Pediatric Status Epilepticus Algorithm

* in children over 1 month of age

Recognition of Status Epilepticus

An unresponsive patient with either one of the following has convulsive status epilepticus:

- Seizure >5 min and/or ongoing seizure on presentation to EMS/ED
- 2 or more seizures without full recovery of consciousness between seizures

Initial Management

- Initiate ABCs, cardiorespiratory and BP monitoring
- O_2 10-15 L/min via non-rebreather mask
- Prioritize giving the first dose of benzodiazepine as early as possible, followed by checking blood glucose
- Monitor for respiratory depression, hypotension, arrhythmias
- Give acetaminophen 15 mg/kg/dose (MAX 650 mg) PR if febrile
- **Consider other investigations:**
  - Electrolytes, blood gas, calcium, CBC, serum glucose
  - Other: anticonvulsant drug levels, LFTs, blood & urine culture

Phase 1
5-15 min

Prehospital

1. Give Midazolam IM/intranasal (IN) (see dosing table).
2. Check blood glucose:
   If blood glucose <3.3 mmol/L (<60 mg/dL):
   Treat with D25W 2 mL/kg/dose IV (MAX 100 mL/dose) OR
   D10W 5 mL/kg/dose IV (MAX 250 mL/dose).
3. If still seizing after 5 minutes, give Midazolam second dose.
   MAX cumulative dose 10 mg in prehospital setting.

Emergency Department (ED)

1. Give benzodiazepine if two doses not already given prior to ED arrival (see dosing table).
2. Check blood glucose if not already done. Treat hypoglycemia as above. Reassess blood glucose in 5 minutes.
3. Give second benzodiazepine dose for ongoing seizures 5 minutes after first dose. When IV/IO access available, switch to IV/IO route.

CAUTION: Do not give more than 2 doses of benzodiazepines.

First Line Agents

No IV/IO	
Midazolam IM or IN	⩽13 kg: 0.2 mg/kg/dose 13-40 kg: 5 mg/dose >40 kg: 10 mg/dose MAX 10 mg/dose
IV/IO	
Lorazepam IV/IO	0.1 mg/kg/dose MAX 4 mg/dose
Midazolam IV/IO	0.1 mg/kg/dose MAX 10 mg/dose

Reassess ABCs, monitor for respiratory depression. If still seizing give one of these second-line agents:

Phase 2
15-20 min

Drug	Dose	Age	Comments/Cautions
Levetiracetam	60 mg/kg/dose IV/IO (MAX 3000 mg/dose) Infuse over 5 minutes	Any age	↓side effects/drug interactions, low risk of psychosis
Fosphenytoin	20 mg phenytoin equivalent (PE)/kg/dose IV/IO/IM (MAX 1000 mg PE/dose) Infuse over 10 minutes	Any age	↓BP, ↓HR, arrhythmia; avoid in toxicologic seizures; choose alternate drug if on phenytoin at home or consider partial loading dose of 10 mg PE/kg/dose
Valproic Acid	40 mg/kg/dose IV/IO (MAX 3000 mg/dose) Infuse over 10 minutes	⩾2 years	In Canada, only available via Health Canada Special Access Program; caution in patients with liver dysfunction, mitochondrial disease, urea disorder, thrombocytopenia or unexpected developmental delay
Phenytoin	20 mg/kg/dose IV/IO (MAX 1000 mg/dose) **Infuse over 20 minutes**	Any age	↓BP, ↓HR, arrhythmia; avoid in toxicologic seizures; choose alternate drug if on phenytoin at home or consider partial loading dose of 10 mg kg/dose; use only if Fosphenytoin not available
Phenobarbital	20 mg/kg/dose IV/IO (MAX 1000 mg/dose) **Infuse over 20 minutes**	**<6 mos**	Respiratory depression, especially in combination with benzodiazepines

Reassess ABCs, monitor for respiratory depression. If still seizing:

Administer alternative second line agent (e.g., if fosphenytoin given, use levetiracetam)

Pediatric Referral Centre Discussion:

- Need for intubation vs. bag-mask ventilation; hypercapnia is common and resolves with seizure cessation and non-invasive respiratory support
- Additional work up including full septic work up, use of antibiotics/antivirals, brain imaging
- Persistent altered LOC possibly related to non-convulsive status epilepticus or severe underlying brain disorder
- Third line agent: infusion of midazolam, pentobarbital, propofol OR ketamine

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