Created by MF Wiese as part of the Children's Hospital Management of Status Epilepticus Guideline, C39/2006

LRI Emergency Department

Status epilepticus in children

Version 57

Management tool to aid control of generalized tonic-clonic seizures in children

NB: **Drug dilution and administration instructions may differ from those shown on Medusa**

Disclaimer:
This is a clinical template; clinicians should always use judgment when managing individual patients

Re-approved by ED guideline committee on 29Jan25
Review due Mar28 . Trust Ref: C33/2016

Patient details

Full name

DoB

Unit number

(use sticker if available)

HH:MM Time of arrival

5 min

HH:MM Time vascular access established

HH:MM Time 1st dose of benzodiazepine given

5 min

HH:MM Time 2nd dose of benzodiazepine given

5 min

HH:MM Time infusion started

15 min

HH:MM Time RSI performed or seizure stops

Age

Weight kg

Blood glucose

- ABCDE approach in resuscitation room (ER)
- Check blood glucose / treat hypoglycaemia
- Record
  - Age and estimated weight (use ER folder)
  - Time vascular access established
  - Time each antiepileptic drug given
  - Time seizure terminated
- Determine drug doses (see boxes 1 – 7)

Time seizure started HH:MM

Vascular access already achieved? (Y / N)

if seizure stops

STEP 1

Lorazepam 0.1mg/kg IV or IO (see box 2)
Administer ¼ total every minute until full dose reached or seizure has stopped

See box 1 for options

if already fitting >30min

if seizure stops

Was a benzodiazepine dose already given prehospitally? (Y / N)

STEP 2

Lorazepam 0.1mg/kg IV or IO (see box 2)
Administer ¼ total every minute until full dose reached or seizure has stopped

if seizure stops

Prepare levetiracetam 40mg/kg (see box 3)

Contact CAT registrar on bleep **4124** and ask them to attend urgently
Be ready to start infusion if seizure not stopped 5min after **STEP 2** started

if seizure stops

STEP 3

Administer levetiracetam IV or IO
Ask switchboard on **2222** to 'fast-bleep anaesthetist covering paediatrics on **6793** and the ODP on **4220** for ED resus'

NB: If clear that team will **NOT** be ready to RSI 15min after STEP 3 started, give phenytoin 20mg /kg as per boxes 4-7 (or phenobarbitone 20mg/kg instead in neonates and in children already on phenytoin) unless seizure stops when infusion ready

Prepare for rapid sequence induction (RSI) using thiopentone 3-5mg/kg or propofol IV or IO
Be ready to proceed if seizure not stopped 15min after **STEP 3** started

if seizure stops

STEP 4 RSI → Aftercare

This patient was managed by

Print name | Signature | Role | Date | Time

① Enteral benzodiazepine

- ☐ < 1 month
  No enteral medicine recommended; prioritise IV or IO access for lorazepam
- ☐ 1 month to < 3 months
  Diazepam suppository 5mg rectally
- ☐ 3 months to < 1 year
  Midazolam buccally — **2.5mg syringe**
- ☐ 1 year to < 5 years
  Midazolam buccally — **5mg syringe**
- ☐ 5 year to < 10 years
  Midazolam buccally — **7.5mg syringe**
- ☐ 10 years and over
  Midazolam buccally — **10mg syringe**

*Pre-filled midazolam syringes contain **1mg in 0.2mL**; administer whole*

② Intravenous Lorazepam

***NB**: Lorazepam is too viscous to use undiluted*

***Warning**: UHL orders two different strengths depending on availability. Look at ampoule label and use correct dilution recipe below.*

- ☐ ***2mg-in-1mL** ampoule*
  Draw up 3mL of 0.9% NaCl in a 5ml syringe then inject some of the NaCl into the ampoule
  If more than 2mg of lorazepam are needed as per table below, prepare two syringes
- ☐ ***4mg-in-1mL** ampoule*
  Draw up 7mL of 0.9% NaCl in a 10ml syringe then inject some of the NaCl into the ampoule

*Whichever one of the above is used, now draw the content of the ampoule back into the syringe, resulting in a 0.5mg/mL solution (**1mg in 2mL**)*

For injection volumes less than 5mL, use a second syringe of the correct size (see below) and a blunt fill needle to take out the exact amount required from the first syringe

	Weight	2nd syringe size	mg	mL
☐	2.5kg	1 mL	0.25	0.5
☐	3kg		0.3	0.6
☐	4kg		0.4	0.8
☐	5kg		0.5	1.0
☐	6kg	2 mL	0.6	1.2
☐	7kg		0.7	1.4
☐	8kg		0.8	1.6
☐	9kg		0.9	1.8
☐	10kg	5 mL (if initial preparation in 10mL syringe)	1.0	2.0
☐	11kg		1.1	2.2
☐	12kg		1.2	2.4
☐	14kg		1.4	2.8
☐	16kg		1.6	3.2
☐	18kg		1.8	3.6
☐	20kg		2.0	4.0
☐	22kg	NO transfer to a 2nd syringe needed	2.2	4.4
☐	25kg		2.5	5.0
☐	28kg		2.8	5.6
☐	31kg		3.1	6.2
☐	34kg		3.4	6.8
☐	38kg		3.8	7.6
☐	≥40kg		4.0	8.0

③ Intravenous Levetiracetam

Ampoules contain 500mg in 5mL (i.e. concentration is 100mg/mL)

