

Preface

This volume is intended to be a synopsis of seizure disorders with a goal of describing key studies in animals and humans. The translation of pertinent findings from animal to human studies, and to potential human studies, is emphasized where possible. Specific cogent animal studies/results that deserve exploration in human seizure disorders are identified. The current rate of translation is estimated to be from 7 to 9 years, and the success rate of translation was very recently listed as less than one half. The success rate is defined as results in human studies which were predicted in advance by animal studies. Both the time between animal and human attempts plus the success rate clearly need improvement. A clear cause of delay is a lack of controlled randomized placebo studies in humans once suggestive data are identified in animals.

This epilepsy volume is not intended to be a 3-volume, 3,000-page encyclopedic description of epilepsy. It does not cover every published study relating to epilepsy in animals and humans. Several excellent recent publications filling the need for inclusiveness have been published, and the reader is referred to them.

This volume is designed to facilitate translation and be synoptic in nature. The arrangement of epilepsy chapters is in two parts whenever possible: animal studies, and related human studies. Each chapter has a similar organizational format. The chapters have a brief introductory section, followed by clinical descriptions. Animal studies with a bearing on human clinical issues are presented. The rationale for future human clinical investigations based on animal results is clearly presented when available. Translation is an important consideration in such a complicated field as epilepsy, and its facilitation is critical.

The complicated nature of the study of epilepsy is obvious even at the start by the confusion and controversy regarding even the classification of seizures. Several systems are in use, ranging from those based on genetics, age, metabolism, etc. In this volume, the 1981 classification is used, supplemented by some expansion supported by an updated version from 2006. Classification of seizures is certainly subject to change based on new knowledge gleaned from new technological advances in imaging, diagnostics, new drug development, and new molecular biology concepts.

This volume examines features of animal and human studies related to both simple and complex partial seizures. Partial (focal) seizures that spread and evolve into

secondary generalized seizures are described. Attention is paid to those seizure types which produce the most numbers of human epilepsies. Generalized onset seizures will be examined, including absence seizures, as well as clonic, tonic, tonic clonic, etc. Typical as well as atypical seizures are discussed. Some seizure disorders that do not clearly fit into a classification are described, as well as nocturnal epilepsy. Whenever possible, studies in primates receive careful attention. These descriptions are always mindful of translation.

Other areas such as pediatric considerations, status epilepticus, and surgical approaches are included. As stated above, the focus is on the presentation of data from animal studies, which is timely and appropriate for translation to human disorders. The issue of world health concerns is neglected. Epilepsy in third world countries is largely untreated, and so studies applicable to patients in these settings are described. Possible treatments that might be applied or investigated with this in mind receive special attention in this volume.

Therefore, this volume is not intended to be all inclusive, but rather a synopsis of sorts, with a clear focus. If certain studies have been replicated 25 times over the last 10 years, not all will be cited. Studies with no bearing on the stated purpose of this volume are likely omitted. There are other very good sources of this material.

An important feature of this synoptic epilepsy book is to try to provide credence for each quoted study by including salient characteristics of each study. One often sees quotes such as “epilepsy was associated with dementia (followed by references) 32, 34, 36–40, 42, 43, and 48–51”. The reader cannot tell if these references are significant or not. In this volume, we have tried to include enough actual information (ages, numbers of patients, epilepsy features, materials and methods, statistics used, etc.) in order for the reader to at least partially evaluate the validity/reliability of the results. We even occasionally state “this is an outstanding study”.

In the preparation of this synopsis, we felt it was better to present less papers, but in a way for the reader to judge their significance, than to present 5,000 references which cannot be evaluated. As an aside, many journals now have the Materials and Methods sections at the end of a manuscript, when actually they should be first!

This synopsis of epilepsy – both experimental and clinical – will have appeal to physician assistants, primary care physicians, nurse anesthetists, osteopathic physicians, psychologists, radiologists, psychiatrists, dieticians, neurosurgeons, as well as neurologists will all find value in this book. More and more a team approach is most effective in epilepsy study and treatment. Increasing numbers of patients in the US accessing health care will place additional burdens on already overworked health care providers.

This book is as timely as is possible. As stated above, new technology and drug development are progressing. Thousands of epilepsy-related papers are published annually. It is important to try to identify those results which are of significance. Sources known for publishing high-quality investigations are identified in order to select the best papers.

It is our goal to produce a volume on epilepsy which will provide results of excellent critical investigations which will stimulate further thinking about aspects of this highly interesting, yet complicated subject area. It is our hope that this information, concisely presented, will motivate others to attempt to translate animal results into productive human studies. In this way, it is expected that human epilepsy will be modulated in ways which will reduce the severity and frequency of seizures.



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