Lecture 54

Editing file

Medicine Team

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Epilepsy

Objectives:

- ★ Definition of epileptic seizure, provoked seizure and epilepsy.
- ★ Status epilepticus.
- ★ Frequent causes of seizure and risk factors.
- ★ Triggers of seizures in epileptic patient.
- ★ Epilepsy classification and seizure semiology.
- ★ DDX of SZ
- ★ Seizure vs syncope
- ★ Approach to seizure disorder (Hx, Ex, inx)
- ★ Medical and surgical management of epilepsy.
- ★ How to select antiepileptic medications.
- ★ When to stop antiepileptic medications.

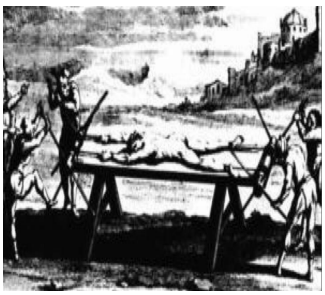
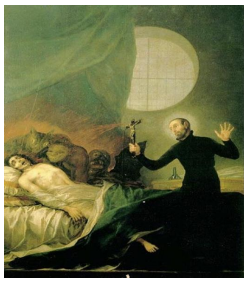
Color index:

Original text Females slides Males slides
Doctor's notes Textbook Important Golden notes Extra

Epilepsy

◀ History Of Epilepsy :

- One of the earliest descriptions of a secondarily generalized tonic-clonic seizure was recorded over 3000 years ago in Mesopotamia.
- The seizure was attributed to the god of the moon
- Epileptic seizures were described in ancient cultures, including those of China, Egypt, and India.
- Hippocrates wrote the f irst book about epilepsy almost 2500 years ago.
- Hippocrates in his book On Sacred Disease described the first neurosurgery procedure referring that craniotomy should be performed at the opposite side of the brain of the seizures, in order to spare patients from “phlegma” that caused the disease.
- In 18th and 19th century, medicine made important advances and research on epilepsy was emancipated from religious superstitions such as the fact that epilepsy was a divine punishment


◀ What is Epilepsy?

1 **Epileptic seizure**

Transient occurrence of signs and symptoms of sudden changes in neurological function due to **abnormal excessive** and **synchronous** discharge of cortical neurons.

2 **Provoked seizures**

Occurs in the setting of acute medical and neurological illnesses[1] in people with no prior history of seizures

3 **Epilepsy**

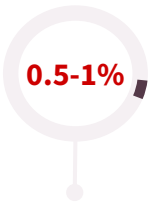
Recurrent (two or more) **unprovoked** seizures.

➔ **Seizure is a symptom of epilepsy, it's not a diagnosis.**

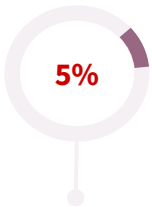
1: Ex: hypoglycemia, hyponatremia, hypernatremia, fever, stroke, meningitis, intracerebral hemorrhage or sinus infection

Epilepsy

◀ Epidemiology and Course:

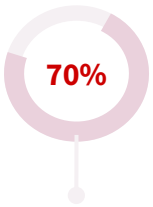


have recurrent seizures = EPILEPSY

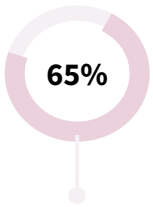


suffer a single **seizure** at some time

of epilepsies are at least resistant to drug treatments = INTRACTABLE EPILEPSY.



of epilepsies are well controlled with drugs (prolonged remissions)



have unknown cause

◀ Risk Factors for Epilepsy:

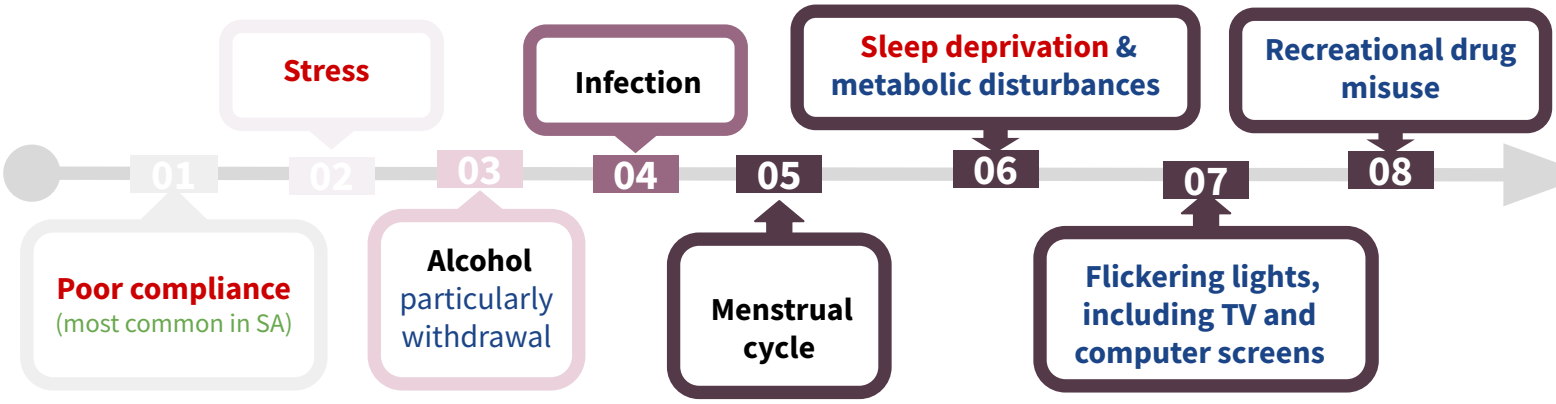
1. Febrile convulsion
   recurrent febrile seizures
2. Family history
3. CNS mass lesion
   (Tumor)
4. CNS infection
5. Perinatal insult
   (intrauterine infection e.g. toxoplasmosis, rubella)
6. Abnormal gestation or delivery
   (Hypoxic insult during delivery leading to ischemic encephalopathy)
7. Head injury
   (Frontal penetrating injury)
8. Developmental delay
9. Stroke (ischemic or hemorrhagic)

