433 Teams

MEDICINE

433medicine.team@gmail.com

جامعة الملك سعود
King Saud University

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Objectives:

1. Definition of epileptic seizure, provoked seizure and epilepsy.
2. Status epilepticus.
3. Frequent causes of seizure and risk factors.
4. Triggers of seizures in epileptic patient.
5. Epilepsy classification and seizure semiology.
6. DDX of SZ
7. Approach to seizure disorder (Hx, Ex, Inx).
8. Medical and surgical management of epilepsy.
9. How to select antiepileptic medications.
10. When to stop antiepileptic medications.

Seizure is a symptom for underlying disease

What is epilepsy ?

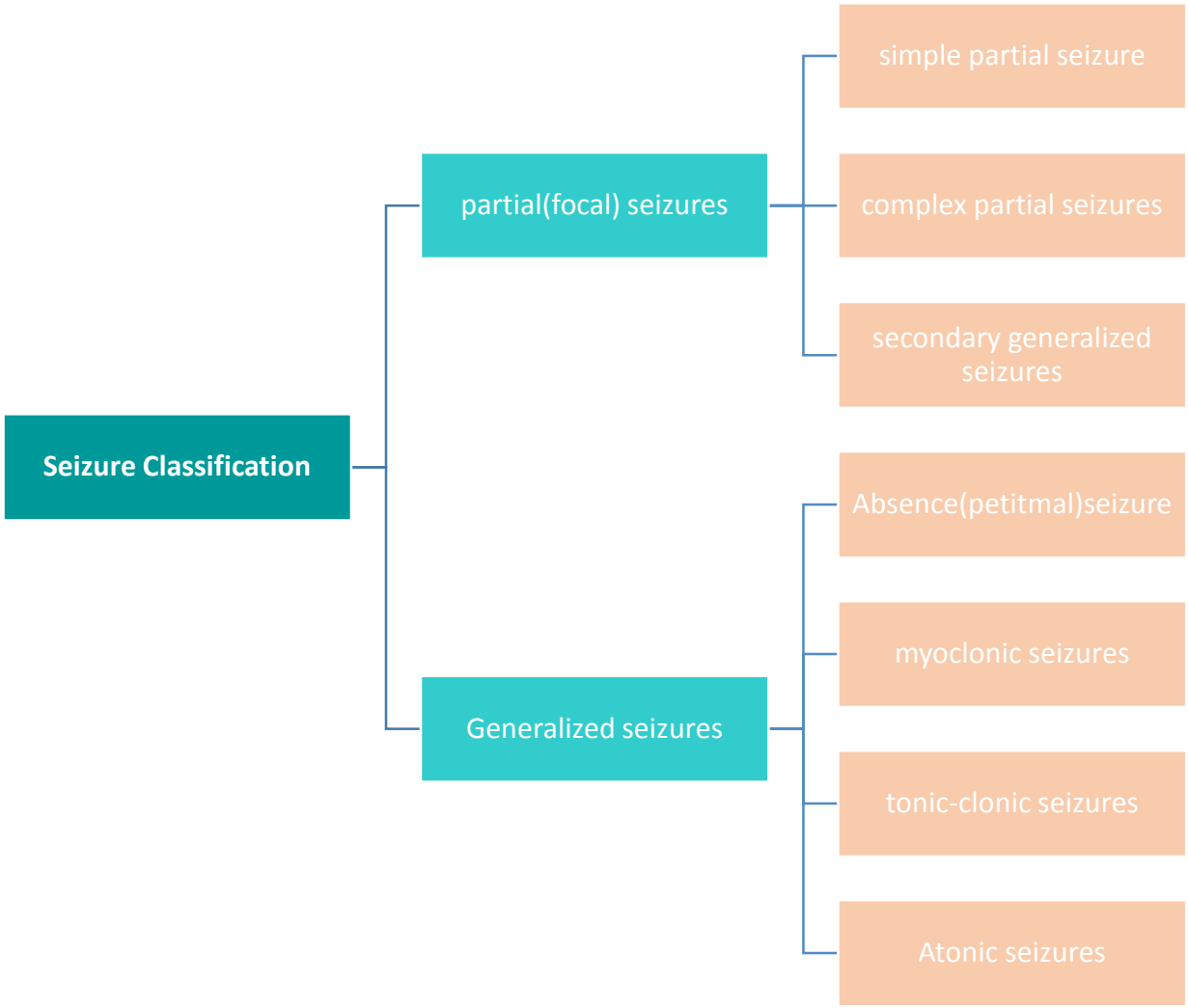
- **Epileptic seizure:** transient occurrence of signs and symptoms of sudden changes in neurological function due to abnormal excessive, synchronous discharge of cortical neurons.
- **Provoked seizures:** occur in the setting of acute medical and neurological illnesses in people with no prior history of seizures. (in other words, It's a seizure due to medical illness such as renal failure)
- **Epilepsy:** recurrent (two or more) unprovoked seizures.
- **Seizure is a symptom of epilepsy.**
- **Status epilepticus (SE):** defined as recurrent convulsions that last for more than 20 minutes and are interrupted by only brief periods of partial relief or recurrent seizure with no recovery of consciousness in between, it is a serious, potentially life-threatening.
- **Any type of seizure can lead to SE, the most serious form of status epilepticus is the generalized tonic-clonic type.**

