

Management of convulsive status epilepticus (SE)

Reviewed by Prof E Trinka. Inspired by the Status Epilepticus pocket card of the Italian League against Epilepsy.

Note: the indicated doses apply to adults and to children > 1 year unless stated otherwise

Early SE

5-10 minutes



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- Check and maintain airway, breathing and circulation and vitals
- Get IV access
- Check glycemia (fingerstick glucose)
- Draw blood for blood gases, complete blood count and biochemical tests
- If alcohol-related SE: administer IV thiamine 100 mg followed by dextrose

General

Medication	Dose	Max. dose (incl. repeat if applicable)
Lorazepam	0.1 mg/kg (up to 4 mg/dose)	8 mg
Diazepam	0.1 mg/kg (5-10 mg/dose)	20 mg
Midazolam	0.1-0.2 mg/kg (up to 10 mg/dose)	20 mg
Phenobarbital*	10-20 mg/kg	700 mg
Clonazepam	1 mg	2 mg

IV

Medications

All medications (except for phenobarbital) may be repeated once after 5-10 min

Medication	Dose	Route	Repeat (if needed)
Midazolam	10 mg (5 mg in elderly or patients <50 kg)	IM, buccal	once in 10 min
Diazepam		Rectal	

Other

Established SE

10-30 minutes
or failure of initial treatment



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- Investigate the underlying aetiology with neuroimaging (CT or MRI)
- Manage any metabolic imbalances or hypertension
- Perform EEG (check for non-convulsive SE, monitor response to treatment)
- Inform intensive care unit

General

Medication	Dose	Max. rate	Considerations
Fosphenytoin	30 mg/kg	150 mg/min	Contraindicated in AV block, severe ↓ BP; Avoid in myoclonic SE; Monitor ECG and BP
Phenytoin	20 mg/kg (max 1500 mg PE)	50 mg/min	Contraindicated in severe liver dysfunction, mitochondrial disease. Can cause pancreatitis and thrombocytopenia
Sodium valproate	30-40 mg/kg (max 3000 mg)	10 mg/kg/min (over 10-20 min)	Reduce dose in severe renal failure
Levetiracetam	60 mg/kg (max 4500 mg)	2-5 mg/kg/min (over 15 min)	
Lacosamide	200-400 mg (max 600 mg)	5-10 mg/min (over 15-30 min)	Contraindicated in grade II-III AV block
Phenobarbital	10-15 mg/kg (max 20 mg/kg)	50 mg/min	Contraindicated in porphyria, liver failure, respiratory depression. Needs cardiorespiratory monitoring

1st line

Medications

2nd line

PE, phenytoin equivalent; BP, blood pressure

Refractory SE

30-60 minutes
or failure of initial treatment



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General

- Transfer to intensive care unit
- Intubate, induce therapeutic coma
- Treat hyperthermia
- EEG monitoring (response to treatment [goal is seizure suppression] and level of sedation)

Medication	Loading dose	Maintenance*	Side effects
Midazolam	0.1-0.3 mg/kg	0.05-0.5 mg/kg/h	Accumulation in obesity, elderly and kidney failure.
Propofol	2 mg/kg	5-10 mg/kg/h initially, reduce to 1-3 mg/kg/h	PRIS, cardiorespiratory depression
Thiopental	5 mg/kg	0.5-5 mg/kg/h	Respiratory and cardiovascular depression, accumulation, paralytic ileus, immunosuppression, lingual edema, hyponatremia
Ketamine	2-7.5 mg/kg/hr	0.3-5 mg/kg/hr	Tachycardia, arrhythmias (incl. asystole), hypertension

*PRIS, propofol infusion syndrome: cardiovascular collapse, lactic acidosis, hypertriglyceridemia and rhabdomyolysis

Medications

Super-refractory SE

> 24 hours
after initiation of IV anaesthetic



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General

- Manage in intensive care unit jointly with intensivist/anaesthetist
- Identify and treat rare causes (metabolic, genetic, mitochondrial, rare infections, autoimmune, paraneoplastic, etc)

There are no randomised controlled trials on treatment of super-refractory SE; the available evidence is based on case reports and small case series (Class IV evidence).

Alternative AEDs

- Topiramate: 5 mg/kg/d in children, 500-1000 mg/d in adults (risk of hyperammonemia)
- Pregabalin: mean dose 350 mg/d (risk of worsening myoclonic seizures)
- Perampanel: lower (4mg [2-12mg]/day, titrated up to 12 mg/day) & higher dose (16-32mg/day, no titration) are both safe in comatose individuals (expert)

Other therapies

- Magnesium sulphate 2-6 g/h (target serum level of 3.5 mmol/L)
- Lidocaine IV
- Inhalational anaesthetics: isoflurane, desflurane, or sevoflurane (risk of thrombosis/embolism, bleeding, ileus)
- Hypothermia (32 and 35 °C) for 24-48 h
- Ketogenic diet (risk of acidosis, hypoglycemia, hyperlipidemia)

Immunological therapies

1st line:

- IV Methylprednisolone (MP) 1 g/day 3-5 days → MP or prednisolone 1 mg/kg/day
- IV IgG (0.4 g/kg/day) over 5 days
- Plasma exchange

2nd line: rituximab, tocilizumab, anakinra, cyclophosphamide

Neurosurgery or neurostimulation

- Resection of well-localised ictal (seizure) onset zone
- Vagal nerve stimulation
- Responsive neurostimulation
- Deep brain stimulation
- Repetitive transcranial magnetic stimulation

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