



Contents Preface to the First Edition

PART I FUNDAMENTALS OF CARDIOVASCULAR DISEASE

- 1 Global Burden of Cardiovascular Disease, 1**
THOMAS A. GAZIANO, DORAIRAJ PRABHAKARAN,
AND J. MICHAEL GAZIANO
- 2 Ethics in Cardiovascular Medicine, 19**
SAVITRI E. FEDSON AND LAURENCE B. MCCULLOUGH
- 3 Clinical Decision Making in Cardiology, 25**
JOHN E. BRUSH JR AND HARLAN M. KRUMHOLZ
- 4 Measuring and Improving Quality of Care:
Relevance to Cardiovascular Clinical
Practice, 33**
FREDERICK A. MASOUDI AND JOHN S. RUMSFELD
- 5 Critical Evaluation of Clinical Trials, 39**
ELLIOTT M. ANTMAN

PART II GENETICS AND PERSONALIZED MEDICINE

- 6 Personalized and Precision Cardiovascular
Medicine, 47**
CALUM A. MACRAE
- 7 Principles of Cardiovascular Genetics, 53**
KIRAN MUSUNURU AND SEKAR KATHIRESAN
- 8 Drug Therapeutics and Personalized
Medicine, 64**
DAN M. RODEN
- 9 Biomarkers and Use in Precision
Medicine, 73**
PETER LIBBY, ROBERT E. GERSZTEN, AND PAUL M. RIDKER

PART III EVALUATION OF THE PATIENT

- 10 History and Physical Examination: An
Evidence-Based Approach, 83**
JAMES C. FANG AND PATRICK T. O'GARA
- 11 Anesthesia and Noncardiac Surgery in
Patients with Heart Disease, 102**
LEE A. FLEISHER AND JOSHUA A. BECKMAN

- 12 Electrocardiography, 117**
DAVID M. MIRVIS AND ARY L. GOLDBERGER
Guidelines: Electrocardiography, 151
DAVID M. MIRVIS AND ARY L. GOLDBERGER
- 13 Exercise Electrocardiographic Testing, 154**
GARY J. BALADY AND ANTHONY P. MORISE

- 14 Echocardiography*, 174**
SCOTT D. SOLOMON, JUSTINA C. WU, AND LINDA GILLAM
Appropriate Use Criteria: Echocardiography, 244
SCOTT D. SOLOMON AND ROBERT O. BONOW

- 15 The Chest Radiograph in Cardiovascular
Disease, 252**
CYLEN JAVIDAN-NEJAD AND SANJEEV BHALLA

- 16 Nuclear Cardiology*, 261**
JAMES E. UDELSON, VASKEN DILSIZIAN, AND ROBERT O. BONOW

- 17 Cardiovascular Magnetic Resonance
Imaging*, 301**
RAYMOND Y. KWONG

- 18 Cardiac Computed Tomography*, 321**
JAMES K. MIN

- *Appropriate Use Criteria: Multimodality Imaging
in Stable Ischemic Heart Disease and Heart
Failure, 343**
JAMES E. UDELSON, VASKEN DILSIZIAN, AND ROBERT O. BONOW

- 19 Cardiac Catheterization, 348**
JOERG HERRMANN

- 20 Coronary Angiography and Intravascular
Imaging, 374**
ROXANA MEHRAN AND GEORGE D. DANGAS

PART IV HEART FAILURE

- 21 Approach to the Patient with Heart
Failure, 403**
JAMES L. JANUZZI JR AND DOUGLAS L. MANN

- Guidelines: Initial Evaluation of the Patient with
Heart Failure, 414**
JAMES L. JANUZZI JR AND DOUGLAS L. MANN