Risk Factors and Frequent Causes

- Febrile convulsion Only from 6 months to 6 years
- Perinatal insult
- CNS infection (3%) (Any infection during pregnancy can cause seizure)
- CNS mass lesion (4%)
- Family history of epilepsy (8%)
- Head injury (Not any trauma to the head can be a risk for seizure, Frontal penetrating trauma is the one)
- Abnormal gestation or delivery
- Developmental delay
- Stroke (ischemic or hemorrhagic) (10%)
- Unknown causes (65%)

Triggers for Seizures Important

- Poor compliance (missed doses of antiepieliptic drugs)
- Sleep deprivation (in weekends, there are lots of patients come to ER with epilepsy :()
- Stress
- Alcohol
- Infection
- Menstrual cycle



Focal (partial) seizure: accounts for – account for 80% of adult epilepsies . It begins in one part of the brain (typically the temporal lobe) and initially produces symptoms that are referable to the region of the cortex involved.

simple partial seizure

- consciousness remains intact. The seizure remains localized but may evolve into a complex partial seizure.
- May involve transient unilateral clonic-tonic movement.

complex partial seizure:

- Consciousness is impaired; postictal confusion.
- Automatisms (lasts 1 to 3 minutes) purposeless, involuntary, repetitive movements (such as lip smacking or chewing); patients may become aggressive if restraint is attempted.
- Olfactory or gustatory hallucinations.

Secondary generalized seizure:

Start in one area and spread to both sides of the brain.

Generalized seizures:
characterized by loss of consciousness. Involves disruption of electrical activity in the entire brain.

