Guideline for the Management of Generalised Convulsive Status Epilepticus in Adults

Note: - This does not include eclampsia (see O & G guideline for the treatment of eclampsia)

A clinical guideline recommended for use

In:	Adult patients with continuous seizures
By:	Accident and Emergency, Neurology wards, EAU Medical staff
For:	Patients with continuous seizures or intermittent seizures with no recovery of conscious level
Division responsible for document:	Medical Division (Including Emergency)
Key words:	Status Epilepticus, Adults, , Lorazepam, Phenytoin, Levetiracetam
Names of document authors:	H. Hollis , J. Cochius, C. Beech
Job titles of document authors:	Consultant in Accident and Emergency, Consultant Neurologist, Deputy Chief Pharmacist
Name and Job title of document authors Line Manager:	Dr F Swords , Chief of Division
Assessed and approved by the:	Clinical Guidelines Assessment Panel (CGAP) If approved by committee or Governance Lead Chair's Action; tick here ☑
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To be reviewed by:	Mr H Hollis and Dr J Cochius Neurology
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Description of changes:	Separation of previous joint guidelines
Compliance links:	NICE
If Yes – does the strategy/policy deviate from the recommendations of NICE? If so, why?	No deviations

This guideline has been approved by the Trust's Clinical Guidelines Assessment Panel as an aid to the diagnosis and management of relevant patients and clinical circumstances. Not every patient or situation fits neatly into a standard guideline scenario and the guideline must be interpreted and applied in practice in the light of prevailing clinical circumstances, the diagnostic and treatment options available and the professional judgement, knowledge and expertise of relevant clinicians. It is advised that the rationale for any departure from relevant guidance should be documented in the patient's case notes.

The Trust's guidelines are made publicly available as part of the collective endeavour to continuously improve the quality of healthcare through sharing medical experience and knowledge. The Trust accepts no responsibility for any misunderstanding or misapplication of this document.

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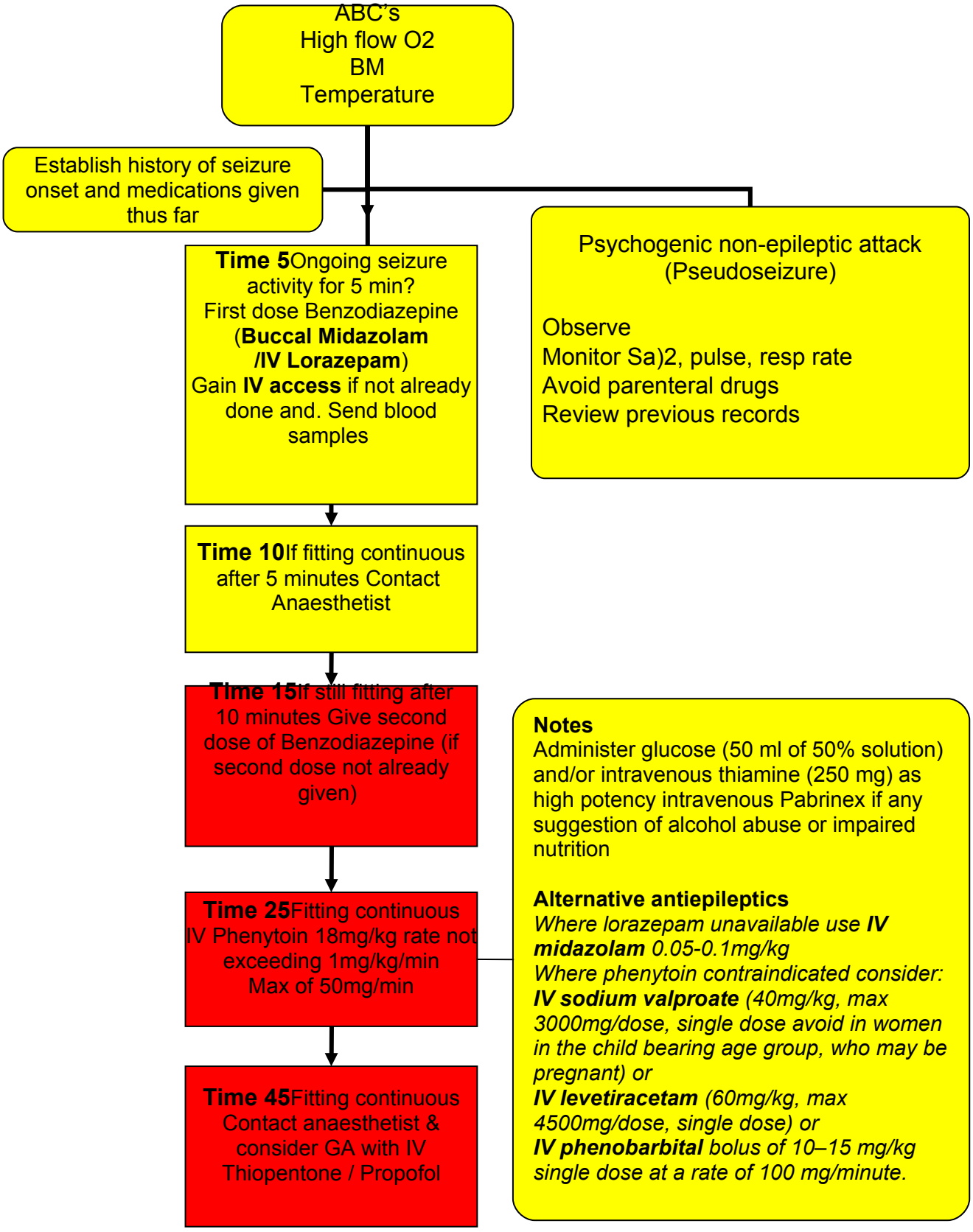

