# Contents

List of contributors vii  
Acknowledgments xi  

## Section I: The Pharmacological Basis for Parkinson’s Disease Treatment

1 The pharmacological basis of Parkinson’s disease therapy: an overview  
Néstor Gálvez-Jiménez, Hubert H. Fernandez, Alberto J. Espay and Susan H. Fox  

2 Anticholinergic agents in the management of Parkinson’s disease  
Juan Carlos Giugni and Ramon L. Rodríguez-Cruz  

3 Amantadine and antiglutamatergic drugs in the management of Parkinson’s disease  
Marco Onofrj, Valerio Frazzini, Laura Bonanni and Astrid Thomas  

4 Monoamine oxidase inhibitors in the management of Parkinson’s disease  
Sven-Eric Pålhagen  

5 Oral dopamine agonists in the management of Parkinson’s disease  
Javier Pagonabarraga, Juan Marin-Lahoz and Jaime Kulisevsky  

6 Subcutaneous, intranasal and transdermal dopamine agonists in the management of Parkinson’s disease  
Antoniya Todorova and K. Ray Chaudhuri  

7 Oral and infusion levodopa therapy in the management of Parkinson’s disease  
M. Angela Cenci-Nilsson and Per Odin  

8 Catechol-O-methyltransferase inhibitors in the management of Parkinson’s disease  
Ilana Schlesinger and Amos D. Korczyn  

9 Experimental pharmacological agents in the management of Parkinson’s disease  
Krishe Menezes, Lawrence W. Elmer and Robert A. Hauser  

## Section II: Management of Nonmotor Symptoms of Parkinson’s Disease

10 Management of autonomic dysfunction in Parkinson’s disease  
Shen-Yang Lim and Ai Huey Tan  

11 Management of cognitive impairment in Parkinson’s disease  
Dawn M. Schiehser, Eva Pirogovsky-Turk and Irene Litvan  

12 A neurobehavioralist approach to the management of cognitive impairment in Parkinson’s disease  
Po-Heng Tsai  

13 Management of disease-related behavioral disturbances in Parkinson’s disease  
Joseph H. Friedman  

14 Management of treatment-related behavioral disturbances in Parkinson’s disease  
Mayur Pandya, Dimitrios A. Nacopoulos and Naveed Khokhar  

15 Management of sleep disorders in Parkinson’s disease  
Daniela Calandrella and Alberto Albanese  

16 Management of pain and neuromuscular complications in Parkinson’s disease  
John A. Morren
Contents

Section III: Surgical Management of Parkinson’s Disease

17 Thalamotomy, pallidotomy and subthalamotomy in the management of Parkinson’s disease 175
   Malco Rossi, Daniel Cerquetti, Jorge Mandolesi and Marcelo Merello

18 Deep-brain stimulation of the globus pallidus internus in the management of Parkinson’s disease 187
   Lilia C. Lovera, Alberto J. Espay and Andrew P. Duker

19 Deep-brain stimulation of the subthalamic nucleus in the management of Parkinson’s disease 195
   David A. Schmerler, Alberto J. Espay and Andrew P. Duker

20 Deep-brain stimulation of the thalamic ventral intermediate nucleus in the management of Parkinson’s disease 206
   Diana Apetauerova, Jay L. Shils and Peter K. Dempsey

21 Emerging targets and other stimulation-related procedures in the management of Parkinson’s disease 216
   Tiago A. Mestre and Elena Moro

Section IV: Clinical Trials in Parkinson’s Disease: Lessons, Controversies and Challenges

22 Rating scales and clinical outcome measures in the evaluation of patients with Parkinson’s disease 231
   Pablo Martinez-Martin and Carmen Rodríguez-Blázquez

23 Functional imaging markers as outcome measures in clinical trials for Parkinson’s disease 242
   Ryan R. Walsh

24 Cerebrospinal fluid and blood biomarkers as outcome measures in clinical trials for Parkinson’s disease 249
   Thomas F. Tropea and Claire Henchcliffe

25 Lessons learned: neuroprotective trials in Parkinson’s disease 265
   Isabelle Beaulieu-Boire and Anthony E. Lang

26 Lessons learned: symptomatic trials in early Parkinson’s disease 280
   Ramon Lugo-Sanchez and Néstor Gálvez-Jiménez

27 Controversy: globus pallidus internus versus subthalamic nucleus deep-brain stimulation in the management of Parkinson’s disease 287
   Sarah K. Bourne, Sean J. Nagel and Darlene A. Lobel

28 Controversy: ablative surgery vs deep-brain stimulation in the management of Parkinson’s disease 297
   Gian D. Pal and Leo Verhagen Metman

29 Controversy: midstage vs advanced-stage deep-brain stimulation in the management of Parkinson’s disease 313
   Mallory L. Hacker and David Charles

30 Lessons and challenges of trials for cognitive and behavioral complications of Parkinson’s disease 325
   Daniel Weintraub and Lama M. Chahine

31 Lessons and challenges of trials for other nonmotor complications of Parkinson’s disease 337
   Federico E. Micheli and Carlos Zúñiga-Ramírez

32 Lessons and challenges of trials involving ancillary therapies for the management of Parkinson’s disease 349
   Chris J. Hass, Elizabeth L. Stegemöller, Madeleine E. Hackney and Joe R. Nocera

Index 361
Color plate section between pp. 324 and 325