

Contents

List of Contributors page ix

Preface xv

-
- 1 **Development of the Concept of Dystonia as a Disease, a Syndrome and a Movement Phenomenology** 1
Stanley Fahn
- Section I Basics**
- 2 **Classification of Dystonia** 9
Alberto Albanese and Stefania Lalli
- 3 **Primary or Idiopathic Dystonias ('Isolated Dystonia')** 15
Bettina Balint, Roberto Erro and Kailash P. Bhatia
- 4 **Non-Primary Dystonias** 20
Peter Kaňovský and Dirk Dressler
- 5 **Epidemiology of Dystonia** 27
Bulent Elibol and Gul Yalcin Cakmakli
- 6 **The Motor Network Model for Dystonia** 32
Hyder A. Jinnah and Ellen J. Hess
- 7 **Functional Imaging in Dystonia** 36
Scott A. Norris and Joel S. Perlmutter
- 8 **The Pathophysiology of Dystonia** 40
Jung E. Park, Sophie Cho and Mark Hallett
- 9 **Animal Models of Dystonia** 49
Marta Maltese, Paola Imbriani and Antonio Pisani
- 10 **Genetics of the Dystonias: Overview** 53
Aloysius Domingo and Christine Klein
- 11 **Dystonia: from Genomics to Proteomics and Beyond** 59
Thomas T. Warner and Daniela Hansen
- 12 **Dystonia and Tremor** 63
Ellen B. Penney and Elan D. Louis
- 13 **Posttraumatic Dystonia** 66
Karen Frei and Daniel Truong
- 14 **Non-Motor Symptoms in Dystonia** 68
Marjan Jahanshahi
- 15 **Scales for Assessment of Dystonia** 75
Cynthia L. Comella and Glenn T. Stebbins

- 16 **Theories Behind Dystonia Scale Development** 79
Sophie Cleanthous and Stefan J. Cano
- 17 **Linking Allied Health Professionals and Physicians: The IAB Model** 82
Fereshte Adib Saberi and Dirk Dressler
- 18 **The Role and Responsibility of the Dystonia Specialist Nurse** 85
Marianne King
- 19 **History of Dystonia Treatments** 87
Frank Erbguth
- 20 **Dystonia in Arts and Artists** 92
Hansjörg Bätzner and Christian Riederer
- Section II Botulinum Toxin Therapy**
- 21 **The Global Market for Botulinum Toxin** 99
Andy Pickett
- 22 **Molecular Mechanisms of Botulinum Toxin** 102
Ornella Rossetto and Cesare Montecucco
- 23 **Indirect Central Nervous System Effects of Botulinum Toxin** 106
Melanie Leigh D. Supnet and Raymond L. Rosales
- 24 **Direct Central Nervous System Effects of Botulinum Neurotoxin** 111
Matteo Caleo and Riccardo Mazzocchio
- 25 **Analgesic Effects of Botulinum Toxins** 115
Zdravko Lacković and Maja Relja
- 26 **Manufacture of Commercial Botulinum Neurotoxins for Human Treatment** 120
Eric A. Johnson
- 27 **Pharmacology of Botulinum Toxins** 128
Dirk Dressler and Keith Foster
- 28 **Immunology of Botulinum Toxin Therapy** 133
Dirk Dressler and Hans Bigalke
- 29 **Use of Non-A/Non-B Botulinum Toxins** 137
Roberto Eleopra

