J. Robert Troyer, Ph.D.   |     |
| 2. THE ROLE OF CONNECTIVE TISSUE IN CARDIOVASCULAR DISEASE .....                                    | 27  |
| Gerald S. Berenson, M.D.<br>Bhandaru Radhakrishnamurthy, Ph.D.                                      |     |
| 3. REGULATION OF CARDIAC OUTPUT .....   | 43  |
| Arthur C. Guyton, M.D.  |     |
| 4. REGULATION OF BLOOD PRESSURE .....   | 55  |
| Paul Kezdi, M.D.  |     |
| 5. NORMAL AND ABNORMAL HEART VALVE FUNCTION .....   | 63  |
| William L. Winters, Jr., M.D.   |     |
| 6. ELECTRICAL PROPERTIES OF CARDIAC FIBERS .....  | 79  |
| Hans H. Hecht, M.D.   |     |
| 7. GENESIS OF CARDIAC ARRHYTHMIAS .....   | 93  |
| Yoshio Watanabe, M.D.<br>Leonard S. Dreifus, M.D.   |     |
| 8. CORONARY BLOOD FLOW AND METABOLIC REQUIREMENTS .....   | 110 |
| Robert B. Case, M.D.  |     |
| 9. PERIPHERAL ARTERIAL CIRCULATION .....  | 121 |
| Travis Winsor, M.D.   |     |
| 10. MICROCIRCULATION .....  | 135 |
| Walter Redisch, M.D.<br>Edward J. Messina, B.S.<br>M. Stephen Schwartz, M.D.<br>Roy H. Clauss, M.D. |     |
| 11. THE RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM .....  | 144 |
| Jacques Genest, M.D.  |     |
| 12. PATHOPHYSIOLOGY OF CARDIAC SYMPTOMS .....   | 160 |
| Bernard L. Charms, M.D.   |     |
| 13. CONGESTIVE HEART FAILURE .....  | 176 |
| Douglas M. Griggs, Jr., M.D.  |     |
| 14. CARDIOGENIC SHOCK .....   | 185 |
| Albert N. Brest, M.D.<br>Lewis C. Mills, M.D.   |     |

## Part II

## DIAGNOSTIC STUDIES

|     |   |     |
|-----|---|-----|
| 15. | <b>PHYSICAL EXAMINATION OF THE HEART AND CIRCULATION</b> .....                      | 197 |
|     | Albert N. Brest, M.D.   |     |
| 16. | <b>AUSCULTATION AND PHONOCARDIOGRAPHY</b> .....                                     | 204 |
|     | Bernard L. Segal, M.D.  |     |
| 17. | <b>ECHOCARDIOGRAPHY</b> .....   | 217 |
|     | Bernard L. Segal, M.D.  |     |
| 18. | <b>ELECTROCARDIOGRAPHY AND VECTORCARDIOGRAPHY</b> .....                             | 223 |
|     | Demetrio Sodi-Pallares, M.D.  |     |
|     | Gustavo A. Medrano, M.D.  |     |
|     | Abdo Bisteni, M.D.  |     |
|     | Jose Ponce de León, M.D.  |     |
|     | Fernando Cisneros, M.D.   |     |
| 19. | <b>CARDIAC CATHETERIZATION</b> .....  | 260 |
|     | Harold J. Swan, M.B., Ph.D.   |     |
| 20. | <b>ROUTINE ROENTGENOGRAPHIC AND FLUOROSCOPIC<br/>EXAMINATION OF THE HEART</b> ..... | 270 |
|     | John A. Campbell, M.D.  |     |
|     | Charles H. Helmen, M.D.   |     |
| 21. | <b>ANGIOCARDIOGRAPHY</b> .....  | 294 |
|     | Herbert L. Abrams, M.D.   |     |
| 22. | <b>CORONARY ARTERIOGRAPHY</b> .....   | 309 |
|     | Hratch Kasparian, M.D.  |     |
| 23. | <b>THORACIC AORTOGRAPHY</b> .....   | 320 |
|     | Herbert L. Abrams, M.D.   |     |
| 24. | <b>AORTOILIAC AND FEMORAL ARTERIOGRAPHY</b> .....                                   | 331 |
|     | Stanley Baum, M.D.  |     |
| 25. | <b>VENOGRAPHY OF THE EXTREMITIES</b> .....  | 340 |
|     | Richard A. Kramer, M.D.   |     |
| 26. | <b>LYMPHANGIOGRAPHY</b> .....   | 349 |
|     | Sidney Wallace, M.D.  |     |
|     | Laird Jackson, M.D.   |     |
| 27. | <b>MYOCARDIAL ENZYMES</b> .....   | 360 |
|     | John S. LaDue, M.D., Ph.D.  |     |
|     | Dieter Burckhardt, M.D.   |     |
|     | Irwin Nydick, M.D.  |     |
| 28. | <b>RENIN-ANGIOTENSIN SYSTEM: METHODS</b> .....                                      | 373 |
|     | Jacques Genest, M.D.  |     |
|     | Roger Boucher, Ph.D.  |     |

