

# Epilepsy: Treating Status Epilepticus : Diagnostic concepts based on EEG



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Status epilepticus is a relatively common medical and neurologic emergency that requires prompt evaluation and treatment. There are many different status epilepticus syndromes, defined by clinical features and EEG findings.

Patients with convulsive status epilepticus present with characteristic motor manifestations that vary according to the seizure type. While patients with generalized convulsive status epilepticus (GCSE) have obvious bilateral tonic and clonic motor activity and loss of consciousness, patients with focal motor status epilepticus may have jerking movements restricted to one area of the body, usually with preserved consciousness. Myoclonic status epilepticus typically involves much more rapid, but lower amplitude, jerking muscle activity, but with marked variability. Tonic status epilepticus includes slower, more sustained maintenance of a posture, or slow movement.

During GCSE, the EEG is often obscured by muscle and movement artifacts, but it may show continuous spike and wave activity indicative of generalized seizure activity. In some cases of GCSE, a focal onset is evident on EEG, especially early in the episode, and this can help to focus the evaluation on an underlying focal cause. Once convulsions have ceased, EEG is crucial in determining whether status epilepticus has truly ended, or whether there is continuing seizure activity without convulsions. In many cases of focal motor status epilepticus, EEG evidence of seizure activity is subtle or absent. This is generally thought due to a deeper seizure focus or orientation of the seizure discharges such that they are not evident on surface, scalp EEGs. The seizures of focal status epilepticus can also be intermittent and thereby absent on a short EEG recording.

Nonconvulsive status epilepticus (NCSE) was originally described in patients with chronic epilepsy, but it is now recognized with increased frequency in other patient populations, especially the critically ill. NCSE is defined as a condition of ongoing or intermittent seizure activity without convulsions for at least 30 minutes, without recovery of consciousness between attacks.

The diagnosis NCSE requires an EEG, since clinical signs and symptoms are pleomorphic and nonspecific. In some cases an IV anti-epileptic drug trial is also required to help determine the significance of uncertain EEG patterns. The criteria for diagnosing NCSE in adults have largely focused on EEG patterns, combined with an acute intravenous (IV) antiepileptic drug (AED) trial for patients in whom the diagnosis is in doubt. However, the ultimate interpretation of ictal versus non-ictal epileptiform activity often remains unclear, even with expert EEG interpretation and proper AED trials, particularly in critically ill patients.