- 30 **Clinical Muscular Anatomy for the Botulinum Toxin Injector** 139
Mandar Jog and Robert Chen
- 31 **Ultrasound Guidance for Botulinum Toxin Application** 149
Uwe Walter and Dirk Dressler
- 32 **Treatment Algorithms and Injection Schemes for Botulinum Toxin Therapy of Dystonia** 154
Dirk Dressler
- 33 **Botulinum Toxin Therapy for Cervical Dystonia** 160
Mary Ann Thenganatt and Joseph Jankovic
- 34 **Botulinum Toxin Therapy for Cranial Dystonia** 167
Karoline Wenzel and Carlo Colosimo
- 35 **Botulinum Toxin Therapy for Spasmodic Dysphonia** 172
Christopher Tang and Andrew Blitzer
- 36 **Botulinum Toxin Therapy for Writer's Cramp and Other Focal Hand Dystonias** 178
Barbara Illovsy Karp
- 37 **Botulinum Toxin Therapy for Bruxism** 182
Olga Orlova
- 38 **Treatment of Blepharospasm With Eyelid-Opening Apraxia** 185
Rainer Laskawi and Dirk Dressler
- 39 **Organisation of a Botulinum Toxin Clinic** 189
Austen Peter Moore
- Section III Musician's Dystonia**
- 40 **Phenomenology of Musician's Dystonia** 195
Steven J. Frucht
- 41 **Aetiological Concepts of Musician's Dystonia** 202
Eckart Altenmüller and Christos I. Ioannou
- 42 **Treatment of Musician's Dystonia With Botulinum Toxin** 206
Miriam Sklerov and Seth L. Pullman
- 43 **Experimental Occupational and Brain Stimulation Therapies for Musician's Dystonia** 210
Eckart Altenmüller and Shinichi Furuya
- Section IV Psychogenic Dystonia**
- 44 **The Clinical Spectrum of Functional/Psychogenic Dystonia** 217
Thomas D. L. Steeves and Anthony E. Lang
- 45 **Diagnosis of Psychogenic Dystonias** 224
Carine W. Maurer and Mark Hallett
- Section V Treatment of Paediatric Dystonia**
- 46 **Intrathecal Baclofen for Dyskinetic Cerebral Palsy** 229
R. Jeroen Vermeulen, Laura A. Bonouevrie, Annemieke I. Buizer, Willem J. R. van Ouwerkerk, Jasper van Aalst, Onno Teernstra, Dan Soudant and Jules G. Becher
- 47 **Deep Brain Stimulation for the Treatment of Paediatric Dystonia** 233
Laura Cif and Philippe Coubes
- 48 **Deep Brain Stimulation for Small Children With Dystonia** 238
Keyoumars Ashkan and Jean-Pierre Lin
- Section VI Rehabilitation of Dystonia**
- 49 **Treatment Strategies for the Rehabilitation of Dystonia** 247
Teresa Jacobson Kimberley, Heidrun Pickenbrock and Lena Zetterberg
- 50 **Rehabilitation of Cervical Dystonia** 252
Jean-Pierre Bleton
- 51 **Rehabilitation and Plasticity of Task-Specific Focal Hand Dystonia** 256
Jaume Rosset-Llobet and Silvia Fàbregas-Molas
- Section VII Pharmacotherapy for Dystonia**
- 52 **Pharmacotherapy of Dystonia: an Overview** 263
Vladimir S. Kostić and Zvezdan Pirtošek
- 53 **Anticholinergics in the Treatment of Dystonia** 268
Michel Sáenz-Farret and Federico Micheli
- 54 **Tetrabenazine for the Treatment of Dystonia** 272
Christoph Schrader and Saeed A. Bohlega
- 55 **Treatment of Dopa-Responsive Dystonia** 279
Ryu Kim and Beomseok Jeon
- 56 **Treatment of Paroxysmal Dystonia** 292
Roberto Erro, Bettina Balint and Kailash P. Bhatia
- Section VIII Surgical Treatment of Dystonia**
- 57 **History of Surgical Treatments for Dystonia** 299
Joachim K. Krauss
- 58 **Selective Neurotomy for the Treatment of Dystonia** 306
Takaomi Taira, Shiro Horisawa, Nobuhiko Takeda and Tomoko Hanada
- 59 **Selective Peripheral Denervation for the Treatment of Cervical Dystonia** 310
James Palmer