◀ Danger of epilepsy

- Main reason for road traffic accidents
- Drowning
- Admission to ICU (due to status epilepticus)
- Sudden death **"SUDEP"** (sudden unexpected death in epilepsy)
  - How does it happen? When they are asleep they role on there face and suffocate themselves, or they get arrhythmia

Seizures

◀ Triggers for seizures:

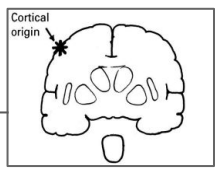


◀ Classification of seizures[1]

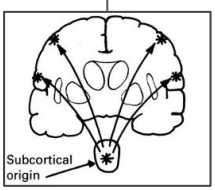
Types of Seizures

Focal Seizures[2]
(Account for **80%** of adult epilepsies)
preceded by warning "Aura"

- Simple partial seizures → **preserved** consciousness
- Complex partial seizures → **Altered** consciousness **but not** complete loss
- Partial seizures secondarily generalised



Generalized seizures[3]
comes with **no aura** (no warning) and leads to **complete loss of consciousness**.



Unclassified seizures[4]

1: Importance of classification is that management differs depending on the type, as focal epilepsy may benefit from surgery, but those with generalized seizure are not candidate for surgery.
2: one place in the brain produce discharges
3: whole brain wil fire at same time. Patient describe it as light off-on.
4: ex: epileptic spasm, usually affect pediatric pt (6m to 6 yo).

Seizures *(cont.)*

◀ International classification of seizures 1981

Partial Seizure		Any disturbance of cortical architecture and function can precipitate this, whether focal infection, tumour, hamartoma or trauma-related scarring. If focal seizures remain localised, the symptoms experienced depend on which cortical area is affected. An initial **'aura'** may be experienced by the patient, depending on the cortical area from which the seizure originates. • **Simple (no loss of consciousness of memory)** 1. Sensory 2. Motor 3. Sensory-Motor 4. Psychic (abnormal thoughts or perceptions), 5. Autonomic (heat, nausea, flushing, etc.) • **Complex (consciousness or memory impaired (not lost))** 1. With or without aura (warning) → depends on lobe involved. ex: deja vu, oral Automatism (chewing), hand movement, epigastric racing sensation or nausea. 2. With or without automatisms. • **Secondarily generalized**
Generalized Seizures	**Absence (petit mal)**	• Always start in **childhood**. The attacks are rarely mistaken for focal seizures because of their **brevity**. They can occur so frequently (20–30 times a day) that they are mistaken for daydreaming or poor concentration in school. • Characterized by **fast recovery** from seizure (No post-ictal phase), and can be **provoked by hyperventilation**
	Tonic-clonic "grand mal"	• The patient then becomes **rigid (tonic) and unconscious**, falling heavily if standing ('like a log') and risking facial injury. During this phase, breathing stops and central cyanosis may occur. • As cortical discharges reduce in frequency, **jerking (clonic)** movements emerge for 2 minutes at most. • Afterwards, there is a **flaccid state** of deep coma, which can persist for some minutes, and on regaining awareness the patient may be confused, disorientated and/or amnesic. • During the attack, **urinary incontinence and tongue-biting** may occur. • Subsequently, the patient usually feels unwell and sleepy, with headache and myalgia.
	Atonic "drop seizures"	Involving **brief loss of muscle tone**, usually resulting in heavy falls with or without loss of consciousness.
	Myoclonic	Typically **brief, jerking movements**, predominating in the arms.
	Other Unclassifiable seizure	**Tonic:** Associated with a **generalised increase in tone** and an associated loss of awareness. They are usually seen as part of an epilepsy syndrome and are unlikely to be isolated. **Clonic:** Similar to tonic–clonic seizures but there is no preceding tonic phase.

