

Lecture:



Epilepsy & Status Epilepticus

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What is a seizure and what is epilepsy?

* نوبة ناتجة عن زيادة الشحنات الكهربائية بالمخ

→ **A seizure**: is a single event "Transient disturbance of cerebral function" due to abnormal, excessive discharge of neurons in the brain that usually results in altered perception or behaviour.

→ **Single seizure** is not epilepsy but indication for investigation.

• Not all seizures imply epilepsy "for example, seizures during hypoglycemia, SAH". These seizures are not epilepsy (**Acute symptomatic seizure**)

• The recurrence rate during the first year 70%.

• 7-10% of the population will have a seizure at some point in their lives.

ل 7-10% من الناس مرة واحدة تشنج

ل مرة واحدة

واحد أو أكثر
تشنج، محله

CBC, Chemistry

يمكن تكون حالة

hypoglycemia

تشنج CT يمكن Tumor

EEG "

(seizure 2 or more)
↑

Epilepsy: is the condition of **recurrent unprovoked**

seizures caused by sudden excessive changes in the electrical function of the brain.

0.5-1% of the population currently has epilepsy.

* not all seizure imply epilepsy ...

مثل كل نوبات التشنج يدخلوا بصر، مثلاً: وضح
عنه recurrent hypoglycemia وبخل recurrent seizure
هل اعتبره epilepsy لا ..

Subarachnoid hemorrhage والتشنج هل اعتبره epilepsy

لا ...
acute symptomatic seizure
تشنج: لا تشنج

Symptoms من لا disease المسببة

Epilepsy: Epidemiology

- ✓ There is about 50 million epileptic patients in the world.
- ✓ About 1-8 new cases per 1000 population each year in the US.
- ✓ Approximately 65 people suffer their first seizure each day in the US.
- ✓ Over two-thirds of all epileptic seizures begin in childhood (most in the first year of the life).
- ✓ 0.5-1% of the population affected.
- ✓ All ages affected.
- ✓ The incidences of epilepsy increases again slightly after age 60.

* most common epilepsy affect: [childhood]

يكثر في الـ 60 و موضوع الـ epilepsy هو غير .. لأنه لا يعرف في الـ 60 و
تنتج نسبة tumor, neurodegenerative disease, post stroke epilepsy

II. Partial or focal seizures "seizures beginning locally":

1. **Simple partial seizures** "consciousness is not impaired":

a. With motor signs "motor Jacksonian type".

b. With sensory signs "sensory Jacksonian type".

2. **Complex partial seizures** "with impaired consciousness".

↳ Temporal lobe epilepsy.

III. Unclassified seizures: (febrile seizure) (reflex epilepsy)

Febrile and other seizures of infancy and childhood, reflex epilepsy.

تشخيص طري، لا يحتاج علاج كـ epilepsy

لا يعتبر epilepsy، صنف سبب الـ fever ونقل الحرارة، لحد صور 5 سنوات

في عمر 6 و غالبا ينتهي ...

International Classification Of Epileptic Seizures "International League Against Epilepsy (ILAE)-1981"

I. **Generalized seizures** "bilaterally symmetrical and without local onset":

A. Tonic, clonic, atonic or tonic-clonic "grand-mal or generalized major convulsions".

B. **Absence** "petit mal":

C. Infantile spasm "West syndrome".

D. **Juvenile myoclonic epilepsy**.

↳ rapid jerky movement

يكون عادة بملامح غابة نقر وحده، loss consciousness
عكس الـ myoclonic تكون physiological زرع، لا تتعمم، عادي ساع
وتنحى تمام غابة بوعث.

Etiology of Epilepsy

- **Idiopathic:** 70%. → خاصة عند الأطفال
- **Symptomatic:** 30%.

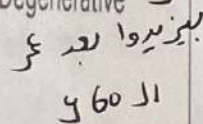
- ✓ Abnormal development of the brain.
- ✓ Head trauma.
- ✓ Stroke.
- ✓ CNS infections.
- ✓ Brain tumors.
- ✓ Degenerative disease.
- ✓ Metabolic.
- ✓ Hippocampal sclerosis.
- ✓ Drugs and drugs withdrawal.
- ✓ Alcohol abuse.
- ✓ Neurosurgical operation.

