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Original research article

# Convulsive status epilepticus management in adults and children: Report of the Working Group of the Polish Society of Epileptology

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ABSTRACT

*Introduction:* The Working Group was established at the initiative of the General Board of the Polish Society of Epileptology (PSE) to develop an expert position on the treatment of convulsive status epilepticus (SE) in adults and children in Poland. Generalized convulsive SE is the most common form and also represents the greatest threat to life, highlighting the importance of the choice of appropriate therapeutic treatment.

*Aim of guideline:* We present the therapeutic options separately for treatment during the early preclinical (>5–30 min), established (30–60 min), and refractory (>60 min) SE phases. This division is based on time and response to AEDs, and indicates a practical approach based on pathophysiological data.

*Results:* Benzodiazepines (BZD) are the first-line drugs. In cases of ineffective first-line treatment and persistence of the seizure, the use of second-line treatment: phenytoin, valproic acid or phenobarbital is required. SE that persists after the administration of benzodiazepines and phenytoin or another second-line AED at appropriate doses is defined



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as refractory and drug resistant and requires treatment in the intensive care unit (ICU). EEG monitoring is essential during therapy at this stage. Anesthesia is typically continued for an initial period of 24 h followed by a slow reversal and is re-established if seizures recur. Anesthesia is usually administered either to the level of the ''burst suppression pattern'' or to obtain the ''EEG suppression'' pattern.

*Conclusions:* Experts agree that close and early cooperation with a neurologist and anesthetist aiming to reduce the risk of pharmacoresistant cases is an extremely important factor in the treatment of patients with SE. This report has educational, practical and organizational aspects, outlining a standard plan for SE management in Poland that will improve therapeutic efficacy.





## 1. Introduction

The Working Group was established at the initiative of the General Board of the Polish Society of Epileptology (PSE) to develop an expert position on the treatment of convulsive status epilepticus (SE) in adults and children in Poland. For many years the PSE has promoted the highest standards of medical care. However, there are few updated papers on management and treatment of SE in Polish literature [1–4].

The development and preparation of these recommendations is a vital contribution for patients with epilepsy in Poland, and now must be translated into daily clinical practice. Physicians, particularly neurologists and neurosurgeons need to be familiar with SE. The generalized convulsive SE is one of the most common life-threatening conditions that requires a prompt rescue therapy in order to prevent from further consequences. Prolonged and/or repetitive tonic–clonic seizures involving a whole body are extremely exhausting and lead to the energy crisis. Besides, the longer the seizure lasts, the lower probability of self-limitation and adequate response to an antiepileptic rescue treatment. All of above factors plus in addition unknown cause of the GTCS (for example a medical origin), lead to the higher morbidity in this emergency situation.

## 2. Purpose of this report

SE treatment should proceed in accordance with familiar and well-understood procedures, but should also be updated and supplemented with new information. Recommendations for SE developed by the European Federation of Neurological Societies (EFNS) as well as the Report of the Guideline Committee of the American Epilepsy Society 2016 have recently been published [5,6], and the new definitions and classifications for SE were developed by the International League Against Epilepsy (ILAE) [7]. Our report has educational, practical and organizational aspects, outlining a standard plan for SE management in Poland that will further improve therapeutic efficacy.

It is also crucial to elaborate a therapeutic treatment protocol for neurologists and anaesthesiologists, ideally available in every neurological and anesthesia ward.

### 2.1. Methods

The expert opinion presented in this paper is based on a review of the current literature regarding strategies for seizure disorder management as well as the clinical experience and good medical practice of clinicians with extensive backgrounds in the area. Each of the panelists provided comments and made remarks, and the version presented here was developed after reaching consensus.

## 3. Definitions of terms

According to Trinka et all 2015 ''Status epilepticus is a condition resulting either from the failure of the mechanisms responsible for seizure termination or from the initiation of mechanisms, which lead to abnormally, prolonged seizures (after time point t1). It is a condition, which can have long-term consequences (after time point t2), including neuronal death, neuronal injury, and alteration of neuronal networks, depending on the type and duration of seizures'' [7].

Clinical trials suggest that a single seizure seldom lasts longer than 2 min, therefore we assume that the generalized seizures in SE include all cases of seizure lasting >5 min, or 2 seizures without baseline recovery. This ''operational'' definition indicates the necessity of immediate pharmacological treatment for all patients with prolonged seizures over 5 min [5–10]. It should be pointed that in the case of convulsive (tonic–clonic) SE, both time points (t1 at 5 min and t2 at 30 min) are based on animal experiments and clinical research. This evidence is incomplete, and there is furthermore considerable variation, so these time points should be considered as the best estimates currently available [7].

Refractory SE is defined as no response to a benzodiazepine plus an anti-seizure drug [11].

Super-refractory SE is a stage of refractory SE characterized by unresponsiveness to initial anesthetic therapy and is defined as ''SE that continues or recurs 24 h or more after the onset of anesthesia, including those cases in which SE recurs on the reduction or withdrawal of anesthesia.'' [11]. Super-refractory SE can also be defined as SE that has continued or recurred despite 24 h of general anesthesia [12].

The new clinical syndrome defined as new-onset refractory status epilepticus (NORSE) refers to patients with acute brain

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