Maximum dose to be administered is 3 grams

Steps to work out infusion prescription
worked example for a child weighing 13kg

1. *Weight (in kg) x 40 = dose required in mg*
   e.g. 13x40 = 520mg
2. *Dose divided by 100 = volume needed in mL*
   e.g. 520 divided by 100 = 5.2mL
3. *Add same volume of 0.9% NaCl*
   e.g. 5.2+5.2 = 10.4mL total infusion volume
4. *Total infusion volume x 12 = rate required to complete infusion in 5min, in mL/h*
   e.g. 10.4x12 = 124.8mL/h

See box 8 for the full example prescription

LRI ED IV Phenytoin Preparation Aid: Patients < 50kg

Do not use if patient is already taking Phenytoin . Use adults version of this aid if patient weighs > 49kg

- Run infusion via designated syringe driver (labelled 'for phenytoin infusion in kids only'; stored in the resuscitation room)
- Total loading dose when using tables below will be 19 – 20.3 mg/kg
- Neat infusion of phenytoin is preferred (dilution carries risk of precipitation), but this is impractical in smaller patients due to the tiny drug volumes needed. In those weighing up to 30kg, drug is therefore diluted in 0.9% sodium chloride as per below.

Find patient's weight in one of the tables below, then follow its *SPECIFIC* instructions (NB: all four are different)

④ 2 – 12 kg

Draw up 45mL 0.9% sodium chloride in a 60mL syringe. Add 1 vial (250mg in 5mL) of phenytoin, resulting in a **5mg/mL** solution (i.e. **1mg=0.2mL**). Find required volume in table below and expunge excess from syringe.

Weight	Phenytoin dose (20mg/kg)		Infusion rate (1 mg/kg/min)
kg	Drug mg	Required volume mL	(mL/h)
☐ 2	40	8	24
☐ 3	60	12	36
☐ 3.5	70	14	42
☐ 4	80	16	48
☐ 5	100	20	60
☐ 6	120	24	72
☐ 7	140	28	84
☐ 8	160	32	96
☐ 9	180	36	108
☐ 10	200	40	120
☐ 11	220	44	132
☐ 12	240	48	144

⑤ 13 – 25 kg

Draw up 40mL 0.9% sodium chloride in a 60mL syringe. Add 2 vials (2x250mg in 5mL) of phenytoin, resulting in a **10mg/mL** solution (i.e. **1mg=0.1mL**). Find required volume in table below and expunge excess from syringe.

Weight	Phenytoin dose (20mg/kg)		Infusion rate (1 mg/kg/min)
kg	Drug mg	Required volume mL	(mL/h)
☐ 13	260	26	78
☐ 14	280	28	84
☐ 15	300	30	90
☐ 16	320	32	96
☐ 17	340	34	102
☐ 18	360	36	108
☐ 19	380	38	114
☐ 20	400	40	120
☐ 21	420	42	126
☐ 22	440	44	132
☐ 23	460	46	138
☐ 24	480	48	144
☐ 25	500	50	150

⑥ 26 – 30 kg

Discard 40mL 0.9% sodium chloride from a 100mL bag. Add 3 vials (3x250mg in 5mL) of phenytoin to the remaining 60mL, resulting in a **10mg/mL** solution (i.e. **1mg=0.1mL**). Find required volume in table below and draw it up from the bag into a 60mL syringe.

Weight	Phenytoin dose (20mg/kg)		Infusion rate (1 mg/kg/min)
kg	Drug mg	Required volume mL	(mL/h)
☐ 26	520	52	156
☐ 27	540	54	162
☐ 28	560	56	168
☐ 29	580	58	174
☐ 30	600	60	180

⑦ 31 – 49 kg

Find required volume of **NEAT p**henytoin in table below.

Do not dilute.

Vials contain 250mg in 5mL, or **50mg/mL** (i.e. **1mg=0.02mL**). Draw up exact amount in 60mL syringe.

Weight	Phenytoin dose (19– 20.3 mg/kg)		Infusion rate (1 mg/kg/min)
kg	Drug mg	Volume mL	(mL/h)
☐ 31	600	12	36
☐ 32 - 34	650	13	39
☐ 35 - 36	700	14	42
☐ 37 - 39	750	15	45
☐ 40 - 42	800	16	48
☐ 43 - 44	850	17	51
☐ 45 - 47	900	18	54
☐ 48 - 49	950	19	57

Example prescription for 13kg patient

Example prescription for 32kg patient

PARENTERAL INFUSIONS

	Infusion Fluid		Additions to Infusion				
Date	Type/Strength	Vol.	Medicine	Dose	Route	Time to run or ml/hr	Prescriber
03/12/21	0.9% NaCl	26mL (10mg/mL)	Phenytoin	260mg	IV	78mL/h	Your Name
03/12/21	50mg/mL	13mL	Phenytoin (neat)	650mg	IV	39mL/h	Your Name

- Continuous cardiac monitoring must be in place and NIBP and respiratory rate must be measured frequently
- Connect infusion via a 0.22-0.45 micron in-line filter if diluted drug is given (**NB**: This is not required if neat phenytoin is used)
- Use dedicated IV access & flush IV line generously with 0.9% sodium chloride before & after infusion (**NB**: Do not use glucose)
- The rate of infusion has been calculated to ensure that it will complete within 20min
- Stop infusion if low BP or bradycardia observed; restart once resolved, halving the rate (i.e. will then complete within 40min)

⑧ Levetiracetam example prescription *for 13kg patient as per worked example in box 3*

	Infusion Fluid		Additions to Infusion				
Date	Type/Strength	Vol.	Medicine	Dose	Route	Time to run or ml/hr	Prescriber
14/02/22	0.9% NaCl	5.2mL	Levetiracetam	520mg = 5.2mL	IV	124.8mL/h (i.e. runs over 5min)	Your Name