عوامل بعض تشنجات
✓ **Provoked seizures:** photosensitivity, hyperventilation and sleep deprivation, flickering light, including TV and computer screens, uncommonly (music, reading and hot baths).

If precentral gyrus Tumor
منه عند
نصفين تشنجات
رابطه المثلث
لأنه الورم زود
function of this area

تشنجات TV
أو سماع
الموسيقى

سريع



↑ paroxysmal activity of brain

والـ neutron لا يؤثر على

- 192 no 44 عذف
Oligodendroglioma

epilepsy

benign tumor
epilepsy
meningioma
located in
convexity

Cerebral hemisphere → types of meninges → 3 layers of
brain discharge القشر Cortex is

- 5-10% after ischemic strokes.
- 15-20% after primary intracranial hemorrhage.
- 25-30% after SAH.

* 5-10% من الـ ischemic stroke بعد فترة من الزمن يحدث لهم post-stroke epilepsy

* 25-30% من حالات Subarachnoid hemorrhage (سحابة) epilepsy

* وفي خطر الحوضيع او epilepsy اذا كانت stroke I. في Cortex
والـ basal nuclei و Cortex لـ grey matter في neuron

- Onset is almost always in childhood.
- No structural abnormality is present and there is often a substantial genetic predisposition.

لذلك بعض الاحياء يعانون بكون عنه
" Generalized " " بعض عنه
epilepsy

Partial Epilepsy

- Partial seizures may arise from any disease of the brain.
- The presence of partial seizures signifies the presence of focal cerebral pathology. $\Rightarrow$ CT/MRI

- Stroke
- abscess
- tumor
- cyst

Local brain damage: $\Leftarrow$ له يعني اكلو شئ يكون ناتج عنه

2. Ictal stage (seizure):

a. **Sudden loss of consciousness:** not more than **5 min**

b. **Tonic phase (10 sec):**

- The body becomes rigid. $\rightarrow$ hyperextension بحيد
- Extended limbs.
- The patient utters a cry (spasm of vocal cord) and falls.
- Rolling of eye upwards. $\rightarrow$ له عكسك لشيح صوت لشخير أو
- Cyanotic face. $\rightarrow$ صوخة عندها خيش
- Tongue is usually bitten. $\rightarrow$ spasm of Vocal cord
- Urine incontinence.
- Frothing. from mouth $\rightarrow$ ريك لبيضا

c. **Clonic phase (2 min):**

- Generalized convulsion with frothing at the mouth.
- Rhythmic jerking of muscles (contract and relax repeatedly and rapidly). This lasts from a few seconds to several minutes in status epilepticus.

لو قعدت < 5 min

Tonic-Clonic Seizures

(Grand-Mal Seizures Or Generalized Major Convulsions)

Characterized by 3 stages:

- Preictal stage (aura).
- Ictal stage (seizure).
- Postictal stage.

1. Preictal stage (aura):

- It is a warning sign for the coming attack. $\rightarrow$ إشارة تحذير منه
- May be somatic (fatigue), psychic (depression), autonomic (nausea, vomiting), blurred vision, abdominal pain $\rightarrow$ متروك المنوبة

كل aura مختلف من عيار للتأني حسب رينا موجود
epileptic focus $\rightarrow$ ا

3. Postictal stage:

a. **Somatic:** generalized fatigue, sleepiness or coma, aphasia, Todd's paralysis (paralysis not more 24 hrs). $\rightarrow$ هاب الاعراض تستقر ل 24 و يروح

b. **Autonomic:** headache, dizziness, vomiting. (due to $\uparrow$ ICP)

c. **Psychic:** confusion.

$\rightarrow$ بصير المياع هزيل/لقاب مرهه ، به نيام

Petit Mal Epilepsy (Absence)

- Also called **generalized nonconvulsive seizures**.
- Onset usually in **childhood** between **4-12 years** of age.
- Family history** in **40%** of patients.
- The seizures consist of **multiple brief staring episodes with behavioral arrest**.
بكونه يتكلم معنا فجأة يسبح ويفعل *less see*
- The absence may occur many times a day within duration of **5-15 seconds**.
- Attacks may be induced by **hyperventilation**.
بتهجير الحلة لما يحرقه كثير
- They are associated with generalized **3-hertz spike and slow wave** discharges on EEG.

