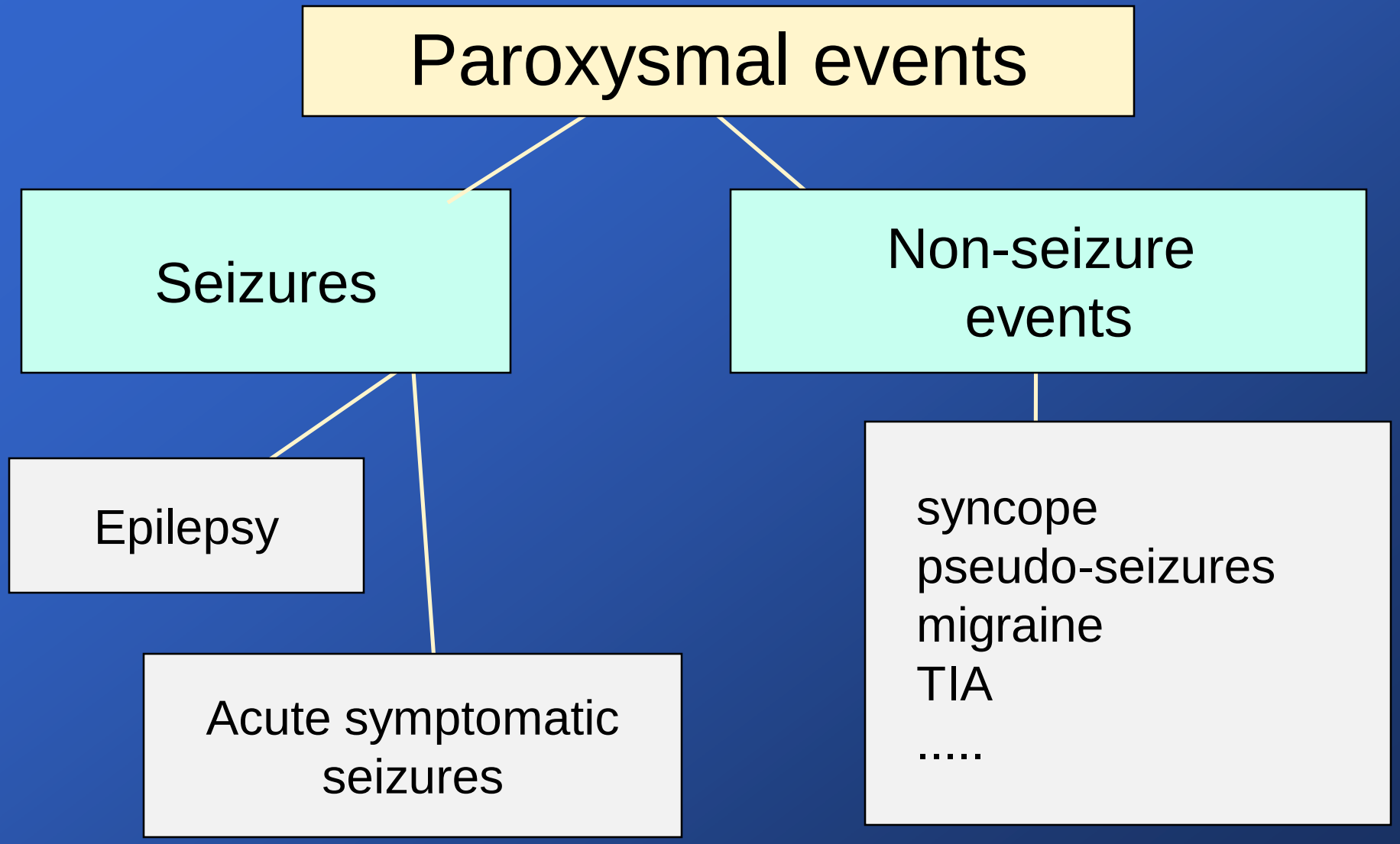
Epilepsy

- Is it a fit / seizure?
- Is it epilepsy?


Paroxysmal events
Seizures
Non-seizure events
Epilepsy
Acute symptomatic seizures
syncope
pseudo-seizures
migraine
TIA
.....