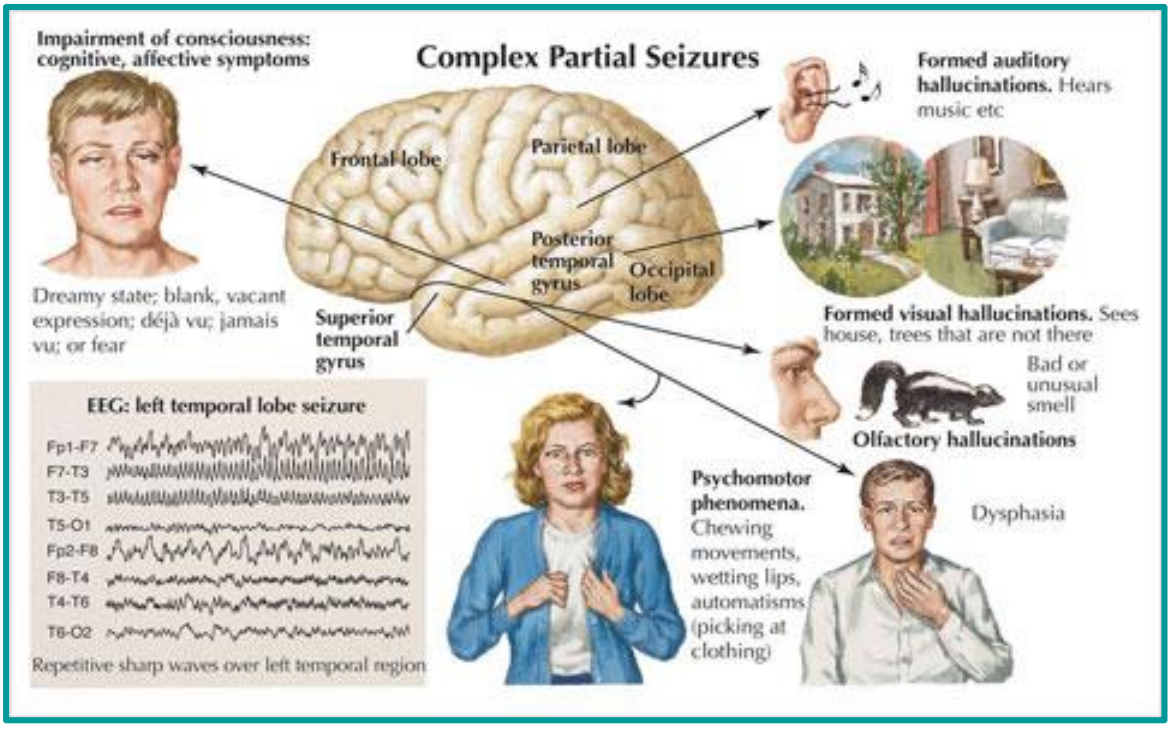
Absence (petit mal) seizure:

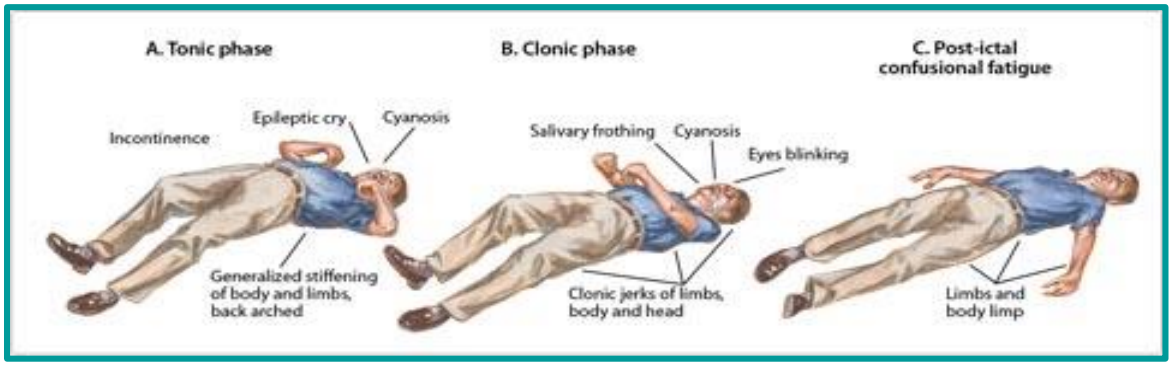
- Typically involves school-age children – usually resolves as child grows older.
- Patient seems to disengage from current activity and "stare into space" – then returns to the activity several seconds later; patient looks "absent minded" during these episodes, which are often confused with "daydreaming".
- Episodes are brief (lasting a few seconds) but may be quite frequent (up to 100 times per day).
- Impairment of consciousness but no loss of postural tone or continence, and no postictal confusion.
- Minor clonic activity (eye blinks or head nodding) in up to 45% of cases.

