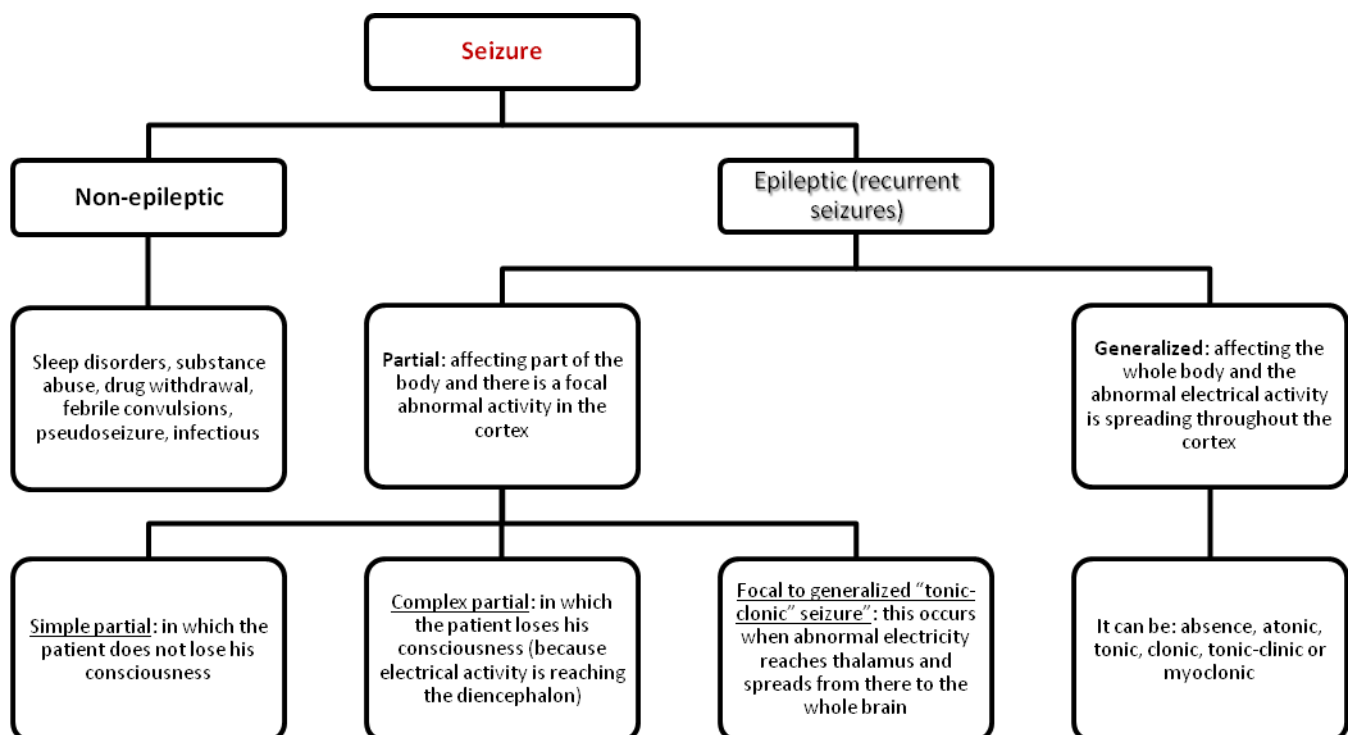




- **Definition of seizure:** it is an abnormal excessive electrical discharge in the brain which can result in changes in:
  - **Level of consciousness:** depending if it reaches the diencephalon or not.
  - **Motor/ sensory ability.**
  - **Behavior:** also known as prodrome and may precede the attack by some hours!
- **Etiology of seizure:** 70% is idiopathic (due to unknown reason) while 30% result from pathological conditions.
- **Definition of epilepsy:** two or more seizures experienced by a person (recurrent seizure attacks).
- **Epidemiology:**
  - 1% of the population in the world is suffering from epilepsy.
  - 8% of population in the world might experience seizure (at least one in their lifetime).
- **Differential diagnosis of seizures:**



