

Contributors .....	xix
Preface .....	xl

## **PART I** The Profession of Medicine

1 The Practice of Medicine .....	1
<i>The Editors</i>	
2 Promoting Good Health .....	8
<i>Donald M. Lloyd-Jones, Kathleen M. McKibbin</i>	
3 Decision-Making in Clinical Medicine.....	13
<i>Daniel B. Mark, John B. Wong</i>	
4 Screening and Prevention of Disease .....	22
<i>Katrina A. Armstrong, Gary J. Martin</i>	
5 Health Care Systems in Developed Countries.....	27
<i>Richard B. Saltman</i>	
6 The Safety and Quality of Health Care.....	33
<i>David W. Bates</i>	
7 Racial and Ethnic Disparities in Health Care.....	37
<i>Joseph R. Betancourt, Alexander R. Green</i>	
8 Ethical Issues in Clinical Medicine.....	44
<i>Bernard Lo, Christine Grady</i>	
9 Palliative and End-of-Life Care .....	47
<i>Ezekiel J. Emanuel</i>	

## **PART II** Cardinal Manifestations and Presentation of Diseases

### **SECTION 1** Pain

10 Pain: Pathophysiology and Management .....	65
<i>James P. Rathmell, Howard L. Fields</i>	
11 Chest Discomfort .....	73
<i>David A. Morrow</i>	
12 Abdominal Pain.....	81
<i>Danny O. Jacobs</i>	
13 Headache.....	85
<i>Peter J. Goadsby</i>	
14 Back and Neck Pain .....	89
<i>John W. Engstrom</i>	

### **SECTION 2** Alterations in Body Temperature

15 Fever .....	102
<i>Charles A. Dinarello, Reuven Porat</i>	
16 Fever and Rash .....	105
<i>Elaine T. Kaye, Kenneth M. Kaye</i>	
17 Fever of Unknown Origin .....	114
<i>Chantal P. Bleeker-Rovers, Jos W. M. van der Meer</i>	

### **SECTION 3** Nervous System Dysfunction

18 Syncope .....	122
<i>Roy Freeman</i>	
19 Dizziness and Vertigo.....	129
<i>Mark F. Walker, Robert B. Daroff</i>	
20 Fatigue .....	132
<i>Jeffrey M. Gelfand, Vanja C. Douglas</i>	

21 Neurologic Causes of Weakness and Paralysis .....	135
<i>Michael J. Aminoff</i>	
22 Numbness, Tingling, and Sensory Loss .....	139
<i>Michael J. Aminoff</i>	
23 Gait Disorders, Imbalance, and Falls .....	143
<i>Jessica M. Baker, Lewis R. Sudarsky</i>	
24 Confusion and Delirium .....	147
<i>S. Andrew Josephson, Bruce L. Miller</i>	
25 Dementia.....	152
<i>William W. Seeley, Bruce L. Miller</i>	
26 Aphasia, Memory Loss, Hemispatial Neglect, Frontal Syndromes, and Other Cerebral Disorders .....	157
<i>M.-Marsel Mesulam</i>	
27 Sleep Disorders.....	166
<i>Thomas E. Scammell, Clifford B. Saper, Charles A. Czeisler</i>	

### **SECTION 4** Disorders of Eyes, Ears, Nose, and Throat

28 Disorders of the Eye.....	177
<i>Jonathan C. Horton</i>	
29 Disorders of Smell and Taste .....	194
<i>Richard L. Doty, Steven M. Bromley</i>	
30 Disorders of Hearing.....	200
<i>Anil K. Lalwani</i>	
31 Sore Throat, Earache, and Upper Respiratory Symptoms.....	208
<i>Michael A. Rubin, Larry C. Ford, Ralph Gonzales</i>	
32 Oral Manifestations of Disease .....	219
<i>Samuel C. Durso</i>	

### **SECTION 5** Alterations in Circulatory and Respiratory Functions

33 Dyspnea .....	226
<i>Rebecca M. Baron</i>	
34 Cough .....	230
<i>Christopher H. Fanta</i>	
35 Hemoptysis .....	232
<i>Anna K. Brady, Patricia A. Kritek</i>	
36 Hypoxia and Cyanosis .....	234
<i>Joseph Loscalzo</i>	
37 Edema.....	237
<i>Eugene Braunwald, Joseph Loscalzo</i>	
38 Approach to the Patient with a Heart Murmur .....	240
<i>Patrick T. O'Gara, Joseph Loscalzo</i>	
39 Palpitations.....	249
<i>Joseph Loscalzo</i>	

### **SECTION 6** Alterations in Gastrointestinal Function

40 Dysphagia.....	249
<i>Ikuo Hirano, Peter J. Kabrilas</i>	
41 Nausea, Vomiting, and Indigestion .....	253
<i>William L. Hasler</i>	
42 Diarrhea and Constipation.....	259
<i>Michael Camilleri, Joseph A. Murray</i>	

43 Unintentional Weight Loss .....	270
<i>J. Larry Jameson</i>	
44 Gastrointestinal Bleeding.....	272
<i>Loren Laine</i>	
45 Jaundice.....	276
<i>Savio John, Daniel S. Pratt</i>	
46 Abdominal Swelling and Ascites .....	281
<i>Kathleen E. Corey, Lawrence S. Friedman</i>	

## ALTERATIONS IN RENAL AND URINARY TRACT FUNCTION

47 Dysuria, Bladder Pain, and the Interstitial Cystitis/ Bladder Pain Syndrome.....	285
<i>John W. Warren</i>	
48 Azotemia and Urinary Abnormalities .....	288
<i>David B. Mount</i>	
49 Fluid and Electrolyte Disturbances .....	295
<i>David B. Mount</i>	
50 Hypercalcemia and Hypocalcemia .....	312
<i>Sundeep Khosla</i>	
51 Acidosis and Alkalosis.....	315
<i>Thomas D. DuBose, Jr.</i>	

## ALTERATIONS IN THE SKIN

52 Approach to the Patient with a Skin Disorder .....	324
<i>Kim B. Yancey, Thomas J. Lawley</i>	
53 Eczema, Psoriasis, Cutaneous Infections, Acne, and Other Common Skin Disorders.....	329
<i>Leslie P. Lawley, Calvin O. McCall, Thomas J. Lawley</i>	
54 Skin Manifestations of Internal Disease .....	339
<i>Jean L. Bolognia, Irwin M. Braverman</i>	
55 Immunologically Mediated Skin Diseases .....	355
<i>Kim B. Yancey, Thomas J. Lawley</i>	
56 Cutaneous Drug Reactions .....	362
<i>Robert G. Micheletti, Misha Rosenbach, Bruce U. Wintroub, Kanade Shinkai</i>	
57 Photosensitivity and Other Reactions to Light .....	372
<i>Alexander G. Marneros, David R. Bickers</i>	

## HEMATOLOGIC ALTERATIONS

58 Interpreting Peripheral Blood Smears.....	379
<i>Dan L. Longo</i>	
59 Anemia and Polycythemia.....	385
<i>John W. Adamson, Dan L. Longo</i>	
60 Disorders of Granulocytes and Monocytes .....	394
<i>Steven M. Holland, John I. Gallin</i>	
61 Bleeding and Thrombosis.....	404
<i>Barbara A. Konkle</i>	
62 Enlargement of Lymph Nodes and Spleen .....	411
<i>Dan L. Longo</i>	

