2023 GW Epilepsy Board Review & Best Practices

NONEPILEPTIC PAROXYSMAL DISORDERS IN ADULTS

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DISCLOSURES

- **Disclosure of Financial Relationships**
  - **None**

- **Off-Label Usage**
  - **None**

Overview

- Differential Diagnosis of Seizures
- Non-epileptic events (physiologic)
- Non-epileptic events (psychogenic)
- Frontal Lobe Seizures and Focal Aware Seizures

Differential Diagnosis of Seizures

- Detailed history is crucial (in lay person terms)
- Cell phone home videos are extremely helpful
- Non-epileptic ≠ Psychogenic

Non-epileptic Events

- Physiologic
  - Cerebrovascular
  - Sleep disorders
  - Cardiac/Syncope
  - Movement disorders
  - Migraine
  - Behavioral
- Psychogenic
  - Conversion disorder / PTSD
  - Panic attacks / Anxiety
  - Factitious disorder and malingering

Cerebrovascular

- TIA and stroke → negative symptoms
- Epileptic seizures → positive symptoms

- Both may be stereotyped
- Both may be new onset in elderly
- Both may present with limb shaking (esp. in setting of critical carotid stenosis)

Sleep Disorders

- Hypnic Jerks (Benign Myoclonus of Sleep)
- Narcolepsy
- Parasomnias
- Sleep paralysis
- Obstructive sleep apnea
- Hypersomnia

In the differential diagnosis of nocturnal events, which of the following parasomnias are more likely to occur much later during a night of sleep?

A. Somnambulism
B. Confusional Arousals
C. Nightmares
D. Night Terrors
E. Sleep Related Eating Disorder

Parasomnias

- Early in the night (NREM)
  - Sleepwalking
  - Sleep Related Eating Disorder
  - Confusional Arousals
  - Night terrors
- Late in the night (REM sleep)
  - REM Behavior Disorder
  - Nightmares

Cardiac/Syncope

- Arrhythmia
- Valvular Disease
- Vasovagal Syncope
- Orthostasis

Syncope vs. Seizure

Convulsive Syncope	Bilateral Tonic Clonic Seizure
"Aura" of lightheadedness, palpitations, tunnel vision, tunnel hearing	Aura with typical epileptic semiology (or no aura, if primarily generalized)
Brief duration (<1 min)	Longer duration (2-3 min)
May respond to sitting / lying down (orthostasis)	Usually not positional
Possibly decreased tone	Increased tone
Generalized or multifocal myoclonus	Synchronous clonic activity
No post-event confusion*	Post-event confusion

