Clinical Guideline

WATCh – MANAGEMENT OF CHILDREN IN STATUS EPILEPTICUS IN THE DISTRICT GENERAL HOSPITAL

SETTING	Wales and West Acute Transport for Children
FOR STAFF	WATCh Team, South West and Wales District General Hospital medical and nursing teams.
PATIENTS	Children with status epilepticus in a DGH requiring local extubation or WATCh retrieval.

GUIDANCE

Commence treatment in all seizures >5 minutes duration as per the APLS algorithm. This guideline provides advice for the child requiring either a WATCh retrieval or a pathway to support local extubation. If ongoing seizures see **REFRACTORY STATUS EPILEPTICUS (RSE)**. A summary guideline can be found on page 2 and is available on the WATCh website (www.watch.nhs.uk).

ABBREVIATIONS

VP – Ventricular Peritoneal
NaCl – Sodium Chloride
FBC – Full Blood Count
RSI – Rapid Sequence Induction
CRP – C-Reactive Protein

REFERENCES	APLS (2022) Wilfong (2021) Management of Convulsive Status Epilepticus in Children
RELATED DOCUMENTS AND PAGES	Refractory status epilepticus management on paediatric intensive care
AUTHORISING BODY	WATCh governance group
SAFETY	Treatment for Refractory Status Epilepticus should be discussed with WATCh +/- a tertiary neurologist.
QUERIES AND CONTACT	0300 0300 789
AUDIT REQUIREMNTS	Annual audit of regional practice

Document Change Control

Date of Version	Version Number	Lead for Revisions	Type of Revision	Description of Revision
Sept 2022	3.0	WATCh clinical guidelines group	Major/ Minor	Levetiracetam as second line treatment for status epilepticus

MANAGEMENT OF CHILDREN IN STATUS EPILEPTICUS IN THE DISTRICT GENERAL HOSPITAL

Prolonged seizure (>5mins) or recurrent seizures without return to baseline between seizures.
If ongoing seizures see REFRACTORY STATUS EPILEPTICUS (RSE) below

CAUSES

Most common: Febrile convulsion and known epilepsy
Consider: meningitis, encephalitis, head injury, cerebral infarct or bleed, blocked VP shunt, space occupying lesion.
Other causes: Hypoglycaemia, hyponatraemia, hypoxic ischaemic event, poisoning, inborn error of metabolism

URGENT INVESTIGATIONS

Blood glucose and blood gas
FBC, Urea and electrolytes, Calcium, Magnesium, CRP
Consider ammonia
Consider toxicology screen
Blood pressure to exclude malignant hypertension
Anti-Epileptic Drugs levels (if appropriate)
Consider CT Brain if focal seizure/neurology, trauma or suspected space occupying lesion or VP shunt blockage

POTENTIAL COMPLICATIONS

Hypoventilation / hypotension post benzodiazepines
Difficulty recognising ongoing seizures
Difficulty identifying cause
Dravet Syndrome – phenytoin is contraindicated

MANAGEMENT

Manage Airway, Breathing, Circulation (treat hypoxia, hypotension).
Treat seizures as per APLS algorithm
First line: Benzodiazepines (max 2 doses including pre-hospital doses) or as per child's individual seizure management plan.
Second line: Levetiracetam 40mg/kg IV/IO (max 3g) over 5mins (dilute to 50mg/ml with 0.9% NaCl)
RSI:
If prepared, RSI with Ketamine or Thiopental or Propofol (see WATCh drug sheet for dosages)
If delay in RSI give Phenytoin or Phenobarbital whilst preparing for RSI.
Find and treat underlying cause:

- Consider antibiotics/acyclovir
- Hypoglycaemia – 2ml/kg 10% glucose
- Correct hyponatraemia – 5ml/kg 2.7% NaCl to achieve serum Na >125mmol/l
- Antipyretics for fever

May require intubation either for seizure management or following termination of seizure (for respiratory depression, decreased level of consciousness or CT Brain).