Seizures *(cont.)*

◀ New ILAE classification (2017)

Dr: I won't ask you about the new classification

Focal onset

Further classified into:

- Aware (simple partial)
- Impaired awareness (complex partial)

1 Motor onset

- Automatism
- Atonic
- Clonic
- Epileptic spasms
- Hyperkinetic
- Myoclonic
- Tonic

2 Non-motor onset

- Autonomic
- behavioral arrest
- cognitive
- emotional
- sensory

3 Focal to bilateral tonic-clonic

Generalized onset

1 Motor onset

- Tonic-Clonic
- Tonic
- Clonic
- Myoclonic
- Myoclonic-Tonic-Clonic
- Myoclonic-atonic
- Atonic
- Epileptic spasms

2 Non-motor (absence)

- Typical
- Atypical
- Myotonic
- Eyelid myoclonia

Unknown onset

1 Motor onset

- Tonic-Clonic
- Epileptic spasms

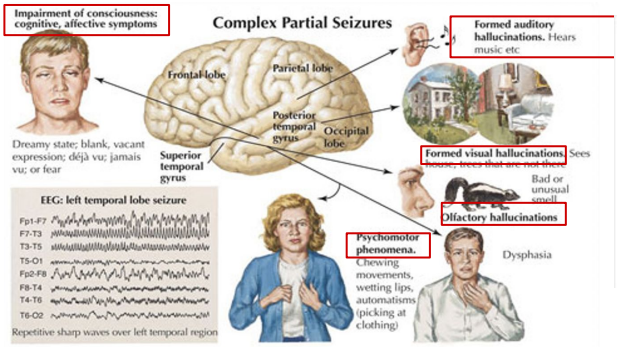
2 Non-motor

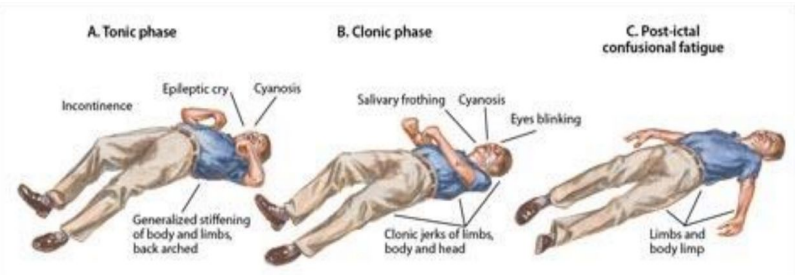
- behavioral arrest

Unclassified

Seizures *(cont.)*

◀ Seizure Semiology





To know which lobe of the brain we're dealing with, and the type of the seizure and to choose the appropriate Anti-epileptic medication

- **Parietal lobe:** usually sensory ex: pain, tingling.
- **Temporal lobe** ex: epigastric rising sensation, memory impairment, hand automatism or deja vu.
- **Occipital lobe:** symptoms related to vision (e.g. flashlight or decreased vision, etc).
- **Frontal lobe:** hypermotor Activity. ex: bicycling leg movement, frontal lobe seizure usually happen during sleep.

◀ Differential Diagnosis for Seizure attacks:

1. **TIA**
   Patients experience weakness of a part of their body relieved after minutes.
2. **Syncope**
3. **Migraine**
   Because patients experience an aura -ex: nausea.
4. **Panic attack**
5. **Movement disorders**
6. **Psychogenic seizure**

◀ Seizure approach

01 Non invasive tests

- Clinical history
- MRI
- Neuropsychological evaluation
- video EEG
- Nuclear medicine

02 Invasive monitoring

i 25.34 Investigation of epilepsy

From where is the epilepsy arising?	
• Standard EEG	• EEG with special electrodes (foramen ovale, subdural)
• Sleep EEG	
What is the cause of the epilepsy?	
Structural lesion?	
• CT	• MRI
Metabolic disorder?	
• Urea and electrolytes	• Blood glucose
• Liver function tests	• Serum calcium, magnesium
Inflammatory or infective disorder?	
• Full blood count, erythrocyte sedimentation rate, C-reactive protein	• Serology for syphilis, HIV, collagen disease
• Chest X-ray	• CSF examination
Are the attacks truly epileptic?	
• Ambulatory EEG	• Videotelemetry

(CSF = cerebrospinal fluid; CT = computed tomography; EEG = electroencephalography; HIV = human immunodeficiency virus; MRI = magnetic resonance imaging)

Approach to Seizures

01 Clinical history

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

1
Was any warning noted before the spell?
→ Differentiate between focal and generalized seizures

2
What did the patient do during the spell?
→ for type of seizure + Lobe involved

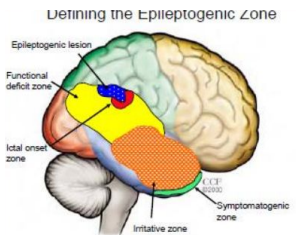
3
Was the patient able to relate to the environment during the spell?
→ for consciousness (simple partial, complex partial or generalized)