## PHARMACOLOGY

63 Principles of Clinical Pharmacology .....	419
<i>Dan M. Roden</i>	
64 Pharmacogenomics.....	429
<i>Dan M. Roden</i>	

## PART IV Oncology and Hematology

### SECTION ONE Neoplastic Disorders

65 Approach to the Patient with Cancer .....	435
<i>Dan L. Longo</i>	
66 Prevention and Early Detection of Cancer.....	443
<i>Jennifer M. Croswell, Otis W. Brawley, Barnett S. Kramer</i>	
67 Cancer Genetics.....	452
<i>Fred Bunz, Bert Vogelstein</i>	
68 Cancer Cell Biology .....	461
<i>Jeffrey W. Clark, Dan L. Longo</i>	
69 Principles of Cancer Treatment .....	480
<i>Edward A. Sausville, Dan L. Longo</i>	
70 Infections in Patients with Cancer.....	502
<i>Robert W. Finberg</i>	
71 Oncologic Emergencies.....	511
<i>Rasim Gucalp, Janice P. Dutcher</i>	
72 Cancer of the Skin.....	522
<i>Brendan D. Curti, Sancy Leachman, Walter J. Urba</i>	
73 Head and Neck Cancer .....	532
<i>Everett E. Vokes</i>	
74 Neoplasms of the Lung .....	537
<i>Leora Horn, Christine M. Lovly</i>	
75 Breast Cancer .....	555
<i>Daniel F. Hayes, Marc E. Lippman</i>	
76 Upper Gastrointestinal Tract Cancers.....	566
<i>Robert J. Mayer</i>	
77 Lower Gastrointestinal Cancers .....	572
<i>Robert J. Mayer</i>	
78 Tumors of the Liver and Biliary Tree .....	578
<i>Josep M. Llovet</i>	
79 Pancreatic Cancer .....	591
<i>Daniel D. Von Hoff</i>	
80 Neuroendocrine Tumors of the Gastrointestinal Tract and Pancreas .....	596
<i>Robert T. Jensen</i>	
81 Renal Cell Carcinoma .....	616
<i>Robert J. Motzer</i>	
82 Cancer of the Bladder and Urinary Tract.....	619
<i>Noah M. Hahn</i>	
83 Benign and Malignant Diseases of the Prostate.....	623
<i>Howard I. Scher, James A. Eastham</i>	
84 Testicular Cancer .....	632
<i>David J. Vaughn</i>	
85 Gynecologic Malignancies .....	637
<i>David Spriggs</i>	
86 Primary and Metastatic Tumors of the Nervous System .....	643
<i>Lisa M. DeAngelis, Patrick Y. Wen</i>	
87 Soft Tissue and Bone Sarcomas and Bone Metastases .....	653
<i>Shreyaskumar R. Patel</i>	
88 Carcinoma of Unknown Primary.....	657
<i>Gauri R. Varadbachary, James L. Abbruzzese</i>	
89 Paraneoplastic Syndromes: Endocrinologic/ Hematologic .....	662
<i>J. Larry Jameson, Dan L. Longo</i>	

STANFORD

90 Paraneoplastic Neurologic Syndromes and Autoimmune Encephalitis.....	668
<i>Josep Dalmau, Myrna R. Rosenfeld</i>	
91 Late Consequences of Cancer and Its Treatment.....	674
<i>Carl E. Freter, Dan L. Longo</i>	

**SECTION 2 Hematopoietic Disorders**

92 Hematopoietic Stem Cells.....	679
<i>David T. Scadden, Dan L. Longo</i>	
93 Iron Deficiency and Other Hypoproliferative Anemias ...	683
<i>John W. Adamson</i>	
94 Disorders of Hemoglobin.....	690
<i>Edward J. Benz, Jr.</i>	
95 Megaloblastic Anemias .....	698
<i>A. Victor Hoffbrand</i>	
96 Hemolytic Anemias .....	708
<i>Lucio Luzzatto</i>	
97 Anemia Due to Acute Blood Loss .....	723
<i>Dan L. Longo</i>	
98 Bone Marrow Failure Syndromes Including Aplastic Anemia and Myelodysplasia.....	723
<i>Neal S. Young</i>	
99 Polycythemia Vera and Other Myeloproliferative Neoplasms .....	733
<i>Jerry L. Spivak</i>	
100 Acute Myeloid Leukemia.....	739
<i>William Blum, Clara D. Bloomfield</i>	
101 Chronic Myeloid Leukemia.....	748
<i>Hagop Kantarjian, Jorge Cortes</i>	
102 Acute Lymphoid Leukemia .....	757
<i>Dieter Hoelzer</i>	
103 Chronic Lymphocytic Leukemia .....	763
<i>Jennifer A. Woyach, John C. Byrd</i>	
104 Non-Hodgkin's Lymphoma .....	769
<i>Caron A. Jacobson, Dan L. Longo</i>	
105 Hodgkin's Lymphoma.....	780
<i>Caron A. Jacobson, Dan L. Longo</i>	
106 Less Common Hematologic Malignancies .....	783
<i>Ayalew Tefferi, Dan L. Longo</i>	
107 Plasma Cell Disorders .....	793
<i>Nikhil C. Munshi, Dan L. Longo, Kenneth C. Anderson</i>	
108 Amyloidosis .....	803
<i>John L. Berk, Vaishali Sanctorawala</i>	
109 Transfusion Biology and Therapy.....	809
<i>Jeffery S. Dzieckowski, Pierre Tiberghien, Kenneth C. Anderson</i>	
110 Hematopoietic Cell Transplantation.....	816
<i>Frederick R. Appelbaum</i>	

**SECTION 3 Disorders of Hemostasis**

111 Disorders of Platelets and Vessel Wall.....	822
<i>Barbara A. Konkle</i>	
112 Coagulation Disorders .....	830
<i>Valder R. Arruda, Katherine A. High</i>	
113 Arterial and Venous Thrombosis .....	839
<i>Jane E. Freedman, Joseph Loscalzo</i>	
114 Antiplatelet, Anticoagulant, and Fibrinolytic Drugs .....	843
<i>Jeffrey I. Weitz</i>	

**Infectious Diseases****SECTION 1 Basic Considerations in Infectious Diseases**

115 Approach to the Patient with an Infectious Disease.....	859
<i>Neeraj K. Surana, Dennis L. Kasper</i>	
116 Molecular Mechanisms of Microbial Pathogenesis.....	866
<i>Gerald B. Pier</i>	
117 Approach to the Acutely Ill Infected Febrile Patient.....	877
<i>Tamar F. Barlam, Dennis L. Kasper</i>	
118 Immunization Principles and Vaccine Use .....	884
<i>Nancy Messonnier, Anne Schuchat, Lisa A. Jackson</i>	
119 Health Recommendations for International Travel .....	892
<i>Jay S. Keystone, Phyllis E. Kozarsky</i>	
120 Climate Change and Infectious Disease.....	900
<i>Aaron S. Bernstein</i>	

