

Subhairline EEG Part III – Seizures and Spikes

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Objectives

- To discuss lateralised periodic discharges
- To review generalised periodic discharges
- To show examples of focal and generalised seizures

Subhairline EEG

- Young et al 2009
 - Continuous subhairline EEG monitoring detects 70% of non-convulsive seizures when compared to formal EEG
 - But, 98% specificity when seizures are seen
- The lower sensitivity for seizures is because only the anterior frontal and temporal lobes are covered by the subhairline electrodes

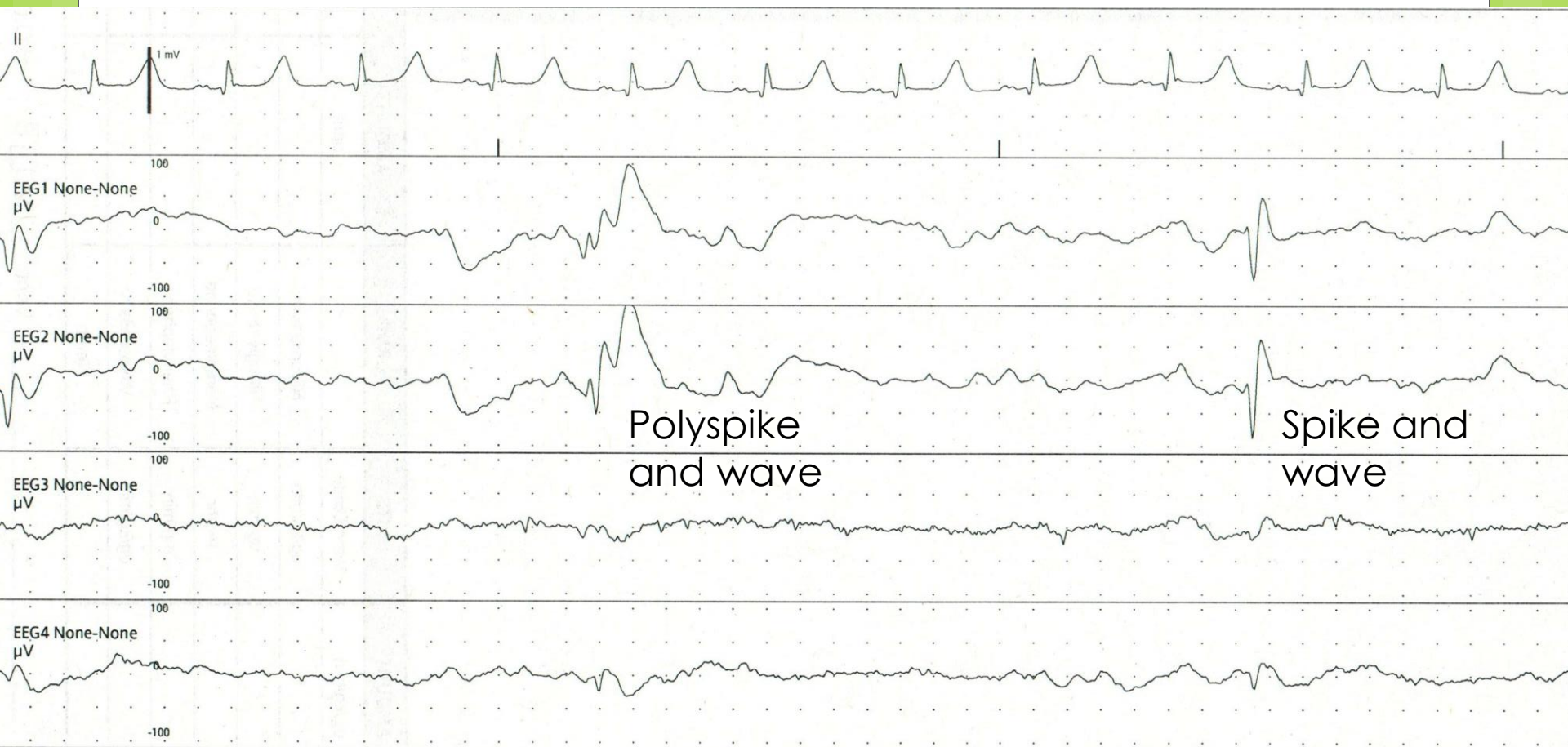
Epileptiform Abnormalities

- Generally include:
 - Spikes
 - Seizures
- These may be focal, multifocal, lateralised or generalised

Spikes

- Brief, sharply contoured discharges
- aftercoming slow wave
- May be focal, multifocal or generalised

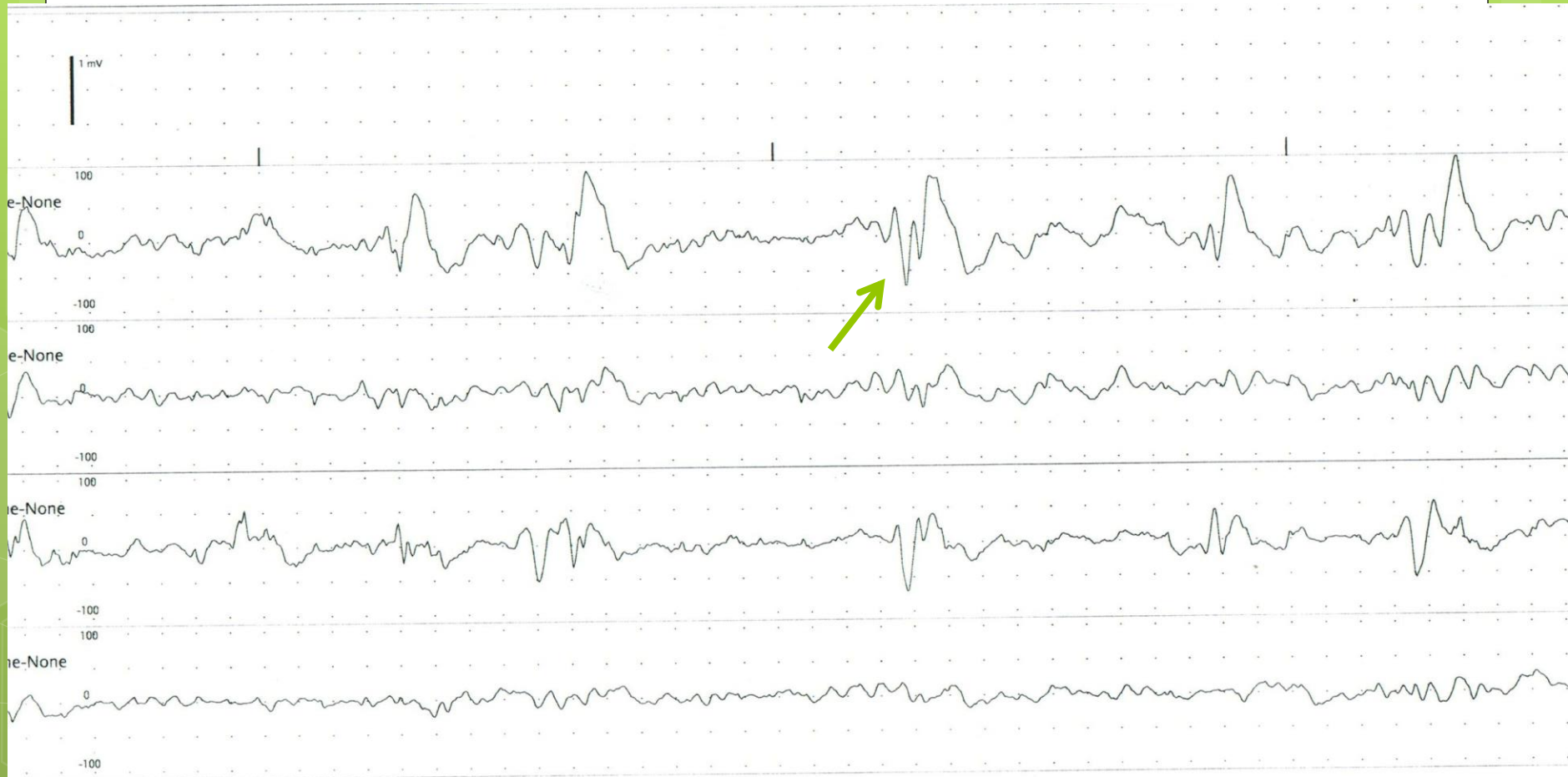
Spikes



Bifrontal Spikes



Left Polyspikes



Lateralised Periodic Discharges (LPDs)