*post-event (situationally appropriate) disorientation is common in any LOC

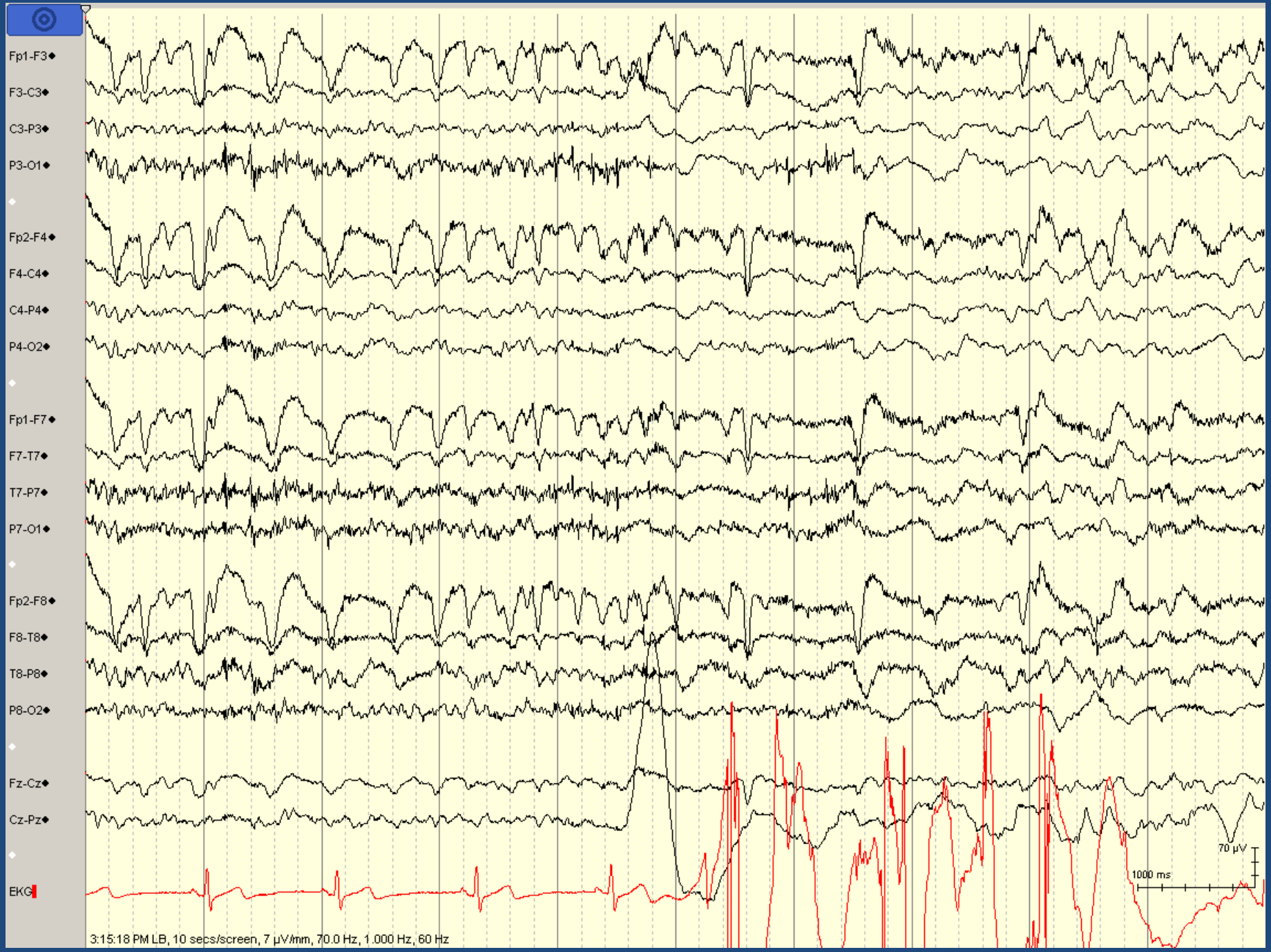
Shaking in syncope is common!

- 56 healthy volunteers had syncope induced using hyperventilation, orthostasis and valsalva
- 90% had myoclonic activity
  - Usually multifocal
  - Less commonly was generalized
- 79% had other movements

Lempert et al, Ann Neurol, 1994

The EEG findings in syncope are best characterized by:

A. Burst suppression
B. Normal background with abnormal EKG
C. Generalized slow activity, then attenuation
D. Focal slow activity, then attenuation
E. Focal attenuation, then slow activity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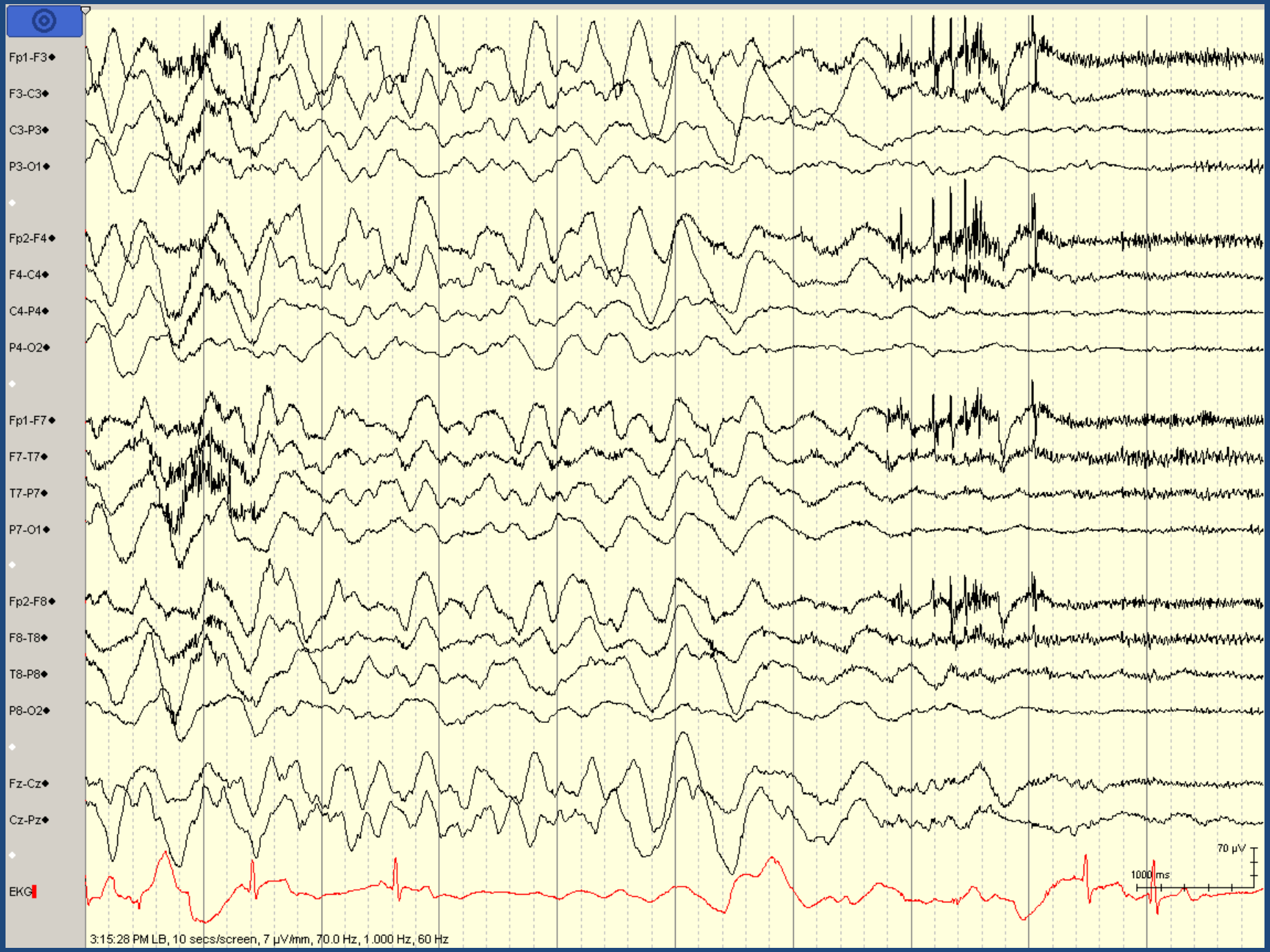
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