

STATUS EPILEPTICUS IN ADULTS
(Convulsive Seizures in patients aged > 16 years old)
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Status epilepticus (SE) is defined as continuous seizure activity which has failed to self-terminate leading to a risk of neurological damage. The risks are highest with generalised tonic/clonic (convulsive) seizures. Convulsive SE may present as either a run of discrete generalised tonic/clonic seizures without full recovery in between (ie without regaining consciousness), or continuous generalised tonic/clonic seizure activity. Most convulsive seizures terminate spontaneously within 3 minutes, and do NOT need emergency treatment. *Convulsive seizures lasting longer than 5 minutes, or recurring without recovery should be managed as Convulsive SE*, unless the patient is known to habitually have longer seizures with self-termination (eg information from relatives, friends, or the patient's epilepsy card or diary). The mortality and morbidity of generalised status epilepticus is high, and it is important to control fits as soon as possible, to use adequate doses of 1st and 2nd line agents, but not to over-treat patients in whom seizures have terminated but are slow to recover.

GENERAL MANAGEMENT

1st stage (0-10mins). Protect the patient e.g. padded bed rails. Do not restrain. Administer oxygen. During an inter-ictal period insert an airway and then administer oxygen. Do not attempt to insert anything in the patient's mouth during a seizure, even if the tongue is injured. Place the patient in a semi-prone position with the head down to prevent aspiration. Establish iv access. *Note the time.*

2nd Stage (0-30mins). Institute regular monitoring (temperature, cardiac, respiration, BP). Consider possibility of non-epileptic status. If there is any suggestion of alcohol abuse or impaired nutrition, give thiamine as high potency intravenous Pabrinex BEFORE GLUCOSE. Estimate blood glucose rapidly using a blood test. If the patient is hypoglycaemic, give 100ml of 10% glucose rapidly, and if still fitting or unconscious, repeat and then start 10% glucose at 100ml/hr. (Refer to management of Hypoglycaemia).

Emergency investigations: venous blood count, clotting, glucose, urea, sodium, potassium, calcium, liver function and anti-convulsant drug levels (irrespective of known history at this stage). Save 5ml blood and 50ml urine for toxicology. Treat acidosis if severe. CXR to evaluate possible aspiration.

3rd Stage (0-60mins). Establish aetiology: *Gain information* (Is there evidence of previous epilepsy, any anticonvulsant drugs, diary or wallet card or bracelet?). Consider need for urgent CT (no previous epilepsy history, new focal neurology, any refractory case). Alert anaesthetist and ICU. Identify and treat medical complications. Consider pressor therapy if needed.

4th Stage (30-90mins). Refractory status: Transfer to ICU. Establish ICU monitoring & EEG if available.

ALL: Investigate the cause and consider maintenance anti-epileptic medication on the adult neurology (> 16years: Epilepsy registrar - bleep 8134) team. All adult (> 16years) patients with convulsive status epilepticus should be reviewed by a member of the epilepsy team (Mon-Friday), or on-call neurology (24h/day) within 24hours of presentation for advice on on-going management.

DRUGS Check if any pre-hospital benzodiazepines have been given. If two adequate doses of any benzodiazepine have been administered and seizures have recurred within a 24-hour period, move straight to 2nd line/established status treatment.

1. Early Status (0-10mins). The drug of first choice is lorazepam given as an IV bolus injected at 2mg/min, ideally in a dose of 4mg for adults. If Lorazepam is unavailable, give 10mg Diazepam iv or 10mg Buccal Midazolam. If no iv access, give Buccal Midazolam. A 2nd dose of a benzodiazepine may be repeated once within 10-20minutes. Give usual anti-epileptics if already on treatment. For sustained control, or if seizures recur: **NB:** Benzodiazepines must be written up on the 'stat dose' rather than the 'pm' part of the drug chart. Write up a maximum of two stat doses with clear instructions on when to give, eg. 'for convulsions > 5mins' (not just 'if fits').

2. Established status (10-30mins): Alert the on-call anaesthetist in case of later need. Start an iv infusion of a 2nd line antiepileptic agent. Of the listed options, only Phenytoin is licensed for status epilepticus. However, current evidence and consensus expert opinion support clinical equipoise between Phenytoin, Valproate and Levetiracetam in terms of efficacy and safety for this indication. The results of clinical trials currently underway are pending. In the meantime choice of agent may be guided by the table.