Tonic-clonic (grand mal) seizure:

- bilaterally symmetric and without focal onset.
- Begins with aura (e.g.olfactory hallucination, epigastric discomfort ..) then sudden loss of consciousness – a fall to the ground.
- Tonic phase – The patient becomes rigid; trunk and limb extension occurs. The patient may become apneic during this phase.
- Clonic phase – This is musculature jerking of the limbs and body for at least 30 seconds.
- The patient then becomes flaccid and comatose before regaining consciousness.
- Postictal confusion, headache and drowsiness are characteristics and can last for hours, although 10 to 30 minutes is more typical.
- Other features may include tongue biting, vomiting, apnea, and

Seizure Semiology

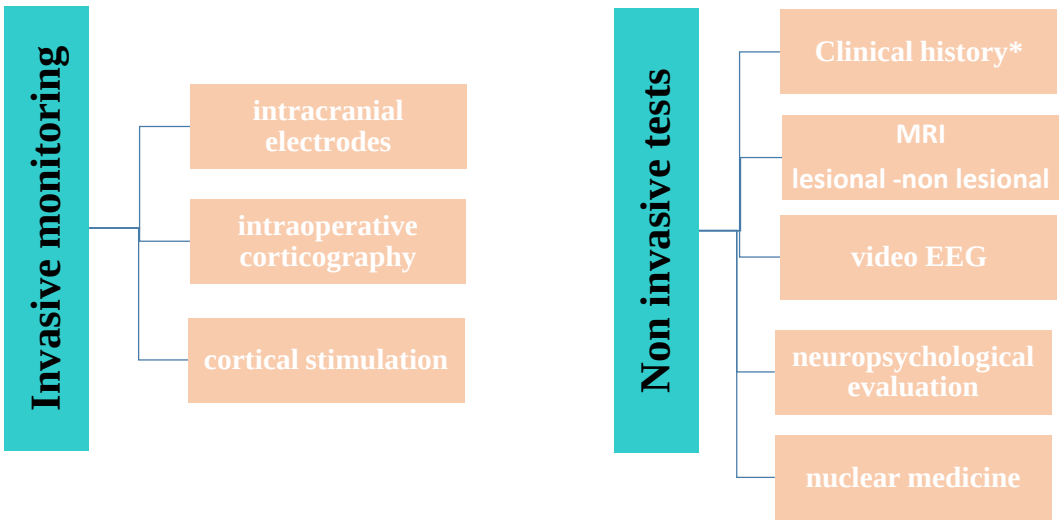




Differential Diagnosis important

- Transient ischemic attack (TIA)
- Syncope
- Migraine
- Movement disorders
- Panic attack
- Psychogenic seizure

Seizure Approach



*Questions that help clarify the type of seizure include the following:

- ✓ Was any warning noted before the spell? If so, what kind of warning occurred?
- ✓ What did the patient do during the spell?
- ✓ Was the patient able to relate to the environment during the spell?
- ✓ How did the patient feel after the spell? How long did it take for the patient to get back to baseline condition?
- ✓ How long did the spell last?
- ✓ How frequent do the spells occur?
- ✓ Are any precipitants associated with the spells?

Treatment important

General Principles: for all seizures ABC take priority so secure airway and roll patient onto his side to prevent aspiration

Antiepileptic drugs:

1- MOA: Current antiepileptic drugs are thought to act mainly by two main mechanisms

- Reducing electrical excitability of cell membranes, possibly through inhibition of sodium channel.
- Enhancing GABA. This may be achieved by inhibiting GABA-transaminase Or by drugs with direct GABA-agonist properties.:

Clinical uses: important

- ***Tonic-clonic (grand mal)* seizures: phenytoin, valproate**. Use of single drug is preferred when possible, because of risk of pharmacokinetic interactions.
- ***Partial (focal)* seizures: carbamazepine**, valproate; clonazepam or phenytoin are alternatives.
- ***Absence seizures (petit mal)*: ethosuximide (is the best** and prefer to be used in children) or **valproate**. Valproate is used when absence seizures coexist with tonic-clonic seizures, since most drugs used for tonic-clonic seizures may worsen absence seizures.
- ***Myoclonic seizures*: valproate** or **clonazepam**.
- ***Status epilepticus*:** must be treated as an emergency. (+ you give Benzodiazepine , Fosphenytoin ,Phenobarbital , general anesthesia)