**SECTION 2 Clinical Syndromes: Community-Acquired Infections**

121 Pneumonia .....	908
<i>Lionel A. Mandell, Richard Wunderink</i>	
122 Lung Abscess .....	919
<i>Rebecca M. Baron, Miriam Baron Barshak</i>	
123 Infective Endocarditis .....	921
<i>Adolf W. Karchmer</i>	
124 Infections of the Skin, Muscles, and Soft Tissues .....	933
<i>Dennis L. Stevens</i>	
125 Infectious Arthritis .....	939
<i>Lawrence C. Madoff</i>	
126 Osteomyelitis .....	944
<i>Werner Zimmerli</i>	
127 Intraabdominal Infections and Abscesses .....	952
<i>Miriam Baron Barshak, Dennis L. Kasper</i>	
128 Acute Infectious Diarrheal Diseases and Bacterial Food Poisoning .....	959
<i>Richelle C. Charles, Stephen B. Calderwood, Regina C. LaRocque</i>	
129 <i>Clostridium difficile</i> Infection, Including Pseudomembranous Colitis .....	964
<i>Dale N. Gerding, Stuart Johnson</i>	
130 Urinary Tract Infections, Pyelonephritis, and Prostatitis .....	968
<i>Kalpana Gupta, Barbara W. Trautner</i>	
131 Sexually Transmitted Infections: Overview and Clinical Approach.....	976
<i>Jeanne M. Marrazzo, King K. Holmes</i>	
132 Encephalitis .....	991
<i>Karen L. Roos, Kenneth L. Tyler</i>	
133 Acute Meningitis .....	998
<i>Karen L. Roos, Kenneth L. Tyler</i>	
134 Chronic and Recurrent Meningitis .....	1007
<i>Walter J. Koroshetz, Michael R. Wilson, Avindra Nath</i>	
135 Brain Abscess and Empyema.....	1013
<i>Karen L. Roos, Kenneth L. Tyler</i>	
136 Infectious Complications of Bites.....	1019
<i>Sandeep S. Jubbal, Florencia Pereyra, Lawrence C. Madoff</i>	

## Clinical Syndromes: Health Care-Associated Infections

- 137 Infections Acquired in Health Care Facilities ..... 1022  
*Robert A. Weinstein*
- 138 Infections in Transplant Recipients ..... 1030  
*Robert W. Finberg, Joyce D. Fingerot*

## Therapy for Bacterial Diseases

- 139 Treatment and Prophylaxis of Bacterial Infections ..... 1042  
*David C. Hooper, Erica S. Shenoy, Christy A. Varughese*
- 140 Bacterial Resistance to Antimicrobial Agents ..... 1057  
*David C. Hooper*

## Diseases Caused by Gram-Positive Bacteria

- 141 Pneumococcal Infections ..... 1062  
*David Goldblatt, Katherine L. O'Brien*
- 142 Staphylococcal Infections ..... 1071  
*Franklin D. Lowy*
- 143 Streptococcal Infections ..... 1081  
*Michael R. Wessels*
- 144 Enterococcal Infections ..... 1089  
*Cesar A. Arias, Barbara E. Murray*
- 145 Diphtheria and Other Corynebacterial Infections ..... 1095  
*William R. Bishai, John R. Murphy*
- 146 *Listeria monocytogenes* Infections ..... 1100  
*Elizabeth L. Hohmann, Daniel A. Portnoy*
- 147 Tetanus ..... 1102  
*C. Louise Thwaites, Lam Minh Yen*
- 148 Botulism ..... 1105  
*Agam K. Rao, Susan Maslanka*
- 149 Gas Gangrene and Other Clostridial Infections ..... 1109  
*Amy E. Bryant, Dennis L. Stevens*

## Diseases Caused by Gram-Negative Bacteria

- 150 Meningococcal Infections ..... 1114  
*Andrew J. Pollard*
- 151 Gonococcal Infections ..... 1122  
*Sanjay Ram, Peter A. Rice*
- 152 *Haemophilus* and *Moraxella* Infections ..... 1129  
*Timothy F. Murphy*
- 153 Infections Due to the HACEK Group and Miscellaneous Gram-Negative Bacteria ..... 1134  
*Tamar F. Barlam, Dennis L. Kasper*
- 154 *Legionella* Infections ..... 1137  
*Victor L. Yu, M. Luisa Pedro-Botet, Yusen E. Lin*
- 155 Pertussis and Other *Bordetella* Infections ..... 1142  
*Karina A. Top, Scott A. Halperin*
- 156 Diseases Caused by Gram-Negative Enteric Bacilli ..... 1146  
*Thomas A. Russo, James R. Johnson*
- 157 *Acinetobacter* Infections ..... 1158  
*Rossana Rosa, L. Silvia Munoz-Price*
- 158 *Helicobacter pylori* Infections ..... 1162  
*John C. Atherton, Martin J. Blaser*
- 159 Infections Due to *Pseudomonas*, *Burkholderia*, and *Stenotrophomonas* Species ..... 1167  
*Reuben Ramphal*

- 160 Salmonellosis ..... 1173  
*David A. Pegues, Samuel I. Miller*

- 161 Shigellosis ..... 1180  
*Philippe J. Sansonetti, Jean Bergounioux*

- 162 Infections Due to *Campylobacter* and Related Organisms ..... 1184  
*Beth D. Kirkpatrick, Martin J. Blaser*

- 163 Cholera and Other Vibrios ..... 1186  
*Matthew K. Waldor, Edward T. Ryan*

- 164 Brucellosis ..... 1192  
*Nicholas J. Beeching*

- 165 Tularemia ..... 1196  
*Jeannine M. Petersen, Paul S. Mead*

- 166 Plague and Other *Yersinia* Infections ..... 1200  
*Michael B. Prentice*

- 167 *Bartonella* Infections, Including Cat-Scratch Disease ..... 1209  
*Michael Giladi, Moshe Ephros*

- 168 Donovanosis ..... 1214  
*Nigel O'Farrell*

## Miscellaneous Bacterial Infections

- 169 Nocardiosis ..... 1215  
*Gregory A. Filice*
- 170 Actinomycosis ..... 1220  
*Thomas A. Russo*
- 171 Whipple's Disease ..... 1223  
*Thomas A. Russo*
- 172 Infections Due to Mixed Anaerobic Organisms ..... 1227  
*Neeraj K. Surana, Dennis L. Kasper*

## Mycobacterial Diseases

- 173 Tuberculosis ..... 1236  
*Mario C. Ravaglione*
- 174 Leprosy ..... 1259  
*Robert H. Gelber*
- 175 Nontuberculous Mycobacterial Infections ..... 1266  
*Steven M. Holland*
- 176 Antimycobacterial Agents ..... 1270  
*Divya Reddy, Max R. O'Donnell*

## Spirochetal Diseases

- 177 Syphilis ..... 1279  
*Sheila A. Lukehart*
- 178 Endemic Treponematoses ..... 1286  
*Sheila A. Lukehart*
- 179 Leptospirosis ..... 1290  
*Jiri F. P. Wagenaar, Marga G. A. Goris*
- 180 Relapsing Fever ..... 1295  
*Alan G. Barbour*
- 181 Lyme Borreliosis ..... 1298  
*Allen C. Steere*