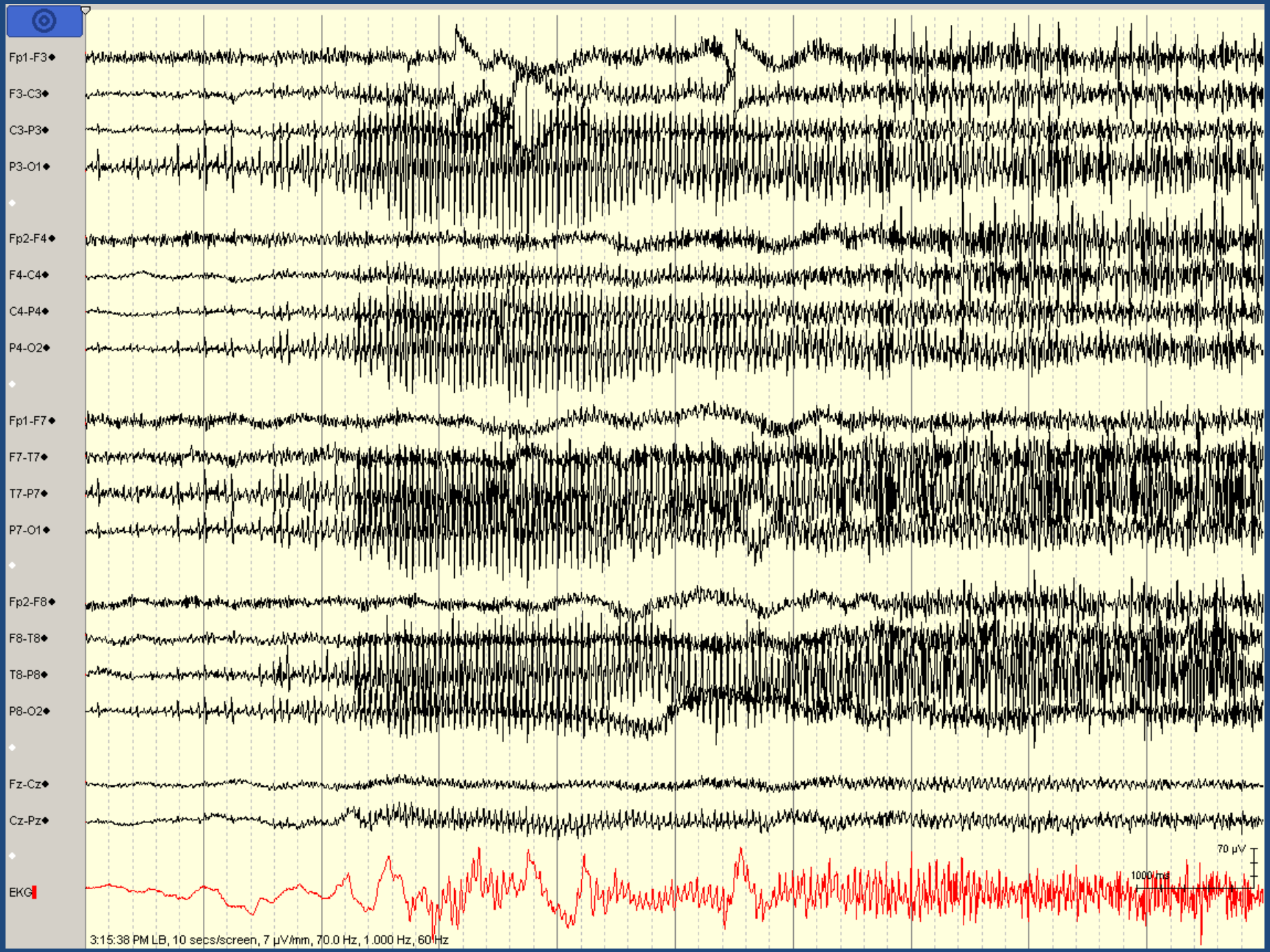
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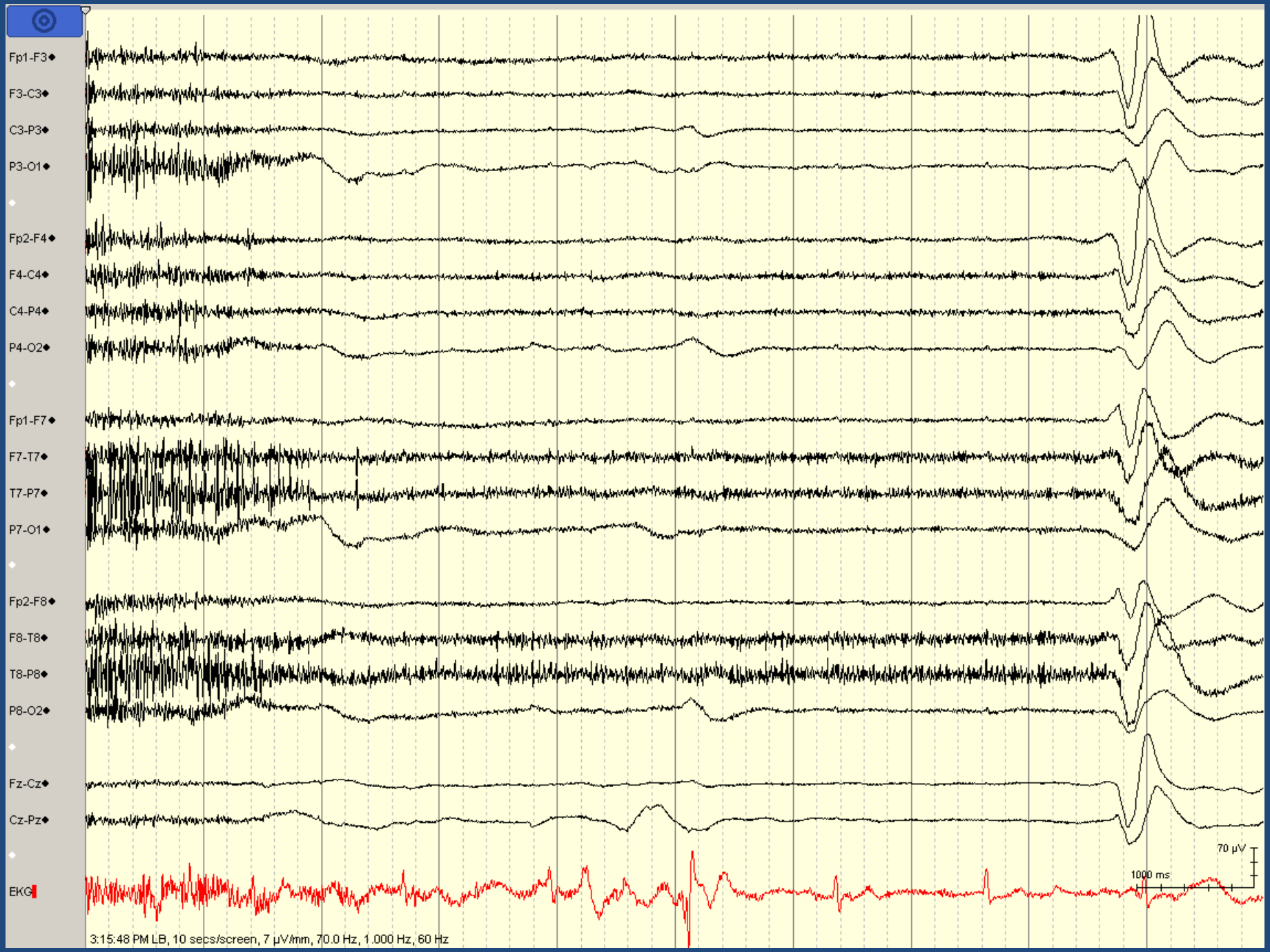