- Also known as periodic lateralised epileptiform discharges (PLEDs)
- Occur unilaterally
- Occur periodically – with regular frequency
 - Usually from 0.5 – 3 Hz
- Stereotyped – look the same each time
- Morphology – sharp waves or sharp wave complexes

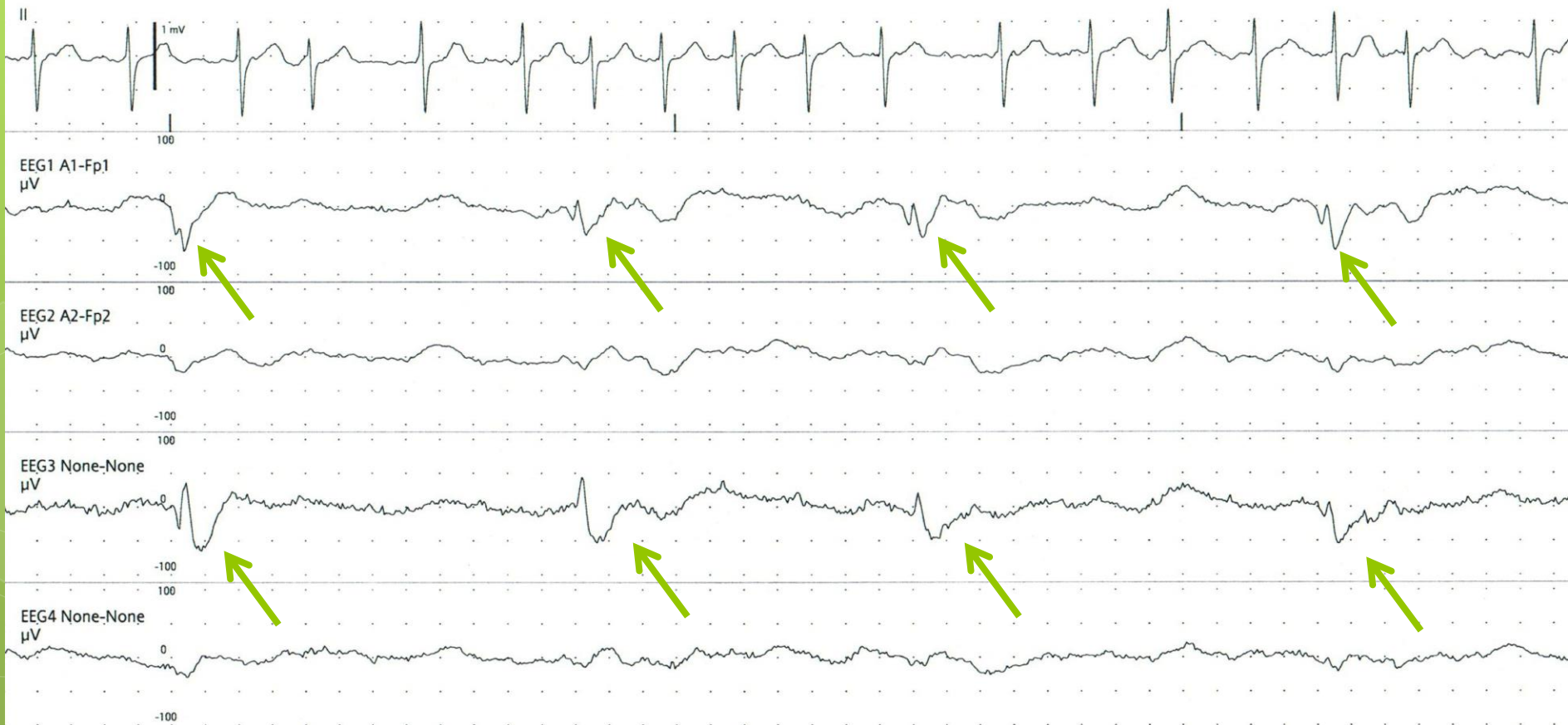
Lateralised Periodic Discharges (LPDs)

- Generally associated with an acute, focal, destructive neurological process
 - e.g. acute stroke (most common cause)
 - e.g. herpes simplex encephalitis
- Usually transient
 - Lasting hours to weeks
- Most patients with LPDs do not have a history of epilepsy

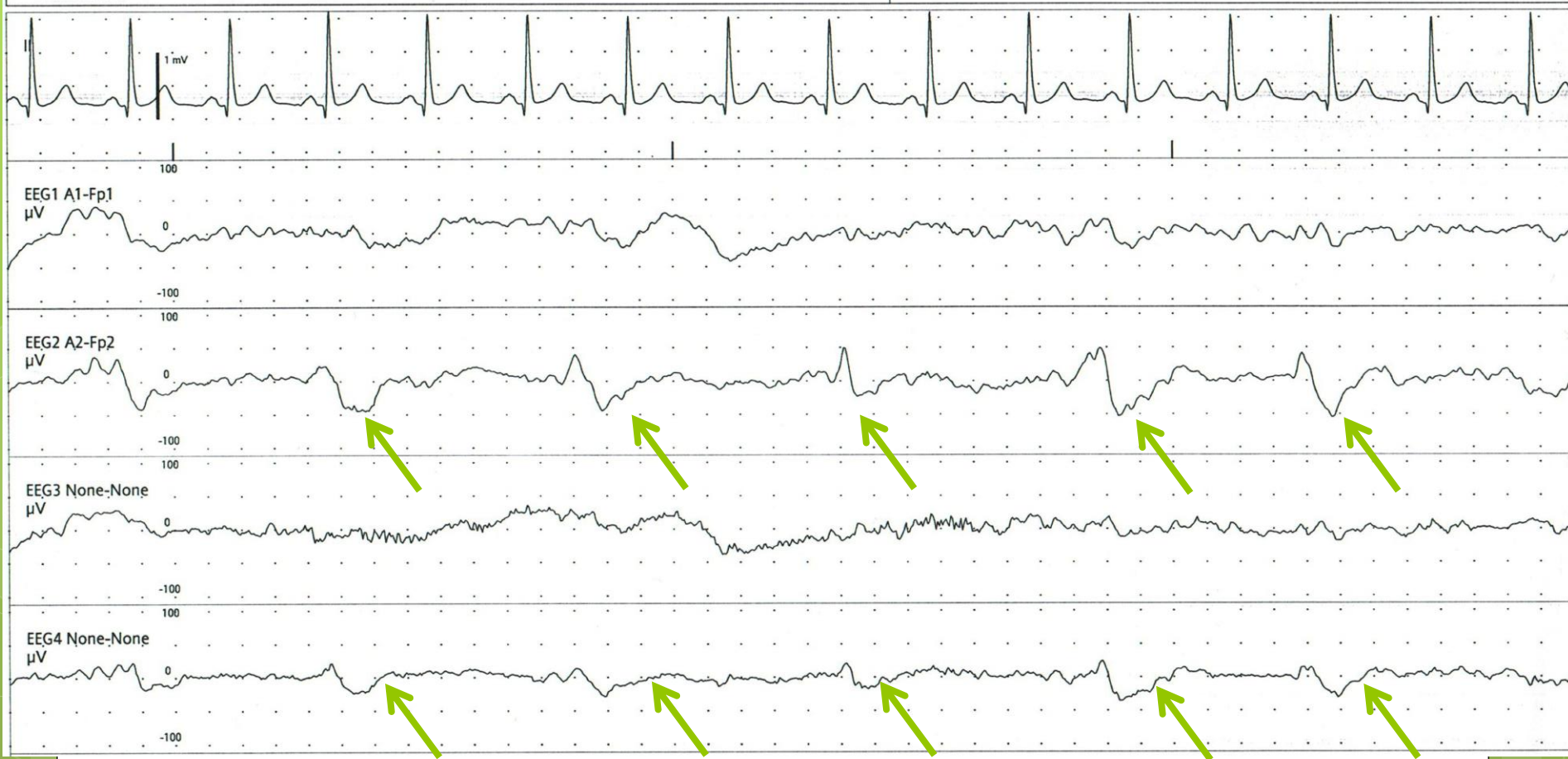
Lateralised Periodic Discharges (LPDs)