## Diseases Caused by Rickettsiae, Mycoplasmas, and Chlamydiae

- 182 Rickettsial Diseases ..... 1303  
*David H. Walker, J. Stephen Dumler, Lucas S. Blanton, Thomas Marrie*

183 Infections Due to Mycoplasmas .....	1313
<i>R. Doug Hardy</i>	
184 Chlamydial Infections .....	1316
<i>Charlotte A. Gaydos, Thomas C. Quinn</i>	

## SECTION 11 Viral Diseases: General Considerations

185 Medical Virology .....	1325
<i>Fred Wang, Elliott Kieff</i>	
186 Antiviral Chemotherapy, Excluding Antiretroviral Drugs .....	1334
<i>Lindsey R. Baden</i>	

## SECTION 12 Infections Due to DNA Viruses

187 Herpes Simplex Virus Infections .....	1345
<i>Lawrence Corey</i>	
188 Varicella-Zoster Virus Infections .....	1354
<i>Richard J. Whitley</i>	
189 Epstein-Barr Virus Infections, Including Infectious Mononucleosis .....	1358
<i>Jeffrey I. Cohen</i>	
190 Cytomegalovirus and Human Herpesvirus Types 6, 7, and 8 .....	1361
<i>Camille Nelson Kotton, Martin S. Hirsch</i>	
191 Molluscum Contagiosum, Monkeypox, and Other Poxvirus Infections .....	1366
<i>Fred Wang</i>	
192 Parvovirus Infections .....	1367
<i>Kevin E. Brown</i>	
193 Human Papillomavirus Infections .....	1370
<i>Darron R. Brown, Aaron Ermel</i>	

## SECTION 13 Infections Due to DNA and RNA Respiratory Viruses

194 Common Viral Respiratory Infections .....	1375
<i>James E. Crowe, Jr.</i>	
195 Influenza .....	1382
<i>Peter F. Wright</i>	

## SECTION 14 Infections Due to Human Immunodeficiency Virus and Other Human Retroviruses

196 The Human Retroviruses .....	1388
<i>Dan L. Longo, Anthony S. Fauci</i>	
197 Human Immunodeficiency Virus Disease: AIDS and Related Disorders .....	1393
<i>Anthony S. Fauci, Gregory K. Folkers, H. Clifford Lane</i>	

## SECTION 15 Infections Due to RNA Viruses

198 Viral Gastroenteritis .....	1463
<i>Umesh D. Parashar, Roger I. Glass</i>	
199 Enterovirus, Parechovirus, and Reovirus Infections .....	1468
<i>Jeffrey I. Cohen</i>	
200 Measles (Rubeola) .....	1474
<i>Kaitlin Rainwater-Lovett, William J. Moss</i>	
201 Rubella (German Measles) .....	1478
<i>Laura A. Zimmerman, Susan E. Reef</i>	
202 Mumps .....	1481
<i>Steven A. Rubin</i>	

203 Rabies and Other Rhabdovirus Infections .....	1484
<i>Alan C. Jackson</i>	
204 Arthropod-Borne and Rodent-Borne Virus Infections .....	1489
<i>Jens H. Kuhn, Rémi N. Charrel</i>	
205 Ebolavirus and Marburgvirus Infections .....	1509
<i>Jens H. Kuhn</i>	

## SECTION 16 Fungal Infections

206 Diagnosis and Treatment of Fungal Infections .....	1515
<i>John E. Edwards, Jr.</i>	
207 Histoplasmosis .....	1518
<i>Chadi A. Hage, L. Joseph Wheat</i>	
208 Coccidioidomycosis .....	1521
<i>Neil M. Ampel</i>	
209 Blastomycosis .....	1524
<i>S. Travis King, Rathel L. Nolan, III</i>	
210 Cryptococcosis .....	1526
<i>Arturo Casadevall</i>	
211 Candidiasis .....	1529
<i>John E. Edwards, Jr.</i>	
212 Aspergillosis .....	1532
<i>David W. Denning</i>	
213 Mucormycosis .....	1537
<i>Brad Spellberg, Ashraf S. Ibrahim</i>	
214 Superficial Mycoses and Less Common Systemic Mycoses .....	1541
<i>Carol A. Kauffman</i>	
215 <i>Pneumocystis</i> Infections .....	1547
<i>Alison Morris, Henry Masur</i>	

## SECTION 17 Protozoal and Helminthic Infections: General Considerations

216 Introduction to Parasitic Infections .....	1551
<i>Sharon L. Reed, Charles E. Davis</i>	
217 Agents Used to Treat Parasitic Infections .....	1556
<i>Thomas A. Moore</i>	

## SECTION 18 Protozoal Infections

218 Amebiasis and Infection with Free-Living Amebae .....	1568
<i>Rosa M. Andrade, Sharon L. Reed</i>	
219 Malaria .....	1575
<i>Nicholas J. White, Elizabeth A. Ashley</i>	
220 Babesiosis .....	1590
<i>Edouard Vannier, Peter J. Krause</i>	
221 Leishmaniasis .....	1594
<i>Shyam Sundar</i>	
222 Chagas Disease and African Trypanosomiasis .....	1601
<i>François Chappuis, Yves Jackson</i>	
223 <i>Toxoplasma</i> Infections .....	1609
<i>Kami Kim</i>	
224 Protozoal Intestinal Infections and Trichomoniasis .....	1615
<i>Peter F. Weller</i>	

## SECTION 19 Helminthic Infections

225 Introduction to Helminthic Infections .....	1620
<i>Peter F. Weller</i>	

226 Trichinellosis and Other Tissue Nematode Infections...	1621
Peter F. Weller	
227 Intestinal Nematode Infections .....	1625
Peter F. Weller, Thomas B. Nutman	
228 Filarial and Related Infections.....	1629
Thomas B. Nutman, Peter F. Weller	
229 Schistosomiasis and Other Trematode Infections.....	1635
Birgitte Jyding Vennervald	
230 Cestode Infections .....	1641
A. Clinton White, Jr., Peter F. Weller	

## Disorders of the Cardiovascular System

### Introduction to Cardiovascular Disorders

231 Approach to the Patient with Possible Cardiovascular Disease .....	1649
Joseph Loscalzo	
232 Basic Biology of the Cardiovascular System .....	1651
Joseph Loscalzo, Peter Libby, Calum A. MacRae	
233 Epidemiology of Cardiovascular Disease .....	1662
Thomas A. Gaziano, J. Michael Gaziano	

### Diagnosis of Cardiovascular Disorders

234 Physical Examination of the Cardiovascular System ....	1666
Patrick T. O'Gara, Joseph Loscalzo	
235 Electrocardiography .....	1675
Ary L. Goldberger	
236 Noninvasive Cardiac Imaging: Echocardiography, Nuclear Cardiology, and Magnetic Resonance/ Computed Tomography Imaging.....	1683
Marcelo F. Di Carli, Raymond Y. Kwong, Scott D. Solomon	
237 Diagnostic Cardiac Catheterization and Coronary Angiography .....	1709
Jane A. Leopold, David P. Faxon	

