EEG WORKSHOP

Nonepileptiform Abnormalities

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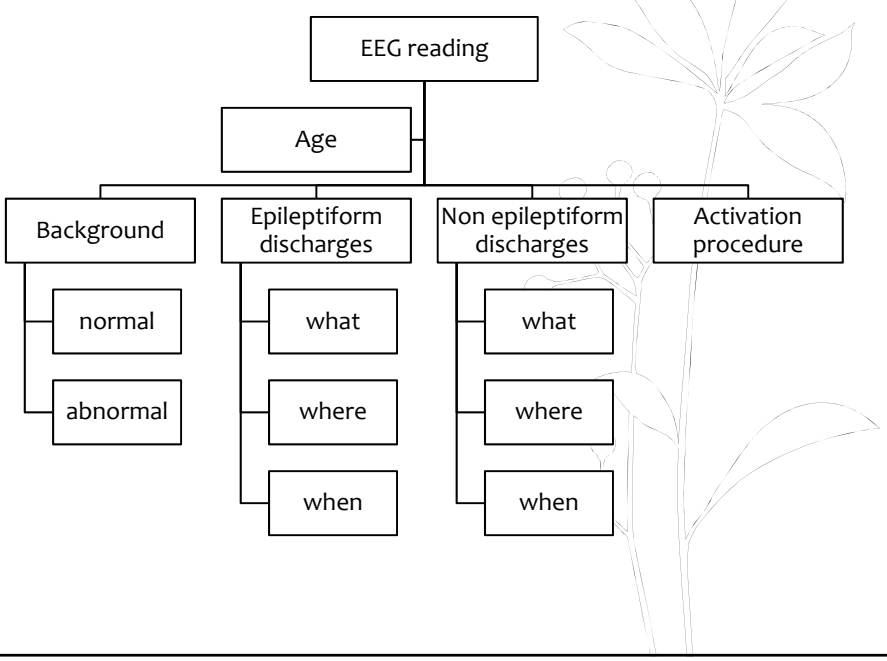
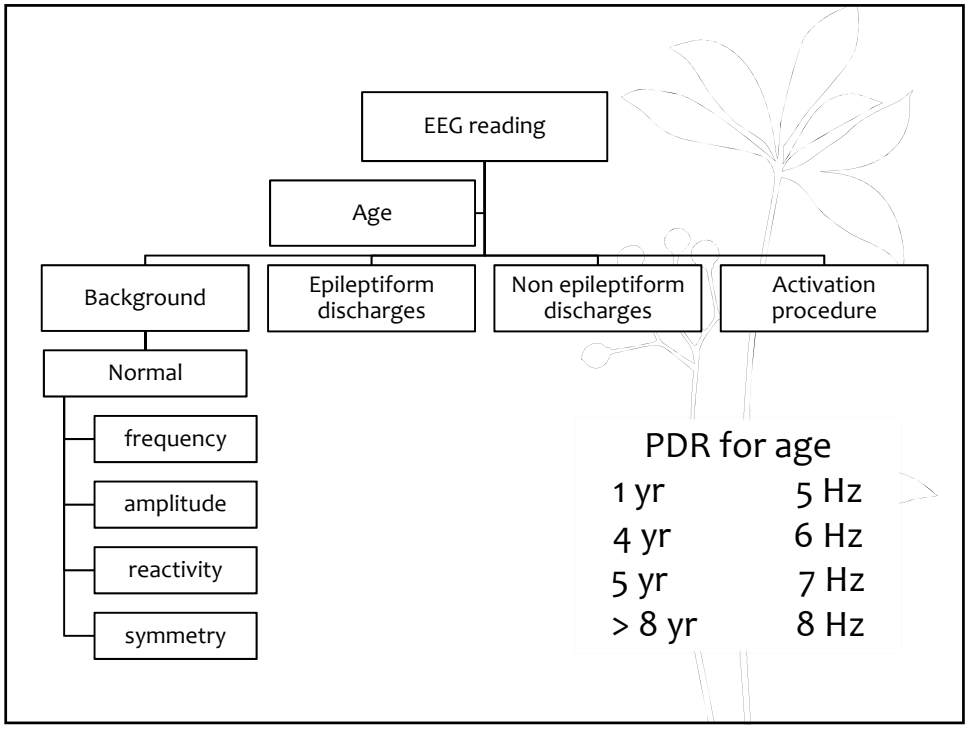
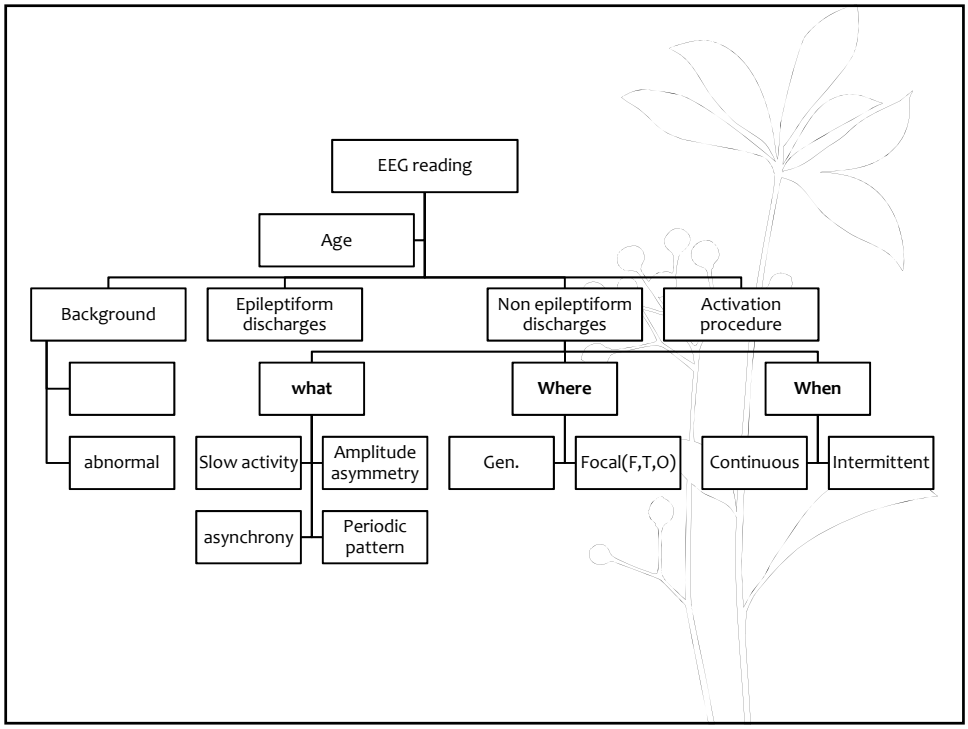
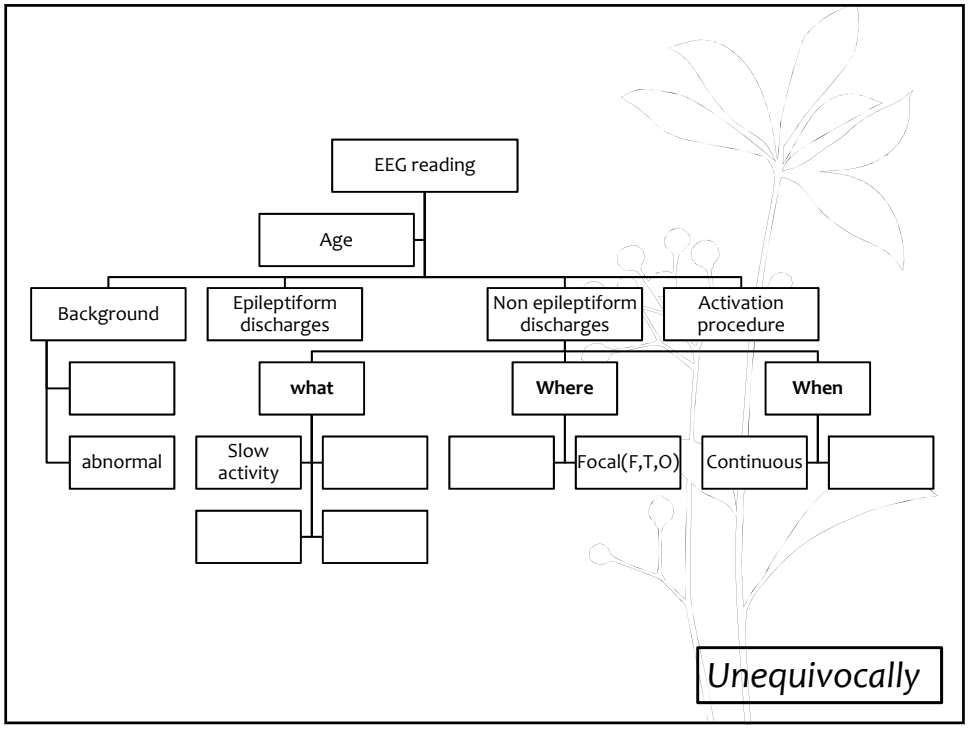
EST: 20th July 2010