Is it a seizure?

- transient occurrence of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain

- brief disturbance in consciousness, behaviour, emotion, motor function or sensation

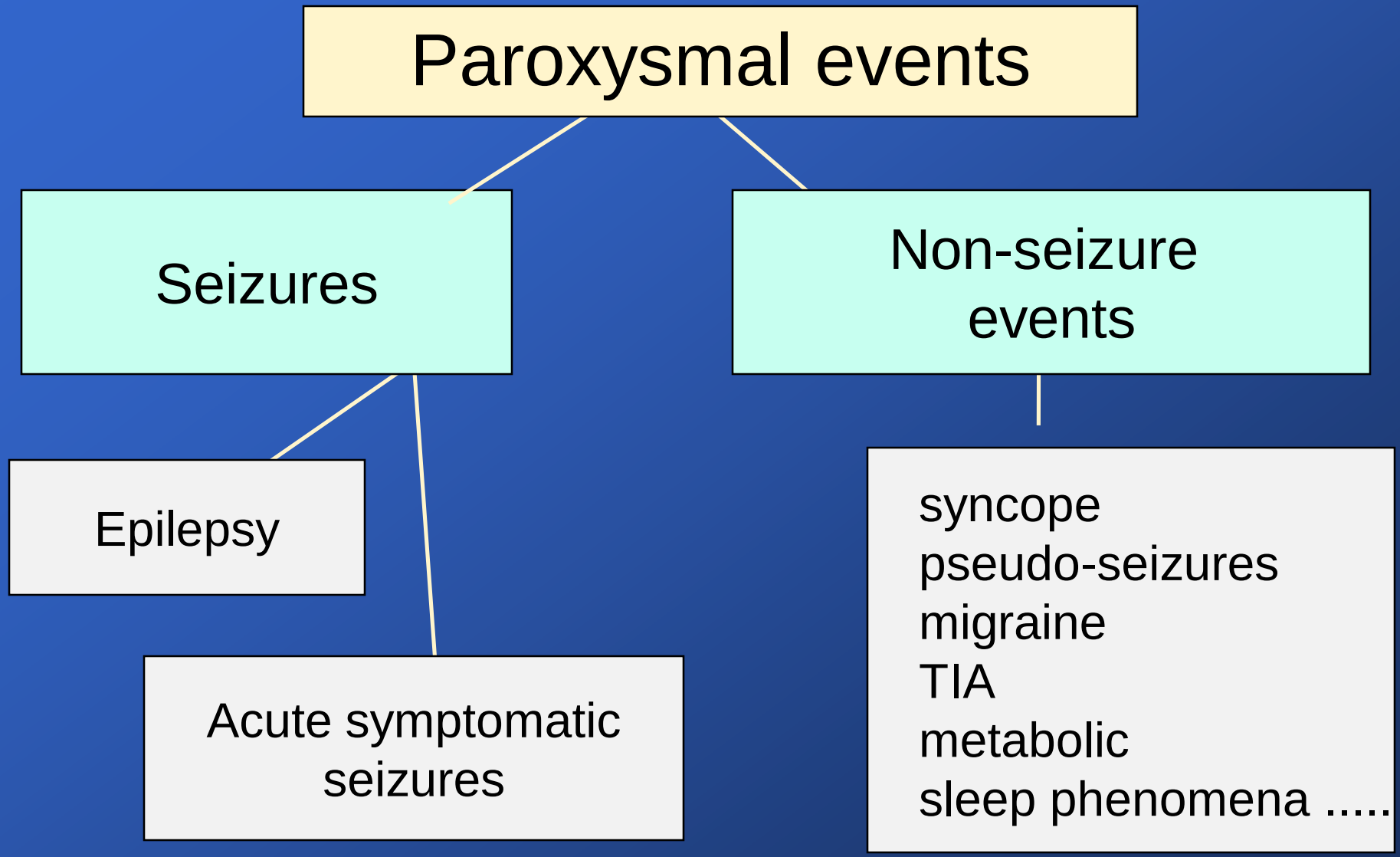
Is it epilepsy?

