

# Epilepsy & Status Epilepticus



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- An epileptic seizure can be defined as a sudden synchronous discharge of cerebral neurones causing symptoms or signs that are apparent either to the patient or to an observer.
- This definition excludes disorders such as migrainous aura that are more gradual in onset and usually more prolonged, and EEG discharges that do not have a clinical correlate.
- Epilepsy is an ongoing liability to recurrent epileptic seizures.



# Classification of seizures

## 1. Generalized seizures

A. Tonic–clonic seizures (grand mal)

B. Absence seizures with 3Hz spike-and-wave discharge (petit mal)

C. Myoclonic seizures

D. Tonic, clonic and atonic seizures



# Classification of seizures

2. Focal seizures (originating within one hemisphere). Characterized according to one or more features:

A. Aura

B. Motor (without impaired awareness, e.g. Jacksonian seizures)

C. Awareness and responsiveness altered or retained (e.g. with impaired awareness, in temporal lobe seizures)

A focal seizure can evolve into bilateral convulsive seizure – secondary generalization

3. Unknown (insufficient evidence to characterize as focal, generalized or both)



# Causes of epilepsy

- Primary generalized epilepsy, e.g. juvenile myoclonic epilepsy
- Developmental, e.g. neuronal migration abnormalities, cortical dysplasia Hippocampal sclerosis
- Brain trauma and surgery
- Intracranial mass lesions, e.g. tumour
- Vascular, e.g. cerebral infarction, arteriovenous malformation
- Infectious, e.g. viral encephalitis, meningitis, cerebral tuberculosis, HIV



# Causes of epilepsy

- Immune, e.g. NMDA receptor antibody and potassium channel antibody encephalitis
- Genetic, e.g. channelopathies
- Metabolic abnormalities, e.g. hyponatraemia, hypocalcaemia

Neurodegenerative disorders, e.g. Alzheimer's

- Drugs, e.g. ciclosporin, lidocaine, quinolones, tricyclic antidepressants, antipsychotics, lithium, stimulant drugs such as cocaine
- Alcohol withdrawal



# Pseudoseizures are an important differential diagnosis characterised by:

- volitional or non-volitional
- preserved consciousness or purposeful movements
- asymmetric movements
- poorly coordinated thrashing
- back arching
- eyes held shut
- head rolling
- pelvic thrusting
- bicycling/ pedalling movements of legs



# Status epilepticus

- This means seizures lasting for  $>30\text{min}$ , or repeated seizures without intervening consciousness.
- Mortality and the risk of permanent brain damage increase with the length of attack.
- Aim to terminate seizures lasting more than a few minutes as soon as possible ( $<20\text{min}$ )





- Status usually occurs in patients with known epilepsy. If it is the 1st presentation, the chance of a structural brain lesion is high (>50%).
- Diagnosis of tonic–clonic status is usually clear.
- Non-convulsive status (eg absence status or continuous partial seizures with preservation of consciousness) may be more difficult: look for subtle eye or lid movement.



# Investigations

- Bedside glucose, the following tests can be done once treatment has started: lab glucose, ABG, U&E,  $\text{Ca}^{2+}$ , FBC, ECG.
- Consider anticonvulsant levels, toxicology screen, LP, culture blood and urine, EEG, CT, carbon monoxide level.
- Pulse oximetry, cardiac monitor.



# Goals of management

1. Resuscitation to prevent secondary brain injury and maintain cerebral perfusion pressure
2. Terminate seizure
3. Decrease cerebral metabolic rate
4. Diagnose and treat cause
5. Treat complications



# Management of status epilepticus

Open and secure airway (adjuncts as necessary)



Oxygen, 100% with suction



IV access & take blood: urea & electrolytes, FBC, glucose, calcium, toxicology screening & anticonvulsant levels if indicated.



IV bolus- to stop seizures: Ex lorazepam 4mg  
Give 2<sup>nd</sup> dose of lorazepam if no response after 10 minutes



**Thiamine 250mg IV over 30 minutes if alcoholism or malnourishment is suspected.  
Glucose 50ml 50% IV, unless glucose known to be normal**

**Correct hypotension with fluids**

**IV infusion: If seizures continue, start phenytoin 15mg/kg at a rate of 50mg/min.  
Monitor ECG & BP.  
100mg/6-8h is a maintenance dose**

**If seizures are still uncontrolled call anaesthetist for rapid sequence induction.**



- As soon as seizures are controlled,
  1. Start oral drugs .
  2. Ask what the cause was, eg hypoglycaemia, pregnancy, alcohol, drugs, CNS lesion or infection, hypertensive encephalopathy, inadequate anticonvulsant dose/compliance
  3. Monitor for ongoing seizures.



# Prevent and treat complications

- aspiration
- neurogenic pulmonary oedema
- rhabdomyolysis
- hyperthermia
- trauma (e.g. head injury due to fall, posterior shoulder dislocation)
- Todd's paralysis (may last 24h)



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