

# CONVULSIVE STATUS EPILEPTICUS (CSE)

Convulsive status epilepticus is a time critical neurological emergency defined by persistent convulsive seizure activity with failure of normal termination mechanisms. Neuronal injury begins early; delay in treatment markedly increases morbidity and mortality.

## ED objectives:

- Terminate seizures early
- Maintain oxygenation and perfusion
- Prevent secondary brain injury
- Identify and treat reversible causes
- Escalate decisively if refractory

## DEFINITION (ED RELEVANT)

Convulsive status epilepticus is:

- A single seizure lasting  $\geq 5$  minutes, OR
- $\geq 3$  recurrent seizures without recovery of consciousness

After  $\sim 5$  minutes, spontaneous seizure termination is unlikely.

## EARLY ED PRIORITIES (PARALLEL, NOT SEQUENTIAL)

- ABCs
- IV access (IO if needed)
- Oxygen immediately
- Record seizure onset
- Check capillary glucose
- time

Do not wait for investigations to treat seizures.

## PATHOPHYSIOLOGY (WHY TIME MATTERS)

- Ongoing seizure  $\rightarrow$  cerebral hypermetabolism
- $\uparrow$  Oxygen demand  $\rightarrow$  hypoxia
- $\uparrow$  Lactate  $\rightarrow$  acidosis
- Loss of GABA responsiveness over time

## PHASED MANAGEMENT (TIME BASED)

### 0–10 MINUTES: EMERGENCY TREATMENT

Benzodiazepines — first line, immediately

- Diazepam IV
- Midazolam IM / buccal / IV (preferred if no IV)

Key principle:

- Adequate dose once or twice
- Under dosing is a common cause of failure

### 10–30 MINUTES: URGENT TREATMENT

Second line antiseizure medication

Choose the **best available locally**:

- Levetiracetam
- Phenytoin
- Valproate
- Phenobarbital (especially where ICU limited)

These are not alternatives to benzodiazepines — they are sequential.

### >30 MINUTES: REFRACTORY STATUS EPILEPTICUS

Seizure persists despite benzodiazepine + second line agent.

- Requires **anaesthesia level therapy**
- **Airway control + intubation**
- Continuous sedation (availability dependent)

This is an **ICU level emergency**.

## SUPPORTIVE & CAUSE DIRECTED CARE

- Treat hypoglycaemia immediately
- Consider:
  - Missed antiepileptic drugs
  - CNS infection
  - Alcohol withdrawal
  - Electrolyte derangements
  - Trauma
  - Toxins
- Infections and metabolic causes are **common and reversible**.

## IMAGING & INVESTIGATIONS

- **Glucose is mandatory**
- Electrolytes if available ( $\text{Na}^+$ ,  $\text{Ca}^{2+}$ )
- CT head **only if available and stabilised**
  - Do **not** delay seizure termination

## WHAT TO AVOID (COMMON FAILURES)

- Delayed benzodiazepine
- Inadequate benzo dosing
- Repeating benzos endlessly without escalation
- Waiting for labs or CT before treating
- Failure to plan airway early

## DISPOSITION

- All patients with CSE require admission
- **ICU if refractory, intubated, or unclear cause**
- Even resolved CSE requires close observation



# CHECKLIST

## SUSPECTED OR CONFIRMED CONVULSIVE STATUS EPILEPTICUS

### INITIAL STABILISATION (ABCDE)

#### Airway

- Protect airway as required
- Suction secretions
- Lateral positioning initially

#### Breathing

- Oxygen (target SpO<sub>2</sub> ≥94%)
- BVM if apnoeic or hypoventilating

#### Circulation

- IV access ×1–2 (IO if no IV)
- Monitor HR and BP

#### Disability

- Ongoing convulsions
- GCS if assessable
- Pupils

#### Glucose

- Finger stick glucose
- IV dextrose if hypoglycaemic
- Thiamine first if malnourished / alcohol dependence suspected

### IMMEDIATE SEIZURE TERMINATION (≤10 MIN)

- Do NOT delay benzodiazepine

Options:  Diazepam IV (repeat once after 5–10 min)

- Diazepam PR if no IV
- Midazolam IM / buccal (preferred if no IV access)
- Document seizure onset time and drug timing

### URGENT INVESTIGATIONS (ONLY IF AVAILABLE)

- Blood glucose (already done)
- Electrolytes (Na<sup>+</sup>, Ca<sup>2+</sup>)
- Malaria test if endemic
- Infection screen if febrile
- CT head ONLY if stable and available

### SECOND LINE ANTISEIZURE THERAPY (10–30 MIN)

- Give **one** appropriate agent:

Options:  Phenytoin IV (slow infusion; cardiac monitoring if possible)

- Phenobarbital IV or IM (watch for respiratory depression)
- Levetiracetam IV if available
- Valproate IV if available
- Continue oxygen and close monitoring

### REFRACTORY STATUS EPILEPTICUS (>30 MIN)

- Call senior / referral support early
- Prepare for airway protection
- Anaesthesia based seizure control if resources allow
- Prioritise seizure control + transfer if ICU unavailable

### IDENTIFY & TREAT COMMON CAUSES

- Missed AEDs (most common)
- CNS infection → give empiric antibiotics ± antivirals
- Hypoglycaemia
- Electrolyte disturbance
- Malaria (if endemic)
- Alcohol withdrawal / toxins

### PREVENT SECONDARY INJURY

- Lateral position
- Avoid hypoxia and hypotension
- Control fever
- IV fluids to reduce rhabdomyolysis risk
- Protect patient from trauma during seizures

### WHAT TO AVOID (CRITICAL)

- Notify senior early
- Arrange transfer if seizures persist
- Clearly communicate:
  - Seizure duration
  - Drugs given (dose + timing)
  - Response to treatment

### DISPOSITION

- Admit all patients
- ICU if refractory, intubated, or unclear cause
- Restart / optimise maintenance AEDs
- Counsel family on adherence and seizure safety
- Plan follow up if available