EEG reading
Age
Background
Epileptiform discharges
Non epileptiform discharges
Activation procedure
Normal
frequency
amplitude
reactivity
symmetry
PDR for age
1 yr 5 Hz
4 yr 6 Hz
5 yr 7 Hz
> 8 yr 8 Hz

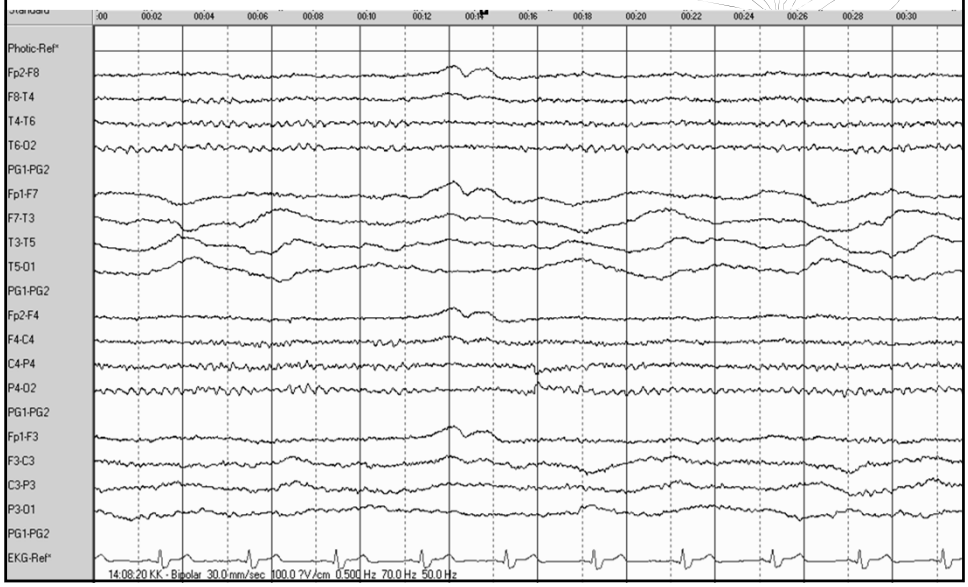

EEG reading
Age
Background
Epileptiform discharges
Non epileptiform discharges
Activation procedure
what
Where
When
abnormal
Slow activity
Amplitude asymmetry
asynchrony
Periodic pattern
Gen.
Focal(F,T,O)
Continuous
Intermittent

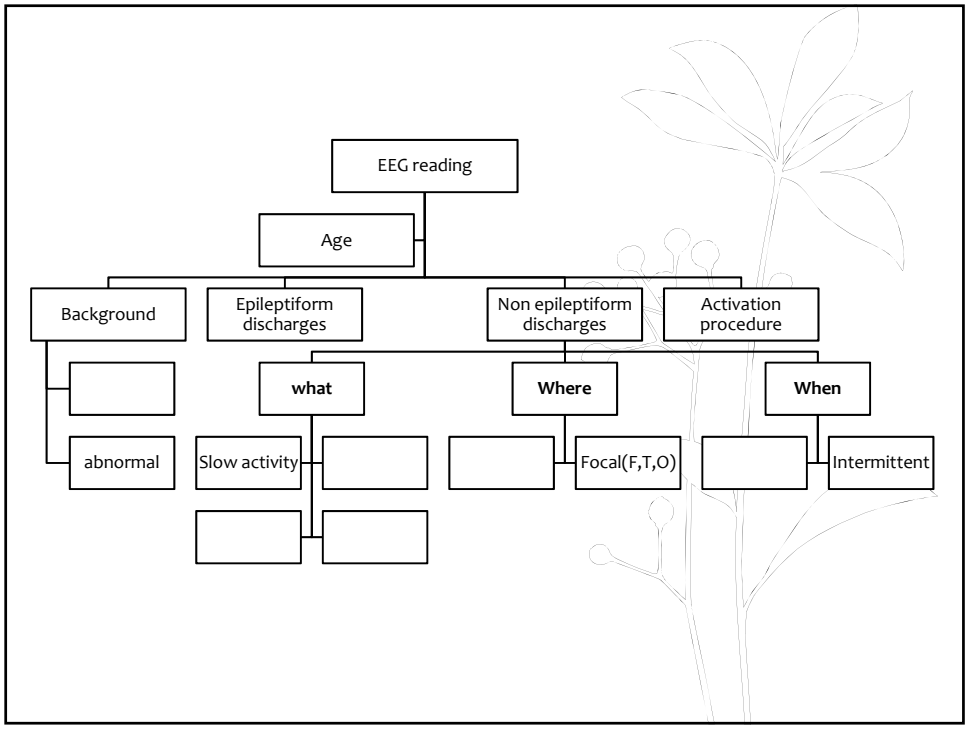


Slow activity

- Most common EEG manifestation of <u>focal brain dysfunction</u>
- More reliable when it is : continuous
  : unreactive
  : high amplitude
  : polymorphic
  : unilateral

Continuous F-T delta slowing





IRDA: Intermittent rhythmic delta activity

- Varied form
  - : non-specific
  - : metabolic
  - : structural
  - : infectious
  - : epilepsy / epileptiform pattern

Epilepsia 48(2), 2007

IRDA

Adult	Children
• FIRDA	• FIRDA (unclear sig)
• TIRDA	• TIRDA
• OIRDA (less common)	• OIRDA

