

# Paediatric Neurosciences: Management of Epileptic Seizures (Including prolonged seizures & status epilepticus) in Children and Young People in Hospital



Title: <b>Paediatric Neurosciences: Management of Epileptic Seizures (including prolonged seizures &amp; status epilepticus) in Children and Young People in Hospital.</b>			
<b>Date effective from:</b>	11/01/2021	<b>Review date:</b>	01/09/2023
<b>Approved by:</b>	Associate Medical Director, Associate Nurse Director, and Drug and Therapeutics Committee		
<b>Approval Date:</b>	06/01/2021		
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<b>Executive Lead:</b>	Consultant Paediatric Neurologist.		
<b>Target Audience:</b>	NHS Lothian paediatric services.		
<b>Supersedes:</b>	Neurosciences: Management of status epilepticus in infants and children in hospital. (2014)		
<b>Keywords (min. 5):</b>	Status, Epileptic, Seizure, Paediatric, Lorazepam, Midazolam, Phenytoin, Phenobarbital, Convulsive status epilepticus, Rapid sequence intubation.		

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## Version Control

Date	Author	Version/Page	Reason for change
February 2014	Consultant Paediatric Neurologist	1	Updated to new guideline template.

## Contents

	Page number
1.0 Purpose	4
2.0 Scope	4
3.0 Definitions	4
4.0 Roles and responsibilities	4
5.0 Main content	5
Introduction	5
Immediate Management	5
Aetiology	6
Investigations	6
Treatment	6
Treatment Pathway	7
Drug Table	8-9
6.0 Associated materials	10
7.0 Evidence base	10
8.0 References	10
9.0 Monitoring and review	10

## 1.0 Purpose

The purpose of this document is to ensure all nursing and medical staff working within NHS Lothian paediatric services are able to manage epileptic seizures (including prolonged seizures & status epilepticus) in children and young people in hospital.

## 2.0 Scope

This guideline applies to all nursing and medical staff caring for children and young people within NHS Lothian paediatric services.

## 3.0 Definitions

CSE – Convulsive Status Epilepticus

IO – Intraosseous Injection

IV – Intravenous Injection

MAX - Maximum

RSI – Rapid sequence intubation

RHCYP – Royal Hospital for Children and Young People

SE – Status Epilepticus

SJH – St John's Hospital

## 4.0 Roles and responsibilities

It is the responsibility of all staff involved in the care of a patient receiving treatment for epileptic seizures to have read and understood this guideline. If any member of staff has any concerns they should address these with a trained member of staff before proceeding.

## 5.0 Main content and evidence base

### Introduction

Most epileptic seizures self-terminate within 5 minutes and will only generally require supportive measures. A prolonged epileptic seizure, by definition, lasts for more than 5 minutes. Medical intervention is usually instituted at 5 minutes as longer persisting seizures are less likely to stop spontaneously than shorter seizures.

Prolonged epileptic seizures require urgent treatment to prevent brain injury. Termination of epileptic seizures within 30 minutes is less likely to be associated with long term neurological consequences. Historically the definition of convulsive status epilepticus was a seizure with a duration equal to or lasting longer 30 minutes. The definition was revised to a seizure with 5 minutes or more of continuous clinical and/or electrographic seizure activity, or recurrent seizure activity without recovery between seizures. Treatment should be initiated at 5 minutes of continuous seizure thus preventing associated brain damage from prolonged seizures.

Please note that many patients in the community setting have individual emergency medication guidelines for seizure management. Professionals should confirm with parents/carers if the patient has an individual emergency medication guideline and whether they have had treatment prior to presentation in RHCYP/SJH ED. Individual emergency medication guidelines are bespoke management plans and may include doses different to those included within this guideline. When individual emergency medication guideline doses differ to the doses within this guideline, staff should use doses from the patient's individualised plan. If patient specific emergency medication guidelines are not available staff should use dosage information from this guideline.

### Immediate Management of Prolonged Epileptic Seizures

**Airway** – Establish and maintain airway. If poor air entry chin-lift, jaw thrust manoeuvres should be carried out and airway reassessed. Deliver high flow oxygen by mask (10-15 litres per minute).

**Breathing** – Assess work, efficiency and effectiveness of breathing. Bag-valve-mask ventilation, if indicated. Monitor oxygen saturations with pulse oximeter.

**Circulation** - Assess heart rate, rhythm, blood pressure and capillary refill time, support if necessary. Establish intravenous access as soon as possible. If unable to obtain intravenous access consider intra-osseous access.