- LPDs can be confused with EKG artifact, especially if left sided
- Due to proximity to the heart, EKG artifact is most likely to be seen in channel 3 (left temporal)

Left LPDs



Right LPDs



LPDs and Seizures

- Many patients with LPDs also have seizures
 - Usually focal motor seizures

Bilateral LPDs (BiPLEDs)



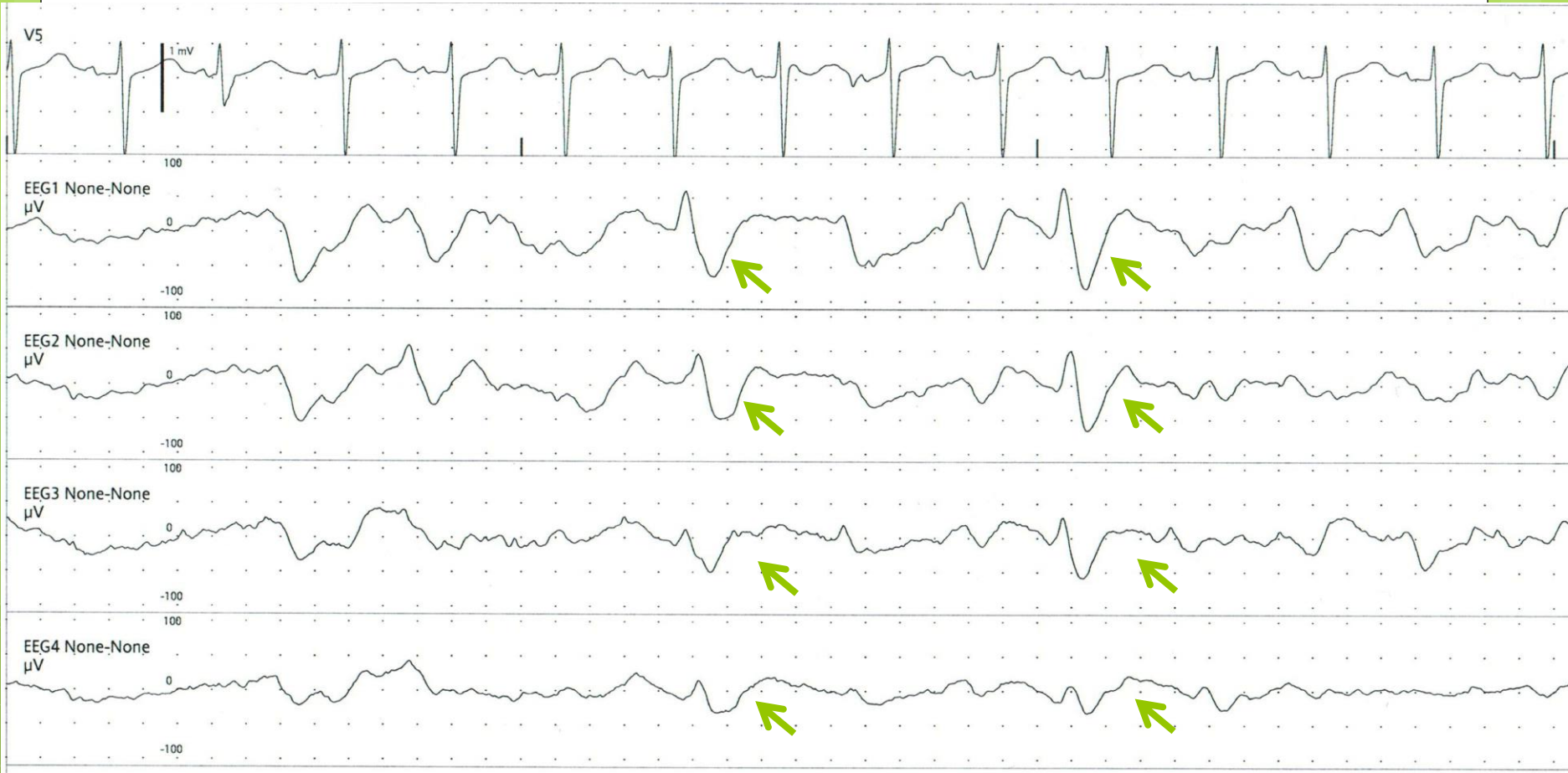
Generalised Periodic Discharges (GPDs)

- Most frequently seen in critical care setting
- Similar to LPDs, but seen throughout the brain
- Represent severe cerebral dysfunction
- May be a type of seizure, but it is uncertain if aggressive treatment alters outcome

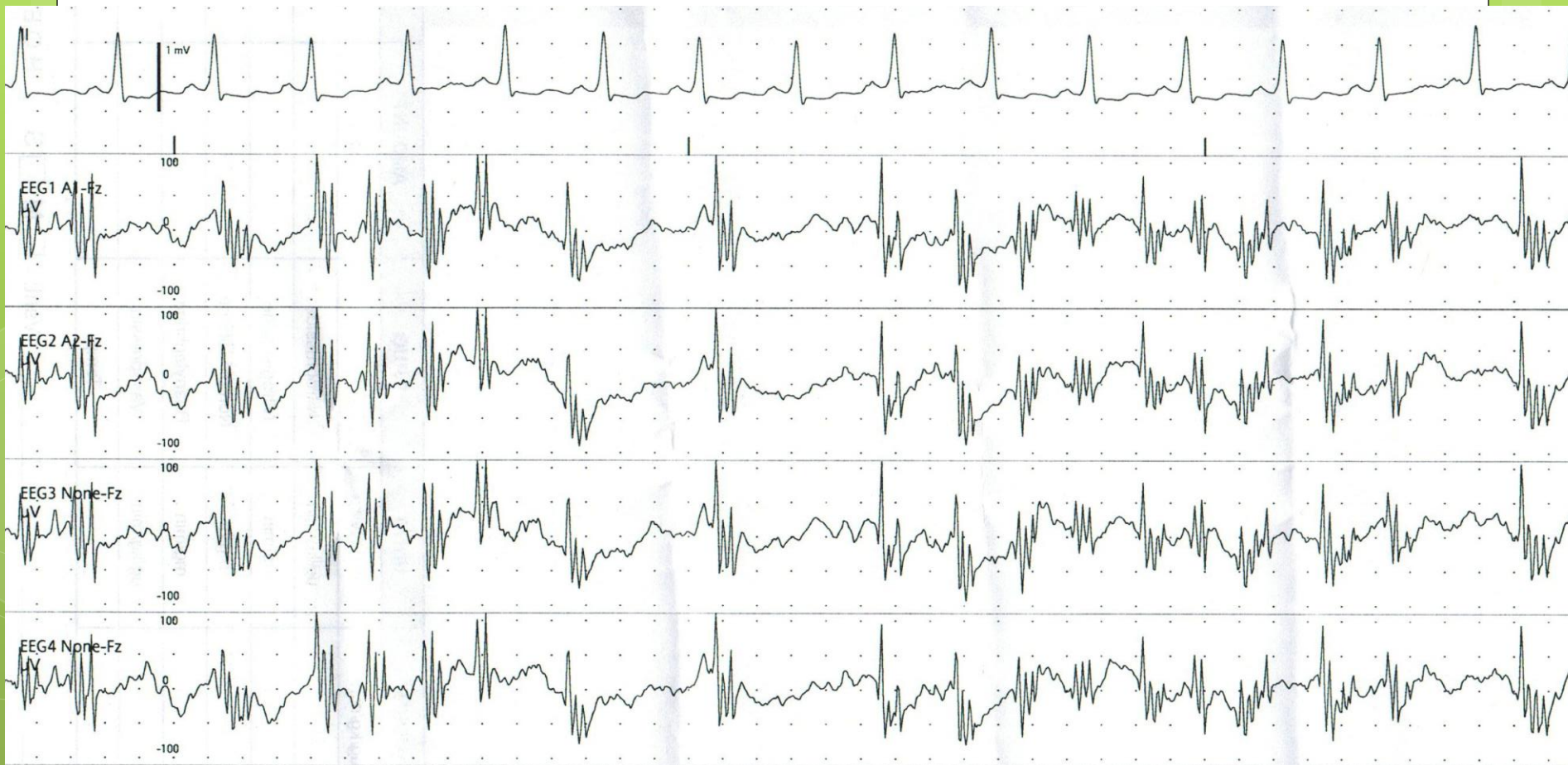
Generalised Periodic Discharges (GPDs)