### Disorders of Rhythm

238 Principles of Electrophysiology.....	1716
David D. Spragg, Gordon F. Tomaselli	
239 The Bradyarrhythmias: Disorders of the Sinoatrial Node.....	1722
David D. Spragg, Gordon F. Tomaselli	
240 The Bradyarrhythmias: Disorders of the Atrioventricular Node.....	1727
David D. Spragg, Gordon F. Tomaselli	
241 Approach to Supraventricular Tachyarrhythmias .....	1733
Gregory F. Michaud, William G. Stevenson	
242 Physiologic and Nonphysiologic Sinus Tachycardia.....	1735
Gregory F. Michaud, William G. Stevenson	
243 Focal Atrial Tachycardia.....	1736
Gregory F. Michaud, William G. Stevenson	
244 Paroxysmal Supraventricular Tachycardias .....	1739
Gregory F. Michaud, William G. Stevenson	
245 Common Atrial Flutter, Macroreentrant, and Multifocal Atrial Tachycardias .....	1743
Gregory F. Michaud, William G. Stevenson	

246 Atrial Fibrillation.....	1746
Gregory F. Michaud, William G. Stevenson	
247 Approach to Ventricular Arrhythmias.....	1750
Roy M. John, William G. Stevenson	
248 Premature Ventricular Beats, Non-Sustained Ventricular Tachycardia, and Idioventricular Rhythm ...	1755
Roy M. John, William G. Stevenson	
249 Sustained Ventricular Tachycardia .....	1757
Roy M. John, William G. Stevenson	
250 Polymorphic Ventricular Tachycardia and Ventricular Fibrillation .....	1759
Roy M. John, William G. Stevenson	
251 Electrical Storm and Incessant VT .....	1762
Roy M. John, William G. Stevenson	

### Disorders of the Heart

252 Heart Failure: Pathophysiology and Diagnosis.....	1763
Douglas L. Mann, Murali Chakinala	
253 Heart Failure: Management .....	1769
Mandeep R. Mehra	
254 Cardiomyopathy and Myocarditis.....	1779
Neal K. Lakdawala, Lynne Warner Stevenson, Joseph Loscalzo	
255 Cardiac Transplantation and Prolonged Assisted Circulation .....	1797
Mandeep R. Mehra	
256 Aortic Valve Disease .....	1802
Patrick T. O'Gara, Joseph Loscalzo	
257 Aortic Regurgitation.....	1809
Patrick T. O'Gara, Joseph Loscalzo	
258 Mitral Stenosis .....	1813
Patrick T. O'Gara, Joseph Loscalzo	
259 Mitral Regurgitation.....	1818
Patrick T. O'Gara, Joseph Loscalzo	
260 Mitral Valve Prolapse .....	1821
Patrick T. O'Gara, Joseph Loscalzo	
261 Tricuspid Valve Disease.....	1823
Patrick T. O'Gara, Joseph Loscalzo	
262 Pulmonic Valve Disease.....	1826
Patrick T. O'Gara, Joseph Loscalzo	
263 Multiple and Mixed Valvular Heart Disease.....	1827
Patrick T. O'Gara, Joseph Loscalzo	
264 Congenital Heart Disease in the Adult .....	1829
Anne Marie Valente, Michael J. Landzberg	
265 Pericardial Disease .....	1841
Eugene Braunwald	
266 Atrial Myxoma and Other Cardiac Tumors.....	1847
Eric H. Awtry	

### Coronary and Peripheral Vascular Disease

267 Ischemic Heart Disease.....	1850
Elliott M. Antman, Joseph Loscalzo	
268 Non-ST-Segment Elevation Acute Coronary Syndrome (Non-ST-Segment Elevation Myocardial Infarction and Unstable Angina) .....	1866
Robert P. Giugliano, Christopher P. Cannon, Eugene Braunwald	



269 ST-Segment Elevation Myocardial Infarction .....	1872
<i>Elliott M. Antman, Joseph Loscalzo</i>	
270 Percutaneous Coronary Interventions and Other Interventional Procedures .....	1885
<i>David P. Faxon, Deepak L. Bhatt</i>	
271 Hypertensive Vascular Disease .....	1890
<i>Theodore A. Kotchen</i>	
272 Renovascular Disease.....	1906
<i>Stephen C. Texier</i>	
273 Deep Venous Thrombosis and Pulmonary Thromboembolism .....	1910
<i>Samuel Z. Goldhaber</i>	
274 Diseases of the Aorta.....	1917
<i>Mark A. Creager, Joseph Loscalzo</i>	
275 Arterial Diseases of the Extremities.....	1923
<i>Mark A. Creager, Joseph Loscalzo</i>	
276 Chronic Venous Disease and Lymphedema .....	1930
<i>Mark A. Creager, Joseph Loscalzo</i>	
277 Pulmonary Hypertension .....	1935
<i>Aaron B. Waxman, Joseph Loscalzo</i>	

**PART 8 Critical Care Medicine****SECTION 1 Respiratory Critical Care**

293 Approach to the Patient with Critical Illness.....	2023
<i>John P. Kress, Jesse B. Hall</i>	
294 Acute Respiratory Distress Syndrome .....	2030
<i>Rebecca M. Baron, Bruce D. Levy</i>	
295 Mechanical Ventilatory Support.....	2035
<i>Bartolome R. Celli</i>	

**SECTION 2 Shock and Cardiac Arrest**

296 Approach to the Patient with Shock .....	2039
<i>Anthony F. Massaro</i>	
297 Sepsis and Septic Shock .....	2044
<i>Christopher W. Seymour, Derek C. Angus</i>	
298 Cardiogenic Shock and Pulmonary Edema.....	2052
<i>David H. Ingbar, Holger Thiele</i>	
299 Cardiovascular Collapse, Cardiac Arrest, and Sudden Cardiac Death.....	2059
<i>Christine M. Albert, William G. Stevenson</i>	

**SECTION 3 Neurologic Critical Care**

300 Coma.....	2068
<i>S. Andrew Josephson, Allan H. Ropper, Stephen L. Hauser</i>	
301 Severe Acute Encephalopathies and Critical Care Weakness .....	2074
<i>J. Claude Hemphill, III, Wade S. Smith, S. Andrew Josephson, Daryl R. Gress</i>	
302 Subarachnoid Hemorrhage .....	2084
<i>J. Claude Hemphill, III, Wade S. Smith, Daryl R. Gress</i>	

**PART 9 Disorders of the Kidney and  
Urinary Tract**

303 Cellular and Molecular Biology of the Kidney.....	2089
<i>Alfred L. George, Jr., Eric G. Neilson</i>	
304 Acute Kidney Injury.....	2099
<i>Sushrut S. Waikar, Joseph V. Bonventre</i>	
305 Chronic Kidney Disease.....	2111
<i>Joanne M. Bargman, Karl L. Skorecki</i>	
306 Dialysis in the Treatment of Renal Failure .....	2121
<i>Kathleen D. Liu, Glenn M. Chertow</i>	
307 Transplantation in the Treatment of Renal Failure .....	2126
<i>Jamil Azzi, Edgar L. Milford, Mohamed H. Sayegh, Anil Chandraker</i>	
308 Glomerular Diseases .....	2132
<i>Julia B. Lewis, Eric G. Neilson</i>	
309 Polycystic Kidney Disease and Other Inherited Disorders of Tubule Growth and Development.....	2150
<i>Jing Zhou, Martin R. Pollak</i>	
310 Tubulointerstitial Diseases of the Kidney.....	2157
<i>Laurence H. Beck, Jr., David J. Salant</i>	
311 Vascular Injury to the Kidney .....	2164
<i>Ronald S. Go, Nelson Leung</i>	
312 Nephrolithiasis .....	2168
<i>Gary C. Curhan</i>	
313 Urinary Tract Obstruction .....	2173
<i>Julian L. Seifert</i>	