- 22 Mechanisms of Cardiac Contraction and Relaxation, 418**
DONALD M. BERS AND BARRY A. BORLAUG
- 23 Pathophysiology of Heart Failure, 442**
GERD HASENFUSS AND DOUGLAS L. MANN
- 24 Diagnosis and Management of Acute Heart Failure, 462**
G. MICHAEL FELKER AND JOHN R. TEERLINK
Guidelines: The Hospitalized Patient, 488
G. MICHAEL FELKER AND JOHN R. TEERLINK
- 25 Management of Heart Failure Patients with Reduced Ejection Fraction, 490**
DOUGLAS L. MANN
Guidelines: Management of Heart Failure with a Reduced Ejection Fraction, 516
DOUGLAS L. MANN
- 26 Heart Failure with a Preserved Ejection Fraction, 523**
MICHAEL R. ZILE AND SHELDON E. LITWIN
Guidelines: Heart Failure with a Preserved Ejection Fraction, 542
MICHAEL R. ZILE AND SHELDON E. LITWIN
- 27 Devices for Monitoring and Managing Heart Failure, 543**
WILLIAM T. ABRAHAM
Guidelines: Cardiac Resynchronization and Implantable Cardioverter-Defibrillators in Heart Failure with a Reduced Ejection Fraction, 551
WILLIAM T. ABRAHAM
- 28 Surgical Management of Heart Failure, 553**
MARIELL JESSUP, PAVAN ATLURI, AND MICHAEL A. ACKER
- 29 Mechanical Circulatory Support, 568**
KEITH D. AARONSON AND FRANCIS D. PAGANI
- 30 Cardiovascular Regeneration and Repair, 580**
KIRAN MUSUNURU AND JOSEPH C. WU
- 31 Management of Patients with Cardiovascular Disease Approaching End of Life, 589**
LARRY A. ALLEN AND LYNNE WARNER STEVENSON
- PART V ARRHYTHMIAS, SUDDEN DEATH, AND SYNCOPE**
- 32 Approach to the Patient with Cardiac Arrhythmias, 597**
GORDON F. TOMASELLI AND DOUGLAS P. ZIPES
- 33 Genetics of Cardiac Arrhythmias, 604**
DAVID J. TESTER AND MICHAEL J. ACKERMAN
- 34 Mechanisms of Cardiac Arrhythmias, 619**
GORDON F. TOMASELLI, MICHAEL RUBART, AND DOUGLAS P. ZIPES
- 35 Diagnosis of Cardiac Arrhythmias, 648**
JOHN M. MILLER, GORDON F. TOMASELLI, AND DOUGLAS P. ZIPES
Guidelines: Ambulatory Electrocardiographic and Electrophysiologic Testing, 663
JOHN M. MILLER, GORDON F. TOMASELLI, AND DOUGLAS P. ZIPES
- 36 Therapy for Cardiac Arrhythmias, 670**
JOHN M. MILLER, GORDON F. TOMASELLI, AND DOUGLAS P. ZIPES
- 37 Supraventricular Arrhythmias, 706**
JEFFREY E. OLGIN AND DOUGLAS P. ZIPES
- 38 Atrial Fibrillation: Clinical Features, Mechanisms, and Management, 730**
FRED MORADY AND DOUGLAS P. ZIPES
Guidelines: Atrial Fibrillation, 746
FRED MORADY AND DOUGLAS P. ZIPES
- 39 Ventricular Arrhythmias, 753**
JEFFREY E. OLGIN, GORDON F. TOMASELLI, AND DOUGLAS P. ZIPES
- 40 Bradyarrhythmias and Atrioventricular Block, 772**
JEFFREY E. OLGIN AND DOUGLAS P. ZIPES
- 41 Pacemakers and Implantable Cardioverter-Defibrillators, 780**
CHARLES D. SWERDLOW, PAUL J. WANG, AND DOUGLAS P. ZIPES
Guidelines: Cardiac Pacemakers and Cardioverter-Defibrillators, 800
CHARLES D. SWERDLOW, PAUL J. WANG, AND DOUGLAS P. ZIPES
- 42 Cardiac Arrest and Sudden Cardiac Death, 807**
ROBERT J. MYERBURG AND JEFFREY J. GOLDBERGER
- 43 Hypotension and Syncope, 848**
HUGH CALKINS AND DOUGLAS P. ZIPES
- PART VI PREVENTIVE CARDIOLOGY**
- 44 The Vascular Biology of Atherosclerosis, 859**
PETER LIBBY
- 45 Risk Markers and the Primary Prevention of Cardiovascular Disease, 876**
PAUL M. RIDKER, PETER LIBBY, AND JULIE E. BURING

