

List of Contributors v

Preface to the Fourth Edition ix

Preface to the First Edition xi

Historical Introduction: The Drug Treatment of Epilepsy from 1857 to 2015 xiii

Section I – Introduction (Lead editor: Simon Shorvon)

1 Definition (Terminology) and Classification in Epilepsy: A Historical Survey and Current Formulation, with Special Reference to the ILAE 1
Simon Shorvon

2 Differential Diagnosis of Epilepsy 24
Mark Cook

3 Mechanisms of Epileptogenesis 38
Giuliano Avanzini and Silvana Franceschetti

4 Antiepileptic Drug Discovery 52
H. Steve White and Melissa Barker-Haliski

5 Antiepileptic Drug Development 61
Dieter Schmidt

6 Mechanisms of Antiepileptic Drug Action 75
Matthew C. Walker and Rainer Surges

7 Mechanisms of Drug Resistance and Tolerance 92
Wolfgang Löscher and Dieter Schmidt

8 Epilepsy Biomarkers 103
Jerome Engel, Jr. and Asla Pitkänen

Section II – Principles of Medical Management (Lead editor: Simon Shorvon)

9 General Principles of Medical Management 110
Emilio Perucca

10 Pharmacokinetic Optimization of Therapy 124
Svein I. Johannessen, Cecilie Johannessen Landmark and Emilio Perucca

11 Management of Chronic Active Epilepsy in Adults 139
Simon Shorvon

12 Management of Epilepsy in Remission 148
Patrick Kwan, Howan Leung and Xiaoting Hao

13 Management of Epilepsy in Neonates and Infants 156
Elissa G. Yozawitz and Solomon L. Moshé

14 Management of Childhood Epilepsy Syndromes 174
Colin D. Ferrie

15 Management of Epilepsy in People with Intellectual Disabilities 193
Eylert Brodtkorb

16 Management of Epilepsy in the Elderly 205
Hiba Arif Haider and Lawrence J. Hirsch

17 Emergency Treatment of Seizures and Status Epilepticus 221
Matthew C. Walker and Simon Shorvon

18 Management of Medical Comorbidity Associated with Epilepsy 245
Gagandeep Singh

19 Psychiatric Features of Epilepsy and their Management 259
Brent Elliott and Simon Shorvon

20 Prevention and Management of Side-effects of Antiepileptic Drugs 275
Gaetano Zaccara and Piero Perucca

21 Ketogenic Diets 288
Eric H. Kossoff and Courtney A. Haney

22 Complementary and Alternative Treatments for Epilepsy 298
Sallie Baxendale

23 Reproductive Aspects of Epilepsy Treatment 311
Torbjörn Tomson

24 Genetic Counselling in Epilepsy 323
Federico Zara

25 Drug Interactions 344
Edoardo Spina and Domenico Italiano

26 Medical Treatment of Epilepsy in Resource-Poor Countries 360
Patrick Adjei

Section III – Antiepileptic Drugs (Lead editor: Emilio Perucca)