## Part III

## CLINICAL PHARMACOLOGY

|     |   |     |
|-----|---|-----|
| 29. | DIGITALIS AND RELATED PREPARATIONS .....          | 383 |
|     | Dean T. Mason, M.D.<br>Eugene Braunwald, M.D.     |     |
| 30. | DIURETIC DRUGS .....                              | 397 |
|     | Robert H. Seller, M.D.<br>Albert N. Brest, M.D.   |     |
| 31. | ANTILIPIDEMIC DRUGS .....                         | 404 |
|     | Sheldon R. Bender, M.D.                           |     |
| 32. | ADRENERGIC AND ANTIADRENERGIC AGENTS .....        | 411 |
|     | William Abrams, M.D.<br>Robert A. Moe, Ph.D.      |     |
| 33. | ANTIARRHYTHMIC DRUGS .....                        | 423 |
|     | Leonard S. Dreifus, M.D.<br>Yoshio Watanabe, M.D. |     |
| 34. | ANTICOAGULANT DRUGS .....                         | 433 |
|     | Walter G. Levine, Ph.D.                           |     |
| 35. | ANTIANGINAL DRUGS .....                           | 442 |
|     | George G. Rowe, M.D.                              |     |
| 36. | PERIPHERAL VASODILATORS .....                     | 451 |
|     | Irwin J. Schatz, M.D.                             |     |
| 37. | ANTIHYPERTENSIVE DRUGS .....                      | 455 |
|     | Albert N. Brest, M.D.<br>John H. Moyer, M.D.      |     |

## Part IV

## CLINICAL DISORDERS OF THE HEART

## Section A—CONGENITAL HEART DISEASE

|     |   |     |
|-----|---|-----|
| 38. | CONGENITAL LESIONS WITH LEFT-TO-RIGHT SHUNTS .....    | 467 |
|     | Bernard L. Segal, M.D.                                |     |
| 39. | CONGENITAL LESIONS WITH RIGHT-TO-LEFT SHUNTS .....    | 488 |
|     | Mary A. Engle, M.D.<br>Kathryn Hawes Ehlers, M.D.     |     |
| 40. | CONGENITAL LESIONS WITHOUT A SHUNT .....              | 515 |
|     | Bernard L. Segal, M.D.                                |     |
| 41. | MEDICAL MANAGEMENT OF CONGENITAL HEART DISEASE .....  | 530 |
|     | Daniel F. Downing, M.D.                               |     |
| 42. | SURGICAL MANAGEMENT OF CONGENITAL HEART DISEASE ..... | 534 |
|     | Gumersindo Blanco, M.D.                               |     |