**DEF** – Don't ever forget Glucose

**Glucose** – Measure bedside glucose. Correct hypoglycaemia if present. See ED hypoglycaemia pathway.

**History** – Present and past history including febrile illness, herpetic contacts, recent trauma, history of epilepsy, individual emergency medication guidelines and possible poison ingestion.

**Consider Aetiology**

Febrile convulsion  
 Hypoglycaemia  
 Hyponatraemia  
 Inborn error of metabolism  
 Meningoencephalitis  
 Poisoning (accidental or deliberate)  
 Trauma/Non Accidental Injury  
 Recent dose adjustment or outgrown doses  
 Suspected poor compliance in a child with known epilepsy

**Investigations**

Bloods:

- Full blood count, urea, creatinine and electrolytes, plus calcium, magnesium, phosphate and glucose.
- Phenytoin level if child on phenytoin.

Consider:

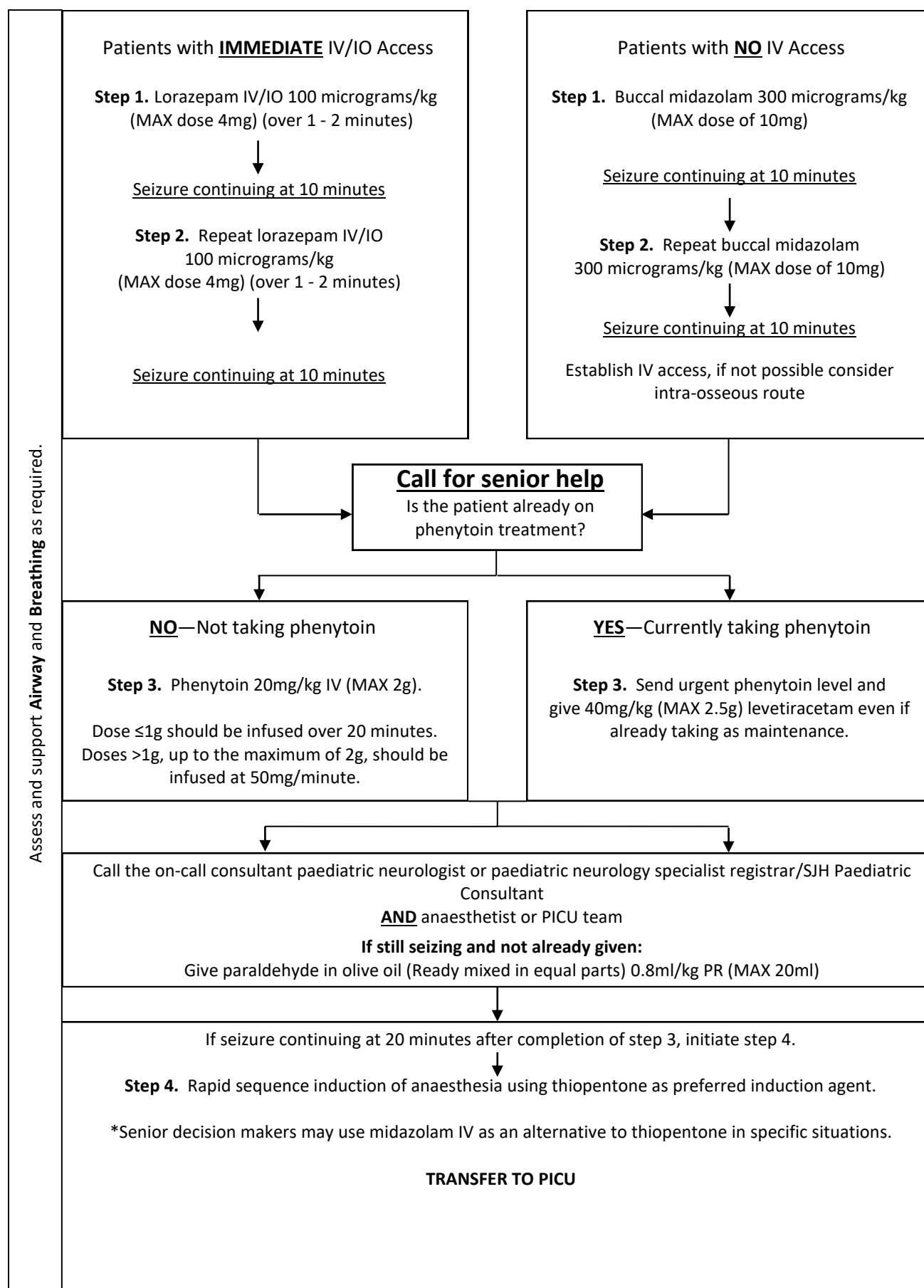
- Antiepileptic drug levels in patients taking other antiepileptic drugs
- Infection Screen (Note never perform a lumbar puncture on an unconscious child without prior imaging. If meningo-encephalitis is suspected start appropriate therapy and consider lumbar puncture after imaging.)
- Urine culture/toxicology
- Neuro imaging (CT/MRI Brain – Discuss with consultant)
- Metabolic screen. (Discuss with senior medical staff)