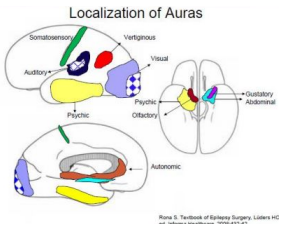
4
How did the patient feel after the spell? How long did it take for the patient to get back to baseline condition?[1]

5
How long did the spell last?
→ >5 min = status epilepticus

6
How frequent do the spells occur?
→ for management

7
Are any precipitants associated with the spells?





02 MRI[2]

01 Lesional

Tumor , Vascular, Trauma
Developmental, Mesial Temporal Sclerosis

02 Non lesional

Imaging cannot establish a diagnosis of epilepsy but identifies any structural cause.

Indications for brain imaging in epilepsy:

- Epilepsy starting after the age of 16 years
- Seizures having focal features clinically
- Electroencephalogram showing a focal seizure source
- Control of seizures difficult or deteriorating

03 Cognitive testing[3] (neuropsychology)

1 Intelligence

2 Memory

- Verbal
- Visual

3 Language

1: Post-ectal prolong> generalized. no post-ectal phase → Absence seizures,prolonged post-ectal → complex partial.
2: most pts experience seizure should do MRI to rule out focal lesion
3: important for surgery, for ex: if seizures happening in left temporal lobe with impaired function and there is intact function of right temporal lobe, we may remove the affected area as a management if the function of left lobe (affected lobe) intact we can't do surgery.

Approach to Seizures *(cont.)*

04 Video EEG

- Video EEG may be necessary to differentiate these from psychogenic attacks (which are more common) but abruptness of onset, stereotyped nature, relative brevity and nocturnal preponderance may indicate a frontal origin.
- An EEG performed immediately after a seizure may be more helpful in showing focal features than if performed after a delay.
- Seizure activity is usually apparent as spike and wave discharges.

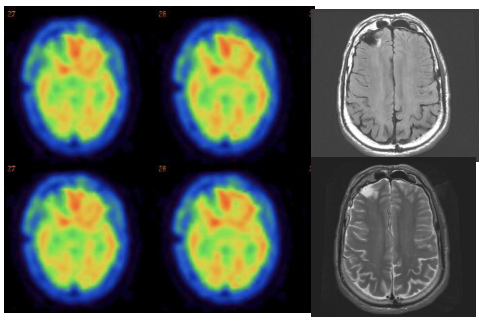
VEM

➔ **Summary on the typical signs of video EEG**

Typical EEG Sign	Localizes to	Typical EEG Sign	Localizes to
Oral Automatismes	Temporal lobe	Tonic arm elevation	Supplementary motor area
Hypermotor automatism	Frontal lobe	Epigastric Aura	Temporal lobe
Manual picking automatismes	Temporal lobe	Throat tightening Sensation	Insula
Visual Hallucinations	Occipital lobe	Ictal pain	Parietal lobe
Auditory Hallucinations	Temporal neocortex (Heschl's Gyrus)	Somatosensory sensations	Postcentral gyrus or Supplementary motor area
Olfactory Hallucinations	Mesial temporal lobe	Clonic activity	Precentral gyrus
Nystagmus, eye blinking, eye pulling sensation	Occipital lobe	De-ja-vu or jamais vu aura	Mesial / Medial temporal lobe
Ictal amaurosis		Fear	Most often temporal, but also frontal lobe

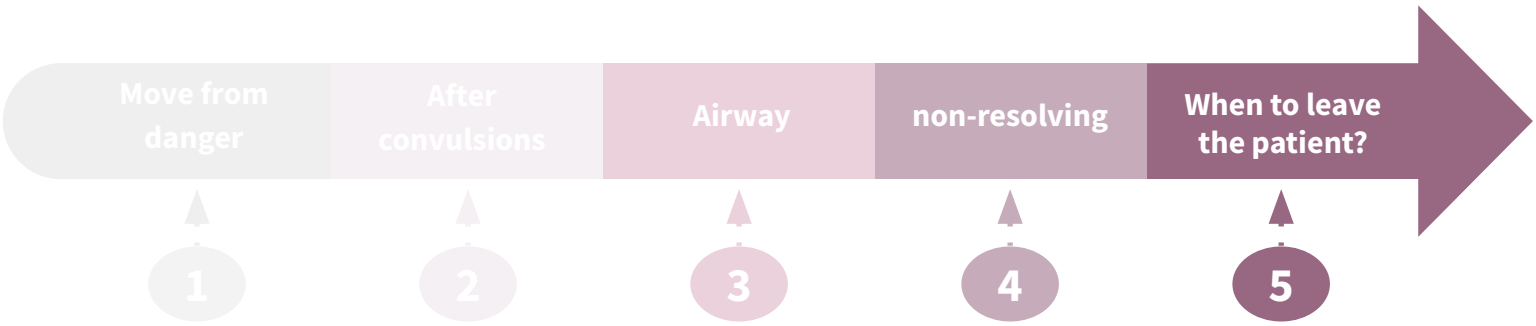
05 Nuclear medicine

➔ might be helpful to localize seizure.