v2

PART IV—CLINICAL DISORDERS OF THE HEART—*Continued***Section B—ACUTE RHEUMATIC FEVER AND ACQUIRED VALVULAR DISEASE**

43. RHEUMATIC FEVER AND ACTIVE RHEUMATIC CARDITIS ..... 551  
Ellen Simpson, M.D.
44. MITRAL STENOSIS ..... 561  
Martial A. Demany, M.D.  
Henry A. Zimmerman, M.D.
45. MITRAL REGURGITATION ..... 579  
Philip Samet, M.D.  
Cesar Castillo, M.D.  
William H. Bernstein, M.D.
46. AORTIC STENOSIS ..... 601  
Martial A. Demany, M.D.  
Henry A. Zimmerman, M.D.
47. AORTIC REGURGITATION ..... 613  
J. David Bristow, M.D.
48. DISEASES OF THE TRICUSPID VALVE ..... 626  
Bruce C. Sinclair-Smith, M.B.
49. ACQUIRED (NONRHEUMATIC) VALVULAR HEART DISEASE ..... 638  
Edward W. Dennis, M.D.
50. SURGICAL MANAGEMENT OF ACQUIRED VALVULAR HEART DISEASE ..... 648  
Charles A. Hufnagel, M.D.

**Section C—CORONARY HEART DISEASE**

51. ETIOLOGY AND PATHOGENESIS OF CORONARY ATHEROSCLEROSIS ..... 657  
Meyer Friedman, M.D.  
Ray H. Rosenman, M.D.
52. NATURAL HISTORY OF CORONARY ATHEROSCLEROSIS ..... 666  
Henry I. Russek, M.D.  
Burton L. Zohman, M.D.
53. NONARTERIOSCLEROTIC CORONARY DISEASE ..... 676  
George C. Griffith, M.D.
54. CLINICAL MANIFESTATIONS OF CORONARY ATHEROSCLEROSIS ..... 680  
George C. Griffith, M.D.
55. MANAGEMENT OF CORONARY ATHEROSCLEROSIS AND ITS COMPLICATIONS ..... 689  
William Likoff, M.D.
56. SURGERY OF CORONARY ARTERY DISEASE ..... 704  
Dwight E. Harken, M.D.  
Jack M. Matloff, M.D.

PART IV—CLINICAL DISORDERS OF THE HEART—*Continued***Section D—ENDOCARDIAL DISEASES**

57. **ENDOCARDITIS** ..... 727  
 Lewis E. January, M.D.  
 Sergio Rabinovich, M.D.  
 Ian M. Smith, M.D.
58. **ENDOCARDIAL FIBROELASTOSIS** ..... 736  
 Gerald S. Berenson, M.D.

**Section E—PERICARDITIS**

59. **ACUTE PERICARDITIS** ..... 751  
 Elwyn Evans, M.D.
60. **CHRONIC CONSTRICTIVE PERICARDITIS** ..... 771  
 Donald B. Effler, M.D.

**Section F—MYOCARDIAL DISEASES**

61. **THE HEART DURING INFECTIOUS DISEASES: MYOCARDITIS** ..... 781  
 Hobart A. Reimann, M.D.
62. **PRIMARY MYOCARDIAL DISEASE** ..... 791  
 Ralph Shabetai, M.D.

**Section G—PULMONARY HEART DISEASE**

63. **PULMONARY HEART DISEASE** ..... 817  
 Harold M. Lowe, M.D.  
 E. Grey Dimond, M.D.

**Section H—DISTURBANCES OF RHYTHM AND  
SUDDEN DEATH**

64. **CARDIAC ARRHYTHMIAS** ..... 835  
 Leonard S. Dreifus, M.D.  
 Yoshio Watanabe, M.D.
65. **CARDIAC RESUSCITATION AND SUDDEN CARDIAC DEATH** ..... 852  
 Paul M. Zoll, M.D.

**Section I—LESS COMMON DISEASES OF THE HEART**

66. **HYPERKINETIC (HIGH CARDIAC OUTPUT) STATES** ..... 859  
 Joseph F. Uricchio, M.D.
67. **CARDIOVASCULAR SYPHILIS** ..... 863  
 Louis A. Soloff, M.D.
68. **THE HEART IN HYPERTHYROIDISM** ..... 873  
 William J. deGroot, M.D.  
 James J. Leonard, M.D.

