Treatment Algorithm for Adult Status Epilepticus

Generalised Seizure
0-5 mins

START TIMER - INTITAL SEIZURE MANAGEMENT
Assess - Airway / Breathing / Circulation
Start high flow O2
Position patient to prevent aspiration and ensure safety
Establish IV access
Capillary blood glucose check
Monitor vital signs: SpO2 / HR / BP / ECG

Early SE
5-15 mins

STATUS EPILEPTICUS - 5 minutes
≥ 5 minutes continued generalised seizure activity ***or***
≥ 5 minutes recurrent generalised seizures without recovery

1st Line treatment - IV Access

Lorazepam 4mg IV bolus ***or***
Diazepam 10mg IV bolus

MONITOR FOR 5 MINUTES - **If status continues at 5 minutes repeat dose**

1st Line treatment - No IV Access

Midazolam 10 mg Buccal / IM ***or***
Diazepam 10mg PR

MONITOR FOR 5 MINUTES - **If status continues at 5 minutes repeat dose**

Established SE
15-30 mins

ESTABLISHED STATUS EPILEPTICUS – 15 minutes
Escalate to ICU / Anaesthetics (via switchboard)
Ensure IV or IO access established to begin 2nd line treatment as below

2nd Line treatment – AED Loading at 15 minutes

Loading with **one** of the following IV anti-epileptic drugs (AEDs):

IV Levetiracetam 60mg/kg, maximum 4500mg - In 100ml sodium chloride 0.9% over 10 minutes

IV Phenytoin 20mg/kg, maximum 2000mg - Give undiluted. Rate 50mg/min or 25mg/min for elderly or cardiac history. An in-line filter (0.22 microns) should be used. ALWAYS INFUSE WITH ECG MONITORING

IV Valproate 40mg/kg, maximum 3000mg - In 100ml sodium chloride 0.9% over 5 minutes. AVOID IN WOMEN OF CHILDBEARING AGE IF POSSIBLE

ONGOING STATUS EPILEPTICUS DESPITE 2nd LINE THERAPY < 30 minutes

Commence additional IV AED from above list
If no AED suitable from list call medical registrar

At ≥ 30 minutes move to refractory status algorithm

Refractory SE
30+ minutes

REFRACTORY STATUS EPILEPTICUS (RSE)
Generalised seizures of >30 minutes duration despite 2 doses of benzodiazepine and at least 1 dose of AED.

- Manage only in appropriate setting with anaesthetics / ICU input for airway support.
- These treatments are only to be delivered by clinicians experienced in their use.

3rd line treatment - General Anaesthetic

1. **INDUCTION**: Propofol, midazolam, thiopentone or ketamine
2. **MAINTENANCE:** Continuous infusion of propofol and/or midazolam.
3. **CONTINUE AEDs**: Ensure newly loaded AEDs and pre-hospital AEDs prescribed on eMEDs

Failure of seizure control after 1 hour

- Check AED levels
- Consider anaesthetic agent bolus – Propofol or Midazolam
- Consider starting additional IV AED – Discuss with medical reg/ consultant on-call if required

On-going failure of seizure control

- Consider infusion with additional anaesthetic agent
- Liaise with neurology team
- Liaise with pharmacist

Super Refractory SE
>24hours

SUPER REFRACTORY STATUS EPILEPTICUS (SRSE)
Generalised convulsive seizures 24 hours after induction with general anaesthesia.
- Seek specialist neurology/centre input.
- Ensure AEDs and anaesthetic agent doses are optimised.

Treatment of SRSE should be guided by neuro-intensive care, neurology, neurophysiology and pharmacy in an MDT approach.
The management of SRSE does not currently have high quality randomised controlled trial evidence.