Dose, indications and contraindications for second line antiepileptic agents in the treatment of status epilepticus

Drug	Dose; Rate (Maximum)	May be preferable	Contraindicated
Phenytoin	20mg/kg; 50mg/min (N/A)	• Already taking Phenytoin, suspected poor adherence • Alternatives contra-indicated or previously ineffective	• Significant hypotension • Bradycardia • Heart block • Porphyria • Generalized epilepsy* • Overdose of recreational drugs or antidepressants
Valproate	30mg/kg; 10mg/kg/min (3000mg)	• Already taking Valproate, suspected poor adherence • Generalized epilepsy* • Comorbid migraine, mood disorder • Alternatives contra-indicated or previously ineffective	• Known pregnancy • Pre-existing liver disease or pancreatitis • Known metabolic disorder predisposing to hepatotoxicity
Levetiracetam	40mg/kg; 6mg/kg/min (4500mg)	• Already taking Levetiracetam, suspected poor adherence • Need for minimal drug interactions • Alternatives contra-indicated or previously ineffective	May not be best choice in • acute or prior brain injury • known mood./behaviour disorder (may exacerbate)

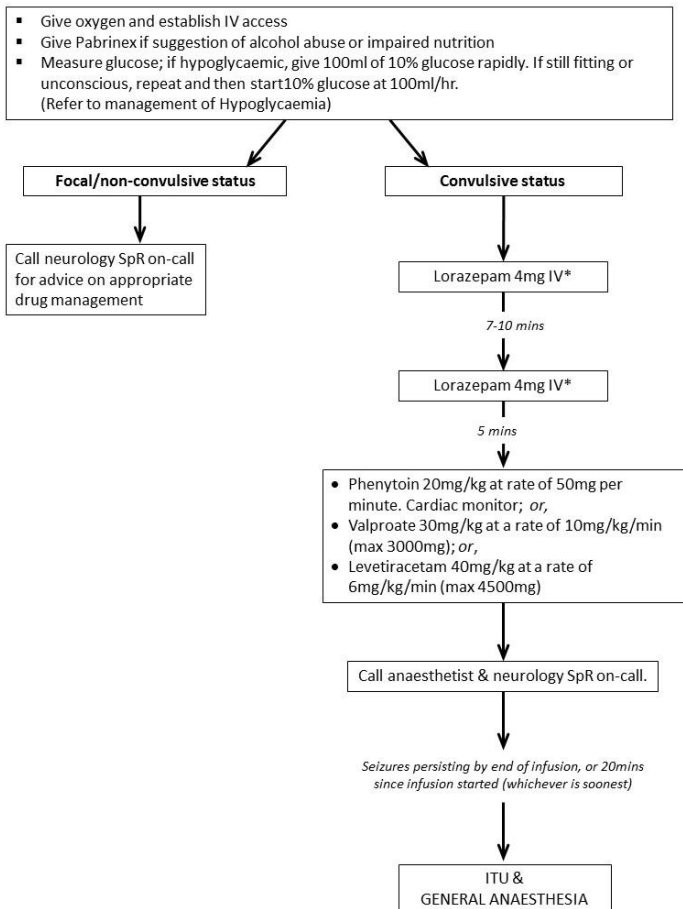
*known or suspected idiopathic (genetic) generalized epilepsy, eg. history of myoclonus or typical absence seizures

3. Refractory Status (30-90mins): Requires general anaesthesia with one of the following, titrated to effect. Anaesthesia should be continued for 12-24 hrs after last clinical or electrographic seizure, then dose tapered.

- Propofol (1-2mg/kg bolus then 2-10mg/kg/hr). Risk of infusion syndrome increases with duration of therapy
- Midazolam (0.1-0.2mg/kg bolus, then 0.05-0.5mg/kg/hr)
- Thiopental sodium (3-5mg/kg bolus then 3-5mg/kg/hour). After 2-3 days infusion rate needs reduction as fat stores are saturated.

Neurology advice should always be sought for on-going management in adults. Send blood for pyridoxine (vitamin B6) level and give Pyridoxine 50mg iv (as Pabrinex) if not already given. At the least, intermittent EEG monitoring is necessary for refractory status. The recommended primary endpoint is suppression of epileptic activity on EEG, with a secondary end point of burst-suppression pattern.

Treatment of Convulsive Status Epilepticus in adults



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