- 46 Systemic Hypertension: Mechanisms and Diagnosis, 910**
RONALD G. VICTOR
- 47 Systemic Hypertension: Management, 928**
RONALD G. VICTOR AND PETER LIBBY
- Guidelines: Treatment of Hypertension, 956**
RONALD G. VICTOR AND PETER LIBBY
- 48 Lipoprotein Disorders and Cardiovascular Disease, 960**
JACQUES GENEST AND PETER LIBBY
- Guidelines: Lipid Management, 979**
JACQUES GENEST AND PETER LIBBY
- 49 Nutrition and Cardiovascular and Metabolic Diseases, 983**
DARIUSH MOZAFFARIAN
- 50 Obesity and Cardiometabolic Disease, 998**
JEAN-PIERRE DESPRÉS, ERIC LAROSE, AND PAUL POIRIER
- 51 Diabetes and the Cardiovascular System, 1007**
DARREN K. MCGUIRE, SILVIO E. INZUCCHI, AND NIKOLAUS MARX
- Guidelines: Diabetes and Heart Disease, 1027**
DARREN K. MCGUIRE, SILVIO E. INZUCCHI, AND NIKOLAUS MARX
- 52 Air Pollution and Cardiovascular Disease, 1032**
ARUNI BHATNAGAR
- 53 Exercise and Sports Cardiology, 1038**
PAUL D. THOMPSON AND AARON L. BAGGISH
- 54 Exercise-Based, Comprehensive Cardiac Rehabilitation, 1046**
PAUL D. THOMPSON AND PHILIP A. ADES
- 55 Integrative Approaches to the Management of Patients with Heart Disease, 1052**
STEPHEN DEVRIES
- PART VII ATHEROSCLEROTIC CARDIOVASCULAR DISEASE**
- 56 Approach to the Patient with Chest Pain, 1059**
MARC P. BONACA AND MARC S. SABATINE
- 57 Coronary Blood Flow and Myocardial Ischemia, 1069**
DIRK J. DUNCKER AND JOHN M. CANTY JR
- 58 ST-Elevation Myocardial Infarction: Pathophysiology and Clinical Evolution, 1095**
BENJAMIN M. SCIRICA, PETER LIBBY, AND DAVID A. MORROW
- 59 ST-Elevation Myocardial Infarction: Management, 1123**
ERIN A. BOHULA AND DAVID A. MORROW
- Guidelines: Management of Patients with ST-Elevation Myocardial Infarction, 1172**
STEPHEN D. WIVIOTT
- 60 Non-ST Elevation Acute Coronary Syndromes, 1181**
ROBERT P. GIUGLIANO AND EUGENE BRAUNWALD
- Guidelines: Non-ST Elevation Acute Coronary Syndromes, 1202**
ROBERT P. GIUGLIANO AND EUGENE BRAUNWALD
- 61 Stable Ischemic Heart Disease, 1209**
DAVID A. MORROW AND JAMES A. DE LEMOS
- Guidelines: Stable Ischemic Heart Disease, 1258**
DAVID A. MORROW AND JAMES A. DE LEMOS
- 62 Percutaneous Coronary Intervention, 1271**
LAURA MAURI AND DEEPAK L. BHATT
- Guidelines: Percutaneous Coronary Intervention, 1287**
LAURA MAURI AND DEEPAK L. BHATT
- 63 Diseases of the Aorta, 1295**
ALAN C. BRAVERMAN AND MARC SCHERMERHORN
- Guidelines: Diseases of the Aorta, 1325**
ALAN C. BRAVERMAN AND MARC SCHERMERHORN
- 64 Peripheral Artery Diseases, 1328**
MARC P. BONACA AND MARK A. CREAGER
- Guidelines: Peripheral Artery Diseases, 1347**
MARC P. BONACA AND MARK A. CREAGER
- 65 Prevention and Management of Ischemic Stroke, 1352**
LARRY B. GOLDSTEIN
- 66 Treatment of Noncoronary Obstructive Vascular Disease, 1365**
SCOTT KINLAY AND DEEPAK L. BHATT
- PART VIII DISEASES OF THE HEART VALVES**
- 67 Approach to the Patient with Valvular Heart Disease, 1383**
CATHERINE M. OTTO AND ROBERT O. BONOW

- 68 Aortic Valve Disease, 1389**
BRIAN R. LINDMAN, ROBERT O. BONOW, AND CATHERINE M. OTTO
- 69 Mitral Valve Disease, 1415**
JAMES D. THOMAS AND ROBERT O. BONOW
- 70 Tricuspid, Pulmonic, and Multivalvular Disease, 1445**
PATRICIA A. PELLIKKA
- 71 Prosthetic Heart Valves, 1455**
PHILIPPE PIBAROT AND PATRICK T. O'GARA
- 72 Transcatheter Therapies for Valvular Heart Disease, 1464**
HOWARD C. HERRMANN AND MICHAEL J. MACK
- Guidelines: Management of Valvular Heart Disease, 1473**
ROBERT O. BONOW AND CATHERINE M. OTTO
- 73 Cardiovascular Infections, 1483**
LARRY M. BADDOUR, WILLIAM K. FREEMAN, RAKESH M. SURI, AND WALTER R. WILSON
- Guidelines: Infective Endocarditis, 1507**
LARRY M. BADDOUR, WILLIAM K. FREEMAN, RAKESH M. SURI, WALTER R. WILSON, AND ROBERT O. BONOW
- 74 Rheumatic Fever, 1510**
BONGANI M. MAYOSI
- PART IX DISEASES OF THE MYOCARDIUM, PERICARDIUM, AND PULMONARY VASCULATURE BED**
- 75 Congenital Heart Disease in the Adult and Pediatric Patient, 1519**
GARY D. WEBB, JEFFREY F. SMALLHORN, JUDITH THERRIEN, AND ANDREW N. REDINGTON
- 76 Catheter-Based Treatment of Congenital Heart Disease in Adults, 1574**
JOHN M. LASALA AND DAVID T. BALZER
- 77 The Dilated, Restrictive, and Infiltrative Cardiomyopathies, 1580**
RODNEY H. FALK AND RAY E. HERSHBERGER
- 78 Hypertrophic Cardiomyopathy, 1602**
BARRY J. MARON, MARTIN S. MARON, AND IACOPO OLIVOTTO
- 79 Myocarditis, 1617**
LESLIE T. COOPER JR AND KIRK U. KNOWLTON
- 80 Cardiomyopathies Induced by Drugs or Toxins, 1631**
RICHARD A. LANGE AND L. DAVID HILLIS
- 81 Cardio-Oncology, 1641**
BONNIE KY
- 82 Cardiovascular Abnormalities in HIV-Infected Individuals, 1651**
PRISCILLA Y. HSUE AND DAVID D. WATERS
- 83 Pericardial Diseases, 1662**
MARTIN M. LEWINTER AND MASSIMO IMAZIO
- 84 Pulmonary Embolism, 1681**
SAMUEL Z. GOLDBABER
- 85 Pulmonary Hypertension, 1699**
VALLERIE V. MCLAUGHLIN AND MARC HUMBERT
- 86 Chronic Lung Diseases and Cardiovascular Disease, 1720**
SURYA P. BHATT AND MARK T. DRANSFIELD
- 87 Sleep-Disordered Breathing and Cardiac Disease, 1726**
SUSAN REDLINE
- PART X CARDIOVASCULAR DISEASE IN SPECIAL POPULATIONS**
- 88 Cardiovascular Disease in the Elderly, 1735**
DANIEL E. FORMAN, JEROME L. FLEG, AND NANETTE KASS WENGER
- 89 Cardiovascular Disease in Women, 1767**
MARTHA GULATI AND C. NOEL BAIREY MERZ
- 90 Pregnancy and Heart Disease, 1780**
CANDICE K. SILVERSIDES AND CAROLE A. WARNES
- Guidelines: Pregnancy and Heart Disease, 1794**
CANDICE K. SILVERSIDES AND CAROLE A. WARNES
- 91 Cardiovascular Disease in Heterogeneous Populations, 1799**
MICHELLE A. ALBERT AND MERCEDES R. CARNETHON
- 16 Nuclear Cardiology, 261**
- PART XI CARDIOVASCULAR DISEASE AND DISORDERS OF OTHER ORGANS**
- 92 Endocrine Disorders and Cardiovascular Disease, 1807**
IRWIN KLEIN AND BERNADETTE BIONDI
- 93 Hemostasis, Thrombosis, Fibrinolysis, and Cardiovascular Disease, 1822**
JEFFREY I. WEITZ
- 94 Rheumatic Diseases and the Cardiovascular System, 1847**
JUSTIN C. MASON