Epilepsia 48(2), 2007

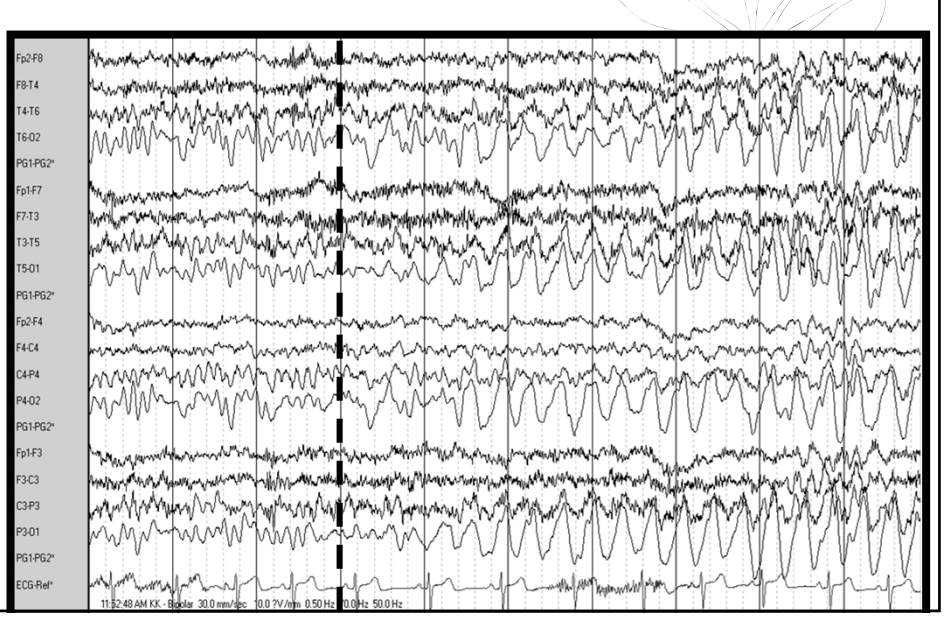
OIRDA

- Occurs almost exclusively in children
- Associated with 1° generalized syndrome (childhood absence epilepsy)
- Occasionally seen in encephalopathic children (Salmonella infectⁿ, SSPE)

OIRDA

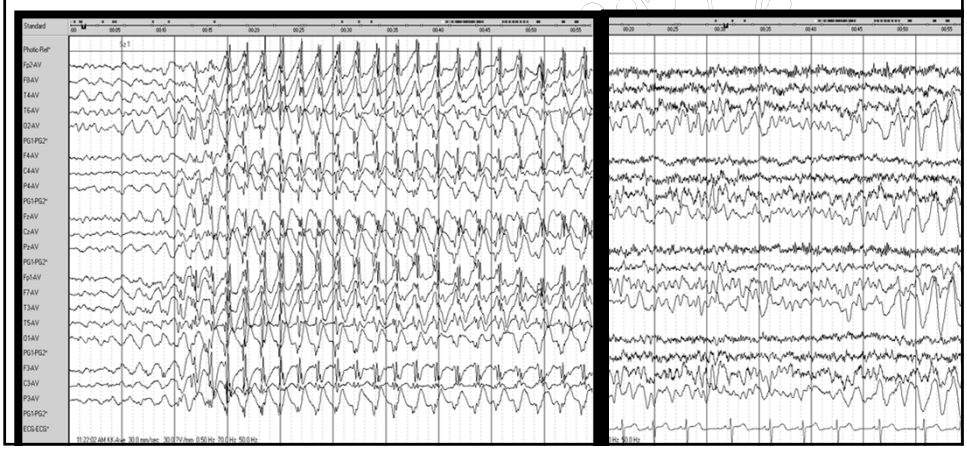
- Typical absence > atypical absence
- OIRDA in absence sz : 3-4 Hz
- OIRDA in localization-related sz : 2-3 Hz
- Most OIRDA < 5 sec
- When : awake and asleep recording

OIRDA

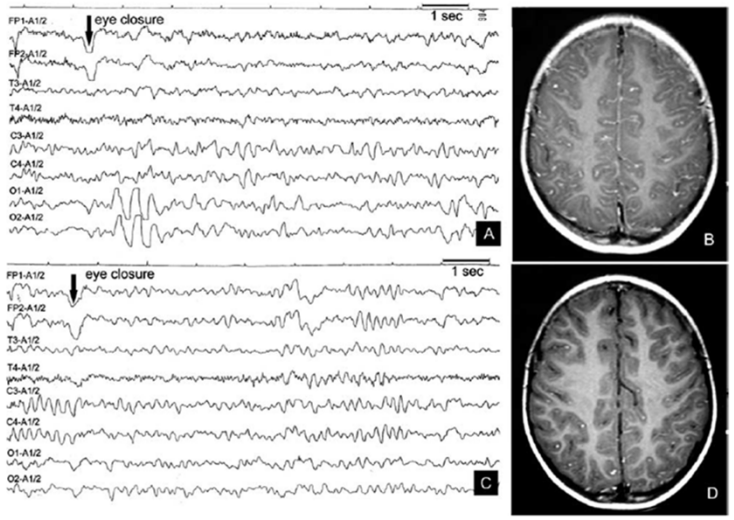


OIRDA

Absence sz : 3 Hz spike/wave and OIRDA



OIRDA in atypical CNS Samonellosis



Clinical Neurophysiology 2005

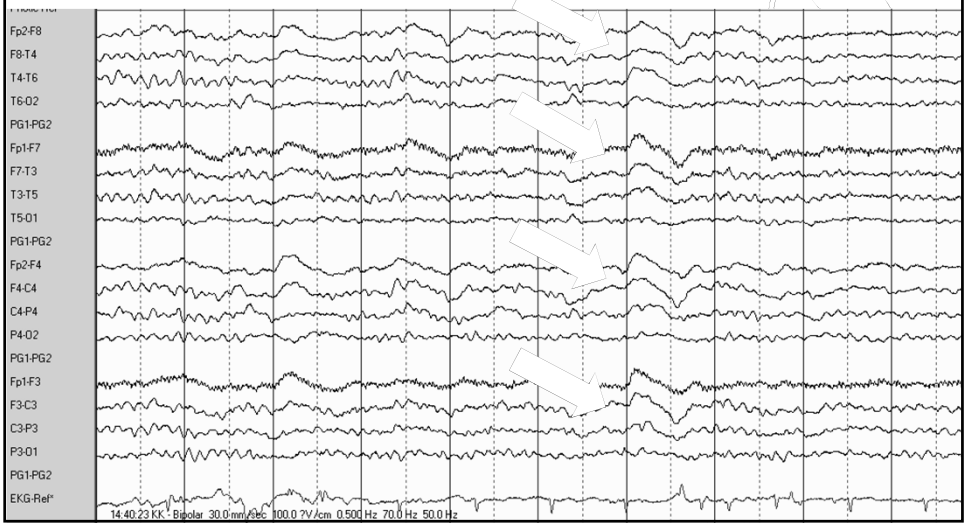
FIRDA

- 1.5-4 Hz, Mostly in waking adult EEG
- Previously = deep midline structure, post^{r} fossa tumor, pituitary tumor, subcortical lesion, HC, cerebral edema, IICP
- Currently = ischemic brain injury, hemispheric brain tumor with mild to mod metabolic impairment, postictal