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Adult patients with continuous seizures

1. Protect the airway, assess breathing and give oxygen.
2. Assess circulation and insert IV cannula.
3. If seizure does not resolve spontaneously or is intermittent with no recovery of conscious level give

Buccal midazolam >18 years 10mg

or

IV Lorazepam 0.1 mg/kg (usually a 4mg bolus, repeated once after 5 minutes; rate not critical). Where lorazepam unavailable use IV midazolam 0.05-0.1mg/kg

or

IV diazepam 0.1mg/kg

4. Repeat once after 10 mins if seizure is not controlled.
5. Check blood glucose and treat if < 5 mmol/L. Administer glucose (50 ml of 50% solution) and/or intravenous thiamine (250 mg) as high potency intravenous Pabrinex if any suggestion of alcohol abuse or impaired nutrition
6. If seizure continues for more than a further 10 minutes, give:
   Phenytoin 18mg/kg IV at a rate NOT exceeding 1mg/kg/min with maximal rate of 50mg/min. Where possible try to obtain an accurate weight but if not use best estimate.

   Phenytoin should ideally be given undiluted via a syringe driver, see appendix 1 for details and alternative method of infusion for adults.,
   Where phenytoin is contra-indicated e.g. hypersensitivity to phenytoin, sinus bradycardia, sino-atrial block, second or third degree AV block, Stokes-Adams syndrome consider use of

   IV sodium valproate (40mg/kg, max 3000mg/dose, single dose avoid in women in the child bearing age group, who may be pregnant) or
   IV levetiracetam (30-60mg/kg, max 4500mg/dose, single dose) or
   IV phenobarbital bolus of 10–15 mg/kg single dose at a rate of 100 mg/minute.

   Monitor respiratory rate, ECG and BP during administration.
7. If the seizure continues, discuss sedation and ventilation with the on-call Anaesthetist.

Rationale for the recommendations

- Good research evidence and resulting consensus between neurologists and paediatricians now indicates buccal midazolam is the treatment of choice for seizures in both adults and children. (**4**)
- The status epilepticus protocol proposed within these guidelines follow on from the BPNA Status Epilepticus Working Group Guidelines. They take account of subsequent evidence, personal experience and results from the NLSTEPSS audit (**1**). There are minor differences between these local guidelines and APLS and NICE

guidelines, for example incorporating pre-hospital care; omission of paraldehyde; addition of buccal midazolam.

- For the purposes of this guideline the definition of status epilepticus is; a seizure, or series of seizures during which consciousness is not regained, that lasts for at least 5 minutes (**5**).
- Treatment of CSE begins at the time of initial therapy, irrespective of whether the initial treatment was given in the pre-hospital or hospital settings (**2**).
- Rectal or buccal medications should only be administered within the hospital setting (**3**).
- Recommendations for the use of injectable phenytoin as per NHSI Patient Safety Alert (6)
- Recommendations for alternatives to IV phenytoin in the treatment of status epilepticus (7)
- Valproate medicines are contraindicated in women and girls of childbearing potential unless conditions of Pregnancy Prevention Programme are met. (8)

Clinical audit standards

Review of all status epilepticus cases against the guidelines over a 12 month period?