95 Tumors Affecting the Cardiovascular System, 1866
DANIEL J. LENIHAN, SYED WAMIQUE YUSUF, AND ASHISH SHAH

96 Psychiatric and Behavioral Aspects of Cardiovascular Disease, 1879
VIOLA VACCARINO AND J. DOUGLAS BREMNER

97 Neurologic Disorders and Cardiovascular Disease, 1890
WILLIAM J. GROH, GORDON F. TOMASELLI, AND DOUGLAS P. ZIPES

98 Interface Between Renal Disease and Cardiovascular Illness, 1910
PETER A. MCCULLOUGH

99 Cardiovascular Manifestations of Autonomic Disorders, 1930
DAVID ROBERTSON AND ROSE MARIE ROBERTSON

100 Non-ST-Elevation Acute Coronary Syndrome: Management of Myocardial Infarction, 1172
PATRICK A. WILSON AND PATRICK T. O'GARRA

101 Stable Ischemic Heart Disease, 1209
DAVID A. MORROW AND JAMES A. DE LEMOS

102 Sleep-Disordered Breathing and Cardiovascular Diseases, 1250
SURYA P. BHATT AND MARK T. DRANSKY

103 Diabetes and the Cardiovascular System, 1307
DARRIN K. MCGUIRE, SILVIO F. DI VITO, AND NIKOLAUS MARX

104 Cardiovascular Disease in the Elderly, 1335
DANIEL E. FORMAN, JEROME L. FEE, AND NANETTE KASS

105 Cardiovascular Disease in Women, 1367
MARTHA GULATI AND C. NOEL BAIREY MERZ

106 Pregnancy and Heart Disease, 1380
ARUNI BHATNAGAR

107 Exercise and Cardiovascular Health, 1400
CAMPBELL S. SIVITER AND CAROL A. WARDLE

108 Cardiovascular Disease in Heterogeneous Populations, 1499
MICHÈLE A. ALBERT AND NEREESE B. CAMPBELL

109 Management of Patients with Heart Disease, 1052

110 Endocrine Disorders and Cardiovascular Disease, 1807
IRWIN KLEIN AND BERNADETTE BIONDI

111 Hemostasis, Thrombolysis, and Cardiovascular Disease, 1823
JEFFREY J. WEITZINBERG, S. MARC BONACA, AND MARC S. D'AMICO