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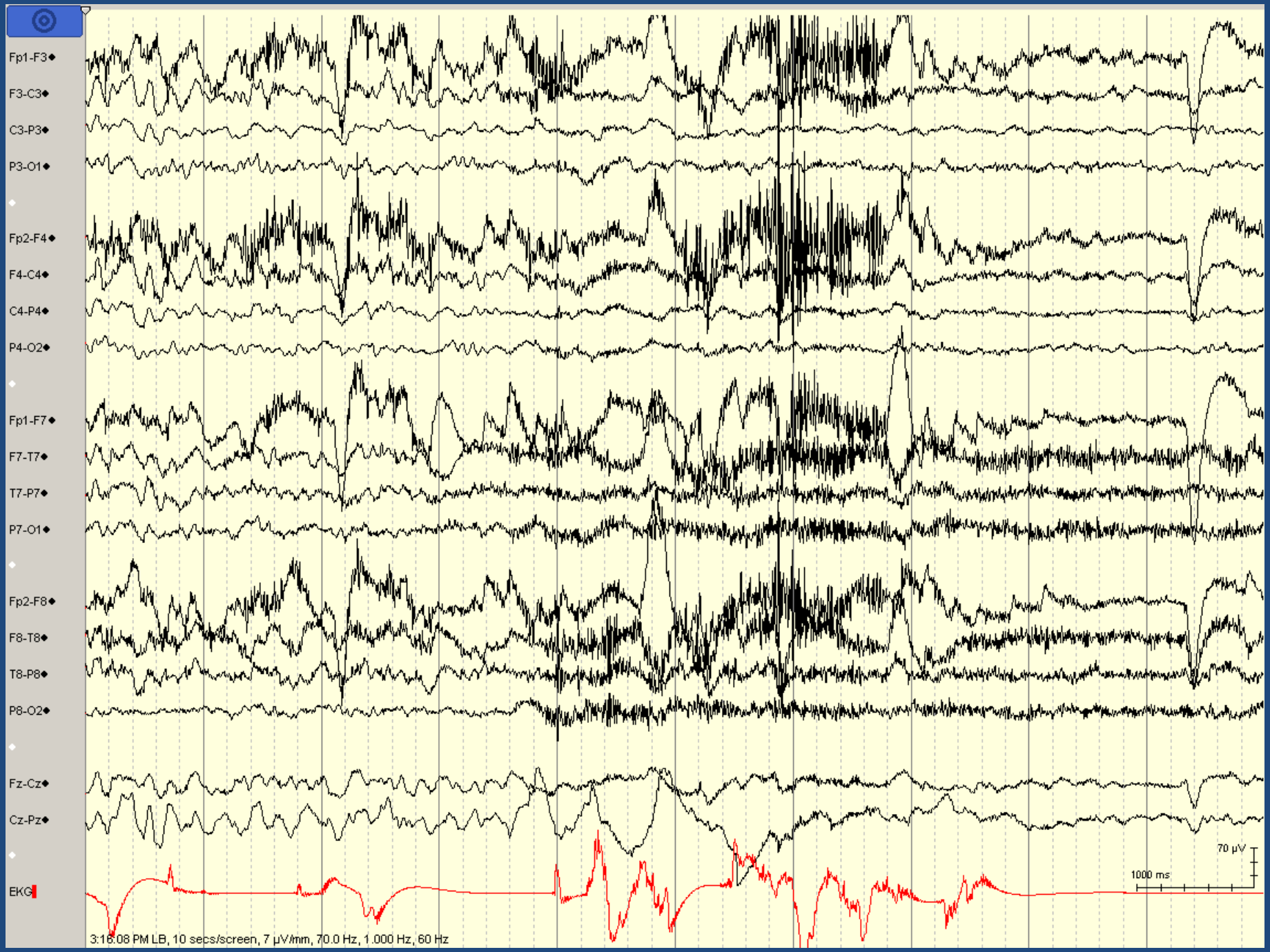
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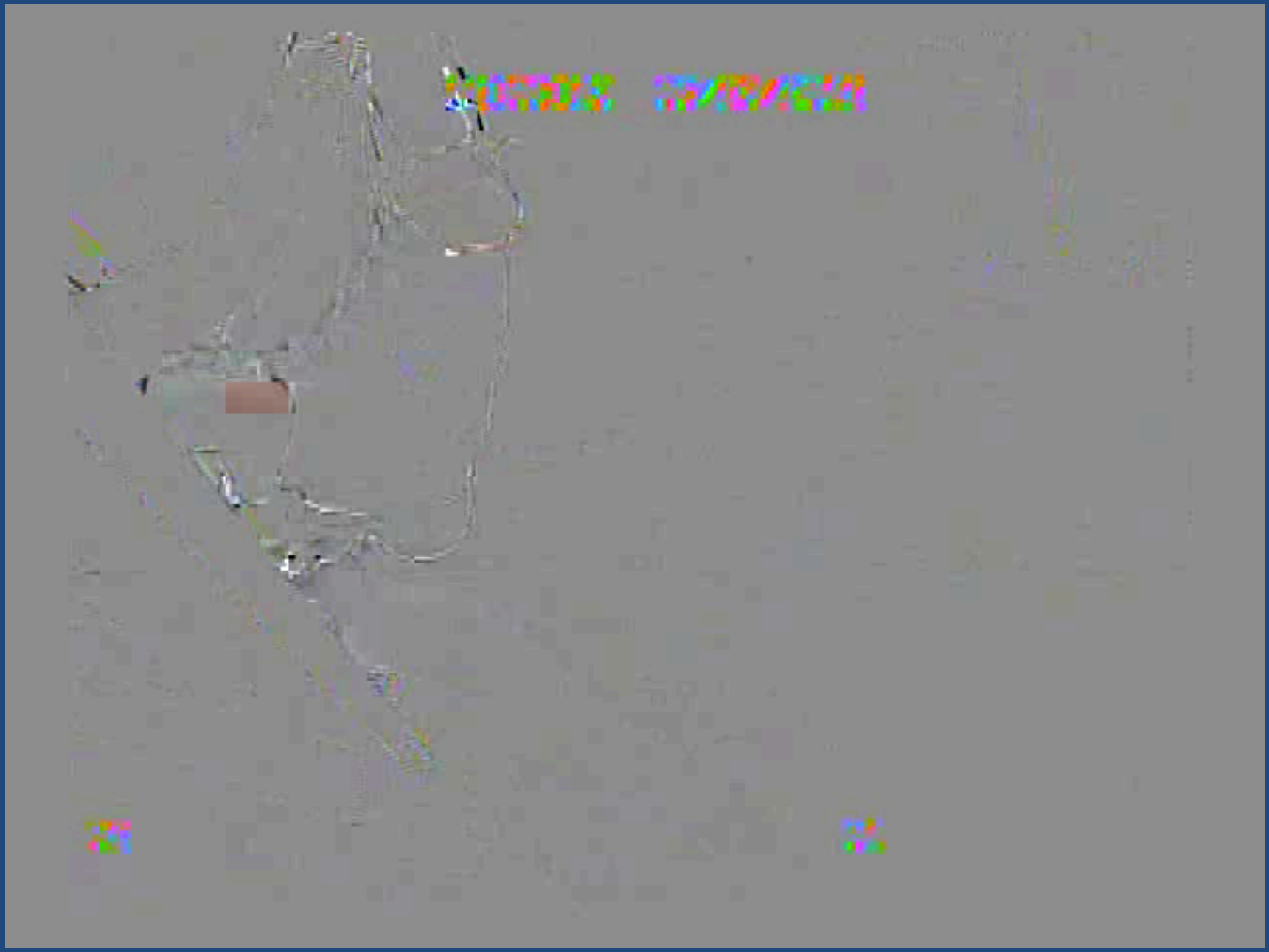