EEG in Epilepsy

لوعلمنا EEG سيرة لنوبات ولقائنا نورال هذا لا يعني عندنا *epilepsy*

- A normal EEG between attacks (interictal) does not in any way exclude epilepsy.
- Many people with epilepsy have normal interictal EEG.
- EEG should be performed within **24 hours** of the seizure.
- If the routine EEG findings are normal, a **sleep-deprived**

EEG and video-EEG should be performed

* EEG " ثبت ولا ينفي ، ينفي ولا ثبت " مريض عنده صرع وقت نائم كثير

علما EEG لقائنا discharge ↑ مع انه ما بتسبح الحياه ، بق من حين *epilepsy*

Epilepsy: Differential Diagnosis

- Syncope**: cardiac, vasovagal, micturition, orthostatic hypotension.
- Transient Ischemic attack**.
- Panic attacks**. → related to psychologic نوبات الهلع جوع
- Sleep disorder** (Narcolepsy, restless legs syndrome).
- Non-epileptic "**pseudoseizures or hysterical seizures**".
- Hypoglycaemia**.
- Phaeochromocytoma**.
- SAH**.
sudden m. weak يعني Cataplexy
sleep hallucination, sleep paralysis وبالليل برضه m. hypotonia
في نيام الصبح بتكررت شو صار معاه

