Worcestershire Acute Hospitals NHS Trust

GUIDELINES FOR STATUS EPILEPTICUS

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Key Amendments

DATE	AMENDMENT	APPROVED BY
19th November 2020	Document extended for one year	Paediatric QIM/Dr J West
26th March 2021	Approved with no amendments	Paediatric QIM

INTRODUCTION

Definition

Generalised convulsive (tonic–clonic) status epilepticus is defined as a generalised convulsion lasting 30 minutes or longer, or repeated tonic–clonic convulsions occurring over a 30 minutes period without recovery of consciousness between each convulsion**. However, the guideline stated that 'for practical purposes, the approach to the child who presents with a tonic–clonic convulsion lasting more than 5 minutes should be the same as the child who is in "established" status – to stop the seizure and to prevent the development of status epilepticus'**

Any type of seizure may develop into status epilepticus; generalised tonic clonic is the most common and most serious type.

Aetiology

- Remote symptomatic (where there is a chronic non-progressive or progressive disturbance of brain function including epilepsy, metabolic diseases)
- Acute symptomatic (acute neurological or systemic disorder, including infections i.e. meningitis and encephalitis, head injury, accidental or deliberate ingestion)
- Febrile (occurring in febrile children with no previous history of non-febrile seizures and no evidence of meningitis/encephalitis)
- Idiopathic

Significance of Status Epilepticus

Convulsive status epilepticus in childhood is a life threatening condition with serious risk of neurological sequelae and constitutes medical emergency.

Commence emergency treatment if convulsive epileptic seizure has persisted more than 5 minutes. Focal motor seizures with preserved consciousness / responsiveness are generally less noxious and should be tolerated for a longer period before giving emergency treatment.

Pathophysiology

Prolonged convulsive status cause irreversible damage within hippocampus, amygdala, cerebellum, thalamus and cerebral cortex.

This damage results from a cytotoxic chain reaction involving excitatory amino acids (e.g. glutamate),

free radical release, mitochondrial dysfunction, cerebral oedema and cerebral ischaemia.

Persisting status epilepticus leads to a loss of physiological compensatory mechanisms, with consequent biochemical, renal, hepatic and cardiac failure, and ultimately death.

COMPETENCIES REQUIRED

Training in Basic Life Support
Intravenous Cannulation
Intraosseous Cannulation
Resuscitation Team - Trained in APLS/EPLS
Administering intravenous medication as per guideline.
Training in the administration of Buccolam (buccal midazolam)

PATIENTS COVERED

With the exclusion of neonates, the guideline covers all children from 1 month to 16 years of age who fits the definition of status epilepticus. If individual patients have had a previous adverse experience e.g. with Benzodiazepines, or for other reasons have their own "tailor made" individual emergency plan, this should be used in preference to the generic default guideline.

GUIDELINE:

Primary Assessment

AIRWAY

- Assess airway patency by '**look, listen, and feel'** method. If no air entry, chin lift-jaw thrust manoeuvres should be carried out and reassessed. If no improvement, rescue breaths to be given.

BREATHING Assess adequacy of breathing

- Effort of breathing: recession, respiratory rate grunting
- Efficacy of breathing: breath sounds, chest expansion
- Effects of breathing: heart rate, skin colour

Monitor oxygen saturation with pulse oximeter

CIRCULATION Assess adequacy of circulation

- Cardiovascular status: heart rate (presence of inappropriate **bradycardia suggest raised intracranial pressure**), pulse, capillary refill, **blood pressure** (significant hypertension >97th percentile for age indicates possible aetiology)

Monitor heart rate, rhythm, blood pressure, and core/toe temperature difference

DISABILITY Assess neurological function.

- Pupillary size and reaction (very small pupils suggest opiate poisoning, dilated pupils seen in amphetamine, atropine, tricyclic antidepressant poisoning)
- Note child's posture. (Decorticate, decerebrate posture suggests raised ICP)
- Look for neck stiffness and full fontanelle which suggest meningitis
- Focal neurological signs.

EXPOSURE

- Take child's temperature (hyperthermia suggest infective cause, hypothermia suggests poisoning with barbiturates, ethanol.)
- Look for rash to rule out meningococcal disease.

RESUSCITATION

- Maintain patent airway and left lateral position (unless needs intubation)
- Clear secretion by gentle suction
- High flow oxygen through face mask
- Gain intravenous/intraosseous access - **check blood glucose**, correct hypoglycaemia if present.
- Give 20ml/kg bolus of crystalloid (e.g. 0.9% sodium chloride (normal saline)) **only if** signs of shock present.
- Antibiotic to any child in whom diagnosis of meningitis is made after taking blood for culture.

Obtain full history from parents/carers/ambulance crew to ascertain underlying diagnosis.

FULL HISTORY AND EXAMINATION.

INVESTIGATIONS

Bloods: FBC, U&E, LFT, CRP, Blood Gas, Blood Culture, glucose.
Consider Plasma Ammonia, Lactate, Serum amino acid, Urine amino and organic acids to rule out inborn errors of metabolism.
Anticonvulsant levels if a known epileptic on anticonvulsants.
Save serum.