FIRDA

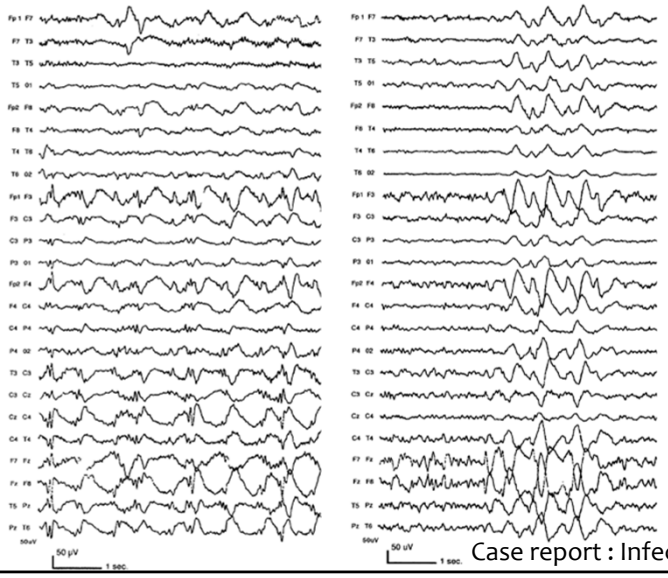
- FIRDA + normal b/g → structural lesion
- FIRDA + abnormal b/g → encephalopathy

FIRDA (+ normal b/g)



FIRDA(+ abn b/g)

1st EEG

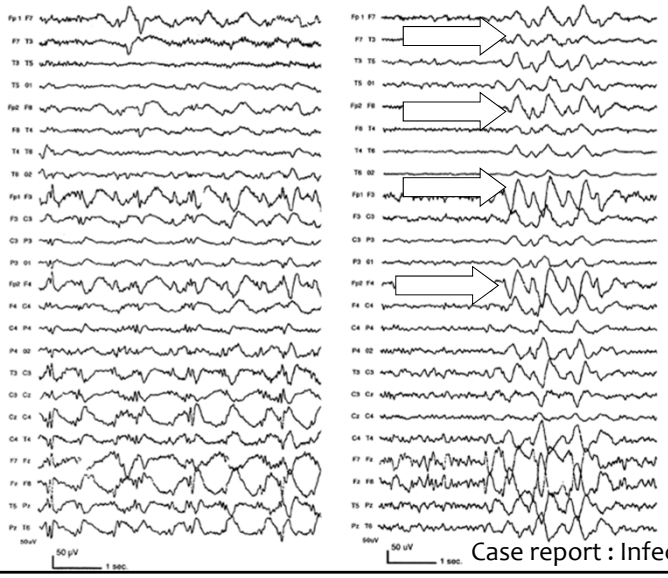


2nd EEG

Case report : Infectious 2001

FIRDA(+ abn b/g) in Salmonella encephalopathy in adult

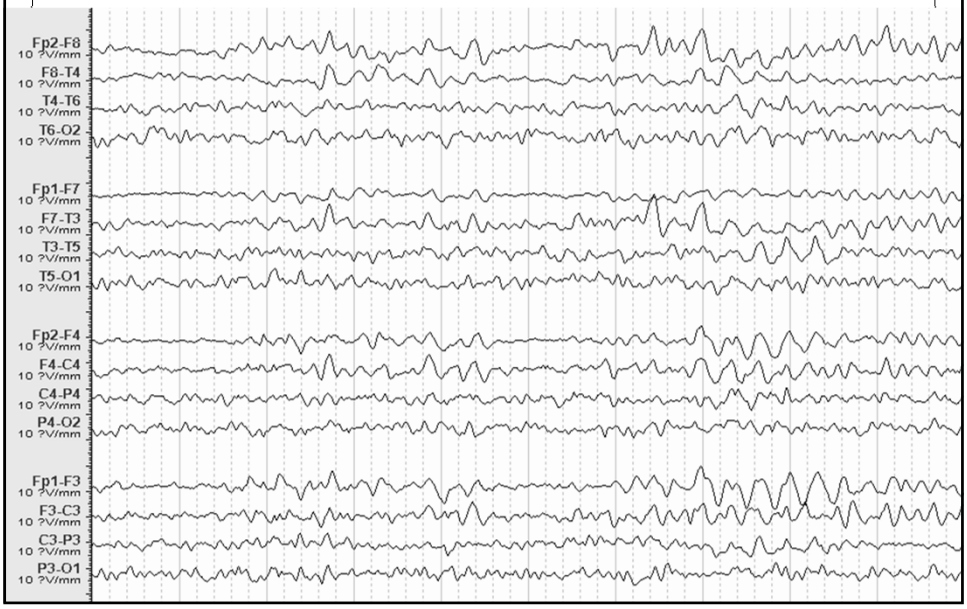
1st EEG



2nd EEG

Case report : Infectious 2001

FIRDA + abnormal b/g



TIRDA

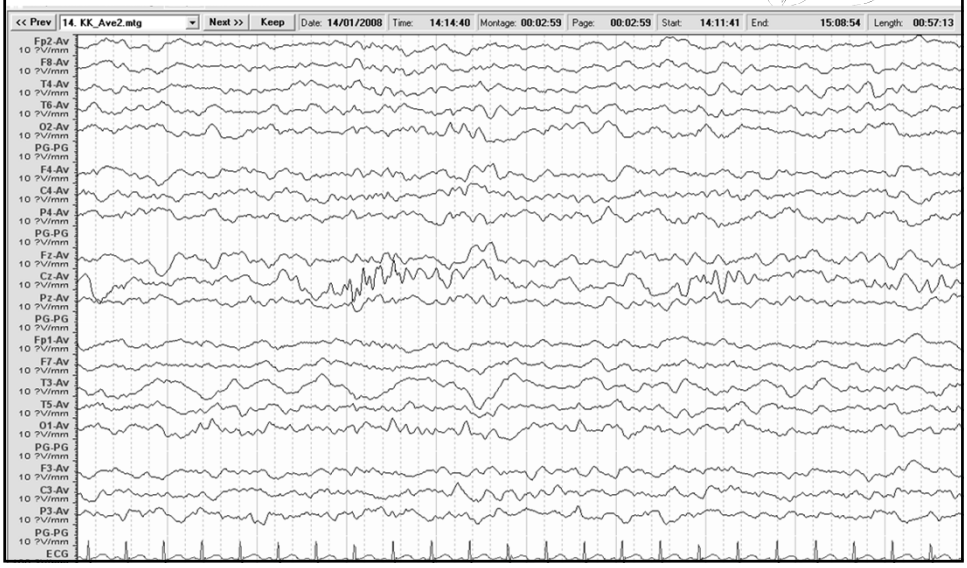
- TIRDA = Temporal intermittent rhythmic delta activity
- TIPDA = Temporal intermittent polymorphic delta activity
- TIRDA → suggests temporal epileptogenesis