112 Rheumatic Diseases and the Cardiovascular System, 1847
JUSTIN C. MASOR, TYNTA M. NHO, AND J. DIRK

113 Guidelines: Management of Myocardial Infarction, 1172
STEPHEN D. WILSON AND PATRICK T. O'GARRA

114 Guidelines: Non-ST-Elevation Acute Coronary Syndrome, 1209
ROBERT P. GIUGLIANO AND EUGENE D. RAVENHILL

115 Guidelines: Stable Ischemic Heart Disease, 1209
DAVID A. MORROW AND JAMES A. DE LEMOS

116 Guidelines: Infective Endocarditis, 1207
LARRY M. BADDOUR, WILLIAM K. FREEMAN, RAKESH M. SURJ, AND WALTER R. WILSON

117 Guidelines: Percutaneous Coronary Intervention, 1287
LAURA MAURI AND DEEPAK L. BHATT

118 Guidelines: Diseases of the Aorta, 1325

119 Guidelines: Management of Myocardial Infarction, 1172

120 Guidelines: Management of Myocardial Infarction, 1172

121 Guidelines: Management of Myocardial Infarction, 1172

122 Guidelines: Management of Myocardial Infarction, 1172

123 Guidelines: Management of Myocardial Infarction, 1172

124 Guidelines: Management of Myocardial Infarction, 1172

125 Guidelines: Management of Myocardial Infarction, 1172

126 Guidelines: Management of Myocardial Infarction, 1172

127 Guidelines: Management of Myocardial Infarction, 1172

128 Guidelines: Management of Myocardial Infarction, 1172

129 Guidelines: Management of Myocardial Infarction, 1172

130 Guidelines: Management of Myocardial Infarction, 1172

131 Guidelines: Management of Myocardial Infarction, 1172

132 Guidelines: Management of Myocardial Infarction, 1172

133 Guidelines: Management of Myocardial Infarction, 1172

134 Guidelines: Management of Myocardial Infarction, 1172

135 Guidelines: Management of Myocardial Infarction, 1172

136 Guidelines: Management of Myocardial Infarction, 1172

137 Guidelines: Management of Myocardial Infarction, 1172

138 Guidelines: Management of Myocardial Infarction, 1172

139 Guidelines: Management of Myocardial Infarction, 1172

140 Guidelines: Management of Myocardial Infarction, 1172

141 Guidelines: Management of Myocardial Infarction, 1172

142 Guidelines: Management of Myocardial Infarction, 1172

143 Guidelines: Management of Myocardial Infarction, 1172

144 Guidelines: Management of Myocardial Infarction, 1172

145 Guidelines: Management of Myocardial Infarction, 1172

146 Guidelines: Management of Myocardial Infarction, 1172

147 Guidelines: Management of Myocardial Infarction, 1172

148 Guidelines: Management of Myocardial Infarction, 1172

149 Guidelines: Management of Myocardial Infarction, 1172

150 Guidelines: Management of Myocardial Infarction, 1172

Video Contents

10 History and Physical Examination: An Evidence-Based Approach, 83

- 10.1 V wave
- 10.2 Kussmaul sign
- 10.3 Precordial diastolic gallop

14 Echocardiography, 174

- 14.1 Mirror artifact
- 14.2 Four-dimensional transesophageal echocardiogram of aortic and mitral valves
- 14.3 Echo contrast demonstrating pseudoaneurysm at left ventricular apex
- 14.4 Left anterior descending artery infarct
- 14.5 Right ventricle and inferior myocardial infarction
- 14.6 Flail anterior mitral valve
- 14.7 Flail anterior mitral valve with color Doppler showing severe mitral regurgitation
- 14.8 Anteroseptal ventricular septal defect
- 14.9 Inferoseptal ventricular septal defect
- 14.10 Left ventricular pseudoaneurysm
- 14.11 Hemopericardium
- 14.12 Giant left ventricular aneurysm
- 14.13 Takotsubo cardiomyopathy with left ventricular thrombus
- 14.14 Sarcoidosis
- 14.15 Ischemic cardiomyopathy with mitral regurgitation
- 14.16 Functional mitral regurgitation as shown from the left atrial aspect
- 14.17 Hypertrophic obstructive cardiomyopathy
- 14.18 Hypertrophic obstructive cardiomyopathy
- 14.19 Apical hypertrophic cardiomyopathy with apical aneurysm
- 14.20 Left ventricular noncompaction
- 14.21 Arrhythmogenic cardiomyopathy
- 14.22 Amyloid heart
- 14.23 Löffler endocarditis
- 14.24 Positive stress echocardiogram for left anterior descending artery ischemia
- 14.25 Positive stress echocardiogram for inferior ischemia and ischemic mitral regurgitation
- 14.26 Normal mitral valve, by 4D transesophageal echocardiography
- 14.27 Rheumatic mitral stenosis
- 14.28 Rheumatic mitral stenosis viewed from left ventricular aspect, by 3D transesophageal echocardiography
- 14.29 Bileaflet mitral valve prolapse
- 14.30 Bicuspid aortic valve, short-axis view
- 14.31 Bicuspid aortic valve, long-axis view
- 14.32 Unicuspid aortic valve

- 14.33 Quadricuspid aortic valve
- 14.34 Tricuspid stenosis
- 14.35 Carcinoid tricuspid valve
- 14.36 Pulmonic stenosis
- 14.37 Normal bileaflet mechanical mitral prosthesis, by 4D transesophageal echocardiography
- 14.38 Rocking aortic valve bioprosthesis
- 14.39 Thrombosed bileaflet mechanical mitral prosthesis
- 14.40 Tamponade with right atrial inversion
- 14.41 Tamponade with right ventricular outflow tract inversion
- 14.42 Constriction with respirophasic septal shift
- 14.43 Aortic dissection in a Marfan patient
- 14.44 Aortic dissection and severe aortic regurgitation in a Marfan patient
- 14.45 Aortic dissection with flap prolapsing back through aortic valve on transesophageal echocardiography
- 14.46 Aortic dissection showing site of perforation on transesophageal echocardiography
- 14.47 Deep venous thrombus in transit through right atrium
- 14.48 McConnell sign of pulmonary embolus
- 14.49 Vegetation on a rheumatic mitral valve
- 14.50 Abscess around a bicuspid aortic valve
- 14.51 Left atrial myxoma
- 14.52 Papillary fibroelastoma on aortic valve
- 14.53 Spontaneous echo contrast ("smoke") in left atrial appendage on transesophageal echocardiography
- 14.54 Left atrial thrombus and spontaneous echo contrast s/p MV repair
- 14.55 Patent foramen ovale bubble study and interatrial septal aneurysm
- 14.56 MitraClip, as viewed on 4D transesophageal echocardiography