PART IV—CLINICAL DISORDERS OF THE HEART—*Continued*

69. **THE HEART IN HYPOTHYROIDISM** ..... 884  
 Milton W. Hamolsky, M.D.  
 George S. Kurland, M.D.  
 A. Stone Freedberg, M.D.
70. **TUMORS OF THE HEART** ..... 893  
 Harold J. Robinson, M.D.  
 Joseph A. Wagner, M.D.
71. **HEART DISEASE IN PREGNANCY** ..... 899  
 Robert A. Cosgrove, M.D.
72. **STRESS AND HEART DISEASE** ..... 906  
 Van Buren O. Hammett, M.D.  
 Stuart Wolfe, M.D.
73. **TRAUMATIC HEART DISEASE** ..... 916  
 Richard P. Lynch, M.D.  
 Jesse E. Edwards, M.D.

## Part V

## CLINICAL DISORDERS OF BLOOD VESSELS

## Section A—DISORDERS OF BLOOD PRESSURE

74. **ETIOLOGY OF ESSENTIAL HYPERTENSION** ..... 929  
 Milton Mendlowitz, M.D.
75. **NATURAL HISTORY, CLINICAL MANIFESTATIONS, AND  
 DIAGNOSIS OF ESSENTIAL HYPERTENSION** ..... 938  
 J. Edwin Wood, M.D.
76. **MANAGEMENT OF ESSENTIAL HYPERTENSION AND ITS  
 COMPLICATIONS** ..... 945  
 Ray W. Gifford, Jr., M.D.
77. **HYPERTENSION ASSOCIATED WITH RENAL PARENCHYMAL  
 DISEASE** ..... 956  
 H. Mitchell Perry, Jr., M.D.  
 Frank J. Catanzaro, M.D.
78. **HYPERTENSION SECONDARY TO DISORDERS OF THE ADRENAL  
 CORTEX** ..... 965  
 Roger B. Hickler, M.D.  
 Ezra A. Amsterdam, M.D.  
 A. Richard Christlieb, M.D.
79. **PHEOCHROMOCYTOMA** ..... 979  
 Sheldon G. Sheps, M.D.

PART V—CLINICAL DISORDERS OF BLOOD VESSELS—*Continued*

|   |  |      |
|---|--|------|
| 80.   | RENAL ARTERIAL HYPERTENSION .....                        | 989  |
|   | George C. Morris, Jr., M.D.<br>Michael E. DeBakey, M.D.  |      |
| 81.   | HYPERTENSION DUE TO TOXEMIA OF PREGNANCY .....           | 1000 |
|   | Frank A. Finnerty, Jr., M.D.                             |      |
| 82.   | SYSTOLIC HYPERTENSION .....                              | 1005 |
|   | Richard P. Lasser, M.D.<br>Arthur M. Master, M.D.        |      |
| 83.   | HYPOTENSION .....  | 1010 |
|   | Edgar A. Hines, Jr., M.D.                                |      |
| <b>Section B—DISORDERS OF ARTERIES, VEINS,<br/>AND LYMPHATICS</b> |  |      |
| 84.   | DISEASES OF THE AORTA AND THE PERIPHERAL ARTERIES .....  | 1017 |
|   | Ray W. Gifford, Jr., M.D.                                |      |
| 85.   | AORTIC ARCH SYNDROME .....                               | 1057 |
|   | George C. Morris, Jr., M.D.<br>Michael E. DeBakey, M.D.  |      |
| 86.   | INTRACRANIAL CEREBROVASCULAR INSUFFICIENCY .....         | 1065 |
|   | Elliott L. Mancall, M.D.                                 |      |
| 87.   | MESENTERIC VASCULAR INSUFFICIENCY .....                  | 1075 |
|   | George C. Morris, Jr., M.D.<br>Michael E. DeBakey, M.D.  |      |
| 88.   | DISEASES OF THE VEINS .....                              | 1082 |
|   | John L. Juergens, M.D.<br>Nelson W. Barker, M.D.         |      |
| 89.   | LYMPHATIC DISORDERS .....                                | 1092 |
|   | Alexander Schirger, M.D.<br>Edgar G. Harrison, Jr., M.D. |      |