- tendency to recurrent seizures

Acute symptomatic seizures

- Provoked seizures -
  associated with acute encephalopathic state - alcohol, drugs, metabolic, infection, trauma, vascular, etc.

- confusion / systemic disturbance lasting more than seizure
- seizures stop when acute encephalopathic state is resolved


Paroxysmal events
Seizures
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Acute symptomatic seizures
syncope
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metabolic
sleep phenomena .....

	seizure	syncope

	seizure	syncope
precipitant	usually none	usually +
situation	any, sleep attacks +	upright, emotion
onset	rapid, aura +/-	gradual , ‘feel faint’, dizzy, blurred vision
motor	rigid, tonic/clonic	flaccid, ? jerking
skin	pale/flushed, ?blue	pale
breathing	foamy, stertorous	shallow
HR, BP	↑	↓
LOC	minutes	seconds
accompaniments	incontinence, injury	? incontinent,
post ictal	prominent	-

	seizure	pseudo-seizure
precipitant	usually none	usually +
situation	any, sleep attacks +	emotion, ‘audience’, inducible
onset	rapid, aura +/-	variable
motor	rigid, tonic/clonic	variable, bizarre - limb thrashing, tremor, posturing
duration	minutes	prolonged
accompaniments	incontinence, injury, side of tongue	incontinence, injury mild, tip of tongue
post ictal	prominent	vague, behavioural
associations	+/-	psycho-somatic, history of abuse

What is epilepsy?

- tendency to recurrent seizures

What is Epilepsy?

- tendency to recurrent seizures

- two **unprovoked** or reflex seizures occurring at least 24 h apart
- at least one **unprovoked** or reflex seizure, with high risk of recurrence
- diagnosis of epilepsy syndrome

Classification of Epilepsy

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- generalized
- partial
- unclassifiable

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- generalized
- partial
- unclassifiable

- absence (petit mal)
- tonic
  clonic
  tonic - clonic (grand mal)
- myoclonic
- atonic

Classification of Epilepsy

- generalized
- partial (focal)
- unclassifiable

- simple partial
- complex partial
- partial $\rightarrow$ IIry generalization

Diagnosis of Epilepsy

Diagnosis of Epilepsy

- on clinical features - mainly history
- eye witness account
- investigations

evolution of a seizure

evolution of a seizure

prodrome - hours - hunger, irritability, lethargy, euphoria,…

aura - ~ 30 sec - focal onset

ictus - tonic - cry, extensor posturing, apnoea, fall, injury, incontinence

clonic - 1-2 min - limb jerks

post ictal changes - flaccid, confusion, drowsy, headache, body aches, violence, focal deficits (Todd paralysis)

How do I investigate?

How do I investigate?

EEG - ictal
interictal

Imaging - CT
MRI, functional MRI
SPECT, PET

EEG in epilepsy

- diagnostic aid
  - 10-15% ‘normal’ population - abnormal EEG only 1% - spike-wave
  - single inter ictal EEG - only 30% +ve repeated recording - ~ 50%
- classify epilepsy - seizure type
- detect underlying abnormality

Imaging in epilepsy - when?

- late onset generalized seizures - > 20 years
- partial seizures (focal onset)
- focal neurological signs
- focal EEG change
- poor seizure control

Epilepsy syndromes

Idiopathic generalised epilepsy

seizure type - generalised tonic- clonic seizure (grand mal)

- prodrome
- no aura
- ictus - tonic - cry, extensor posturing, apnoea, fall, injury, incontinence