**Commence treatment of Epileptic Seizures if continuing longer than 5 minutes**

Establish if any medication has already been given prior (including in the community setting). Commence treatment of an epileptic seizure if continuing longer than **5 MINUTES**. If out with ED, put out PET call.

Patients should receive a maximum of **TWO** benzodiazepines in the hospital setting. It may be appropriate to give a **THIRD** benzodiazepine dose if the patient received a previous buccal or rectal dose before arrival to hospital.

## Treatment Pathway



## Epileptic Seizure Drug Table

Drug	Dose & Frequency	Route & Administration	Maximum Frequency	Comments
Diazepam	< 1 year: 2.5mg 1-5 years: 5mg 6-12 years: 10mg >12 years: 10mg – 20mg	Rectal	Repeat dose after 10 minutes Maximum 3 doses in 24 hours	If further doses are required seek help from senior medical staff.  Rectal tubes available in 2.5mg, 5mg and 10mg.
Levetiracetam <sup>(9)</sup>	Loading Dose: Neonates: 40mg/kg Child > 1 month: 40mg/kg (Maximum 2500mg) Maintenance: See BNFc for dosing information.	Intravenous Infusion over 15 minutes	Single dose	40mg/kg doses are used for termination of prolonged seizures. Dosing may be different for other circumstances, discuss doses with neurology medical staff for other indications.  See Medusa Monograph for dilution.
Lorazepam (Activan®)	0.1mg/kg (Maximum 4mg)	Intravenous bolus over 1 - 2 minutes	Repeat after 10 minutes.	4mg/ml Ampoules. STORED IN FRIDGE See Medusa Monograph for dilution.  Cautioned in renal impairment and liver disease. Respiratory depression and hypotension may occur; appropriate resuscitation facilities should be available.
Midazolam (Buccal)	0.3mg/kg (Maximum 10mg)	Buccal	Repeat dose after 10 minutes. Maximum 3 doses in 24 hours	If further doses required, review by senior medical staff.  Use 10mg/ml buccal liquid. Also available in pre-filled syringes 10mg.
Midazolam (IV)	150-200 micrograms/kg then 1 microgram/kg/minute initially.	Loading dose followed by continuous infusion	Increase by 1 microgram/kg/minute every 15 minutes until seizure controlled. (Maximum 5micrograms/kg/minute)	Adjust according to response. Anaesthetic / PICU care only with ventilatory support available.  See Medusa Monograph for dilution.



Drug	Dose & Frequency	Route & Administration	Maximum Frequency	Comments
Paraldehyde 50% in Olive Oil  (Ready mixed in equal parts)	0.8ml/kg (Maximum 20ml)	Rectal	Maximum 3 doses in 24 hours	Available ready mixed with equal volume olive oil. Administer dose with syringe and quill.
Phenytoin	Loading Dose: 20mg/kg (not if already on phenytoin) MAX 2g  Maintenance: See BNFC for dosing information.	Dose $\leq 1g$ should be infused over 20 minutes.  Doses $>1g$ , up to the maximum of 2g, should be infused at 50mg/minute. (I.e. 2g dose infused over 40 minutes.)	Single dose See IV Monograph for maintenance dose	See Medusa Monograph for dilution.  IV infusion at a maximum rate of 1mg/kg/minute, not exceeding 50mg/minute.  Requires cardiac monitoring during intravenous infusion.
Thiopentone (Thiopental)	As per anaesthetist.	IV bolus	Single dose	Anaesthetic / PICU care only, with ventilatory support available.  See Medusa Monograph for reconstitution and dilution.

Note that doses may differ to the current edition of the BNFC and that some products are being used off label or unlicensed.

## 6.0 Associated materials

## 7.0 Evidence Base

## 8.0 References

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## 9.0 Monitoring and review

Next review: September 2023.

Approved by RHCYP Drug and Therapeutics committee August 2020.