Ann & Robert H. Lurie Children's Hospital of Chicago®

# Status Epilepticus Algorithm

## INCLUSION

- Patients with one continuous seizure lasting ≥5 min
- Patients with multiple, intermittent seizures lasting ≥ 5 min **between which the patient does not regain consciousness**

## EXCLUSION

- For patients with readily accessible individualized seizure plans, please defer to patient-specific plan

## NEONATES ≤28 DAYS

- Treat with benzodiazepine and administer Phenobarbital 20mg/kg as 2nd medication (see Table 3).

## KEY POINT

The care team's ability to stop a patient's seizure/seizures depends on timely administration of medications.

The longer the seizure, the more treatment-resistant it becomes.

| | Helper RN | Bedside or Primary RN | Primary Service Provider (MD/APN) |
|---|---|---|---|
| 0 min | **RN Helper Arrives**<br>Obtain Labs:<br>• BMP, CBC & iCa<br>• Glucose via iStat or Accucheck.<br>• PRN drug levels<br>• Report glucose **aloud to team** | **Patient Seizure Starts**<br>*(*RN documents start time)*<br>1) Assess ABCs (See Table 1)<br>2) Obtain Patient Temp x 1<br>3) Call Local RN Helper<br>4) Notify Primary Service Provider | **Provider Arrives**<br>• Assess patient<br>• Order labs per order set |
| | **TEAM QUESTION**<br>Does the patient have IV access? | | |
| | NO: • **Insert PIV or Page VAT, STAT** • **Pull 1st Medication Dose** (IM or intranasal midazolam) from med pyxis<br>YES: • **Confirm IV works** • **Pull 1st Medication Dose** (IV lorazepam) from med pyxis | | NO: • **Order PIV Insertion** • **Order 1st Medication Dose**<br>▪ IM midazolam 0.2mg/kg (max dose 10mg)<br>OR<br>▪ If atomizer available, intranasal midazolam 0.2mg/kg (max dose 10mg; split dose between nostrils)<br>YES: • **Order 1st Medication Dose**<br>▪ IV Lorazepam 0.1mg/kg/dose (max dose 4mg) |
| 5min | • **Pull Fosphenytoin** (for IV, when available)<br>• **Prepare 1st Fosphenytoin Dose** (see dilution instructions on label/in MAR) | **Continue to Monitor ABCs**<br>**1) ADMINISTER 1st Medication Dose @ 5min mark**<br>**2) DOCUMENT Timing** | • **If patient > 28 days, order 1st Dose of IV Fosphenytoin** 20mg PE/kg (max dose 1500mg/dose)<br>*Consult neurology and See Table 2 if patient hypotensive or with known Fosphenytoin allergy.<br>*If <28 days, see Table 3. |
| | **TEAM QUESTION**<br>Does the seizure continue? Has the patient had multiple seizures without regaining consciousness? | | |
| 10min | YES: • **Pull Fosphenytoin** from med pyxis<br>• **Prepare 2nd Fosphenytoin Dose** (see dilution instructions on label/ in MAR) | YES: **1) CHECK BP to assess for hypotension**<br>**•If normotensive, proceed to step 2.**<br>**•If hypotensive, pause for team discussion.**<br>**2) ADMINISTER 2nd Medication Dose@ 10min**<br>• **Preferred Choice ( if > 28 days age):** Fosphenytoin 20mg PE/kg IV over 10 minutes<br>• **If No IV Access or Fosphenytoin Not Ready:** Repeat 1st Medication Dose<br>3) **DOCUMENT Timing** | YES: **Consult Neurology** (emergently page Neurology fellow).<br>• **If patient >28 days, order 2nd Dose of IV Fosphenytoin** 10mg PE/kg (max dose 1500mg/dose).<br>* Consult neurology and see Table 2 if hypotensive or with known Fosphenytoin allergy.<br>*If <28 days, see Table 3. |
| | **TEAM QUESTION**<br>Does the seizure continue? Has the patient had multiple seizures without regaining consciousness? | | |
| 20min | YES: • **Continue to Monitor ABCs**<br>• **Validate documentation** in Epic of seizure duration, medication delivery times and patient vitals | YES: **1) CHECK BP to assess for hypotension**<br>**•If normotensive, proceed to step 2.**<br>**•If hypotensive, pause for team discussion.**<br>**2) ADMINISTER 2nd Medication Dose@ 20min**<br>• **Preferred Choice ( if > 28 days age):** Fosphenytoin 10mg PE/kg IV over 10 minutes<br>3) **DOCUMENT Timing** | YES: • **Further Discussion (varies by location)**<br>▪ Acute Care Patients: Call CAT<br>▪ ED Patients: Call PICU<br>▪ ICU Patients: Further On-Unit Discussion<br>• **Review Resulted STAT Labs**<br>▪ See Table 4 for diagnostic studies & treat primary cause |
| | **TEAM DISCUSSION**<br>In collaboration with Neurology, determine plan for patient care. See page 2 for considerations after 30 minute mark. | | |