Psychogenic pseudosyncope (PPS)

- In “idiopathic syncope,” psychogenic causes are not necessarily investigated
- Video-EEG (or TCDs) usually required; often performed with Tilt Table Testing
- Eyes may be open during true syncope (and closed during PPS)
- Patients typically have increase in HR and BP with PPS

Raj et al, Autonomic Neuroscience, 2014

Non-epileptic Events

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  - Cerebrovascular
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  - Cardiac/Syncope
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  - Migraine
  - Behavioral
- Psychogenic
  - Conversion disorder / PTSD
  - Panic attacks / Anxiety
  - Factitious disorder and malingering

Psychogenic non-epileptic events

- Also called psychogenic non-epileptic seizures (PNES) or pseudoseizures
- The words “pseudo” or “seizure” or “spell” have negative connotations and should be avoided
- Includes “seizures” starting from “sleep” (i.e., pseudo-sleep)

Psychogenic non-epileptic events

- Video is as important as EEG correlation
- Detailed history and correlation with typical events is key
- Pathology usually is PTSD / conversion disorder (NOT malingerers or factitious)*

*though secondary gain may perpetuate it

Etiology and Predisposing Factors

- Trauma (Combat, Abuse)
- Personality Disorders (esp. borderline)
- Poor Coping Skills
- Comorbidities (PTSD, Anxiety, Depression)
- Illness Perception
  - Alexithymia (inability to name/express emotions)
  - External locus of control

Reuber, Epilepsy and Behavior, 2008

PNES: Patient education

- Avoid “pseudo-seizure” or “seizure” (“non-epileptic” may be too technical)
- Use easy-to-understand examples that patients may understand
  - stress-induced migraines, ulcers, fainting
  - PTSD in veteran and victims of abuse/violence
- Validate the diagnosis
  - Clearly state that the patient ***is not faking it*** and ***is not doing it on purpose***
  - Not saying this implies the opposite, in most cases
  - Written brochure on PNES will help validate it as a “real” diagnosis (patients assume we give this diagnosis because “we can’t really figure it out”)
- Do not abandon patient
  - Establish clear follow up with neurology and psychiatry
  - Assess patient’s understanding and insight at the follow-up visit

PNES: Provider education

- Provide clear education and documentation to other providers
- Many neurologists, psychiatrists, and PCPs still believe these patients are malingering / factitious (which is WRONG)
- Psychiatrists will be hesitant to treat without clear statement of:
  - confirmed diagnosis of PNES
  - normal EEG without any evidence of seizures or epilepsy
  - neurologist's opinion that medications are not indicated
  - neurologist managing meds (and tapering them off, if appropriate)
- Lack of neurology follow up often results in "neurologist shopping" and inappropriate restarting of medication

Characteristic PNES Semiology

- gradual onset or termination
- occurrence during “pseudosleep”
- discontinuous movements
- asynchronous (out-of-phase) activity
- side-to-side head movement
- pelvic thrusting
- opisthotonic posturing
- stuttering
- weeping
- preserved awareness during bilateral motor activity
- postictal whispering
- eye closure of long duration
- less severe physical injuries - controversial

Gedzelman and LaRoche, Neuropsychiatr Dis Treat, 2014

Which of the following symptoms are commonly seen in psychogenic non-epileptic events (but NOT typically seen in generalized / bilateral tonic clonic seizures)?