- Often a result of
 - Hypoxic-ischemic encephalopathy
 - Neurodegenerative disease
 - Terminal stages of generalised status epilepticus
- High degree of mortality associated with GPDs

GPDs



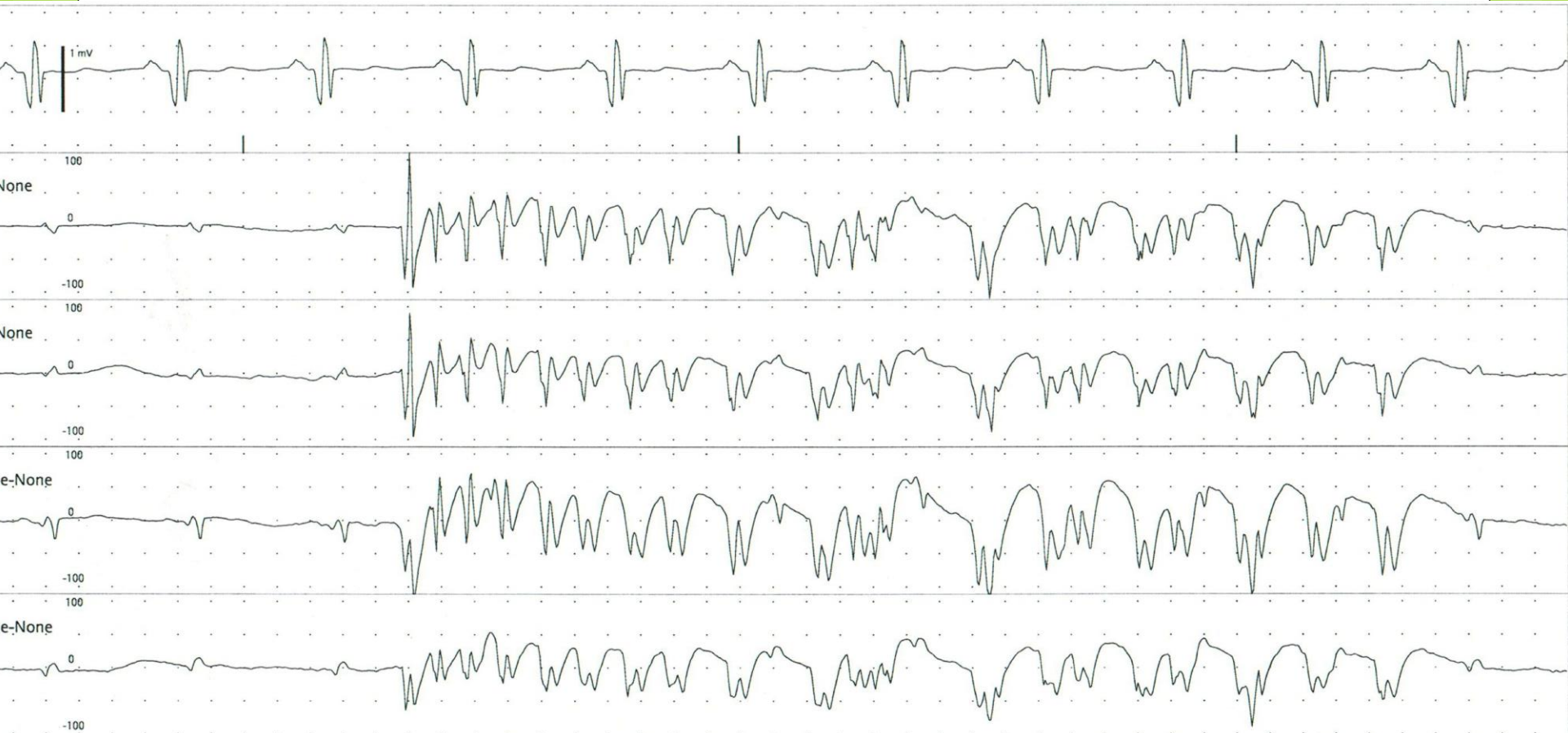
GPDs



Generalised Seizure

- Involves both hemispheres from the onset
- Evolution of frequency and voltage over time
- Postictal suppression or delta is common

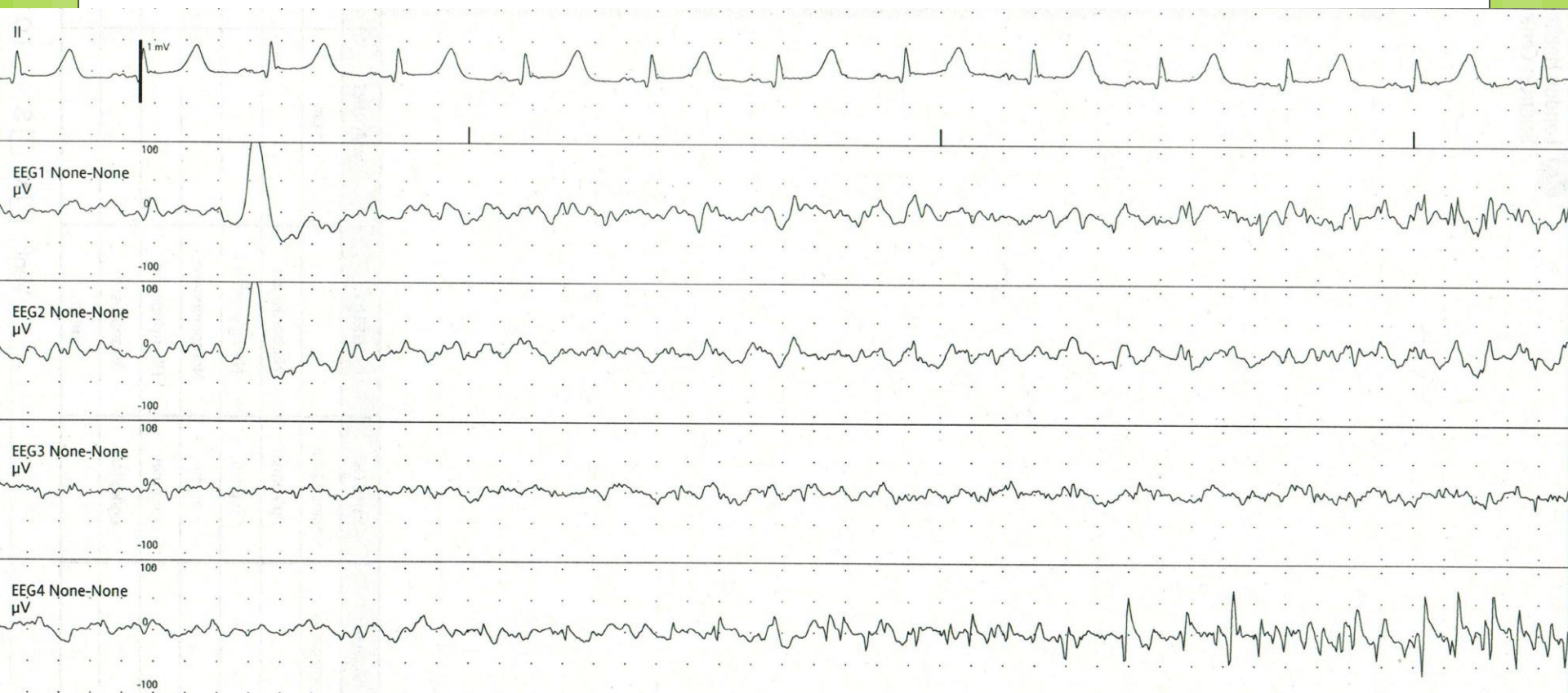
Larval Seizure (<10 sec)