  clonic - 1-2 min - limb jerks
- post ictal changes

Childhood absence epilepsy

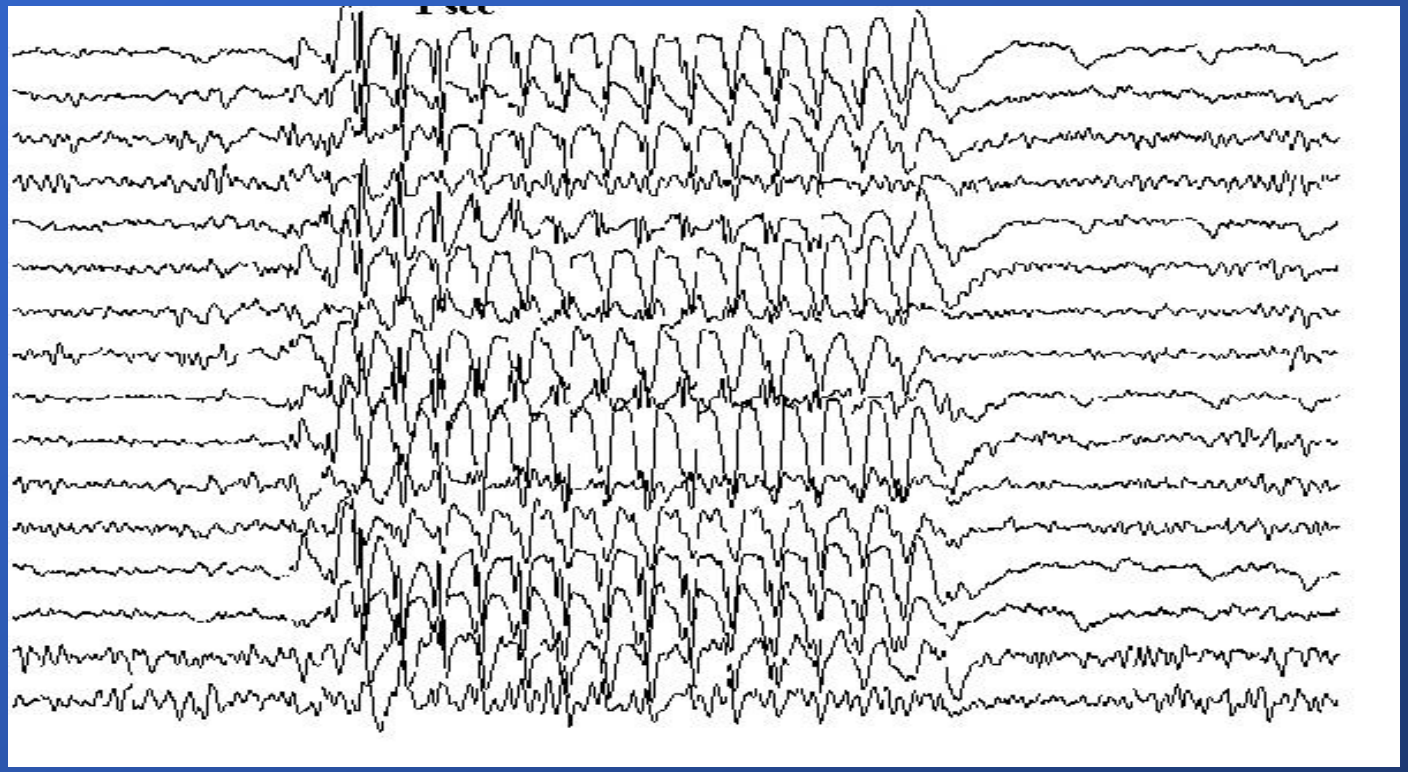
seizure type - typical absence seizure (petit mal)

- no prodrome, no aura
- ictus - ‘absence’ - altered awareness

  cessation of activity

  motor changes - minimal
- no post ictal changes

childhood absence epilepsy (petit mal)



- generalized 3Hz spike-wave activity (can get in any primary gen. epilepsy)
- abrupt onset and offset

Juvenile myoclonic epilepsy

seizure type - myoclonic, GTCS

- myoclonic jerks - sleep deprivation, alcohol
- prodrome -
- no aura
- ictus - myoclonic, GTCS
- post ictal changes