A. Synchronous limb jerking
B. Post event confusion
C. Tip of the tongue bite
D. Urinary incontinence
E. Bowel incontinence

PNES vs. Seizure

Convulsive PNES	Generalized / Bilateral Tonic Clonic Seizure
Variable or multiple symptom types	Stereotyped symptoms
Prolonged duration (>5 minutes)	Duration usually 2-3 minutes
Waxing and waning intensity	Tonic activity → Clonic activity that slows down and stops
May have explosive frequency (without apparent functional interference)	Usually infrequent
Asynchronous or variable shaking (flailing, flopping, or lateral movements)	Synchronous clonic activity
Post event confusion minimal in comparison to event	Post-event confusion
Keeping eyes closed (or resisting opening)	Eyes open
Rapid, shallow (or normal) breathing (during or after event)	Slow, deep stertorous respiration (post-ictal)
Medial/anterior/tip tongue bite	Lateral/posterior tongue bite

Predictive Value of PNES Semiology

- Prospective study of eyewitness reports of 48 PNES and ES signs, compared to (EEG-blinded) epileptologist video review
- Eyewitness reports not reliable (equivalent to guessing)
- Reliable for PNES (high spec, low sens):
  - Preserved awareness
  - Eye flutter
  - Bystanders can intensify or alleviate
- Reliable for ES (high sens, low spec):
  - Abrupt onset
  - Eye-opening/widening at onset
  - Postictal confusion/sleep

Syed et al, Ann Neurol, 2011

Which of the following respiration patterns is commonly seen in psychogenic non-epileptic events (but NOT typically seen in generalized / bilateral tonic clonic seizures)?

A. Short inspiratory phases
B. Long expiratory phases
C. Long duration of respirations
D. Loud snoring
E. Slow respiratory rate

Post-event breathing pattern

	Bilateral Tonic Clonic Seizure	PNES
Inspiratory and expiratory phases	Long	Short
Respiratory rate	Regular	Increased and irregular
Duration of altered breathing	Long (mean 347 s)	Short (mean 94 s)
Snoring (stertor)	Loud	Absent
Post-event agitation	Possible	Rare

Azar et al, Epilepsia, 2008

Treatment trials in PNES

- CBT effective (series of 21 patients, 12 weeks)
  - 17 completed program, 11 became event free
  - Statistically significant improvement in multiple surveys/scales of depression, trauma, impulsivity, and psychosocial functional status
- Pilot RCT (34 patients, 16 weeks)
  - CBT vs. sertraline vs. both vs. treatment as usual
  - [CBT] and [CBT + sertraline] arms showed significant improvement in event frequency and some psychosocial scales

Lafrance et al, Epilepsy Behav, 2009
Lafrance et al, JAMA Psychiatry, 2014

Which of the following features suggest a poorer prognosis in patients with psychogenic nonepileptic events?

A. Female gender
B. Lower intelligence quotient
C. Identifiable psychological trauma
D. Short duration of illness
E. No ongoing anti-epileptic drug use

Good Prognostic Factors*

- Short duration (mean dx delay 7-16 yrs)
- Minimal psych comorbidities
- Identifiable trauma
- Living independently
- Normal IQ
- Less dramatic event symptoms
- No ICU / “status epilepticus” admissions
- Female gender
- No ongoing seizure medication use

*Prognosis Variable (not systematically studied)

1/3 of patients become event free

1/4 or more become chronic

Many will relapse after 2-5 years

Bodde et al., Seizure, 2009

Reuber, Epilepsy and Behavior, 2008

Frontal Lobe Seizures

- Semiology “too” bizarre to be psychogenic
- May have normal ictal and interictal EEG

- Typically short and stereotyped
- Often nocturnal (out of real sleep, not pseudosleep)
- May have pelvic thrusting and hypermotor activity

- Diagnostic clues:
  - Medication responsiveness
  - evolution to bilateral tonic clonic seizures

What percentage of focal aware (simple partial) seizures have scalp EEG correlate?

A. 0%
B. 25%
C. 50%
D. 75%
E. 100%

Focal Aware Seizures

(Simple Partial Seizures)

- Focal seizures without alteration of awareness (includes isolated auras)
- 70-90% do not have scalp EEG correlate
- Predominantly subjective events without EEG change should be interpreted with caution

Verma and Radtke, J Clin Neurophysiol, 2006

Summary

- History and video-EEG monitoring are crucial in differentiating epileptic seizures from non-epileptic events

- Not all non-epileptic events are psychogenic
- Most psychogenic patients are conversion disorder
- Neurologists must not abandon psychogenic patients

- Lack of EEG changes not enough to diagnose non-epileptic events
  - video as important as EEG
  - be cautious about frontal lobe and focal aware seizures

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