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## TABLE 1: ABC Assessment

- Provide oxygen to maintain SO2 >92%
- Cycle blood pressure cuff every 3 minutes, administer NS bolus if hypotensive
- Monitor heart rate

## TABLE 2: Alternatives to Fosphenytoin

If Fosphenytoin is contraindicated, can administer:

- Levitaracetam 60mg/kg (max 4500mg/dose)

**OR**

- Phenobarbital 20mg/kg

## TABLE 3: Neonates <28 days

- Consult Neurology
- Preferred 2nd medication at 10 minutes is Phenobarbital 20mg/kg
- Discuss 3rd medication choice/dose with Neurology
- In partnership with Neurology, expedite order of MR Ventricle DWI/ADC/GRE

## TABLE 4: Studies for SE without Identified Etiology

**Initial Studies:**

- Serum electrolytes & glucose
- Complete blood count
- Antiepileptic drug levels (if applicable)
- Lumbar puncture:
  - Consider if febrile or concern for CNS infection
  - Obtain cell count, glucose, protein and culture
- Imaging Studies:
  - MR Ventricle with DWI and GRE *or* CT Head

**Additional/Expanded Studies to Consider (for unusual presentation, refractory seizures):**

- CSF: meningoencephalitis panel, viral studies, lactate, autoimmune encephalitis panel
- Metabolic studies: lactate, pyruvate, acylcarnitine profile, serum amino acids, urine organic acids
- Blood and urine cultures
- Expanded CNS imaging (once seizures controlled):
  - Full MRI Brain
  - Vascular imaging (MRA/CTA, MR venogram)
  - MR Spectroscopy


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# Status Epilepticus Algorithm

| Considerations for after 30 min: Overview of Treatment of Refractory Status Epilepticus | |
|---|---|
| *If seizures continue despite appropriate doses of a benzodiazepine and a loading dose of another anticonvulsant, the patient is in refractory SE.*<br>Key management principles include:<br>▪ Advance drug dosing quickly<br>▪ Use bolus doses to initiate therapy<br>▪ Use physiologic management (BP, oxygenation, CO2, temperature) and attention to metabolic stressors to attenuate secondary injury<br>▪ If possible identify and treat the underlying cause | |
| Initial Steps:<br>▪ If not already done, call CAT for patients outside of the ER or ICU<br>▪ Patients are likely to require intubation. Anticipate the need for pressors as therapy is escalated (consider a-line, central line).<br>▪ Video-EEG monitoring should be initiated for all patients in refractory SE<br>▪ Emergently consult neurology if not already done | |
| First Line Therapy | **Midazolam**<br>▪ Load with 100-200mcg/kg<br>▪ Continuous infusion starting at 100mcg/kg/h<br>▪ Increase dose every 15 minutes by 50mcg/kg/h until electrographic seizure control achieved<br>▪ Max dose 600-800mcg/kg/h |
| Second Line Therapy | **Pentobarbital**<br>▪ Load with 6-8mg/kg IV<br>▪ DO NOT use if hypotension cannot be controlled<br>▪ Start maintenance 1-4mg/kg/h<br>▪ Titrate to burst suppression on EEG |
| Further steps for super-refractory SE, or if pentobarbital contraindicated | Possible medication choices include:<br>▪ Topiramate (enteral loading dose)<br>▪ Ketamine<br>▪ Ketogenic diet |

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