60	Stereotactic Lesioning for the Treatment of Dystonia	315	76	Complications of Deep Brain Stimulation for Dystonia	404
	Robert E. Gross and Matthew A. Stern			Marwan Hariz and Gun-Marie Hariz	
61	Direct Cortical Stimulation for the Treatment of Dystonia	335			
	Giuseppe Messina, Giovanni Broggi, Roberto Cordella and Angelo Franzini				
Section IX Deep Brain Stimulation for Dystonia					
62	Functional Mechanisms of Deep Brain Stimulation in Dystonia	345	77	Experimental Occupational Therapies for Writer's Cramp	409
	Andrea A. Kühn and Angelo Quartarone			Arne Knutzen and Kirsten E. Zeuner	
63	Deep Brain Stimulation for Isolated Generalised Dystonia	352	78	Transcranial Electric and Magnetic Stimulation for Dystonia	414
	Binit B. Shah and Elena Moro			Ulf Ziemann	
64	Deep Brain Stimulation for Isolated Focal and Segmental Dystonia	356	79	Cannabinoids in Dystonias	420
	René Reese and Jens Volkmann			Eckart Altenmüller and André Lee	
65	Deep Brain Stimulation for Meige Syndrome	360			
	Joachim K. Krauss				
66	Contemporary Thalamotomy for Dystonia	363	80	Future Trends in Dystonia Research	427
	Takaomi Taira, Shiro Horisawa, Nobuhiko Takeda and Tomoko Hanada			Dirk Dressler, Eckart Altenmüller, Thomas Gasser, Mark Hallett and Joachim K. Krauss	
67	Deep Brain Stimulation for Myoclonus-Dystonia	368			
	Ausaf A. Bari and Andres M. Lozano				
68	Deep Brain Stimulation for Tardive Dystonia	372			
	Doreen Gruber and Andreas Kupsch				
69	Deep Brain Stimulation for Choreaathetosis in Cerebral Palsy	378			
	Marie Vidailhet and Christian Amlang				
70	Deep Brain Stimulation for Other Secondary Dystonias	382			
	Lars Timmermann and Anne Koy				
71	The Subthalamic Nucleus as a Deep Brain Stimulation Target for Dystonia	385			
	Jill L. Ostrem and Kelly A. Mills				
72	The Thalamus as a Target for Deep Brain Stimulation in Dystonia	389			
	Akshitkumar M. Mistry and Joseph S. Neimat				
73	Dystonia Patients Non-Responsive to Deep Brain Stimulation	392			
	Amande Pauls				
74	Akinesia Induced by Deep Brain Stimulation	397			
	Christian Blahak				
75	Programing Deep Brain Stimulation for Treatment of Dystonia	400			
	Christos Sidiropoulos, Paul Krack and Elena Moro				
Section X Emerging Therapies for Dystonia					
77	Experimental Occupational Therapies for Writer's Cramp	409			
	Arne Knutzen and Kirsten E. Zeuner				
78	Transcranial Electric and Magnetic Stimulation for Dystonia	414			
	Ulf Ziemann				
79	Cannabinoids in Dystonias	420			
	Eckart Altenmüller and André Lee				
Section XI Future Trends in Dystonia Therapy					
80	Future Trends in Dystonia Research	427			
	Dirk Dressler, Eckart Altenmüller, Thomas Gasser, Mark Hallett and Joachim K. Krauss				
Appendix I Dystonia Medical Research Foundation: 40 Years of Patient Advocacy and Stimulating Research 435					
	Janet Hieshettter and Jessica Feeley				
Appendix II Dystonia Europe: Developing Partnerships in the Dystonia Community 437					
	Alistair Newton				
Appendix III The Dystonia Coalition 440					
	Ami R. Rosen and Hyder A. Jinnah				
Appendix IV DystonieNet: A Dutch Approach for Optimising the Treatment of Cervical Dystonia 444					
	Maria A. J. de Koning-Tijssen and Joost van den Dool				
Appendix V Musicians With Dystonia 446					
	Glen Estrin				
Appendix VI Funding for Dystonia Research: Trends and Challenges 448					
	Jan K. Teller				
Index 451					