Facts

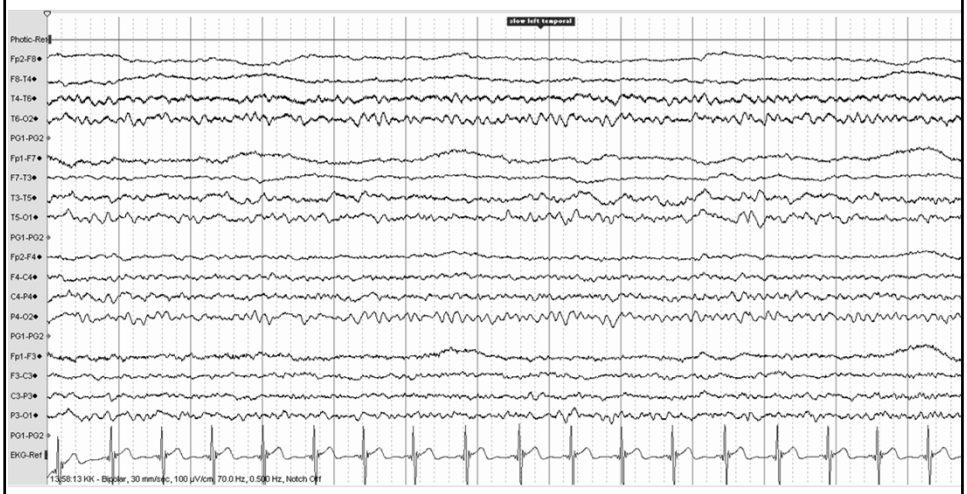
Temporal lobe epilepsy

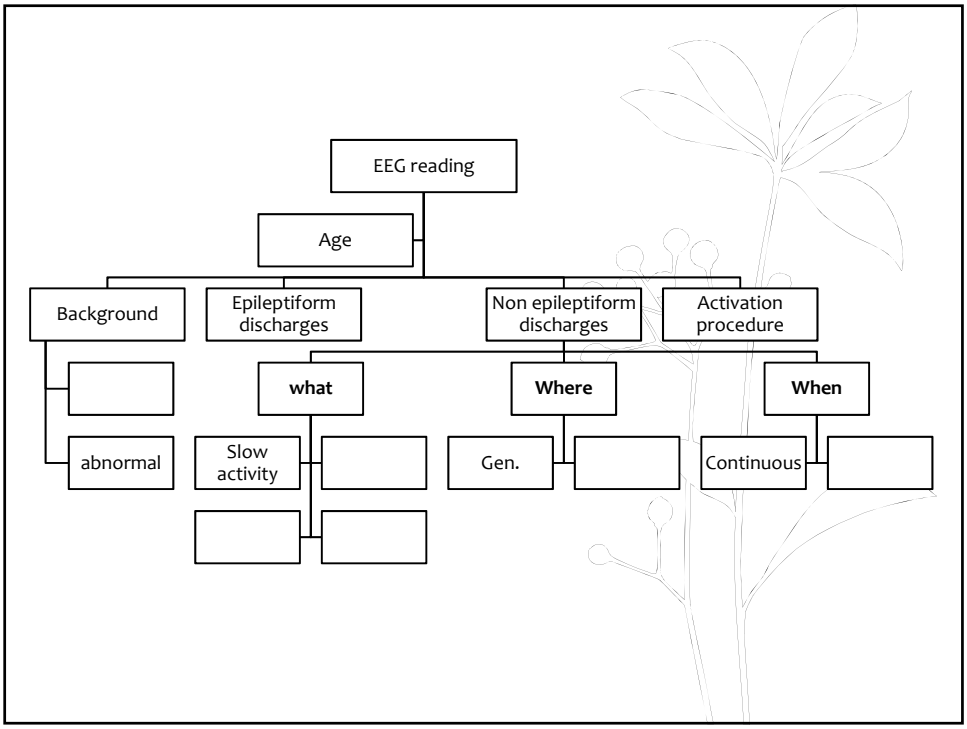
- normal awake and asleep EEG
- HV or PS → may or may not induces abnormalities
- sleep deprivation → may induces epileptiform discharges
- TIRDA + epileptiform d/c → temporal lobe epilepsy

TIRDA

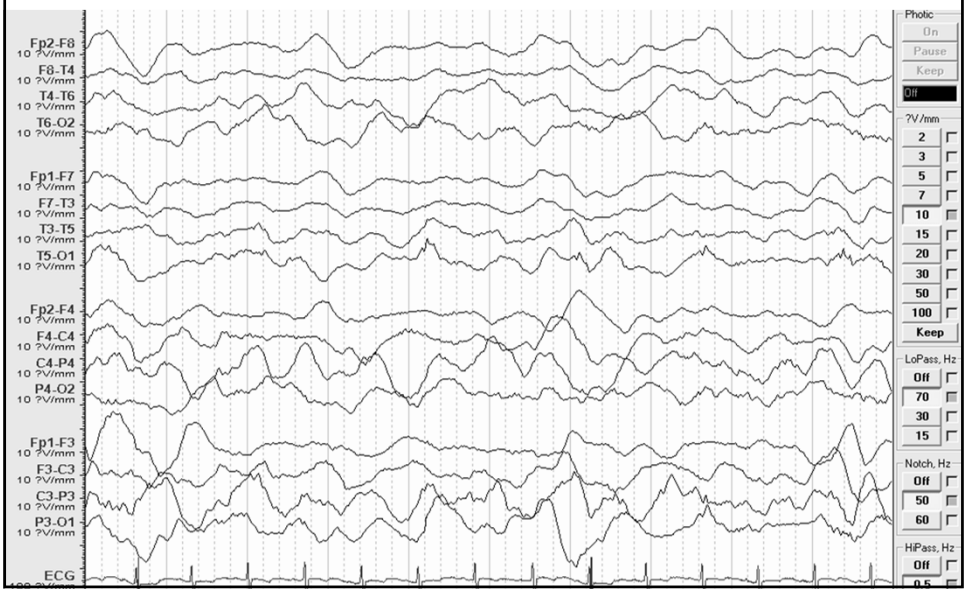


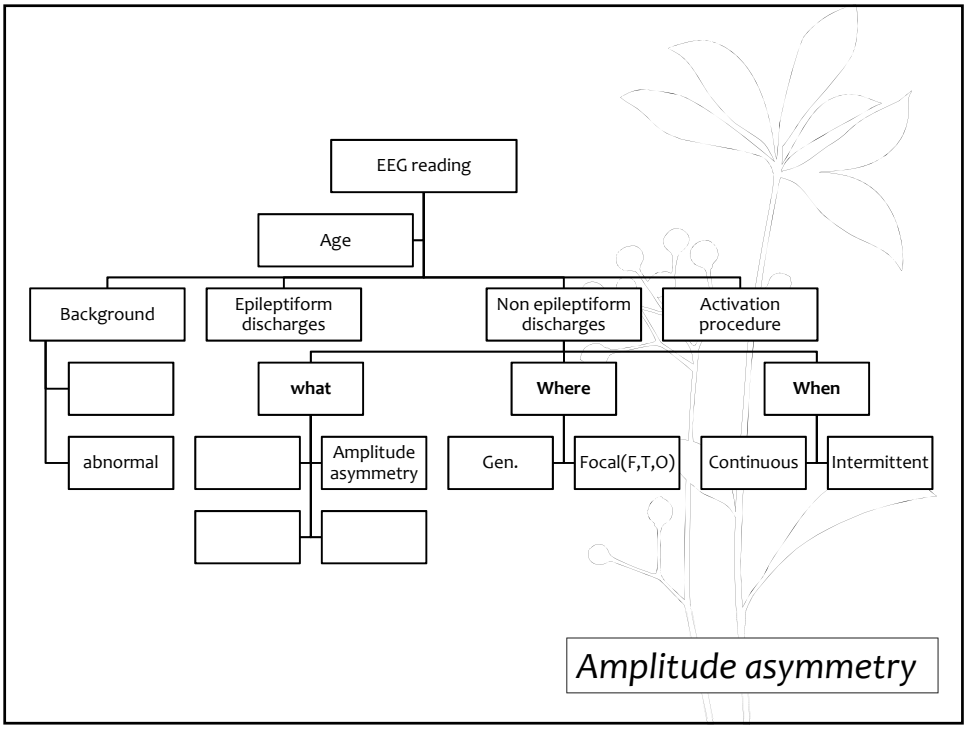
TIRDA


slow left temporal
Photic-Ref
Fp2-F8
F8-T4
T4-T6
T6-O2
PG1-PG2
Fp1-F7
F7-T3
T3-T5
T5-O1
PG1-PG2
Fp2-F4
F4-C4
C4-P4
P4-O2
PG1-PG2
Fp1-F3
F3-C3
C3-P3
P3-O1
PG1-PG2
EKG-Ref