Management

How to administer first aid for seizures



1. Move the person away from danger (fire, water, machinery, furniture)
2. After convulsions cease, turn the person into the 'recovery' position (semi-prone)
3. Ensure the airway is clear but do NOT insert anything in the mouth (tongue-biting occurs at seizure onset and cannot be prevented by observers)
4. If convulsions continue for more than 5 mins or recur without the person regaining consciousness, summon urgent medical attention
5. Do not leave the person alone until fully recovered (drowsiness and delirium can persist for up to 1 hr)

Lifestyle

- People with epilepsy (the term 'epileptic' is no longer used) should be encouraged to lead lives as unrestricted as reasonably possible, though with simple, safety measures such as:
  - avoiding swimming and dangerous sports such as rock-climbing.
- Advice at home includes:
  - **leaving bathroom and lavatory doors unlocked**
  - taking showers rather than baths.
- Epilepsy triggers such as sleep deprivation, excess alcohol and drugs should be avoided, and strobe lighting where there is EEG evidence of a photo-paroxysmal response.

Epilepsy and driving

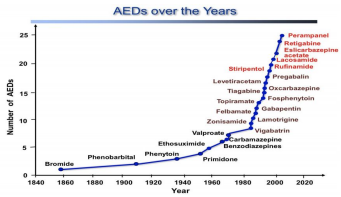
- Patients should be asked to **stop driving** after a seizure and to **inform the regulatory authorities if they hold a driving licence**.
- After a seizure, a temporary driving ban until seizure free is usual but regulations vary from country to country.
- Many driving regulatory bodies also suggest **refraining from driving while withdrawing from AEDs.**

Treatment

◄ First: Medical

Drugs

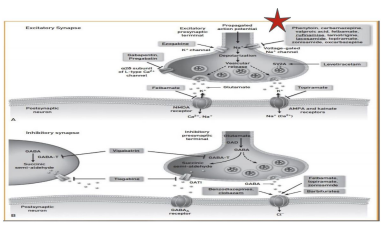
Phenytoin, Ethosuximide, Carbamazepine, Valproate, Lamotrigine, Oxcarbazepine, Bromide salt, Phenobarbital, Primidone, Clonazepam, Felbamate, Gabapentin, Topiramate, Tiagabine, Levetiracetam, Zonisamide, Pregabalin, Rufinamide, Lacosamide, and Ezogabine.



- Phenytoin is no longer considered a first-line AED; it is now principally used in emergency control of seizures.
- Levetiracetam is increasingly used in most types of epilepsy.
- Carbamazepine can worsen absence seizure and myoclonic epilepsy.

MOA

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



1. **Reducing electrical excitability of cell membranes.**
   - **by inhibition of sodium channel.**
2. **Enhancing GABA.**
   - By inhibiting GABA-transaminase
   - By drugs with direct GABA-agonist properties.

Clinical uses of Antiepileptic drugs

1. **Tonic-clonic (grand mal) seizures: phenytoin or valproate** (drug of choice)
   - Use of single drug is preferred when possible because of risk of pharmacokinetic interactions. 70% of patients will have good seizure control with a single AED.
2. **Partial (focal) seizures: carbamazepine** (drug of choice)
   - valproate; clonazepam or phenytoin are alternatives.
3. **Absence seizures (petit mal): ethosuximide** (drug of choice) or valproate
4. **Myoclonic seizures: valproate** or clonazepam

Basic rules for drug treatment

- Drug treatment should be simple, preferably using one anticonvulsant (**monotherapy**). "Start low, increase slow" → titrate upwards until the seizures are controlled or side effects become unacceptable.
- **Add-on therapy** is necessary in some patients (If seizures not controlled with first AED, gradually introduce second agent and then slowly withdraw the first AED. If still not seizure free then combination therapy is required).
- If patient i**s seizure-free for three years, withdrawa**l of pharmacotherapy should be considered.
  - Should be performed very carefully and **slowly!**
  - 20% (50%) of pts will suffer a further seizure **within 2 years**.

Seizure freedom with AED use

1st drug → seizure free (47%)
2nd drug → seizure free (14%)
3rd drug → seizure free (3%)

So there is no benefit adding 3rd drug

Side effects of AEDs

- Intoxication with most AEDs causes unsteadiness, nystagmus and drowsiness.
- Side effects are commoner with multiple AEDs.
- Skin rashes are seen particularly with lamotrigine, carbamazepine and phenytoin.
- A wide variety of idiosyncratic drug reactions may occur, e.g. blood dyscrasias with carbamazepine.