## **SECTION II Disorders of the Gastrointestinal System**

### **Disorders of the Alimentary Tract**

314 Approach to the Patient with Gastrointestinal Disease..	2177
<i>William L. Hasler, Chung Owyang</i>	
315 Gastrointestinal Endoscopy .....	2182
<i>Louis Michel Wong Kee Song, Mark Topazian</i>	
316 Diseases of the Esophagus.....	2209
<i>Peter J. Kahrilas, Ikuo Hirano</i>	
317 Peptic Ulcer Disease and Related Disorders .....	2220
<i>John Del Valle</i>	
318 Disorders of Absorption.....	2244
<i>Henry J. Binder</i>	
319 Inflammatory Bowel Disease.....	2258
<i>Sonia Friedman, Richard S. Blumberg</i>	
320 Irritable Bowel Syndrome.....	2276
<i>Chung Owyang</i>	
321 Diverticular Disease and Common Anorectal Disorders.....	2283
<i>Rizwan Ahmed, Susan L. Gearhart</i>	
322 Mesenteric Vascular Insufficiency.....	2291
<i>Satinderjit Locharia, Mahmoud Malas</i>	
323 Acute Intestinal Obstruction.....	2294
<i>Danny O. Jacobs</i>	
324 Acute Appendicitis and Peritonitis .....	2298
<i>Danny O. Jacobs</i>	

### **Nutrition**

325 Nutrient Requirements and Dietary Assessment.....	2303
<i>Johanna Dwyer</i>	
326 Vitamin and Trace Mineral Deficiency and Excess.....	2309
<i>Paolo M. Suter, Robert M. Russell</i>	
327 Malnutrition and Nutritional Assessment .....	2319
<i>Gordon L. Jensen</i>	
328 Enteral and Parenteral Nutrition .....	2324
<i>L. John Hoffer, Bruce R. Bistrian, David F. Driscoll</i>	

### **Liver and Biliary Tract Disease**

329 Approach to the Patient with Liver Disease .....	2332
<i>Marc G. Ghany, Jay H. Hoofnagle</i>	
330 Evaluation of Liver Function.....	2338
<i>Daniel S. Pratt</i>	
331 The Hyperbilirubinemias .....	2342
<i>Allan W. Wolff</i>	
332 Acute Viral Hepatitis .....	2347
<i>Jules L. Dienstag</i>	
333 Toxic and Drug-Induced Hepatitis.....	2366
<i>William M. Lee, Jules L. Dienstag</i>	
334 Chronic Hepatitis .....	2375
<i>Jules L. Dienstag</i>	
335 Alcoholic Liver Disease.....	2399
<i>Mark E. Mailliard, Michael F. Sorrell</i>	
336 Nonalcoholic Fatty Liver Diseases and Nonalcoholic Steatohepatitis .....	2401
<i>Manal F. Abdelmalek, Anna Mae Diehl</i>	

### **337 Cirrhosis and Its Complications .....**

*Bruce R. Bacon*

2405

### **338 Liver Transplantation.....**

*Raymond T. Chung, Jules L. Dienstag*

2414

### **339 Diseases of the Gallbladder and Bile Ducts.....**

*Norton J. Greenberger, Gustav Paumgartner*

2422

### **SECTION III Disorders of the Pancreas**

#### **340 Approach to the Patient with Pancreatic Disease.....**

*Darwin L. Conwell, Norton J. Greenberger,  
Peter A. Banks*

2433

#### **341 Acute and Chronic Pancreatitis .....**

*Darwin L. Conwell, Peter A. Banks, Norton J. Greenberger*

2437

### **SECTION IV Immune-Mediated, Inflammatory, and Rheumatologic Disorders**

#### **SECTION V The Immune System in Health and Disease**

##### **342 Introduction to the Immune System.....**

*Barton F. Haynes, Kelly A. Soderberg, Anthony S. Fauci*

2451

##### **343 The Major Histocompatibility Complex .....**

*Gerald T. Nepom*

2480

##### **344 Primary Immune Deficiency Diseases .....**

*Alain Fischer*

2488

### **SECTION VI Disorders of Immune-Mediated Injury**

#### **345 Urticaria, Angioedema, and Allergic Rhinitis.....**

*Katherine N. Cahill, Joshua A. Boyce*

2498

#### **346 Anaphylaxis .....**

*David Hong, Joshua A. Boyce*

2506

#### **347 Mastocytosis .....**

*Cem Akin, Joshua A. Boyce*

2508

#### **348 Autoimmunity and Autoimmune Diseases .....**

*Betty Diamond, Peter E. Lipsky*

2510

#### **349 Systemic Lupus Erythematosus.....**

*Bevra Hannahs Hahn*

2515

#### **350 Antiphospholipid Syndrome .....**

*Haralampos M. Moutsopoulos*

2526

#### **351 Rheumatoid Arthritis.....**

*Ankoor Shah, E. William St. Clair*

2527

#### **352 Acute Rheumatic Fever .....**

*Jonathan R. Carapetis*

2541

#### **353 Systemic Sclerosis (Scleroderma) and Related Disorders.....**

*John Varga*

2546

#### **354 Sjögren's Syndrome .....**

*Haralampos M. Moutsopoulos*

2560

#### **355 The Spondyloarthritides .....**

*Joel D. Taurog*

2563

#### **356 The Vasculitis Syndromes .....**

*Carol A. Langford, Anthony S. Fauci*

2574

#### **357 Behcet's Syndrome.....**

*Haralampos M. Moutsopoulos*

2589

#### **358 Inflammatory Myopathies.....**

*Steven A. Greenberg, Anthony A. Amato*

2590

#### **359 Relapsing Polychondritis.....**

*Carol A. Langford*

2597

360 Sarcoidosis.....	2600
<i>Robert P. Baughman, Elyse E. Lower</i>	
361 IgG4-Related Disease.....	2607
<i>John H. Stone</i>	
362 Familial Mediterranean Fever and Other Hereditary Autoinflammatory Diseases .....	2610
<i>Daniel L. Kastner</i>	