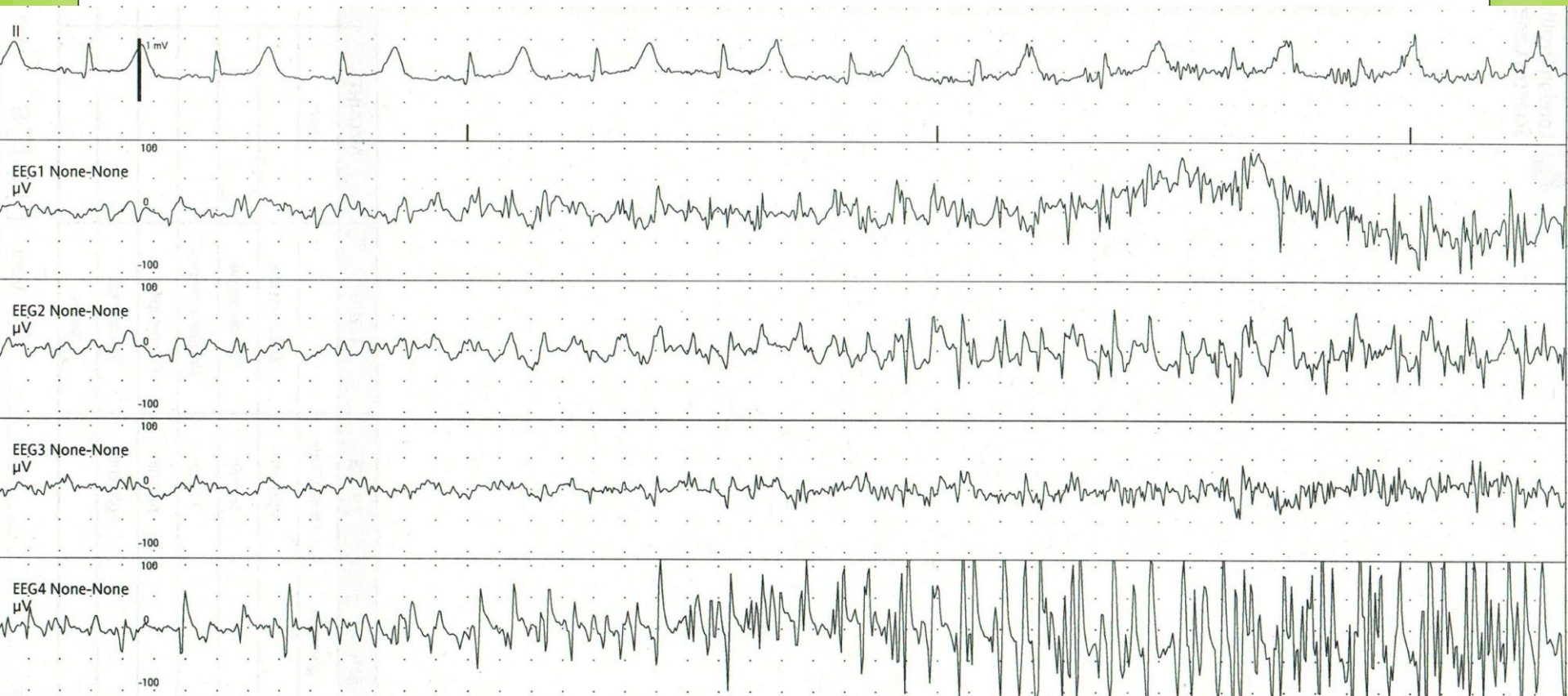
Generalised Convulsive Seizure



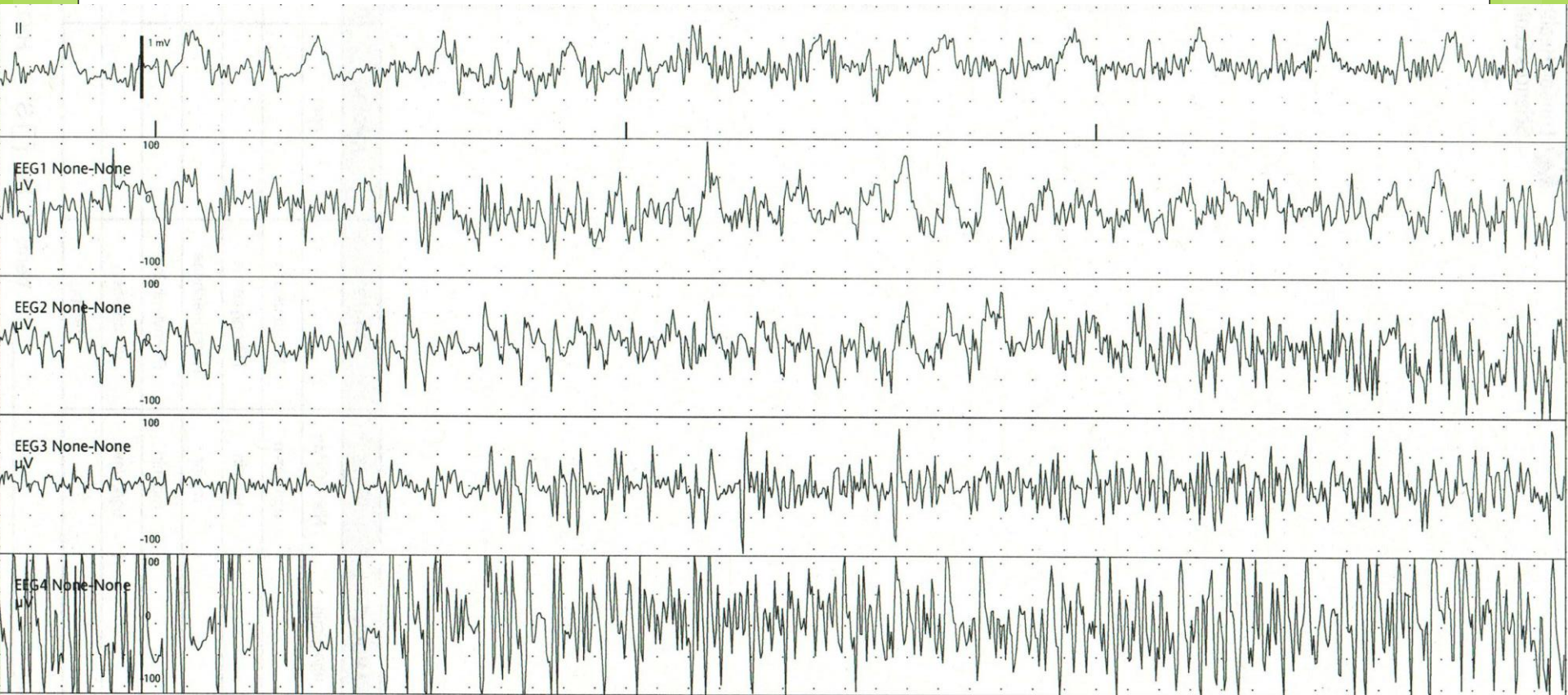
Generalised Convulsive Seizure



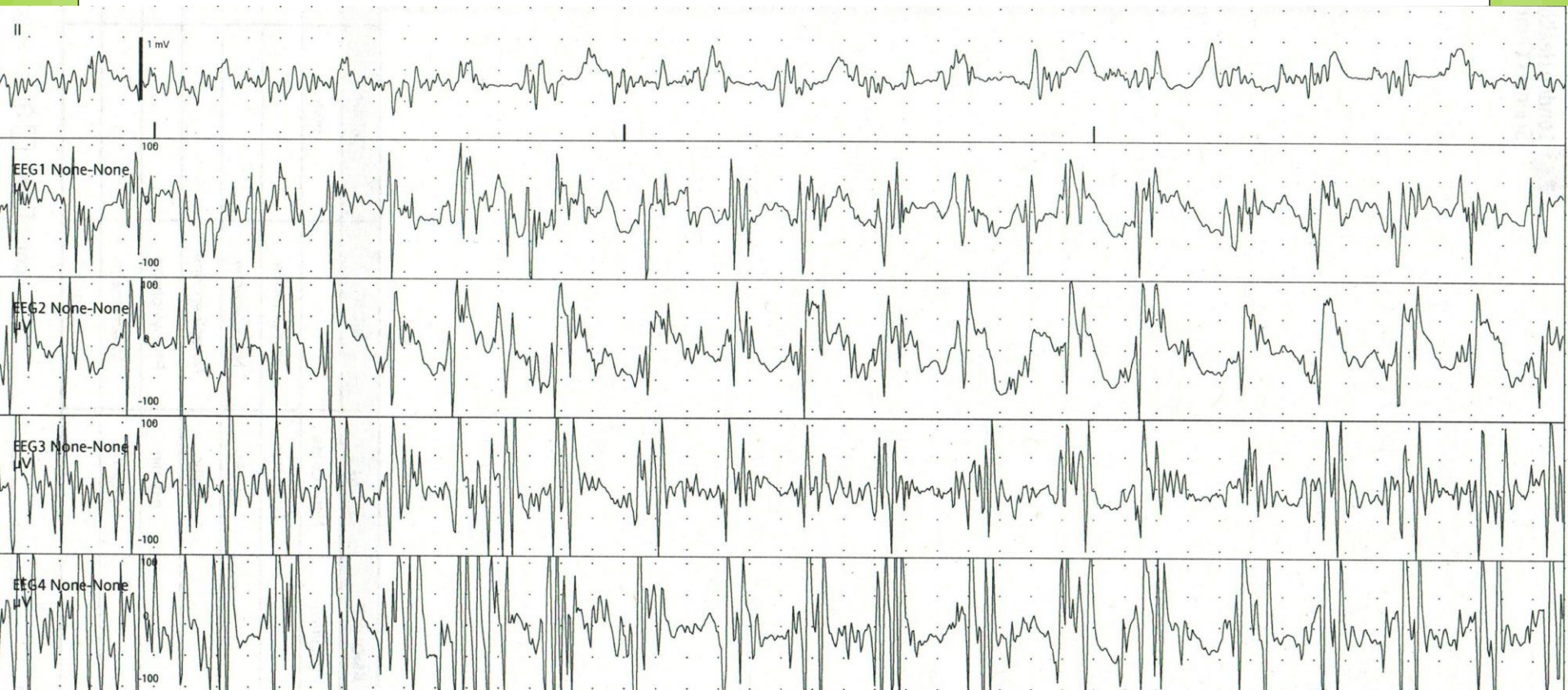
Generalised Convulsive Seizure



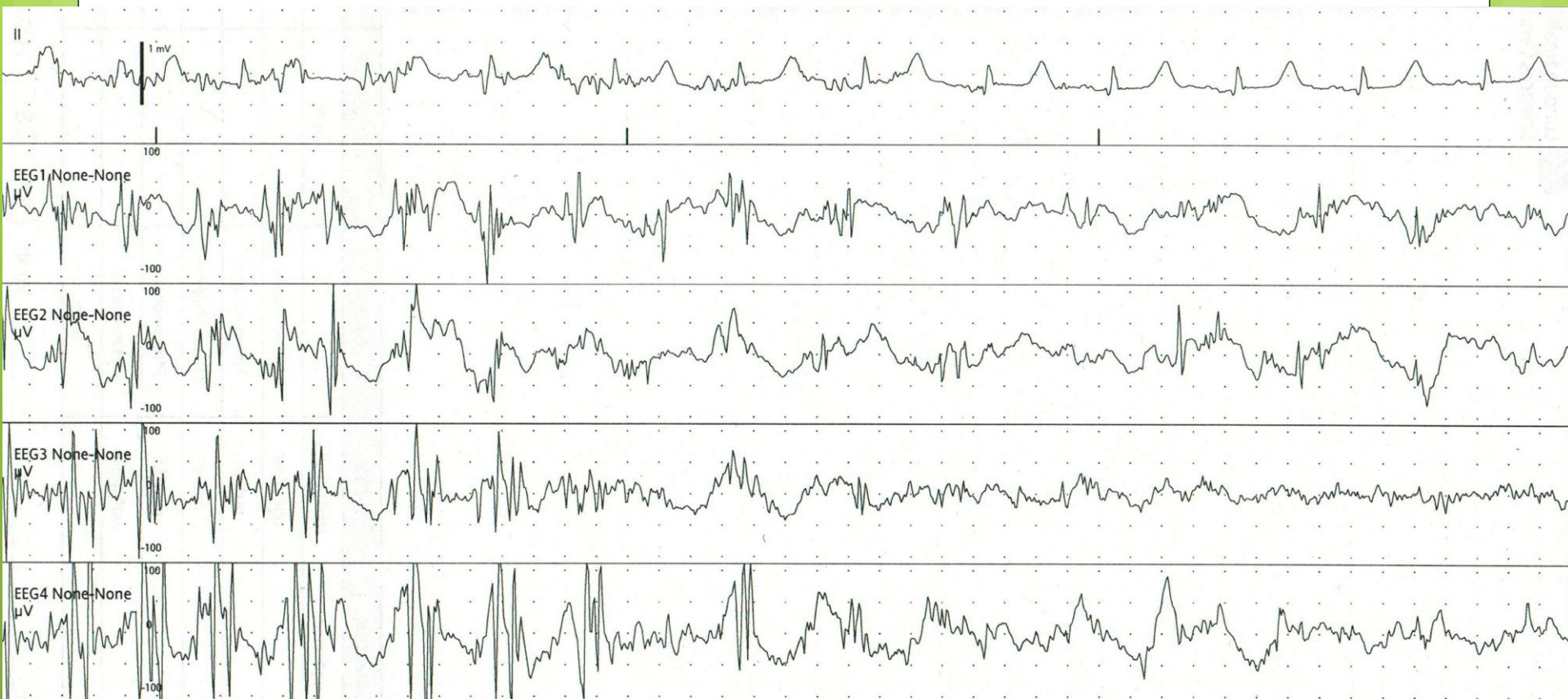