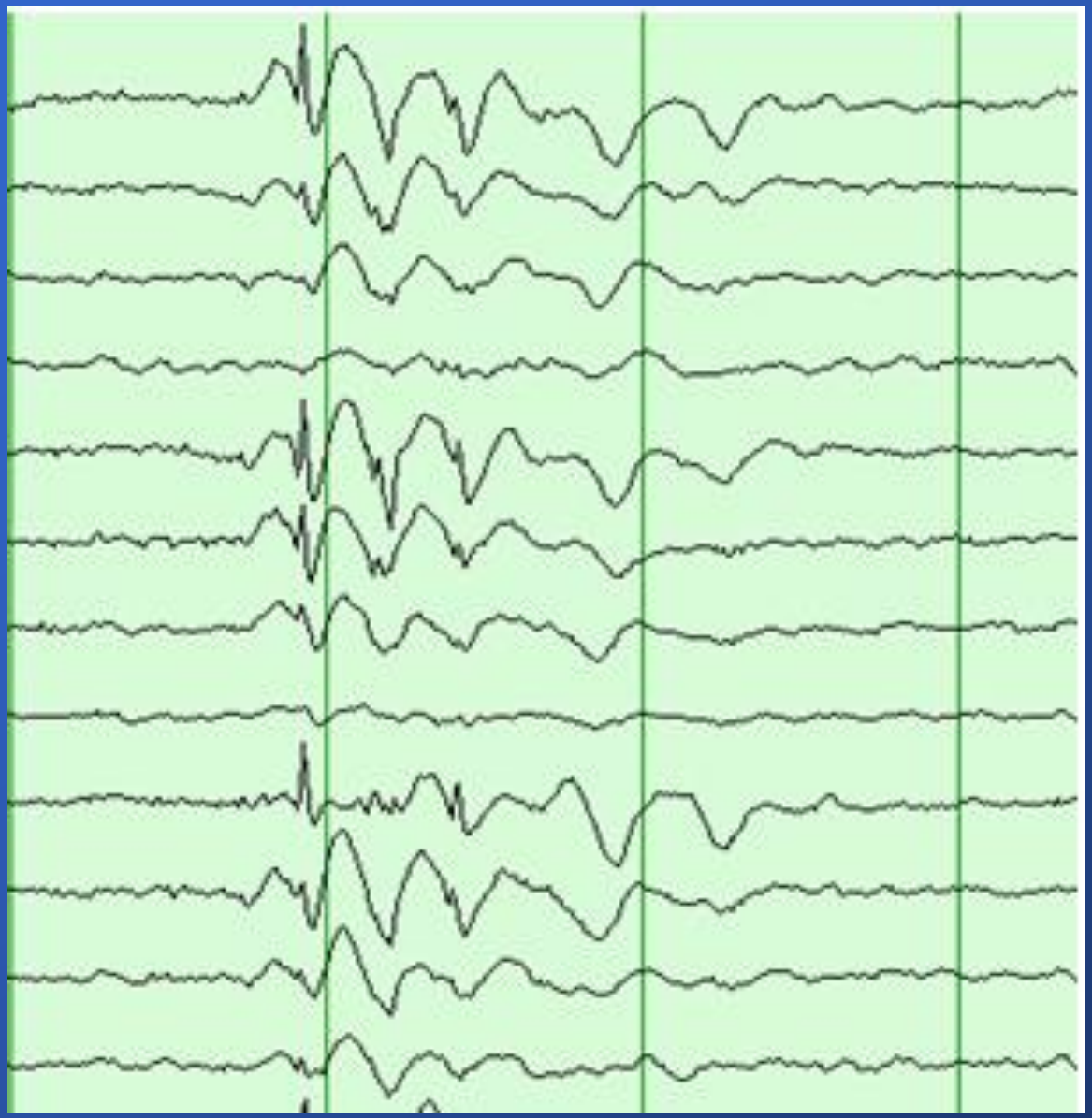
Temporal lobe epilepsy

seizure type - complex partial seizure

- aura - epigastric, olfactory, gustatory, speech, fear, memory - déjà vu, jamais vu, visual, …
- absence (altered consciousness)
- automatisms - oro-facial, motor, verbal, …
- autonomic changes
- post ictal changes

- hippocampal sclerosis (MRI)
- febrile convulsions, family history

partial seizure



focal spike and wave discharges

Treating epilepsy

Life style change

avoid precipitants

sleep deprivation

hunger

fatigue

menstruation

alcohol

reflex epilepsy- visual stimuli, ...

....