EEG reading
Age
Background
Epileptiform discharges
Non epileptiform discharges
Activation procedure
what
Where
When
abnormal
Slow activity
Gen.
Continuous

Continuous generalized delta slowing



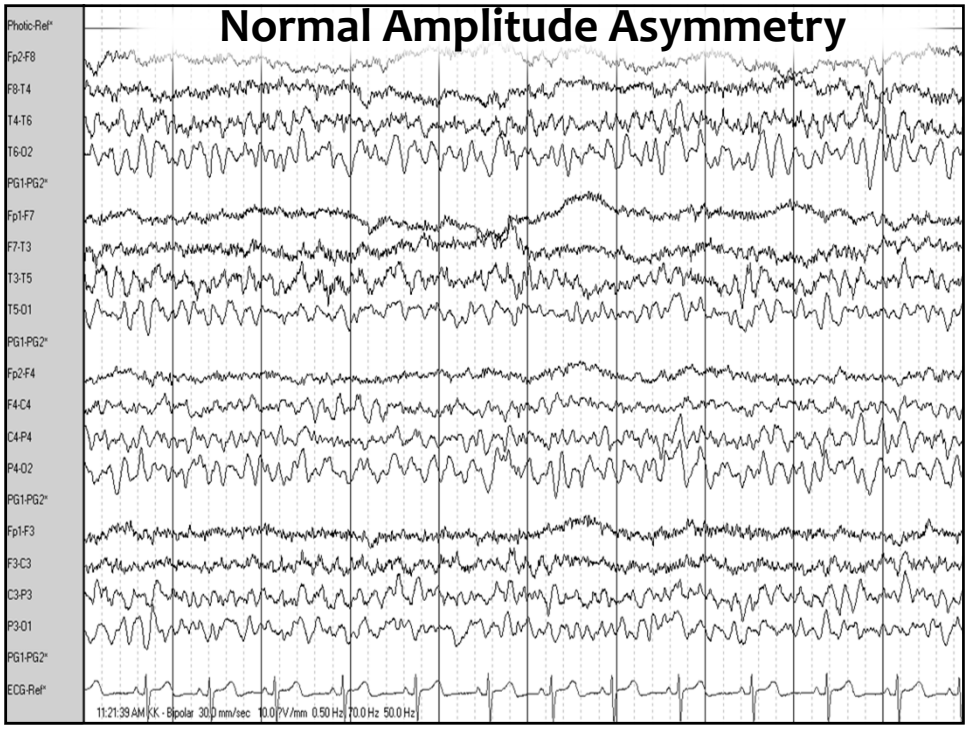


Amplitude asymmetry

1. May occur as normal finding: isolated finding e.g. alpha in R-H higher than L-H

2. If amplitude on the Rt is higher than the left for 1 ½ times = significant asymmetry

3. If amplitude on the Lt is 25% higher than the Rt = significant asymmetry

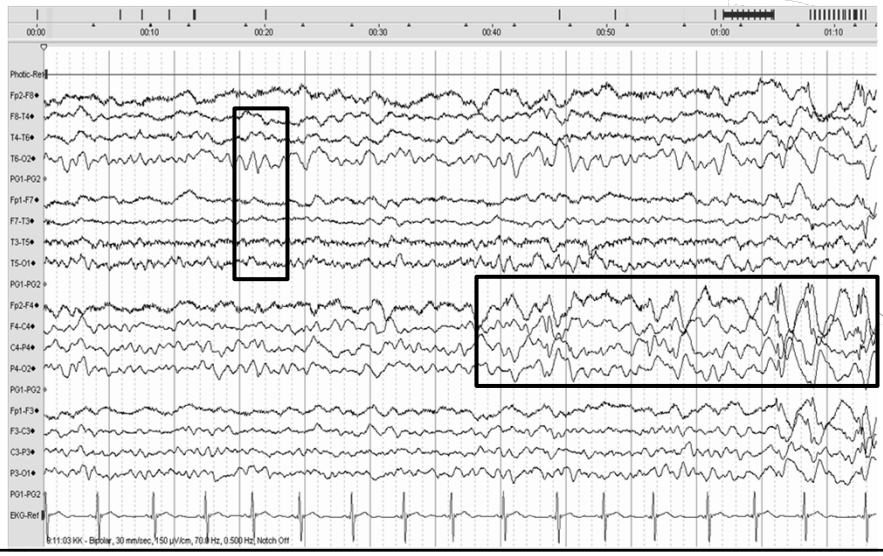


Differences in amplitude

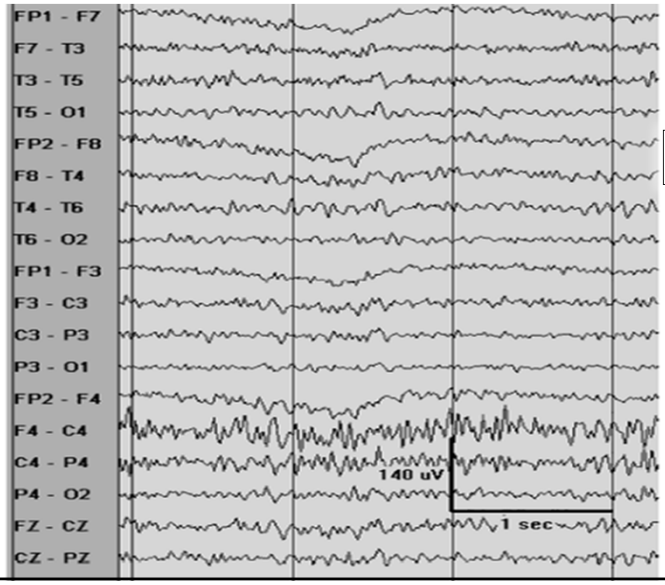
- Increased amplitude can be seen in *ipsilateral lesions* (plus epileptiform discharges)

- Diminished amplitude
  1. excess fluid between the cortex and electrodes
  2. abnormalities of cortical gray matter
  3. congenital lesions: SWS, porencephalic cyst
  4. transient b/g attenuation = postictal