Summary of development and consultation process undertaken before registration and dissemination

The guideline was drafted by the authors listed, who are agreed on the final content
During its development it was circulated for comment to: Dr. P. Jenkins (Director, Medical Assessment Unit), Paediatric, Neurology and A&E consultants and Paediatric Anaesthetists. Various suggestions have been incorporated. Where the literature is conflicting and there has been debate about which recommendation to adopt, thus the BPNA Status Epilepticus Working Group Guidelines and recommendations have been used, notably in the use of Buccal Midazolam in children. The Drugs and Therapeutics Committee reviewed the guideline in June 2000 and found no problems.

May 2006. The authors reviewed the guideline and no changes were made.
September 2010 Dr Richard Beach made the following amendments:

1) Removed paraldehyde as this is no longer available.
2) Put in buccal midazolam as the first choice for children where there is no iv access. This was approved by Dr Cochius and Dr Daynes

February 2012 Dr. Ruchi Arora made the following amendments:

1) Introduced flowchart for SE management.
2) Adjusted buccal midazolam age appropriate dosages.
3) Practise based on recent literature and search results; especially NLSTEPSS audit.
4) Removed IV lorazepam as not available.

May 2012 the authors reviewed the guideline and no further changes were made.
July 2015 the authors reviewed and CGAP Chair rearranged the order putting children first.
March 2017 the authors reviewed the guideline and produced separate guidelines for adults and children, added alternatives to IV phenytoin where this is contra-indicated and added guidelines for the safe administration of IV phenytoin as a result of the Patient Safety Alert on injectable phenytoin (November 2016). February 2018 the document was separated from previous joint guidelines.

Distribution list/dissemination method

To be placed on the Trust Intranet

This guideline will be promoted through the A&E education programme. Consideration will be given to the feasibility of its inclusion in Paediatrics, Neurology and MAU education programmes.

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Appendix 1

Phenytoin loading dose administration guidelines in Adults

These guidelines relate to the administration of a **loading dose of phenytoin in adults only** and supplement the instructions provided by Medusa IV Guide available via the trust intranet web system page.

Why is a loading dose needed?

For patients with status epilepticus who **have not** been taking phenytoin, a loading dose of 18mg/kg is used (or a standard 1 gram loading dose) in order to obtain a rapid effect. This can be followed by a maintenance dose of 100mg every 6 to 8 hours.

How to administer

- Phenytoin injection is very alkaline it can be irritant to the veins and therefore a large vein and a large gauge needle should be used. This should be flushed before and after administration with 10ml sodium chloride 0.9%.
- Phenytoin is also very insoluble and likely to precipitate when added to infusion fluids. Therefore, the preferred method of administration should be **undiluted using a syringe driver**.
- Phenytoin must be given slowly at a rate no greater than 50mg/min to avoid arrhythmias and hypotension.

Method of administration

Preferred method

Using the undiluted 250mg in 5mL phenytoin injection via a syringe driver

Based on the recommended loading dose of **18mg/kg** the following doses should be required

Weight	Loading Dose of phenytoin required	Volume of phenytoin 250mg/5mL to be infused via syringe driver	Minimum administration time	Suggested administration time
45 to less than 55 kg	900mg	18 mL	18 minutes	30 minutes
55 to less than 65 kg	1100mg	22 mL	22 minutes	
65 to less than 75 kg	1250mg	25 mL	25 minutes	
75 to less than 85 kg	1450mg	29 mL	29 minutes	45 minutes
85 to less than 95 kg	1600mg	32 mL	32 minutes	
95 kg and over	1800mg	36 mL	36 minutes	

For example:

Dose required: 1250 mg (a loading dose based on patient weighing 70kg).

Administration: Draw up 1250mg (i.e. 25mL using the 250mg in 5mL preparation) into a 50mL syringe. Give using a 50mL syringe driver.

Infusion rate: The **maximum rate** is 50mg per minute, therefore run the syringe driver no faster than 1mL/minute. The suggested rate is therefore over 30 minutes.

Alternative method of administration – add the volume of phenytoin required to 250mL sodium chloride 0.9% and administer as per the table above. An in-line filter 0.22-0.5micron and an infusion pump must be used during the administration of intravenous phenytoin if given by this method.

The product should be inspected visually for particulate matter and discolouration prior to administration.