27 Introduction to the Choice of Antiepileptic Drugs 365

Emilio Perucca

28 Acetazolamide 376

Miri Y. Neufeld

29 Adrenocorticotrophic Hormone and Corticosteroids 388

Federico Vigevano and Maria Roberta Cilio

30 Benzodiazepines Used in the Treatment of Epilepsy 398

Eugen Trinko and Francesco Brigo

31 Brivaracetam 418

Joseph D'Souza and Emilio Perucca

32 Carbamazepine 431

Torbjörn Tomson and Svein I. Johannessen

33 Eslicarbazepine Acetate 447

Meir Bialer and Christian Elger

34 Ethosuximide 460

Tracy A. Glauser and Emilio Perucca

35 Felbamate 472

Ilo E. Leppik and James R. White

36 Gabapentin 479

Ernest R. Somerville, Andrew W. Mitchell and Arjune Sen

37 Lacosamide 489

Rajesh Sachdeo and Roopal Karia

38 Lamotrigine 498

Awais Riaz and Fumisuke Matsuo

39 Levetiracetam 516

Derek J. Chong and Jacqueline A. French

40 Oxcarbazepine 533

Edward Faught and Hyunmi Kim

41 Perampanel 546

Martin Brodie

42 Phenobarbital, Primidone and Other Barbiturates 555

Roberto Michelucci and Elena Pasini

43 Phenytoin 574

Mervyn J. Eadie

44 Piracetam 589

Simon D. Shorvon

45 Pregabalin 595

Sylvain Rheims and Philippe Ryvlin

46 Retigabine 606

Michel Baulac

47 Rufinamide 617

Victor Biton

48 Stiripentol 628

Tapani Keränen

49 Tiagabine 633

Reetta Kälviäinen

50 Topiramate 642

J. Helen Cross and Catherine J. Riney

51 Valproate 652

Anthony G. Marson and Graeme J. Sills

52 Vigabatrin 667

Günter Krämer and Gabriele Ch. Wohlrab

53 Zonisamide 680

Michel Baulac

54 Other Less Commonly Used Antiepileptic Drugs 689

Martin Holtkamp

55 Drugs in Clinical Development 701

Norman Delanty and H. Steve White

Section IV – Presurgical Assessment and Epilepsy Surgery (Lead editor: Jerome Engel, Jr.)

56 Overview of Surgical Treatment for Epilepsy 709

Jerome Engel, Jr.

57 Scalp EEG in the Epilepsy Surgery Evaluation 723

Christine B. Baca and John M. Stern

58 Invasive EEG in Presurgical Evaluation of Epilepsy 733

Dennis Spencer, Dang K. Nguyen and Adithya Sivaraju

59 MEG in Epilepsy Surgery Evaluation 756

Hermann Stefan and Paul Boon

60 MRI in Presurgical Evaluation 764

Christian E. Elger and Bernd Weber

61 PET and SPECT in Presurgical Evaluation of Epilepsy 775

Karolien Goffin and Wim Van Paesschen

62 Special Neurophysiological Techniques 787

François Mauguière and Julien Jung

63 Neuropsychological Testing in Presurgical Evaluation 804

Marilyn Jones-Gotman and Gail L. Risse

64 Presurgical Psychiatric Evaluation 817

Andres M. Kanner

65 Mesial Temporal Lobe Surgery and Other Lobar Resections 829

James Leiphart and Itzhak Fried

66 Resective Surgery of Neoplasms 842

Nicholas M. Wetjen and Gregory D. Cascino

67 Resective Surgery of Vascular and Infective Lesions for Epilepsy 858

Christopher E. Uff and Neil D. Kitchen

68 Surgery of Developmental Anomalies Causing Epilepsy 878

Ahyuda Oh, Joshua J. Chern and Youssef G. Comair

69 Hemispheric Operations for Epilepsy 887

Georg Dorfmueller, Christine Bulteau and Olivier Delalande

70 Corpus Callosum Operations 895

David W. Roberts

71 Hypothalamic Hamartoma 903

John F. Kerrigan

72 Multiple Subpial Transection 916

Adriana Bermeo-Ovalle and Michael C. Smith

73 Awake Surgery for Epilepsy 922

Webster H. Pilcher

74 Epilepsy Surgery in Children 931

Jason S. Hauptman and Gary W. Mathern

75 Complications of Epilepsy Surgery 941

Charles E. Polkey

76 Anaesthesia for Epilepsy Surgery 952

Barbara M. Van de Wiele

77 Vagus and Trigeminal Nerve Stimulation 959

Steven C. Schachter

78 Brain Stimulation for Epilepsy 967

Gregory K. Bergey and Robert S. Fisher

79 Non-Resective Approaches for Medically Intractable Epilepsy 980

Thomas J. Gianaris, Andrea G. Scherer and Nicholas M. Barbaro

80 Future Focal Treatment Approaches to Epilepsy 987

Laura Mantoan Ritter and Hannah Cock

81 Epilepsy Surgery in Countries with Limited Resources 999

Andre Palmi and Kurupath Radhakrishnan

Index 1008