CEWT

Children's Epilepsy Workstream in Trent

# Management of prolonged convulsive epileptic seizures in Children and Young People

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**Consultation and Ratification: CEWT (Children's Epilepsy Workstream in Trent)**

- This is a default guideline for children presenting with ongoing prolonged (>5 minutes) convulsive seizures with loss of consciousness, **EXCEPT** seizures occurring in the neonatal period (see separate protocol).
- If individual patients have had a previous adverse experience e.g. with Benzodiazepines, or for other reasons have their own "tailor made" individual emergency plan, this should be used in preference to the generic default guideline.

**Neurosurgical patients may be more sensitive to Benzodiazepines or conversely may be more resistant to anticonvulsant treatment**

## Definitions

• *Status epilepticus* should be diagnosed if a seizure has persisted for more than 30 minutes, or if there is no awakening between shorter repetitive seizures for the same period of time.

• *Prolonged convulsive epileptic seizure* should be diagnosed if a convulsive seizure with loss of consciousness / responsiveness has persisted for more than 5 minutes, or if there is no awakening between shorter repetitive seizures for the same period of time. Focal motor seizures with preserved consciousness / responsiveness are generally less noxious and should be tolerated for a longer period before giving emergency treatment.

• Commence emergency treatment if convulsive epileptic seizure has persisted more than 5 minutes.

• Consider carefully whether the convulsion is still ongoing or settled, and whether it may be syncopal, psychogenic non-epileptic, tonic-vibratory spasms due to raised intracranial pressure (decerebrate and / or decorticate), a movement disorder e.g. a drug related occulo-gyric crisis or other non-epileptic seizure, especially if emergency treatment fails.

## History

Obtain information regarding this event, 1st hand witness account if possible; including what happened just before, the evolution of the episode, duration and what it looked like. Consider possibility of NAI, ask about fever and measures taken to control it, recent infection or vaccination, family history of epilepsy. Record current drug treatments, regular and emergency treatments already given, (compliance, timing, dosage, possible over-dosage), history of head injury, history suggestive of raised intra-cranial pressure. Check past history for previous episodes and their management, and other illnesses e.g. diabetes, neurosurgery.

## Physical Examination

1) Assess cardio-respiratory status (ABC)
2) Assess the seizure semiology, including whether the patient appears conscious or responsive
during the seizure, and which parts of the body are posturing or moving, stiff or jerking or making complex movements
3) Look for evidence of a cause for the seizure:

- Trauma
- Blood pressure
- Pupil size, reaction and symmetry
- Head circumference
- Sepsis
- Muscle tone and reflexes
- Fundi (papilloedema,
- Skin signs of neurological haemorrhage) diseases
- Dehydration
- Fontanelle
- Examine for signs of raised ICP, focal deficits, doll‟s eye movements

## Investigations

**In all patients:**

- blood glucose at bed-side

**Then only if specifically indicated consider:**

- plasma glucose (laboratory), electrolytes, Ca, Mg, FBC, LFT‟s, blood cultures, anti-epileptic drug (AED) levels*, toxicology screen. (See afebrile seizure, febrile seizure or reduced conscious level guideline).

* AED levels taken at about the time of prolonged convulsive epileptic seizures are useful in that if the plasma or serum concentration is high (at or above the top of the target range), that AED may need to be changed. If the plasma or serum concentration is mid range or low then it may be worth exploring reasons (e.g. poor adherence, or gastroenteritis) and / or increasing the dose.

**If there are signs of raised ICP or focal neurological signs, further management and imaging should be discussed with Paediatric Neurologist / Senior Paediatrician, Neurosurgeon and Neuroradiologist**

## Complications

• Post ictal drowsiness and confusion, sleep or GCS <12 usually resolves by 1 hour
• Facial / scalp / tongue lacerations
• Secondary hypoglycaemia
• Fractured vertebrae
• Todd‟s paresis
• Cerebral oedema
• Cerebral hypoxia
    o reversible
    o Irreversible
        • § residual hemiparesis
        • § temporal lobe damage

Children with refractory convulsive status epilepticus will require admission to PICU for ventilation and further management.

**If the child is still convulsing or suffers respiratory depression requiring intervention, e.g. airway support, then PICU is indicated**

Inform anaesthetist / intensivist at stage 3 (i.e. if Phenytoin or Phenobarbital is needed) or if there is significant respiratory compromise (requiring intervention).

• If going to PICU, contact the Clinical Neurophysiology Department or the on-call Clinical Neurophysiology Technician (if out of hours) to plan EEG & CFAM, *after* any emergency brain imaging, even if convulsive movements have settled (see PICU status guideline). Further advice from the Paediatric Neurology team may be helpful at this stage.

• Consider emergency brain imaging with CT or MRI before transfer to PICU if safe to do so, or at least before EEG / CFAM electrodes are applied.