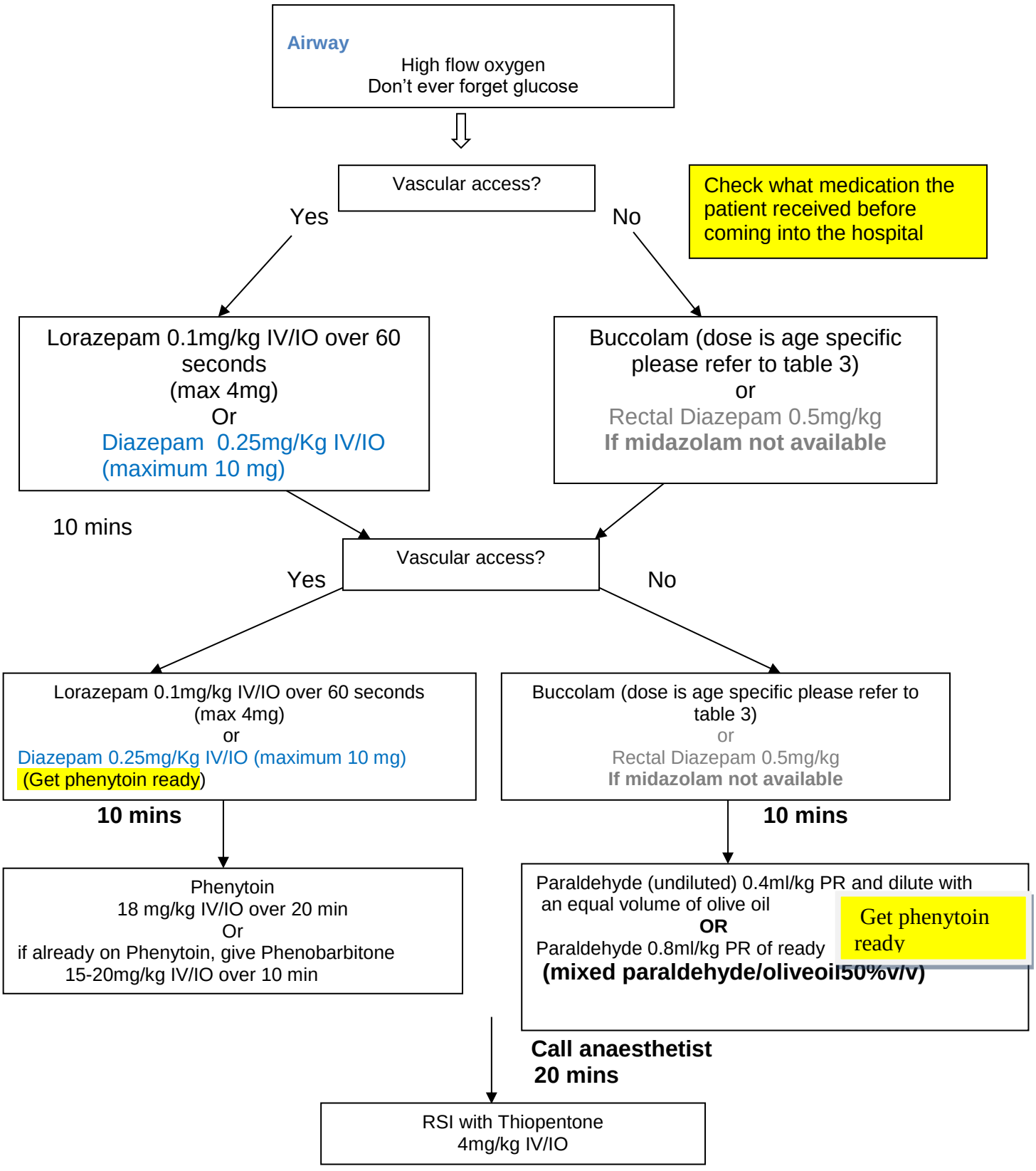
Urine : MC&S, reducing substance, toxicology, amino acids & organic acids.

Imaging: CT Scan of brain if suspect NAI or Space occupying lesion or raised intracranial pressure. (MRI may be needed later to evaluate other neurodevelopmental causes of Epilepsy)

TREATMENT OF UNDERLYING CAUSES e.g. antibiotics, antiviral, antiepileptic etc.

LIAISE WITH POISONS CENTRE (if suspecting ingestion

Algorithm to emergency convulsive treatment



Diazepam dose I.V.

For patients weighing less than 10kg:

Volume to administer I.V. Doses are rounded to nearest ml:

Dilute 10mg (i.e. 2ml) of diazepam with 8 ml of 0.9% sodium chloride to give a solution of 10mg/10ml = 1mg/ml. Dose of 0.25mg/Kg = 0.25ml/Kg

Table 1

2.5kg	0.6ml	(0.6mg)	total dose
5kg	1.2ml	(1.2mg)	total dose
7.5kg	1.8ml	(1.8mg)	total dose
10kg	2.5ml	(2.5mg)	total dose

For patients more than 10kg:

Weight **Volume to administer I.V:**

Give undiluted 10mg/2ml
Dose of 0.25mg/Kg = 0.05ml/Kg

Table 2

12.5kg	0.6ml	(3mg)	total dose
15kg	0.75ml	(3.75mg)	total dose
17.5kg	0.9ml	(4.5mg)	total dose
20-30kg	1.2ml	(6mg)	total dose
30-40kg	1.8ml	(9mg)	total dose
>40kg	2ml	(10mg)	total dose

Buccolam *is the only licensed oromucosal midazolam for the treatment of prolonged, acute, convulsive seizures in infants, children and adolescents (from 3 months to <18 yrs of age). Available in age – specific, pre-filled, plastic, colour-coded oromucosal-dosing syringes. Has a shelf life of 18 months. (The doses below are equivalent to about 0.3mg/Kg.)*

Buccolam unit dose preparations:

Table 3

Label colour	Age range	Midazolam dose
Yellow	1-3 months	1.25mg (half 2.5 syringe)
Yellow	3 to 6 months	2.5 mg
Yellow	>6 months< 1 year	2.5mg
Blue	1 to <5 years	5mg
Purple	5 to <10years	7.5mg
Orange	10 to <18years	10mg

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