Generalised Convulsive Seizure



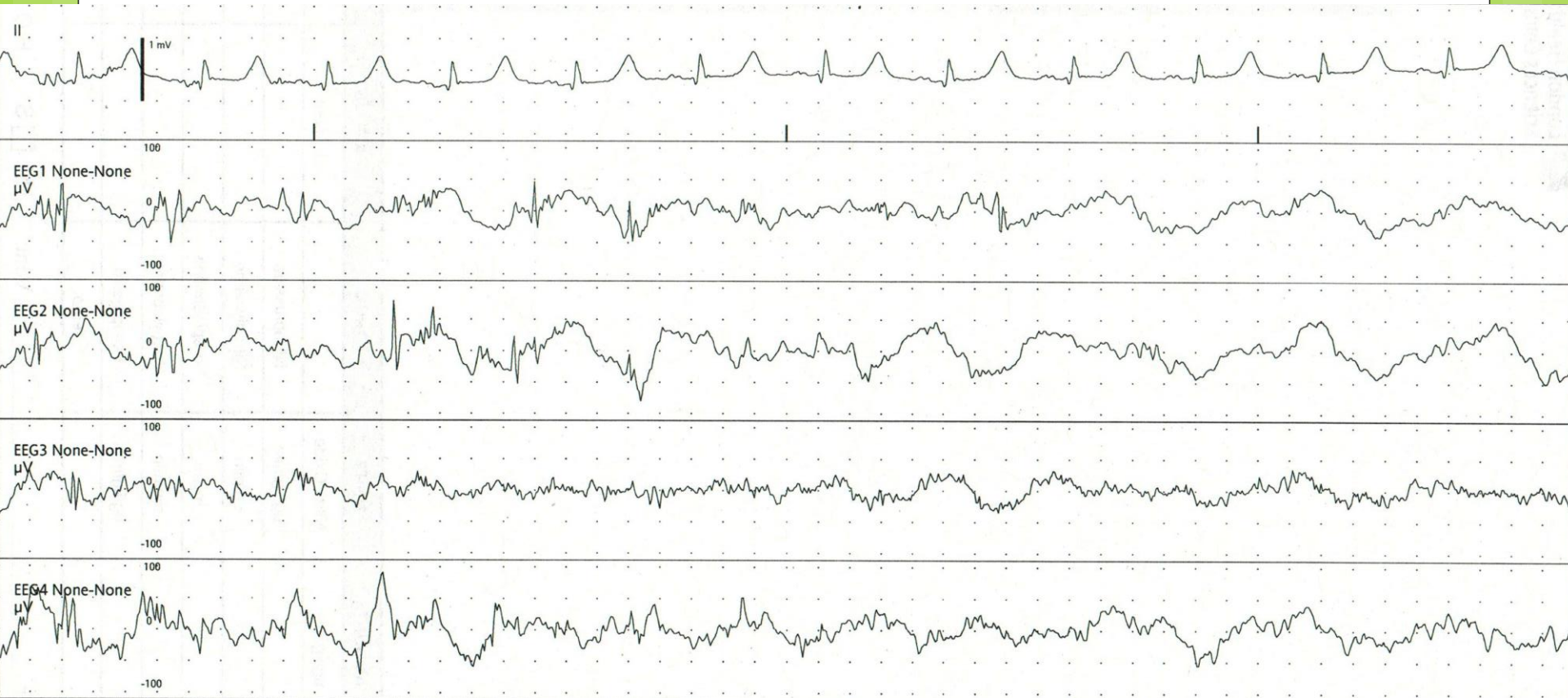
Generalised Convulsive Seizure



Generalised Convulsive Seizure



Generalised Convulsive Seizure



Generalised Convulsive Seizure