- In SE there will be cardiorespiratory dysfunction ,Hyperthermia and metabolic derangements
- You start with benzo if seizures continue give the other one
- Carbamazepine worsen generalized epilepsy and phenytoin increase absence seizure

Basic Rules for Drug Treatment

- Single seizure has been regarded as an indication for investigation and assessment but not for drug treatment
- Drug treatment should be considered after two seizures
- Drug treatment should be simple, preferably using one anticonvulsant (monotherapy). "Start low, increase slow".
- Add-on therapy is necessary in some patients.
- If patient is seizure-free for two to three years, withdrawal of pharmacotherapy should be considered.
- It should be performed very carefully and slowly! 20% of pts will suffer a further sz within 2 yrs.

Epilepsy treatment and pregnancy:

- The risk of teratogenicity is well known (~5%), especially with valproates, but withdrawing drug therapy in pregnancy is more risky than continuation. (so all should be given folic acid)
- Epileptic females must be aware of this problem and thorough family planning should be recommended.
- Over 90% of pregnant women with epilepsy will deliver a normal child.
- Lamotrigine is the safest in pregnancy

Elderly and epilepsy:

- More cautious dosing
- Monotherapy preferred
- More frequent SEs
- Comorbid medical problems/meds
- Osteoporosis
- Cognitive decline
- Risk of falls/injury

Seizure freedom with AED use:

1 st drug ---------- seizure free (47%)
2 nd drugs---------- seizure free (14%)
3 rd drugs---------- seizure free (3%)
Medication resistant 36%