EEG- interictal

Abnormal interictal EEG

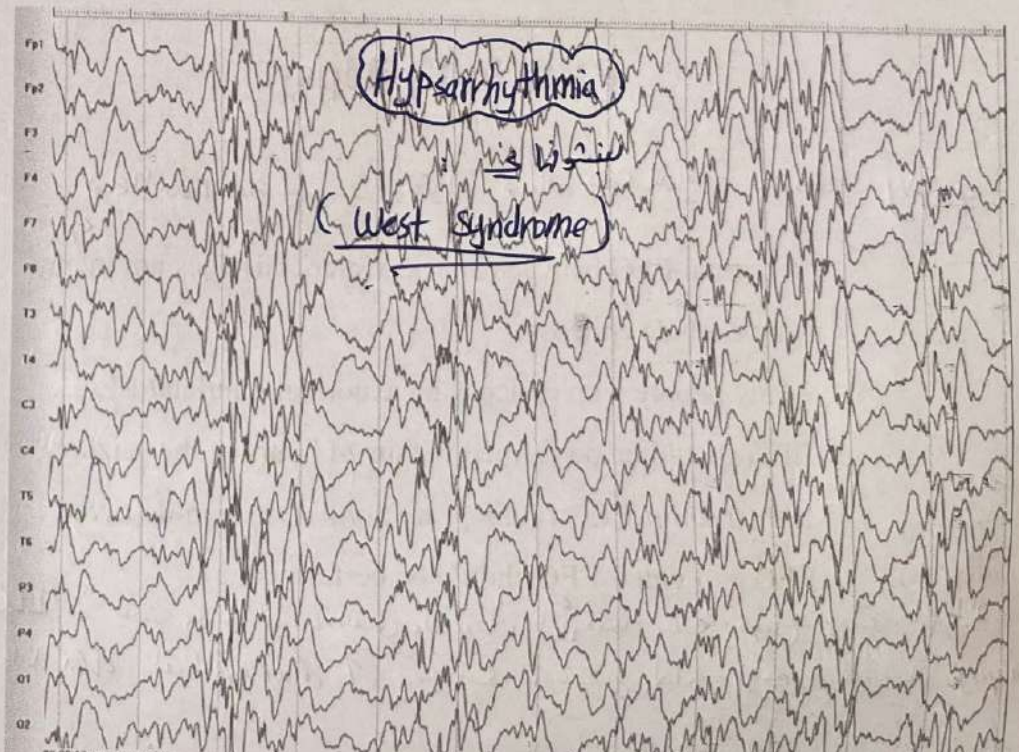
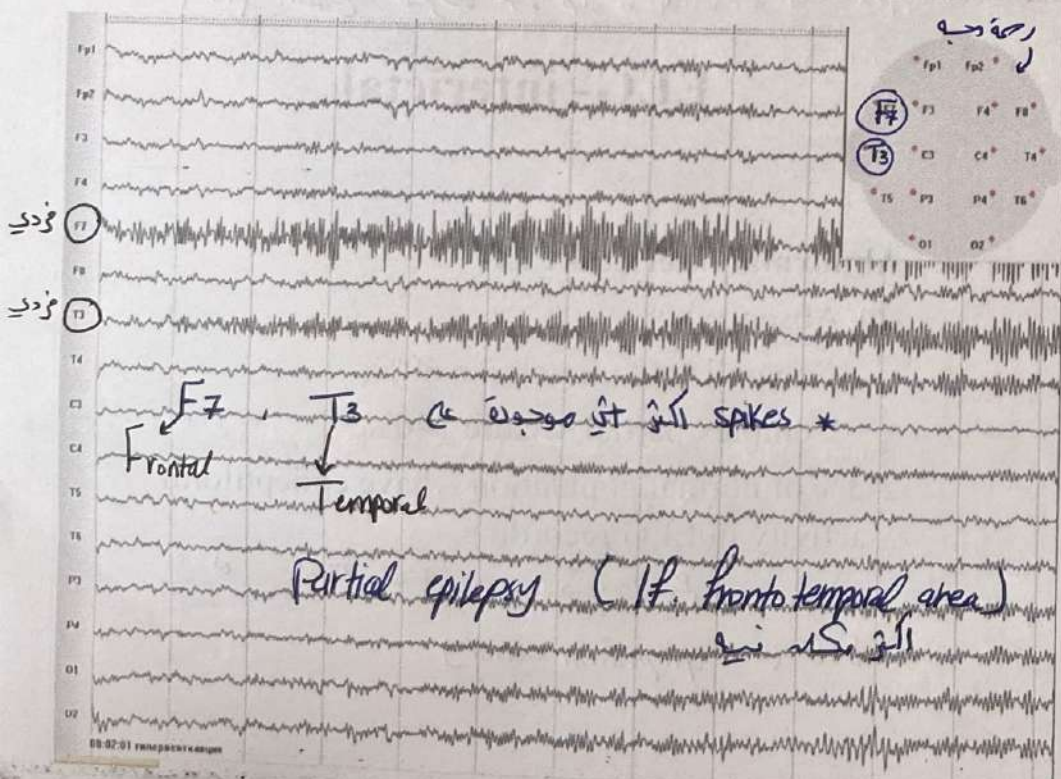