**SECTION 2 Sex- and Gender-Based Medicine**

383 Disorders of Sex Development .....	2760
<i>John C. Achermann, J. Larry Jameson</i>	
384 Disorders of the Testes and Male Reproductive System.....	2769
<i>Shalender Bhansali, J. Larry Jameson</i>	
385 Disorders of the Female Reproductive System .....	2787
<i>Janet E. Hall</i>	
386 Menstrual Disorders and Pelvic Pain .....	2794
<i>Janet E. Hall</i>	
387 Hirsutism .....	2799
<i>David A. Ehrmann</i>	
388 Menopause and Postmenopausal Hormone Therapy ....	2803
<i>JoAnn E. Manson, Shari S. Bassuk</i>	
389 Infertility and Contraception .....	2810
<i>Janet E. Hall</i>	
390 Sexual Dysfunction.....	2816
<i>Kevin T. McVary</i>	
391 Women's Health.....	2823
<i>Andrea Dunaif</i>	
392 Men's Health .....	2828
<i>Shalender Bhansali, Shehzad Basaria</i>	
393 Lesbian, Gay, Bisexual, and Transgender (LGBT) Health .....	2835
<i>Baligh R. Yehia, Harvey J. Makadon</i>	

**PART 12 Endocrinology and Metabolism****SECTION 1 Endocrinology**

369 Approach to the Patient with Endocrine Disorders .....	2649
<i>J. Larry Jameson</i>	
370 Mechanisms of Hormone Action .....	2653
<i>J. Larry Jameson</i>	
371 Physiology of Anterior Pituitary Hormones .....	2659
<i>Shlomo Melmed, J. Larry Jameson</i>	
372 Hypopituitarism .....	2664
<i>Shlomo Melmed, J. Larry Jameson</i>	
373 Pituitary Tumor Syndromes .....	2670
<i>Shlomo Melmed, J. Larry Jameson</i>	
374 Disorders of the Neurohypophysis .....	2684
<i>Gary L. Robertson</i>	
375 Thyroid Gland Physiology and Testing.....	2692
<i>J. Larry Jameson, Susan J. Mandel, Anthony P. Weetman</i>	
376 Hypothyroidism.....	2698
<i>J. Larry Jameson, Susan J. Mandel, Anthony P. Weetman</i>	
377 Hyperthyroidism.....	2703
<i>J. Larry Jameson, Susan J. Mandel, Anthony P. Weetman</i>	
378 Thyroid Nodular Disease and Thyroid Cancer.....	2710
<i>J. Larry Jameson, Susan J. Mandel, Anthony P. Weetman</i>	
379 Disorders of the Adrenal Cortex.....	2719
<i>Wiebke Arlt</i>	
380 Pheochromocytoma .....	2739
<i>Hartmut P. H. Neumann</i>	
381 Multiple Endocrine Neoplasia.....	2746
<i>R. V. Thakker</i>	
382 Autoimmune Polyendocrine Syndromes .....	2756
<i>Peter A. Gottlieb, Aaron W. Michels</i>	

**SECTION 2 Obesity, Diabetes Mellitus, and Metabolic Syndrome**

394 Pathobiology of Obesity.....	2837
<i>Jeffrey S. Flier, Eleftheria Maratos-Flier</i>	
395 Evaluation and Management of Obesity.....	2843
<i>Robert F. Kushner</i>	
396 Diabetes Mellitus: Diagnosis, Classification, and Pathophysiology.....	2850
<i>Alvin C. Powers, Kevin D. Niswender, Carmella Evans-Molina</i>	
397 Diabetes Mellitus: Management and Therapies .....	2859
<i>Alvin C. Powers, Kevin D. Niswender, Michael R. Rickels</i>	
398 Diabetes Mellitus: Complications .....	2875
<i>Alvin C. Powers, John M. Stafford, Michael R. Rickels</i>	
399 Hypoglycemia .....	2883
<i>Philip E. Cryer, Stephen N. Davis</i>	
400 Disorders of Lipoprotein Metabolism.....	2889
<i>Daniel J. Rader, Sekar Kathiresan</i>	
401 The Metabolic Syndrome.....	2903
<i>Robert H. Eckel</i>	

**SECTION 3 Disorders of Bone and Mineral Metabolism**

402 Bone and Mineral Metabolism in Health and Disease.....	2909
<i>F. Richard Bringhurst, Marie B. Demay, Henry M. Kronenberg</i>	
403 Disorders of the Parathyroid Gland and Calcium Homeostasis .....	2921
<i>John T. Potts, Jr., Harald W. Jüppner</i>	
404 Osteoporosis.....	2942
<i>Robert Lindsay, Felicia Cosman</i>	