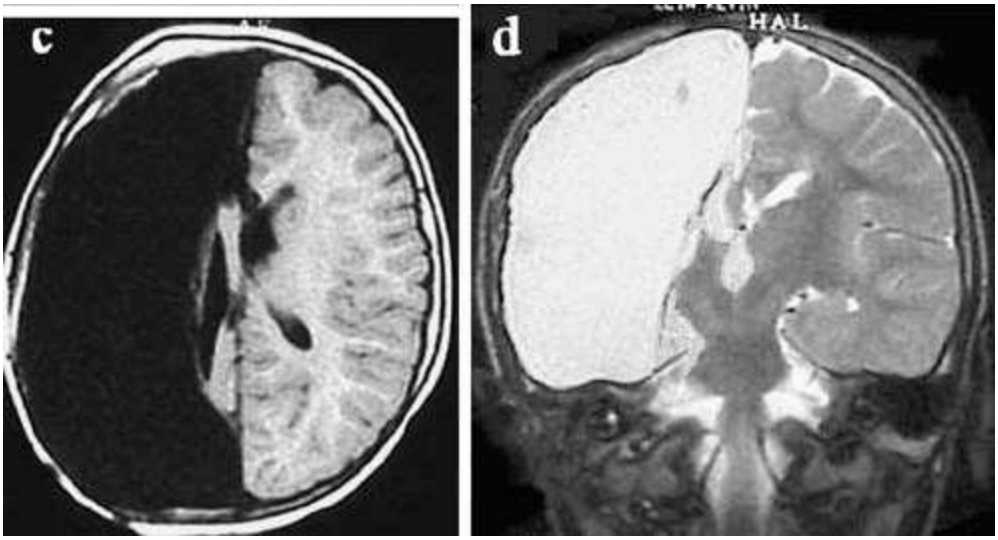
Drug resistant epilepsy

Failure of at least TWO antiepileptic medications to completely control seizures

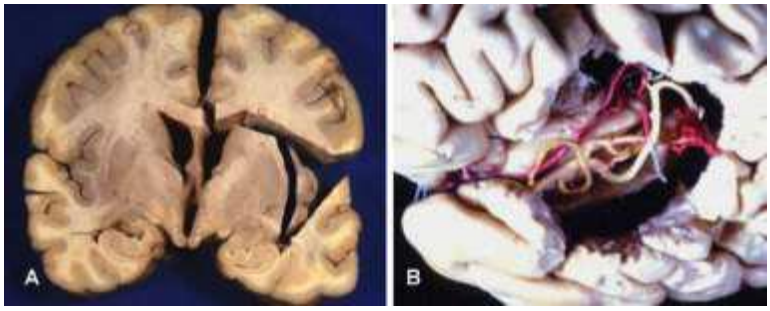
- Appropriately chosen for seizure type
- Taken as prescribed
- Well tolerated (not failed due to side effects)

surgery

- Indicated if patient is drug resistant:
  - **Hemispherectomy:** complete removal of one cerebral hemisphere



  - **Hemispherotomy:** disconnect the two hemispheres by cutting the carpus callosum



- **What if the patient is not a candidate for surgery?** (e.g. the affected area is responsible for an important function to the patient like speech)
  - VNS (vagus nerve stimulation): decrease the seizure by 50%

  - DBS (deep brain stimulation): electrode inside the brain to suppress any abnormal electrical activity

The difference between seizure and syncope

Automatism refers to a set of brief unconscious behaviors and usually indicate temporal lobe epilepsy

Suggests Syncope

- Triggering factor
- Distinct Prodrome
- 'Convulsion' after Loss of Consciousness, & <15 seconds
- A Short duration
- A Quick recovery
- Ongoing lethargy but no confusion

Suggests Seizure

- Patient history of same
- Aura
- Automatisms
- Convulsions at onset of Loss of Consciousness
- Longer duration
- Post-ictal phase
- Tongue biting
- Incontinence

Comparison of clinical features in cardiogenic syncope versus seizure disorders

Clinical features	Cardiogenic syncope	Seizure disorders
Loss of consciousness	Typical	Common
Episode duration	Seconds	Minutes
Involuntary movements	Common	Typical
Amnesia	Yes	Yes
Arrhythmia	Common	Rare*
Electroencephalogram	Slow waves Flattening	Focal or general spike activity
Responsive to AEDs	No	Often
Short term mortality†	High	Low

*Holter monitor is used to differentiate between them.

* If you diagnosed a patient with epilepsy and you gave him medication but he still has seizure think about syncope

Questions

1.A teacher of a 14-year-old child recounts episodes where the child stares into space and does not respond to verbal commands for a few seconds. These episodes occur several times per day. An EEG shows 3-per-second spike and slow wave discharges. Which type of seizures does he experience ?

a. Absence (petit mal) seizure
b. Complex partial seizure
c. Simple partial seizure
d. Atonic seizure

2.Why is an EEG indicated in the evaluation of almost all patients with seizures?

a-to distinguish partial from generalized seizure disorders.

b- to localize the site of seizure onset of partial seizures
c-to characterize the epilepsy syndrome
d- all of the above

3.when either the natural history of the epilepsy suggests that seizures will not recur or when the diagnosis of epilepsy is not definite. How long approximately must a patient be seizure-free before anti-epileptic withdrawal is considered?

a-1-2 years
b-2-3 years
c-3- years
d- never.

4- 68 years old male is seen in the ER after an unwitnessed syncopeal episode. His wife heard a strange noise and found him confused on the floor. His wife told that he has no ongoing medical problems, does not take any medications, and does not use alcohol or drugs. On examination the patient is drowsy and has toungue laceration, and his pants are wet with urine serum electrolytes are normal, Which of the following the best next step in evaluation?

a- MRI of the brain
b- b- Holter monitor
c- c- CT of the head
d- d- ECG

1-a 2-d 3-b 4-a

Done By:

Nada Dammas	Omar Aldahas
Yasmeen Alshehri	Hala Alaskar
Faroq Abdulfattah	Areej Alwahaib