

Treating convulsive status epilepticus in children

SEIZURE STARTS

Management

- Confirm clinically
- Check ABC, high-flow O₂, attach monitoring
- Check blood glucose, treat < 3 mmol L-1

5 MIN

1st line agents

- Consider pre-hospital treatment already given: 2 doses of benzodiazepines max
- Midazolam 0.3–0.5 mg kg⁻¹ bucally see BNFc for exact age related dose
- Lorazepam 0.1 mg kg⁻¹ IV or IO

10-15 MIN

- Lorazepam 0.1 mg kg⁻¹ IV
- Reconfirm epileptic seizure and prepare second-line agent of choice for next step

15-35 MIN

2nd line agents

- Levetiracetam $30-60 \text{ mg kg}^{-1}$ (over 5 min, max 3 g) OR
- Phenytoin 20 mg kg⁻¹ by slow IV infusion over 20 min with ECG monitoring
 OR
- Phenobarbital 20 mg kg⁻¹ by IV infusion over 5 min

Call anaesthetist and PICU

20-40 MIN

2nd or 3rd line agents

- If preparation for deeper anaethesia with intubation and ventilation complete, proceed to next step OR
- Administer further alternative second-line drug (levetiracetam, phenytoin, phenobarbitol)

3rd line agents

- Rapid sequence induction of anaesthesia using thiopental sodium 4 mg kg⁻¹ IV OR
- Propofol 1–1.5 mg kg⁻¹ IV (with single dose recuronium if using NMB); ketamine and midazolam alternatives
- Intubation and ventilation; monitoring neurological signs
- Ongoing seizures are not always easy to identify (EEG)

- Definition of convulsive status epilepticus (CSE) is a seizure that continues for greater than 5 min, so treatment usually starts once seizure has lasted > 5 min
- After 5 min seizures are unlikely to spontaneously terminate
- The risk of a seizure becoming refractory increases with increasing seizure duration.
- *ESETT/**ECLIPSE/***ConSEPT trials showed equal potency for phenytoin, levetiracetam and valproate
- Levetiracetam has a good safety profile and is easy to administer
- Children who frequently have seizures or CSE usually have an individually tailored guideline.
- Do not give phenytoin too rapidly as it will cause bradycardia and/or asystole.
- In sepsis consider measuring calcium and magnesium levels as they are sometimes low.
- Monitor glucose aim for 4-8 mmol L⁻¹
- Measure serum sodium and treat if
 125 mmol L⁻¹ (3 mL kg⁻¹ 3% sodium chloride)
- Consider temperature control measures if hyperthermic
- Consider meningitis, encephalitis and Raised ICP
- Consider CNS haemorrhage if signs of trauma
- There is no evidence for the ideal third line agent: thiopentone, propofol, ketamine and midazolam may all be used
- * Kapur et al. Randomized Trial of Three Anticonvulsant Medications for Status Epilepticus. N Engl J Med 2019;381:2103-2113.doi:10.1056/ NEJMoa1905795
- ** Lyttle M, Pereira M et al. Levetiracetam versus phenytoin for second-line treatment of paediatric convulsive status epilepticus (EcLiPSE): a multicentre, open-label, randomised trial. Lancet, Volume 393, Issue 10186, 2125 – 2134
- *** Dalziel SR, Borland ML et al; PREDICT research network. Levetiracetam versus phenytoin for second-line treatment of convulsive status epilepticus in children (Concept): an open-label, multicentre, randomised controlled trial. Lancet. 2019 May 25;393(10186):2135-2145