Patient care after SE

IMMEDIATE MANAGEMENT AFTER STATUS EPILEPTICUS

- Reassess - Airway / Breathing / Circulation
- Assess GCS - If remains low consider causes (see box to right)
- Assess for focal neurology
- Consider aetiology of seizure
- In known epilepsy consider triggers

ENSURE NEWLY LOADED AEDs CONTINED

- Prescribe maintenance doses of loaded antiepileptic drugs
- If using phenytoin, ensure drug level prior to next dose

CONSIDER WHERE TO MANAGE PATIENTS POST STATUS

- Patients need to be in an environment where they can be observed easily
- Discuss location with SpR / consultant in charge of patient's care
- Commence a 'Seizure Record'
- Continue to monitor regularly for further seizure activity over next 24H

Patients not known to have epilepsy will need 'First Fit Clinic' follow up

INITIAL INVESTIGATIONS

- FBC, U&Es, LFTs, Ca2+, Mg2+, clotting studies, VBG, Glucose & Urinalysis
- If applicable: bloods for AED levels, B-HCG, Consider tax screen and paracetamol levels
- **If no known seizure history or overt trigger**: consider neuroimaging

IF HYPOGLYCAEMIC (Glucose < 4 mmol/L)

1. Give 150-200ml 10% glucose IV over 15mins (i.e. 600ml/Hr)
2. If seizures continue, repeat step 1 AND commence 10% glucose infusion at 100ml/Hr.

*If suspicion of alcohol excess or malnutrition give 2x pair IV Pabrinex or Thiamine (follow Embeds) with the IV glucose replacement

Benzodiazepine dosing for low body weight (<40Kg): Lorazepam= 0.1 mg/kg, maximum 4 mg. **Diazepam**= 0.2 mg/ kg, maximum 10 mg

CONSIDER IN ALL PATIENTS

Collateral History:
- ?known epilepsy +/- seizure care plan
- Medication history
- Review Latest Neurology letter

Consider aetiology of seizure +/- management of cause:
- Drug intoxication or withdrawal (including alcohol)
- AED issues (poor compliance, poor absorption, recent AED changes, medication interactions or sub therapeutic levels)
- Infection (Sepsis / CNS infection) - *Consider early LP*
- Metabolic disturbance (electrolytes, glucose)
- CNS pathology (tumour, stroke, encephalitis, PRES,
- neurodegenerative diseases etc.)

Consider PNES (Psychogenic non-epileptic seizure) / NEAD (Non-epileptic attack disorder): If doubt discuss with med reg but continue pathway. Do **not** use lactate as sole marker of epilepsy vs. NEAD

CONSIDERATION FOR AED CHOICE

LEVETIRACETAM	**Avoid if:** • Behaviour or mood disorder • Renal impairment (see BNF), • Using brivaracetam **Preferred for:** • Women of childbearing age, • Polypharmacy (relatively few drug-drug interactions)
PHENYTOIN	**Avoid if:** • Known or suspected generalised / genetic epilepsy. • Low BP / HR. • Heart block. • Porphyria. • Overdose of recreational drugs. • Alcohol withdrawal. **Needs ECG monitoring:** • Risk of arrhythmia.
VALPROATE	**Avoid if:** • Woman of childbearing age • Metabolic/mitochondrial disease (suspected or known) • Liver failure • Pancreatitis. **Preferred for:** • Known or suspected generalised / genetic epilepsy,. • Co-morbid mood disorder / migraines

THERAPEUTIC TARGET

Burst suppression with no breakthrough seizures (clinical or EEG) for 24 - 48 hours

EARLY CONSIDERATIONS

- Consider neuroimaging
- Correct any metabolic derangement
- Female patients – Ensure pregnancy / eclampsia excluded
- Continuous EEG / bispectral index (BIS) monitoring, or regular EEGs
- Ensure on adequate antiepileptic medication / AED level checked
- Ensure NOK informed and aware of treatment decisions / prognosis

PATIENTS WHO CLINICALLY REMAIN LOW GCS OR CONFUSED POST STATUS DESPITE RESOLUTION OF GENERALISED SEIZURE ACTIVITY
Commonly post-ictal state – monitor for recovery

If slow to recover GCS, consider:
- Underlying pathology causing status (e.g. low glucose, alcoholic encephalopathy, illicit drug use, sepsis, stroke, cerebral bleed, CNS infection)
- Benzodiazepine or AED side effect
- Non-convulsive status epilepticus (especially in elderly - discuss with med reg +/- arrange urgent EEG)