405 Paget's Disease and Other Dysplasias of Bone .....	2959	
<i>Murray J. Favus, Tamara J. Vokes</i>		
<b>SECTION 1 Disorders of Intermediary Metabolism</b>		
406 Heritable Disorders of Connective Tissue.....	2967	
<i>Darwin J. Prockop, John F. Bateman</i>		
407 Hemochromatosis.....	2977	
<i>Lawrie W. Powell</i>		
408 Wilson's Disease .....	2982	
<i>George J. Brewer</i>		
409 The Porphyrias .....	2984	
<i>Robert J. Desnick, Manisha Balwani</i>		
410 Disorders of Purine and Pyrimidine Metabolism .....	2997	
<i>John N. Mecchella, Christopher M. Burns</i>		
411 Lysosomal Storage Diseases .....	3003	
<i>Robert J. Hopkin, Gregory A. Grabowski</i>		
412 Glycogen Storage Diseases and Other Inherited Disorders of Carbohydrate Metabolism.....	3009	
<i>Priya S. Kishnani, Yuan-Tsong Chen</i>		
413 Inherited Disorders of Amino Acid Metabolism in Adults.....	3015	
<i>Nicola Longo</i>		
414 Inherited Defects of Membrane Transport .....	3020	
<i>Nicola Longo</i>		
<b>PART II Neurologic Disorders</b>		
<b>SECTION 1 Diagnosis of Neurologic Disorders</b>		
415 Approach to the Patient with Neurologic Disease .....	3025	
<i>Daniel H. Lowenstein, Joseph B. Martin, Stephen L. Hauser</i>		
416 Neuroimaging in Neurologic Disorders .....	3030	
<i>William P. Dillon</i>		
417 Pathobiology of Neurologic Diseases.....	3039	
<i>Stephen L. Hauser, Arnold R. Kriegstein, Stanley B. Prusiner</i>		
<b>SECTION 1 Diseases of the Central Nervous System</b>		
418 Seizures and Epilepsy.....	3050	
<i>Daniel H. Lowenstein</i>		
419 Cerebrovascular Diseases .....	3068	
<i>Wade S. Smith, S. Claiborne Johnston, J. Claude Hemphill, III</i>		
420 Ischemic Stroke .....	3079	
<i>Wade S. Smith, S. Claiborne Johnston, J. Claude Hemphill, III</i>		
421 Intracranial Hemorrhage.....	3091	
<i>Wade S. Smith, J. Claude Hemphill, III, S. Claiborne Johnston</i>		
422 Migraine and Other Primary Headache Disorders.....	3096	
<i>Peter J. Goadsby</i>		
423 Alzheimer's Disease .....	3108	
<i>William W. Seeley, Bruce L. Miller</i>		
424 Frontotemporal Dementia .....	3115	
<i>William W. Seeley, Bruce L. Miller</i>		
425 Vascular Dementia.....	3118	
<i>Joel Kramer, William W. Seeley, Bruce L. Miller</i>		
426 Dementia with Lewy Bodies.....	3119	
<i>William W. Seeley, Caroline M. Tanner, Bruce L. Miller</i>		
427 Parkinson's Disease .....	3120	
<i>C. Warren Olanow, Christine Klein, Anthony H. V. Schapira</i>		
428 Tremor, Chorea, and Other Movement Disorders.....	3132	
<i>C. Warren Olanow, Christine Klein, Jose A. Obeso</i>		
429 Amyotrophic Lateral Sclerosis and Other Motor Neuron Diseases .....	3141	
<i>Robert H. Brown, Jr.</i>		
430 Prion Diseases .....	3148	
<i>Stanley B. Prusiner, Bruce L. Miller</i>		
431 Ataxic Disorders .....	3154	
<i>Roger N. Rosenberg</i>		
432 Disorders of the Autonomic Nervous System.....	3158	
<i>Christopher H. Gibbons, John W. Engstrom</i>		
433 Trigeminal Neuralgia, Bell's Palsy, and Other Cranial Nerve Disorders.....	3166	
<i>M. Flint Beal, Stephen L. Hauser</i>		
434 Diseases of the Spinal Cord .....	3172	
<i>Stephen L. Hauser</i>		
435 Concussion and Other Traumatic Brain Injuries.....	3183	
<i>Geoffrey T. Manley, Stephen L. Hauser, Michael McCrea</i>		
436 Multiple Sclerosis .....	3188	
<i>Bruce A. C. Cree, Stephen L. Hauser</i>		
437 Neuromyelitis Optica .....	3202	
<i>Bruce A. C. Cree, Stephen L. Hauser</i>		
<b>SECTION 1 Nerve and Muscle Disorders</b>		
438 Peripheral Neuropathy .....	3204	
<i>Anthony A. Amato, Richard J. Barohn</i>		
439 Guillain-Barré Syndrome and Other Immune-Mediated Neuropathies .....	3225	
<i>Stephen L. Hauser, Anthony A. Amato</i>		
440 Myasthenia Gravis and Other Diseases of the Neuromuscular Junction .....	3232	
<i>Anthony A. Amato</i>		
441 Muscular Dystrophies and Other Muscle Diseases .....	3239	
<i>Anthony A. Amato, Robert H. Brown, Jr.</i>		
<b>SECTION 1 Chronic Fatigue Syndrome</b>		
442 Chronic Fatigue Syndrome .....	3254	
<i>Gijs Bleijenberg, Jos W. M. van der Meer</i>		
<b>SECTION 1 Psychiatric and Addiction Disorders</b>		
443 Biology of Psychiatric Disorders .....	3256	
<i>Robert O. Messing, Eric J. Nestler, Matthew W. State</i>		
444 Psychiatric Disorders .....	3262	
<i>Victor I. Reus</i>		
445 Alcohol and Alcohol Use Disorders .....	3277	
<i>Marc A. Schuckit</i>		
446 Opioid-Related Disorders .....	3284	
<i>Thomas R. Kosten, Colin N. Haile</i>		
447 Cocaine and Other Commonly Used Drugs .....	3287	
<i>Karran A. Phillips, Antonello Bonci</i>		
448 Nicotine Addiction .....	3292	
<i>David M. Burns</i>		
<b>PART III Poisoning, Drug Overdose, and Envenomation</b>		
449 Heavy Metal Poisoning .....	3297	
<i>Howard Hu</i>		
450 Poisoning and Drug Overdose .....	3300	
<i>Mark B. Mycyk</i>		

<p><b>PART 15 Disorders Associated with Environmental Exposures</b></p> <p>451 Disorders Caused by Venomous Snakebites and Marine Animal Exposures ..... 3313  <i>Charles Lei, Kirsten B. Hornbeak, Paul S. Auerbach, Robert L. Norris</i></p> <p>452 Ectoparasite Infestations and Arthropod Injuries ..... 3324  <i>Richard J. Pollack, Scott A. Norton</i></p>	<p>464 Clinical Problems Associated with the Aging Process.... 3420  <i>Joseph G. Ouslander, Bernardo Reyes</i></p>
<b>PART 16 Genes, the Environment, and Disease</b>	
<p>453 Altitude Illness ..... 3333  <i>Buddha Basnyat, Geoffrey Tabin</i></p> <p>454 Hypothermia and Peripheral Cold Injuries ..... 3338  <i>Daniel F. Danzl</i></p> <p>455 Heat-Related Illnesses ..... 3343  <i>Daniel F. Danzl</i></p>	<p><b>PART 19 Consultative Medicine</b></p> <p>465 Approach to Medical Consultation..... 3439  <i>Jack Ende, Jeffrey Berns</i></p> <p>466 Medical Disorders During Pregnancy..... 3440  <i>Robert L. Barbieri, John T. Repke</i></p> <p>467 Medical Evaluation of the Surgical Patient ..... 3446  <i>Prashant Vaishnava, Kim A. Eagle</i></p>
<b>PART 17 Global Medicine</b>	
<p>456 Principles of Human Genetics ..... 3347  <i>J. Larry Jameson, Peter Kopp</i></p> <p>457 The Practice of Genetics in Clinical Medicine ..... 3369  <i>Susan M. Domchek, J. Larry Jameson, Susan Miesfeldt</i></p> <p>458 Gene and Cell Based Therapy in Clinical Medicine ..... 3375  <i>Katherine A. High, Malcolm K. Brenner</i></p> <p>459 The Human Microbiome ..... 3379  <i>Neeraj K. Surana, Dennis L. Kasper</i></p>	<p><b>PART 20 Frontiers</b></p> <p>468 Behavioral Economics and Health..... 3453  <i>Kevin G. Volpp, George Loewenstein, David A. Asch</i></p> <p>469 Complementary, Alternative, and Integrative Health Approaches ..... 3462  <i>Josephine P. Briggs</i></p> <p>470 Telomere Disease..... 3466  <i>Rodrigo T. Calado, Neal S. Young</i></p> <p>471 The Role of Epigenetics in Disease and Treatment..... 3471  <i>Brian C. Capell, Shelley L. Berger</i></p> <p>472 Mitochondrial DNA and Heritable Traits and Diseases ..... 3476  <i>Karl L. Skorecki, Bruce H. Cohen</i></p> <p>473 Applications of Stem Cell Biology in Clinical Medicine ..... 3488  <i>John A. Kessler</i></p> <p>474 Microbial Genomics and Infectious Disease ..... 3491  <i>Roby P. Bhattacharyya, Yonatan H. Grad, Deborah T. Hung</i></p> <p>475 The Role of Circadian Biology in Health and Disease ..... 3504  <i>Jonathan Cedernaes, Kathryn Moynihan Ramsey, Joseph Bass</i></p> <p>476 Network Medicine: Systems Biology in Health and Disease ..... 3515  <i>Joseph Loscalzo</i></p> <p>477 Emerging Neurotherapeutic Technologies ..... 3522  <i>Jyoti Mishra, Karunesh Ganguly</i></p>
<b>PART 18 Aging</b>	
<p>463 The Biology of Aging ..... 3413  <i>Rafael de Cabo, David G. Le Couteur</i></p>	<p>Index ..... I-1</p>