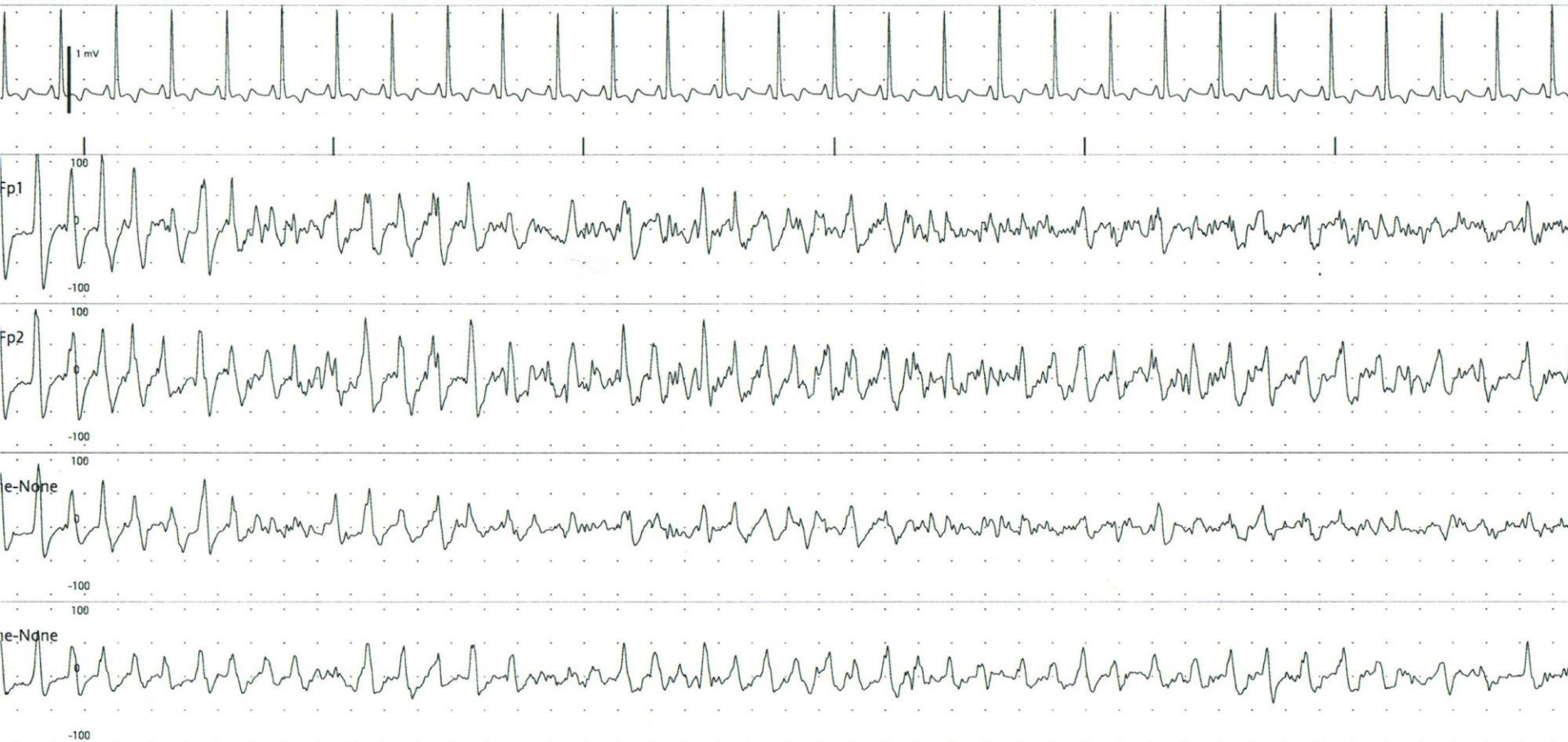
Generalised Non-convulsive Seizure



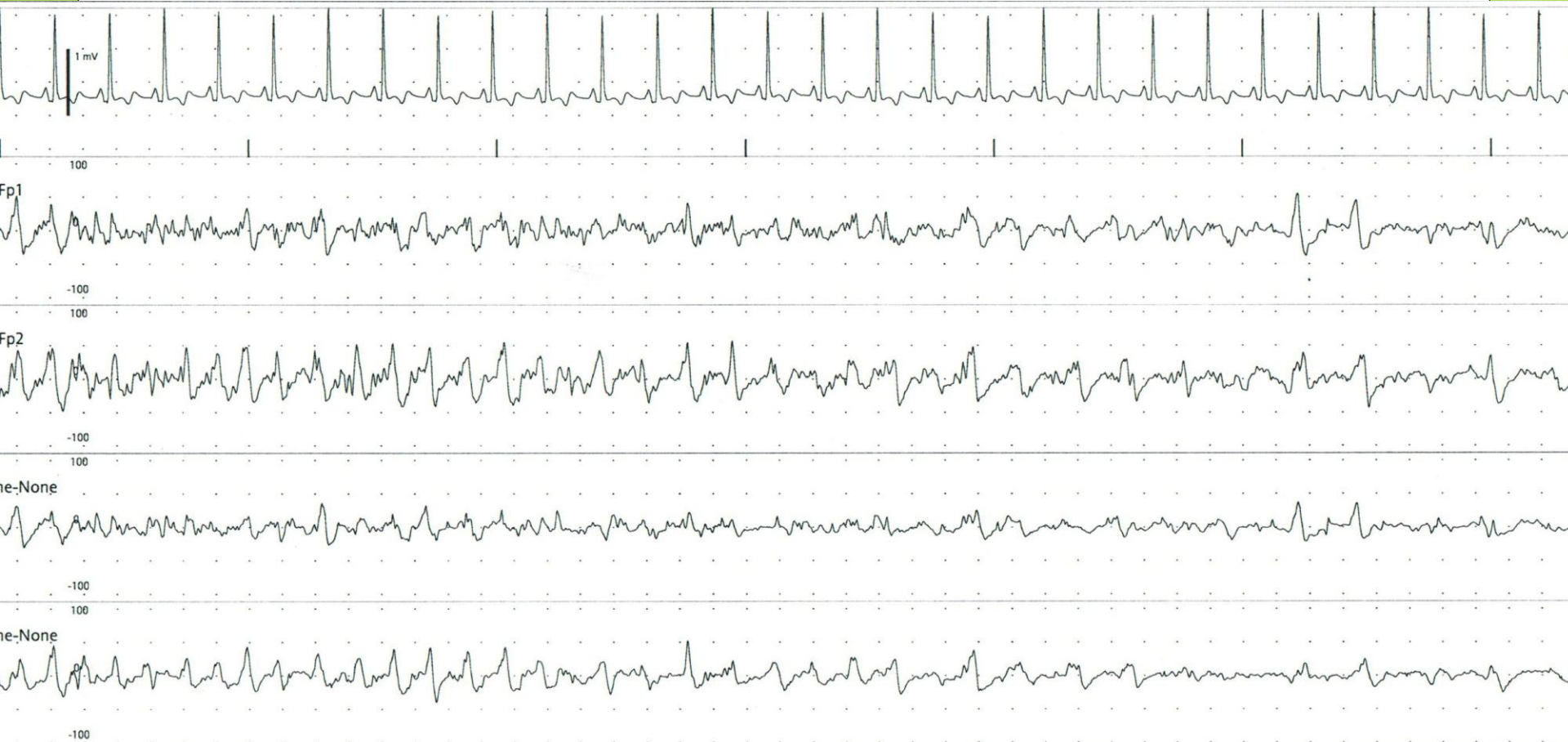
Generalised Non-convulsive Seizure



Generalised Non-convulsive Seizure



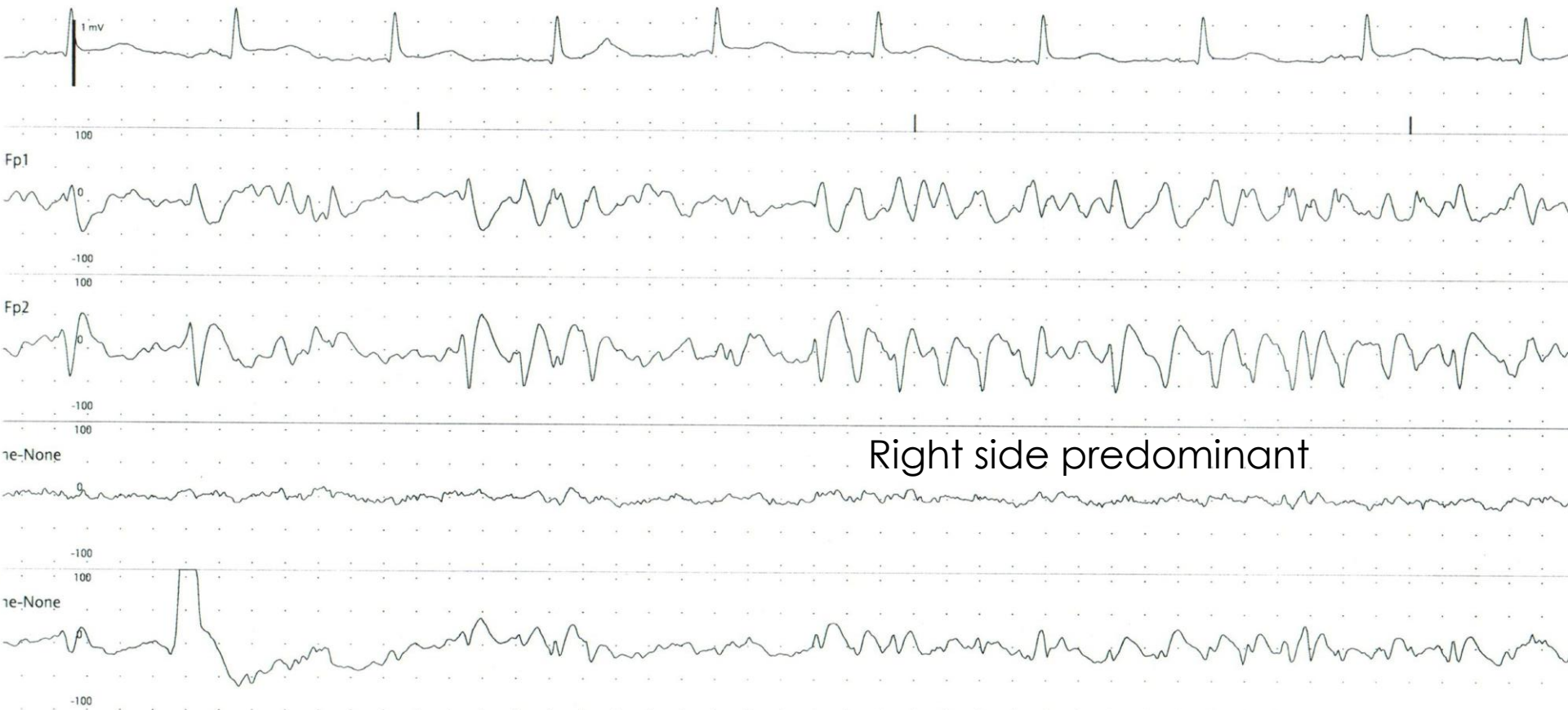
Generalised Non-convulsive Seizure