- **Predisposing factors:**
  - **Family history:** 40% of cases with absence seizure have a positive family history.
  - **Antenatal and perinatal factors:**
    - ✓ Intrauterine infections (toxoplasmosis, rubella), maternal drug abuse or irradiation in early gestation.
    - ✓ Perinatal trauma and anoxia.
  - **Trauma (closed or open) and surgery to cerebral hemispheres (in 10%).**
  - **Metabolic causes:** hypoglycemia, hypocalcemia, hypo/hyper natremia.
  - **Toxic causes:**
    - ✓ Rapid withdrawal of anti-epileptic drugs.
    - ✓ Chronic alcohol abuse.
    - ✓ Toxic agents such as: lead, mercury and carbon monoxide.
  - **Infectious and inflammatory causes:**
    - ✓ Herpes encephalitis, meningitis or brain abscess.
    - ✓ Febrile convulsions in children (generalized seizure): they are self-limiting and don't tend to recur in adult life.



- **Vascular causes:**
  - ✓ Vascular malformations: 70% of patients with arteriovenous malformations will experience seizures.
  - ✓ Infarction: seen in patients with sickle-cell disease (SCD) in which multiple infarcts occur in frontal and parietal lobes.

- **Brain tumors.**
- **Photosensitivity**: some seizure types are precipitated by flashing lights or computer screens.
- **Sleep-deprivation.**

- Classification of seizures:

- **Generalized seizure:**
  - ✓ Absence (lasting from few seconds to about half a minute): this is common in children and characterized by sudden brief loss of consciousness which consists of staring and automatisms (performance of actions without conscious thought). This type of seizure can happen many times a day.
  - ✓ Tonic (lasting 30s to several minutes): characterized by sudden increase in muscle tone with loss of consciousness and autonomic changes.
  - ✓ Clonic (lasting several minutes): alternative muscle contraction and relaxation (jerking movements).
  - ✓ Tonic-clonic (lasting 2-5 minutes): there will be a sudden stiffness of the body (tonic) followed by muscle contraction or jerking movements (clonic). In the post-ictal phase, there will be headache, confusion, flaccid limbs, sore tongue and amnesia. There is a high risk of injury due to the potential for falling to the ground and sometimes the violent jerking movements.
  - ✓ Atonic (lasting for seconds): it is characterized by a sudden loss of muscle tone causing the person to fall and predisposing him to injuries. This type of seizure is the most resistant to medications.
  - ✓ Myoclonic (lasting for few seconds): brief jerking or stiffening of extremities or sometimes the head (it may be symmetric or asymmetric).
- **Partial/focal seizure:**
  - ✓ Simple partial (without impaired consciousness): which can manifest as motor, sensory or psychic symptoms.
  - ✓ Complex partial (impaired consciousness).  
**Note:** in partial seizure, aura may manifest itself as a feeling of déjà vu, jamais vu, fear, visual/auditory hallucinations, unpleasant odor or abnormal sensation.

- Pseudoseizure: it is a non-epileptic seizure which can be differentiated by:

- Pre-attack preparation and absence of post-ictal confusion.
- Disorganized movements and pelvic thrusting.
- Bilateral convulsions without loss of consciousness.
- Violent behavior and dirty language.

Characteristic	Seizure	Pseudoseizure*
Triggers	Uncommon	Emotional disturbance
Duration	Brief or prolonged	May be prolonged
Motor Activity	Synchronous, stereotypic, automatisms, lateral tongue biting, eyes rolled back	Opisthotonos, rigidity, forced eye closure, irregular extremity movements, shaking head, pelvic thrust, crying, geotropic eye movements, tongue biting at the tip
Timing	Day or night	Day; other people present
Physical Injury	May occur	Rare
Incontinence	May occur	Rare
Reproduction of Attack	Spontaneous	Suggestion ± stimulus
EEG	Often inter-ictal discharges	Normal
Prolactin	Increased	Normal



- **Investigations:**
  - **Hematology, biochemistry (for electrolytes, urea and calcium) and chest x-ray.**
  - **EEG.**
  - **Neuroimaging (CT and MRI: with MRI being the most sensitive and the main modality):**
    - ✓ Performed for all patient aged 25 or above and presenting with first seizure.
    - ✓ In all patients with focal epilepsy (irrespective of age).
    - ✓ For patient with focal epilepsy and secondary generalization.
    - ✓ For patient with epilepsy which is not classified (if it is partial or generalized).
    - ✓ For poorly-controlled seizures.
- **Treatment and management: refer to pharmacology note.**