Increased amplitude + epileptiform d/c = ipsilateral lesion



Increased amplitude from the skull defect
Excessive fast activity



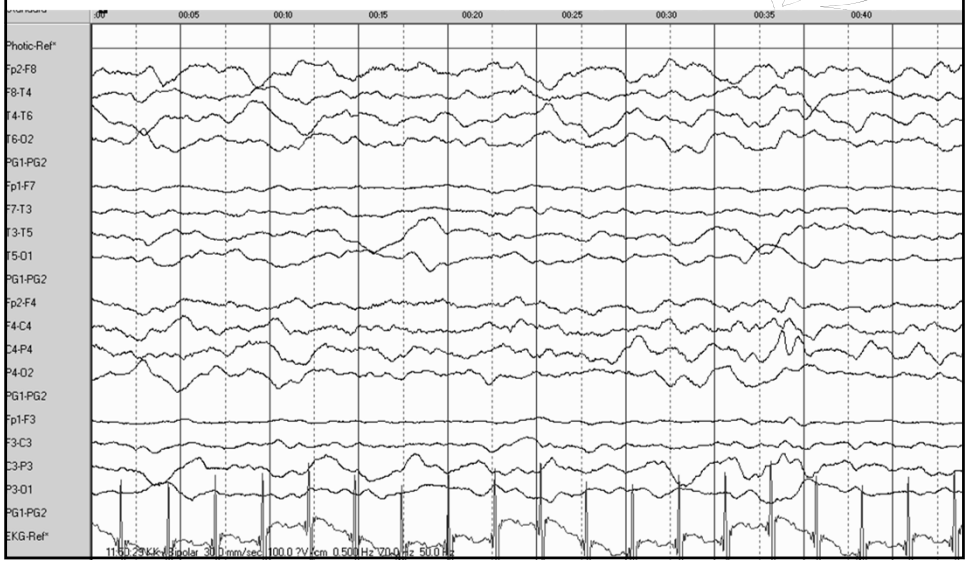
Breach rhythm

Diminished amplitude

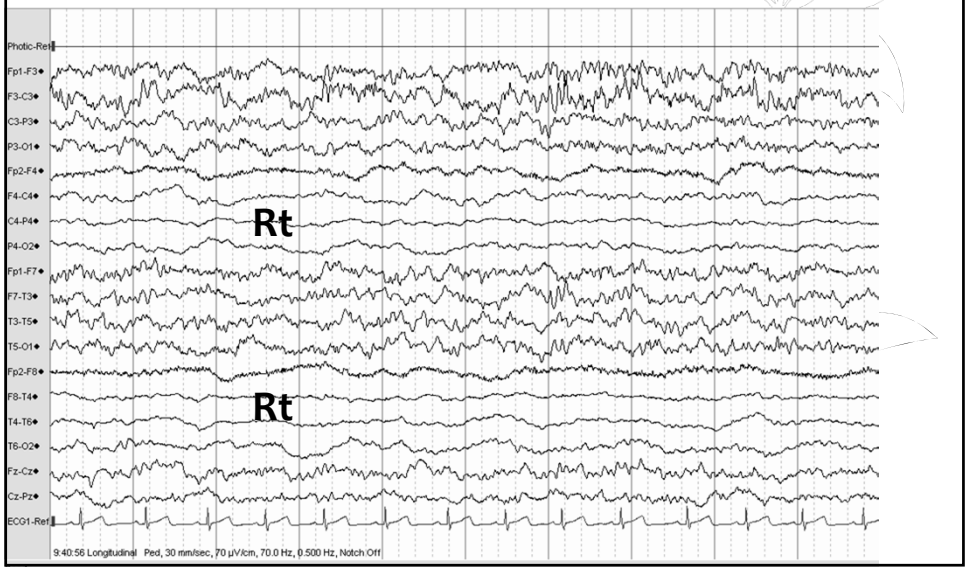
<u>Diminished</u> amplitude

1. excess fluid between the cortex and electrodes
2. abnormalities of cortical gray matter
3. congenital lesions: SWS, porencephalic cyst
4. transient b/g attenuation = postictal

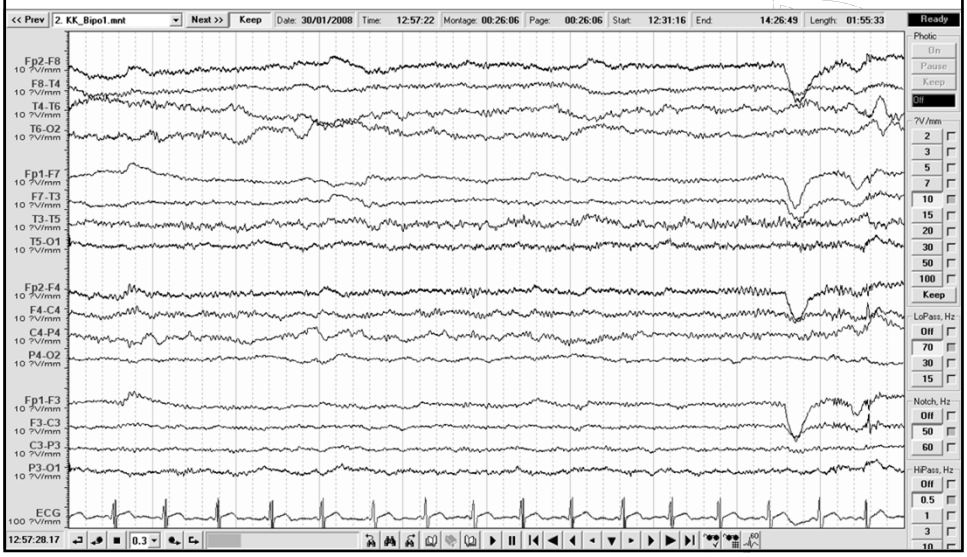
1. excess fluid between the cortex and electrode



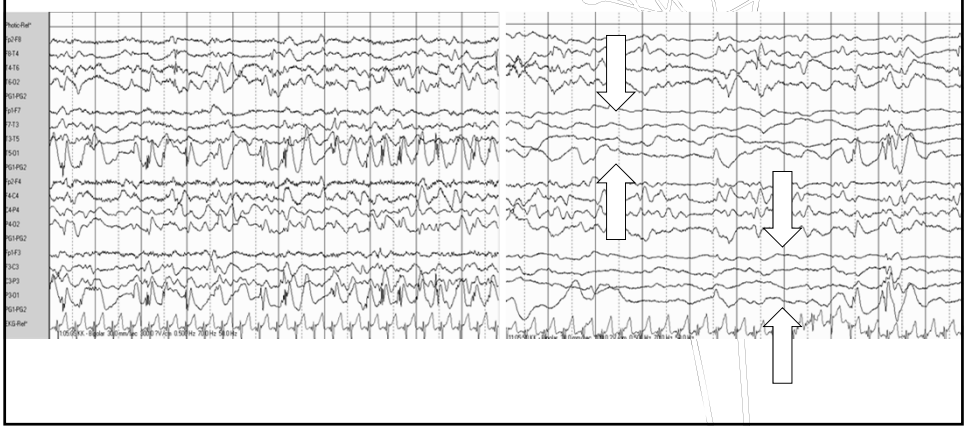
2. Abnormalities of cortical gray matter