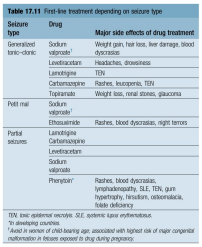


Table 17.11 First-line treatment depending on seizure type

Seizure type	Drug	Major side effects of drug treatment
Generalized tonic–clonic	Sodium valproate[1]	Weight gain, hair loss, liver damage, blood dyscrasias
	Levetiracetam	Headaches, drowsiness
	Lamotrigine	TEN
	Carbamazepine	Rashes, leucopenia, TEN
	Topiramate	Weight loss, renal stones, glaucoma
Petit mal	Sodium valproate[1]	
	Ethosuximide	Rashes, blood dyscrasias, night terrors
Partial seizures	Lamotrigine	
	Carbamazepine	
	Levetiracetam	
	Sodium valproate	
	Phenytoin[1]	Rashes, blood dyscrasias, lymphadenopathy, SLE, TEN, gum hypertrophy, hirsutism, osteomalacia, folate deficiency

TEN: toxic epidermal necrolysis. SLE: systemic lupus erythematosus.
[1]In developing countries.
[2]Avoid in women of child-bearing age; associated with highest risk of major congenital malformation in fetuses exposed to drug during pregnancy.

Drug resistant epilepsy

Medication resistant → (36%)

- 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)

Treatment *(cont.)*

Guidelines for Antiepileptic drug therapy

01	Start with one first-line drug, at a low dose; gradually increase dose until effective control of seizures is achieved or side-effects develop and optimise adherence.
02	If first drug fails (seizures continue or side-effects develop), start second first-line drug, followed if possible by gradual withdrawal of first
03	If second drug fails (seizures continue or side-effects develop), start second-line drug in combination with the preferred baseline drug at maximum tolerated dose (beware interactions)
04	If this combination fails (seizures continue or side-effects develop), replace second-line drug with alternative second-line drug
05	If this combination fails, check adherence and reconsider diagnosis (Are events seizures? Occult lesion? Treatment adherence/alcohol/ drugs confounding response?)
06	Consider alternative, non-drug treatments (e.g. epilepsy surgery, vagal nerve stimulation) and Use minimum number of drugs in combination at any one time

Epilepsy Type	First Line	Second Line	Third Line
Focal onset and/or secondary GTCS	• Lamotrigine	• Carbamazepine • Levetiracetam • Sodium valproate • Topiramate • Zonisamide • Lacosamide	• Clobazam • Gabapentin • Oxcarbazepine • Phenobarbital • Phenytoin • Pregabalin • Primidone • Tiagabine
GTCS[1]	• **Sodium valproate** • **Levetiracetam**	• Lamotrigine • Topiramate • Zonisamide	• Carbamazepine • Phenytoin • Primidone • Phenobarbital • Acetazolamide
Absence	• Ethosuximide	• Sodium valproate	• Lamotrigine • Clonazepam
Myoclonic	• Sodium valproate	• Levetiracetam • Clonazepam	• Lamotrigine • Phenobarbital

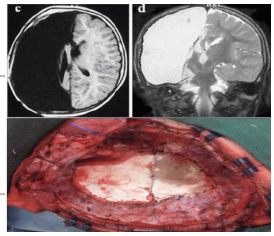
Treatment *(cont.)*

◀ Second: Surgical

Hemispherectomy

Definition

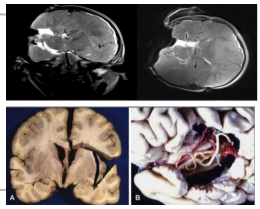
Hemispherectomy is a surgical treatment for epilepsy in which one of the two cerebral hemispheres is removed.



Hemispherotomy

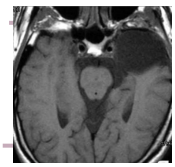
Definition

A hemispherotomy is an operation that disconnects the cortex of a hemisphere from the other without removing it by cutting the corpus callosum. it is done so seizure won't start focally on one hemisphere and travel to the other hemisphere to become generalized.



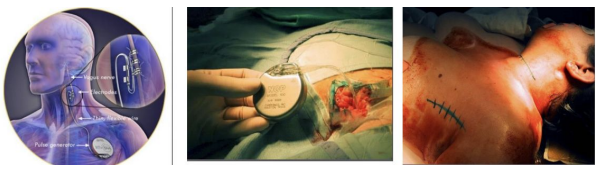
Temporal lobectomy

Temporal lobectomy will result in seizure freedom in 50–70% of selected patients with uncontrolled seizures caused by hippocampal sclerosis (defined by imaging and confirmed by EEG).

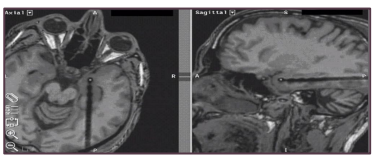


◀ If my patient is not a good candidate for surgery?