16 Nuclear Cardiology, 261

- 16.1 Rubidium PET imaging
- 16.2 FDG PET imaging

17 Cardiovascular Magnetic Resonance Imaging, 301

- 17.1 Cine CMR imaging of myocardial infarction complications
- 17.2 CMR imaging of ischemia and infarct extent
- 17.3 Quantitation of myocardial iron content
- 17.4 Myocardial rupture after acute inferior myocardial infarction
- 17.5 Severe left anterior descending arterial stenosis
- 17.6 Mitral valve anomaly in hypertrophic cardiomyopathy

- 17.7 Microvascular dysfunction in a patient with hypertrophic cardiomyopathy
- 17.8 Ventricular tachycardia and syncope
- 17.9 Takotsubo cardiomyopathy
- 17.10 Chronic constrictive pericarditis with pericardial adhesions post radiation
- 17.11 Atrial septal defect
- 17.12 Vector flow lines in the normal aorta
- 17.13 Abnormal flow patterns
- 17.14 Cine imaging of large mass attached to mitral valve
- 17.15 Myocardial infarction and coronary stenosis
- 19 Cardiac Catheterization, 348**
- 19.1 Radial artery catheterization using Seldinger technique
- 19.2 Right heart catheterization via 7F sheath in right internal jugular vein
- 19.3 Left ventriculogram of extensive regional wall motion abnormalities
- 19.4 Left ventriculogram of mild-moderate mitral regurgitation (grade I-II)
- 19.5 Left ventriculogram of ventricular septal defect
- 19.6 Aortogram of moderate aortic regurgitation, Sellers grade II
- 19.7 Aortogram of De Bakey type II dissection of the ascending aorta
- 19.8 Right ventriculogram of patient with pulmonary valve stenosis
- 34 Mechanisms of Cardiac Arrhythmias, 619**
- 34.1 Simulation of anterograde conduction through the atrioventricular node
- 34.2 Simulation of fast-slow reentry using an electroanatomical model
- 34.3 Posterior left atrial activation during atrial fibrillation
- 34.4 Ventricular fibrillation spiral wave activity
- 35 Diagnosis of Cardiac Arrhythmias, 648**
- 35.1 Focal atrial tachycardia
- 35.2 Macroreentrant right atrial tachycardia following atriotomy for repair of atrial septal defect
- 36 Therapy for Cardiac Arrhythmias, 670**
- 36.1 Macroreentrant left atrial tachycardia after pulmonary vein isolation
- 36.2 Macroreentrant left atrial tachycardia after pulmonary vein isolation
- 62 Percutaneous Coronary Intervention, 1271**
- 62.1 Air injected down the right coronary artery
- 62.2 Three coronary arteries off the right coronary cusp
- 63 Diseases of the Aorta, 1295**
- 63.1 Echocardiogram of a patient with Marfan syndrome
- 63.2 Transesophageal echocardiogram of bicuspid aortic valve and dissection flap
- 63.3 Acute type A aortic dissection complicating a massive aortic root aneurysm
- 63.4 Transthoracic echocardiogram of the root phenotype of a bicuspid aortic valve
- 63.5 Transesophageal echocardiogram of dilated aortic root
- 63.6 Acute type A aortic dissection complicated by severe aortic regurgitation
- 63.7 Transesophageal echocardiogram of acute type A aortic dissection
- 63.8 Color flow Doppler of acute type A aortic dissection
- 63.9 Transesophageal echocardiogram of acute type A aortic dissection with prolapse of dissection flap
- 63.10 Color flow transesophageal echocardiogram of severe aortic regurgitation due to acute type A aortic dissection
- 63.11 Color flow transesophageal echocardiogram of severe aortic regurgitation due to massive aortic root aneurysm
- 63.12 Transthoracic echocardiogram of type A aortic dissection
- 63.13 Transthoracic echocardiogram of patient presenting with severe chest pain and near syncope
- 63.14 Transthoracic echocardiogram (subcostal view) of patient with chest pain demonstrating acute aortic dissection
- 63.15 Transesophageal echocardiogram of highly mobile dissection flap
- 63.16 Transesophageal echocardiogram of acute type A aortic dissection
- 63.17 Transesophageal echocardiogram of acute type A aortic dissection
- 63.18 Acute type A aortic dissection
- 63.19 Type A aortic dissection with dissection flap originating in the aortic root
- 63.20 Transesophageal echocardiogram of type A intramural hematoma of the aorta
- 63.21 Transesophageal echocardiogram of an intramural hematoma of the aorta
- 66 Treatment of Noncoronary Obstructive Vascular Disease, 1365**
- 66.1 Diagnostic angiography
- 66.2 Distal superficial femoral artery
- 66.3 Wire advancement through superficial femoral artery
- 66.4 Percutaneous transluminal angioplasty of the superficial femoral artery
- 66.5 Angiography following percutaneous transluminal angioplasty
- 66.6 Angiography following first stent insertion
- 66.7 Angiography of the more proximal lesion
- 66.8 Angiography following second stent insertion
- 66.9 Post-stent dilation angiography
- 66.10 Post-stent angiography
- 68 Aortic Valve Disease, 1389**
- 68.1 Level of outflow obstruction
- 68.2 Left ventricular dilation and increased sphericity with chronic severe aortic regurgitation
- 68.3 Mild aortic regurgitation