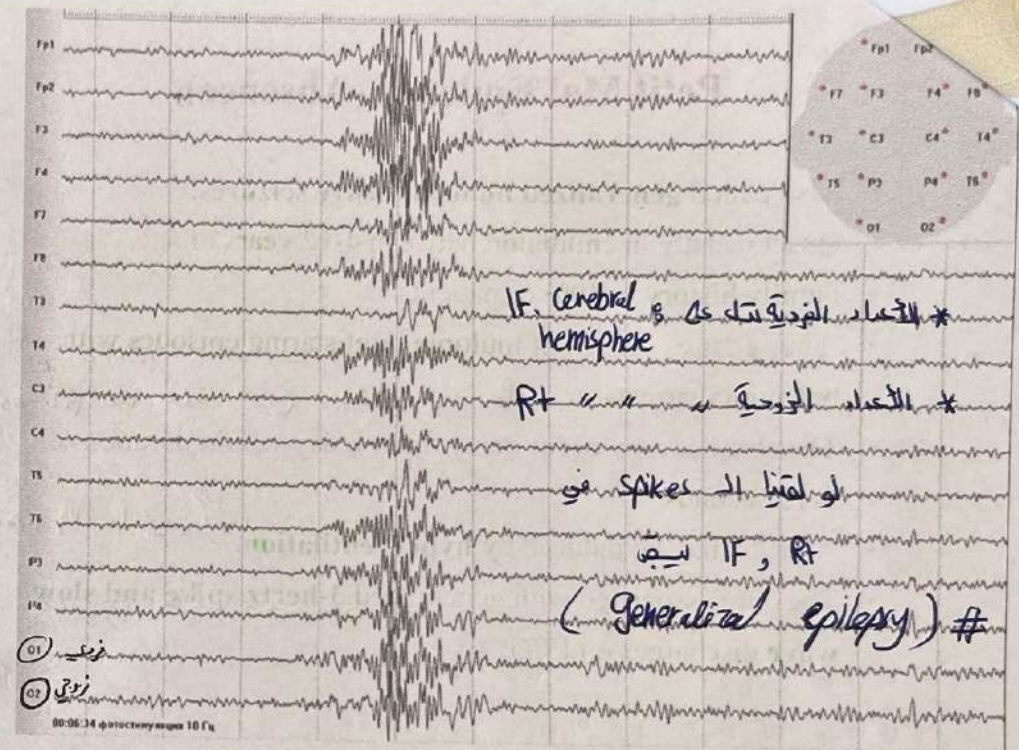
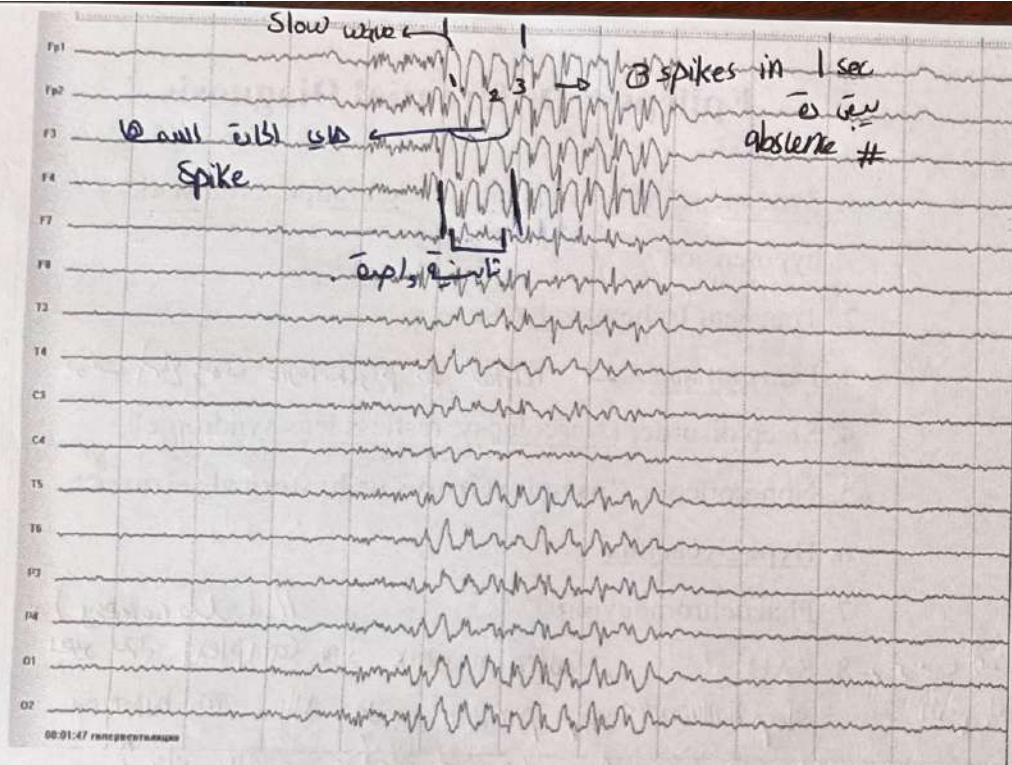
in Absence 80%.