Anti-epileptic drugs - AEDs

Anti-epileptic drugs - AEDs

Standard	New
carbamazepine	lamotrigine
phenytoin	vigabatrin
valproate	gabapentin
phenobarbitone	topiramate
clobazam	oxcarbazepine
clonazepam	levetiracetam

	Narrow spectrum carbamazepine phenytoin oxcarbazepine gabapentin	**Broad spectrum** valproate lamotrigine topiramate levetiracetam
partial	√	√
Iry generalized- GTCS	??	√
tonic / atonic		√
myoclonic	×	√ (not lamotrigine)
absence	×	√

	DOC	2nd line
partial	CBZ, ?VPA, ?PHE	lamot, new AED, clob
GTCS	VPA, CBZ	PHE
myoclonic	VPA	levetiracetam
other Iry gen.	VPA	lamotrigine levetiracetam topiramate
absences	VPA	ethosuximide
unclassified	< 25 years - VPA > 25 years - CBZ	
infantile spasms	vigabatrin	ACTH

AEDs - when to start?

- 2 or more unprovoked seizures
  interval < 1 year
- consider - wishes of patient / family
- first fit - ?

AEDs - how to start?

- monotherapy - 70% effective
- rational polytherapy - 10% more
- start with monotherapy
- poor control - consider why?

  re-evaluate drug, dose, diagnosis
- then consider polytherapy

AEDs - how to stop?

- 2-3 year seizure free interval
- consider - wishes of patient / family
- slow reduction - over 3-6 months

Epilepsy and pregnancy

Epilepsy and pregnancy - effects on foetus

- satisfactory outcome in > 90%
- ↑ in birth defects -
  - 2-3 times more in mothers with epilepsy on AEDs > non epileptics
  - risk ↑ with polytherapy
  - which drug ? - VPA > PHT > CBZ
- enzyme induction → vit K deficiency → fetal ICH

Epilepsy and pregnancy - management

- ideally pre planned -
  withdraw AEDs 6 months before conception
- folate supplementation
- monotherapy
- best drug for seizure type / syndrome
- do not reduce / stop treatment
- Vit K - last month of pregnancy, neonate

Status epilepticus

Status epilepticus

- continuous or intermittent seizures that last >30 min with no regaining of consciousness in between

- >30 min - Established status

  > 5 min - Impending status - treat as status

- mortality ~ 20%

Status epilepticus

- metabolic - electrolyte, renal, liver, sepsis, toxic, hypoglycaemia, alcohol
- drug toxicity - penicillin, tricyclics, cocaine
- CNS - infection, stroke, head injury
- eclampsia
- breakthrough status - stopping Dx, infection, sleep deprivation, alcohol abuse/withdrawal
- pseudo status

Impending status stage (< 30 min)

ABC, monitor, oxygen, routine investigations
iv lorazepam / diazepam
iv thiamine, iv glucose
look for cause

Established (30- 60 min)

iv phenobarbitone/ phenytoin/ fosphenytoin/ valproate

ICU

Refractory (> 60 min)

GA - iv midazolam/ propofol / thiopentone
paralysis/ ventilation

Refractory epilepsy

- seizures so frequent or severe that they limit or interfere with day to day life despite drug therapy

OR

- medication effective, but intolerable side effects

Exclude common causes of poor control

- poor compliance
- life style factors
  sleep deprivation, stress, illness,
  alcohol abuse / withdrawal, visual stimuli
- treatment factors
  wrong drug / dose / frequency
  drug interactions
- progressive brain disorder
- pseudoseizures

Treating refractory epilepsy

- Surgery for epilepsy
  - Resection

    identify focal origin → remove culprit lesion
  - Functional surgery

    modify brain activity - minimise seizure spread - eg. corpus callosotomy
- Vagal nerve stimulation

Counselling patient and family

	for withdrawal	against withdraw.
age of onset	childhood	adult
seizure type	GTCS, absence	partial, JME,
duration of epilepsy	short	long
seizures before	few	many
control with	monotherapy	polytherapy
seizure free period	long	short
neuro. examination	normal	abnormal
EEG	normal	abnormal
structural lesion	absent	present

Epilepsy and pregnancy - effects on mother

- satisfactory outcome in > 90%
- slight ↑ in seizure frequency - largely non compliance
- slight ↑ in assisted deliveries, caesarian sections
- slight ↑ in pregnancy related complications - pre eclampsia, APH, preterm labour

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