- 68.4 Vena contracta measurements
- 68.5 Imaging findings in severe aortic regurgitation
- 68.6 Severe aortic regurgitation
- 68.7 Transesophageal echocardiography of a stenotic bicuspid aortic valve
- 68.8 Bicuspid aortic valve
- 69 Mitral Valve Disease, 1415**
- 69.1 Mild rheumatic mitral stenosis
- 69.2 Planimetry of mitral valve area
- 69.3 Mitral stenosis jet on color-flow Doppler imaging
- 69.4 Three-dimensional transesophageal echocardiography of mitral stenosis
- 69.5 Three-dimensional visualization of rheumatic mitral stenosis
- 69.6 Spontaneous left atrial contrast
- 69.7 Transesophageal echocardiography-guided balloon mitral commissurotomy
- 69.8 Mitral valve morphology
- 69.9 Normal degree of mitral regurgitation
- 69.10 Mitral valve prolapse
- 69.11 Flail mitral valve leaflet
- 69.12 Mitral leaflet flail
- 69.13 Functional mitral regurgitation
- 69.14 Anteriorly directed mitral regurgitation on transesophageal echocardiography
- 69.15 Posteriorly directed mitral regurgitation on transesophageal echocardiography
- 69.16 Bileaflet prolapse and late systolic mitral regurgitation
- 69.17 Multiple mitral regurgitation jets on transesophageal echocardiography
- 69.18 Three-dimensional image of a mitral valve
- 69.19 Radiation-induced aortic and mitral stenosis
- 69.20 Secondary mitral regurgitation
- 69.21 Proximal isovelocity surface area imaging
- 70 Tricuspid, Pulmonic, and Multivalvular Disease, 1445**
- 70.1 Cafergot-induced tricuspid valve disease
- 70.2 Tricuspid stenosis
- 71 Prosthetic Heart Valves, 1455**
- 71.1 Transesophageal echocardiographic view of obstructed mitral bileaflet mechanical valve
- 71.2 Transthoracic echocardiographic parasternal long-axis view of stented bioprosthetic valve
- 71.3 Transthoracic color Doppler-echocardiographic parasternal long-axis view of obstructive valve thrombosis in balloon transcatheter aortic valve
- 71.4 Transthoracic color Doppler echocardiographic apical three-chamber view of two paravalvular regurgitant jets in a transcatheter aortic valve
- 75 Congenital Heart Disease in the Adult and Pediatric Patient, 1519**
- 75.1 Anomalous origin of left coronary artery from pulmonary artery
- 75.2 Anomalous origin of left coronary artery from pulmonary artery
- 75.3 Anomalous left coronary artery originating from right pulmonary artery
- 75.4 Scimitar syndrome
- 75.5 Scimitar syndrome
- 75.6 Parachute mitral valve
- 75.7 Tricuspid atresia and dextrocardia
- 75.8 Normal heart
- 75.9 Atrioventricular discordance
- 75.10 Atrioventricular and ventriculoarterial discordance
- 75.11 Double-inlet left ventricle
- 75.12 Double-inlet left ventricle
- 75.13 Double-inlet left ventricle
- 75.14 Double-inlet left ventricle
- 75.15 Double-inlet left ventricle
- 75.16 Double-inlet left ventricle
- 75.17 Double-inlet left ventricle
- 75.18 Double-inlet ventricle with common atrium and common atrioventricular valve
- 75.19 Hypoplastic posterior left ventricle
- 75.20 Superior-inferior ventricles and crisscross heart
- 75.21 Ventricular inversion with common atrioventricular valve and ostium prima defect
- 75.22 Tricuspid atresia
- 75.23 Tricuspid atresia
- 75.24 Hypoplastic right ventricle
- 75.25 Hypoplastic left heart syndrome
- 75.26 Repaired common atrioventricular valve
- 75.27 Repaired common atrioventricular valve
- 75.28 Three-dimensional echocardiography of tricuspid valve, with a hypoplastic mitral valve
- 75.29 Coronary sinus defect
- 75.30 Coronary sinus defect
- 75.31 Anomalous pulmonary venous drainage
- 75.32 Sinus venosus defect
- 75.33 Sinus venosus defect
- 75.34 Amplatzer closure of secundum atrial septal defect
- 75.35 Cause and treatment of platypnea/orthodeoxia syndrome
- 75.36 Three-dimensional echocardiography of cleft mitral leaflet
- 75.37 Primum atrial defect
- 75.38 Primum atrial defect
- 75.39 Regurgitant left atrioventricular valve in a primum atrial defect
- 75.40 Unbalanced atrioventricular septal defect
- 75.41 Unbalanced atrioventricular septal defect
- 75.42 Unbalanced atrioventricular septal defect
- 75.43 Doubly committed subarterial ventricular septal defect
- 75.44 Doubly committed subarterial ventricular septal defect
- 75.45 Doubly committed subarterial ventricular septal defect
- 75.46 Perimembranous inlet ventricular septal defect
- 75.47 Perimembranous inlet ventricular septal defect