- Generalized tonic-clonic 60%.
- Complex partial seizure 40%.

2-3% of normal population – have epileptiform activity in EEG recording.

ل 2-3% من الناس الطبيعية عندهم

EEG is epileptiform activity



non epileptic seizure

Pseudoseizures

تشنج كاذب

- The fit usually occurs in the presence of other people to gain their sympathy. * تحدث مع وجود الاقارب جلب
- The patient alert with generalized convulsion. عطفهم للرئيسة يكون مغفيا
- Eyes often closed during attack. * never occurs during sleep. عنه وبومش
- The patient never hurts himself (by tongue-biting or body injury). ما ياذب نفسه ولا يوقع ولا يترك
- Autonomic signs during attack uncommon.
- Urine incontinence never occur.
- EEG is normal and AED contraindication.
- Normal prolactin level after attack.

* تشنج نطفي anti epileptic drug

prolactin في 180 من حالات epilepsy يزيد
خلال 20 د بعد النوبة ، لكنه هذا ...

Guidelines for Anticonvulsant Therapy

- Start one first line drug.
- Start with low dose.
- Gradually increase dose to effective control of seizures or side effect "use serum drug level". *بخطي ازود تدريجي الجرعة الفعالة بعد level control أو تظهر S.O.E لدراد*
- If first drug failed "seizures continue or side effects", start second-line drug whilst gradually withdrawing first. *حسب الاول منطفي هرب واحد ثاني*
- Try three singly drugs before using combination. *منطفي هرب واحد ثالث*
- Do not use more than three drugs in combination. *منطفي هرب Combination*
- The goal of therapy should be complete seizures control with a single drug and without side effects.

When to start treatment after the first seizure?
Which patients are at highest risk for recurrent seizures?

في حالات يبدأ معها علاج بعد أول نوبة

Seizure recurrence is more likely if the patient has:

- Focal neurologic deficit.
- Mental retardation.
- EEG demonstrates severe epileptiform abnormalities.
- Structural brain lesion. → Tumor عليا CT لفتيا Tumor أو abscess
- An initial high density of seizure. نوبة موزة كثرة
- Positive family history.
- Seizure during sleep → طما حرات مرة يمكن لها مكل low electrical discharge يكون تشنج كذا وهو غير حصلت ، لكان ، احنا ناعية يكون تشنج recurrent

Common Antiepileptic Drugs

Generic Name	Trade Name
Valproic acid	Depakin
Phenytoin	Epanutin
Carbamazepin	Tegretol
Phenobarbital	Luminal
Topiramate	Topamax
Vigabatrin	Sabrin
Gabapentin	Neurontin
Levetiracetam	Keppra
Clonazepam	Clonex
Lamotrigine	Lamictal
Diazepam	Assival, Valium
Lorazepam	Loracare
Midazolam	Dormicum
Propofol	Diprivan
ACTH	ACTH

Epilepsy: General Management

أبداً المريض
عند الامكان الخطر

1. Moderation of patient's physical activities: swimming, driving, walking near machines or at highest.
2. Avoid precipitating factors. (السعر, الجوال, TV)
3. Diet:
 - a. Alcohol intake is forbidden. **منع كحول**
 - b. Ketogenic diets are high in fat and low in carbohydrates, with intake of fluids often limited (acidosis raises threshold of stimulation of brain cells, while alkalosis lower it).

تقبل discharge

منع بعد التشنج مباشرة

تغادر القسم متى ساعة / ساعة
عمال ويصطحب صديق

B. Immediate medical care:

- • Ensure airway is clear.
- • Give oxygen to avoid cerebral hypoxia.
- • Most seizures last only minutes and end spontaneously.
- • A prolonged seizure longer than 3 minutes or repeated seizures outside hospital, best treated with rectal or intravenous diazepam 10 mg.
- • Take blood for routine bloods "include alcohol, Ca, Mg, anticonvulsant levels and serum prolactin level (if known case of epilepsy).
- • Exclude **hypoglycaemia** and treat if present.
- • If convulsions are continuous or repeated manage as for status epilepticus.

m. contraction
سبب
الى حركات
ود - حركات
acute renal
failure

Immediate care of seizures

A. First aid:

- Move person away from danger (fire, water, machinery, furniture).
- Ensure airway is clear.
- **Do not insert anything in mouth.**
- If convulsions continue more than 3 minute or recur without person regaining consciousness summon urgent medical attention.
- Person may be drowsy, confused for some 30-60 minutes and should not left alone until fully recovered.