CONSIDERATION FOR LOCAL EXTUBATION

Extubate locally if:
RESP: Saturations within expected range
Oxygen <45%
Peak Pressure <22
Positive End Expiratory Pressure <8
Spontaneously breathing
Normal blood gas
CVS: Cardiovascular stability
CNS: Seizures controlled
Absence of focal neurology
Airway reflexes present
Normal posture
Pupils equal and reactive
Responding to voice or better

NB: If conscious level is reduced due to repeated anticonvulsant doses hold sedation and reassess for extubation in 4-6 hours

REQUEST WATCH RETRIEVAL

If seizure terminated but not suitable for local extubation prepare for transfer while awaiting WATCh arrival:
Insert Nasogastric tube (NGT)
CXR for Endotracheal Tube (ETT) and NGT position
Blood gas post intubation
Suction as required
Commence Intravenous (IV) sedation with Morphine and Midazolam according to WATCh drug sheet.
Hourly neuro observations and pupil checks
Restrict isotonic maintenance fluid to 80% (60% if evidence of raised intracranial pressure [ICP])
Urinary catheter

Neuroprotective measures if raised ICP on CT Brain or clinical signs present:
Glucose - aim 4-8mmol
Sodium - aim for >145mmol/L - 5ml/kg 2.7% NaCl
Normothermia - Antipyretics / active cooling
Normocarbia – aim 4-4.5kpa
Position - Midline and 30 degree head tilt

REFRACTORY STATUS EPILEPTICUS (seizures continue following RSI)

Conference call with WATCh and neurologist
Increase Midazolam by 60micrograms/kg/hr every 15 minutes until seizure terminates (max 300micrograms/kg/hr). If RSE continues on the maximum dose advised in the BNFc the midazolam can be increased by 100microgram/kg/hr every 15 minutes until the seizure terminates (max reported dose of 1.6mg/kg/hr), but MUST be in discussion with WATCh Consultant/Tertiary Neurologist

Paediatric Status epilepticus flow diagram

Treat and investigate as per APLS protocol & WATCh – Management of children in status epilepticus in the DGH

Respiratory inadequacy or airway compromise ongoing seizures, focal neurology, GCS<8/15 after termination of seizure / not returning to normal baseline

RAPID SEQUENCE INDUCTION

↓

Intubated child

↓

DISCUSS CHILD WITH WATCh

Concerns?

- Acute illness e.g. meningitis, pneumonia, aspiration
- Metabolic disorder, hypoglycaemia, poisoning
- Focal seizure/neurology, trauma or suspected space occupying lesion, VP shunt blockage
- Other reasons seizure unlikely to terminate

NO ↓

Hold sedation and assess for extubation

↓

Clinical

RS	Saturations within expected range
	Oxygen <45%
	PIP <22; PEEP <8
	Spontaneously breathing
	Normal blood gas
CVS	Cardiovascular stability?
CNS	Seizures controlled
	Absence of focal neurology
	Airway reflexes present
	Normal posture
	Pupils equal and reactive
	Responding to voice or better
SEPSIS	No signs of evolving LRTI (secretions, CXR, labs)

'YES' TO ALL ↓ (**'NO' TO ANY** → Failed criteria for extubation)

Logistics & Resources

Appropriately skilled doctors & nurses available?
Suitable High Dependency area for on-going care?

YES ↓

Extubate child

Agree appropriateness for local extubation, but <u>maintain close contact with WATCh.</u>
Consider light sedation with propofol infusion 1-4mg/kg/hr whilst optimising respiratory function.
Monitor closely in High Dependency setting for 12-24 hours post-extubation

YES ↓

Failed criteria for extubation

IV sedation with Morphine & Midazolam according to WATCh drug sheet.

Avoid muscle relaxant prior to transfer to allow for neurological assessment

↓

Await WATCh retrieval to PICU

Ongoing Management:

Insert Nasogastric tube
CXR to confirm endotracheal tube & NGT position
Post intubation blood gas
Hourly neuro observations and pupil checks
Restrict isotonic maintenance fluid to 80% (60% if evidence of raised ICP)
Urinary catheter

Neuroprotective measures if raised ICP on CT or clinical signs present:

Glucose (aim 4-8mmol)
2.7% NaCl 5ml/kg to achieve a serum sodium >145 mmol/L
Antipyretics / active cooling (aim for normothermia)
Ceftriaxone +/- Acyclovir (if meningitis suspected)
Nurse with head midline; 30 degree head tilt
Ventilate to $ETCO_2$ 4-4.5kpa