- 75.48** Perimembranous ventricular septal defect with right ventricular muscle bundles and a small subaortic ridge
- 75.49** Perimembranous ventricular septal defect with right ventricular muscle bundles and small subaortic ridge
- 75.50** Perimembranous ventricular septal defect with right ventricular muscle bundles and small subarterial ridge
- 75.51** Perimembranous ventricular septal defect with right ventricular muscle bundles
- 75.52** Perimembranous ventricular septal defect with right ventricular muscle bundles and small subaortic ridge
- 75.53** Stenotic homograft conduit with stent therapy
- 75.54** Radiofrequency-assisted balloon dilation of atretic pulmonary valve
- 75.55** Calcified homograft conduit with potential coronary compression
- 75.56** Melody valve placement in stenotic homograft conduit
- 75.57** Catheter management of troubled Fontan circulation
- 75.58** Interventional and thrombolytic management of thrombosis in Fontan patient
- 75.59** Catheter management of stenotic left pulmonary artery in Fontan patient
- 75.60** Stent management of kinked Fontan connection
- 75.61** Postoperative view of a palliative Senning procedure
- 75.62** Postoperative view of palliative Senning procedure
- 75.63** Postoperative view of palliative Senning procedure
- 75.64** Postoperative view of palliative Senning procedure
- 75.65** Systemic tricuspid valve coaptation after Senning procedure
- 75.66** Postoperative view of Rastelli procedure
- 75.67** Postoperative view of Rastelli procedure
- 75.68** Rastelli repair of tricuspid valve regurgitation shows moderate tricuspid regurgitation
- 75.69** Moderate systemic tricuspid regurgitation after Senning procedure
- 75.70** Systemic tricuspid regurgitation after Senning procedure
- 75.71** Three-dimensional echocardiography of systemic tricuspid valve after Senning procedure
- 75.72** Interventional therapy of Mustard baffle stenosis and leakage
- 75.73** Poor tricuspid leaflet coaptation
- 75.74** Three-dimensional echocardiography of tricuspid regurgitation
- 75.75** Transesophageal echocardiography of tricuspid regurgitation
- 75.76** Abnormal systemic tricuspid valve in congenitally corrected transposition of the great arteries
- 75.77** Abnormal tricuspid valve in congenitally corrected transposition of the great arteries
- 75.78** Three-dimensional echocardiography of abnormal tricuspid valve in congenitally corrected transposition of the great arteries
- 75.79** Three-dimensional echocardiography of abnormal tricuspid valve in congenitally corrected transposition of the great arteries
- 75.80** Three-dimensional echocardiography of tricuspid regurgitation in congenitally corrected transposition of the great arteries
- 75.81** Stent management of hypoplastic aortic arch
- 75.82** Stent management of adult aortic coarctation
- 75.83** Stent management of complex coarctation repair
- 75.84** Stent management of aortic coarctation
- 75.85** Balloon dilation of critical neonatal aortic stenosis
- 75.86** Fibromuscular subaortic stenosis
- 75.87** Tunnel subaortic stenosis
- 75.88** Three-dimensional echocardiography of fibromuscular subaortic stenosis
- 75.89** Transesophageal echocardiography of congenital mitral stenosis
- 75.90** Transesophageal echocardiography of congenital mitral stenosis and fibromuscular subaortic stenosis
- 75.91** Isolated cleft of the mitral valve
- 75.92** Isolated cleft of the mitral valve
- 75.93** Three-dimensional echocardiography of isolated mitral cleft
- 75.94** Muscular inlet ventricular septal defect
- 75.95** Double-orifice mitral valve
- 75.96** Three-dimensional echocardiography of double-orifice mitral valve
- 75.97** Severe tricuspid regurgitation in congenitally corrected transposition of the great arteries
- 75.98** Ebstein malformation of tricuspid valve
- 75.99** Ebstein malformation of tricuspid valve
- 75.100** Ebstein malformation of tricuspid valve
- 75.101** Valvular pulmonary stenosis
- 75.102** Valvular pulmonary stenosis
- 75.103** Dysplastic pulmonary valve stenosis
- 75.104** Catheter management of neonatal pulmonary atresia with intact ventricular septum
- 75.105** Cor triatriatum
- 75.106** Cor triatriatum
- 75.107** Cor triatriatum
- 75.108** Catheter management of large circumflex artery fistula to left ventricle
- 83 Pericardial Diseases, 1662**
- 83.1** Cine loops of two-dimensional echocardiogram from a patient with cardiac tamponade
- 83.2** Cine MR images in a patient with pericardial effusion and underlying pulmonary hypertension
- 83.3** Cine MR images in a patient with both pericardial and pleural effusions
- 83.4** Cine MR images illustrating septal "bounce" in a patient with constrictive pericarditis
- 83.5** Cine MR images of a patient with constrictive pericarditis before pericardiectomy
- 83.6** Cine MR images of a patient with constrictive pericarditis after pericardiectomy illustrating relief of exaggerated ventricular interaction