• مريض في فمه
والدكتور يتركه
في حركات حلقية
قال عظمه مانيضا
لأن

✓ لو استمر التشنج < 3 min على طول حركته على الارض
✓ لو هاء اول نوبة بطلت ظهوره عوج الحنك

Status Epilepticus "SE"

✓ تشنج مستمر مع فقدان الوعي لأكثر من 5 د.

Status Epilepticus:

- SE is a state of continuous seizures "prolonged seizure ≥ 5 min. duration" without return of normal neurologic function between them.
- Status epilepticus has a **mortality of 10-15%** from **cardiorespiratory failure, irreversible brain damage, and rhabdomyolysis.**

Types of status epilepticus:

1. Major status (generalized tonic-clonic status). = **Convulsive Status**
2. Minor status (absence status). = **non-Convulsive**
3. Partial motor or sensory status.

Coma
brain hypoxia

Management of Status Epilepticus

❖ **0-5 min:** immediate medical care. ✓

❖ **6-10 min:**

- Thiamin and glucose
- Diazepam

OR

- Lorazepam

- **Side effect:** respiratory depression, hypotension and cardiac dysrhythmias may occur.

لذلك ينبغي ببطء

Refractory Status Epilepticus

>30 min:

Give one of the following drugs:

- ✓ • **Phenobarbital**

- ✓ • **Midazolam**

- ✓ • **Propofol**

من الأدوية كثر الأمان

عند ضبط

في التشخيص

أسمه ، هضول 6 شهور
بزل جرعة المولاد تدريجي

بست شحنة بعد 6 شهور
أثناء أو بعد منوقته

❖ **10-20 min:** لومدة 10-20 ما انقصة ينبغي :

- Phenytoin. loading dose

OR

- Fosphenytoin.

❖ **20-30 min:** لومدة 20-30 ما انقصة صه

- If status persist, give additional phenytoin or fosphenytoin.

- Intubation and mechanical ventilation

- Continues BP and cardiac monitoring.

Notes:

Phenytoin and fosphenytoin should not be diluted in glucose.

منوع تخليطه غير مجلول NS ، ولا هضول
ويراسبوا مع الجلوكوز

When should antiepileptic treatment be stopped?

70-80 % منقصر لنسبة على التشخيص منقصر ، بتلاتي 2-3 سنوات

- 70-80% will eventually become seizure free, it is common practice to consider drug withdrawal after becoming seizure free for 2-3 years.

- Withdrawal should be undertaken slowly, reducing the drug dose gradually over 6 months.

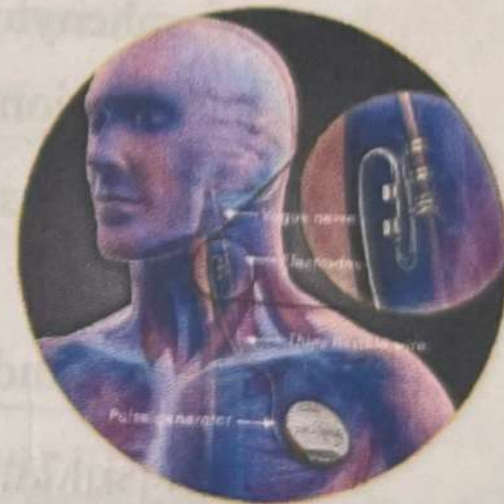
- Recent studies suggest that approximately 33% of adult patients and 25% of children who are seizure free fore 2 years well relapse after termination of AED.

بعد موقوف العلاج يرجع ناي المرض عندهم

Surgical Treatment

❖ For medical refractory epilepsy. Focal brain resection is the most common type of epilepsy surgery:

- ✓ 1. Anterior temporal lobe resection.
- ✓ 2. Lesionectomy: epileptogenic structural lesion resection.
- ✓ 3. Vagus nerve stimulation.



بركبو base maker جهاز ويربطوه مع

Vagus N. فنبقى نوبات التشنج

نبقولوا لي عنهم

medical refractory epilepsy.