



# PREFACE

**W**hile continuing clinical-EEG, imaging, genetic, and molecular biology research have led to better understanding of the epilepsies and, through successive approaches to classification, to the latest terminology and concepts of seizures and epilepsies (Scheffer et al., 2017), the clinical and EEG classification of epileptic seizures of 1981 marked the last attempt to define EEG criteria, then duly in keeping with the dichotomous concept (Gastaut 1970; Commission 1981; 1985; 1989). A comprehensive update of the EEG diagnostic criteria was deemed necessary and the task was commissioned by the Neurophysiology Task Force of the ILAE Committee on the Diagnostic Methods. To this end, a group of EEG / clinical epileptology experts produced the work presented in this volume, which - exceeding the initial objective – proposes:

1. A simple diagnostic system that is applicable to all epilepsy syndromes and could enable electroencephalographers:

- to rate the degree of diagnostic certainty by weighting EEG findings *in relation to the available clinical information*;
- to suggest further EEG diagnostics where conclusive evidence is lacking. It is conceivable that an effective and easy-to-use diagnostic rating system may also improve *homogeneity* in EEG interpretation and reporting.

2. A system of syndrome-specific recording protocols that, used in the relevant clinical presentation or the specific clinical question, can maximize activation of ED and ultimately help with standardization of EEG recording across departments. Because recording methodology also depends on available resources, a two-tier system has been developed to embrace clinical EEG services in the hospitals of resource-limited and industrialized countries.

To better understand the rationale behind the suggested protocols, and to support interpretation and reporting, pertinent clinical and EEG information for each syndrome is provided in abundance.

The standard layout of each Chapters-Syndrome consists of:

- an **Overview** that gives a short description of the syndrome, including its nosological co-ordinates;
- a section on **Seizures: symptoms and semiology** that provides a brief description of all associated seizure types and their relation to state of vigilance and other modulators;
- the **EEG section** that contains ample information about background rhythms and the typical interictal and ictal paroxysmal findings in wakefulness and sleep;
- **Recording protocols** summarize the methodology and techniques that are more likely to activate ED and other EEG characteristics of the particular syndrome to maximize diagnostic yield;
- the section on **Levels of EEG diagnosis** essentially rates diagnostic confidence according to the findings in hand, assuming *newly* presented patients and *available essential clinical information*. Following successive rounds of internal deliberations and critiques, and a number of trials (for more on methodology see Koutroumanidis et al., 2017 part 1), diagnostic confidence for a particular working clinical hypothesis / question is simply, clearly and conveniently graded, from highest to lowest, into the following levels:

**Confirmatory of the clinical diagnosis** when the EEG contains: i) typical seizure(s); ii) typical interictal epileptic activity; iii) no atypical features

**High diagnostic certainty (probable)** when no seizure is recorded, but the EEG contains: i) typical interictal epileptic activity; ii) no atypical features

**Lower diagnostic certainty (possible)** when no seizure is recorded, but the EEG contains: i) typical interictal epileptic activity and ii) some atypical features. In this scenario, findings are diagnostic of the type (class) of epilepsy (i.e., genetic generalized or structural focal), but not strictly suggestive of the suspected syndrome. This level is still clinically significant because it can guide treatment with appropriate anti-epileptic agents, and also important for clinical or epidemiological research.

We very much hope that this work becomes a useful (and enjoyable) educational tool for all EEG technologists and physicians who see people with epilepsy and are interested in EEG, particularly outside tertiary epilepsy centres.

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on behalf of all co-authors