1. **Vagus Nerve Stimulation (VNS)**
   - Reduce seizure by 12-50%



2. **Deep Brain Stimulation (DBS)**

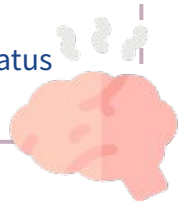


Status epilepticus

Definition

Defined as recurrent convulsions that last for more than **30 minutes (5 min in the last update)**[1] and are interrupted by only brief periods of partial relief[2].

- **It's serious, potentially life-threatening,** has a mortality of 10–15%.
- The longer the duration of status, the greater the risk of permanent cerebral damage.
- **Any type of seizure can lead to SE:**
  - the most serious form of status epilepticus is the generalized tonic-clonic type.
  - **Over 50% of cases occur without a previous history of epilepsy**. Some 25% with apparent refractory status have pseudostatus (non-epileptic attack disorder).
  - Focal status also occurs.
    - **Epilepsia partialis continua** is continuous seizure activity in one part of the body, such as a finger or a limb, without loss of consciousness. This is often due to a cortical neoplasm or, in the elderly, a cortical infarct.
- Not all status is convulsive. In absence status, for example, status is non-convulsive – the patient is in a continuous, distant, stuporous state.
- **Rhabdomyolysis** is a complication of SE that may lead to acute kidney injury in convulsive status epilepticus.



◀ Management:

Early status (up to 30 min)

- **General measures**
  - Administer oxygen, monitor ECG and blood pressure, perform routine blood tests (include glucose, calcium, drug screen, magnesium, FBC, anticonvulsant levels urgently).
  - Secure a venous access through a large vein (some anticonvulsants cause phlebitis)
- **Seizure control**
  - Give **lorazepam IV**, Repeat once if necessary. **Buccal midazolam and rectal diazepam** are alternatives if no IV access is available.
    - Lorazepam may cause respiratory depression and hypotension, resuscitation facilities should be available.

Established status (30–90 min)

- **Phenytoin or fosphenytoin** (a prodrug of phenytoin and can be given faster than phenytoin).
  - Both drugs could cause cardiac dysrythmias, ECG monitoring is essential.

If ongoing seizures

- **Phenobarbital, and Valproate are the third-line therapy.**

Refractory status (>90 min) – general anaesthesia

- Only In Intensive Care Setting; intubation and ventilation usually required
- Propofol Bolus, Thiopental and Midazolam Infusions may also be used
- Use continuous EEG monitoring to assess efficacy of treatment –aim for EEG burst suppression pattern
- Reinstate previous AED medication via nasogastric tube
- Establish Diagnosis: CT or MRI may reveal an underlying cause
- Remember: 25%of apparent status cases turn out to be pseudostatus

1: time is brain, if seizure is prolonged, millions of neurons will be lost
2: patient won't be conscious

Epilepsy in women

Birth defects

The overall risk of birth defects in babies of mothers who take one AED is around 7%, as compared with 3% in women without epilepsy.

Counselling before conception is essential

Contraception

- AEDs inducing hepatic enzymes (e.g. carbamazepine, phenytoin and phenobarbital) reduce efficacy of oral contraceptives.
- A combined contraceptive pill containing a higher dose of oestrogen or the progesterone only pill provides greater contraceptive security.
- An IUCD or barrier methods of contraception are often used in preference to oral contraceptives.

Epilepsy treatment in pregnancy

The **risk of teratogenicity** is well known (~5%), especially with **valproates**, but withdrawing drug therapy in pregnancy is more risky than continuation[2] (risk to the fetus of uncontrolled seizures).

- All antiepileptic medications are not safe, however **lamotrigine** is the **safest**. .
- Preconception treatment with **folic acid** (5 mg daily) before conception and throughout the first trimester, along with use of the smallest effective doses of as few AEDs as possible, may reduce the risk of fetal abnormalities. The risks of abrupt AED withdrawal to the mother should be stressed.
- **Vitamin K** 20 mg orally should also be taken during the month before delivery to prevent neonatal haemorrhage.
- Epileptic females must be aware of this problem and thorough family planning should be recommended (Antenatal screening is necessary).
- Over 90% of pregnant women with epilepsy will deliver a normal child

Breastfeeding

- Mothers taking AEDs need not in general be discouraged from breastfeeding, though manufacturers are often hesitant in assuring that there is no risk to the baby.

1: Sodium valproate is associated with a higher rate of serious malformations (e.g. neural tube defects) and should be stopped or substituted if possible
2: we can decrease doses or shift to safer medication before pregnancy, but No change of medication should be considered during pregnancy.

