



Seizures

Molly Lombardo, APRN-CNP



Disclosures

- I have no relevant financial or commercial interests



What is a seizure?

- Sudden, uncontrolled and abnormal electrical disturbance in the brain
- Provoked and unprovoked
- Focal and generalized
- Epilepsy



Types of seizures

- FOCAL: start from 1 portion of 1 hemisphere
 - Focal seizures with retained awareness (simple partial seizures)
 - Focal seizures with impaired awareness (complex partial seizures)
- GENERALIZED: start simultaneously in both hemispheres
- Sometimes difficult to determine
- Need EEG to accurately classify



Examples

Focal seizure

<https://www.youtube.com/watch?v=ibGW7on1RYw>

Focal seizure with secondary generalization

<https://www.youtube.com/watch?v=Nds2U4CzvC4>



Who has seizures and why?

- 1 in 11 Americans who live to the age of 80 will have at least one seizure in their lifetime
- 1% of the US population has epilepsy
- Age is an independent risk factor for developing seizures and epilepsy



PROVOKED - Acute symptomatic seizure

- TBI, anoxic brain injury, hypertensive encephalopathy, intracranial surgery, SDH & SAH, CNS infection
- Stroke is the most common cause of provoked seizures and accounts for up to 1/2 of all cases
 - Hemorrhagic, larger strokes, cortical involvement
- Severe metabolic derangements
- Drug and alcohol withdrawal
 - Benzodiazepines, barbiturates



UNPROVOKED

- Cerebrovascular disease, dementia, tumors, vascular malformations, head trauma, prior CNS infection
- Up to 60% have an unknown cause of epilepsy
- Older adults: subacute and chronic stroke
- Alzheimer's disease: 10-20%

- Triggers
 - strong emotions, intense exercise, loud music, flashing lights
- Physiologic conditions that lower the threshold
 - Fever, menstrual period, lack of sleep and stress




Evaluation: Patient History

- The MOST important piece of information
- Helps characterize events, rule out alternative diagnoses, distinguish similar events in the past, look for underlying etiology
- 20-60% of patients presenting for their first evaluation of a seizure have actually had similar or related events in the past
- Family history?



Evaluation: Testing

- EEG
 - Status Epilepticus or subclinical seizures
 - Long term video monitoring
 - A normal EEG does not rule out seizures
 - Many abnormalities on EEG are nonspecific
- Imaging
 - MRI: preferable and more sensitive
- LP
 - CNS infection
 - Leptomeningeal cancer



Stages of a seizure

- Aura
 - Abnormal sensations, déjà vu, emotions, nausea, perceived sounds, tastes or smells, physical sensations like dizziness, headache, numbness and light headedness
- Ictus/ictal
 - Correlates with the electrical seizure activity in the brain
- Postictal



“Seizure-like activity”

- What you see varies based on the location of the seizures in the brain
 - Occipital cortex: flashing lights. Motor cortex: rhythmic jerking movements. Frontal lobe: sudden speech difficulties
- Tongue biting and urinary incontinence
- Postictal Todd's paralysis
- Postictal symptoms out of proportion?
- Older patients vs. younger patients



I think my patient is seizing, now what?!

- Working IV's
- Stay calm
- Most seizures stop spontaneously within 2-3 mins or less
- Tailor your care to what is happening during the seizure
- Never restrain someone's movements
- Turn them on their side to help keep the airway open
- Anticipate...
- Support vital functions: ABC's
- Time the event and how long it takes them to recover



3 minutes or longer?

- Lorazepam 2 mg IV PRN for GTC seizure more than 3 mins, CPS lasting more than 3 mins, after 3rd CPS in 24 hrs.
 - No IV access? Midazolam 10 mg IM for most adults
- Notify physician
- Loading doses of medications to obtain rapid plasma levels
- STATUS: 5 mins or longer. One seizure after another without returning to baseline consciousness in between
- Prepare for intubation and moving to the ICU



Medications: seizure control vs. safety

- Monitor HR, BP and RR
- “Rescue” meds: lorazepam and diazepam
- AED that are typically loaded are levetiracetam, fosphenytoin and valproic acid
- Fosphenytoin
 - Hypotension and heart block
 - Often resolves when the rate of administration is decreased
- Therapeutic monitoring of drug levels
 - For patients with significant side effects or to provide evidence of compliance



Seizure mimics

- Syncope and convulsive syncope
- Behavioral disturbances, abnormal movements
- TIA
 - Positive vs negative symptoms
- Delirium and confusional states
- Transient global amnesia
- Sleep disorders
- Migraine
- Panic attack, anxiety and psychogenic nonepileptic seizure
- Narcolepsy with cataplexy



After discharge

- Referral to neurologist or epileptologist
- Antiepileptic medications vs. no medications
 - EEG changes, previous neurological injury, partial seizures and a family history
- Goals: reduce the risk of recurrent seizure while optimizing quality of life