**Seizure**

1. **In a patient having a seizure:**
   * **Ensure proper airway control (OPA, nasal trumpet, lateral decubitus to prevent aspiration).**
   * **Use drugs (e.g. benzos, phenytoin) promptly to stop the seizure, even before the diagnosis is known**

→ ABCs, O2, 1 amp DW50 IV and thiamine 100 mg IM.

→ Meds to stop seizure, continue to next step if seizure doesn’t respond:

→ Lorazepam 2-4 mg (max 0.1 mg/kg) IV/IM OR diazepam 5-10 mg IV q2-3 min until seizure stops. Can use diazepam PR if no IV access.

→ Phenytoin 20 mg/kg IV at no faster than 50 mg/min (use different IV tubing as benzos and phenytoin are not compatable)

→ Consult neurology

→ Phenobarbital 20 mg/kg IV at 50-75 mg/min or Midazolam 10mg IV bolus then 0.01-0.4mg/kg/hr

→ If the above fails, RSI—Induction amount of propofol

→ Emergency EEG if not response after 15-20 min

→ ICU admission

If pregnant:

→ MgSO4 4-6 g IV then 1-2 g IV per hour

If a child:

→ Lorazepam 0.05 to 0.1mg/kg IV at rate of 2mg/min. Can be repeated in 5 to 10 min (up to max of 10mg over 10 min)

→ Then Fosphenytoin at 20PE (phenytoin equivalents)/kg.

* + **Rule out reversible metabolic causes in a timely fashion (hypoglycemia, hypoxia, heat stroke, and electrolyte abnormalities)**
    - Vitals
    - BW: CBC, lytes, glucose, BUN, Cr, Ca2+, Mg2+, albumin, tox screen, ABG, anticonvulsant level, blood cultures
    - Imaging: c-spine Xray if (post trauma or caused trauma), CXR (r/o malignancy) EEG, CT (if focal findings or pre-LP), MRI (1st seizure), EKG, LP (if febrile, concerned about infxn, or leptomeningeal disease, or R/O SAH)

1. **In a patient presenting with an ill-defined episode (fits, spells), take a history to distinguish a seizure from other events**

***DDx:*** sleep disorder, migraine, TIA, transient global amnesia, syncope, pseudoseizure

***HPI:*** circumstances leading up to seizure, ictal state, post-ictal state, previous seizures, febrile seizures, similar episodes not labeled as seizures. Time of onset (day or night), position (any), speed of onset (sudden or brief), aura, colour (N or cyanotic), timing (brief or prolonged), urinary incontinence, tongue biting (side in seizure, tip in syncope) post ictal sx (w/ tonic-clonic or complex partial), Todd paralysis, injuries (# or dislocations), triggers

Partial: (simple (no LOC), complex (LOC), partial evolving to generalized)

Generalized: (tonic-clonic, absence, myoclonic)

***PMHx:*** head injury, stroke, Alzheimer's disease, history of intracranial infection, alcohol or drug abuse

***Meds:*** especially responsible for generalized tonic-clonic sz

***FHx:*** esp absence or myoclonic

***SHx:*** ETOH, drugs, driving, employment.

1. **In a patient presenting with a seizure, take an appropriate history to direct the investigation (e.g., do not over investigate; a stable known disorder may require only a drug-level measurement, while new or changing seizures may require an extensive work-up).**

As above

1. **In all patients presenting with a seizure, examine carefully for focal neurologic findings.**

Usually have normal physical exam with epileptic seizures. Especially look for signs of NE infection or bleed; i.e. meningismus, Kernig’s/Brudzinski’s, lateralizing signs, hyperreflexia, + Babinski, weakness… anything that points to a lesion.

1. **In a patient with a previously known seizure disorder, who presents with a seizure or a change in the pattern of seizures:**
   * **Assess by history the factors that may affect the primary seizure disorder (e.g., medication compliance, alcohol use, lifestyle, and recent changes in medications [not just antiepileptic medications], other illnesses).** 
     + As above
     + Top five drug induced eitologies- isoniazide, theophylline, oral hypoglycelmics carbon monoxide, and bupropion.
   * **Include other causes of seizure in the differential diagnosis. (Not all seizures are caused by epilepsy.)**
   * Seizures are not synonymous with epilepsy. Acute symptomatic seizures/provoked make up about 40% of all non febrile seizures and result from acutre brain insults. They resolve when the provoking factor is treated and they do not require long term teratment with anti-epileptic drugs.
     + Drugs: withdrawal (anti-epileptics below therapeutic level, ETOH, benzos, barbituates), toxicity (demerol on penicillin, theophylline, lidocaine infusion, isoniazid, lithium, neuroleptics, cocaine, amphetamine).
     + CNS: tumor, previous CVA (most common reason for people >35 to have a seizure), meningitis, encephalitis, CNS vasculitis, idiopathic, HIV giving mass lesions, encephalopathy or meningitis
     + Endo: hypocalcemia, hyponatremia, glucose, Mg2+, hypoxia, uremia, hypercarbia
     + Misc: pseudoseizures
   * Epilepsies are agroup of condition in which an underlying neurologic disorder results in a chronic tendancy to have recurrent, unprovoked seizures. The occurency of two more more of these siezures establishes the diagnosis of epilepsy.
2. **In the ongoing care of a patient with a stable seizure disorder:** 
   * **Regularly inquire about compliance (with medication and lifestyle measures), side effects of anticonvulsant medication, and the impact of the disorder and its treatment on the patient’s life (e.g., on driving, when seizures occur at work or with friends).**
     + A single, unprovoked seizure before diagnosis = no driving for at least 3 mo plus NE assessment including EEG and CT
     + After epilepsy diagnosis = may drive if 12 mos of seizure free, medicated time, physician believes pt will remain compliant, and pt warned against ETOH, fatigue, etc…
   * **Monitor for complications of the anticonvulsant medication (e.g., hematologic complications, osteoporosis).** 
     + Carbamazepine (Tegretol): agranulocytosis, aplastic anemia, thrombocytopenia, SJS/TEN, SIADH
     + VPA: blood dyscrasias, ↑ LFTs, thrombocytopenia, prolonged coagulation times, hyperammonemia giving encephalopathy
     + Topiramate (Topamax): acute closed angle glaucoma, osteoporosis, increased suicidality
     + Phenytoin (Dilantin): macrocytic anemia, increased suicidality, drug induced lupus, SJS/TEN
   * **Modify management of other health issues taking into account the anticonvulsant medication (e.g. in prescribing antibiotics, pregnancy).**
     + No anticonvulsant has been shown to be more teratogenic than any other (risk is 4-8% as opposed to 1-3%). Women should take 4-5 mg of folic acid per day to prevent NTD. Goal for monotherapy at lowest possible dose during pregnancy.
     + Many anticonvulsants increase estrogen and progesterone metabolism, thereby reducing their concentrations. Women on OCP need to increase dose of estradiol for 35 to 50 mcg
     + Anticonvulsants interact with many other drugs, including benzos, clarithromycin, erythromycin, warfarin, antacids.