Seizures VS syncope

◀ Seizures vs Syncope:

	Cardiogenic Syncope	Seizure Disorders
Definition	due to sudden reflex bradycardia with vasodilation of both peripheral and splanchnic vasculature	sudden synchronous discharge of cerebral neurons causing symptoms or signs.
Loss of Consciousness	Typical	Common
Aura	-	+
Cyanosis	-	+
Episode Duration	Seconds	Minutes
Involuntary movements	Common	Typical
Amnesia	Yes	Yes
Post-ictal delirium	-	+
Post-ictal headache	-	+
Arrhythmia	Common	Rare
Electroencephalogram	Slow waves Flattening	Focal or General Spike
Responsive to AED (anti-epileptic medications)	No	Often
Short Term Mortality	High	Low
Recovery	**Rapid**, usually taking place over seconds, but may be followed by a feeling of general fatigue	Postictal drowsiness and confusion following a seizure

An area for your notes

Summary

Epilepsy

- Epileptic seizure: transient occurrence of signs and symptoms of sudden changes in neurological function.
- Provoked seizures: occurs in the setting of acute illnesses in people with no Hx of seizures.
- Epilepsy: recurrent (two or more) unprovoked seizures.

Risk factors

- Febrile convulsions
- Family History
- CNS mass/infection
- Trauma
- Stroke

Triggers

- Poor compliance
- Stress
- Infection

Classification

Generalized

- Absence (petit mal)
- Atonic (drop seizure)
- Tonic-clonic (grand mal)
- Myoclonic

Focal

- Simple partial seizures (no change in LOC)
- Complex partial seizures (impairment of LOC)

Seizure semiology

- Frontal:Abnormal behaviour
- Temporal: Deja vu, epigastric aura, olfactory hallucinations
- Parietal: Sensory involvement
- Occipital:Visual hallucinations

Seizures vs Syncope

Syncope

- Episode Duration (Seconds)
- Amnesia
- **NOT** Responsive to AED

Seizures

- Episode Duration (Minutes)
- Amnesia
- Oftenly Responsive to AED

Treatment

- Grand mal: **phenytoin or valproate.**
- Focal: **Carbamazepine (first choice)**
- Absence: **Ethosuximide** (**drug of choice**)
- Myoclonic: **Valproate**

Notes:

- Valproate can be used for all types.
- Carbamazepine can worsen absence seizure and myoclonic epilepsy
- **N.B: all AEDs are teratogenic, BUT lamotrigine is the safest**

Lecture Quiz

Q1: A 38 year old man is evaluated for seizures. He achieves partial control with the addition of a second antiepileptic medication. He drives to work each day.
A- Allow him to drive if he is seizure-free for 1 year.
B- Allow him to drive as long as his seizure history is noted on his license
C- Allow him to drive as long as he is accompanied.
D- Recommend that he find an alternate means of transportation.

Q2: A 15-year-old girl is brought to the emergency department by her mother after experiencing a first-time seizure. The thin-appearing girl has a heart rate of 55/min, signs suggestive of dehydration, and fine, velvety hair covering her arms and legs. The physician calculates her body mass index to be 16.4 kg/m2. When the patient's mother leaves the room for a moment, the patient admits to the physician that she has been feeling depressed recently and that for the past week she has been self-medicating with normal daily doses of one of her friend's antidepressant medications. What antidepressant is the patient most likely taking?
A- Amitriptyline
B- Bupropion
C- Fluoxetine
D- Selegiline

Q3: A 45 years old epileptic patient comes to the hospital with peeling skin and painful blisters all over his body. Which of these epileptic drug did he take?
A- Lamotrigine
B- Sodium Valproate
C- Phenytoin
D- Topiramate

Q4: Which of the following is the drug of choice in case of absent seizure?
A- Lamotrigine
B- Ethosuximide
C- Sodium Valproate
D- Phenytoin

Q5: A 17-year-old girl is brought into accident and emergency with generalized tonic-clonic seizure. Her mother had found her fitting in her bedroom about 20 minutes ago. The ambulance crew handover state that her sats are 96 per cent on 15 L of oxygen and they have given her two doses of rectal diazepam, but she has not stopped fitting. What is the most appropriate management?
A- Phenytoin loading
B- Lorazepam
C-Intubation
D- Phenobarbital

Q6:A 23-year-old woman is seen in clinic for recurrent funny turns. She is not aware of them, but her family and friends have noticed them. They say she looks around blankly, then starts picking at her clothes and sometimes yawns, then she comes back after a minute. She can get drowsy after these episodes. What seizure type does this patient describe?
A- Absence.
B-Generalized
C- Tonic clonic
D- Complex partial

Q7: 24-year-old female is seen in the clinic complaining that she suddenly finds herself walking around the house without control. on history the doctor found out that she has this episode during night and it last for 1-2 minutes, she feels oriented when these episodes happen and her family didn't notice any loss of consciousness. the doctor admitted her for monitoring and her EEG showed spikes at night, when she experiences the same episode, and she was diagnosed with epilepsy. Which lobe is the most likely affected in this lady?
A- Parietal lobe
B-Occipital lobe
C- Temporal lobe
D- Frontal lobe

Answers: Q1:D | Q2:B | Q3:A | Q4:B | Q5:A | Q6:D | Q7:D |

THANKS!!

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Send us your feedback:
We are all ears!