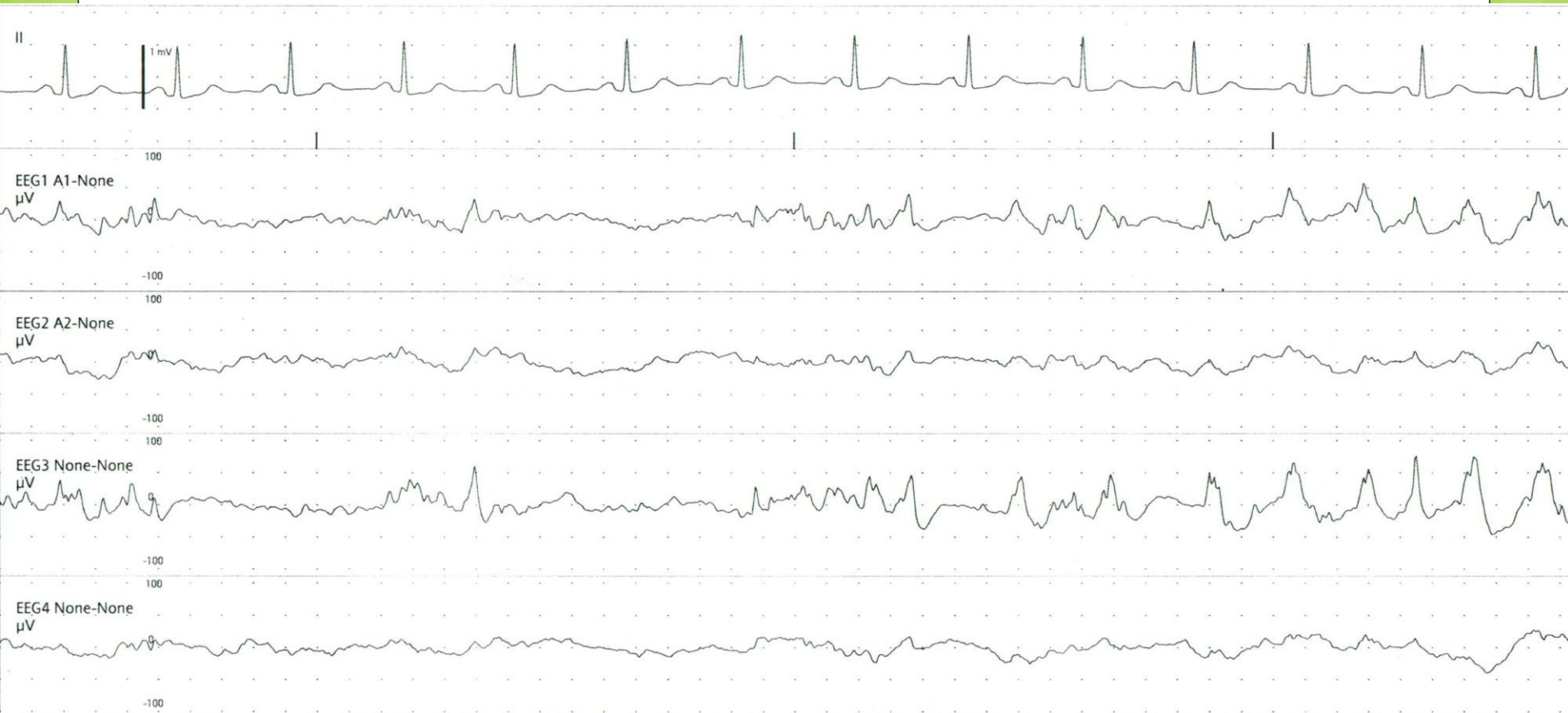
Focal Seizure

- Onset in a focal region
- May secondarily generalise to involve all cerebral regions

Focal Seizure



Focal Seizure 2



Focal Seizure 2



Focal Seizure 2



Focal Seizure 2