3. Congenital lesion + fluid collection

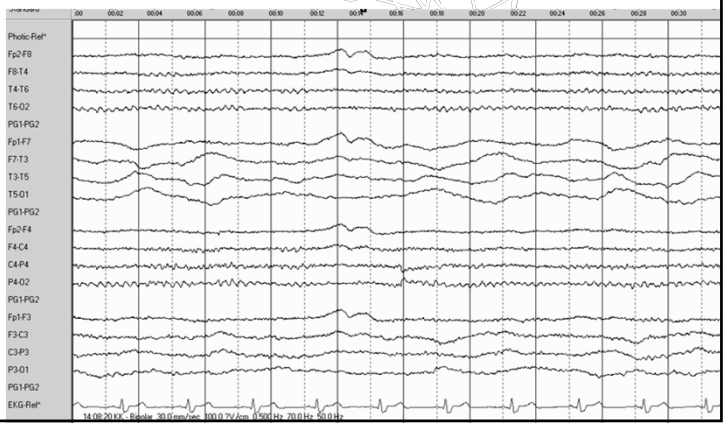


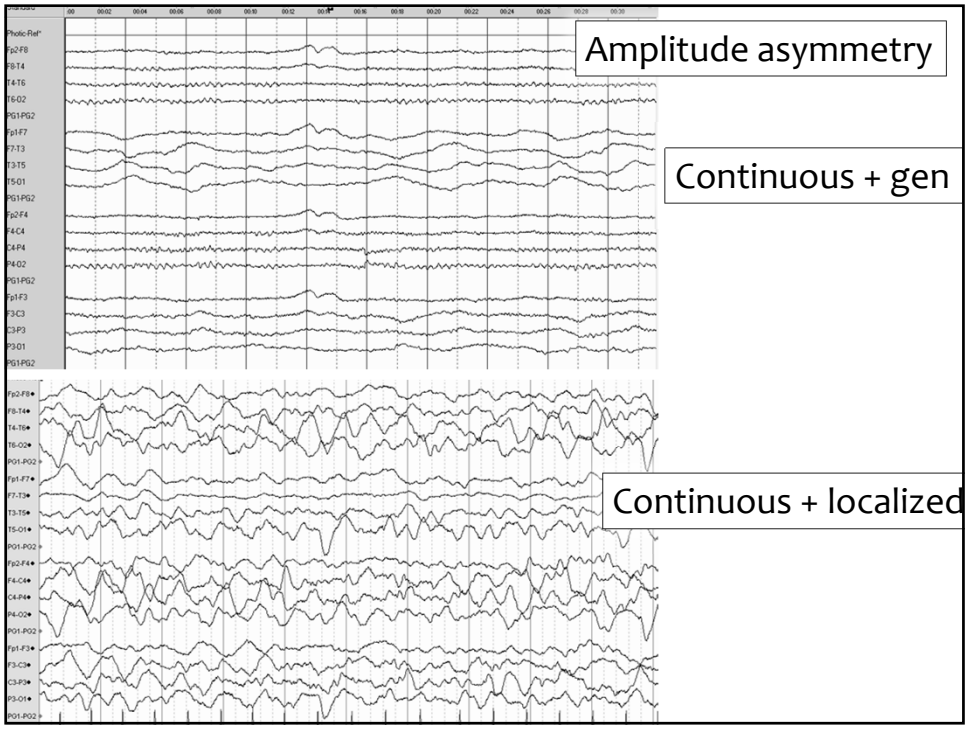
4. Transient b/g attenuation in postictal

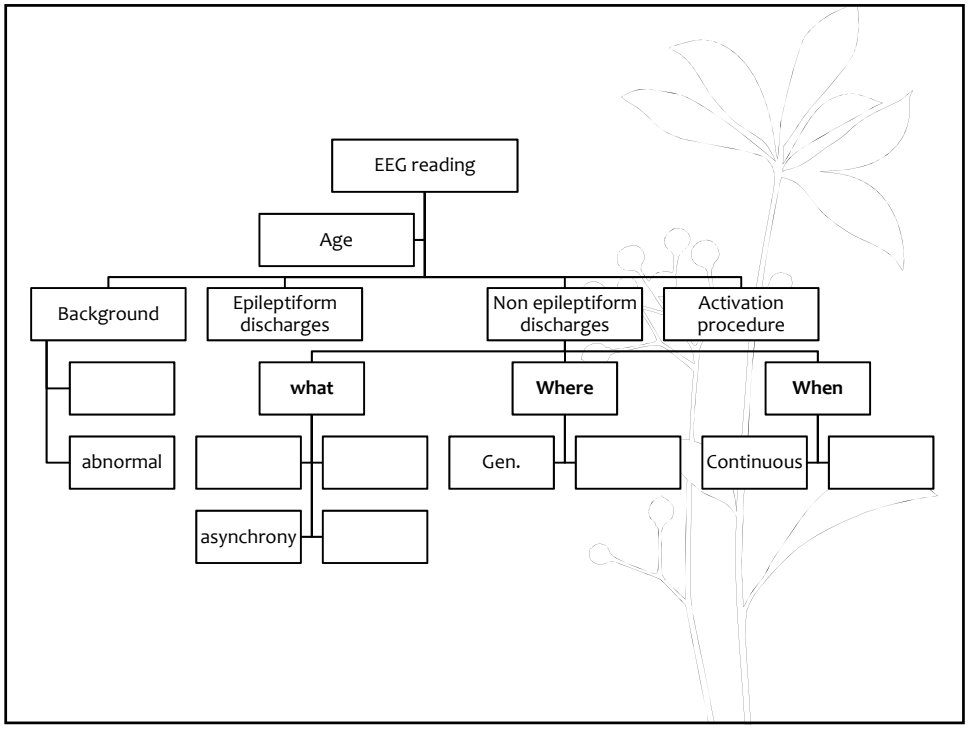


Slow activity and amplitude asymmetry

- abnormalities of gray matter c white matter involvement e.g. ischemic stroke
- diminished amplitude b/g + polymorphic delta activity






EEG reading
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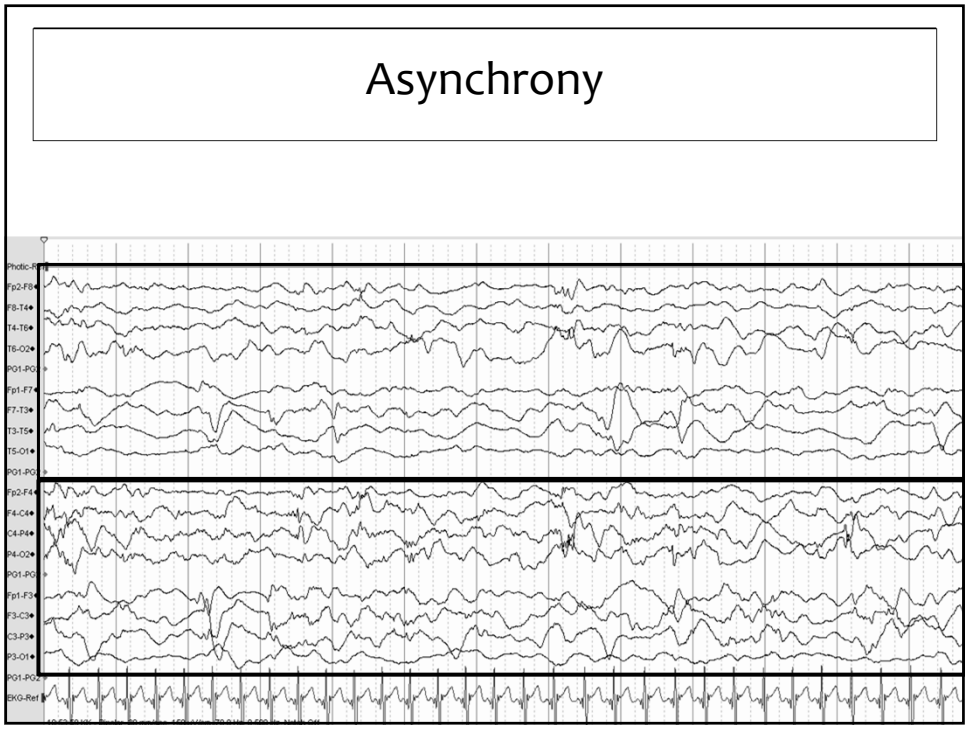
asynchrony


Asynchrony