## Management Aims

1. Support vital functions (ABC).

2. Control seizures to assist support of ABC.

3. Assess vital function / resuscitate: ABC. Give oxygen by mask. Position patient head
to allow optimal airway. Consider intubation if respiratory assistance is needed.

4. Establish IV access. Draw venous blood sample for laboratory investigations. (see afebrile seizure or reduced conscious level guideline)

5. Fluid Therapy
• Fluids may be restricted to 2/3 maintenance due to the risk of SIADH. This is unless the child is clinically dehydrated or has a fever when fluid requirements are increased. If hypoglycaemic, administer glucose 5 ml/kg of 10% glucose. Avoid hypotonic fluids. Introduce feeds early.

6. Drug Therapy – see below

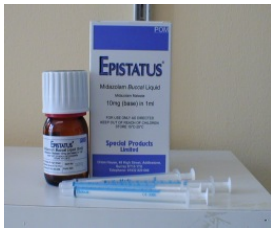
**If pre-hospital benzodiazepines have already been administered then give only one more dose** of Lorazepam IV before proceeding to Phenytoin or Phenobarbital.

## Buccal Midazolam

0.5 mg/kg. Buccal Fossa. Maximum dose 10mg (available as *Hypnovel* 10 mg in 2 ml ampoules; **or** *Epistatus* 10 mg/ml oral solution; **or** *Buccolam* (10mg in 2ml) prefilled syringes which have 4 available strengths). The *Buccolam* syringes are designed such that the whole dose is administered; partial administration of a pre-filled syringe is not recommended.

| Buccolam syringe colour | Strength of buccal midazolam (mg) |
|---|---|
| Red | 10mg |
| Purple | 7.5mg |
| Blue | 5mg |
| Yellow | 2.5mg |


*Epistatus* (10mg/ml) is available as a bottle or as pre-filled syringes. If using the bottle then prescribe to the nearest ml or to 2.5/5/7.5/10mg doses.



## Rectal Diazepam
0.5 mg/kg PR. Maximum dose 20 mg (available in 2.5 mg, 5 mg and 10 mg rectal tubes) use in the absence of venous access if it is not possible to administer Buccal Midazolam.

## Lorazepam
0.1 mg/kg IV. Maximum dose 4 mg. Dilute with equal volume 0.9% saline or water for injections. Administer total dose over 1-2 minutes.

## Paraldehyde
0.4 ml/kg PR of paraldehyde. Maximum dose 12 ml. It is usually available in a pre-mixed formulation with oil, in which case 0.8ml/kg of pre-mixed solution should be used. May be given as an earlier (e.g. step 1) alternative status drug in selected children e.g. previous benzodiazepine reaction.

## Phenytoin
IV loading dose of 20 mg/kg IV. Maximum dose 1000 mg if not previously on Phenytoin. It must be given into a 0.9% saline IV line with close BP and ECG control and at a maximum rate of 1 mg/kg/min initially (e.g. over 20 minutes). Doses up to 500 mgs should be diluted in 50 ml 0.9% saline. Doses 500 mg – 1 g should be diluted in 100 ml 0.9% saline, (if the child's fluid restriction prevents this, then Phenytoin should be diluted to 10 mg/ml or less concentrated). It must not be given IM. It can be given IO.

## Phenobarbital
IV Loading dose 20 mg/kg, dilute x 10 with water for injections and infuse over 20 minutes. It can be given IO.

## Midazolam
IVI on PICU (ampoule 10 mgs in 2 mls) 500 mcg/kg bolus followed by 2 mcg/kg/min IV infusion and accelerating doses of Midazolam according to PICU guideline (up to 32 mcg/kg/min) with EEG and / or CFM monitoring. Titrate down when seizures controlled.

## Lidocaine (previously Lignocaine)
IVI on PICU (500 ml containers of 0.2% Lignocaine in 5% glucose, 2 mgs lidocaine/ml solution): 4 mg/kg/hour (2 mls/kg/hour) for the first hour and then 1 – 4 mg/kg/hour (0.5 – 2 mls/kg/hour) for 24 hours.

## 'Rescue Medication' Discharge Planning
Buccal midazolam as 'rescue medication' at home should be considered in children who have had a previous prolonged convulsive seizure. This will always require formal training for the parents from either trained nursing staff or Epilepsy Specialist Nurses. Each patient will need a written care plan (usually completed at the time of training) and specific training is required for different formulations of buccal midazolam e.g. *Buccolam* or *Epistatus*. Most of the children who may be considered for buccal midazolam at home will have already received a benzodiazepine for prolonged convulsive status. In those children, however, who are benzodiazepine naïve a test dose may be

considered to be low risk of respiratory depression. Follow local guidelines regarding the need for test doses.

**Follow up**
All children prescribed rescue medication, including those with prolonged febrile convulsions, should have ongoing follow up. This includes those who may remain seizure free and reach a point where rescue medication is no longer needed and then can be formally discontinued.

## References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